Rolling Plains Groundwater Conservation District
Groundwater Management Plan 2020-2025

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ROLLING PLAINS GROUNDWATER CONSERVATION DISTRICT

GROUNDWATER MANAGEMENT PLAN 2020-2025

DISTRICT MISSION

The Rolling Plains Groundwater Conservation 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.

TIME PERIOD FOR THIS PLAN

This management document is intended as a tool to focus the thoughts and actions of those given the responsibility for the execution of district activities throughout the five-year period that is the focus of this plan, (i.e. 2020-2025). After five years, the plan will be reviewed, but may be revised at any time in order to maintain consistency or to address any new or revised data, groundwater availability models, desired future conditions, state or regional water plans, or district management strategies.

STATEMENT OF GUIDING PRINCIPLES

The District recognizes that the groundwater resources of the region are of vital importance. The preservation of this most valuable resource can be managed in a prudent and cost-effective manner through education and cooperation. The greatest threat to prevent the district from achieving the stated mission is inappropriate management, based on a lack of understanding of local conditions. A basic understanding of the aquifers and their hydrogeologic properties, as well as a quantification of resources, is the foundation from which to build prudent planning measures.

GENERAL DESCRIPTION

The District was created by the citizens of Haskell and Knox Counties through election, January 27, 1999. Baylor County was added to the District after an annexation petition and subsequent referendum on August 12, 2000. Senate Bill 611 of the Seventy-seventh Legislature was signed by the Governor on May 5, 2001. This changed the name of the District and provided for the Board of Directors to include members from Baylor County. The current officers are Glenn Ray Howell-President, Barry Ratliff-Vice-President, and, Chris Orsak-Secretary-Treasurer. The other members are Jerry Bob Daniel, Jimmy Burson, Travis Floyd, David Albus, Micheal Adams, and Kenny Shipman. Senate Bill 1925 in the Seventy-eighth Legislature further defined the District's properties. The District General Manager is Mike McGuire, who represents Water Districts as a voting member of RWPG B and GMA 6 on RWPG Brazos G. Rolling Plains Groundwater Conservation District (RPGCD) has the same areal extent as that of Baylor, Haskell and Knox Counties, Texas. The Counties have an economy dominated by the agricultural community. The

agricultural income is derived primarily from cotton, peanuts, wheat, and beef cattle production. Production of petroleum also contributes to the income of the counties. Wind farms are a new sight for the counties.

LOCATION AND EXTENT

Baylor, Haskell and Knox Counties, having an areal extent of 2,667 square miles, are located in northwest central Texas. The counties are bounded on the east by Archer and Throckmorton Counties, on the north by Foard and Wilbarger Counties, on the west by King and Stonewall Counties, and on the south by Jones and Shackelford Counties. Seymour, which is centrally located in the county, is the county seat of Baylor County. Haskell, which is centrally located in the county, is the county seat of Haskell County. Benjamin, which is centrally located in the county, is the county seat of Knox County.

TOPOGRAPHY AND DRAINAGE

Topographically, the District consists of rolling plains heavily dissected by Brazos and Wichita River drainage. The altitude of the land surface ranges from 1,053 to 1,681 feet above mean sea level.

Baylor County lies within the drainage system of the Brazos and Wichita River basins. The Brazos River enters the county from the west and traverses through the middle of the county and exits through the southeast corner. The Wichita River enters the county from the west and traverses across the upper half of the county and exits through the northeast corner.

Knox County lies within the drainage system of the Brazos and Wichita River basins. The Brazos River enters the county in the southwest and traverses through the middle of the county and exits through the east side. The Wichita River enters the county from the west and traverses through the middle of the county and exits through the northeast corner.

Haskell County lies within the drainage system of the Brazos River. The Brazos River parallels the western boundary of the county and shows up again in the southeastern corner of the county.

GROUNDWATER RESOURCES OF BAYLOR, HASKELL AND KNOX COUNTIES

The Seymour Aquifer is the only source of moderate to large supplies of fresh groundwater in Baylor, Haskell and Knox Counties. No alternative fresh supplies exist from deeper formations. The aquifer underlies 321,220 acres and furnishes water to over 3,000 irrigation wells. Municipal, domestic, and stock supplies are also dependent on the Seymour.

The geologic and hydrologic character of the Seymour is quite variable. Typically, wells are 40 to 60 feet deep and are completed in the lower part of the formation, which normally consists of sand and gravel. Well yields average 125 gallons per minute and are as high as 400 gallons per minute.

Specific capacities of wells average over 50 gallons per minute per foot of drawdown. Saturated thickness is typically between 20 and 40 feet. Transmissivities range from 20,000 to over 300,000 gallons per day per foot and average 100,000 gallons per day per foot. Ground-water movement rates, unaffected by pumping, average between 800 and 1,200 feet per year.

Nearly all recharge to the Seymour is by direct infiltration of precipitation on the land surface. Analysis of pumping, water levels, and precipitation over the past 20 years indicates that nearly 55,000 acre-feet per year is available for pumping by wells. Annual pumping in recent years has ranged from about 30,000 acre-feet to about 70,000 acre-feet, averaging 45,600 acre-feet.

Water quality in the Seymour is variable. The dissolved solids content of natural water from individual wells ranges from about 300 milligrams per liter to 3,500 milligrams per liter. Most values are between 400 and 1,500 milligrams per liter. The best quality water is found in and adjacent to the more important recharge areas. Generally, water quality is satisfactory for irrigation purposes. Most water quality meets state standards for public supplies, except for nitrate content that commonly exceeds the limit of 45 milligrams per liter. Nitrate contents of Seymour water are typically from 30 to 90 milligrams per liter. Available chemical analyses and nitrogen isotope analyses indicate most of the nitrate in the Seymour results from leaching of natural soil nitrate due to cultivation.

The Seymour Aquifer is susceptible to pollution from both surface and near surface sources. Over 3,200 past and present, actual and potential, pollution sources exist on the Seymour Aquifer. Most are only potential sources; actual count is believed to number a few hundred. Existing pollution is due mainly to past pollution sources and activities, and not to current practices. Most existing pollution has been due to oil field brines and septic tank discharge.

It is estimated that about 2 percent of the water in the Seymour Aquifer is affected by pollution. About 75 percent of the existing pollution is estimated to be due to the past disposal of oil field brine into unlined surface pits. An estimated 20 percent has been caused by leaky injection wells and unplugged abandoned holes. About 4 percent of existing pollution results from septic tanks, while miscellaneous sources are responsible for 1 percent. Little effect on water quality results from return flow of irrigation water, evapotranspiration, or agricultural application of fertilizer and pesticides.

The portions of the aquifer affected currently by pollution are relatively localized. The portions of the aquifer affected by pollution will increase in the future due to the natural movement of ground water and to the spreading effects caused by pumping wells. However, portions of the aquifer affected by significant pollution will not become extremely large in the future. Significant future pollution problems will be confined mostly to individual properties as opposed to large areas of the aquifer.

Correcting existing pollution can take years, or even decades, and can be very costly. Thus, prevention rather than correction is most important in dealing with ground-water pollution. For past pollution sources, it is possible only to control the resulting pollution plumes either by removal or avoidance measures. Pollution removal measures involve pumping by wells to remove the pollutants from the aquifer. Typically, this is impractical because of the large volumes of water

that must be pumped, the relatively long period of time required, and problems regarding disposal of pumped water. Avoidance methods include relocating wells affected by pollution or selective pumping and blending to obtain a quality of water that can be used. These can be effective methods if the pollution is not severe or if the property involved is large, and sufficient quantities of unpolluted water can be obtained.

ESTIMATE OF MODELED AVAILABLE GROUNDWATER

The current estimate of Modeled Available Groundwater is detailed in GAM Run 16-031 MAG, attached as Appendix A.

ESTIMATED ANNUAL GROUNDWATER USE

Water resources, needs, demands and management strategies are detailed in the TWDB report, Estimated Historical Water Use and 2017 State Water Plan Datasets, April 3, 2020, which is attached as Appendix B.

ESTIMATES OF ANNUAL GROUNDWATER RECHARGE FROM PRECIPITATION

Refer to GAM Run 19-020 found in Appendix C.

ESTIMATES OF ANNUAL GROUNDWATER DISCHARGE TO SPRINGS/SURFACE WATER BODIES

Refer to GAM Run 19-020 found in Appendix C.

ESTIMATES OF ANNUAL GROUNDWATER FLOW INTO/OUT OF THE DISTRICT; ESTIMATES OF ANNUAL GROUNDWATER FLOW BETWEEN DISTRICT AQUIFERS

Refer to GAM Run 19-020 found in Appendix C.

ESTIMATES OF PROJECTED SURFACE WATER SUPPLY

Refer to Estimated Historical Water Use and 2017 State Water Plan Datasets, April 3, 2020, which is attached as Appendix B.

ESTIMATES OF PROJECTED TOTAL DEMAND FOR WATER IN THE DISTRICT

Refer to Estimated Historical Water Use and 2017 State Water Plan Datasets, April 3, 2020, which is attached as Appendix B.

ESTIMATES OF PROJECTED WATER SUPPLY NEEDS

As a member of Regional Water Planning Groups B & Brazos G, the District provides input, in developing the water supply needs for these groups. Unmet irrigation water supply needs in the adopted state water plan were considered by the District in the development of this management plan and will be considered in those to come. The numbers, presented, discussed and adopted, are presented in the Estimated Historical Water Use/2017 Texas State Water Plan report in Appendix B. Unmet irrigation water needs will be a recurring part of state water plans in the future.

Refer to Estimated Historical Water Use and 2017 State Water Plan Datasets, April 3, 2020, which is attached as Appendix B.

WATER MANAGEMENT STRATEGIES

Water management strategies were considered in an effort to mitigate the projected unmet irrigation needs highlighted in the Estimated Historical Water Use/2017 Texas State Water Plan report in Appendix B. Demand reduction was adopted as the preferred strategy, lacking any other feasible strategy at this time. As technology advances in application techniques, crop mixes, plant breeding and agronomic methods take place, demand reduction may become more feasible over time. These technologies, however, will require time, effort and money to implement, especially without causing major reductions in yield and profitability. The District will monitor research into Managed Aquifer Recharge (MAR) and the technologies being developed to facilitate this process.

Refer to Estimated Historical Water Use and 2017 State Water Plan Datasets, April 3, 2020, which is attached as Appendix B.

DISTRICT RULES

The District Rules are attached as Appendix D. They are also available online at:
http://www.rpgcd.org/rulesandmanagement.html

MANAGEMENT OF GROUNDWATER SUPPLIES

The District will manage the supply of groundwater within the District, in order to conserve the resource while seeking to maintain the economic viability of all resource user groups, public and private. In consideration of the economic and cultural activities occurring within the District, the District will continue to identify and engage in such activities and practices, which if implemented, would result in preservation and protection of the groundwater. The observation network will continue to be reviewed and maintained in order to monitor changing conditions of groundwater within the District. The District will undertake investigations of the groundwater resources within the District and will make the results of investigations available to the public.

The District has adopted rules and has started the process of updating these rules to regulate groundwater withdrawals by means of spacing and/or production limits. The relevant factors to be considered in making the determination to grant a permit or limit groundwater withdrawal, will

include:

1. The purpose of the District and its rules;
2. The equitable conservation and preservation of the resource; and
3. The economic hardship resulting from granting or denying a permit or the terms prescribed by the rules.

In pursuit of the District's mission of preserving and protecting the resource, the District will enforce the terms and conditions of permits and the rules of the District by enjoining the permit holder in a court of competent jurisdiction, as provided for in TWC Chapter 36.102, if necessary.

DROUGHT CONTINGENCY PLAN

Drought is a normal, recurrent feature of climate, although many erroneously consider it a rare and random event. Drought is also a temporary aberration, and differs from aridity, which is restricted to low rainfall regions and is a permanent feature of climate ("What is Drought?", National Drought Mitigation Center). The Rolling Plains Groundwater Conservation District is in an arid region that also experiences drought. However, even in the midst of a drought, rainfall at crucial times of the growing season may significantly reduce irrigation water demand.

Drought response conservation measures typically used in other regions of Texas (i.e. rationing) cannot and are not used in this region due to extreme economic impact potential. In the District, groundwater conservation is stressed at all times. The Board recognizes that irrigated agriculture provides the economic stability to the communities within the District. Therefore, through the notice and hearing provisions required in the development and adoption of this management plan, the Board adopts the official position that, in times of precipitation shortage, irrigated agricultural producers will not be limited to any less usage of groundwater than is provided by District rules.

In order to treat all other groundwater user groups fairly and equally, the District will encourage more stringent conservation measures, where practical, but likewise, will not limit groundwater use in any way not already provided for by District rules.

ACTIONS, PROCEDURES, PERFORMANCE AND AVOIDANCE FOR PLAN IMPLEMENTATION

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

The District has adopted rules and has started the process of updating these rules relating to the implementation of this plan. The rules adopted by the District shall be pursuant to TWC Chapter 36 and the provisions of this plan. All rules will be adhered to and enforced. The promulgation and enforcement of the rules will be based on the best technical evidence available. The rules of the District are available at: **http://www.rpgcd.org/rulesandmanagement.html**

The District shall treat all citizens with equality. Citizens may apply to the District for discretion in enforcement of the rules on grounds of adverse economic effect or unique local characteristics. In granting of discretion to any rule, the Board shall consider the potential for adverse effect on adjacent owners and aquifer conditions. The exercise of said discretion by the Board shall not be construed as limiting the power of the Board.

METHODOLOGY FOR TRACKING PROGRESS TOWARD MEETING GROUNDWATER MANAGEMENT GOALS

The methodology that the District will use to track its progress on an annual basis in achieving all of its management goals will be as follows:
The District manager will prepare and present an annual report to the Board of Directors on District performance in regards to achieving management goals and objectives (during the first quarterly Board of Directors meeting each fiscal year). The report will include the number of instances each activity was engaged in during the year.
The annual report will be maintained on file at the District office.

GOALS, MANAGEMENT OBJECTIVES And PERFORMANCE STANDARDS

<u>Goal 1.0</u> **Providing the most efficient use of groundwater**

1.1. Management Objective

Each year, on four (4) or more occasions, the District will disseminate educational information relating to conservation practices for the efficient use of water resources at meetings, by email, by a posting to the District website, publication in media or by other means. These will include but are not limited to publications from the Texas Water Development Board, Texas Commission on Environmental Quality, Texas Agricultural Extension Service, and other resources.

1.1a Performance Standard

Number, annually, on four (4) or more occasions, the District disseminated educational information relating to conservation practices for the efficient use of water resources.

Goal 2.0 Controlling and preventing waste of groundwater

2.1. Management Objective

Each year, on four (4) or more occasions, the District will disseminate educational/informational materials directed toward preventing the waste of groundwater at meetings, by email, by a posting to the District website, publication in media or by other means.

2.1a Performance Standard

Number, annually, of four (4) or more occasions the District disseminated educational/informational materials directed toward preventing waste of water each year.

Goal 3.0 Addressing conjunctive surface water management issues

3.1. Management Objective

Each year, on three (3) or more occasions, the District manager will attend meetings of Region B, Region O or Brazos G RWPG to remain current with surface water issues and to consider the water supply needs and water management strategies included in the adopted state water plan.

3.1a Performance Standard

Number, annually, on three (3) or more occasions, the District manager attends RWPG meetings.

Goal 4.0 Addressing natural resource issues

4.1. Management Objective

Each year the District will monitor five (5) or more selected wells within the District for possible contamination problems, which would jeopardize the integrity of the groundwater, by collecting samples for analysis**.**

4.1a Performance Standard

Number of samples collected and analyzed each year on five (5) or more wells.

4.1b Performance Standard

Number of contamination problems each year.

Goal 5.0 Addressing drought conditions

5.1. Management Objective

Each year the District will cooperate with the Natural Resource Conservation Service and the West Texas Mesonet in providing weather data on a daily basis for residents of the District. This data will be disseminated by the West Texas Mesonet website **http://www.mesonet.ttu.edu**, and the Agricultural Drought Task Force website **http:/agrilife.tamu.edu/drought**. The web sites will provide assistance in calculation of the evapotranspiration rate (ET) of crops and lawns, to provide for efficient watering of these plants and awareness of drought conditions.
The TWDB website (**http://www.waterdatafortexas.org/drought/)** provides information and data relative to Texas Drought Conditions.

5.1a Performance Standard

Number, annually, of one (1) or more weather stations that the District maintains to provide data collection to these cooperating agencies.

5.2. Management Objective

Each year, the District will cooperate with the Texas Water Development Board in monitoring wells that may be used to implement drought planning and providing for this information to be available on the Internet.

5.2a Performance Standard

Number, annually, of one (1) or more on-line wells the District assists in the collection and dissemination of well levels.

5.2b Performance Standard

Prepare a report reflecting the results of the water level monitor to the Board at the first quarterly meeting each fiscal year for a yearly comparison.

Goal 6.0 Addressing conservation

6.1. Management Objective

Each year, on four (4) or more occasions, the District will disseminate educational information relating to conservation of water resources at meetings, by email, by a posting to the District website, publication in media or by other means.. These will include but are not limited to publications from the Texas Water Development Board, Texas Commission on Environmental Quality, Texas Agricultural Extension Service, and other resources.

6.1a Performance Standard

Number, annually, on four (4) or more occasions, the District disseminated educational information relating to conservation of water resources.

6.2. Management Objective

Each year the District will monitor water levels in five (5) or more selected wells within the District.

6.2a Performance Standard

Number of water levels taken each year on five (5) or more selected wells.

6.2b Performance Standard

Prepare a report reflecting the results of the annual water level program to the Board at the first quarterly meeting each fiscal year for a yearly comparison of water level averages.

Goal 7.0 Addressing the desired future conditions

7.1. Management Objective

Annually, The District will review its permit and well registration in light of the Desired Future Conditions of the groundwater resources within the boundaries of the District to assess whether the District is on target to meet the Desired Future Conditions estimates submitted to the TWDB.

7.1a Performance Standard

The District's Annual Report will include a discussion of the District's permit and well registration and will evaluate the District's progress in achieving the Desired Future Conditions of the groundwater resources within the boundaries of the District and whether the District is on track to maintain the Desired Future Conditions estimates over the 50 year planning period.

7.2. Management Objective

Each year the District will monitor water levels in five (5) or more selected wells within the District.

7.2a Performance Standard

The District will annually measure the water levels in at least five monitoring wells within the District and will determine the five-year water level averages based on the measurements taken. The District will compare the five-year water level averages to the corresponding five-year increment of its Desired Future Conditions in order to track its progress in achieving the Desired Future Conditions.

7.2b Performance Standard

The District's Annual Report will include the water level measurements taken each year to assess the District's progress towards achieving its Desired Future Conditions. Once the District has obtained water level measurements for five consecutive years and is able to calculate water level averages over five-year periods thereafter, the District will include a discussion of its comparison of water level averages to the corresponding five-year increment of its Desired Future Conditions in order to track its progress in achieving its Desired Future Conditions.

SB-1 MANAGEMENT GOALS DETERMINED NOT-APPLICABLE

Controlling and preventing subsidence

Subsidence in GMA 6 only occurs in the form of dissolved gypsum, salt and limestone formations that can cause localized sinkholes, depressions and subsurface cavities. The only way to control these sinkholes is to dewater that portion of the aquifer where the minerals are being dissolved.

The TWDB subsidence risk report: Identification of the Vulnerability of the Major and Minor Aquifers of Texas to Subsidence with Regard to Groundwater Pumping – TWDB Contract Number 1648302062, by LRE Water: http://www.twdb.texas.gov/groundwater/models/research/subsidence/subsidence.asp states that "Results of the assessment suggest that the aquifer has generally low risk for future subsidence due to pumping." *Therefore, the management goal for controlling subsidence within the District is not applicable to the operations of the District*.

Addressing recharge enhancement.

The District has determined that this goal is not presently appropriate or cost-effective. The District continues to monitor research into Managed Aquifer Recharge (MAR) and the technology being developed. *Therefore, the management goal of Recharge Enhancement within the District is not applicable to the operations of the District*.

Addressing rainwater harvesting.

The District has determined that this goal is not presently appropriate or cost-effective. *Therefore, the management goal of Rainwater Harvesting within the District is not applicable to the operations of the District*.

Addressing precipitation enhancement.

The District has determined that this goal is not presently appropriate or cost-effective. *Therefore, the management goal of Precipitation Enhancement within the District is not applicable to the operations of the District*.

Addressing brush control.

Existing programs administered by the USDA-NRCS are addressing this issue. The District has determined that this goal for the District is not presently appropriate or cost-effective. *Therefore, the management goal of Brush Control within the District is not applicable to the operations of the District*.

* Summary definitions.

Optimal- Shall be derived from the minimum number of observations determined by spatial, temporal, and District resource constraints to adequately describe the aquifer system and responses to external influences.

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

1. Withdrawal of groundwater from a groundwater reservoir at a rate and in an amount that causes or threatens to cause intrusion into the reservoir of water unsuitable for agricultural, gardening, domestic, or stock-raising purposes;

2. The flowing or producing of wells from a groundwater reservoir if the water produced is not used for a beneficial purpose;

3. Escape of groundwater from a groundwater reservoir to any other reservoir or geologic strata that does not contain groundwater;

4. Pollution or harmful alteration of groundwater in a groundwater reservoir by salt water or by other deleterious matter admitted from another stratum or from the surface of the ground;

5. Willfully or negligently causing, suffering, or allowing groundwater to escape into 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 order issued by the Commission under Chapter 26 of the Texas Water Code;

6. Groundwater pumped for irrigation that escapes as irrigation tailwater onto land other than that of the owner of the well unless permission has been granted by the occupant of the land receiving the discharge; or

7. For water produced from an artesian well, waste has the meaning assigned by Section 11.205 of the Texas Water Code.

Abandoned Well - shall mean a well or borehole the condition of which is causing, or is likely to cause, pollution of groundwater in the District and includes a well which is or is not in use or which contains no pumping equipment (open or uncovered well). A well or borehole which is not in compliance with applicable law, including the Rules and Regulations of the District, the Texas Water Well Driller's Act, Texas Natural Resource Conservation Commission, or any other state or federal agency or political subdivision having jurisdiction, if presumed to be an abandoned or deteriorated well.

District- the Rolling Plains Groundwater Conservation District.

Board- the Board of Directors of the Rolling Plains Groundwater Conservation District.

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APPENDIX A

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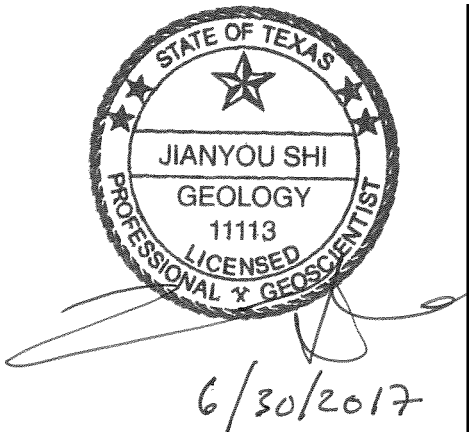
GAM RUN 16-031 MAG:

MODELED AVAILABLE GROUNDWATER FOR THE SEYMOUR, BLAINE, OGALLALA, AND DOCKUM AQUIFERS IN GROUNDWATER MANAGEMENT AREA 6

Jerry Shi, Ph.D., P.G.
Texas Water Development Board
Groundwater Division
Groundwater Availability Modeling Department
(512) 463-5076
June 30, 2017



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GAM RUN 16-031 MAG: MODELED AVAILABLE GROUNDWATER FOR THE SEYMOUR, BLAINE, OGALLALA, AND DOCKUM AQUIFERS IN GROUNDWATER MANAGEMENT AREA 6

Jerry Shi, Ph.D., P.G.
Texas Water Development Board
Groundwater Division
Groundwater Availability Modeling Department
(512) 463-5076
June 30, 2017

EXECUTIVE SUMMARY:

The Texas Water Development Board (TWDB) estimated the modeled available groundwater values for the following relevant aquifers in Groundwater Management Area 6:

- Seymour Aquifer – The modeled available groundwater ranges from 181,589 acre-feet per year in 2020 to 173,102 acre-feet per year in 2070, and is summarized by groundwater conservation districts and counties in Table 1, and by river basins, regional planning areas, and counties in Table 5.
- Blaine Aquifer – The modeled available groundwater ranges from 74,182 acre-feet per year in 2020 to 70,874 acre-feet per year in 2070, and is summarized by groundwater conservation districts and counties in Table 2, and by river basins, regional planning areas, and counties in Table 6.
- Ogallala Aquifer – The modeled available groundwater remains at 409 acre-feet per year between 2020 and 2070, and is summarized by groundwater conservation districts and counties in Table 3, and by river basins, regional planning areas, and counties in Table 7.
- Dockum Aquifer – The modeled available groundwater ranges from 172 acre-feet per year in 2020 to 171 acre-feet per year in 2070, and is summarized by groundwater conservation districts and counties in Table 4, and by river basins, regional planning areas, and counties in Table 8.

The modeled available groundwater values for Groundwater Management Area 6 estimated for counties is slightly different from that estimated for groundwater conservation districts because of the process for rounding the values.

The modeled available groundwater estimates are based on the desired future conditions for the Seymour, Blaine, Ogallala, and Dockum aquifers adopted by groundwater conservation district representatives in Groundwater Management Area 6 on November 17, 2016. The district representatives declared the following aquifers to be non-relevant for purposes of joint planning: the Trinity Aquifer; the Ogallala Aquifer in Collingsworth and Dickens counties; the Blaine Aquifer in King and Stonewall counties; the Dockum Aquifer in Dickens and Kent counties; and the Seymour Aquifer in Wichita, Wilbarger, Archer, Clay, Stonewall, Throckmorton, Young, Kent, and Jones counties. The TWDB determined that the explanatory report and other materials submitted by the district representatives were administratively complete on May 5, 2017.

REQUESTOR:

Mr. Mike McGuire, General Manager of Rolling Plains Groundwater Conservation District and Groundwater Management Area 6 Coordinator.

DESCRIPTION OF REQUEST:

In a letter dated January 17, 2017, Mr. Mike McGuire provided the TWDB with the desired future conditions of the Seymour, Blaine, Ogallala, and Dockum aquifers. The desired future conditions were adopted on November 17, 2016 by the groundwater conservation district representatives in Groundwater Management Area 6. The desired future conditions are:

Dockum Aquifer (Resolution No. 2016-001)

"a. The Desired Future Condition for Fisher County, located in the Clear Fork Groundwater Conservation District is that condition whereby the total decline in water levels will be no more than 27 feet during the period from 2020 - 2070

b. The Desired Future Condition for Motley County, located in the Gateway Groundwater Conservation District is that condition whereby the total decline in water levels will be no more than 27 feet during the period from 2020 - 2070

c. The Dockum Aquifer in Dickens & Kent Counties, not located within a Groundwater Conservation District, has been determined to be non-relevant for joint planning purposes."

Trinity Aquifer (Resolution No. 2016-002)

"The Trinity Group Aquifers within Groundwater Management Area 6 have been determined to be non-relevant for joint planning purposes."

Ogallala Aquifer (Resolution No. 2016-003)

"a. The Desired Future Condition for Motley County, located in the Gateway Groundwater Conservation District, is that condition with average drawdown of between 23 and 27 feet, calculated from the end of 2012 conditions to the year 2070 as documented in GMA 2 Technical Memorandum 16-01.

b. The Ogallala Aquifer in Collingsworth County, located in the Mesquite Groundwater Conservation District, is insignificant or nonexistent, and is determined to be non-relevant for joint planning purposes

c. The Ogallala Aquifer in Dickens County, not located within a Groundwater Conservation District, is determined to be non-relevant for joint planning purposes."

Blaine Aquifer (Resolution No. 2016-004)

"a. The Desired Future Condition for that part of Childress County North of the Red River, located in the Mesquite Groundwater Conservation District, all of Collingsworth and Hall Counties, also located within the Mesquite Groundwater Conservation District; and that part of Childress County North of the Red River located in the Gateway Groundwater Conservation District is that condition whereby the total decline in water levels will be no more than 9 feet during the period from 2020 - 2070

b. The Desired Future Condition for that part of Childress County south of the Red River located in the Mesquite & Gateway Groundwater Conservation Districts; and all of Cottle, Foard, and Hardeman Counties, also located within the Gateway Groundwater Conservation District, is that condition whereby the total decline in water levels will be no more than 2 feet during the period from 2020 - 2070

c. The Desired Future Condition for Fisher County, located within the Clear Fork Groundwater Conservation District, is that condition whereby the total decline in water levels will be no more than 4 feet during the period from 2020 - 2070

d. The Blaine Aquifer in Motley County, located within the Gateway Groundwater Conservation District, and in Knox County, located within the Rolling Plains Groundwater Conservation District, has been determined to be non-relevant for joint planning purposes.

e. The Blaine Aquifer in Dickens, Kent, King, Jones, and Stonewall Counties, not located within a Groundwater Conservation District, has been determined to be non•relevant for joint planning purposes."

Seymour Aquifer (Resolution No. 2016-005)

"a. The Desired Future Condition for Pod 1 in Childress [and] Collingsworth Counties, located in the Mesquite and Gateway Groundwater Conservation Districts, is that condition whereby the total decline in water levels will be no more than 33 feet during the period from 2020 - 2070

b. The Desired Future Condition for Pod 2 in Hall County, located in Mesquite Groundwater Conservation District is that condition whereby the total decline in water levels will be no more than 15 feet during the period from 2020 - 2070

c. The Desired Future Condition for Pod 3 in Briscoe, Hall [and] Motley Counties, located in the Mesquite and Gateway Groundwater Conservation Districts, is that condition whereby the total decline in water levels will be no more than 15 feet during the period from 2020 - 2070

d. The Desired Future Condition for Pod 4 in Childress, Foard, and Hardeman counties, located in Gateway Groundwater Conservation District, is that condition whereby the total decline in water levels will be no more than 1 foot during the period from 2020 – 2070

e. The Desired Future Condition for Pod 6 in Knox County, located in Rolling Plains Groundwater Conservation District is that condition whereby the total decline in water levels will be no more than 18 feet during the period from 2020 –2070

f. The Desired Future Condition for that part of Pod 7 Baylor, Haskell, and Knox Counties, located in Rolling Plains Groundwater Conservation District is that condition whereby the total decline in water levels will be no more than 18 feet during the period from 2020 - 2070

g. The Desired Future Condition for that part of Pod 8 in Baylor County, located in Rolling Plains Groundwater Conservation District is that condition whereby the total water level decline will be no more than 18 feet during the period from 2020 – 2070

h. The Desired Future Condition for that part of Pod 11 in Fisher County, located in Clear Fork Groundwater Conservation District is that condition whereby the total water level decline will be no more than 1 foot during the period from 2020 - 2070

i. The Seymour Aquifer Pods 5, 9, 10, 12, 13, 14, 15, that part of 4 in Wichita and Wilbarger counties, that part of 7 in Stonewall County, that part of 8 in Throckmorton and Young counties, and that part of 11 in Jones and Stonewall counties have been determined to be non-relevant for joint planning purposes."

After review of the submittal, the TWDB sent a request for clarification email to Mr. Mike McGuire on February 28, 2017. On March 20, 2017, Mr. McGuire responded with additional information and clarifications as noted below.

a. Predictive model format - The six predictive model runs submitted for the Seymour and Blaine aquifers were in a format that the TWDB could not open. The TWDB asked for standard MODFLOW-2000 input and output files. Mr. McGuire sent the standard MODFLOW-2000 input packages to the TWDB on a flash drive.

b. Unclear baseline condition years and baseline water level conditions for the Blaine and Seymour aquifers – The explanatory report showed a baseline year of 2020, while the modeling technical report indicated 2010. Mr. McGuire confirmed in his response that the baseline year for calculating drawdown for these two aquifers was 2010. Because this baseline year is after the end of the calibration period for both groundwater availability models (Jigmond and others, 2014; Ewing and others, 2004), available water-level data between the end of the calibration period and the baseline year were evaluated. The result of the evaluation is included in Appendix A.

c. No pumping in the Blaine Aquifer in Fisher County - The groundwater availability model for the Seymour and Blaine aquifers (Ewing and others, 2004) does not contain pumping in the Blaine Aquifer in Fisher County between 1995 and 1999. This would not only result in a zero modeled available groundwater, but would also make it impossible to match the desired future condition for the Blaine Aquifer in Fisher County. Mr. McGuire then requested the TWDB to use an even pumping distribution within the Blaine Aquifer that meets the desired future condition in the county.

d. Desired future condition of the Blaine Aquifer in Foard County - A preliminary model run indicated that even the absence of pumping would cause a drawdown larger than the desired future condition (2 feet). Mr. McGuire clarified that a ten-foot drawdown for the Blaine Aquifer in Foard County is the desired future condition.

e. Unclear baseline condition years for the Dockum and Ogallala aquifers - The desired future conditions specify a timeline from 2020 to 2070. Mr. McGuire informed TWDB to use the year 2012 as Groundwater Management Area 2 did.

f. Desired future conditions of the Dockum and Ogallala aquifer in Fisher and Motley counties – Groundwater Management Area 6 intended to use the desired future conditions from Groundwater Management Area 2 for these two aquifers in Fisher and Motley counties. In his response, Mr. McGuire stated that Groundwater Management Area 6 intended to establish the desired future conditions for the Ogallala and Dockum aquifers in Fisher and Motley counties that reflected the pumping assumptions in those counties to achieve the average drawdown of 27 feet in Groundwater Management Area 2.

g. Aquifer boundaries – Mr. McGuire informed the TWDB that all desired future conditions and associated modeled available groundwater are based on model extent boundaries.

h. Unclear averaging method for recharge (Seymour Aquifer in Haskell, Knox, and Baylor counties) – Mr. McGuire confirmed with the TWDB that the recharge is the arithmetic mean from 2001 to 2005.

i. DFC statements of "no more than" – Mr. McGuire stated that the desired future conditions are based on the average decline within the individual geographical areas described in the Desired Future Conditions Table in Section 1 of the Explanatory Report. Decline is the difference between the baseline year and 2070.

METHODS:

The desired future conditions for Groundwater Management Area 6 are based on water-level declines or drawdowns defined as the difference in well water levels between a baseline year and 2070. Depending on the aquifer, one of three groundwater availability models were used to construct predictive simulations to estimate drawdowns over the same time interval and to calculate modeled available groundwater. The aquifers and corresponding groundwater availability models were:

- Seymour Aquifer of Pod 7 in Baylor, Haskell, and Knox counties – "refined" groundwater availability model for the Seymour Aquifer (Jigmond and others, 2014)

- Seymour Aquifer (except Pod 7) and Blaine Aquifer – groundwater availability model for the Seymour and Blaine aquifers (Ewing and others, 2004)
- Ogallala and Dockum aquifers – groundwater availability model for the High Plains Aquifer System (Deeds and Jigmond, 2015)

Some of the predictive simulations employed for the modeled available groundwater calculations were part of the Groundwater Management Area 6 submittal (Nelson, 2017), while the others were developed by the TWDB (Appendix B).

One of the first steps for a predictive simulation is to verify if the model reflects real-world conditions for the selected baseline year. If the baseline year for a desired future condition falls within the model calibration period, the water levels and/or fluxes for the baseline year have been calibrated to observed data. If the baseline year is after the end of the calibration period, water levels and/or fluxes must be evaluated between the end of the calibration period and the baseline year to confirm if the model reflects real-world conditions. If water levels and/or fluxes have remained steady during this interim period, the end of the calibration period can be used for the baseline year. However, if water levels and/or fluxes have not remained steady, pumping (and sometimes recharge) is typically adjusted until water levels and/or fluxes reflect real-world conditions.

The simulated drawdown for an area (such as a county) is the average of simulated drawdowns in active model cells with centroids located within each designated area. For the Seymour, Ogallala, and Dockum aquifers, the active model cells or modeled extents are the same as, or similar to, the official aquifer boundaries. However, the modeled extent for the Blaine Aquifer is significantly larger than the official aquifer footprint in some counties, such as in Hall and Foard counties. Therefore, in Hall and Foard counties, the drawdown for the desired future condition contains the Blaine Aquifer and equivalent geologic units in the subcrop.

Another factor that affects the drawdown calculation is related to dry model cells. For this study, a model cell is considered dry when its water level falls below a cell bottom at the baseline year. A dry cell is excluded from the average drawdown calculation. This analysis is presented in Appendix C.

The following sections summarize the predictive simulations submitted by Groundwater Management Area 6 and the predictive simulations by the TWDB. The water level drawdowns calculated by these predictive model runs are presented in Appendix B, which can be compared with the desired future conditions.

Seymour Aquifer of Pod 7 in Baylor, Haskell, and Knox Counties

Three predictive simulations submitted by Nelson (2017) were developed from runs using the refined groundwater availability model for the Seymour Aquifer in Baylor, Haskell, and Knox counties (Jigmond and others, 2014). This refined groundwater availability model only covers Pod 7 of the Seymour Aquifer (Figure 1). The predictive simulations included the calibrated period (1949 through 2005) and a predictive period (2006 through 2070). The predictive period used annual time intervals with three different pumping scenarios: 100, 80, or 75 percent of the average pumping of the last five years (2001-2005) of the calibration period (Jigmond and others, 2014).

Because the baseline year for the desired future condition (2010) is after the end of the calibration period, the TWDB evaluated the water-level data at selected wells from winter months between 2005 and 2010. Figure A1 (in Appendix A) shows the average water-level change from 2005 to 2010 in the Seymour Aquifer in Baylor, Haskell, and Knox counties. The average water levels have been stable over the selected time interval. As a result, the TWDB determined that further refinement of pumping was not necessary for the period between 2005 and 2010, and determined that conditions at the end of the calibration period can be used as conditions for the baseline year.

Next, the TWDB checked the MODFLOW-2000 well packages for the predictive simulations and found no problem with the pumping scenario that used 100 percent of the average pumping of the last five years of the groundwater availability model (2001 through 2005). As a result, the TWDB ran this scenario to obtain the MODFLOW-2000 output files. The head output file was used to calculate the drawdowns between 2010 and 2070. The TWDB then compared the drawdowns with the desired future conditions for the Seymour Aquifer in Pod 7 in these three counties. The comparison indicates that the drawdowns do not exceed the desired future conditions (Table B1 in Appendix B).

Seymour and Blaine Aquifers (excluding Pod 7 of Seymour)

The other three predictive simulations by Nelson (2017) were based on the groundwater availability model for the Seymour and Blaine aquifers (Figure 2; Ewing and others, 2004). The predictive simulations were used to determine the desired future conditions for the Blaine Aquifer and all the Seymour Aquifer except Pod 7, which was covered by the refined model described earlier. The predictive simulations included the calibrated period (1975 through 1999) and a predictive period (2000 through 2070). The predictive period used annual time interval with three different pumping scenarios: 100, 75, or 50 percent of the average pumping of the last five years of the calibrated model, 1995 through 1999 (Ewing and others, 2004).

Because the baseline year (2010) is after the end of the calibration period (1999), TWDB evaluated the water-level data at selected wells from winter months between 1999 and 2010. Figure A2 (in Appendix A) illustrates the average water-level change from 1999 to 2010 in the Seymour Aquifer within Groundwater Management Area 6. For the Blaine Aquifer, only one well from Childress County (State Well Number 1231804) meets the selection criterion and its hydrograph is presented in Figure A3. Nevertheless, Figures A2 and A3 indicate that the water level has not significantly changed over the selected time interval. As a result, the TWDB determined that further model refinement of pumping was not necessary for the period between 1999 and 2010, and determined that conditions at the end of the calibration period can be used as conditions for the baseline year.

The TWDB also checked the MODFLOW-2000 well packages for the predictive simulations from Nelson (2017) and discovered a significant inconsistency between the well package from the submittal and that from the TWDB's calculation for the 100-percent pumping scenario based on the last five years of the calibrated groundwater availability model for the Seymour and Blaine aquifers. As a result, the TWDB developed a new predictive simulation for the Seymour and Blaine aquifers using the groundwater availability model by Ewing and others (2004). Because, as discussed above, the water levels did not change much from 1999 to 2010, this predictive simulation uses the water levels of the last stress period (1999) of the groundwater availability model as the initial head for the baseline year (2010). This new predictive simulation runs from 2011 through 2070 with an annual interval and the average recharge of 1995 through 1999 of the calibrated groundwater availability model as stated in the explanatory report and Mr. McGuire's response. The initial pumping is based on the average of the last five years of the calibrated model but was adjusted during the model run to meet the desired future conditions for the Seymour Aquifer (excluding Pod 7) (Table B1 in Appendix B) and Blaine Aquifer (Table B2 in Appendix B).

Ogallala and Dockum Aquifers

Per Mr. McGuire's request, the TWDB used the predictive simulation for the desired future conditions adopted by Groundwater Management Area 2 to reproduce the desired future conditions and to calculate the modeled available groundwater for Groundwater Management Area 6. This predictive simulation ran from 2013 through 2017, with a baseline year of 2012, the same year as the last stress period of the calibrated groundwater availability model by Deeds and Jigmond (2015). The predictive simulation used all boundary conditions from the last stress period of the groundwater availability model except the pumping package, which was modified and adjusted during the model run to meet the desired future conditions of Groundwater Management Area 2 (see GAM Run 16-

028 for details). The simulated drawdown or desired future conditions are presented in Tables B3 and B4 of Appendix B.

Modeled Available Groundwater

Once the predictive simulations met the desired future conditions, the modeled available groundwater values were extracted from the MODFLOW cell-by-cell budget files. Annual pumping rates were then divided by county, river basin, regional water planning area, and groundwater conservation district within Groundwater Management Area 6 (Figures 1 through 6 and Tables 1 through 6).

Modeled Available Groundwater and Permitting

As defined in Chapter 36 of the Texas Water Code, "modeled available groundwater" is the estimated average amount of water that may be produced annually to achieve a desired future condition. Groundwater conservation districts are required to consider modeled available groundwater, along with several other factors, when issuing permits in order to manage groundwater production to achieve the desired future condition(s). The other factors districts must consider include annual precipitation and production patterns, the estimated amount of pumping exempt from permitting, existing permits, and a reasonable estimate of actual groundwater production under existing permits.

PARAMETERS AND ASSUMPTIONS:

The parameters and assumptions for the groundwater availability simulations are described below:

Seymour Aquifer of Pod 7 in Baylor, Haskell, and Knox Counties

- The groundwater availability model for the Seymour Aquifer of Pod 7 by Jigmond and others (2014) was extended to include the predictive model simulation for this analysis (Nelson, 2017).
- The model has one layer, which represents the Seymour Aquifer.
- The model was run with MODFLOW-2000 (Harbaugh and others, 2000).
- During the predictive model run, some model cells went dry (Table C1 of Appendix C).

- Estimates of modeled drawdown and available groundwater from the model simulation were rounded to whole numbers.

Seymour and Blaine Aquifers

- Version 1.01 of the groundwater availability model for the Seymour and Blaine aquifers (Ewing and others, 2004) was updated to include the predictive model simulation for this analysis.

- The model has two layers that represent the Seymour Aquifer (Layer 1) and the Blaine Aquifer as well as other geologic units that underlie the Seymour Aquifer (Layer 2).

- The model was run with MODFLOW-2000 (Harbaugh and others, 2000).

- During the predictive model run, some model cells went dry (Table C2 of Appendix C).

- Estimates of modeled drawdown and available groundwater from the model simulation were rounded to whole numbers.

Ogallala and Dockum Aquifers

- Version 1.01 of the groundwater availability model for the High Plains Aquifer System by Deeds and Jigmond (2015) was used to develop the predictive model simulation used for this analysis (Hutchison, 2016d).

- The model has four layers which represent the Ogallala and Pecos Valley Alluvium aquifers (Layer 1); the Edwards-Trinity (High Plains), Rita Blanca, and Edwards-Trinity (Plateau) aquifers (Layer 2); the Upper Dockum Aquifer (Layer 3); and the Lower Dockum Aquifer (Layer 4). Pass-through cells exist in layers 2 and 3 where the Upper Dockum Aquifer was absent but the cells provided a pathway for flow between the Lower Dockum and the Ogallala or Edwards-Trinity (High Plains) aquifers vertically. These pass-through cells were excluded from the modeled available groundwater calculation.

- The model was run with MODFLOW-NWT (Niswonger and others, 2011). The model uses the Newton-Raphson formulation and the upstream weighting package, which automatically reduces pumping as heads drop in a particular cell as defined by the user. This feature may simulate the declining production of a well as saturated

thickness decreases. Deeds and Jigmond (2015) modified the MODFLOW-NWT code to use a saturated thickness of 30 feet as the threshold (instead of percent of the saturated thickness) when pumping reductions occur during a simulation.

- During the predictive model run, no model cells within Groundwater Management Area 6 went dry.

- Estimates of modeled drawdown and available groundwater from the model simulation were rounded to whole numbers.

RESULTS:

The modeled available groundwater for the Seymour Aquifer that achieves the desired future condition adopted by Groundwater Management Area 6 slightly decreases from 181,589 to 173,102 acre-feet per year between 2020 and 2070. The modeled available groundwater is summarized by groundwater conservation district and county in Table 1. Table 5 summarizes the modeled available groundwater by county, river basin, and regional water planning area for use in the regional water planning process.

The modeled available groundwater for the Blaine Aquifer that achieves the desired future condition adopted by Groundwater Management Area 6 decreases slightly from 74,182 to 70,874 acre-feet per year between 2020 and 2070. The modeled available groundwater is summarized by groundwater conservation district and county in Table 2. Table 6 summarizes the modeled available groundwater by county, river basin, and regional water planning area for use in the regional water planning process.

The modeled available groundwater for the Ogallala Aquifer that achieves the desired future condition adopted by Groundwater Management Area 6 remains at 409 acre-feet per year between 2020 and 2070. The modeled available groundwater is summarized by groundwater conservation district and county in Table 3. Table 7 summarizes the modeled available groundwater by county, river basin, and regional water planning area for use in the regional water planning process.

The modeled available groundwater for the Dockum Aquifer that achieves the desired future condition adopted by Groundwater Management Area 6 remains at about 172 acre-feet per year between 2020 and 2070. The modeled available groundwater is summarized by groundwater conservation district and county in Table 4. Table 8 summarizes the modeled available groundwater by county, river basin, and regional water planning area for use in the regional water planning process.

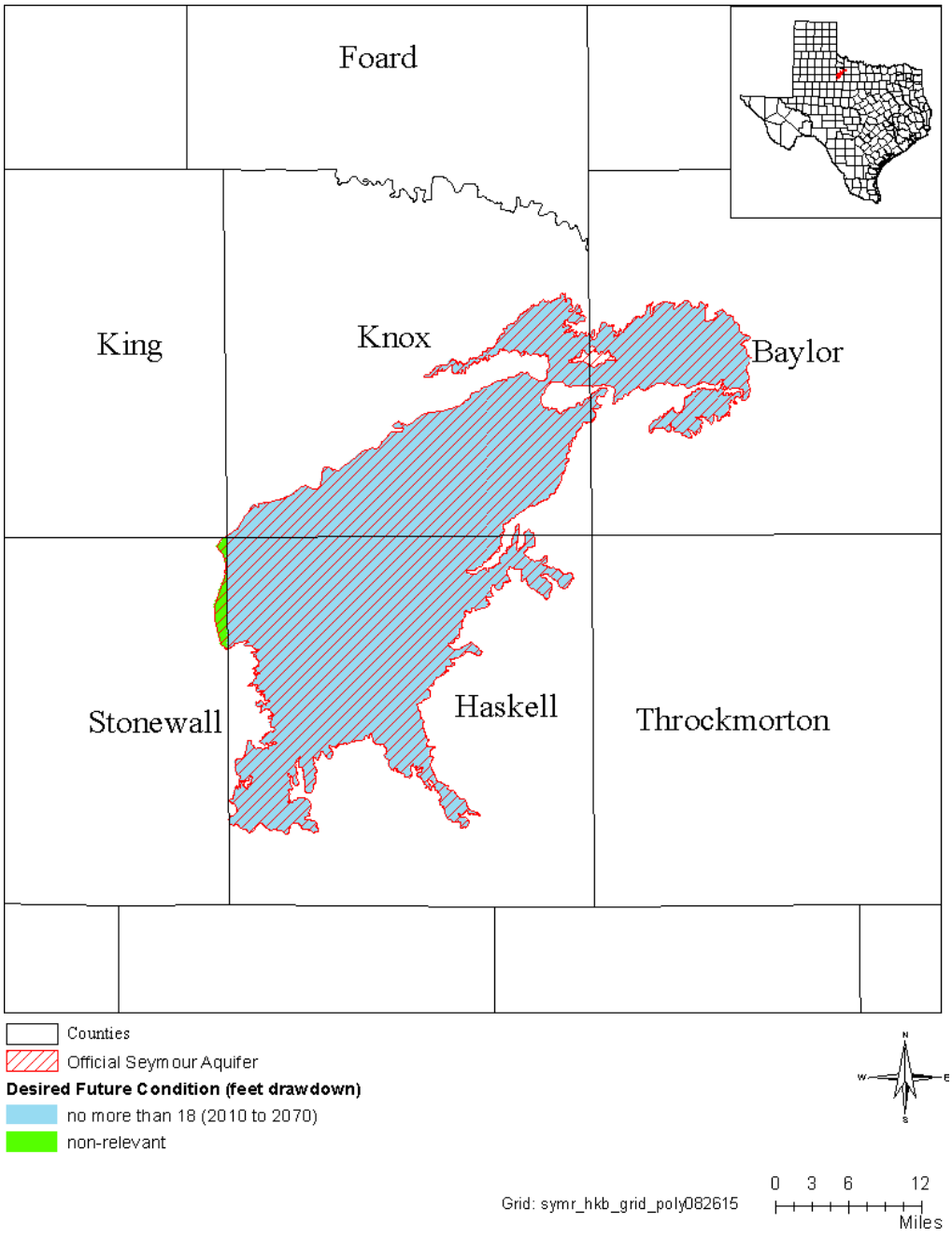

FIGURE 1. MAP SHOWING THE AREA COVERED BY THE REFINED GROUNDWATERAVAILABILITY MODEL FOR THE SEYMOUR AQUIFER POD 7, WHICH INCLUDES BAYLOR, HASKELL, AND KNOX COUNTIES WITHIN GROUNDWATER MANAGEMENT AREA 6.

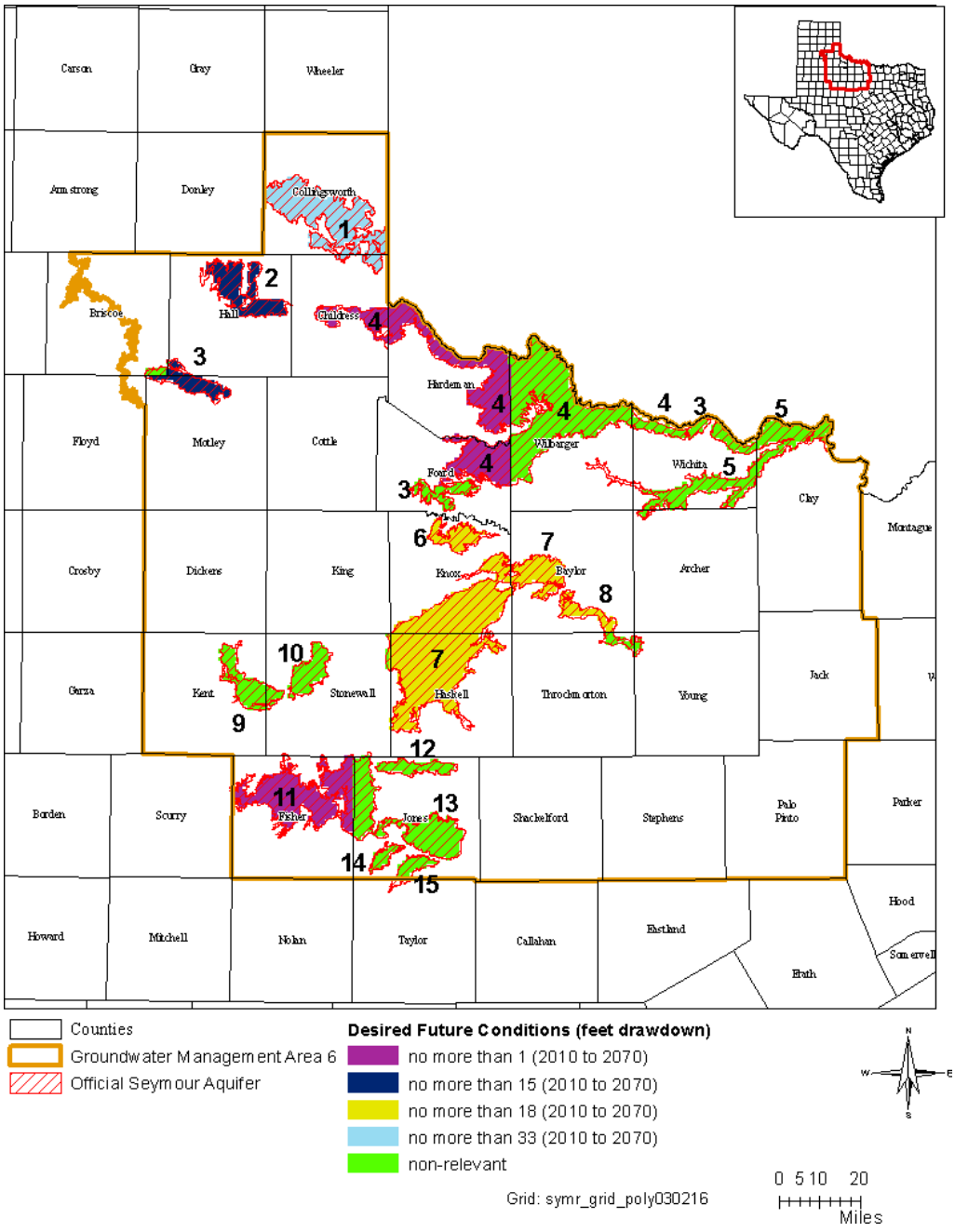

FIGURE 2. MAP SHOWING THE AREA COVERED BY THE SEYMOUR AQUIFER IN THE GROUNDWATER AVAILABILITY MODEL FOR THE SEYMOUR AND BLAINE AQUIFERS WITHIN GROUNDWATER MANAGEMENT AREA 6. THE INTEGERS IN THE FIGUREARE SEYMOUR AQUIFER POD NUMBERS.

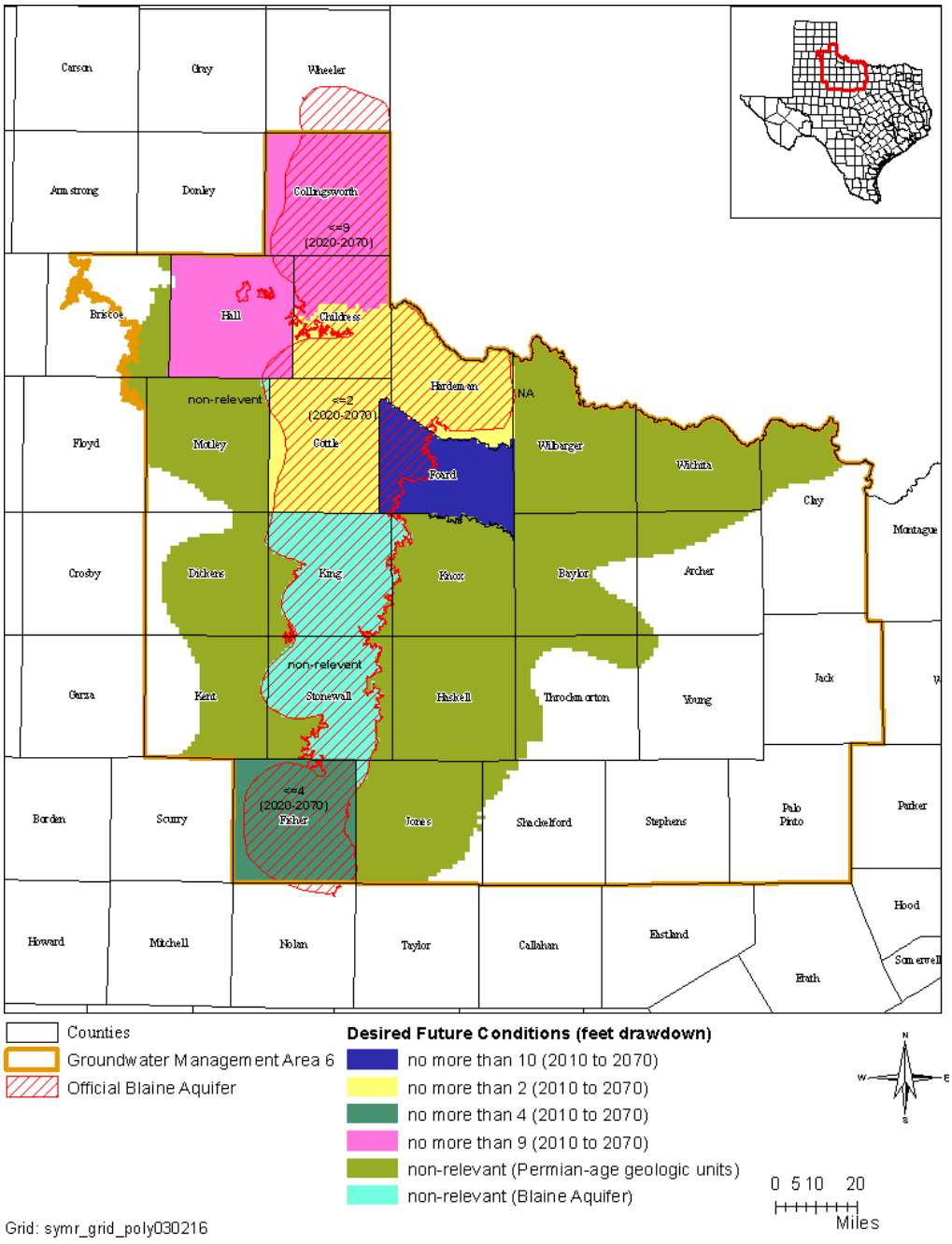

FIGURE 3. MAP SHOWING THE AREA COVERED BY THE BLAINE AQUIFER IN THEGROUNDWATER AVAILABILITY MODEL FOR THE SEYMOUR AND BLAINE AQUIFERS WITHIN GROUNDWATER MANAGEMENT AREA 6.

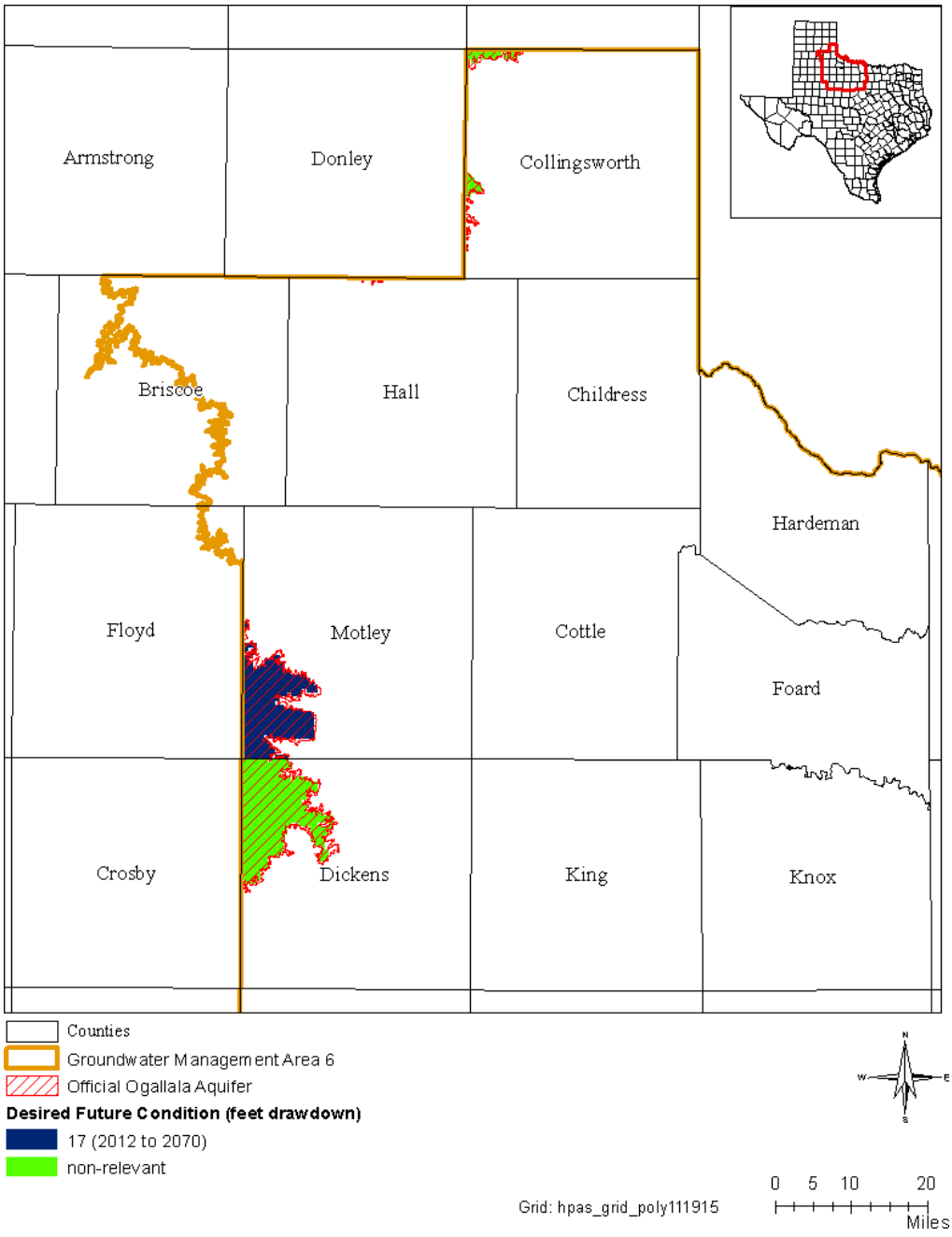

FIGURE 4. MAP SHOWING THE AREA COVERED BY THE OGALLALA AQUIFER IN THE GROUNDWATER AVAILABILITY MODEL FOR THE HIGH PLAINS AQUIFER SYSTEM WITHIN GROUNDWATER MANAGEMENT AREA 6.

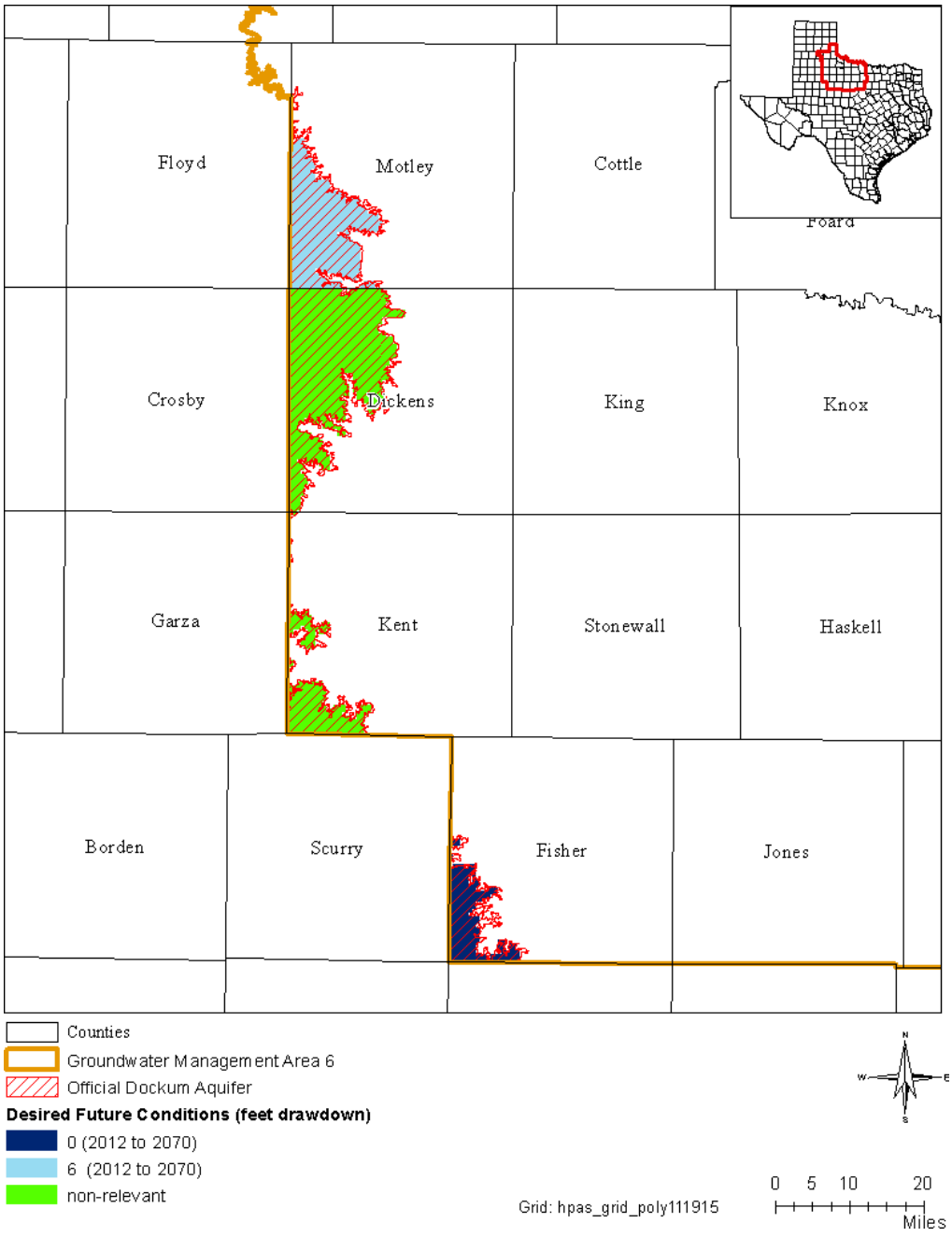

FIGURE 5. MAP SHOWING THE AREA COVERED BY THE DOCKUM AQUIFER IN THE GROUNDWATER AVAILABILITY MODEL FOR THE HIGH PLAINS AQUIFER SYSTEM WITHIN GROUNDWATER MANAGEMENT AREA 6.

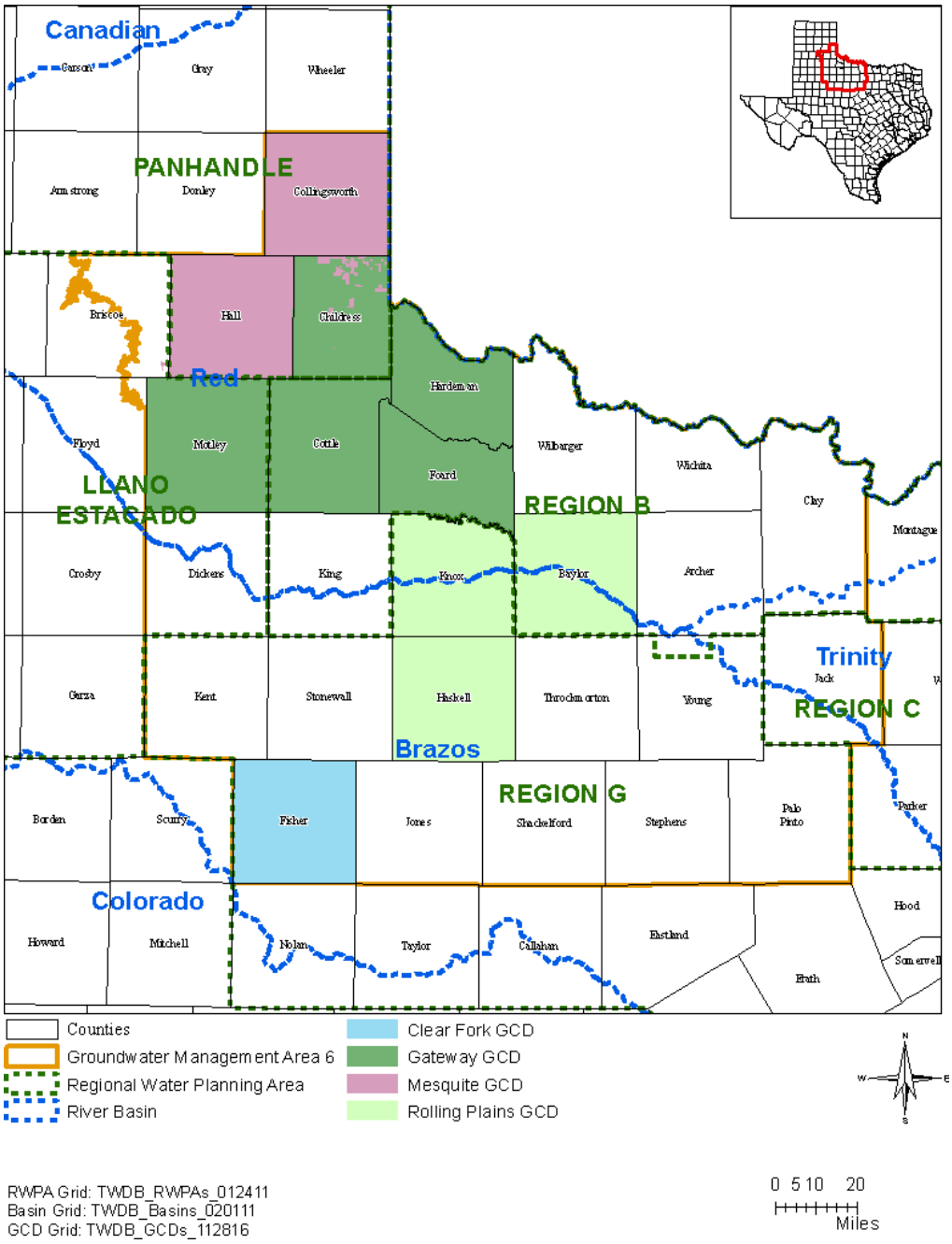

FIGURE 6. MAP SHOWING REGIONAL WATER PLANNING AREAS, GROUNDWATER CONSERVATION DISTRICTS (GCD), COUNTIES, AND RIVER BASINS IN GROUNDWATER MANAGEMENT AREA 6.

TABLE 1. MODELED AVAILABLE GROUNDWATER FOR THE SEYMOUR AQUIFER IN GROUNDWATER MANAGEMENT AREA 6 SUMMARIZED BY GROUNDWATER CONSERVATION DISTRICT (GCD) AND COUNTY FOR EACH DECADE BETWEEN 2010 AND 2070. VALUES ARE IN ACRE-FEET PER YEAR.

Groundwater Conservation District	County	Seymour Aquifer Pod	2010	2020	2030	2040	2050	2060	2070
Clear Fork GCD	**Fisher**	**11**	**2,325**	**6,718**	**6,132**	**6,149**	**6,472**	**6,490**	**6,131**
Gateway GCD	Childress	4	40	2,875	3,230	3,301	3,292	3,301	3,282
Gateway GCD	Foard	4	4,278	11,897	4,945	5,389	8,066	7,815	3,943
Gateway GCD	Hardeman	4	531	20,378	13,040	18,885	17,520	20,002	32,868
Gateway GCD	Motley	3	2,098	4,843	6,679	4,843	4,830	3,972	3,961
Gateway GCD Total			**6,947**	**39,993**	**27,894**	**32,418**	**33,708**	**35,090**	**44,054**
Mesquite GCD	Childress	1	15	86	16	16	16	16	16
Mesquite GCD	Collingsworth	1	17,628	41,345	31,492	28,657	27,165	22,395	22,769
Mesquite GCD	Hall	2	6,837	15,446	16,751	19,666	22,861	25,861	24,595
Mesquite GCD Total			**24,480**	**56,877**	**48,259**	**48,339**	**50,042**	**48,272**	**47,380**
Rolling Plains GCD	Baylor	7	1,426	1,430	1,426	1,430	1,426	1,430	1,426
Rolling Plains GCD	Baylor	8	14	5,785	5,903	5,547	5,304	5,177	5,503
Rolling Plains GCD	Haskell	7	41,636	41,750	41,636	41,750	41,636	41,750	41,636
Rolling Plains GCD	Knox	7	25,641	25,712	25,641	25,712	25,641	25,712	25,641
Rolling Plains GCD	Knox	6	12	3,324	998	512	888	3,454	1,331
Rolling Plains GCD Total			**68,729**	**78,001**	**75,604**	**74,951**	**74,895**	**77,523**	**75,537**
Groundwater Management Area 6			**102,481**	**181,589**	**157,889**	**161,857**	**165,117**	**167,375**	**173,102**

TABLE 2. MODELED AVAILABLE GROUNDWATER FOR THE BLAINE AQUIFER IN GROUNDWATER MANAGEMENT AREA 6 SUMMARIZED BY GROUNDWATER CONSERVATION DISTRICT (GCD) AND COUNTY FOR EACH DECADE BETWEEN 2010 AND 2070. VALUES ARE IN ACRE-FEET PER YEAR.

Groundwater Conservation District	County	2010	2020	2030	2040	2050	2060	2070
ClearFork GCD	**Fisher**	**0**	**12,855**	**12,820**	**12,855**	**12,820**	**12,855**	**12,820**
Gateway GCD	Childress	3,577	17,618	17,570	17,618	17,570	17,618	17,570
Gateway GCD	Cottle	2,688	14,766	11,621	11,653	11,621	11,653	11,621
Gateway GCD	Foard	26	6,582	6,564	6,582	6,564	6,582	6,564
Gateway GCD	Hardeman	4,233	8,488	8,465	8,488	8,465	8,488	8,465
Gateway GCD Total		**10,524**	**47,454**	**44,220**	**44,341**	**44,220**	**44,341**	**44,220**
Mesquite GCD	Childress	1,034	5,957	5,940	5,957	5,940	5,957	5,940
Mesquite GCD	Collingsworth	6,851	2,060	2,054	2,060	2,054	2,060	2,054
Mesquite GCD	Hall	10	5,856	5,840	5,856	5,840	5,856	5,840
Mesquite GCD Total		**7,895**	**13,873**	**13,834**	**13,873**	**13,834**	**13,873**	**13,834**
Groundwater Management Area 6		**18,419**	**74,182**	**70,874**	**71,069**	**70,874**	**71,069**	**70,874**

TABLE 3. MODELED AVAILABLE GROUNDWATER FOR THE OGALLALA AQUIFER IN GROUNDWATER MANAGEMENT AREA 6 SUMMARIZED BY GROUNDWATER CONSERVATION DISTRICT (GCD) AND COUNTY FOR EACH DECADE BETWEEN 2012 AND 2070. VALUES ARE IN ACRE-FEET PER YEAR.

GCD	County	2012	2020	2030	2040	2050	2060	2070
Gateway GCD	Motley	409	409	409	409	409	409	409
Groundwater Management Area 6		**409**	**409**	**409**	**409**	**409**	**409**	**409**

TABLE 4. MODELED AVAILABLE GROUNDWATER FOR THE DOCKUM AQUIFER IN GROUNDWATER MANAGEMENT AREA 6 SUMMARIZED BY GROUNDWATER CONSERVATION DISTRICT (GCD) AND COUNTY FOR EACH DECADE BETWEEN 2012 AND 2070. VALUES ARE IN ACRE-FEET PER YEAR.

GCD	County	2012	2020	2030	2040	2050	2060	2070
Gateway GCD	Motley	93	93	93	93	92	92	92
Clear Fork GCD	Fisher	79	79	79	79	79	79	79
Groundwater Management Area 6		**172**	**172**	**172**	**172**	**171**	**171**	**171**

TABLE 5. MODELED AVAILABLE GROUNDWATER BY DECADE FOR THE SEYMOUR AQUIFER IN GROUNDWATER MANAGEMENT AREA 6. RESULTS ARE IN ACRE-FEET PER YEAR AND ARE SUMMARIZED BY COUNTY, REGIONAL WATER PLANNING AREA (RWPA), AND RIVER BASIN.

County	RWPA	River Basin	Seymour Pod Number	2020	2030	2040	2050	2060	2070
Baylor	Region B	Brazos	7	1,136	1,133	1,136	1,133	1,136	1,133
Baylor	Region B	Red	7	294	294	294	294	294	294
Baylor	Region B	Brazos	8	5,785	5,903	5,547	5,304	5,177	5,503
Childress	Panhandle	Red	1 and 4	2,961	3,246	3,317	3,308	3,317	3,297
Collingsworth	Panhandle	Red	1	41,345	31,492	28,657	27,165	22,395	22,769
Fisher	Region G	Brazos	11	6,718	6,132	6,149	6,472	6,490	6,131
Foard	Region B	Red	4	11,897	4,945	5,389	8,066	7,815	3,943
Hall	Panhandle	Red	2 and 3	15,446	16,751	19,666	22,861	25,861	24,595
Hardeman	Region B	Red	4	20,378	13,040	18,885	17,520	20,002	32,868
Haskell	Region G	Brazos	7	41,750	41,636	41,750	41,636	41,750	41,636
Knox	Region G	Brazos	7	25,699	25,629	25,699	25,629	25,699	25,629
Knox	Region G	Red	7	13	13	13	13	13	13
Knox	Region G	Red	6	3,324	998	512	888	3,454	1,331
Motley	Llano Estacado	Red	3	4,843	6,679	4,843	4,830	3,972	3,961
Groundwater Management Area 6				**181,589**	**157,891**	**161,857**	**165,119**	**167,375**	**173,103**

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

County	RWPA	River Basin	2020	2030	2040	2050	2060	2070
Childress	Panhandle	Red	23,575	23,510	23,575	23,510	23,575	23,510
Collingsworth	Panhandle	Red	2,060	2,054	2,060	2,054	2,060	2,054
Cottle	Region B	Red	14,766	11,621	11,653	11,621	11,653	11,621
Fisher	Region G	Brazos	12,855	12,820	12,855	12,820	12,855	12,820
Foard	Region B	Red	6,582	6,564	6,582	6,564	6,582	6,564
Hall	Panhandle	Red	5,856	5,840	5,856	5,840	5,856	5,840
Hardeman	Region B	Red	8,488	8,465	8,488	8,465	8,488	8,465
Groundwater Management Area 6			**74,182**	**70,874**	**71,069**	**70,874**	**71,069**	**70,874**

TABLE 7. MODELED AVAILABLE GROUNDWATER BY DECADE FOR THE OGALLALA AQUIFER IN GROUNDWATER MANAGEMENT AREA 6. RESULTS ARE IN ACRE-FEET PER YEAR AND ARE SUMMARIZED BY COUNTY, REGIONAL WATER PLANNING AREA (RWPA), AND RIVER BASIN.

County	RWPA	River Basin	2020	2030	2040	2050	2060	2070
Motley	Llano Estacado	Red	409	409	409	409	409	409
Groundwater Management Area 6			**409**	**409**	**409**	**409**	**409**	**409**

TABLE 8. MODELED AVAILABLE GROUNDWATER BY DECADE FOR THE DOCKUM AQUIFER IN GROUNDWATER MANAGEMENT AREA 6. RESULTS ARE IN ACRE-FEET PER YEAR AND ARE SUMMARIZED BY COUNTY, REGIONAL WATER PLANNING AREA (RWPA), AND RIVER BASIN.

County	RWPA	River Basin	2020	2030	2040	2050	2060	2070
Fisher	Region G	Brazos	79	79	79	79	79	79
Motley	Llano Estacado	Red	93	93	93	92	92	92
Groundwater Management Area 6			**172**	**172**	**172**	**171**	**171**	**171**

LIMITATIONS:

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

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

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

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

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

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Appendix A

Water Level Hydrograph

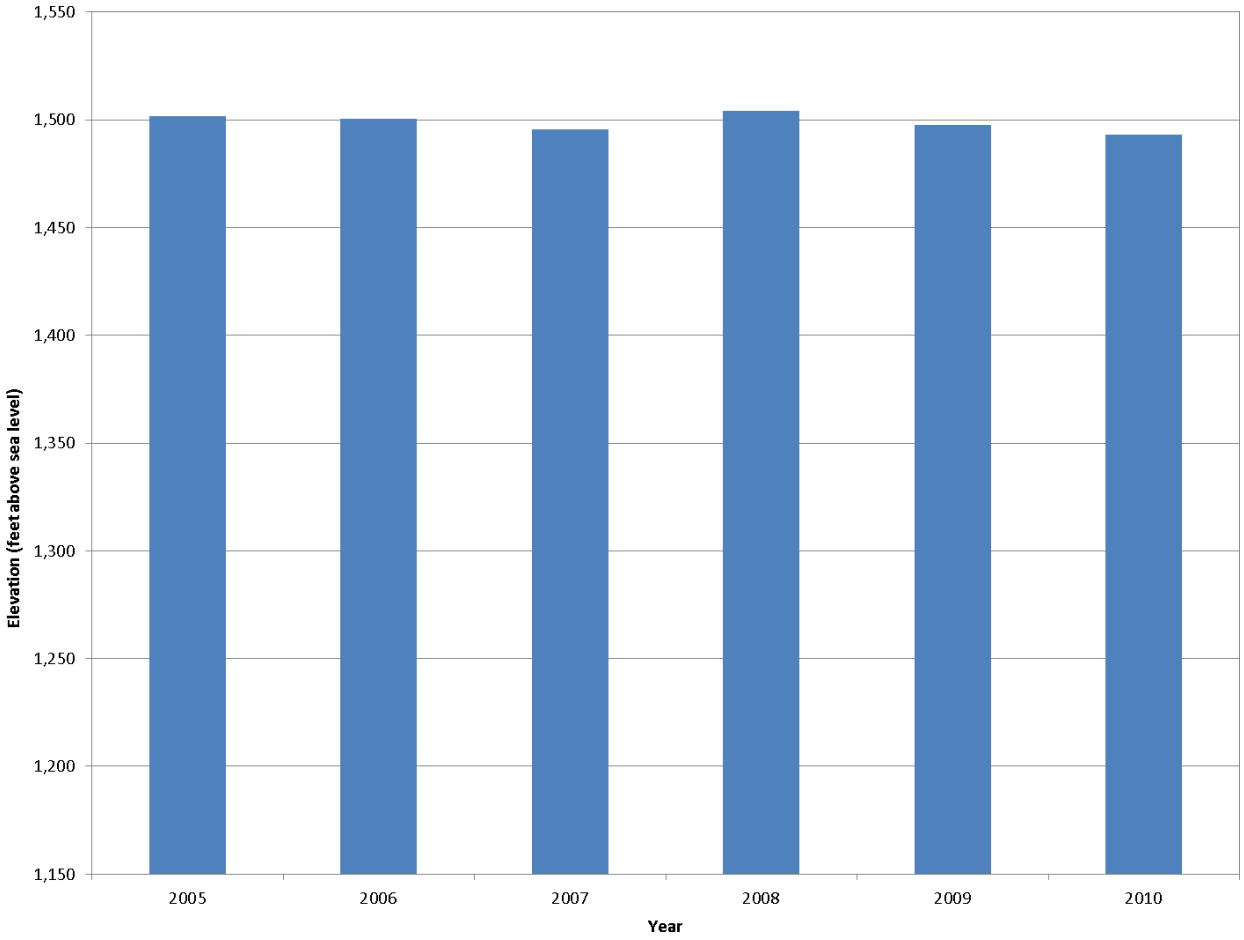

FIGURE A1. AVERAGE WATER-LEVEL HYDROGRAPH OF SEYMOUR AQUIFER IN BAYLOR, HASKELL, AND KNOX COUNTIES BETWEEN 2005 AND 2010.

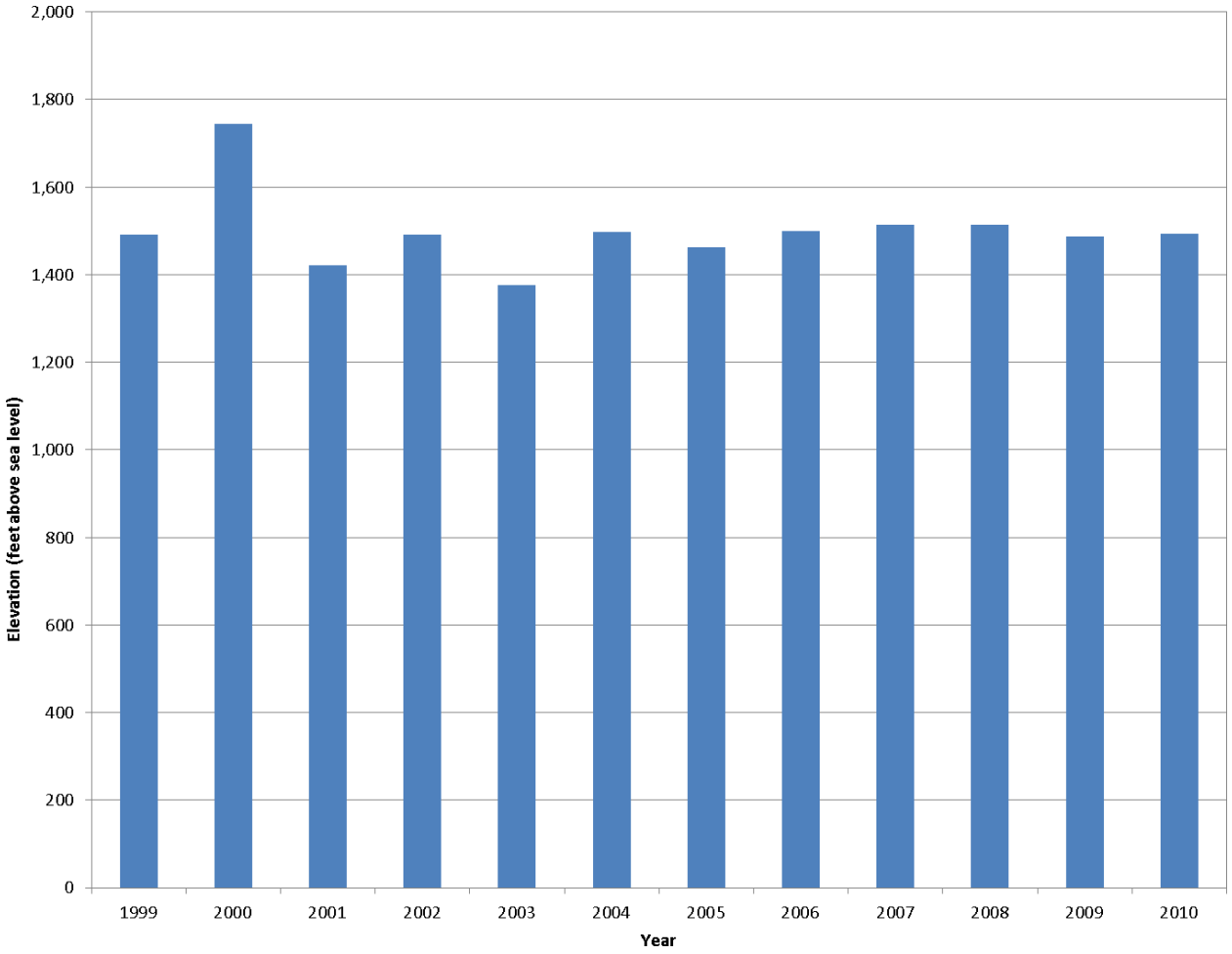

FIGURE A2. AVERAGE WATER-LEVEL HYDROGRAPH OF SEYMOUR AQUIFER IN BAYLOR, HASKELL, AND KNOX COUNTIES BETWEEN 1999 AND 2010.

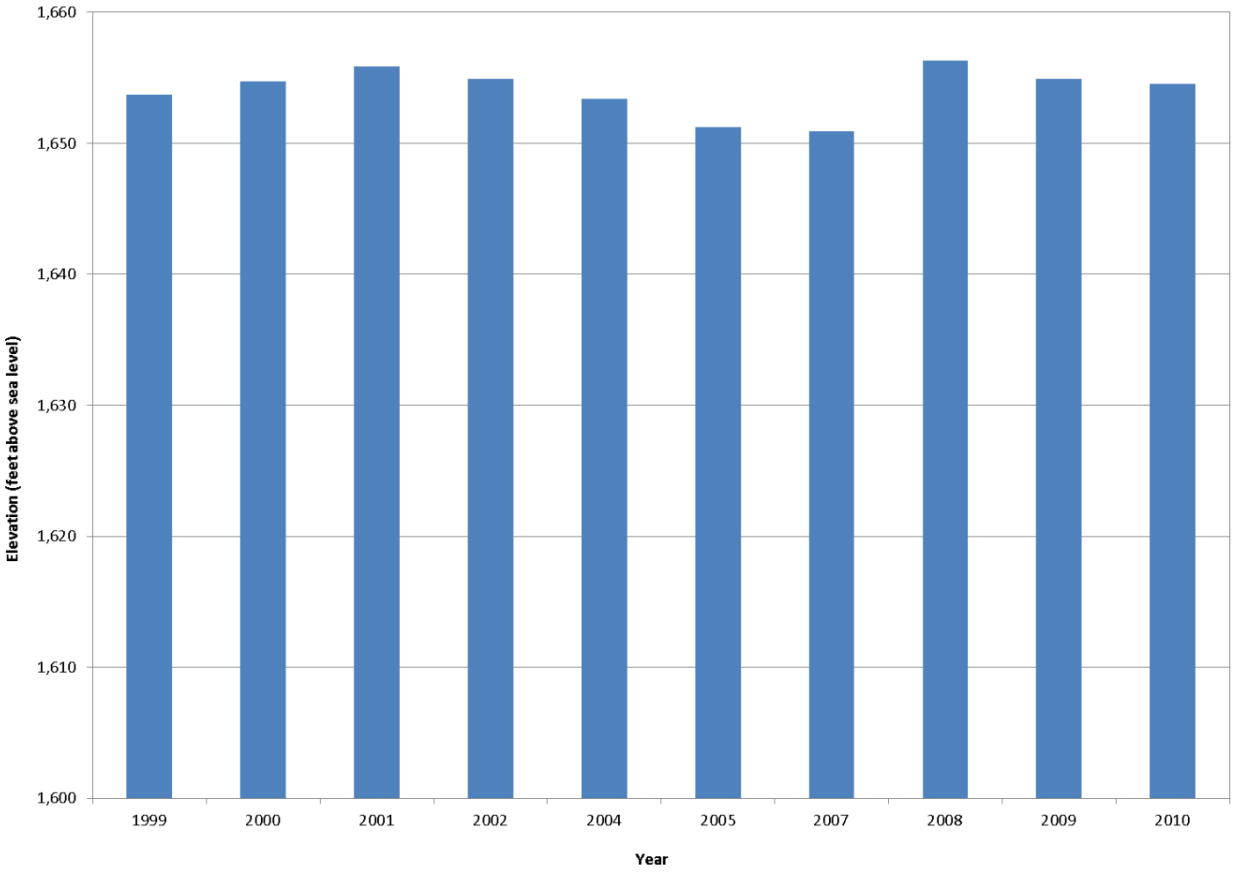

FIGURE A3. WATER-LEVEL HYDROGRAPH OF BLAINE AQUIFER IN CHILDRESS COUNTY (STATE WELL NUMBER 1231804) BETWEEN 1999 AND 2010.

Appendix B

Desired Future Conditions and Simulated Drawdowns

TABLE B1. MODELED DRAWDOWN IN SEYMOUR AQUIFER IN GROUNDWATER MANAGEMENT AREA (GMA) 6. MODELED DRAWDOWN WAS CALCULATED BY TWDB BASED ON MODFLOW HEAD FILE FROM GMA 6 SUBMITTAL, WHICH USED AVERAGE PUMPING OF LAST FIVE YEARS OF THE CALIBRATED MODEL. PUMPING WAS SLIGHTLY MODIFIED, AS NEEDED.

Seymour Aquifer Pod	County	Groundwater Conservation District	Modeled Drawdown (feet 2010 to 2070)	Desired Future Condition (feet drawdown)	Groundwater Availability Model
1	Childress, Collingsworth	Mesquite, Gateway	22.41	no more than 33	Ewing and others (2004)
2	Hall	Mesquite	9.91	no more than 15	Ewing and others (2004)
3	Briscoe, Hall, and Motley	Mesquite, Gateway	13.23	no more than 15	Ewing and others (2004)
4	Childress, Foard, and Hardeman	Gateway	0.97	no more than 1.0	Ewing and others (2004)
6	Knox	Rolling Plains	12.46	no more than 18	Ewing and others (2004)
7	Baylor, Haskell, and Knox	Rolling Plains	7.30	no more than 18	Jigmond and others (2014)
8	Baylor	Rolling Plains	14.80	no more than 18	Ewing and others (2004)
11	Fisher	Clear Fork	0.86	no more than 1.0	Ewing and others (2004)

TABLE B2. MODELED DRAWDOWN IN BLAINE AQUIFER IN GROUNDWATER MANAGEMENT AREA 6. MODELED DRAWDOWN WAS CALCULATED BASED ON A PREDICTIVE SIMULATION BY TWDB.

County	Groundwater Conservation District	Modeled Drawdown (feet 2010 to 2070)	Desired Future Condition (feet drawdown)	Groundwater Availability Model
Childress North of Red River	Mesquite, Gateway	5.94	no more than 9	Ewing and others (2004)
Childress South of Red River	Gateway	1.93	no more than 2	Ewing and others (2004)
Collingsworth	Mesquite	8.43	no more than 9	Ewing and others (2004)
Cottle	Gateway	1.68	no more than 2	Ewing and others (2004)
Fisher	Clear Fork	2.41	no more than 4	Ewing and others (2004)
Foard	Gateway	6.48	no more than 10	Ewing and others (2004)
Hall	Mesquite	4.79	no more than 9	Ewing and others (2004)
Hardeman	Gateway	1.15	no more than 2	Ewing and others (2004)

TABLE B3. MODELED DRAWDOWN IN OGALLALA AQUIFER IN GROUNDWATER MANAGEMENT AREA (GMA) 6. MODELED DRAWDOWN WAS BASED ON GMA 2 DESIRED FUTURE CONDITIONS GROUNDWATER PREDICTIVE MODEL.

County	Groundwater Conservation District	Modeled Drawdown (feet 2010 to 2070)	Desired Future Condition (feet drawdown)	Groundwater Availability Model
Motley	Gateway	17	17	Deeds and Jigmond (2015)

TABLE B4. MODELED DRAWDOWN IN DOCKUM AQUIFER IN GROUNDWATER MANAGEMENT AREA (GMA) 6. MODELED DRAWDOWN WAS BASED ON GMA 2 DESIRED FUTURE CONDITIONS GROUNDWATER PREDICTIVE MODEL.

County	Groundwater Conservation District	Modeled Drawdown (feet 2010 to 2070)	Desired Future Condition (feet drawdown)	Groundwater Availability Model
Fisher	Clear Fork	0	0	Deeds and Jigmond (2015)
Motley	Gateway	6	6	Deeds and Jigmond (2015)

Appendix C

Summary of Model Dry Cells

TABLE C1. MODEL DRY CELLS FROM PREDICTIVE SIMULATION OF SEYMOUR AQUIFER OF POD 7 IN BAYLOR, HASKELL, AND KNOX COUNTIES.

County	Stress Periods	Active Cells	Dry Cells	Wet Cells	Percent of Dry Cells
Baylor	1 to 408 (1980 to 2070)	5,753	401	5,352	7
Haskell	1 to 408 (1980 to 2070)	23,697	596	23,101	3
Knox	1 to 408 (1980 to 2070)	15,927	3,117	12,810	20

TABLE C2. MODEL DRY CELLS FROM PREDICTIVE SIMULATION OF SEYMOUR AND BLAINE AQUIFERS.

Desired Future Condition Zone	Stress Period	Active Cells	Dry Cells	Wet Cells	Percent of Dry Cells
Seymour (Pod 1)	1 to 60 (2011 to 2070)	296	109	187	37
Seymour (Pod 2)	1 to 60 (2011 to 2070)	133	48	85	36
Seymour (Pod 3)	1 to 60 (2011 to 2070)	66	30	36	45
Seymour (Pod 4)	1 to 60 (2011 to 2070)	453	85	368	19
Seymour (Pod 6)	1 to 60 (2011 to 2070)	58	33	25	57
Seymour (Pod 8)	1 to 60 (2011 to 2070)	45	11	34	24
Seymour (Pod 11)	1 to 60 (2011 to 2070)	280	94	186	34
Blaine (North of Red River of Childress)	1 to 60 (2011 to 2070)	309	0	309	0
Blaine (South of Red River of Childress)	1 to 60 (2011 to 2070)	408	0	408	0
Blaine (Collingsworth)	1 to 60 (2011 to 2070)	930	0	930	0
Blaine (Cottle)	1 to 60 (2011 to 2070)	907	0	907	0
Blaine (Fisher)	1 to 60 (2011 to 2070)	900	0	900	0
Blaine (Foard)	1 to 60 (2011 to 2070)	706	0	706	0
Blaine (Hall)	1 to 60 (2011 to 2070)	900	0	900	0
Blaine (Hardeman)	1 to 60 (2011 to 2070)	708	0	708	0

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APPENDIX B

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Estimated Historical Water Use And 2017 State Water Plan Datasets:

Rolling Plains 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 3, 2020

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 4/3/2020. Although it does not happen frequently, either of these datasets are subject to change pending the availability of more accurate WUS data or an amendment to the 2017 SWP. District personnel must review these datasets and correct any discrepancies in order to ensure approval of their groundwater management plan.

The WUS dataset can be verified at this web address:

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

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

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

Estimated Historical Water Use
TWDB Historical Water Use Survey (WUS) Data

Groundwater and surface water historical use estimates are currently unavailable for calendar year 2018. TWDB staff anticipates the calculation and posting of these estimates at a later date.

BAYLOR COUNTY

All values are in acre-feet

Year	Source	Municipal	Manufacturing	Mining	Steam Electric	Irrigation	Livestock	Total
2017	GW	928	0	0	0	3,727	188	4,843
	SW	22	0	0	0	360	749	1,131
2016	GW	934	0	0	0	2,828	147	3,909
	SW	16	0	0	0	782	587	1,385
2015	GW	963	0	0	0	1,754	143	2,860
	SW	10	0	0	0	1,119	569	1,698
2014	GW	903	0	6	0	4,024	142	5,075
	SW	6	0	1	0	694	565	1,266
2013	GW	830	0	0	0	3,157	138	4,125
	SW	15	0	0	0	360	556	931
2012	GW	634	0	0	0	3,464	139	4,237
	SW	11	0	0	0	360	559	930
2011	GW	793	0	0	0	5,970	156	6,919
	SW	0	0	0	0	1,266	625	1,891
2010	GW	637	0	11	0	2,469	148	3,265
	SW	15	0	4	0	1,061	596	1,676
2009	GW	699	0	6	0	2,296	171	3,172
	SW	4	0	2	0	1,114	683	1,803
2008	GW	681	0	0	0	2,165	171	3,017
	SW	2	0	0	0	1,164	685	1,851
2007	GW	646	0	0	0	634	237	1,517
	SW	22	0	0	0	1,124	947	2,093
2006	GW	806	0	0	0	2,094	227	3,127
	SW	0	0	0	0	1,180	910	2,090
2005	GW	713	0	0	0	1,255	217	2,185
	SW	2	0	0	0	1,080	866	1,948
2004	GW	681	0	0	0	1,071	58	1,810
	SW	3	0	0	0	1,040	1,034	2,077
2003	GW	684	0	0	0	1,217	60	1,961
	SW	1	0	0	0	1,078	1,081	2,160
2002	GW	651	0	0	0	1,014	51	1,716
	SW	1	0	0	0	10	913	924

HASKELL COUNTY

All values are in acre-feet

Year	Source	Municipal	Manufacturing	Mining	Steam Electric	Irrigation	Livestock	Total
2017	GW	110	0	0	0	45,057	138	45,305
	SW	737	2	0	0	0	322	1,061
2016	GW	105	0	0	0	40,872	92	41,069
	SW	764	2	0	0	0	216	982
2015	GW	90	0	0	0	39,268	91	39,449
	SW	749	0	0	0	7	213	969
2014	GW	129	0	0	0	62,988	89	63,206
	SW	673	0	0	0	0	207	880
2013	GW	103	0	3	0	45,859	88	46,053
	SW	747	0	1	0	0	204	952
2012	GW	179	0	0	0	62,485	129	62,793
	SW	813	0	0	0	0	302	1,115
2011	GW	219	0	0	0	83,811	187	84,217
	SW	934	0	0	0	93	436	1,463
2010	GW	192	0	27	0	35,865	174	36,258
	SW	858	0	6	0	93	406	1,363
2009	GW	213	0	26	0	41,943	169	42,351
	SW	767	0	6	0	93	393	1,259
2008	GW	183	0	25	0	43,797	159	44,164
	SW	744	0	6	0	96	371	1,217
2007	GW	200	0	0	0	39,890	163	40,253
	SW	637	0	0	0	105	380	1,122
2006	GW	181	0	0	0	39,484	291	39,956
	SW	815	0	0	0	90	678	1,583
2005	GW	208	0	0	0	38,001	233	38,442
	SW	758	0	0	0	71	545	1,374
2004	GW	171	0	0	0	36,278	145	36,594
	SW	709	0	0	0	71	582	1,362
2003	GW	242	0	0	0	35,154	139	35,535
	SW	743	0	0	0	79	555	1,377
2002	GW	235	0	0	0	36,492	108	36,835
	SW	751	0	0	4	0	431	1,186

KNOX COUNTY

All values are in acre-feet

Year	Source	Municipal	Manufacturing	Mining	Steam Electric	Irrigation	Livestock	Total
2017	GW	211	0	0	0	34,970	91	35,272
	SW	479	0	0	0	0	368	847
2016	GW	185	0	2	0	28,460	128	28,775
	SW	451	0	1	0	0	509	961
2015	GW	205	0	0	0	28,967	124	29,296
	SW	400	0	0	0	0	498	898
2014	GW	223	0	0	0	44,545	122	44,890
	SW	382	0	0	0	15	487	884
2013	GW	229	0	0	0	29,553	120	29,902
	SW	472	4	0	0	0	482	958
2012	GW	391	0	0	0	50,314	75	50,780
	SW	552	1	0	0	2	303	858
2011	GW	213	0	0	0	66,335	99	66,647
	SW	573	0	0	0	0	398	971
2010	GW	189	0	10	0	29,131	91	29,421
	SW	625	0	4	0	15	366	1,010
2009	GW	183	0	6	0	37,814	118	38,121
	SW	551	0	2	0	0	474	1,027
2008	GW	175	0	1	0	36,275	111	36,562
	SW	559	0	0	0	0	444	1,003
2007	GW	174	0	0	0	28,336	307	28,817
	SW	673	0	0	0	0	1,229	1,902
2006	GW	187	0	0	0	41,043	227	41,457
	SW	588	0	0	0	0	908	1,496
2005	GW	188	0	0	0	40,269	223	40,680
	SW	574	0	0	0	0	890	1,464
2004	GW	198	0	0	0	40,120	55	40,373
	SW	590	0	0	0	0	1,039	1,629
2003	GW	149	0	0	0	40,112	59	40,320
	SW	561	0	0	0	0	1,103	1,664
2002	GW	156	0	0	0	30,358	53	30,567
	SW	576	0	0	0	0	998	1,574

Projected Surface Water Supplies
TWDB 2017 State Water Plan Data

BAYLOR COUNTY

All values are in acre-feet

RWPG	WUG	WUG Basin	Source Name	2020	2030	2040	2050	2060	2070
B	COUNTY-OTHER, BAYLOR	BRAZOS	MILLERS CREEK LAKE/RESERVOIR	147	147	119	89	60	28
B	IRRIGATION, BAYLOR	BRAZOS	BRAZOS RUN-OF-RIVER	17	17	17	17	17	17
B	LIVESTOCK, BAYLOR	BRAZOS	BRAZOS LIVESTOCK LOCAL SUPPLY	800	799	799	799	799	799
B	LIVESTOCK, BAYLOR	RED	RED LIVESTOCK LOCAL SUPPLY	99	100	100	100	100	100
	Sum of Projected Surface Water Supplies (acre-feet)			**1,063**	**1,063**	**1,035**	**1,005**	**976**	**944**

HASKELL COUNTY

All values are in acre-feet

RWPG	WUG	WUG Basin	Source Name	2020	2030	2040	2050	2060	2070
G	COUNTY-OTHER, HASKELL	BRAZOS	MILLERS CREEK LAKE/RESERVOIR	245	203	162	120	79	38
G	COUNTY-OTHER, HASKELL	BRAZOS	STAMFORD LAKE/RESERVOIR	160	160	160	160	160	160
G	HASKELL	BRAZOS	MILLERS CREEK LAKE/RESERVOIR	461	383	305	227	149	71
G	LIVESTOCK, HASKELL	BRAZOS	BRAZOS LIVESTOCK LOCAL SUPPLY	676	676	676	676	676	676
G	RULE	BRAZOS	MILLERS CREEK LAKE/RESERVOIR	33	27	22	16	11	5
G	STAMFORD	BRAZOS	STAMFORD LAKE/RESERVOIR	13	12	12	12	12	11
G	STEAM ELECTRIC POWER, HASKELL	BRAZOS	STAMFORD LAKE/RESERVOIR	2,200	2,200	2,200	2,200	2,200	2,200
	Sum of Projected Surface Water Supplies (acre-feet)			**3,788**	**3,661**	**3,537**	**3,411**	**3,287**	**3,161**

KNOX COUNTY

All values are in acre-feet

RWPG	WUG	WUG Basin	Source Name	2020	2030	2040	2050	2060	2070
G	COUNTY-OTHER, KNOX	BRAZOS	BRAZOS RUN-OF-RIVER	34	34	34	34	34	34
G	COUNTY-OTHER, KNOX	BRAZOS	MILLERS CREEK LAKE/RESERVOIR	85	71	56	42	28	13
G	COUNTY-OTHER, KNOX	RED	MILLERS CREEK LAKE/RESERVOIR	10	8	7	5	3	2
G	IRRIGATION, KNOX	BRAZOS	LAKE DAVIS LAKE/RESERVOIR	160	142	124	106	88	70
G	KNOX CITY	BRAZOS	MILLERS CREEK LAKE/RESERVOIR	188	156	124	93	61	29
G	LIVESTOCK, KNOX	BRAZOS	BRAZOS LIVESTOCK LOCAL SUPPLY	790	790	790	790	790	790

G	LIVESTOCK, KNOX	RED	RED LIVESTOCK LOCAL SUPPLY	197	197	197	197	197	197
G	MINING, KNOX	BRAZOS	BRAZOS RUN-OF-RIVER	0	0	0	0	0	0
G	MINING, KNOX	RED	BRAZOS RUN-OF-RIVER	0	0	0	0	0	0
G	MUNDAY	BRAZOS	MILLERS CREEK LAKE/RESERVOIR	194	161	128	95	63	30
	Sum of Projected Surface Water Supplies (acre-feet)			**1,658**	**1,559**	**1,460**	**1,362**	**1,264**	**1,165**

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.

BAYLOR COUNTY

All values are in acre-feet

RWPG	WUG	WUG Basin	2020	2030	2040	2050	2060	2070
B	COUNTY-OTHER, BAYLOR	BRAZOS	93	90	87	87	86	86
B	COUNTY-OTHER, BAYLOR	RED	38	36	35	35	35	35
B	IRRIGATION, BAYLOR	BRAZOS	2,421	2,349	2,276	2,208	2,208	2,208
B	IRRIGATION, BAYLOR	RED	889	862	836	810	810	810
B	LIVESTOCK, BAYLOR	BRAZOS	1,054	1,054	1,054	1,054	1,054	1,054
B	LIVESTOCK, BAYLOR	RED	130	130	130	130	130	130
B	MINING, BAYLOR	BRAZOS	6	6	6	6	6	6
B	MINING, BAYLOR	RED	8	8	7	7	7	7
B	SEYMOUR	BRAZOS	496	481	471	470	469	469
	Sum of Projected Water Demands (acre-feet)		**5,135**	**5,016**	**4,902**	**4,807**	**4,805**	**4,805**

HASKELL COUNTY

All values are in acre-feet

RWPG	WUG	WUG Basin	2020	2030	2040	2050	2060	2070
G	COUNTY-OTHER, HASKELL	BRAZOS	255	247	243	245	248	253
G	HASKELL	BRAZOS	519	509	498	496	502	513
G	IRRIGATION, HASKELL	BRAZOS	47,844	46,422	45,040	43,072	42,405	41,207
G	LIVESTOCK, HASKELL	BRAZOS	676	676	676	676	676	676
G	MINING, HASKELL	BRAZOS	93	92	83	74	66	59
G	RULE	BRAZOS	89	86	84	85	86	88
G	STAMFORD	BRAZOS	9	9	9	9	9	9
G	STEAM ELECTRIC POWER, HASKELL	BRAZOS	336	393	462	547	650	720
	Sum of Projected Water Demands (acre-feet)		**49,821**	**48,434**	**47,095**	**45,204**	**44,642**	**43,525**

KNOX COUNTY

All values are in acre-feet

RWPG	WUG	WUG Basin	2020	2030	2040	2050	2060	2070
G	COUNTY-OTHER, KNOX	BRAZOS	124	121	120	123	124	126
G	COUNTY-OTHER, KNOX	RED	14	14	14	14	15	15
G	IRRIGATION, KNOX	BRAZOS	32,826	32,020	31,233	30,466	29,718	29,022
G	IRRIGATION, KNOX	RED	8,207	8,005	7,808	7,616	7,429	7,256
G	KNOX CITY	BRAZOS	242	245	248	253	257	261
G	LIVESTOCK, KNOX	BRAZOS	790	790	790	790	790	790

G	LIVESTOCK, KNOX	RED	197	197	197	197	197	197
G	MINING, KNOX	BRAZOS	12	12	11	11	11	11
G	MINING, KNOX	RED	3	3	3	3	3	3
G	MUNDAY	BRAZOS	256	259	260	266	270	274
	Sum of Projected Water Demands (acre-feet)		**42,671**	**41,666**	**40,684**	**39,739**	**38,814**	**37,955**

Projected Water Supply Needs
TWDB 2017 State Water Plan Data

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

BAYLOR COUNTY

All values are in acre-feet

RWPG	WUG	WUG Basin	2020	2030	2040	2050	2060	2070
B	COUNTY-OTHER, BAYLOR	BRAZOS	179	183	158	128	100	68
B	COUNTY-OTHER, BAYLOR	RED	32	33	34	34	34	34
B	IRRIGATION, BAYLOR	BRAZOS	0	0	0	0	0	0
B	IRRIGATION, BAYLOR	RED	-388	-312	-213	-119	-119	-119
B	LIVESTOCK, BAYLOR	BRAZOS	-130	-130	-130	-130	-130	-130
B	LIVESTOCK, BAYLOR	RED	0	0	0	0	0	0
B	MINING, BAYLOR	BRAZOS	1	1	2	2	2	2
B	MINING, BAYLOR	RED	0	0	0	0	0	0
B	SEYMOUR	BRAZOS	104	119	129	130	131	131
	Sum of Projected Water Supply Needs (acre-feet)		**-518**	**-442**	**-343**	**-249**	**-249**	**-249**

HASKELL COUNTY

All values are in acre-feet

RWPG	WUG	WUG Basin	2020	2030	2040	2050	2060	2070
G	COUNTY-OTHER, HASKELL	BRAZOS	280	241	198	155	114	68
G	HASKELL	BRAZOS	-58	-126	-193	-269	-353	-442
G	IRRIGATION, HASKELL	BRAZOS	-2,225	-2,388	-3,197	-1,065	682	1,880
G	LIVESTOCK, HASKELL	BRAZOS	0	0	0	0	0	0
G	MINING, HASKELL	BRAZOS	-93	-92	-83	-74	-66	-59
G	RULE	BRAZOS	72	64	56	49	46	38
G	STAMFORD	BRAZOS	4	3	3	3	3	2
G	STEAM ELECTRIC POWER, HASKELL	BRAZOS	1,864	1,807	1,738	1,653	1,550	1,480
	Sum of Projected Water Supply Needs (acre-feet)		**-2,376**	**-2,606**	**-3,473**	**-1,408**	**-419**	**-501**

KNOX COUNTY

All values are in acre-feet

RWPG	WUG	WUG Basin	2020	2030	2040	2050	2060	2070
G	COUNTY-OTHER, KNOX	BRAZOS	90	79	65	48	33	16
G	COUNTY-OTHER, KNOX	RED	9	7	6	4	1	0
G	IRRIGATION, KNOX	BRAZOS	-92	-92	-789	-1,768	-92	-92
G	IRRIGATION, KNOX	RED	-3,029	-5,423	-7,716	-7,515	-5,864	-5,013
G	KNOX CITY	BRAZOS	-48	-83	-118	-154	-190	-226
G	LIVESTOCK, KNOX	BRAZOS	0	0	0	0	0	0
G	LIVESTOCK, KNOX	RED	0	0	0	0	0	0

G	MINING, KNOX	BRAZOS	-12	-12	-11	-11	-11	-11
G	MINING, KNOX	RED	-3	-3	-3	-3	-3	-3
G	MUNDAY	BRAZOS	-55	-91	-125	-164	-200	-237
	Sum of Projected Water Supply Needs (acre-feet)		**-3,239**	**-5,704**	**-8,762**	**-9,615**	**-6,360**	**-5,582**

Projected Water Management Strategies
TWDB 2017 State Water Plan Data

BAYLOR COUNTY

WUG, Basin (RWPG)

All values are in acre-feet

Water Management Strategy	Source Name [Origin]	2020	2030	2040	2050	2060	2070
COUNTY-OTHER, BAYLOR, BRAZOS (B)							
MUNICIPAL CONSERVATION - BAYLOR COUNTY OTHER	DEMAND REDUCTION [BAYLOR]	0	0	0	4	7	10
		0	**0**	**0**	**4**	**7**	**10**
COUNTY-OTHER, BAYLOR, RED (B)							
MUNICIPAL CONSERVATION - BAYLOR COUNTY OTHER	DEMAND REDUCTION [BAYLOR]	0	0	0	2	3	4
		0	**0**	**0**	**2**	**3**	**4**
IRRIGATION, BAYLOR, RED (B)							
IRRIGATION CONSERVATION - BAYLOR	DEMAND REDUCTION [BAYLOR]	331	321	311	302	302	302
		331	**321**	**311**	**302**	**302**	**302**
MINING, BAYLOR, BRAZOS (B)							
MINING CONSERVATION - BAYLOR	DEMAND REDUCTION [BAYLOR]	2	2	1	1	1	1
		2	**2**	**1**	**1**	**1**	**1**
MINING, BAYLOR, RED (B)							
MINING CONSERVATION - BAYLOR	DEMAND REDUCTION [BAYLOR]	2	2	2	2	2	2
		2	**2**	**2**	**2**	**2**	**2**
Sum of Projected Water Management Strategies (acre-feet)		**335**	**325**	**314**	**311**	**315**	**319**

HASKELL COUNTY

WUG, Basin (RWPG)

All values are in acre-feet

Water Management Strategy	Source Name [Origin]	2020	2030	2040	2050	2060	2070
COUNTY-OTHER, HASKELL, BRAZOS (G)							
MILLERS CREEK AUGMENTATION	MILLERS CREEK LAKE/RESERVOIR [RESERVOIR]	33	47	62	76	90	105
		33	**47**	**62**	**76**	**90**	**105**
HASKELL, BRAZOS (G)							
MILLERS CREEK AUGMENTATION	MILLERS CREEK LAKE/RESERVOIR [RESERVOIR]	176	254	332	410	488	566
		176	**254**	**332**	**410**	**488**	**566**
IRRIGATION, HASKELL, BRAZOS (G)							

IRRIGATION WATER CONSERVATION	DEMAND REDUCTION [HASKELL]	1,435	2,321	3,153	3,015	0	0
REALLOCATION OF HASKELL CO. SE TO MINING AND IRRIGATION	STAMFORD LAKE/RESERVOIR [RESERVOIR]	790	67	44	0	0	0
		2,225	**2,388**	**3,197**	**3,015**	**0**	**0**
MINING, HASKELL, BRAZOS (G)							
INDUSTRIAL WATER CONSERVATION	DEMAND REDUCTION [HASKELL]	3	5	6	5	5	4
REALLOCATION OF HASKELL CO. SE TO MINING AND IRRIGATION	STAMFORD LAKE/RESERVOIR [RESERVOIR]	90	87	77	69	61	55
		93	**92**	**83**	**74**	**66**	**59**
RULE, BRAZOS (G)							
MILLERS CREEK AUGMENTATION	MILLERS CREEK LAKE/RESERVOIR [RESERVOIR]	12	18	23	29	34	40
		12	**18**	**23**	**29**	**34**	**40**
STAMFORD, BRAZOS (G)							
MUNICIPAL WATER CONSERVATION (SUBURBAN) - STAMFORD	DEMAND REDUCTION [HASKELL]	0	1	2	2	3	3
		0	**1**	**2**	**2**	**3**	**3**
Sum of Projected Water Management Strategies (acre-feet)		**2,539**	**2,800**	**3,699**	**3,606**	**681**	**773**

KNOX COUNTY

WUG, Basin (RWPG)

All values are in acre-feet

Water Management Strategy	Source Name [Origin]	2020	2030	2040	2050	2060	2070
IRRIGATION, KNOX, BRAZOS (G)							
BLAINE AQUIFER DEVELOPMENT	BLAINE AQUIFER [KNOX]	0	0	0	0	0	0
BLAINE AQUIFER DEVELOPMENT	BLAINE AQUIFER [STONEWALL]	0	0	0	0	0	0
IRRIGATION WATER CONSERVATION	DEMAND REDUCTION [KNOX]	233	92	790	1,769	92	92
SEYMOUR AQUIFER DEVELOPMENT	SEYMOUR AQUIFER [KNOX]	0	0	0	0	0	0
		233	**92**	**790**	**1,769**	**92**	**92**
IRRIGATION, KNOX, RED (G)							
BLAINE AQUIFER DEVELOPMENT	BLAINE AQUIFER [KNOX]	460	460	460	460	460	460
BLAINE AQUIFER DEVELOPMENT	BLAINE AQUIFER [STONEWALL]	0	1,709	4,120	5,042	1,855	1,065
IRRIGATION WATER CONSERVATION	DEMAND REDUCTION [KNOX]	998	1,909	1,943	897	2,508	2,447
SEYMOUR AQUIFER DEVELOPMENT	SEYMOUR AQUIFER [KNOX]	1,571	1,345	1,193	1,116	1,041	1,041
		3,029	**5,423**	**7,716**	**7,515**	**5,864**	**5,013**
KNOX CITY, BRAZOS (G)							
MILLERS CREEK AUGMENTATION	MILLERS CREEK LAKE/RESERVOIR [RESERVOIR]	72	104	136	167	199	231

MUNICIPAL WATER CONSERVATION (RURAL) - KNOX CITY	DEMAND REDUCTION [KNOX]	9	25	45	54	54	55
		81	**129**	**181**	**221**	**253**	**286**
MINING, KNOX, BRAZOS (G)							
BLAINE AQUIFER DEVELOPMENT	BLAINE AQUIFER [KNOX]	12	12	12	12	12	12
INDUSTRIAL WATER CONSERVATION	DEMAND REDUCTION [KNOX]	0	1	1	1	1	1
		12	**13**	**13**	**13**	**13**	**13**
MINING, KNOX, RED (G)							
BLAINE AQUIFER DEVELOPMENT	BLAINE AQUIFER [KNOX]	3	3	3	3	3	3
INDUSTRIAL WATER CONSERVATION	DEMAND REDUCTION [KNOX]	0	0	0	0	0	0
		3	**3**	**3**	**3**	**3**	**3**
MUNDAY, BRAZOS (G)							
MILLERS CREEK AUGMENTATION	MILLERS CREEK LAKE/RESERVOIR [RESERVOIR]	74	107	140	173	205	238
MUNICIPAL WATER CONSERVATION (RURAL) - MUNDAY	DEMAND REDUCTION [KNOX]	8	26	36	37	36	37
		82	**133**	**176**	**210**	**241**	**275**
Sum of Projected Water Management Strategies (acre-feet)		**3,440**	**5,793**	**8,879**	**9,731**	**6,466**	**5,682**

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APPENDIX C

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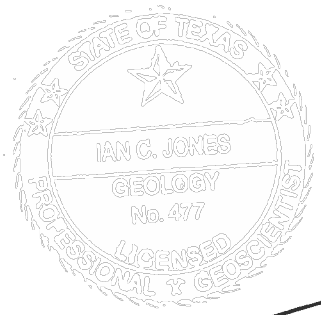
GAM Run 19-020: Rolling Plains Groundwater Conservation District Groundwater Management Plan

Ian C. Jones, Ph.D., P.G.
Texas Water Development Board
Groundwater Division
Groundwater Availability Modeling Department
512-463-6641
July 30, 2019



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GAM RUN 19-020: ROLLING PLAINS GROUNDWATER CONSERVATION DISTRICT GROUNDWATER MANAGEMENT PLAN

Ian C. Jones, Ph.D., P.G.
Texas Water Development Board
Groundwater Division
Groundwater Availability Modeling Department
512-463-6641
July 30, 2019

EXECUTIVE SUMMARY:

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

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

1. the annual amount of recharge from precipitation, if any, to the groundwater resources within the district;

2. for each aquifer within the district, the annual volume of water that discharges from the aquifer to springs and any surface-water bodies, including lakes, streams, and rivers; and

3. the annual volume of flow into and out of the district within each aquifer and between aquifers in the district.

The groundwater management plan for the Rolling Plains Groundwater Conservation District should be adopted by the district on or before June 17, 2020 and submitted to the Executive Administrator of the TWDB on or before July 17, 2020. The current management plan for the Rolling Plains Groundwater Conservation District expires on September 15, 2020.

We used two groundwater availability models to estimate the management plan information for the aquifers within the Rolling Plains Groundwater Conservation District. Information for the Seymour and Blaine aquifers is from the groundwater availability model for the Seymour and Blaine aquifers (Ewing and others, 2004) and from the groundwater availability model for the Seymour Aquifer in Haskell, Knox, and Baylor counties (Jigmond and others, 2014).

This report replaces GAM Run 14-009 (Wade and Boghici, 2015), as the approach used for analyzing model results has been since refined. Tables 1 and 2 summarize the groundwater availability model data required by statute and Figures 1 and 2 show the area of the models from which the values in the tables were extracted. If, after review of the figures, the Rolling Plains 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. We do not have a model for the Cross Timbers Aquifer. Please contact Mr. Stephen Allen at 512-463-7317 or stephen.allen@twdb.texas.gov for any information you may need about this aquifer for your groundwater conservation district management plan.

METHODS:

In accordance with the provisions of the Texas State Water Code, Section 36.1071, Subsection (h), we used the two groundwater availability models mentioned above to estimate the information for the Rolling Plains Groundwater Conservation District management plan. Using ZONEBUDGET Version 3.01 (Harbaugh, 2009), we extracted water budgets from the models' results for the (post-1980) historical model periods for the Seymour and Blaine aquifers (January 1980 through December 1999), and for the Seymour Aquifer in Haskell, Knox, and Baylor counties (January 1980 through December 2005). In this report we summarize the average annual water budget values for recharge, surface-water outflow, inflow to the district, and outflow from the district for the aquifers within the district.

PARAMETERS AND ASSUMPTIONS:

Seymour and Blaine Aquifers

- We used version 1.01 of the groundwater availability model for the Seymour and Blaine Aquifers this analysis. See Ewing and others (2004) for assumptions and limitations of the groundwater availability model.
- This groundwater availability model includes two layers, representing the Seymour Aquifer (Layer 1), and the Blaine Aquifer (Layer 2). In areas where the Blaine Aquifer does not exist the model roughly replicates various Permian units located in the area.
- We ran the model with MODFLOW-2000 (Harbaugh and others, 2000).

Seymour Aquifer in Haskell, Knox, and Baylor Counties

- We used version 1.01 of the refined groundwater availability model for the Seymour Aquifer in Haskell, Knox, and Baylor counties for this analysis. See Jigmond and others (2014) for assumptions and limitations of the groundwater availability model.
- This groundwater availability model includes one layer representing the Seymour Aquifer in Haskell, southern Knox, western Baylor, and a small portion of eastern Stonewall counties.
- We ran the model with MODFLOW-2000 (Harbaugh and others, 2000).

RESULTS:

A groundwater budget summarizes the amount of water entering and leaving the aquifers according to the groundwater availability model. Selected groundwater budget components listed below were extracted from the groundwater availability model results for the Seymour and Blaine aquifers located within Rolling Plains Groundwater Conservation District and averaged over the historical calibration periods, as shown in Tables 1 and 2.

1. Precipitation recharge—the areally distributed recharge sourced from precipitation falling on the outcrop areas of the aquifers (where the aquifer is exposed at land surface) within the district.

2. Surface-water outflow—the total water discharging from the aquifer (outflow) to surface-water features such as streams, reservoirs, and springs.

3. Flow into and out of district—the lateral flow within the aquifer between the district and adjacent counties.

4. Flow between aquifers—the net vertical flow between the aquifer and adjacent aquifers or confining units. This flow is controlled by the relative water levels in each aquifer and aquifer properties of each aquifer or confining unit that define the amount of leakage that occurs.

The information needed for the district's management plan is summarized in Tables 1 and 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 SEYMOUR AQUIFER FOR ROLLING PLAINS GROUNDWATER CONSERVATION DISTRICT'S GROUNDWATER MANAGEMENT PLAN. ALL VALUES ARE REPORTED IN ACRE-FEET PER YEAR AND ROUNDED TO THE NEAREST 1 ACRE-FOOT.

Management Plan requirement	Aquifer or confining unit	Results
Estimated annual amount of recharge from precipitation to the district	Seymour Aquifer	112,253
Estimated annual volume of water that discharges from the aquifer to springs and any surface-water body including lakes, streams, and rivers	Seymour Aquifer	61,661
Estimated annual volume of flow into the district within each aquifer in the district	Seymour Aquifer	62
Estimated annual volume of flow out of the district within each aquifer in the district	Seymour Aquifer	2,945
Estimated net annual volume of flow between each aquifer in the district	Flow from Seymour Aquifer into Permian units	7,134*

***** Based on model results from Ewing and others (2004)

FIGURE 1 AREA OF THE GROUNDWATER AVAILABILITY MODELS FOR THE SEYMOUR AQUIFER FROM WHICH THE INFORMATION IN TABLE 1 WAS EXTRACTED (THE AQUIFER SYSTEM EXTENT WITHIN THE DISTRICT BOUNDARY).

TABLE 2. SUMMARIZED INFORMATION FOR THE BLAINE AQUIFER FOR ROLLING PLAINS GROUNDWATER CONSERVATION DISTRICT'S GROUNDWATER MANAGEMENT PLAN. ALL VALUES ARE REPORTED IN ACRE-FEET PER YEAR AND ROUNDED TO THE NEAREST 1 ACRE-FOOT.

Management Plan requirement	Aquifer or confining unit	Results
Estimated annual amount of recharge from precipitation to the district	Blaine Aquifer	702
Estimated annual volume of water that discharges from the aquifer to springs and any surface-water body including lakes, streams, and rivers	Blaine Aquifer	0
Estimated annual volume of flow into the district within each aquifer in the district	Blaine Aquifer	1,823
Estimated annual volume of flow out of the district within each aquifer in the district	Blaine Aquifer	3
Estimated net annual volume of flow between each aquifer in the district	Flow from the Blaine Aquifer into adjacent Permian units	4,922

FIGURE 2 AREA OF THE GROUNDWATER AVAILABILITY MODEL FOR THE BLAINE AQUIFER FROM WHICH THE INFORMATION IN TABLE 2 WAS EXTRACTED (THE AQUIFER SYSTEM EXTENT WITHIN THE DISTRICT BOUNDARY).

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 historical groundwater flow conditions includes the assumptions about the location in the aquifer where historical pumping was placed. Understanding the amount and location of historical pumping is as important as evaluating the volume of groundwater flow into and out of the district, between aquifers within the district (as applicable), interactions with surface water (as applicable), recharge to the aquifer system (as applicable), and other metrics that describe the impacts of that pumping. In addition, assumptions regarding precipitation, recharge, and interaction with streams are specific to particular historical 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. Historical 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:

Ewing, J. E., Jones, T. L., Pickens, J. F., Chastain-Howley, A., Dean, K. E., Spear, A. A., 2004, Groundwater availability model for the Seymour Aquifer: Final report prepared for the Texas Water Development Board by INTERA, Inc., 533 p., http://www.twdb.texas.gov/groundwater/models/gam/symr/SYMR_Model_Report.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.

Harbaugh, A. W., Banta, E. R., Hill, M. C., and McDonald, M. G., 2000, MODFLOW-2000, the U.S. Geological Survey modular ground-water model -- User guide to modularization concepts and the Ground-Water Flow Process: U.S. Geological Survey Open-File Report 00-92, 121 p.

Jigmond, M., Hutchison, W. R., and Shi, J., 2014, Final Report: Groundwater Availability Model of the Seymour Aquifer in Haskell, Knox, and Baylor Counties, 185 p., http://www.twdb.texas.gov/groundwater/models/gam/symr_hkb/Seymour_HKB_GAM_Report_Sealed_021414.pdf.

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

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

Wade, S. C., and Boghici, R., 2015, GAM Run 14-009: Texas Water Development Board, GAM Run 14-009 Report, 12 p., http://www.twdb.texas.gov/groundwater/docs/GAMruns/GR14-009.pdf.

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APPENDIX D

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Rules of the Rolling Plains Groundwater Conservation District

ORIGINALLY ADOPTED: January 18, 2001

REVISED: July 19, 2001
REVISED: December 19, 2002
REVISED: April 17, 2003
REVISED: September 18, 2003

The rules of the Rolling Plains Groundwater Conservation District, as amended, are hereby published, as of September 18, 2003:

In accordance with Section 59 of Article XVI of the Texas Constitution; Chapter 36 of the Texas Water Code; Haskell/Knox Underground Water Conservation District Enabling Act, 73rd Leg., R.S., ch. 1028, 1993 Tex. Gen. Laws 4435; Act of April 24, 2001, 77th Leg., R.S., ch. 38, 2001 Tex. Gen. Laws 68; and Act of May 30, 2003, 78th Leg., R.S., ch. 992, 2003 Tex. Gen. Laws 2896, the following rules are hereby ratified and adopted as the rules of this District by its Board. Each rule as worded herein has been in effect since the date of passage and as may be hereafter amended. All rules or parts of rules, in conflict with these rules, are hereby repealed. Rolling Plains Groundwater Conservation District first adopted rules on January 18, 2001, and adopted amendments to its rules on July 19, 2001, December 19, 2002, April 17, 2003, and September 18, 2003.

The rules, regulations, and modes of procedure herein contained are and have been adopted to simplify procedures, avoid delays, and facilitate the administration of the water laws of the State and the rules of this District. To the end that these objectives are attained, these rules will be so construed.

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 may these rules be construed as a limitation or restriction upon the exercise of powers, duties, and jurisdiction conferred by law. These rules will not limit or restrict the amount and accuracy of data or information that may be required for the proper administration of the law.

ROLLING PLAINS

GROUNDWATER CONSERVATION DISTRICT

DISTRICT RULES

SECTION 1. DEFINITIONS AND CONCEPTS

Rule 1.1 Definitions of Terms

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

1) "Acre-foot" means the amount of water necessary to cover one acre of land one foot deep, or about 325,000 gallons of water.

2) "Agriculture" has the meaning assigned by Chapter 36, Texas Water Code.

3) "Board" means the Board of Directors of the District.

4) "Commission" means the Texas Commission on Environmental Quality and its successor agencies.

5) "Deteriorated well" means a well, the condition of which will cause, or is potentially likely to cause, pollution of any water in the District.

6) "De-watering well" means a well used to remove water from a construction site or excavation, or to relieve hydrostatic uplift on permanent structures.

7) "District" means the Rolling Plains Groundwater Conservation District.

8) "District Act" means the Haskell/Knox Underground Water Conservation District Enabling Act, 73rd Leg. R.S., ch. 1028, 1993 Tex. Gen. Laws 4435 as amended by Act of April 24, 2001, 77th Leg., R.S., ch. 38, 2001 Tex. Gen. Laws 68 and Act of May 30, 2003, 78th Leg., R.S., ch. 992, 2003 Tex. Gen. Laws 2896; and the non-conflicting provisions of Chapter 36, Texas Water Code.

9) "District office" means the office of the District as established by resolution of the Board.

10) "Drilling permit" means a permit for a water well issued or to be issued by the District allowing a water well to be drilled.

11) "Existing well" means a well drilled and completed on or before December 19, 2002.

12) "Groundwater" means water percolating below the surface of the earth, but does not include water produced with oil in the production of oil and gas.

13) "Hearing body" means the Board, any committee of the Board, or a Hearing Examiner at any hearing held under the authority of the District Act.

14) "Injection well" includes:

   a) An air conditioning return flow well used to return water used for heating or cooling in a heat pump to the aquifer that supplied the water;

   b) A cooling water return flow well used to inject water previously used for cooling;

   c) A drainage well used to drain surface fluid into a subsurface formation;

   d) A recharge well used to replenish the water in an aquifer;

e) A saltwater intrusion barrier well used to inject water into a freshwater aquifer to prevent the intrusion of salt water into the freshwater;

f) A sand backfill well used to inject a mixture of water and sand, mill tailings, or other solids into subsurface mines;

g) A subsidence control well used to inject fluids into a non-oil or gas producing zone to reduce or eliminate subsidence associated with the overdraft of fresh water; or

h) A closed system geothermal well used to circulate water, other fluids, or gases through the earth as a heat source or heat sink.

15) "Landowner" means the person who bears ownership of the land surface.

16) "Leachate well" means a well used to remove contamination from soil or groundwater.

17) "Monitoring well" means a well installed to measure some property of the groundwater or aquifer it penetrates, and does not produce more than 5,000 gallons of groundwater per year.

18) "New well" means a well that was not yet drilled and completed on or before December 19, 2002.

19) "Open meetings law" means Chapter 551, Texas Government Code.

20) "Person" includes corporation, individual, organization, government or governmental subdivision or agency, business trust, estate, trust, partnership, association, or any other legal entity.

21) "Pollution" means the alteration of the physical, thermal, chemical, or biological quality of, or the contamination of, any water in the District that renders the water harmful, detrimental, or injurious to humans, animal life, vegetation, or property or to public health, safety, or welfare, or impairs the usefulness or public enjoyment of the water for any lawful or reasonable use.

22) "Presiding officer" means the President, Vice-President, Secretary, or other Board member presiding at any meeting, hearing, or other proceeding.

23) "Rules" means the rules of the District compiled in this document and as may be supplemented or amended from time to time.

24) "Section" means the land designated by a survey number found in the Baylor, Haskell and Knox County Survey Maps, Texas General Land Office - Archives Division, Austin, Texas.

25) "Texas Public Information Act" means Chapter 552, Texas Government Code.

26) "Use for a beneficial purpose" has the meaning assigned by Chapter 36, Texas Water Code.

27) "Waste" has the meaning assigned by Chapter 36, Texas Water Code.

28) "Water meter" means a water flow-measuring device that can accurately record the amount of groundwater produced during a measured time.

29) "Well" shall mean a water well, injection well, recharge well, dewatering well, or monitoring well used to withdraw groundwater from the groundwater supply within the District.

30) "Well owner" or "well operator" means the person who owns the land upon which a well is located or is to be located or the person who operates a well or a water distribution system supplied by a well.

31) "Well system" means a well or group of wells tied to the same distribution system.

32) “Withdraw” means extracting groundwater by pumping or by another method.

33) “Windmill” means a wind-driven or hand-driven device that uses a piston pump to remove groundwater.

Rule 1.2 Purpose of Rules

These rules are adopted to achieve the provisions of the District Act and accomplish its purposes.

Rule 1.3 Use and Effect of Rules

The District uses these rules as guides in the exercise of the powers conferred by law and in the accomplishment of the purposes of the District Act. They may not be construed as a limitation or restriction on the exercise of any discretion nor be construed to deprive the District or Board of the exercise of any powers, duties or jurisdiction conferred by law, nor be construed to limit or restrict the amount and character of data or information that may be required to be collected for the proper administration of the District Act.

Rule 1.4 Amending of Rules

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

Rule 1.5 Headings and Captions

The section and other headings and captions contained in these rules are for reference purposes only. They do not affect the meaning or interpretation of these rules in any way.

Rule 1.6 Construction

A reference to a title, rule or section without further identification is a reference to a title, chapter or section. Construction of words and phrases is governed by the Code Construction Act, Subchapter B, Chapter 311, Government Code.

Rule 1.7 Methods of Service Under the Rules

Except as otherwise expressly provided in these rules, any notice or documents required by these rules to be served or delivered may be delivered to the recipient, or the recipient's authorized representative, in person, by agent, by courier receipted delivery, by certified mail sent to the recipient's last known address, or by telephonic document transfer to the recipient's current telecopier

number. Service by mail is complete upon deposit in a post office or other official depository of the United States Postal Service. Service by telephonic document transfer is complete upon transfer, except that any transfer occurring after 5:00 p.m. will be deemed complete on 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 time after service, three days will be added to the prescribed period. Where service by one of more methods has been attempted and failed, the service is complete upon notice publication in a newspaper of general circulation in Haskell, Knox and Baylor Counties.

Rule 1.8 Severability

If any one or more of the provisions contained in these rules are for any reason held to be invalid, illegal, or unenforceable in any respect, the invalidity, illegality, or unenforceability may not affect any other rules or provisions of these rules, and these rules must be construed as if such invalid, illegal or unenforceable rules or provision had never been contained in these rules.

SECTION 2. BOARD

Rule 2.1 Purpose of Board

The Board was created to determine policy and regulate the withdrawal of groundwater within the boundaries of the District for conserving, preserving, protecting, and recharging the groundwater within the District, and to exercise its rights, powers, and duties in a way that will effectively and expeditiously accomplish the purposes of the District Act. The Board's responsibilities include, but are not limited to, the adoption and enforcement of reasonable rules and other orders.

Rule 2.2 Board Structure and Officers

The Board consists of the members appointed and qualified as required by the District Act. The Board will elect one of its members to serve as President, to preside over Board meetings and proceedings; one to serve as Vice President, to preside in the absence of the President; and one to serve as Secretary, to keep a true and complete account of all meetings and proceedings of the Board. The Board will elect officers every other year. Members and officers serve until their successors are appointed and sworn in accordance with the District Act and these rules.

Rule 2.3 Meetings

The Board will hold a regular meeting at least once quarterly as the Board may establish from time to time by resolution. At the request of the President, or by written request of at least three members, the Board may hold special meetings. All Board meetings will be held according to the Texas Open Meetings Law.

Rule 2.4 Committees

The President may establish committees for formulation of policy recommendations to the Board and appoint the chair and membership of the committees. Committee members serve at the pleasure of the President.

Rule 2.5 Ex Parte Communications

a) Board members may not communicate, directly or indirectly, about any issue of fact or law in any contested case before the board, with any agency, person, party, or their representatives except on notice and opportunity for all parties to participate.

b) Notwithstanding Subsection (a) of this Rule, a Board member may communicate ex parte with other members of the Board, the General Manager, employees, or attorneys of the District as long as such communication does not violate other applicable law. Subsection (a) of this Rule does not apply to a Board member who abstains from voting on any matter in which ex parte communications have occurred.

SECTION 3. DISTRICT STAFF

Rule 3.1 General Manager

The Board may employ a person to be the General Manager of the District, who is the District's chief administrative officer. The General Manager shall have full authority to manage and operate the affairs of the District subject only to the direction given by the Board through policies and orders adopted by it. The Board will determine the salary and review the position of General Manager each year at the beginning of the third quarter of every fiscal year. The General Manager, with approval of the Board, may employ all persons necessary for the proper handling of the business and operation of the District. Employee salaries shall be set by the Board with recommendations from the General Manager.

Rule 3.2 Delegation of Authority

The General Manager may delegate duties as may be necessary to effectively and expeditiously accomplish those duties, provided that no such delegation may relieve the General Manager from the General Manager's responsibilities under the Texas Water Code, the District Act, and the policies, orders, and permits promulgated by the Board. To the extent not otherwise prohibited by law, the Board may delegate its duties as may be necessary to effectively and expeditiously accomplish those duties.

SECTION 4. DISTRICT RECORDS

Rule 4.1 Minutes and Records of the District

All documents, reports, records, and minutes of the District are available for public inspection and copying under the Texas Public Information Act. Upon written application of any person, the District shall furnish copies of its public records that are not otherwise exempt from disclosure under the Texas Public Information Act or other law. A reasonable copying charge may be assessed pursuant to policies established by the District. A list of the charges for copies shall be furnished by the District.

Rule 4.2 Certified Copies

Requests for certified copies must be in writing. Certified copies will be made under the direction of the Board of Directors. A certification charge and copying charge may be assessed, pursuant to policies established by the Board of Directors. A list of the charges for copies shall be furnished by the District.

SECTION 5. SPACING AND LOCATION REQUIREMENTS

Rule 5.1 Spacing Requirements

a) Except as provided under Rule 11.1, a well to be drilled subsequent to December 19, 2002 shall not be drilled:

   1) within 50 feet from the property line of any adjoining landowner; or

   2) within 100 feet of any existing well.

b) Wells drilled prior to December 19, 2002 shall be drilled in accordance with the rules in effect, if any, on the date such drilling commenced.

c) A well exempt from permitting under Rule 10.5(a)(3) is exempt from the spacing requirements under Rule 5.1. Other wells exempt from permitting under Rule 10.5 shall comply with the spacing and location requirements under Rules 5.1 and 5.2.

Rule 5.2 Location Requirements

a) All new wells must comply with the location requirements set forth under this rule, except that leachate wells, monitoring wells, and de-watering wells may be located where necessity dictates.

b) A well must be located a minimum horizontal distance of **50 feet** from any water-tight sewage facility and liquid-waste collection facility.

c) A well must be located a minimum horizontal distance of 150 feet from any contamination, such as existing or proposed livestock or poultry yards, privies, and septic system absorption fields.

d) A well must be located at a site not generally subject to flooding; provided, however, that if a well must be placed in a flood prone area, it must be completed with a watertight sanitary well seal and steel casing extending a minimum of **24 inches** above the known flood level.

e) No well may be located within five-hundred (500) feet of a sewage treatment plant, solid waste disposal site, or land irrigated by sewage plant effluent, or within three-hundred (300) feet of a sewage wet well, sewage pumping station, or a drainage ditch that contains industrial waste discharges or wastes from sewage treatment systems.

f) After an application for a well permit has been granted, the well, if drilled, must be drilled within ten (10) yards (30 feet) of the location specified in the permit, and not elsewhere. If the well should be commenced or drilled at a different location, the drilling or operation of such well may be enjoined by the Board pursuant to Chapter 36, Texas Water Code, and these Rules. As described in the Texas Water Well Drillers and Pump Installers Rules, all well drillers and persons having a well drilled, deepened, or otherwise altered shall adhere to the provisions of these Rules prescribing the drilling location and proper completion of wells, as well as the spacing and location requirements set forth under this section.

SECTION 6. PRODUCTION LIMITATIONS

Rule 6.1 Maximum Allowable Production

Subject to Subsections (b) and (c) of this Rule, a well or a well system shall not be operated such that the total annual production from the well or well systems exceeds three (3) acre feet of water per surface acre of land. Only land that is contiguous to the acre where the well is located and owned by the same person that owns the acre where the well is located shall be included in such calculation.

b) Notwithstanding Subsection (a) of this Rule and because of the isolated, localized, and discontinuous nature of the aquifer throughout the District, no person shall be entitled to claim as surface acreage for purposes of calculating the maximum allowable production of a well or well system any land that is located in a separate Section than the Section on which the well or well system is located. To the extent that wells comprising a well system are located on more than one Section, the wells located on a particular Section shall be considered as a separate well system from any wells physically located on another Section or Sections for all purposes under these Rules, including the calculation of the appropriate production limitation for a particular well or well system.

c) In the event that the well owner does not own the tract of land on which the well is located and no other wells are located on the tract of land, the well owner shall provide evidence to the District of the well owner's authority to claim the production rights for the surface acreage of the tract of land on which the well is located. In the event that the well owner does not own the tract of land on which the well is located and where other wells owned by persons other than such well owner are located on the same tract of land, such well owner or the owner of the land shall provide written evidence to the District establishing how the total right of groundwater production associated with the acreage included in the tract of land is to be allocated amongst the various wells or well systems located on the land. Failure to provide evidence of such allocation to the satisfaction of the District shall result in all wells located on the tract being shut down by order of the District to cease production for the remainder of the calendar year once the three

acre-feet of water per surface acre limit set forth under Subsections (a) and (b) of this Rule has been reached in a given year by the aggregate production of all wells located on the tract.

SECTION 7. OTHER DISTRICT ACTIONS AND DUTIES

Rule 7.1 District Management Plan

The District Management Plan specifies the acts, procedures, performance and avoidance necessary to prevent waste, the reduction of artesian pressure, or the draw-down of the water table.

The District shall use the Rules of the District to implement the Management Plan. The Board will review the plan at least every fifth year. If the Board considers a new plan necessary or desirable, based on evidence presented at hearing, a new plan will be adopted. A plan, once adopted, remains in effect until the adoption of a new plan.

Rule 7.2 Aquifer Storage and Recovery (ASR)

No ASR project shall be operated within the District, unless such person has obtained a permit authorizing the project from the commission and a copy of such permit has been filed with the District prior to the commencement of injection or recovery operations associated with the ASR project. A person applying for a permit from the commission to authorize an ASR project involving an aquifer within the boundaries of the District shall file a copy of the notice of such application and a copy of the application with the District within ten (10) days of publication of notice or of filing of the application with the commission, whichever is earlier.

SECTION 8. TRANSFER OF GROUNDWATER OUT OF THE DISTRICT:

Rule 8.1 Permit Required

a) No person shall produce groundwater within the District and transport such water for use outside of the district under the following conditions unless the person producing and transporting the water across the boundaries of the District shall obtain a permit to do so from the District:

   1) to increase, on or after March 2, 1997, the amount of groundwater to be transferred under a continuing arrangement in effect before that date; or

   2) to transfer groundwater out of the district on or after March 2, 1997, under a new arrangement.

b) The permit to produce water for transport outside of the District shall be applied for and considered by the Board in the same manner as applications for permits for groundwater use inside of the District, except that:

1) a person transporting groundwater outside of the District shall be subject to payment of the Groundwater Transport Regulatory Fee under Rule 8.2; and

2) the Board shall also consider the following additional criteria in reviewing applications for permits to transport water outside of the District:

a) the availability of water in the district and in the proposed receiving area during the period for which the water supply is requested;

b) the projected effect of the proposed transfer on aquifer conditions, depletion, subsidence, or effects on existing permit holders or other groundwater users within the district; and

c) the approved regional water plan and certified district management plan.

Rule 8.2 Groundwater Transport Regulatory Fee

1) a) A person transporting groundwater outside of the District shall be subject to payment of the Groundwater Transport Regulatory Fee. The Groundwater Transport Regulatory Fee shall be paid to the District on a monthly basis for water produced from wells located within the District for use outside of the District, which fee shall be established by resolution of the Board and paid to the District no less than 30 days after the end of the given reporting month. In no case shall the Board establish a fee in an amount that exceeds: $1 per acre-foot of water used for agricultural use; or

2) 17 cents per thousand gallons of water used for any other purpose.

b) An exempt well is not excused from payment of the Groundwater Transport Regulatory Fee if the groundwater produced from the exempt well is subsequently transported for use outside of the District. The owner of such an exempt well shall identify to the District the amount of water exported from the District on a monthly basis and pay the Groundwater Transport Regulatory Fee to the District in an amount equal to the fee for a non-exempt well for any water actually transported outside of the District.

c) All owners of non-exempt wells who begin transporting water for use outside of the District before October 1, 2003 shall report to the District the amount of water produced and the amount of water actually exported on a monthly basis. All owners of non-exempt wells who begin transporting water for use on or after October 1, 2003 shall report to the District the amount of water produced and the amount of water actually exported on a monthly basis and shall file annual reports with the District describing the amount of water transported and used. The report shall be filed with the District no later than February 15 of each year on the appropriate form provided by the District and shall state the following:

1.) the name of the owner;

2.) the well, permit or registration numbers of each well that is producing water for transport;

3.) the total amount of groundwater produced from each well or well system during the

immediately preceding calendar year;

4.) the total amount of groundwater transported outside the district from each well or well system during each month of the immediately preceding calendar year;

5.) the purposes for which the water was transported;

6.) the amount and source of any surface water transported; and

7.) any other information requested by the District.

d) Groundwater that is discharged pursuant to a permit issued by the commission and not sold is not considered to have been transferred from the District unless the discharge is part of an overall water transfer and sale.

e) All groundwater produced within the District that is subsequently transported across the boundaries of the District for use outside of the District shall be metered as set forth under Section 15 of these Rules.

SECTION 9. DEPOSITS FOR WELL DRILLING PERMITS

Rule 9.1 Deposits

a) Each application for a permit to drill a well or any other activity permitted by the District for which a driller's log (State Well Report) is required to be completed by state law must be accompanied by a $250.00 deposit, which will be accepted and deposited by the District staff. The deposit shall be returned to the applicant by the District if: (1) the application is denied; (2) the application is granted, upon the receipt of a correctly completed driller's log of the well; or (3) the permit location is abandoned without having been drilled or altered or results in a dry hole, upon return and surrender of the permit marked "abandoned" by the applicant.

b) In the event that neither the driller's log of the well nor the permit marked "abandoned" is returned to the District office within eight (8) months after the application date of the permit, the deposit shall become the property of the District.

SECTION 10. REGISTRATION AND PERMITS

Rule 10.1 Registration and Grandfathering of Existing Wells

a) It is a violation of these rules for a well owner or operator to produce water from any well within the District, except leachate wells, monitoring wells, and de-watering wells, without a valid well registration or well permit from the District. Owners and operators of wells that were drilled and completed on or before December 19, 2002, shall have until January 1, 2004, to register their wells with the District on forms to be provided by the District upon request by the owner or operator.

b) The District shall register such an existing well upon receipt from the owner or operator of the following information on a form to be provided by the District, to the extent that such information is requested on the form:

1) the name and address of the owner of the land on which the well is located;

2) if different from owner, the name and address of the applicant and documentation establishing authority to operate the well;

3) a statement of the nature and purpose of use of the water produced from the well, and the amount to be used for each purpose;

4) a declaration that the applicant will comply with the district's management plan, rules, and production limitations;

5) the location of the well and the estimated rate at which water will be withdrawn;

6) the location of use of the water, including a legal description of tracts to be irrigated with water from the well if the well is used for irrigation; and

7) a water well closure plan or declaration that the applicant will comply with well plugging guidelines and report closure to the commission and the District.

c) Existing wells registered in accordance with this section shall not be required to obtain a drilling permit from the District, nor shall they be subject to the District's spacing requirements under Rule 5.1, unless the registration is revoked for violation of registration conditions, District rules, or other applicable law.

d) Failure by the owner or operator of a well that was drilled and completed prior to December 19, 2002 to register such well with the District by January 1, 2004:

1) shall be a violation of these rules if the well is operated after January 1, 2004;

2) shall result in the owner forfeiting the ability to register the well under this Rule and, instead, shall result in the owner or operator being required to obtain a registration or permit for the well under Rule 10.2; and

3) shall create a rebuttable presumption that the well was not an existing well, which, among other things, will subject the well to enforcement of the District's well spacing requirements under Rule 5.1 and subject the well to potential enforcement for failure to comply with the permitting requirements of these Rules.

e) Any person who becomes the owner of a registered well must, within 60 calendar days from the date of the change in ownership, notify the District to change the name on the registration.

Rule 10.2 Registration and Permitting of New Wells

a) Except as otherwise provided under these Rules, it is a violation of these Rules for any person, including a well owner, well operator, or water well driller, to drill, equip, or complete any well in the District or to substantially alter the size of a well or well pump in any well in the District without first filing either an administratively complete well registration or an administratively complete permit application, as appropriate for the type of well, with the District.

b) All new wells, except leachate wells, monitoring wells, and de-watering wells, must be registered with the District by the well owner, well operator, or water well driller prior to being drilled, equipped, completed, or substantially altered in accordance with the application procedure set forth for existing wells under Rule 10.1(b). The General Manager shall review the registration and make a preliminary determination on whether the well qualifies under the

exemptions from permitting provided under Rule 10.5. Providing the preliminary determination is ruled the well is exempt, the registrant may begin drilling immediately upon receiving the approved registration. If the preliminary determination by the General Manager is that the well is not exempt from permitting, the owner, operator, or driller shall submit a well permit application before proceeding with drilling, equipping, completion, or alteration.

Rule 10.3 General Permitting Policies and Procedures

a) **Permit Requirement:** The well owner, well operator, or any other person acting on behalf of the well owner, must file a completed well application for a water well permit before a new, non-exempt well may be drilled, equipped, completed, or substantially altered. Providing the application for a permit is deemed administratively complete, meaning that it meets all of the guidelines and requirements of these rules and contains all of the required information, the applicant may thereupon proceed at his own risk to drill, equip, complete, or alter such well. This application for a permit shall not, however, be officially granted until the opportunity for a due process public hearing has been satisfied and the Board has approved the permit.

b) **Permit Applications:** Each original application for a water well permit or permit renewal requires a separate application. Application forms will be provided by the District and furnished to the applicant upon request. Applications shall contain all of the information set forth under Rule 10.1(b) for well registrations and shall be submitted on a form to be provided by the District, to the extent that such information is requested on the form. The District may at its discretion utilize the same form for permit applications as it does for well registrations.

c) **Notice of Permit Hearing:** Once the District has received an administratively complete original application for a permit, the General Manager shall issue written notice indicating a date and time for a hearing on the application in accordance with these Rules. The District may schedule as many applications at one hearing as deemed necessary.

d) **Decision and Issuance of Permit:** In deciding whether or not to issue a permit, and in setting the terms of the permit, the Board must consider whether the application complies with the District Rules.

e) **Duration of Permits**: Unless specified otherwise by the Board or these Rules, permits to drill, equip, complete, or substantially alter a well or pump size are effective for those purposes for a term ending 120 calendar days after the date the permit was issued.

f) **Permit Provisions**: The permit shall contain the standard provisions listed in Rule 10.4. The permit may also contain provisions relating to the means and methods of transportation of water produced within the District.

g) **Aggregation of Withdrawal:** In issuing a permit, the authorized withdrawal for a given well may be aggregated with the authorized withdrawal from other permitted wells designated by the District. District Rules 5 & 6 shall be considered in determining whether or not to allow aggregation of withdrawal. For the purpose of categorizing wells by the amount of groundwater production, where wells are permitted with an aggregate withdrawal, the total authorized withdrawal may be assigned to the wells in the aggregate, rather than allocating to each well its pro rata share of production, except as otherwise provided in these Rules.

h) **Effect of Acceptance of Permit:** Acceptance of the permit by the person to whom it is issued constitutes acknowledgment of and agreement to comply with all of its terms, provisions,

conditions, limitations, and restrictions.

Rule 10.4 Permit Provisions

All permits are granted subject to these Rules, orders of the Board, and the laws of the State of Texas. In addition to any special provisions or other requirements incorporated into the permit, each permit issued must contain the following standard permit provisions:

a) This permit is granted in accordance with the provisions of the Rules of the District, and acceptance of this permit constitutes an acknowledgment and agreement that the permittee will comply with the Rules of the District.

b) This permit confers only the right to use the permit in compliance with the terms of the permit and the Rules of the District, including but not limited to the production limitations under Rule 6.1, and its terms may be modified or amended pursuant to the provisions of Rule 6.1 and the other Rules of the District as Rule 6.1 and the other Rules of the District may be amended in the future. To protect the permit holder from illegal use by a new landowner, within 60 days after the date of sale, the permit holder must notify the District in writing of the name of the new owner. Any person who becomes the owner of a currently permitted well must, within 60 calendar days from the date of the change in ownership, file an application for an amendment to effect a transfer of the permit.

c) The operation of the well for the authorized withdrawal must be conducted in a non-wasteful manner.

d) At the time a water meter is required under Section 15 of the District's Rules, it shall be installed to accurately record gallons produced during a specified period of time.

e) The well site must be accessible to District representatives for inspection, and the permittee agrees to cooperate fully in any reasonable inspection of the well and well site by the District representatives.

f) The application pursuant to which this permit has been issued is incorporated in this permit, and this permit is granted on the basis of and contingent upon the accuracy of the information supplied in that application. A finding that false information has been supplied is grounds for immediate revocation of the permit.

g) Violation of a permit's terms, conditions, requirements, or special provisions, including pumping amounts in excess of authorized withdrawal, is punishable by civil penalties as provided by the District's Rules and other enforcement.

Rule 10.5 Exemptions

a) The requirement to obtain a permit under Section 10 of these Rules does not apply to:

1) a well used solely for domestic use or for providing water for livestock or poultry on a tract of land larger than 10 acres that is either drilled, completed, or equipped so that it is incapable of producing more than 25,000 gallons of groundwater a day;

2) the drilling of a water well used solely to supply water for a rig that is actively engaged in drilling or exploration operations for an oil or gas well permitted by the Railroad

Commission of Texas provided that the person holding the permit is responsible for drilling and operating the water well and the well is located on the same lease or field associated with the drilling rig; or

3) the drilling of a water well authorized under a permit issued by the Railroad Commission of Texas under Chapter 134, Natural Resources Code, or for production from such a well to the extent the withdrawals are required for mining activities regardless of any subsequent use of the water.

b) A well originally exempt under Subsection (a) is not exempt under this rule if it is subsequently used for a purpose or in a manner that is not exempt under Subsection (a).

c) An entity exempt under Subsection (a)(3) of this Rule shall report monthly to the District:

1) the total amount of water withdrawn during the month;

2) the quantity of water necessary for mining activities; and

3) the quantity of water withdrawn for other purposes.

d) A water well exempted under Subsection (a) shall:

1) be registered in accordance with Rule 10.1; and

2) comply with the location, completion, and re-completion requirements of Section 12 and Rule 5.2 of these Rules.

e) The driller of a well exempted under Subsection (a) shall file the drilling log with the District.

f) Notwithstanding Subsection (a), a well to supply water for a subdivision of land for which a plat approval is required by Chapter 232, Local Government Code, is not exempt under Subsection (a).

g) Groundwater withdrawn from a well exempt from permitting under Subsection (a) and subsequently transported outside the boundaries of the District is subject to the Groundwater Transport Regulatory Fee under Section 8 of these Rules.

SECTION 11. REWORKING AND REPLACING A WELL

Rule 11.1 Procedures

a) An existing well or permitted new well may be reworked, re-drilled, or re-equipped in a manner that will not increase the production capacity of the well by increasing the size of the column pipe or pump without the need for the owner or operator to obtain a permit under Rule 10.2. Such a well shall maintain the existing well or new permitted well status of the original well.

b) A permit must be applied for and obtained under Rule 10.2, if a party wishes to increase the rate of production of an existing well or permitted new well by increasing the size of the column pipe or pump size when reworking, re-equipping, or re-drilling such well.

c) A permit must be applied for and granted by the Board if a party wishes to replace an existing well or permitted new well with a replacement well.

d) A replacement well, in order to be considered such, must be drilled within ten (10) yards (30 feet) of the well to be replaced. The replacement well shall not be drilled nearer the property line

if the original well was "grandfathered" from otherwise violating the spacing requirements of Rule 5.1.

e) In the event a permit application submitted in accordance with this Rule meets the spacing requirements of these Rules, the Board may grant such application without further notice or hearing.

SECTION 12. WELL COMPLETION

Rule 12.1 Standards of Completion for All Wells

a) All wells must be completed in accordance with the following specifications and in compliance with local county or incorporated city ordinances. All wells must also be completed in compliance with the rules and regulations of the Texas Department of Licensing and Regulation related to Water Well Drillers and Pump Installers.

b) The annular space between the borehole and the casing shall be filled from the ground level to a depth of not less than 10 feet below the land surface or well head with cement slurry.

c) All wells shall have a concrete slab or sealing block above the cement slurry around the well at the ground surface.

d) The slab or block shall extend at least **two (2) feet** from the well in all directions and have a minimum thickness of **four inches** and shall be separated from the well casing or mastic coating or sleeve to prevent bonding of the slab to the casing.

e) The surface of the slab shall be sloped to drain away from the well. The casing shall extend a minimum of one foot above the original ground surface.

f) A slab or block as described in Subsections (c) – (e) of this Rule is required above the cement slurry except when a pitless adapter is used. Pitless adapters may be used in such wells, provided that:

   1) the pitless adapter is welded to the casing or fitted with another suitably effective seal; and

   2) the annular space between the borehole and the casing is filled with cement to a depth not less than 15 feet below the adapter connection.

g) All wells, especially those that are gravel packed, shall be completed so that aquifers or zones containing waters that are known to differ significantly in chemical quality are not allowed to commingle through the borehole-casing annulus or the gravel pack and cause quality degradation of any aquifer or zone.

h) The well casing shall be capped or completed in a manner that will prevent pollutants from entering the well.

i) Water well drillers shall indicate the method of completion performed on the Well Report (TDLR Form #001 WWD, Section 10, Surface Completion).

Rule 12.2 Re-completions

a) The landowner shall have the continuing responsibility of insuring that a well does not allow commingling of undesirable water and fresh water or the unwanted loss of water through the wellbore to other porous strata.

b) If a well is allowing the commingling of undesirable water and fresh water or the unwanted loss of water, and the casing in the well cannot be removed and the well re-completed within the applicable rules, the casing in the well shall be perforated and cemented in a manner that will prevent the commingling or loss of water. If such a well has no casing, then the well shall be cased and cemented or plugged in a manner that will prevent such commingling or loss of water.

c) The Board may direct the landowner to take steps to prevent the commingling of undesirable water and fresh water or the unwanted loss of water.

SECTION 13. PROHIBITION AGAINST WASTE AND POLLUTION

Rule 13.1 Prohibition Against Waste and Pollution

a) No person shall allow, cause, suffer, permit, or commit "waste" as that term is defined in Rule 1.1.

b) Groundwater shall not be produced in or used within or without the District, in such a manner as to constitute waste as defined in Rule 1.1.

c) No person shall cause "pollution" of the groundwater reservoir or aquifer in the District as defined in Rule 1.1.

d) No person shall allow the continued existence of a deteriorated well.

e) Groundwater produced in the District shall be used for a beneficial purpose.

SECTION 14. HEARINGS

Rule 14.1 Types of Hearings

The District conducts two general types of hearings: (1) Permit hearings involving permit matters, in which the rights, duties, or privileges of a party are determined after an opportunity for an adjudicative hearing, and (2) rulemaking hearings involving matters of general applicability that implement, interpret, or prescribe the law or District policy, or that describe the procedure or practice requirements of the District. All hearings shall be held before a quorum of the Board.

a) **Permit Hearings:**

1) Permit Applications, Amendments, and Revocations: The District shall hold hearings on permit applications, permit renewals or amendments, and permit revocations or suspensions.

2) Hearings on Motions for Rehearing: Motions for Rehearing will be heard by the Board pursuant to Rule 14.3.

b) **Rulemaking Hearings:**

1) Rules and District Management Plan: The Board may hold a hearing, after giving notice, to consider adoption of a new District Management plan or revising an existing District Management Plan or to amend the District Rules or adopt new District Rules.

2) Other Matters: A public hearing may be held on any matter within the jurisdiction of the Board if the Board deems a hearing to be in the public interest or necessary to effectively carry out the duties and responsibilities of the District.

Rule 14.2 Notice and Schedule of Hearings

a) Notices of all hearings of the District shall be prepared by the General Manager. For all rulemaking hearings, the notice shall include the subject matter of the hearing, the time, date, and place of the hearing, and any other information deemed relevant by the General Manager or the Board. For all permit hearings, the notice shall, at a minimum, state the following information:

1) the name of the applicant;

2) the address or approximate proposed location of the well;

3) the time, date, and location of the hearing; and,

4) any other information the Board or General Manager deem appropriate to include in the notice.

b) For permit hearings, not less than 72 hours prior to the time of the hearing, notice shall be:
(1) posted by the General Manager at a place convenient to the public in the District Office; and
(2) provided by the General Manager to the county clerk of each county in the District, whereupon such county clerk shall post the notice on a bulletin board at a place convenient to the public in the county courthouse.

c) For rulemaking hearings, not less than five days prior to the date of the hearing, notice shall be:
(1) posted by the General Manager at a place convenient to the public in the District Office;
(2) provided by the General Manger to the county clerk of each county in the District, whereupon such county clerk shall post the notice on a bulletin board at a place convenient to the public in the county courthouse; and
(3) published by the General Manager once in a newspaper of general circulation in each county in the District.

d) Hearings may or may not be scheduled during the District's regular business hours, Monday through Friday of each week, except District holidays. All hearings shall be held at the District Office unless the Board directs otherwise. The District may schedule as many applications for consideration at one hearing as deemed desirable. Hearings may be continued from time to time and date to date without additional notice after the initial notice. The General Manager shall set a hearing date within 30 calendar days of a determination that the application is administratively complete. The hearing shall be held within 35 calendar days after the setting of the date.

Rule 14.3 General Procedures for Permit Hearings

a) Authority of Presiding Officer: The presiding officer may conduct the hearing or other proceeding in the manner the presiding officer deems most appropriate for the particular hearing. The presiding officer has the authority to:

1) set hearing dates, other than the initial hearing date for permit matters, which shall be set by the General Manager in accordance with Rule 14.2;
2) convene the hearing at the time and place specified in the notice for public hearing;
3) rule on motions and on the admissibility of evidence;
4) establish the order for presentation of evidence;
5) administer oaths to all persons presenting testimony;
6) examine witnesses;
7) ensure that information and testimony are introduced as conveniently and expeditiously as possible, without prejudicing the rights of any party to the proceeding;
8) conduct public hearings in an orderly manner in accordance with these rules;
9) recess any hearing from time to time and place to place; and,
10) exercise any other appropriate powers necessary or convenient to effectively carry out the responsibilities of presiding officer.

b) Hearing Registration Forms: Each person attending and participating in a hearing of the District must submit a form providing the following information: the person's name; the person's address; who the person represents if other than himself; whether the person wishes to testify; and any other information relevant to the hearing.

Rule 14.4 Appearance; Presentation; Time for Presentation; Ability to Supplement; Conduct and Decorum; Written Testimony

a) Any interested person, including the General Manager, may appear at a hearing in person or may appear by representative provided the representative is fully authorized to speak and act for the principal. Such person or representative may present evidence, exhibits, or testimony, or make an oral presentation as determined by the Board. Any partner may appear on behalf of a partnership. A duly authorized officer or agent of a public or private corporation, political subdivision, governmental agency, municipality, association, firm, or other entity may appear on behalf of the entity. A fiduciary may appear for a ward, trust, or estate. A person appearing in a representative capacity may be required to prove proper authority.

b) After the presiding officer calls a hearing to order, the presiding officer shall announce the subject matter of the hearing and the order and procedure for presentations.

c) The presiding officer may prescribe reasonable time limits for the presentation of evidence and oral argument.

d) In the discretion of the presiding officer, any person who appears at a hearing and makes a presentation before the Board may supplement that presentation by filing additional written evidence with the Board within 10 days after the date of conclusion of the hearing. Cumulative,

repetitive, and unduly burdensome evidence filed under this subsection will not be considered by the Board.

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

f) Written testimony: When a proceeding will be expedited and the interest of the parties will not be prejudiced substantially, testimony may be received in written form. The written testimony of a witness, either in narrative or question and answer form, may be admitted into evidence upon the witness being sworn and identifying the testimony as a true and accurate record of what the testimony would be if given orally.

Rule 14.5 Evidence; Broadening the Issues

a) The presiding officer may admit evidence if it is relevant to an issue at the hearing.

b) The presiding officer may exclude evidence that is irrelevant, immaterial, or unduly repetitious.

c) No person will be allowed to appear in any hearing or other proceeding whose appearance, in the opinion of the presiding officer, is for the sole purpose of unduly broadening the issues to be considered in the hearing or other proceeding.

Rule 14.6 Recording

Hearings and other proceedings shall be recorded on audio cassette tape.

Rule 14.7 Continuance

The presiding officer may continue hearings or other proceedings from time to time and from place to place without the necessity of publishing, serving, mailing, or otherwise issuing a new notice. If a hearing or other proceeding is continued and a time and place (other than the District Office) for the hearing or other proceeding to reconvene are not publicly announced at the hearing or other proceeding by the presiding officer before it is recessed, a notice of any further setting of the hearing or other proceeding will be delivered at a reasonable time to persons who submitted a hearing registration form under Rule 14.3(b), and any other person the presiding officer deems appropriate, but it is not necessary to post a notice at the county courthouses or publish a newspaper notice of the new setting.

Rule 14.8 Filing of Documents; Time Limit; Computing Time

a) Any papers or documents required to be filed under these rules or by law must be received in hand at the District Office within the time limit, if any, set by these rules or by the presiding officer for filing. Mailing within the time period is insufficient if the submissions are not actually received by the District within the time limit.

b) In computing any period of time specified by these rules, by a presiding officer, by Board orders, or by law, the day of the act, event, or default after which the designated period of time begins to run is not included, but the last day of the period computed is included, unless the last day is a Saturday, Sunday, or legal holiday as determined by the Board, in which case the period runs until the end of the next day which is neither a Saturday, Sunday, nor legal holiday.

Rule 14.9 Report

Within 14 days after the date the hearing is finally concluded, the Presiding Officer must submit a hearing report to the Board. The report must include a summary of the subject matter of the hearing, the evidence or public comments received, and the Presiding Officer's recommendations for Board action on the subject matter of the hearing. Any person who participated in the hearing may review a copy of the hearing report and submit to the Board written exceptions to the hearing report. The Presiding Officer may direct the General Manager to prepare the hearing report and recommendations required by this Rule.

Rule 14.10 Board Action

Within 35 days after the final hearing date is concluded, the Board must take action on the subject matter of the hearing.

Rule 14.11 Request for Rehearing and Appeal.

A decision of the Board concerning a hearing matter may be appealed by requesting a rehearing before the Board within 20 calendar days of the date of the Board's decision. Such a rehearing request must be filed at the District Office in writing and must state clear and concise grounds for the request. Such a rehearing request is mandatory with respect to any decision or action of the Board before any appeal to District Court may be brought. The Board's decision is final if no request for rehearing is made within the specified time, upon the Board's denial of the request for rehearing, or upon rendering a decision after rehearing. If the rehearing request is granted by the Board, the date of the rehearing will be within 45 calendar days thereafter. The failure of the Board to grant or deny the request for rehearing within 90 calendar days of the date of submission shall constitute a denial of the request.

Rule 14.12 Rulemaking Hearings Procedures

a) General Procedures: The presiding officer will conduct the rulemaking hearing in the manner the presiding officer deems most appropriate to obtain all relevant information pertaining to the subject of the hearing as conveniently, inexpensively, and expeditiously as possible. In conducting a rulemaking hearing, the presiding officer may elect to utilize procedures set forth in these Rules for permit hearings to the extent that and in the manner that the presiding officer deems most appropriate for the particular rulemaking hearing.

b) Submission of Documents: Any interested person may submit written statements, protests, or comments, briefs, affidavits, exhibits, technical reports, or other documents relating to the subject of the hearing. Such documents must be submitted no later than the time of the hearing, as stated in the notice of hearing given in accordance with Rule 14.2; provided, however, that the presiding officer may grant additional time for the submission of documents.

c) Oral Presentations: Any person desiring to testify on the subject of the hearing must so indicate on the registration form provided at the hearing. The presiding officer establishes the order of testimony and may limit the number of times a person may speak, the time period for oral presentations, and the time period for raising questions. In addition, the presiding officer may limit or exclude cumulative, irrelevant, or unduly repetitious presentations.

d) Conclusion of the Hearing: At the conclusion of the hearing, the Board may take action on the subject matter of the hearing, take no action, or postpone action until a future meeting or hearing of the Board.

SECTION 15. METERING

Rule 15.1 Metering Required

a) Notwithstanding any provision in these Rules to the contrary, to the extent that these Rules require meters to be installed on wells in existence before and on December 19, 2002 , such meters shall be installed by the District at the District's expense. Notwithstanding any provision in these Rules to the contrary, to the extent that these Rules require meters to be installed on wells that come into existence after December 19, 2002, such meters shall be installed by the well owner at the well owner's expense.

b) All owners of wells required under Section 15.2 to equip such wells with a meter shall do so with a flow measurement device meeting the specifications of these Rules and shall operate the meters on such wells to measure the flow rate and cumulative amount of groundwater withdrawn from the well.

c) Approved Meters: A mechanically driven, digital, totalizing water meter is the only meter acceptable. The digital totalizer must not be resetable by the permittee and must be capable of a maximum reading greater than the maximum expected pumpage during the permit term. Battery operated registers must have a minimum five (5) 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

d) A meter shall be installed by the owner of a well, as required under Rule 15.2, no later than four (4) months after December 19, 2002. The water meter must be installed according to the

manufacturer's published specifications in effect at the time of the meter's installation, or its accuracy must be verified by the permittee in accordance with Rule 15.5. If no specifications are published, there must be a minimum length of five pipe diameters of straight pipe upstream of the water meter and one pipe diameter of straight pipe downstream of the water meter. These lengths of straight pipe must contain no check valves, tees, gate valves, 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 ensure an error of not greater than plus or minus five percent.

f) The owner of a well shall be responsible for the installation, operation, maintenance, and repair of the meter associated with that well.

Rule 15.2 Wells Subject to Metering

a) Persons producing or transporting groundwater within the District or transporting water across the District's boundaries shall install meters, if required, as set forth under this Section.

b) The installation of meters shall be mandatory in the following situations and locations:

1) If water is being produced from a well or well system located on a tract of land in one Section and any of such water produced is being used on a different Section of land, a meter shall be installed at the wellhead(s) and/or at a distribution point or points capable of ensuring an accurate accounting for the District of all water produced from the tract of land or Section and all water transported for use at a location outside of that Section;

2) If water is being produced from a well or well system located within the boundaries of the District and any of such water produced is being transported across the District's boundaries for use outside of the District, a meter shall be installed at the wellhead(s) and/or at a distribution point or points, including at any point at which water is finally transported across the District's boundaries, capable of ensuring an accurate accounting for the District of all water produced from such well or well system and all water transported across the District's boundaries for use outside of the District;

3) If a person has been under enforcement by the District for violation of District Rules or Chapter 36, Texas Water Code, and has been determined by the Board to have violated the same, all wells owned or operated by such person and located within the District shall have meters installed at the wellheads, unless a variance is granted by the Board for just cause at its sole discretion; or

4) If the Board by order determines, for good cause, that a well or distribution system should be metered to further the purposes of these Rules, the District Act, or the District's groundwater management plan, the well or distribution system shall be metered in accordance with the Order of the Board.

Rule 15.3 Types of Meters

a) The types of meters approved for installation are:
    1) Internal Impeller;
    2) Magnetic;
    3) Time-Delay Ultrasonic; and
    4) Any flow measurement method approved in writing by the General Manager.

b) All meters must be equipped with a non-resettable mechanical or electronic flow volume accumulator that reads in acre-feet.

c) Types of flow meters prohibited by the District are:
    1) Doppler Ultrasonic;
    2) Pitot Tube; and
    3) Open Discharge.

d) No metering method may be installed or modified prior to written approval given by the General Manager pursuant to an application filed with the District.

e) The General Manager shall approve an application to install a metering method if the General Manager finds the application shows the following:
    1) the meter has a certified error of not greater than plus or minus five percent;
    2) for a meter, it meets the American Water Works Association design and operation standards for design, materials, and accuracy;
    3) the meter has a non-resettable totalizer, or lock box with resettable digital readout;
    4) the totalizing register of the meter has the capacity to record the total quantity of groundwater withdrawn from the aquifer for at least one full year; and
    5) the meter, if used for the distribution of potable water, shall be American National Standards Institute/National Sanitation Foundation (ANSI/NSF) Standard 61 certified.

g) The owner of the meter shall give written notice to the District of the intended start date of the installation or modification 30 days prior to the installation or modification to allow the District to inspect and approve the meter installation or modification.

Rule 15.4 Pre-Existing Meters and Alternative Measuring Methods

a) Within four (4) months of December 19, 2002, the owner of a meter or alternative measuring method shall register the meter or method with the District.

b) All meters existing on the December 19, 2002 shall be inspected by the District for compliance with the meter specifications set forth in these Rules. If the meter complies with these specifications, the General Manager shall approve the meter in writing and advise the owner of the approval. If the meter does not comply with these specifications, the General Manager will issue a notice of deficiency and direct the owner of the meter to install a new meter or modify the existing meter in compliance with Section 15 of these Rules.

c) If at any time the owner of a well has reason to believe that a condition, of any kind whatsoever, may exist that affects the accuracy of a meter, then the owner of the well shall, within seven (7)

days of learning of the fact(s), notify the General Manager that the accuracy of the meter may be in question. Such notification shall be in writing on a form provided by the District.

d) The General Manager may conduct an investigation and, if facts warrant, direct the owner of the meter, at the owner's cost, to evaluate and test the accuracy of the meter and take appropriate corrective action, including replacement, to restore the accuracy and proper working condition of the meter as specified in these Rules.

Rule 15.5 Accuracy Verification

a) The General Manager may require the permittee, at the permittee's expense, to test the accuracy of the water meter and submit a certificate of the test results. The certificate 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 shall 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 and installation. If the test results indicate an accuracy outside the range of 95% to 105% of the actual flow, then appropriate steps shall be taken by the permittee 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 permittee shall reimburse the District for the cost of those tests and investigations, and the permittee shall take appropriate steps to remedy the problem 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 accuracy is impaired, the District may require the permittee, at the permittee's expense, to take appropriate steps to remedy any problem, and to retest the water meter within 90 calendar days from the date the problem is discovered and reported to the permittee.

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 15.6 Removal and Disabling of Meters

a) A meter may not be removed or otherwise disabled, including for routine maintenance, unless the owner gives the District notice in writing on a form provided by the District of the intent to remove or disable the meter. Except in cases of routine maintenance, such notice must be approved in writing by the General Manager before the meter is removed or disabled.

b) The readings on the meter must be recorded prior to removal and again upon reinstallation. The monthly record of pumpage will include an estimate of the amount of groundwater withdrawn during the period the meter was not installed and operating.

c) A meter may be removed or otherwise disabled only by the owner of the meter or the owner's authorized representative.

Rule 15.7 Meter Reading and Groundwater Use Reporting

Owners of wells defined under Rule 15.2 must read each water meter and record the meter readings and the actual amount of pumpage in a log at least monthly. The logs containing the periodic recordings shall be available for inspection by the District at reasonable business hours and copies of such logs must be furnished to the District upon request.

Rule 15.8 Prohibition and Enforcement

a) Except as otherwise provided by District Rule or Board Order, no person my take any action that disables or impairs a meter from accurately measuring and recording the flow rate and cumulative amount of groundwater withdrawn from a well.

b) If the withdrawals are not being metered in accordance with this Section, the Board may issue an order:

   1) suspending the right to make withdrawals from a well; and

   2) requiring corrective action to bring the operation of the well into compliance with this Section.

Rule 15.9 Location of Meters

The location of meters required under this Section shall be determined by the General Manager.

SECTION 16. INVESTIGATIONS AND ENFORCEMENT

Rule 16.1 Right to Inspect and Test Wells

Any authorized officers, employees, agent, or representative of the District shall have the right at all reasonable times to enter upon lands upon which a well or wells may be located, within the boundaries of the District, to inspect such wells or well and to install, read, or interpret any meter, weir box, or other instrument for the purpose of measuring production of water from said well or wells or for determining the pumping capacity of said well or wells; and any authorized officer, employee, agent, or representative of the District shall have the right at all reasonable times to enter upon any lands upon which a well or wells may be located, within the boundaries of the District, for the purposes of testing the pump and the power unit of the well or wells and of making any other reasonable and necessary inspections and tests that may be required or necessary for the ensured compliance or enforcement of the Rules and regulations of the District. The operation of any well may be enjoined by the Board immediately upon the refusal to permit the gathering of information from such well as provided above. Inhibiting or prohibiting access to any Board Member or District agent or employee who is attempting to conduct an investigation under the District Rules constitutes

a violation of these Rules and subjects the person who is inhibiting or prohibiting access, as well as any other person who authorizes or allows such action, to the penalties set forth in § 36.102 of the Texas Water Code.

Rule 16.2 Conduct of Investigation

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

Rule 16.3 Rule Enforcement

If it appears that a person has violated, is violating, or is threatening to violate any provision of the District Rules, the Board of Directors may institute and conduct a suit in the name of the District for enforcement of the Rules pursuant to the provisions of § 36.102 of the Texas Water Code.

Rule 16.4 Sealing of Wells

a) Following due process, the District may, upon order from a judge of a court of law, seal wells that are prohibited from withdrawing groundwater within the District by the District Rules to ensure that a well is not operated in violation of the District Rules. A well may be sealed when: (1) no application has been made for a permit to drill a new water well which is not exempted; (2) no application has been timely made for registration of an existing well; or (3) the Board has denied, canceled, or revoked a permit or registration.

b) A well may be sealed by physical means and tagged to indicate that the well has been sealed by the District. Other appropriate action may be taken as necessary to preclude operation of the well or to identify unauthorized operation of the well.

c) Tampering with, altering, damaging, or removing the seal of a sealed well, or in any other way violating the integrity of the seal, or pumping groundwater from a well that has been sealed constitutes a violation of these Rules and subjects the person performing that action, as well as any well owner or primary operator who authorizes or allows that action, to such penalties as provided by the District Rules.

Rule 16.5 Covering of Wells

a) In this Rule, “open or uncovered well” means an artificial excavation that is dug or drilled for the purpose of exploring for or producing water from the underground water reservoir and is not capped or covered as required.

b) Every owner or operator of any land within the District upon which is located any open or uncovered well is, and shall be, required to close or cap the same permanently or temporarily as

set forth below and in accordance with Chapter 36, Texas Water Code, and subsequent changes thereto.

c) Except when the well is in actual use, the District may require the owner or lessee of land on which an open or uncovered well is located to keep the well permanently closed or capped with a covering capable of preventing surface pollutants from entering the well and capable of sustaining weight of at least 400 pounds.

d) If an owner or lessee fails or refuses to close or cap a well in compliance with this Rule within 10 days after being requested to do so in writing by an officer, agent, or employee of the District, any person, firm, or corporation employed by the District may go on the land and close or cap the well safely and securely according to this Rule.

e) Reasonable expenses incurred by the District in closing or capping a well under this Rule constitute a lien on the land on which the well is located.

f) The lien is perfected by filing the following in the deed records of the county where the well is located:

   1) the existence of the well;

   2) the legal description of the property on which the well is located;

   3) the approximate location of the well on the property; and

   4) an affidavit stating:

      A) the failure or refusal of the owner or lessee, after notification, to close or cap the well within 10 days after the notification;

      B) that the well was closed or capped by the District or by an authorized agent representative, or employee of the District; and

      C) the expense incurred by the District in closing the well.

g) Nothing in this Rule affects the enforcement of Subchapter A, Chapter 756, Health and Safety Code.

SECTION 17. FEES

Rule 17.1 Fees of the District

The Board, by resolution, may establish the following fees:

1) fees for administrative acts of the District, including fees for the cost of reviewing and processing permits and the cost of hearings for permits; such administrative fees shall not unreasonably exceed the cost to the District for performing such administrative acts;

2) a fee for the transportation of groundwater out of the District;

3) a fee for checks returned to the District for insufficient funds, account closed, signature missing, or any other reason causing a check to be returned by the District's depository;

4) a fee for tampering with a meter of a permittee or registrant of the District;

5) a fee for failing to install a meter when required to do so by District Rule; and

6) any other fee determined necessary by the Board.

Rule 17.2 Payment of Fees

All fees are due at the time of application, permitting, or assessment, as applicable, and are late after 30 days beyond the date of application, permitting, or assessment, as applicable.

Rule 17.3 Failure to Make Fee Payments

Payments received within 30 days following the due date will not be subject to a late payment fee. Failure to make complete and timely payment of a fee as required by these Rules or Board Order shall automatically result in a late payment fee of ten percent of the amount not paid. The fee payment plus the late payment fee must be made within 30 days following the date of the assessment of the late payment fee, otherwise any associated permit or registration may be declared void by the Board.

Rule 17.4 Enforcement

After a permit or registration is declared void pursuant to Rule 17.3 for failure to make payment of a fee, 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.

Regular Quarterly Meeting
AGENDA

The Directors of the Rolling Plains Groundwater Conservation District will meet at the North Central Texas Municipal Water Authority, 135 N. Munday Ave., Munday, Texas on Thursday, July 16, 2020 at 7:00 p.m.

Management Plan Hearing

The subject to be discussed or considered or upon which any formal action may be taken is as follows:

1. **Call to Order.**
2. **Roll Call.**
3. **Discussion and Public Comment on Proposed Adoption of the Amended Management Plan.**
4. **Adjourn.**

Regular Quarterly Meeting

Discuss, consider, and take action as necessary concerning the following items of business:

1. **Call to Order.**
2. **Roll Call.**
3. **Public Comments.**
4. **Approval of Minutes of the Previous Meeting.**
5. **Approval of Financial Report & Payment of Current Bills.**
6. **Adopt Revised Management Plan.**
7. **Review and Adopt Investment Policy.**
8. **Report on District Operations.**
8. **Policies and Procedures for the Operation of the District.**
9. **Public Comments.**
10. **Adjourn.**

The above agenda schedule represents an estimate of the order for the indicated items and is subject to change at anytime.

At any time during the meeting and in compliance with the Texas Open Meetings Act, Chapter 551, Government Code, Vernon's Texas Codes, Annotated, the Rolling Plains Groundwater Conservation District Board may meet in executive session on any of the above agenda items for consultation concerning attorney-client matters (§551.071); deliberation regarding real property (§551.072); deliberation regarding prospective gift (§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.

Certification

I do hereby certify that on or before July 10, 2020, at or before 4:00 p.m., I posted and filed by fax copy the above notice of meeting with each County Clerk's office located within the District and also posted a copy in the front window of the Rolling Plains GCD office in a place convenient and readily accessible to the general public all times and that it will remain so posted continuously for at least 72 hours preceding the scheduled time of said meeting in accordance with the Texas Open Meetings Act.

Mike McGuire, General Manager
Rolling Plains GCD

Regular Quarterly Meeting
AGENDA

The Directors of the Rolling Plains Groundwater Conservation District will meet at the North Central Texas Municipal Water Authority, 135 N. Munday Ave., Munday, Texas on Thursday, July 16, 2020 at 7:00 p.m.

Management Plan Hearing

The subject to be discussed or considered or upon which any formal action may be taken is as follows:

1. **Call to Order.**
2. **Roll Call.**
3. **Discussion and Public Comment on Proposed Adoption of the Amended Management Plan.**
4. **Adjourn.**

Regular Quarterly Meeting

Discuss, consider, and take action as necessary concerning the following items of business:

1. **Call to Order.**
2. **Roll Call.**
3. **Public Comments.**
4. **Approval of Minutes of the Previous Meeting.**
5. **Approval of Financial Report & Payment of Current Bills.**
6. **Adopt Revised Management Plan.**
7. **Review and Adopt Investment Policy.**
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Mike McGuire, General Manager 8:18 AM
Rolling Plains GCD

COPY OF POSTING
WAS POSTED ON
THE 10 DAY OF July 20 20

CLERK, KNOX COUNTY, TEXAS
BY _____ DEPUTY

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Mike McGuire, General Manager
Rolling Plains GCD

FILED
9th day of July 2020
CHRIS JAKUBICEK
Clerk County Court
Baylor County, Texas
By _____ Deputy

FILED FOR RECORD
AT 4:57 O'CLOCK P M

JUL 9: 2020

BELIA ABILA
Clerk County Court, Haskell County, Texas
By _____ Deputy

Regular Quarterly Meeting
AGENDA

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Mike McGuire, General Manager
Rolling Plains GCD

Resolution 02-20

Rolling Plains Groundwater Conservation District

P.O. Box 717
Munday, Texas 76371

Management Plan
2020-2025

WHEREAS, the Haskell-Knox Underground Water Conservation District was created in May, 1993 by authority of HB 2862 of the 73rd Texas legislature; and

WHEREAS, by authority of SB 611 of the 77th Texas legislature; the name was changed to the Rolling Plains Groundwater Conservation District (District), and

WHEREAS, the District is required by SB1 through Chapter 36.1071 of the Texas Water Code to develop and adopt a Management Plan; and

WHEREAS, the District is required by SB1 to submit the adopted Management Plan to the Executive Administrator of the Texas Water Development Board for review and certification; and

WHEREAS, the District's revised Management Plan shall be certified by the Executive Administrator, if the plan is administratively complete; and

WHEREAS, the District Board of Directors has determined that the five (5) year Management Plan addresses the requirements of Chapter 36.1071,

NOW, THEREFORE, be it resolved that the Board of Directors of the Rolling Plains Groundwater Conservation District, following notice and hearing, hereby adopts this revised five (5) year Management Plan; and

FURTHER, be it resolved, that this revised Management Plan shall become effective immediately upon adoption.

Adopted this 16th day of July, 2020, by the Board of Directors of the Rolling Plains Groundwater Conservation District.

Chris Orsak, Board Secretary

Glenn Ray Howell, Board President

Mike McGuire

From: Mike McGuire <mmcguire@rpgcd.org>
Sent: Wednesday, June 03, 2020 1:51 PM
To: Stacey Green
Cc: Kerry Maroney
Subject: Management Plan Coordination-Red River Authority and RWPG Region B
Attachments: Rolling Plains GCD 2020 MGTPLAN Certified.pdf

To fulfill the statutory requirement for coordination with surface water management entities and regional water planning groups, enclosed please find attached a copy of the Rolling Plains Groundwater Conservation District's adopted "Groundwater Management Plan" that has been submitted for Texas Water Development Board certification as mandated by Chapter 36 of the Texas Water Code.

The management plan will be in force for 5 years from the date adopted by the Board, with periodic review. If there should be any additional information that you require, please do not hesitate to call.

Mike McGuire
Rolling Plains Groundwater Conservation District
P. O. Box 717
Munday, TX 76371
(940) 422-1095 phone
(940) 422-1094 fax
(940) 864-4646 mobile

Mike McGuire

From: Mike McGuire <mmcguire@rpgcd.org>
Sent: Wednesday, June 03, 2020 1:47 PM
To: Stephen Hamlin
Cc: David Dunn
Subject: Management Plan Coordination-Brazos River Authority and RWPG Brazos G
Attachments: Rolling Plains GCD 2020 MGTPLAN Certified.pdf

To fulfill the statutory requirement for coordination with surface water management entities and regional water planning groups, enclosed please find attached a copy of the Rolling Plains Groundwater Conservation District's adopted "Groundwater Management Plan" that has been submitted for Texas Water Development Board certification as mandated by Chapter 36 of the Texas Water Code.

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(940) 422-1094 fax
(940) 864-4646 mobile

Mike McGuire

From: Mike McGuire <mmcguire@rpgcd.org>
Sent: Wednesday, June 03, 2020 1:53 PM
To: David Kuehler
Subject: Management Plan Coordination- North Central Texas Municipal Water Authority
Attachments: Rolling Plains GCD 2020 MGTPLAN Certified.pdf

To fulfill the statutory requirement for coordination with surface water management entities and regional water planning groups, enclosed please find attached a copy of the Rolling Plains Groundwater Conservation District's adopted "Groundwater Management Plan" that has been submitted for Texas Water Development Board certification as mandated by Chapter 36 of the Texas Water Code.

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(940) 422-1094 fax
(940) 864-4646 mobile

From:	Mike McGuire
To:	Russell Schreiber; wcwid2@sbcglobal.net
Cc:	Stephen Allen
Subject:	Management Plan Coordination
Date:	Wednesday, August 12, 2020 12:12:12 PM
Attachments:	Rolling Plains GCD 2020 MGTPLAN Certified.pdf

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