

**Permian Basin Underground
Water Conservation District
Management Plan**

Adopted August 24, 2023

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District Mission Statement

The Permian Basin Underground Water Conservation District (the District) will develop, promote, and implement management strategies to provide for the conservation, preservation, protection, recharging, and prevention of waste of the groundwater resources, over which it has jurisdictional authority, for the benefit of the people that the District serves.

Time Period for this Plan

This plan becomes effective upon adoption by the Permian Basin Underground Water Conservation District Board of Directors and approved as administratively complete by the Texas Water Development Board. The plan will remain in effect for five years from the date of approval or until a revised plan is adopted and approved.

Statement of Guiding Principles

The District was formed, and has been operated from its inception, with the guiding belief that the ownership and pumpage of groundwater is a private property right. The Board will continue to support that right.

The Board is elected by the registered voters of the District, under the general Election laws of Texas. The rules promulgated to date by the Board were carefully thought out, were the result of specific needs, and were adopted after public input. These rules provide a fair and equitable opportunity for all water users to produce and use water from the aquifer for beneficial purposes. Interpretation and enforcement of the rules of the District are carried out by the District's staff, at the direction of the Board.

This management document is intended to be used as a tool to provide continuity in the management of the District. It will be used by the District staff as a guide to ensure that all aspects of the goals of the District are carried out. It will be referred to by the Board for future planning, as well as a document to measure the performance of the staff on an annual basis.

Conditions can change over time which may cause the Board to modify this document. The dynamic nature of this plan shall be maintained so the District can continue to best serve the needs of the constituents. At the very least, the Board will review and readopt this plan every five years according to Statute.

In the opinion of the Board, the goals, management objectives, and performance standards put forth in this planning document have been set at a reasonable level considering existing and future fiscal and technical resources. Conditions may change which could cause change in the management objectives defined to reach the stated goals. Whatever the future holds, the following guidelines will be used to ensure that the management objectives are set at a sufficient level to be realistic and effective:

- The District’s constituency will determine if the District’s goals are set at a level that is both meaningful and attainable; through their voting right, the public will appraise the District’s overall performance in the process of electing or re-electing Board members.
- The duly elected Board will guide and direct the District staff and will gauge the achievement of the goals set forth in this document.
- The interests and needs of the District’s constituency shall control the direction of the management of the District.
- The Board will endeavor to maintain local control of the privately owned resource over which the District has jurisdictional authority.

General Description, Location and Extent

The District was created on April 25, 1985 when Governor Mark White signed HB 2382, 69th Legislature, in to law. The District was confirmed by voter approval, the initial Board elected, and an ad valorem tax rate cap of \$0.02/\$100 valuation was set in an election held in September 1985. Table 1 lists the current Board of Directors, office held, County served, and term.

Office	Name	County	Term Ends
President	Richie Tubb	Howard	May 2024
Vice-President	Raymond Straub Jr.	Martin	May 2026
Secretary	Brad Tunnell	Martin	May 2024
Member	Brandon Borgstedt	Martin	May 2026
Member	Ed Miller	Howard	May 2026

Table 1: Board of Directors of the Permian Basin Underground Water Conservation District

Originally, the jurisdictional extent of the District was the same as Martin County, Texas. However, in 1991, the voters in the northwest portion of Howard County approved the annexation of that portion of their county into the District.

In 2001 the District annexed all of Howard County save and except City Limits of Big Spring, Texas, the City Limits of Coahoma, Texas, and adjacent areas as shown in figure 1.

The District now covers approximately 1754 square miles of West Texas (Figure 1). Stanton, the county seat of Martin County, is the largest municipality in the District, having a population of 2492.

The District is bordered on the west by Andrews County, on the north by Dawson and Borden Counties, on the south by Midland and Glasscock Counties, and on the east by Mitchell County with Scurry County to the Northeast and Sterling County to the Southeast.

The economy of the District is predominated by the oil and gas industry and to a lesser extent by agriculture. The major agricultural products coming from the area include beef cattle, cotton and grain sorghum.

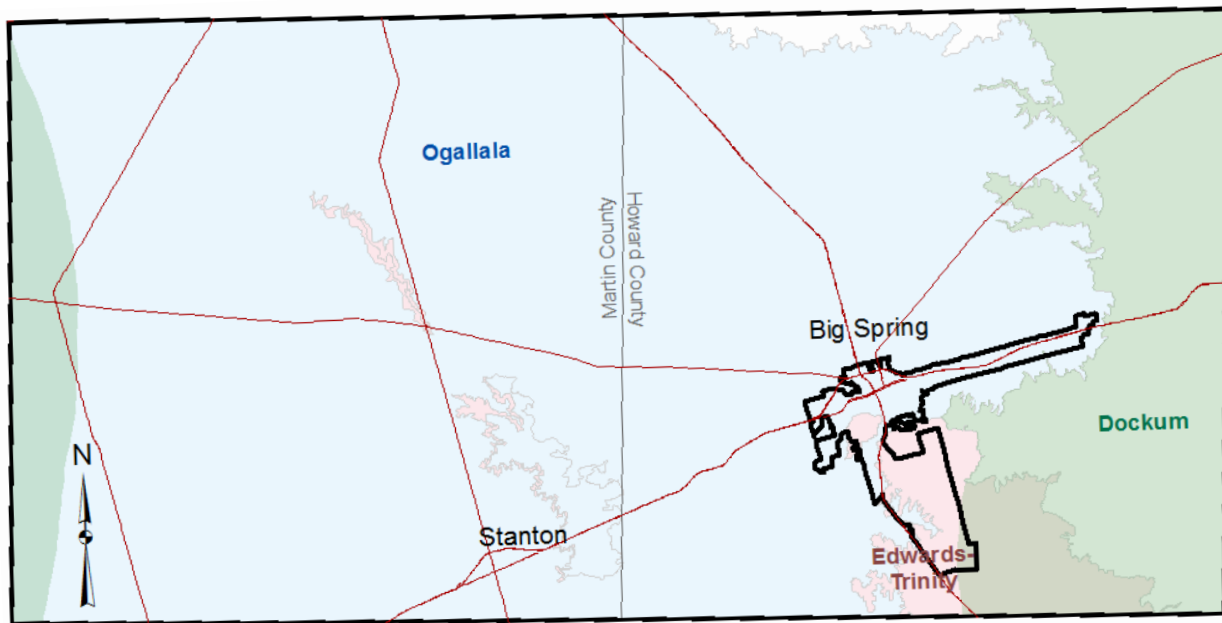


Figure 1: District Boundaries and Aquifers of the Permian Basin Underground Water Conservation District

Groundwater Resources

The District has jurisdictional authority over all groundwater that lies within the District's boundaries. There are two major aquifers that occur within the District: the Ogallala and the Edwards-Trinity (Plateau). The following is a description of these formations that may be beneficial to District constituents.

Ogallala Aquifer

The Ogallala Aquifer is the primary source of groundwater in the District (Fig. 2). The aquifer extends from the ground surface downward, ranging in thickness from less than 20 feet to more than 100 feet.

The formation consists of heterogeneous sequences of clay, silt, sand, and gravel. These sediments are thought to have been deposited by eastward flowing aggrading streams that filled and buried valleys eroded into pre-Ogallala rocks (Ashworth and Hopkins, 1995).

Water levels in the Ogallala Aquifer are primarily influenced by the rate of recharge to and discharge from the aquifer. Recharge to the aquifer occurs primarily by infiltration of precipitation falling on the surface.

Groundwater in the aquifer generally flows from northwest to southeast, normally at right angles to water level contours. Velocities of less than one foot per day are typical, but higher velocities may occur along filled erosion valleys where coarser grained deposits have greater permeabilities.

Discharge from the Ogallala aquifer within the District occurs through the pumping of wells; primarily for municipal, oil and gas production, and irrigation. Groundwater pumpage typically exceeds recharge and results in water-level declines (Ashworth and Hopkins, 1995).

The chemical quality of Ogallala groundwater varies greatly across the District. The suitability of groundwater for irrigation purposes is largely dependent on the chemical composition of the water and is determined primarily by the total concentration of soluble salts.

This district lies at the very southern end of the Ogallala. As such, the Ogallala formation here is thinning and less productive than in other areas. It is also intermingled with other formations, including the Edwards, Fredericksburg, and Antlers Sands in some places in this District.

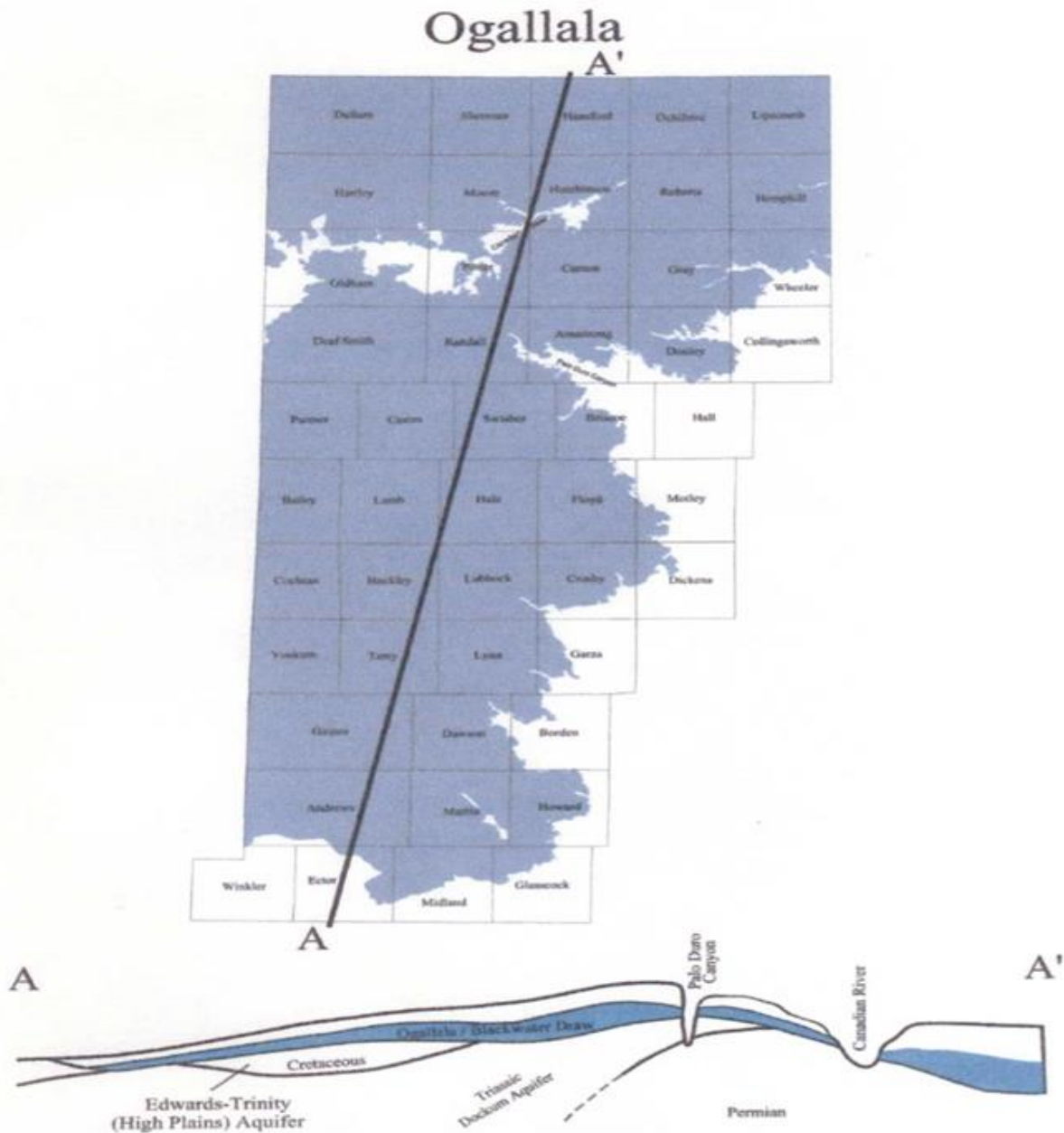


Figure 2: Aerial extent of the Ogallala Aquifer in Texas (Adapted from Ashworth and Hopkins 1995)

Edwards – Trinity (Plateau) Aquifer

The Edward –Trinity (Plateau) Aquifer underlies a small portion of east central and southern Martin County as well as the eastern portions of Howard County within the District (Fig. 3). The aquifer consists of saturated sediments of lower Cretaceous Epoch Trinity Group formations and overlying limestones and dolomites of the Edwards formations.

Chemical quality of the Edwards – Trinity (Plateau) water ranges from fresh to slightly saline. The water is typically hard and may vary widely in concentrations of dissolved solids made up mostly of calcium and bicarbonate. There is little pumpage from the aquifer, and water levels remain relatively constant.

Edwards-Trinity (Plateau)

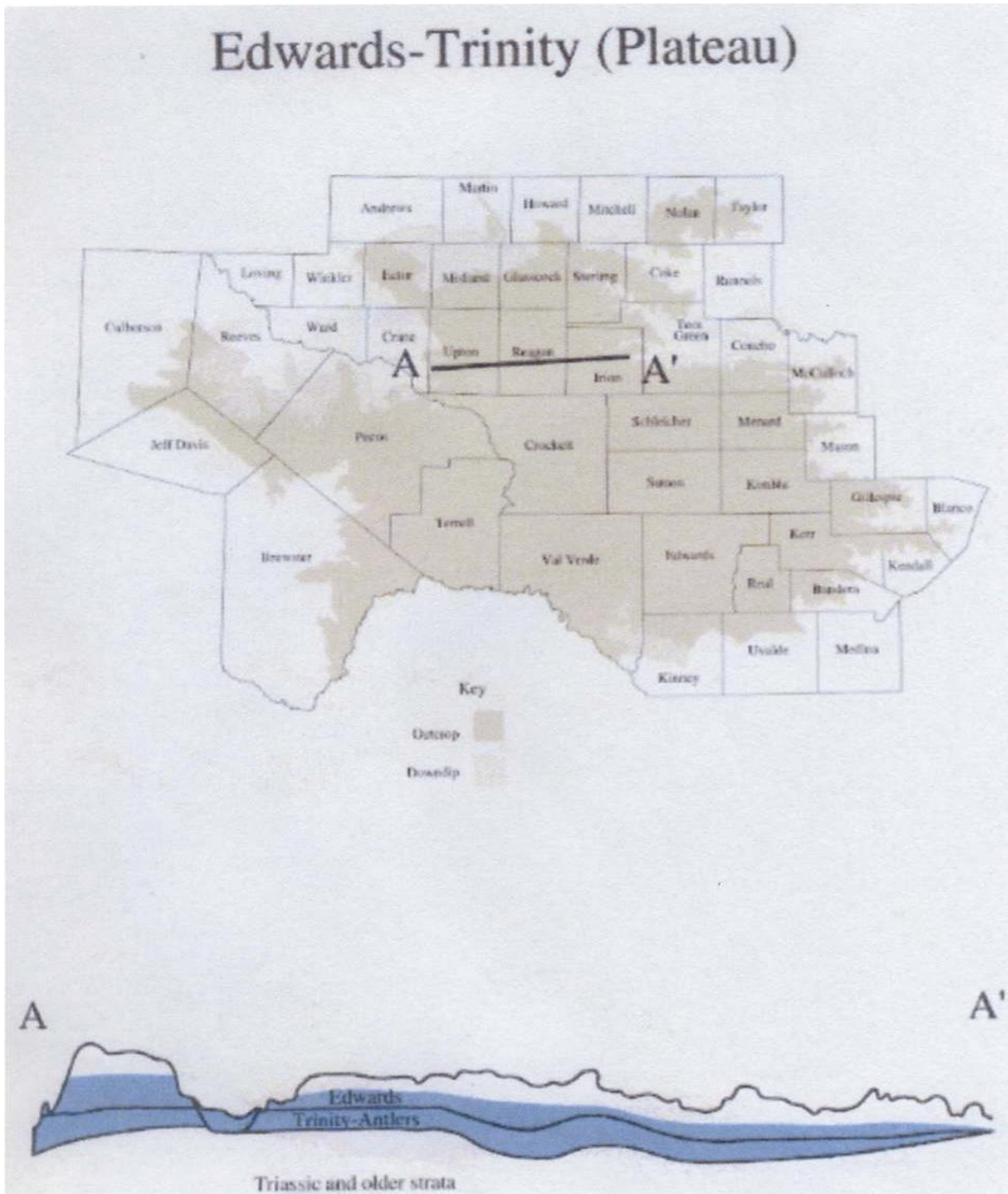


Figure 3: Aerial extent of the Edwards-Trinity (Plateau) Aquifer in Texas (Adapted from Ashworth and Hopkins, 1995)

Modeled Available Groundwater and Desired Future Condition

The District originally adopted Desired Future Conditions (DFC) for relevant aquifers in July 2010 in accordance with Chapter 36.108 of the Texas Water Code. The aquifer conditions were reviewed in the joint planning process and new DFCs were adopted in January 2017 and August 2021. The relevant aquifers are the Ogallala, Edwards-Trinity (High Plains), and the Dockum Aquifers. The District Board in review of the new High Plains Aquifer System GAM Run and Scenario 16 GAM Run by Bill Hutchison developed during the joint planning process decided the Edwards Trinity (Plateau) and Pecos Valley Aquifers are not relevant aquifers for the Permian Basin UWCD at this time.

During the joint planning process, this District and six other Groundwater Conservation Districts of Groundwater Management Area 2 (GMA2) adopted DFC's for the Ogallala, Edwards-Trinity (High Plains), and the Dockum Aquifers based on the average drawdown as documented in GMA 2 Technical Memorandum 20-01 and GMA 2 Technical Memorandum 16-01. In the Permian Basin UWCD, the Ogallala and Edwards Trinity (High Plains) Aquifer cumulative drawdown is predicted to be 28 feet by 2080. For the Dockum Aquifer cumulative drawdown is predicted to be 31 feet by 2080. However, the District is required to evaluate the DFCs every 5 years which will allow us to make any changes accordingly.

The Texas Water Development Board (TWDB) provided the District with the GAM Run 21-008 MAG Addendum modeled available groundwater calculation based on their DFCs. A new MAG will be calculated later this year based on the DFC adopted in GMA 2 in August 2021. Please refer to Appendix C.

The District currently has Rules in effect and is considering amendments in order to better meet the adopted Desired Future Conditions.

Amount of Groundwater Being Used within the District on an Annual Basis

- The Estimated Historical Water Use from the TWDB Historical Water Use Survey (WUS) are estimations of the historical quantity of groundwater used in the area served by the District. It will be used as a guide to estimate future demands on the resource in the District. It should be emphasized that the quantities shown are estimates.

Please refer to Appendix A.

- Annual Amount of Recharge From Precipitation to the Groundwater Resources within the District (GAM Run 22-005)

Please refer to Appendix B.

- Annual Amount of Water that Discharges from the Aquifer to Springs and any Surface Water Bodies within each aquifer of the District (GAM Run 22-005)

Please refer to Appendix B.

- Annual Volume of Flow into the District, out of the District, and Between Aquifers in the District (GAM Run 22-005)

Please refer to Appendix B.

Surface Water Resources

- The most significant surface water resource of benefit to the District is water pumped from the Colorado River Municipal Water District watershed to the City of Stanton.

We will provide Colorado River Municipal Water District a copy of our Management Plan for their comments.

- Projected Surface Water Supply within the District

Please refer to Appendix A, page 5.

- Projected Groundwater Supply and Demand

Projecting groundwater supply and demand is an arduous process. In order to make such projections, one must predict trends of groundwater use. Assumptions must be made regarding population changes, changing agricultural cropping strategies, economic development patterns, and future weather patterns. Naturally, the farther into the future one projects, the less accurate the projections become.

- Projected Total Demand for Water within the District

Please refer to Appendix A, page 6.

Water Supply Needs

Water supply needs exist in the District in these categories: irrigation (Martin County) municipal (Stanton), manufacturing (Howard County), and steam electric (Howard County). The District has considered these water supply needs.

Please refer to Appendix A, page 7.

Water Management Strategies

All water supply needs in the District are addressed with the water management strategies of demand reduction and the Colorado River MWD Lake/Reservoir System. The District has considered these water management strategies.

Please refer to Appendix A, pages 8-11.

Management of Groundwater Resources

The District will endeavor to manage groundwater resources, over which it has jurisdictional authority, in order to conserve the resource while seeking to maintain the economic viability of the District's constituents. A water level monitoring network has been established in order to track water level changes in aquifers each year. The District will employ all technical resources at its disposal to monitor and evaluate the groundwater resource and programs designed to encourage conservation of the same.

Method for Tracking the District's Progress in Achieving Management Goals

The District staff will prepare an annual report to the Board of Directors of the District's performance with regard to achieving management goals and objectives. The report will be maintained on file in the open records of the District.

Actions, Procedures, Performance and Avoidance for Plan Implementation as required by {TWC §36.1071(e)(2)}

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 rules relating to the permitting of wells. The rules adopted by the District are pursuant to TWC §36 and the provisions of this plan. All rules will be adhered to and enforced. The promulgation and enforcement of the rules will be based on the best technical evidence available. District rules are available on the District's website at <http://www.pbuwcd.com> under the rules tab.

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

Management Goals and Performance Standards

Goal 1.0 Providing the Most Efficient Use of Groundwater

1.01 - Objective: Water Level Monitoring

Annually measure and record water level measurements within the District's water level monitoring network.

1.01 - Performance Standard:

The District will maintain a water level monitoring network, annually measuring 80 percent of the wells in the network, and report in the annual report to the Board of Directors.

1.02 - Objective: Well Permitting and Well Completion

The District will issue water well drilling permits for non-exempt water wells in accordance with the District rules.

1.02 - Performance Standard:

The Board of Directors will vote on approval of permits at the regularly scheduled meeting after the permit has been issued, and the total annual number of issued water well drilling permits will be reported in the annual report to the Board of Directors.

Goal 2.0 Controlling and Preventing Waste of Groundwater

2.01 - Objective: Laboratory Services

2.01 - Performance Standard:

The District will provide basic and/or coliform water quality testing upon request, communicate test results to constituents, and report the total annual number of water quality tests performed in the annual report to the Board of Directors.

2.02 – Objective: Open or Uncovered Wells

2.02 - Performance Standard:

The District will inspect any open or uncovered wells found or reported each year, ensure that a found or open hole is properly closed according to statute to prevent

potential contamination of the aquifer, and report the total annual number of open or uncovered wells in the annual report to the Board of Directors.

Goal 3.0 Addressing Drought Conditions

Drought information by the Texas Water Development Board (TWDB) is available online:

<https://www.waterdatafortexas.org/drought/>

3.01 – Objective: Drought Education

3.01 - Performance Standard:

The District will monitor the drought conditions and submit a minimum of one article annually to a newspaper of general circulation within the District focused on water conservation and drought awareness if necessary. The annual number of articles submitted to the newspaper will be reported in the annual report to the Board of Directors.

Goal 4.0 Addressing Conservation, Recharge Enhancement, Rainwater Harvesting, Precipitation Enhancement and Brush control where appropriate and cost effective. (36.1071(a)(7))

4.01 – Objective: Conservation

4.01 - Performance Standard:

Each year the District will provide a minimum of one educational material regarding water conservation to public schools within the District and report it in the annual report to the Board of Directors.

4.02 – Objective: Recharge Enhancement

This goal is not appropriate at present due to cost ineffectiveness; therefore, this goal is not applicable.

4.03 – Objective: Rainwater Harvesting

The District will provide and distribute literature on rainwater harvesting and promote the conservation and efficient use of water.

4.03 - Performance Standard

Each year the District staff will submit a minimum of one article on rainwater harvesting to a newspaper of general circulation located within the District and report it in the annual report to the Board of Directors.

4.04 – Objective: Precipitation Enhancement

A review of past work conducted by others indicates this goal is not appropriate at present due to cost ineffectiveness; therefore, this goal is not applicable.

4.05 – Objective: Brush Control

The District will provide and distribute literature on brush control and promote the conservation and efficient use of water.

4.05 - Performance Standard

Each year the District staff will submit a minimum of one article on brush control to a newspaper of general circulation located within the District and report it in the annual report to the Board of Directors.

Goal 5.0 Addressing the Desired Future Conditions adopted by the District

5.01 - Objective - Calculate Annual Drawdown

5.01 - Performance Standards

5.01.a The District will maintain a water level monitoring network, annually measure 80% of the wells in the network, and report in the annual report to the Board of Directors.

5.01.b Using the results from the annual water level measurement program, the District will calculate the average annual drawdown and long term decline. This analysis will be compared to the currently stated DFC to ensure the District is on track to meet the desired future conditions listed in the earlier section of this plan. These results will be reported in the annual report to the Board of Directors.

5.01.c The District will also submit an article detailing the average drawdown results to at least one newspaper of general circulation within the District each year.

Goal 6.0 Addressing natural resource issues

6.01 - Objective - Saltwater Disposal Well Monitoring

6.01 - Performance Standards

Each year the District will inspect 80 percent of known saltwater disposal sites for indications of pollution potential and report in the annual report to the Board of Directors.

6.02 – Objective – Reporting on Well Usage

6.02- Performance Standards

The District will report the number of wells permitted that are intended to be used for oil and gas production each year in the annual report to the Board of Directors.

Goal 7.0 - Addressing Conjunctive Surface Water Management Issues

7.01 Objective – Participating in Regional Water Planning Group

7.01 – Performance Standards

The district will, in each annual report, document the participation of district representatives in Region F meetings and the number of meetings attended in the preceding calendar year. Documentation will consist of a table listing all Region F meetings scheduled during the preceding 12 months, and the name(s) of district staff attending.

Goals Determined not to be Applicable to the District

The following goals referenced in Chapter 36, Texas Water Code, have been determined not applicable to the District;

- TWC §36.1071 (a) (3) Controlling and preventing subsidence

Subsidence was evaluated using the Texas Aquifer Potential Subsidence Prediction Screening Tool Version 1.0, TWDB, 2018. Representative wells from both Howard & Martin counties were evaluated. The evaluation period was 2012 – 2080. District water level data was used. Well data was extracted from District & TWDB files. The model default aquifer properties for the selected aquifers were accepted. Calculated Risk for Howard County was 3.75; Martin County Risk was 3.59, based on a scale of 0 (no risk) to 10

(highest risk). No measurable subsidence was predicted by the model. Based on the low calculated risk values and the lack of predicted subsidence, subsidence is not currently a relevant concern to the District.

- TWC §36.1071 (a) (7) Addressing recharge and precipitation enhancement issues

Appendix A

Estimated Historical Groundwater Use

And 2022 State Water Plan Datasets:

Permian Basin Underground Water Conservation District

by Stephen Allen

Texas Water Development Board

Groundwater Division

Groundwater Technical Assistance Section

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April 28, 2022

Appendix B

GAM Run 22-005: Permian Basin Underground Water Conservation District Management Plan

Jerry (Jianyou) Shi, Ph.D., P.G.

Texas Water Development Board

Groundwater Division

Groundwater Availability Modeling Section

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May 2, 2022

Appendix C

GAM Run 21-008 MAG Addendum

Jerry Shi, Ph.D., P.G.

Texas Water Development Board

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May 12, 2017