

**PRESIDIO COUNTY UNDERGROUND
WATER CONSERVATION DISTRICT**

MANAGEMENT PLAN

Effective 2020-2025 **DRAFT**

Table of Contents

- I. District Mission..... 4
- II. Purpose of Management Plan 4
- III. District Information 4
 - A. Creation..... 4**
 - B. Directors 4**
 - C. Authority 4**
 - D. Location and Extent 5**
 - E. Topography and drainage..... 6**
 - F. Groundwater Resources in Presidio County..... 6**
- IV. Statement of Guiding Principals..... 6
- V. Criteria for Plan Approval 7
 - A. Planning horizon..... 7**
 - B. Board Resolution 7**
 - C. Plan Adoption 7**
 - D. Coordination with Surface Water Management 7**
- VI. Technical Information Required by TWC 36.1071/31 TAC 356.52..... 7
 - A. Modeled available groundwater based on Desired Future Conditions (DFC) of aquifers in District. 7**
 - B. Amount of groundwater being used by District..... 9**
 - C. Annual amount of recharge from precipitation to the groundwater resources to each aquifer 9**
 - D. Annual amount of discharge from each aquifer to springs and surface water bodies 9**
 - E. Annual volume of flow into and out of each aquifer and between the aquifers..... 9**
 - F. Projected surface water supply to the District..... 9**
 - G. Projected total demand for water in the District..... 9**
- VII. Water Supply Needs 9
 - A. Water Supplies..... 9**
 - B. Water Management Strategies 10**
- VIII. Management of Groundwater Supplies 10
- IX. Actions, Procedures, Performance and Avoidance for Plan Implementation 10
- X. Methodology for Tracking District Progress in Achieving Management Goals 11
- XI. Goals, Management Objectives and Performance Standards 11
 - A. Providing the Most Efficient Use of Groundwater 11**
 - A.1 Management Objective 11**
 - A.2 Management Objective 11**
 - B. Controlling and Preventing Waste of Groundwater. 12**

- B.1 Management Objective..... 12
- B.2 Management Objective..... 12
- B.3 Management Objective..... 12
- C. Controlling and preventing subsidence. 12
- D. Addressing conjunctive surface water management issues. 13
 - D.1 Management Objective 13
- E. Addressing natural resource issues that impact the use and availability of groundwater or that are impacted by the use of groundwater. 13
- F. Implement management strategies that will address drought conditions. 13
 - F.1 Management Objective 13
- G. Implement management strategies that will address water conservation, recharge enhancement, rainwater harvesting, precipitation enhancement, or brush control, where appropriate and cost-effective 14
 - G.1 Management Objective – Conservation 14
 - G.2 Management Objective - Recharge Enhancement 14
 - G.3 Management Objective - Rainwater Harvesting 14
 - G.4 Management Objective - Precipitation Enhancement 14
 - G.5 Management Objective - Brush Control 14
- H. Addressing the Desired Future Conditions. 14
 - H.1 Management Objective - Desired Future Conditions 14

List of Figures

- Figure 1 - District and Aquifer Boundaries5

List of Tables

- Table 1 - Presidio County UWCD Area5
- Table 2 - Texas Water Development Board, Groundwater Availability Model (GAM) Run 16-030 Report, listed in “Description of Request”, Presidio County 8
- Table 3 - Texas Water Development Board, Groundwater Availability Model (GAM) Run 16-030, Tables 8 and 12, Modeled Available Groundwater (MAG) 8

Appendices

- Appendix A16
- Appendix B18
- Appendix C19
- Appendix D19
- Appendix E20
- Appendix F20
- Appendix G21
- SUMMARY DEFINITIONS 22

I. District Mission

The Presidio County Underground Water Conservation District will strive to develop, promote, and implement water conservation and management strategies to protect water resources for the benefit of the citizens, economy, and environment of the District.

II. Purpose of Management Plan

The District's management plan satisfies the requirements of SB 1, SB2, HB 1763, the statutory requirements of Texas Water Code (TWC) Chapter 36, and the rules and requirements of TWDB. This plan further addresses the process established by the District to monitor changes in the aquifer, communicate to the public the findings made by the District, and ensure that the plan can adapt through time to meet the needs of the stakeholders of Presidio County.

III. District Information

A. Creation

The Texas State Legislature in 1949 authorized the creation of Underground Water Conservation Districts to perform certain prescribed duties, functions, and hold specific powers as set forth in Article 7880-3c, Texas Civil Statutes, now codified in Chapter 36 of the Texas Water Code.

This District was legislatively created and confirmed by the citizens of Presidio County through an election on August 31, 1999.

B. Directors

The District's Board of Directors were appointed by the Presidio County Commissioners Court and the present active board of directors is Trey Gerfers, Chair, Virginia Carrasco, Treasurer/Secretary, Brenda Witty, David Williams and Tony Manriquez. The District Manager is Carolyn Macartney

C. Authority

The District derives its authority to manage groundwater within the District by virtue of the powers granted and authorized pursuant to Section 59, Article XVI, Texas Constitution, Chapter 36, Texas Water Code, and the District's enabling act, the Act of May 19, 1995, 74th Leg., R.S., ch. 157, 1995 Tex. Gen. Laws 1007 (See Appendix A). The District, acting under such authority, assumes all the rights and responsibilities of a groundwater conservation district specified in Chapter 36 of the Texas Water Code.

D. Location and Extent

Presidio County is an area of 3,855 square miles, located in the Trans-Pecos region West Texas. The county is bound on the east by Brewster County, on the south by the Rio Grande River, and on the west and north by Jeff Davis County. Marfa is the county seat, which is located in the north portion of the county. Other towns in the county include Presidio and Redford in the south. Candleria and Ruidoso are in the southwest. All the other towns except Marfa are located near the Rio Grande River.

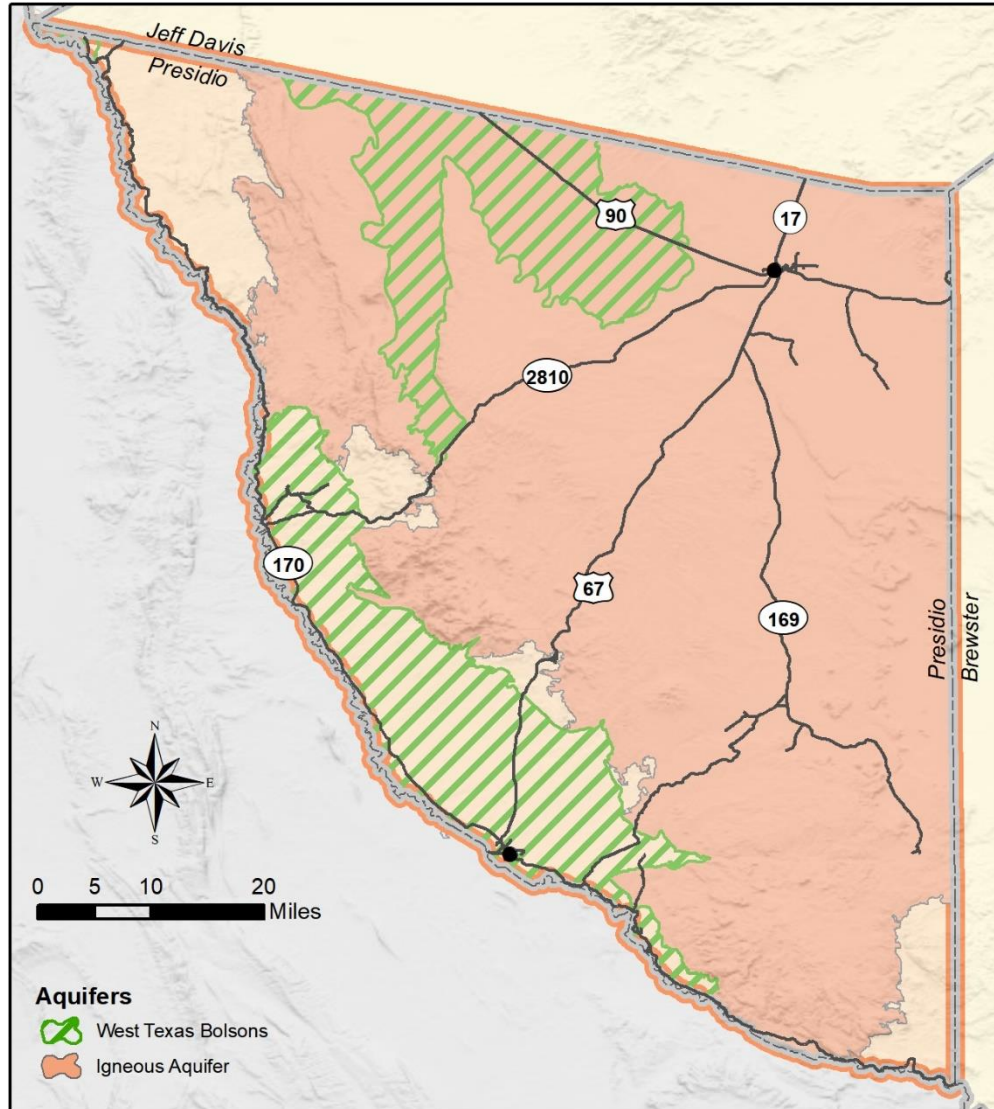


Figure 1 - District and Aquifer Boundaries

County	County Area (acre)	Presidio County UWCD Area (acres)	Percent (%) of County Area
Presidio	2,458,491.65	2,447,785.67	99.56

Table 1 - Presidio County UWCD Area

E. Topography and drainage

The topography of Presidio County is from high plains and plateaus in the north central portion of the county to rugged mountains in the south and southwest. The highest mountain is Chinati Peak, which is 7,730 feet. The farming areas lie in the southern portion of the county, near Presidio and to some extent near Candelaria and Ruidoso in the southwest. The area around Presidio is thought to be the oldest continuously cultivated farmland in Texas. The north central portion of the country or the high plains is the area consisting primarily of ranch land.

F. Groundwater Resources in Presidio County

In the Presidio County Underground Water Conservation District, the known groundwater resources are within the West Texas Bolsons aquifers including the Ryan Flat and Presidio-Redford Bolsons and the Igneous aquifer.

The West Texas bolsons are fault-bounded basins filled with sediments eroded from the surrounding highlands. The Presidio-Redford Bolson aquifer is located in the southern portion of Presidio County along the Rio Grande. It is the source of municipal supply for the City of Presidio. Water quality above the Rio Grande flood plain is fresh.

The Ryan Flat Bolson occurs in the northwestern part of Presidio County. Ryan Flat is the southernmost extension of the Salt Basin in Texas. It is bounded by mountains along its western, southern and eastern margins, and is thought to be hydro geologically connected with Lobo Valley outside the District.

The largest aquifer in the county is the Igneous Aquifer. The Igneous aquifer consists of many layers of highly fractured and faulted igneous rocks and overlying volcanoclastic alluvial fill. The principal water-bearing volcanic units are the Petan basalt and the Tascotal formations. The Igneous Aquifer supplies municipal water to the City of Marfa.

IV. Statement of Guiding Principals

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

The goals of this plan can best be achieved through guidance from the locally elected board members who have an understanding of local conditions as well as technical support from the Texas Water Development Board and qualified consulting agencies. This management plan is intended as a tool to focus the thoughts and actions and those given the responsibility for the execution of the District activities.

V. Criteria for Plan Approval

A. Planning horizon

This plan becomes effective upon adoption by the District Board of Directors and approval by the Texas Water Development Board (TWDB) affirming the plan is administratively complete. This District management plan will remain in effect for a period of five (5) years from the date of TWDB's approval, or until a revised plan is approved by the TWDB.

B. Board Resolution

A copy of the Presidio County District's resolution for adopting the 2015 to 2020 Management Plan is located in Appendix A.

C. Plan Adoption

This plan replaces the existing plan adopted by the District Board of Directors, which was approved by TWDB on February 27, 2015.

D. Coordination with Surface Water Management

There are no irrigation or surface drainage districts within the jurisdiction of this groundwater district.

VI. Technical Information Required by TWC 36.1071/31 TAC 356.52

A. Modeled available groundwater based on Desired Future Conditions (DFC) of aquifers in District.

Section 36.001 of the Texas Water Code defines Modeled Available Groundwater as the amount of water that the executive administrator determines may be produced on an average annual basis to achieve a desired future condition established under Section 36.108. House Bill 1763 passed by the 79th Texas Legislature in 2005 provided that the Desired Future Conditions of the aquifer may only be determined through the joint planning process within a Groundwater Management Area and must be adopted prior to the statutory deadline of September 1, 2010, and every five years thereafter.

DESIRED FUTURE CONDITIONS ESTABLISHED FOR THE DISTRICT

Aquifer	Amount average draw down should not exceed after 50 years (feet)
Igneous	14
Salt Basin Portion of the West Texas Bolsons	72
Presidio-Redford Bolson	72

Table 2 - Texas Water Development Board, Groundwater Availability Model (GAM) Run 16-030 Report, listed in “Description of Request”, Presidio County

The joint planning process set forth in Section 36.108 of the Texas Water Code must be conducted by all groundwater conservation districts within the same Groundwater Management Area. The District is a member of GMA 4. The groundwater conservation districts adopted Desired Future Conditions prior to the September 1, 2010 deadline and then forwarded them to the TWDB for development of the Modeled Available Groundwater calculations.

Aquifer (Rio Grande Basin)	Modeled Available Groundwater Totals for each decade in the planning period, 2020-2070 (in acre-ft. per year)					
	2020	2030	2040	2050	2060	2070
Igneous Aquifer	4,064	4,064	4,064	4,063	4,063	4,063
Ryan Flat (West Texas Bolsons) Aquifer	9,112	8,982	8,834	8,710	8,571	8,436
Presidio-Redford (West Texas Bolsons) Aquifer	7,661	7,661	7,661	7,661	7,661	7,661
Total	20,837	20,707	20,559	20,434	20,295	20,160

Table 3 - Texas Water Development Board, Groundwater Availability Model (GAM) Run 16-030, Tables 8 and 12, Modeled Available Groundwater (MAG)

The Desired Future Conditions adopted by Groundwater Management Area 4 represent the quantified, measurable conditions of the groundwater resources of the District over the 50-year planning period (2010-2060). Section 36.001(30) defines Desired Future Condition as a quantitative description, adopted in accordance with Section 36.108, of the desired condition of the groundwater resources in a management area at one or more specified future times. The Desired Future Conditions provided below demonstrate the maximum

amount of water level declines that the District must not exceed over the 50 year planning period (2020-2070).

B. Amount of groundwater being used by District

See Appendix B, TWDB, 2017 State Water Plan

C. Annual amount of recharge from precipitation to the groundwater resources to each aquifer

See Appendix C, GAM Run 19-007

D. Annual amount of discharge from each aquifer to springs and surface water bodies

See Appendix C, GAM Run 19-007

E. Annual volume of flow into and out of each aquifer and between the aquifers

See Appendix C, GAM Run 19-007

F. Projected surface water supply to the District

See Appendix D, TWDB, 2017 State Water Plan

G. Projected total demand for water in the District

See Appendix E, TWDB, 2017 State Water Plan

VII. Water Supply Needs

A. Water Supplies

The District considered the water supply needs covered in the 2017 State Water Plan. According to the projected water supply needs data supplied from the 2017 State Water Plan the urban water needs of the two towns in Presidio County, Marfa and Presidio, will decrease over the next fifty years. The projected water supply needs for irrigation are projected to increase slightly over the next 50 years in Presidio County, while the projected water supply needs for mining in Presidio County, are projected to remain unchanged. The projected water supply needs for county other in Presidio County are projected to decrease over the next 50 years, while the projected needs for livestock will remain at zero according to the 2017 State Water Plan data.

See Appendix F, TWDB, 2017 State Water Plan

B. Water Management Strategies

The District considered the water management strategies covered in the 2017 State Water Plan. The city of Marfa has secured funding to create an additional groundwater well to meet future needs. The City of Presidio is actively working to address water loss and will secure funding for an additional groundwater well.

See Appendix G, TWDB, 2017 State Water Plan

VIII. 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 the resource user groups, public and private. In consideration of the economic and cultural activities occurring within the District, the District will identify and engage in such activities and practices, that if implemented would result a reduction of groundwater use. An observation network shall be established and maintained in order to monitor changing storage conditions of groundwater supplies within the District.

The District will make regular assessments of water supply and groundwater storage conditions and will report those conditions to the Board and to the public. The district will undertake, as necessary and co-operate with investigations of the groundwater resources within the District and will make the results of investigations available to the public upon adoption of the Board.

The District has rules to regulate groundwater withdrawals by means of production limits. The District may grant or deny a well construction permit application or limit groundwater withdrawals in accordance with the guidelines stated in the rules of the District.

In pursuit of the District's mission of protecting the resource, the District may require reduction of groundwater withdrawals to amounts that will allow the District to achieve the Desired Future Conditions established for the aquifers within the District's boundaries. To achieve this purpose, the District may, at the Boards discretion and in accordance with District's rules, amend or revoke any permit after notice and hearing. The determination to seek such an amendment or revocation of a permit by the District will be based on aquifer conditions observed by the District and as set forth in the District's rules.

Link to District rules (no direct link) <http://www.co.presidio.tx.us/> hover over > county offices > Presidio County Underground Water conservation District > Rules, well permit application, operating permit application, well registration.

IX. Actions, Procedures, Performance and Avoidance for Plan Implementation

The District will implement the provisions of this plan and will utilize the provision 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 provision of this plan.

The District has adopted and implemented rules that regulate the permitting of wells and the production of groundwater. The rules adopted by the District were adopted pursuant to TWC 36 and consistent with 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 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 effects or unique local conditions. In granting of discretion to any rule, the Board shall consider the potential for adverse effects on adjacent landowners. The exercise of said discretion by the Board shall not be construed as limiting the power of the Board.

The District will seek cooperation in the implementation of the plan and 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 water management entity.

X. Methodology for Tracking District Progress in Achieving Management Goals

The District manager will prepare and present an annual report to the Board of Directors on District performance in regards to achieving management goals and objectives (during last monthly Board of Directors meeting each fiscal year. The report will include the number of instances each activity was engaged in during the year, referenced to the expenditure of staff time and budget so that the effectiveness and efficiency of each activity may be evaluated.

The annual report will be maintained on file at the District office.

XI. Goals, Management Objectives and Performance Standards

A. Providing the Most Efficient Use of Groundwater

A.1 Management Objective

Each Year, require meters to be installed on 100 percent of the new non-exempt production wells.

Performance Standard

Each year, provide a report to the Board of Directors indicating the number of meters installed on new non-exempt production wells in the District and the location and ownership.

A.2 Management Objective

All current existing rules and regulations will be reviewed and amended, if necessary to address the needs of the District at least once every three years.

Performance Standard

Each year, report to the Board of Directors the number of changes required to keep District rules updated to District needs.

B. Controlling and Preventing Waste of Groundwater.

B.1 Management Objective

Each year, investigate 100 percent of the reports of wasteful practices within the District.

Performance Standards

- a) Each year, locate 100 percent of the complaint sites on a District map.
- b) Each year, provide a report to the Board of Directors indicating the number of wasteful practice reports and the number of those reports that were investigated.

B.2 Management Objective

Each year, register 100 percent of the new wells drilled in the District.

Performance Standards

- a) District will maintain files including information on the drilling and completion of all new wells in the District.
- b) Annually report to the Board of Directors on the number of new wells registered during the year.

B.3 Management Objective

Each year the District will monitor the Texas Railroad Commission (RRC) website to identify the location and status of all new oil and/or gas production and injection wells.

Performance Standards

Each year, provide a report to the Board of Directors indicating the number, status and type of new RRC wells within the District

C. Controlling and preventing subsidence.

The District considered the Final Report: Identification of the Vulnerability of the Major and Minor Aquifers of Texas to Subsidence with Regard to Groundwater Pumping TWDB Contract Number 1648302062.

The results from this report suggest that the Igneous Aquifer has a low risk for future subsidence due to pumping and the risk for future subsidence from future pumping is generally low to medium for the West Texas Bolson Aquifer.

D. Addressing conjunctive surface water management issues.

D.1 Management Objective

Each year, the District will participate in the regional planning process by attending the Region F-Regional Water Planning Group meetings to convey information about groundwater availability and groundwater use within the District and to explore the development of surface water supplies to meet the needs of water user groups in the District.

Performance Standard

The attendance of a District representative at at least one Region F Regional Water Planning Group meeting will be noted in the annual report presented to the District's Board of Directors.

E. Addressing natural resource issues that impact the use and availability of groundwater or that are impacted by the use of groundwater.

Addressing natural resources is not applicable to the District. The District has no documented occurrences of endangered or threatened species dependent upon groundwater resources, nor any other natural resource issues that impact the use and availability of groundwater or that are impacted by the use of groundwater.

F. Implement management strategies that will address drought conditions.

F.1 Management Objective

The District will monitor the Palmer Drought Severity Index (PDSI) by Texas Climatic Divisions at least once quarterly. If PDSI indicates that the District will experience severe drought conditions, the District will notify all public water suppliers within the District.

Performance Standard

The District will report in the annual report to the Board of Directors the number of times the District experienced severe drought conditions according to the PDSI and the number of times notification was sent to all public water suppliers within the District.

G. Implement management strategies that will address water conservation, recharge enhancement, rainwater harvesting, precipitation enhancement, or brush control, where appropriate and cost-effective

G.1 Management Objective – Conservation

Distribute educational information yearly regarding the current conservation practices for efficient use of water resources.

Performance Standard

Each year, the District will include in the annual report to the Board of Directors the number of water conservation literature packets handed out.

G.2 Management Objective - Recharge Enhancement

Not Applicable - not cost effective.

G.3 Management Objective - Rainwater Harvesting

Not Applicable - not cost effective.

G.4 Management Objective - Precipitation Enhancement

Not Applicable - not cost effective.

G.5 Management Objective - Brush Control

Not Applicable - not cost effective

H. Addressing the Desired Future Conditions.

H.1 Management Objective - Desired Future Conditions

The District will review and calculate the amount of water allocated through permits and well registrations, and will also estimate actual use within the District to determine whether the District is on target to meet the Desired Future Conditions estimates for the groundwater resources within its boundaries.

Performance Standard

Each year, the annual report will include a discussion of the amount of water allocated through permits and well registrations and the estimate of actual use within the District and will include an evaluation of the District's progress towards meeting its Desired Future Conditions.

Appendices

- A. Copy of Board Resolution**
- B. Estimated Historical Use (2017 State Plan)**
- C. Estimated Annual Recharge, Discharge to Springs and Surface Water Bodies and Flows into and out of Each Aquifer (2019, GAM Run 19-007)**
- D. Projected Surface Water Supplies (2017 State Plan)**
- E. Projected Water Demands (2017 State Plan)**
- F. Projected Water Supply Needs (2017 State Plan)**
- G. Projected Water Management Strategies (2017 State Plan)**

Appendix A

RESOLUTION OF THE BOARD OF DIRECTORS OF THE PRESIDIO COUNTY UNDERGROUND WATER CONSERVATION DISTRICT HEARING AND MEETING HELD DECEMBER 10, 2014

A RESOLUTION ADOPTING DISTRICT'S MANAGEMENT PLAN

WHEREAS, the Presidio County Underground Water Conservation District (the "District") is a political subdivision of the State of Texas organized and existing under and by virtue of Article XVI, Section 59, of the Texas Constitution, and is a groundwater conservation district acting under Chapter 36 of the Texas Water Code and the District's enabling act, Act of the 73rd Legislature, 1993, Regular Session, Chapter 453 (House Bill 2817);

WHEREAS, under the direction of its Board of Directors, and in accordance with Section 36.1071, Texas Water Code, and Chapter 356, Title 31, Texas Administrative Code, the District has revised its current Management Plan, which took effect on January 12, 2010;

WHEREAS, the District held multiple properly noticed public meetings during 2014 to receive and consider public comments on the District's Management Plan;

WHEREAS, the District worked with and obtained comments from the Texas Water Development Board's ("TWDB's") staff, submitted the draft Management Plan for a preliminary review by TWDB staff, and then addressed all TWDB staff's comments in the development of its Management Plan;

WHEREAS, at its Board meeting held November 14, 2014, the District's Board set a public hearing on its Management Plan for December 10, 2014, and directed its General Manager and General Counsel to immediately coordinate to post notice compliant with the District's rules, the Texas Open Meetings Act, Chapter 36 of the Texas Water Code, and TWDB's regulations;

WHEREAS, the District timely complied with all notice requirements by timely publishing notice of this December 10th hearing in the appropriate newspaper and coordinating with the Presidio County Clerk to post this December 10th hearing notice on a bulletin board at a place convenient to the public at the Presidio County Courthouse more than 10 days before the hearing;

WHEREAS, in mid-November 2014, more than 10 days prior to its December 10th public hearing, the District made its Management Plan available for public review at the Presidio County Courthouse, Marfa City Hall and Marfa Public Library in Marfa, Texas; and the Presidio County Courthouse Annex, Presidio City Hall and Presidio Public Library in Presidio;

WHEREAS, the District's Board of Directors convened its public hearing and meeting at 9:00 a.m. on December 10, 2014, at the Presidio County Courthouse Courtroom, 301 North Highland Street, Marfa, Texas, received and considered public comment, completed its five-year review, and took formal action to adopt its revised Management Plan;

Appendix A (continued)

WHEREAS, the District will coordinate with the appropriate surface water management entities after the public hearing and adoption of its revised Management Plan to afford surface water management entities within the boundaries of the District the opportunity to review and provide comments to the District on its Management Plan; and

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

NOW THEREFORE, BE IT RESOLVED THAT:

The above recitals are true and correct.

The attached Management Plan is hereby adopted as the groundwater management plan for the District.

The Board and General Manager are further authorized to take any and all action necessary to implement this resolution and file and distribute the attached Management Plan with the TWDB, to take any and all action necessary to coordinate with the TWDB as may be required in furtherance of TWDB's approval pursuant to the provisions of Chapter 36 of the Texas Water Code and other applicable law.

AND IT IS SO ORDERED.

Upon motion duly made by Director Carlos Pineda, and seconded by Director David Williams, and upon discussion, the Board voted 3 in favor and ___ opposed, ___ abstained, and 2 absent, and the motion thereby PASSED on this 10th day of December, 2014.

PRESIDIO COUNTY UNDERGROUND WATER CONSERVATION DISTRICT

By: James R. Kestner
Board President

ATTEST:

David Williams
Board Member

Appendix B

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

Groundwater and surface water historical use estimates are currently unavailable for calendar year 2017. TWDB staff anticipates the calculation and posting of these estimates at a later date.

PRESIDIO COUNTY

All values are in acre-feet

Year	Source	Municipal	Manufacturing	Mining	Steam Electric	Irrigation	Livestock	Total
2016	GW	3,307	0	0	0	1,873	233	5,413
	SW	0	0	0	0	1,698	26	1,724
2015	GW	2,857	0	0	0	1,836	230	4,923
	SW	0	0	0	0	1,168	26	1,194
2014	GW	3,301	0	0	0	1,691	226	5,218
	SW	0	0	0	0	1,565	25	1,590
2013	GW	1,517	0	0	0	1,806	274	3,597
	SW	0	0	0	0	758	30	788
2012	GW	1,573	0	0	0	1,246	302	3,121
	SW	0	0	0	0	1,300	34	1,334
2011	GW	1,415	0	0	0	1,210	339	2,964
	SW	0	0	0	0	6,140	38	6,178
2010	GW	1,293	0	0	0	2,712	336	4,341
	SW	0	0	0	0	1,600	37	1,637
2009	GW	1,198	0	0	0	2,861	355	4,414
	SW	0	0	0	0	1,314	40	1,354
2008	GW	1,222	0	0	0	2,318	367	3,907
	SW	0	0	0	0	1,648	41	1,689
2007	GW	1,230	0	0	0	1,501	285	3,016
	SW	0	0	0	0	2,800	32	2,832
2006	GW	1,392	0	0	0	3,247	315	4,954
	SW	0	0	0	0	3,461	35	3,496
2005	GW	1,375	0	0	0	3,738	331	5,444
	SW	0	0	0	0	3,204	37	3,241
2004	GW	1,358	0	0	0	4,395	324	6,077
	SW	0	0	0	0	2,855	17	2,872
2003	GW	1,592	0	0	0	4,110	340	6,042
	SW	0	0	0	0	4,442	18	4,460
2002	GW	1,590	0	0	0	5,132	516	7,238
	SW	0	0	0	0	29,081	27	29,108
2001	GW	1,625	0	0	0	2,425	591	4,641
	SW	0	0	0	0	16,169	31	16,200

Appendix C

Estimated Annual Recharge, Discharge to Springs and Surface Water Bodies and Flow into and out of Each Aquifer

Management Plan requirement	Aquifer or confining unit	Results*
Estimated annual amount of recharge from precipitation to the district	West Texas Bolsons Aquifer	14,031
Estimated annual volume of water that discharges from the aquifer to springs and any surface-water body including lakes, streams, and rivers	West Texas Bolsons Aquifer	9,117
Estimated annual volume of flow into the district within each aquifer in the district	West Texas Bolsons Aquifer	22,275
Estimated annual volume of flow out of the district within each aquifer in the district	West Texas Bolsons Aquifer	37,465
Estimated net annual volume of flow between each aquifer in the district	Net flow from West Texas Bolsons Aquifer into overlying Rio Grande alluvium	838
	Net flow from Igneous Aquifer and other underlying units into West Texas Bolsons Aquifer	12,965

*Due to changes to the model grid attributes for the West Texas Bolsons (Presidio and Redford) Aquifer Groundwater Availability Model since the previous management plan report (2013), the groundwater flow volumes have also changed.

TWDB, GAM Run 19-007

Appendix D

Projected Surface Water Supplies TWDB 2017 State Water Plan Data

PRESIDIO COUNTY

All values are in acre-feet

RWPG	WUG	WUG Basin	Source Name	2020	2030	2040	2050	2060	2070
E	IRRIGATION, PRESIDIO	RIO GRANDE	RIO GRANDE RUN-OF-RIVER	6,140	6,140	6,140	6,140	6,140	6,140
E	LIVESTOCK, PRESIDIO	RIO GRANDE	RIO GRANDE LIVESTOCK LOCAL SUPPLY	41	41	41	41	41	41
Sum of Projected Surface Water Supplies (acre-feet)				6,181	6,181	6,181	6,181	6,181	6,181

TWDB, 2017 State Plan

Appendix E

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.

PRESIDIO COUNTY All values are in acre-feet

RWPG	WUG	WUG Basin	2020	2030	2040	2050	2060	2070
E	COUNTY-OTHER, PRESIDIO	RIO GRANDE	249	267	287	313	338	361
E	IRRIGATION, PRESIDIO	RIO GRANDE	4,630	4,539	4,450	4,363	4,278	4,197
E	LIVESTOCK, PRESIDIO	RIO GRANDE	408	408	408	408	408	408
E	MARFA	RIO GRANDE	589	627	667	718	764	808
E	MINING, PRESIDIO	RIO GRANDE	403	0	0	0	0	0
E	PRESIDIO	RIO GRANDE	659	689	721	764	808	851
Sum of Projected Water Demands (acre-feet)			6,938	6,530	6,533	6,566	6,596	6,625

TWDB, 2017 State Plan

Appendix F

Projected Water Supply Needs TWDB 2017 State Water Plan Data

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

PRESIDIO COUNTY All values are in acre-feet

RWPG	WUG	WUG Basin	2020	2030	2040	2050	2060	2070
E	COUNTY-OTHER, PRESIDIO	RIO GRANDE	339	321	301	275	250	227
E	IRRIGATION, PRESIDIO	RIO GRANDE	4,371	4,462	4,551	4,638	4,723	4,804
E	LIVESTOCK, PRESIDIO	RIO GRANDE	0	0	0	0	0	0
E	MARFA	RIO GRANDE	1,185	1,147	1,107	1,056	1,010	966
E	MINING, PRESIDIO	RIO GRANDE	0	403	403	403	403	403
E	PRESIDIO	RIO GRANDE	2,930	2,900	2,868	2,825	2,781	2,738
Sum of Projected Water Supply Needs (acre-feet)			0	0	0	0	0	0

TWDB, 2017 State Plan

Appendix G

Projected Water Management Strategies TWDB 2017 State Water Plan Data

PRESIDIO COUNTY

WUG, Basin (RWPB)

All values are in acre-feet

Water Management Strategy	Source Name [Origin]	2020	2030	2040	2050	2060	2070
MARFA, RIO GRANDE (E)							
CITY OF MARFA - ADDITIONAL GROUNDWATER WELL	IGNEOUS AQUIFER [PRESIDIO]	785	785	785	785	785	785
		785	785	785	785	785	785
PRESIDIO, RIO GRANDE (E)							
CITY OF PRESIDIO - ADDITIONAL GROUNDWATER WELL IN THE WEST TEXAS BOLSONS AQUIFER	WEST TEXAS BOLSONS AQUIFER [PRESIDIO]	120	120	120	120	120	120
CITY OF PRESIDIO - WATER LOSS AUDIT AND MAIN-LINE REPAIR	DEMAND REDUCTION [PRESIDIO]	9	9	9	9	9	9
		129	129	129	129	129	129
Sum of Projected Water Management Strategies (acre-feet)		914	914	914	914	914	914

TWDB, 2017 State Plan

SUMMARY DEFINITIONS

“Board” - the Board of Directors of the Presidio County Underground Water Conservation District. “District” - the Presidio County Underground Water Conservation District. “TWDB” - Texas Water Development Board. “Waste” - as defined by Chapter 36 of the Texas Water Code means anyone 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 a 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 tail water 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.
7. For water produced from an artesian well "waste" has the meaning assigned by Section 11.205 of the Texas Water Code.