

INITIALLY PREPARED PLAN

# CHAPTER 11: COMPARISON TO PREVIOUS REGIONAL WATER PLAN

Rio Grande Regional Water Plan

B&V PROJECT NO. 192863

PREPARED FOR

Rio Grande Regional Water Planning Group

3 MARCH 2020





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## List of Abbreviations

acft/yr	Acre-Feet per Year
ASR	Aquifer Storage and Recovery
DFC	Desired Future Condition
GAM	Groundwater Availability Model
GMA	Ground Management Area
ID	Irrigation District
MAG	Managed Available Groundwater
mgd	Million Gallons per Day
MUD	Municipal Utility District
RWP	Regional Water Plan
RWPG	Regional Water Planning Group
SCADA	Supervisory Control and Data Acquisition
SUD	Special Utility District
TCEQ	Texas Commission on Environmental Quality
TWDB	Texas Water Development Board
WAM	Water Availability Model
WMS	Water Management Strategy
WSC	Water Supply Corporation
WTP	Water Treatment Plant
WUG	Water User Group
WWP	Wholesale Water Provider
WWTP	Wastewater Treatment Plant



# CHAPTER 11: COMPARISON TO PREVIOUS REGIONAL WATER PLAN

## 11.1 INTRODUCTION

Each update to the Regional Water Plan (RWP) is an opportunity for the Regional Water Planning Group (RWPG) to evaluate the changes in the region's water use and conservation goals, and to lay out a path toward meeting future water needs. Every 5 year cycle of planning includes reevaluation of demands, current and future, an update of supplies currently being used, and development of a range of water management strategies (WMSs) that can be used to meet projected needs. A few of the changes to the planning process for this 2021 update are:

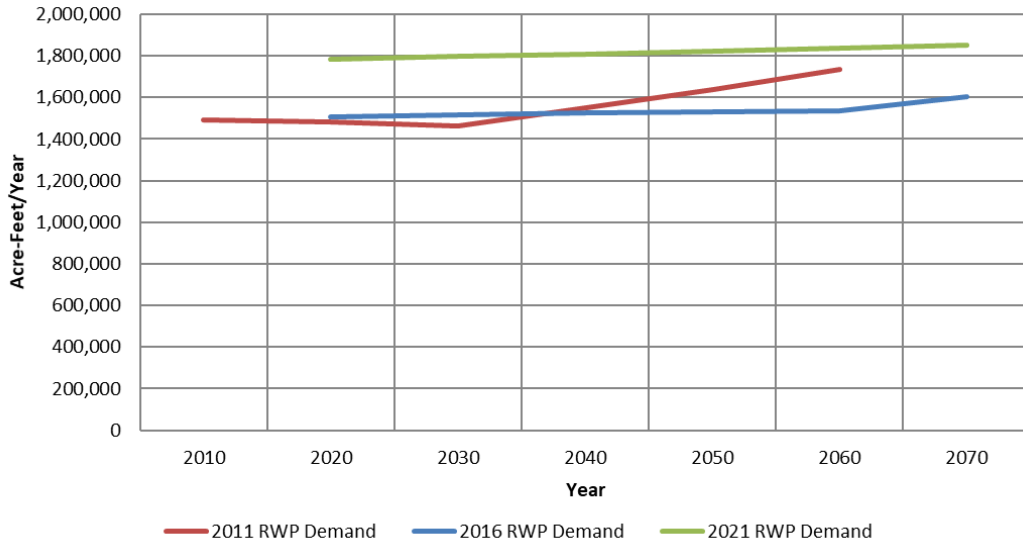
- Municipal water user groups (WUGs) were changed from being based on the municipal boundaries (2016 RWPs and earlier), to being defined by the extent of the water supply utility;
- Consideration of ASR as a potential WMS is required; and
- Major Water Providers (MWP) were introduced as a new designation, and each planning group defined the designation. The Rio Grande RWPG elected to define a MWP as any entity that provides 3,000 acft/yr or more of water for municipal use.

The revisions from the 2016 Rio Grande RWP (Region M Plan) and the current 2021 update to that plan are described below. A detailed quantitative comparison is included in Appendices A.10a and A.10b.

## 11.2 DEMANDS

For each cycle of regional water planning the Texas Water Development Board (TWDB) evaluates demographic data and information on agricultural and industrial water usage. This information is used to develop the current demands (base year demands) and to develop an anticipated rate of change to project those demands over the 50 year planning horizon. Municipal demands are developed for each water user group (WUG), which is defined as any utility or water systems that provide more than 100 acre-feet per year (acft/yr) for municipal use, as opposed to the 2016 RWP, which defined a WUG as serving a population of 500 or more. Rural, industrial, and irrigation demands are aggregated into WUGs for each county and river basin. Demand projections are developed initially by the TWDB technical staff and are then evaluated by the RWPGs for accuracy and revised if necessary. The demand projection methodology is discussed in detail in Chapter 2.

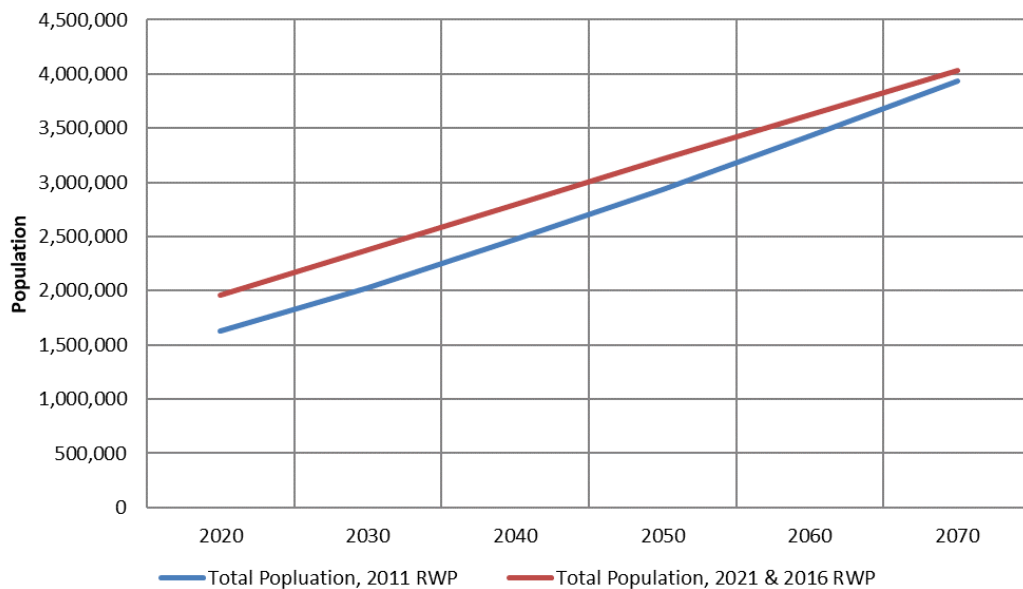
The Region M planning group approved the draft projections developed by the TWDB for manufacturing, livestock, mining, and steam-electric power generation demands. The TWDB projections for municipal and irrigation demands were revised based on local information. The total demand projections for all WUGs over the planning horizon are shown aggregated for this RWP and the 2011 RWP on Figure 11-1.



**Figure 11-1 Comparison of Regional Demand Projections, 2011, 2016, and 2021 RWPs**

### 11.2.1 Population Projections

The population projections were developed with similar methodology in the third (2011), fourth (2016), and fifth (2021) cycles of regional planning. The 2010 census is used as a basis, and population growth is estimated using demographics and projected birth, death, and migration rates. The countywide population data were not changed from the 2016 RWP to the 2021 RWP. The Region M Planning Group requested various changes to the population projections for municipal WUGs using survey responses and local information. None of the countywide population estimates that were developed by TWDB were changed, only the distribution of population within a county. Refer to Figure 11-2.



**Figure 11-2 Comparison of Population Projections, 2011, 2016, and 2021 RWPs**



In the updated plan, only a small change is noted in the distribution of projected population on a county basis, as shown on Figure 11-3.

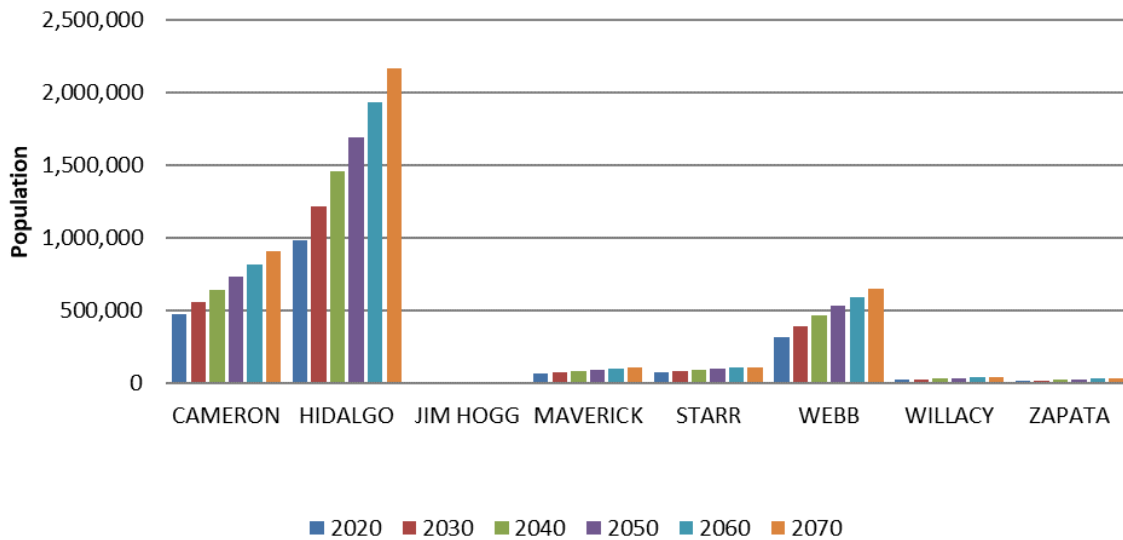


Figure 11-3 Population Projections by County, 2021 RWP

### 11.2.2 Municipal Water Demands

The municipal demand projections for 2021 are slightly higher than the 2016 RWP projections (Figure 11-4) because of a slightly lower projected population and lower measured and projected per-capita water use.

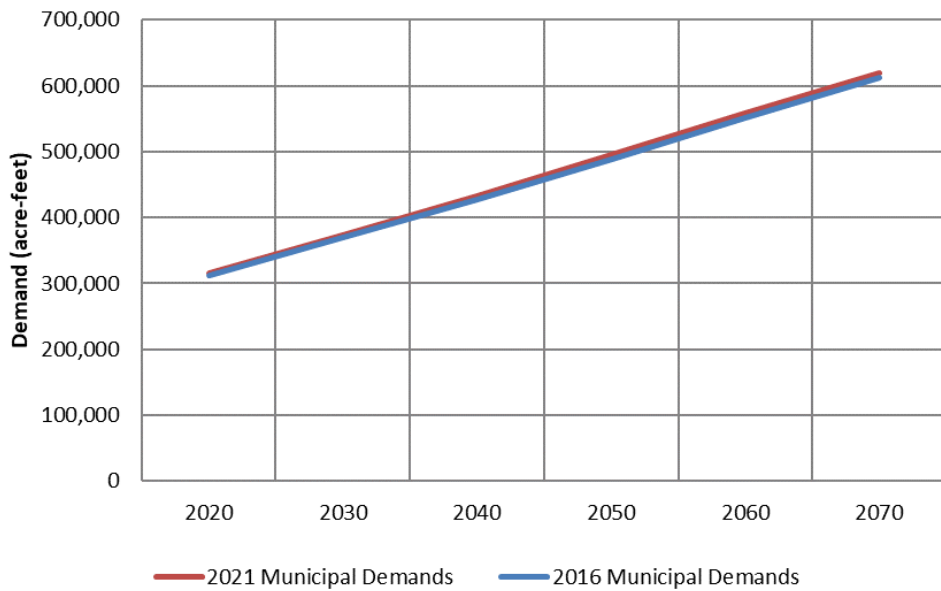


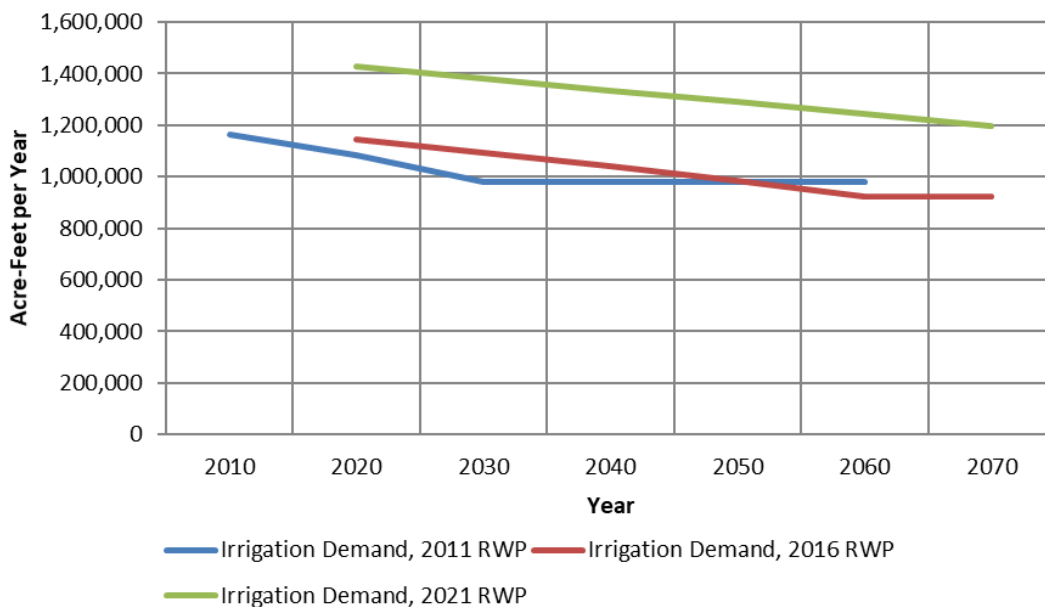
Figure 11-4 Comparison of Municipal Demand Projections, 2016 and 2021 RWPs

### 11.2.3 Irrigation Demands

Each cycle of planning in Region M has predicted decreasing demand for irrigation water over the planning horizon, based on anticipated urbanization, particularly in Cameron and Hidalgo counties (Figure 11-5).

The 2021 irrigation demand projections are based on the TWDB Historical Water Use Estimates<sup>1</sup> for 2011, data provided in May of 2017, which was considered representative of a year with high water storage (not supply-limited), and low rainfall (high demand). The rate of change was estimated by the rate of conversion of water rights from irrigation to municipal use across the planning region and was based on Texas Commission on Environmental Quality (TCEQ) records of active water rights.<sup>2</sup>

In 2016, the planning group used recorded irrigation use from 2005 to 2009 and compiled the highest demand year for each county to predict a base year demand. The rate of change that was initially recommended by the TWDB was based on the 2001 RWP, and was determined by the planning group to be outdated. The projected increases in municipal demand relate to increasing development and urbanization, which should correlate to decreased irrigated land and it is assumed that water rights will be converted from irrigation use to municipal use. The rate that irrigation water use is projected to decrease can be correlated with the increasing municipal demands, given that there are limited alternative sources for irrigation water. For the purposes of this study, the planning group estimated the rate of decreasing irrigation demand by the inverse of the rate at which municipal water demand increases.



**Figure 11-5 Comparison of Irrigation Demand Projections, 2011, 2016, and 2021 RWPs**

<sup>1</sup> <http://www.twdb.texas.gov/waterplanning/waterusesurvey/estimates/index.asp>.

<sup>2</sup> "WRActive" file available [https://www.tceq.texas.gov/permitting/water\\_rights/wr-permitting/wrwud](https://www.tceq.texas.gov/permitting/water_rights/wr-permitting/wrwud). Previous downloads of the file were dated and a trend analysis performed for the classification of water rights.

### 11.2.4 Manufacturing Demands

Manufacturing demands represent a very small portion of the overall regional water demands and are revised upward slightly in this plan (Figure 11-6). The base year increased slightly because of reported water use, and the rate of change is tied to population growth in both planning cycles.

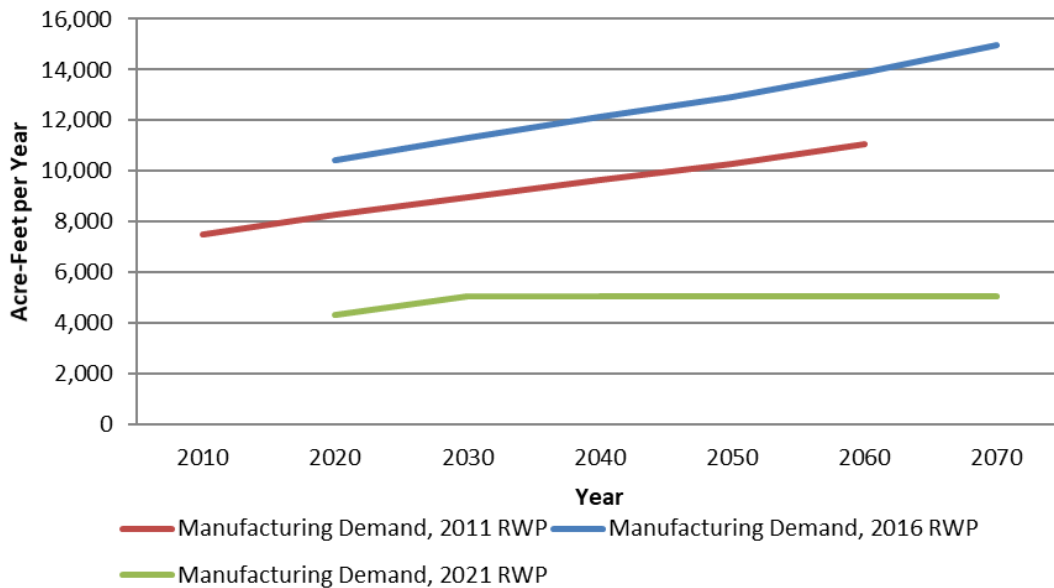
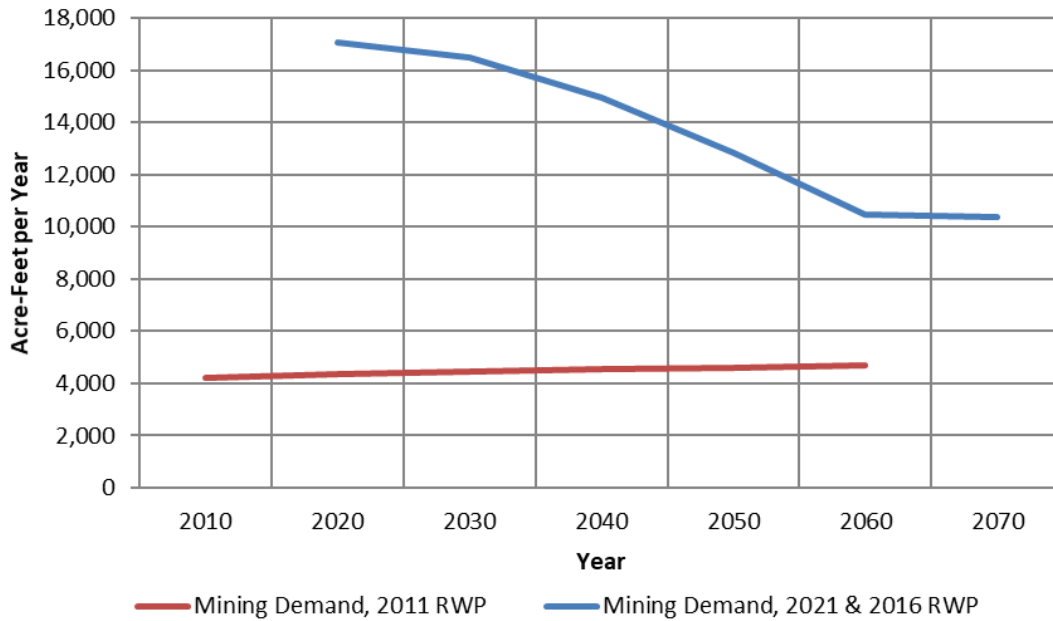


Figure 11-6 Comparison of Manufacturing Demand Projections, 2011, 2016, and 2021 RWPs

### 11.2.5 Mining Demands

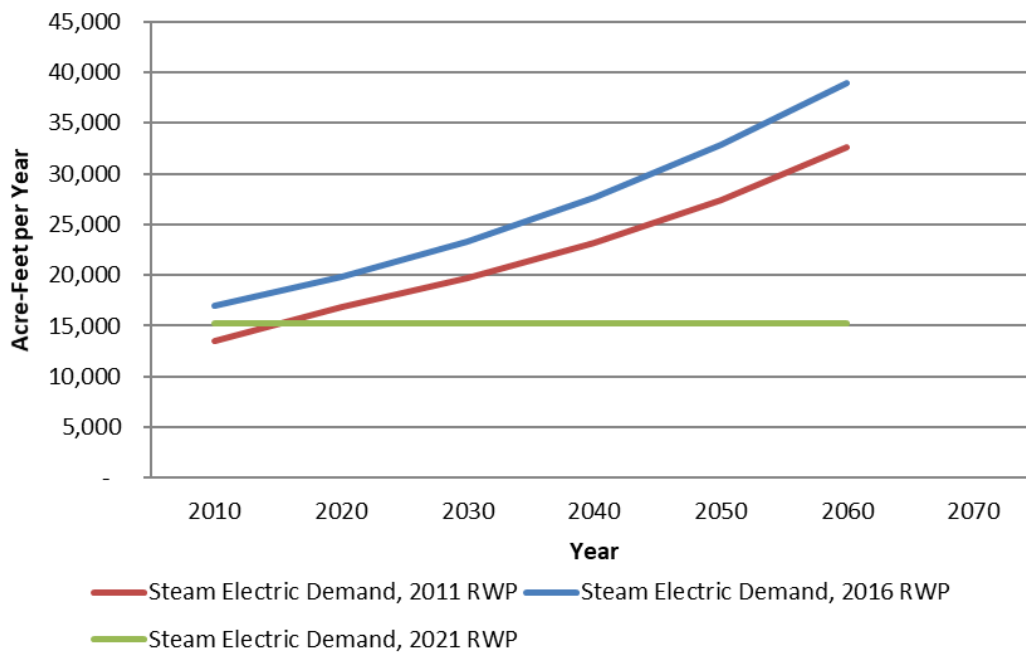
The mining demand projections shifted radically from the 2011 RWP (Figure 11-7). The demands associated with aggregates and standard method oil and gas extraction were fairly consistent, but the introduction of hydraulic fracturing in Webb County increased the overall mining water demand projections and affected how these demands are expected to change over time. The planning group used the Bureau of Economic Geology’s most recent reports in conjunction with the TCEQ Watermaster’s office records to estimate water use. Mining demands are extremely difficult to estimate as a result of water use reporting exemptions in place for the industry.



**Figure 11-7 Comparison of Mining Demand Projections, 2011, 2016, and 2021 RWPs**

### 11.2.6 Steam-Electric Power Generation Demand Projections

The steam-electric power generation demand projections from both 2011 and this current plan are based on the 2008 TWDB report water demand projections for power generation in Texas, as shown on Figure 11-8. These projections link population growth with an increased demand for power.



**Figure 11-8 Comparison of Steam Electric Demand Projections, 2011, 2016, and 2021 RWPs**

### 11.2.7 Livestock Demands

The RWPs since 2001 have estimated livestock demand using the numbers of each type of livestock and estimated water usage for each type. The rate of change has been assumed to be constant in both this plan, the 2016 RWP, and the 2011 RWP. Base year livestock demands in this plan are shown to be slightly lower than the projections from the 2016 RWP, as shown on Figure 11-9.

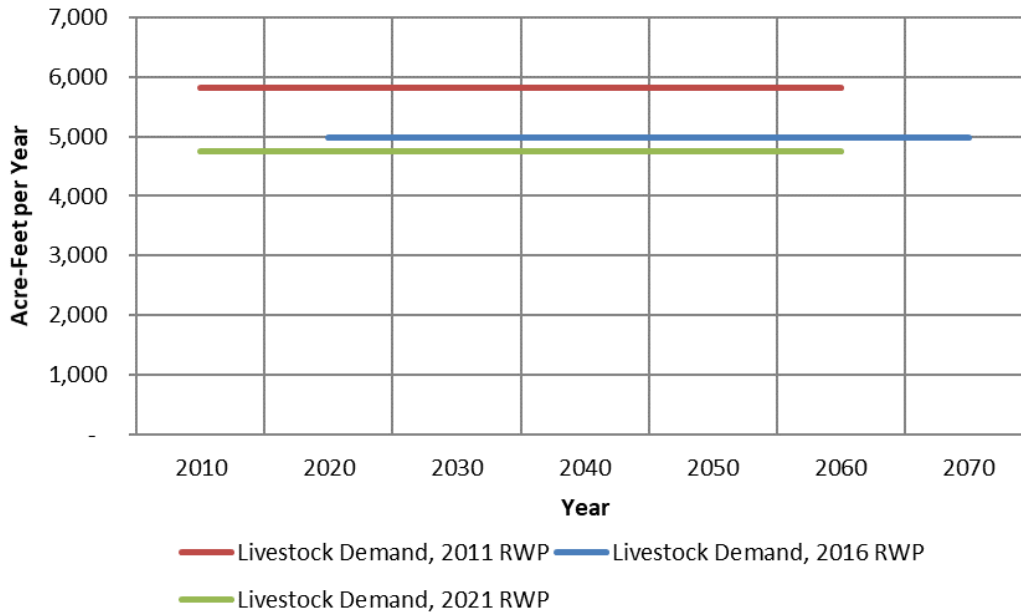


Figure 11-9 Comparison of Livestock Demand Projections, 2011, 2016, and 2021 RWPs

### 11.3 AVAILABILITY AND SUPPLY

The Rio Grande Water Availability Model (WAM) was revised as a part of the fourth cycle of planning for Region M, which impacted the firm yield values that are used in the planning process. The fourth and fifth planning cycles are required to fit all current and future groundwater supplies within the managed available groundwater (MAG) as established by ground management area (GMA) 13 and GMA 16.

#### 11.3.1 Rio Grande WAM

The Rio Grande WAM was updated as described in the Technical Memorandum, such that the current distribution of water rights is included, and the revisions made by Region E to the upper basin are included in the Region M modeling for consistency. A correction to the sedimentation estimates was implemented between the 2011 and 2016 RWPs, which accounts for a slower rate of reduction in capacity and yield. Figure 11-10 shows the variation in the firm yield from the Rio Grande WAM in the last three planning cycles.

The naturalized flow record only extends to 2000, but the 2019 Texas Legislature allocated funding to update the data for the Rio Grande and three other basins by 2023. This and a comprehensive evaluation of the accuracy and modeling logic in the Rio Grande WAM are highly recommended by the Region M planning group.

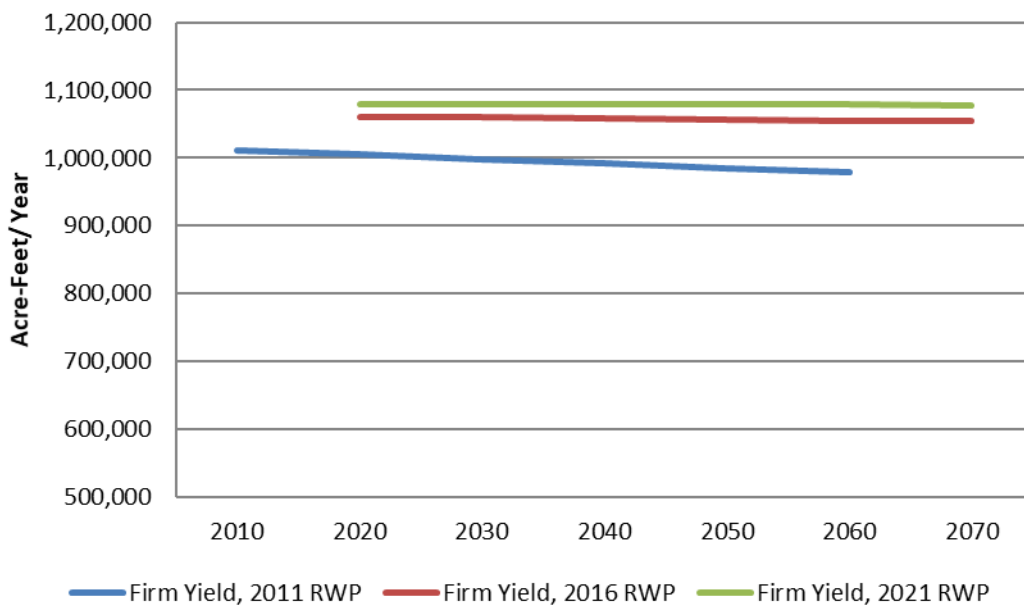


Figure 11-10 Firm Yield Projections for the Amistad-Falcon Reservoir System, 2011, 2016, and 2021 RWPs

#### 11.3.2 Groundwater

The 2016 RWP was the first cycle of planning that required that all current and future groundwater usage described in the plan to not exceed the MAG values. GMAs were established across the state to help facilitate local regulation of groundwater. Groundwater can be regulated locally by groundwater conservation districts where they have been formed, but most of Region M is not within a district. The groundwater conservation districts within a single GMA determine the desired future conditions (DFCs)

for the aquifers in that area. DFCs are conservation goals associated with a quantifiable measure of aquifer conditions, such as future water levels, water quality, or spring flows that are specified for certain times in the future, i.e., 12 feet of drawdown in 50 years. In the case of Region M, representatives from the existing GCDs in GMA 16 and GMA 13 established the DFCs.

A groundwater availability model (GAM) allows the TWDB to evaluate what amount of groundwater production, on an average annual basis, will achieve the stated DFCs for an aquifer. The current MAGs do not specify water quality, but the supplies are identified as fresh, fresh/brackish, or brackish according to the aquifer and the location within that aquifer (specified by county and river basin).

Region M has two major and one minor aquifer for which MAGs are available. Figure 11-11 shows the previous estimates of groundwater availability for each aquifer that were used in the 2011 RWP (in green/on the right), and the current MAGs in blue/on the left. More detailed information about regional groundwater availability is available in Chapter 3.

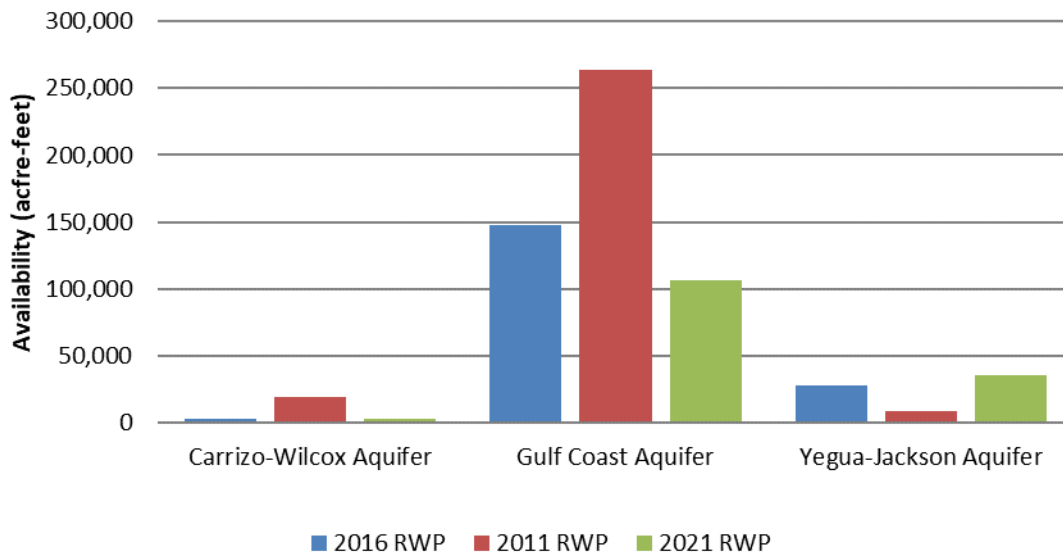


Figure 11-11 Modeled Available Groundwater Projections, 2011,2016, and 2021 RWPs

## 11.4 WATER MANAGEMENT STRATEGIES

The process for gathering all potentially feasible WMSs included WMSs from the following three sources:

1. A data request was sent to all the municipal WUGs, utilities, irrigation districts (IDs), and stakeholders representing farmers, environmental interests, and other water users. Responses included some proposed strategies that were evaluated for compliance with TWDB rules, completeness, and consistency.
2. WMSs were developed where entities did not provide information to the planning group, and continued outreach and review were offered to WUGs:

- a. Advanced conservation was evaluated for each municipal WUG;
  - b. Reuse was evaluated for each WUG with a wastewater treatment plant (WWTP) that has an average annual effluent stream of 2 million gallons per day (mgd) or greater and WUGs with limited other water supply alternatives;
  - c. An ID improvements WMS was developed for each ID with aggregated costs and water savings that were based on the estimated efficiency, quantity of water, and existing components of each system (whether the district has storage capacity, whether the majority of the network is canal or pipeline, etc.); and
  - d. Acquisition of water rights will be considered for all WMSs up to the firm yield of the Amistad-Falcon Reservoir System and as water rights are expected to be available through conversion from irrigation to municipal.
3. Recommended WMSs from the 2016 RWP were considered when the WMS was still feasible and where there was sufficient information for the strategy to be evaluated. All WMSs from the 2016 RWP were updated to 2018 dollars or costs re-estimated.

Once the list of potentially feasible WMSs was fully developed, it was used in conjunction with the “Needs Analysis” based on supplies and demands. Advanced municipal conservation, reuse, ID improvements, and industrial conservation WMSs were applied to the WUGs and wholesale water providers (WWPs), and a secondary needs calculation was performed.

These secondary needs were then compared to the submitted, developed, and carried over WMS available to each WUG or WWP. Staying within the bounds of water availability from each source, the WMSs specific to each WUG were selected that could meet the projected need with the lowest cost. A detailed description of the “Needs Analysis” is discussed in Chapter 4, and the WMS evaluation process is included in Chapter 5. The 2021 recommended WMS are listed in Table 11-1.

**Table 11-1 2021 Recommended WMSs**

COUNTY	SPONSOR	PROJECT NAME	PROJECT TYPE
Cameron	County-Other, Cameron	Acquisition of Water Rights through Urbanization	Acquisition of Water Rights
Cameron	East Rio Hondo WSC	Acquisition of Water Rights through Urbanization	Acquisition of Water Rights
Cameron	Harlingen Waterworks	Acquisition of Water Rights through Urbanization	Acquisition of Water Rights
Cameron	Laguna Madre Water District	Acquisition of Water Rights through Urbanization	Acquisition of Water Rights
Cameron	Olmito WSC	Acquisition of Water Rights through Urbanization	Acquisition of Water Rights
Cameron	Primera	Acquisition of Water Rights through Urbanization	Acquisition of Water Rights
Cameron	San Benito	Acquisition of Water Rights through Urbanization	Acquisition of Water Rights



COUNTY	SPONSOR	PROJECT NAME	PROJECT TYPE
Hidalgo	Agua SUD	Acquisition of Water Rights through Urbanization	Acquisition of Water Rights
Hidalgo	Alamo	Acquisition of Water Rights through Urbanization	Acquisition of Water Rights
Hidalgo	County-Other, Hidalgo	Acquisition of Water Rights through Urbanization	Acquisition of Water Rights
Hidalgo	Donna	Acquisition of Water Rights through Urbanization	Acquisition of Water Rights
Hidalgo	Edinburg	Acquisition of Water Rights through Urbanization	Acquisition of Water Rights
Hidalgo	Elsa	Acquisition of Water Rights through Urbanization	Acquisition of Water Rights
Hidalgo	Hidalgo	Acquisition of Water Rights through Urbanization	Acquisition of Water Rights
Hidalgo	Hidalgo County MUD 1	Acquisition of Water Rights through Urbanization	Acquisition of Water Rights
Hidalgo	La Villa	Acquisition of Water Rights through Urbanization	Acquisition of Water Rights
Hidalgo	McAllen	Acquisition of Water Rights through Urbanization	Acquisition of Water Rights
Hidalgo	Mercedes	Acquisition of Water Rights through Urbanization	Acquisition of Water Rights
Hidalgo	Military Highway WSC	Acquisition of Water Rights through Urbanization	Acquisition of Water Rights
Hidalgo	Mission	Acquisition of Water Rights through Urbanization	Acquisition of Water Rights
Hidalgo	North Alamo WSC	Acquisition of Water Rights through Urbanization	Acquisition of Water Rights
Hidalgo	Pharr	Acquisition of Water Rights through Urbanization	Acquisition of Water Rights
Hidalgo	San Juan	Acquisition of Water Rights through Urbanization	Acquisition of Water Rights
Hidalgo	Sharyland WSC	Acquisition of Water Rights through Urbanization	Acquisition of Water Rights
Hidalgo	Weslaco	Acquisition of Water Rights through Urbanization	Acquisition of Water Rights

COUNTY	SPONSOR	PROJECT NAME	PROJECT TYPE
Maverick	County-Other, Maverick	Acquisition of Water Rights through Urbanization	Acquisition of Water Rights
Maverick	Eagle Pass	Acquisition of Water Rights through Urbanization	Acquisition of Water Rights
Starr	County-Other, Starr	Acquisition of Water Rights through Urbanization	Acquisition of Water Rights
Starr	El Jardin WSC	Acquisition of Water Rights through Urbanization	Acquisition of Water Rights
Starr	El Sauz WSC	Acquisition of Water Rights through Urbanization	Acquisition of Water Rights
Starr	El Tanque WSC	Acquisition of Water Rights through Urbanization	Acquisition of Water Rights
Starr	La Grulla	Acquisition of Water Rights through Urbanization	Acquisition of Water Rights
Starr	La Joya	Acquisition of Water Rights through Urbanization	Acquisition of Water Rights
Starr	Rio Grande City	Acquisition of Water Rights through Urbanization	Acquisition of Water Rights
Starr	Rio WSC	Acquisition of Water Rights through Urbanization	Acquisition of Water Rights
Starr	Union WSC	Acquisition of Water Rights through Urbanization	Acquisition of Water Rights
Webb	Laredo	Acquisition of Water Rights through Urbanization	Acquisition of Water Rights
Webb	Mirando City WSC	Acquisition of Water Rights through Urbanization	Acquisition of Water Rights
Webb	Webb County	Acquisition of Water Rights through Urbanization	Acquisition of Water Rights
Willacy	Port Mansfield PUD	Acquisition of Water Rights through Urbanization	Acquisition of Water Rights
Willacy	Sebastian MUD	Acquisition of Water Rights through Urbanization	Acquisition of Water Rights
Zapata	County-Other, Zapata	Acquisition of Water Rights through Urbanization	Acquisition of Water Rights
Zapata	Siesta Shores WCID	Acquisition of Water Rights through Urbanization	Acquisition of Water Rights
Hidalgo	McAllen	New Brackish Water Treatment Plant	Brackish Groundwater

COUNTY	SPONSOR	PROJECT NAME	PROJECT TYPE
Hidalgo	Mission	New Brackish Water Treatment Plant	Brackish Groundwater
Hidalgo	Sharyland WSC	Water Treatment Plant No. 2 Brackish Groundwater Desalination	Brackish Groundwater
Hidalgo	Sharyland WSC	Water Treatment Plant No. 3 Brackish Groundwater Desalination	Brackish Groundwater
Willacy	Lyford	New Brackish Well and Water Treatment Plant	Brackish Groundwater
Cameron	Irrigation - Nueces-Rio Grande	Biological Control of A. Donax	Brush Control
Cameron	Irrigation - Rio Grande	Biological Control of A. Donax	Brush Control
Hidalgo	Irrigation - Nueces-Rio Grande	Biological Control of A. Donax	Brush Control
Hidalgo	Irrigation - Rio Grande	Biological Control of A. Donax	Brush Control
Maverick	Irrigation - Nueces	Biological Control of A. Donax	Brush Control
Maverick	Irrigation - Rio Grande	Biological Control of A. Donax	Brush Control
Starr	Irrigation - Rio Grande	Biological Control of A. Donax	Brush Control
Webb	Irrigation - Rio Grande	Biological Control of A. Donax	Brush Control
Willacy	Irrigation - Nueces-Rio Grande	Biological Control of A. Donax	Brush Control
Zapata	Irrigation - Rio Grande	Biological Control of A. Donax	Brush Control
Cameron	Laguna Madre Water District	Seawater Desalination	Desalination
Hidalgo	Alamo	New Brackish Groundwater Desalination Plant	Desalination
Hidalgo	Alamo	Groundwater Well	Fresh Groundwater
Hidalgo	Edcouch	New Groundwater Supply	Fresh Groundwater
Hidalgo	Hidalgo	Groundwater Well	Fresh Groundwater
Hidalgo	Weslaco	Groundwater Well	Fresh Groundwater
Starr	County-Other, Starr	Additional Groundwater Wells	Fresh Groundwater

COUNTY	SPONSOR	PROJECT NAME	PROJECT TYPE
Webb	County-Other, Webb	Additional Groundwater Wells	Fresh Groundwater
Zapata	Zapata County Waterworks	New Groundwater Supply	Fresh Groundwater
Cameron	Manufacturing - Nueces-Rio Grande	Implementation of Best Management Practices	Industrial Conservation
Cameron	Mining - Nueces-Rio Grande	Implementation of Best Management Practices	Industrial Conservation
Cameron	Steam Elec - Nueces-Rio Grande	Implementation of Best Management Practices	Industrial Conservation
Hidalgo	Manufacturing - Nueces-Rio Grande	Implementation of Best Management Practices	Industrial Conservation
Hidalgo	Mining - Nueces-Rio Grande	Implementation of Best Management Practices	Industrial Conservation
Hidalgo	Mining - Rio Grande	Implementation of Best Management Practices	Industrial Conservation
Hidalgo	Steam Elec - Nueces-Rio Grande	Implementation of Best Management Practices	Industrial Conservation
Jim Hogg	Mining - Nueces-Rio Grande	Implementation of Best Management Practices	Industrial Conservation
Jim Hogg	Mining - Rio Grande	Implementation of Best Management Practices	Industrial Conservation
Maverick	Manufacturing - Rio Grande	Implementation of Best Management Practices	Industrial Conservation
Maverick	Mining - Nueces	Implementation of Best Management Practices	Industrial Conservation
Maverick	Mining - Rio Grande	Implementation of Best Management Practices	Industrial Conservation
Starr	Manufacturing - Rio Grande	Implementation of Best Management Practices	Industrial Conservation
Starr	Mining - Nueces-Rio Grande	Implementation of Best Management Practices	Industrial Conservation
Starr	Mining - Rio Grande	Implementation of Best Management Practices	Industrial Conservation
Webb	Manufacturing - Nueces	Implementation of Best Management Practices	Industrial Conservation
Webb	Manufacturing - Rio Grande	Implementation of Best Management Practices	Industrial Conservation

COUNTY	SPONSOR	PROJECT NAME	PROJECT TYPE
Webb	Mining - Nueces	Implementation of Best Management Practices	Industrial Conservation
Webb	Mining - Nueces-Rio Grande	Implementation of Best Management Practices	Industrial Conservation
Webb	Mining - Rio Grande	Implementation of Best Management Practices	Industrial Conservation
Webb	Steam Elec - Rio Grande	Implementation of Best Management Practices	Industrial Conservation
Willacy	Mining - Nueces-Rio Grande	Implementation of Best Management Practices	Industrial Conservation
Zapata	Manufacturing - Nueces-Rio Grande	Implementation of Best Management Practices	Industrial Conservation
Zapata	Mining - Rio Grande	Implementation of Best Management Practices	Industrial Conservation
Cameron	Bayview Irrigation District	General Improvement Suggested by RWPG	Irrigation District Improvements
Cameron	Brownsville Irrigation District	River Pump Discharge Flume	Irrigation District Improvements
Cameron	Brownsville Irrigation District	Lining of Wyrick Canal	Irrigation District Improvements
Cameron	Brownsville Irrigation District	Earthen Canal to pipeline- Canal No. 6	Irrigation District Improvements
Cameron	Brownsville Irrigation District	Replace and pressurize taylor pipeline	Irrigation District Improvements
Cameron	Brownsville Irrigation District	Installation and Improvements of Pipeline	Irrigation District Improvements
Cameron	Cameron County Irrigation District No. 2	Canal 13-A1 Lining	Irrigation District Improvements
Cameron	Cameron County Irrigation District No. 2	Canal 13-A1 South Pipeline	Irrigation District Improvements
Cameron	Cameron County Irrigation District No. 2	Canal B North Lining	Irrigation District Improvements
Cameron	Cameron County Irrigation District No. 2	Canal B South Lining	Irrigation District Improvements

COUNTY	SPONSOR	PROJECT NAME	PROJECT TYPE
Cameron	Cameron County Irrigation District No. 2	Canal Lining 13-A1 North Pipeline	Irrigation District Improvements
Cameron	Cameron County Irrigation District No. 2	Canal Lining for 13-A	Irrigation District Improvements
Cameron	Cameron County Irrigation District No. 2	Resaca By-Pass Pipeline	Irrigation District Improvements
Cameron	Cameron County Irrigation District No. 2	Upper Canal C lining	Irrigation District Improvements
Cameron	Cameron County Irrigation District No. 6, Los Fresnos	General Improvement Suggested by RWPG	Irrigation District Improvements
Cameron	Cameron County W.I.D No. 10, Rutherford Harding	General Improvement Suggested by RWPG	Irrigation District Improvements
Cameron	Harlingen Irrigation District-Cameron County #1	Canal Automation	Irrigation District Improvements
Cameron	Harlingen Irrigation District-Cameron County #1	Main Canal lining/pipeline conversion	Irrigation District Improvements
Cameron	Harlingen Irrigation District-Cameron County #1	Second reservoir to pipeline conversion	Irrigation District Improvements
Cameron	Harlingen Irrigation District-Cameron County #1	Wilson Canal inter connect	Irrigation District Improvements
Cameron	Harlingen Irrigation District-Cameron County #1	Concrete lined canal to pipeline-Canal No. 1	Irrigation District Improvements
Cameron	Harlingen Irrigation District-Cameron County #1	Earthen canal into pipeline-Canal No. 4	Irrigation District Improvements
Cameron	Harlingen Irrigation District-Cameron County #1	Earthen canal into pipeline-Canal No. 5	Irrigation District Improvements

COUNTY	SPONSOR	PROJECT NAME	PROJECT TYPE
Cameron	Harlingen Irrigation District-Cameron County #1	Simmons Spur Improvements	Irrigation District Improvements
Hidalgo	Donna ID	Replace lateral canal with pipelines	Irrigation District Improvements
Hidalgo	Engelman ID	Canal lining, leak prevention and improvement of connectivity	Irrigation District Improvements
Hidalgo	Hidalgo County Irrigation District #2	Pipeline Improvement Project I-22	Irrigation District Improvements
Hidalgo	Hidalgo County Irrigation District #2	Lateral Canal E - Re-lining	Irrigation District Improvements
Hidalgo	Hidalgo County Irrigation District #2	Flood Protection Improvements for River Pumps and Reservoir	Irrigation District Improvements
Hidalgo	Hidalgo County Irrigation District #6	Canal Lining, Installation of Pipeline, and General Improvements	Irrigation District Improvements
Hidalgo	Hidalgo County Irrigation District No. 13	General Improvement Suggested by RWPG	Irrigation District Improvements
Hidalgo	Hidalgo County Irrigation District No. 6, Mission 6	General Improvement Suggested by RWPG	Irrigation District Improvements
Hidalgo	Hidalgo County WID #3	Canal Lining	Irrigation District Improvements
Hidalgo	Hidalgo County WID #3	District Furnished Portable Drip Systems	Irrigation District Improvements
Hidalgo	Hidalgo County WID #3	Renewal of Lawn Irrigation Systems	Irrigation District Improvements
Hidalgo	Santa Cruz Irrigation District #15	Canal Re-Lining	Irrigation District Improvements
Hidalgo	Santa Cruz Irrigation District #15	Contingency Supply Strategy	Irrigation District Improvements
Hidalgo	Santa Cruz Irrigation District #15	District merger with HCID #1	Irrigation District Improvements
Hidalgo	Santa Cruz Irrigation District #15	Pump Station Output/System Demand Matching	Irrigation District Improvements
Hidalgo	Santa Cruz Irrigation District #15	Replace Unlined Canal Pipeline	Irrigation District Improvements

COUNTY	SPONSOR	PROJECT NAME	PROJECT TYPE
Hidalgo	Santa Cruz Irrigation District #15	Santa Cruz Irrigation District #15 Edinburg Lake Reservoir Project	Irrigation District Improvements
Hidalgo	Santa Cruz Irrigation District #15	Santa Cruz Irrigation District #15 Water Conservation Program: Pipe Replacement Project	Irrigation District Improvements
Hidalgo	United Irrigation District	Canal lining Main Canal	Irrigation District Improvements
Hidalgo	United Irrigation District	Off Canal Storage	Irrigation District Improvements
Hidalgo	Valley Acres Irrigation District	canal lining	Irrigation District Improvements
Hidalgo	Valley Acres Irrigation District	Channel to pipeline	Irrigation District Improvements
Hidalgo/Cameron	Hidalgo & Cameron Counties irrigation District #9	River Lift Pump Modernization	Irrigation District Improvements
Hidalgo/Cameron	Hidalgo & Cameron Counties irrigation District #9	Canal Gate Automation	Irrigation District Improvements
Hidalgo/Cameron	Hidalgo & Cameron Counties irrigation District #9	SCADA for Canal Gate and Pumping	Irrigation District Improvements
Hidalgo/Cameron	Hidalgo & Cameron Counties irrigation District #9	Lining of the Mercedes Main Canal	Irrigation District Improvements
Maverick	Maverick County Water Improvement District	General Improvement Suggested by RWPG	Irrigation District Improvements
Willacy	Delta Lake Irrigation District	Bypass Canal Lining Project	Irrigation District Improvements
Willacy	Delta Lake Irrigation District	Canal A, Canal H&I and Canal J. Replacement (all concrete lined)	Irrigation District Improvements
Willacy	Delta Lake Irrigation District	Main J Canal Lining Project	Irrigation District Improvements
Cameron	Brownsville Public Utilities Board	Advanced Municipal Water Conservation	Municipal Conservation
Cameron	Brownsville Public Utilities Board	Advanced Municipal Water Conservation	Municipal Conservation



COUNTY	SPONSOR	PROJECT NAME	PROJECT TYPE
Cameron	Combes	Advanced Municipal Water Conservation	Municipal Conservation
Cameron	East Rio Hondo WSC	Advanced Municipal Water Conservation	Municipal Conservation
Cameron	Harlingen Waterworks	Advanced Municipal Water Conservation	Municipal Conservation
Cameron	Harlingen Waterworks	Advanced Municipal Water Conservation	Municipal Conservation
Cameron	La Feria	Advanced Municipal Water Conservation	Municipal Conservation
Cameron	Laguna Madre Water District	Advanced Municipal Water Conservation	Municipal Conservation
Cameron	Los Fresnos	Advanced Municipal Water Conservation	Municipal Conservation
Cameron	Military Highway WSC	Advanced Municipal Water Conservation	Municipal Conservation
Cameron	Olmito WSC	Advanced Municipal Water Conservation	Municipal Conservation
Cameron	Palm Valley	Advanced Municipal Water Conservation	Municipal Conservation
Cameron	Primera	Advanced Municipal Water Conservation	Municipal Conservation
Cameron	Rio Hondo	Advanced Municipal Water Conservation	Municipal Conservation
Cameron	San Benito	Advanced Municipal Water Conservation	Municipal Conservation
Cameron	Santa Rosa	Advanced Municipal Water Conservation	Municipal Conservation
Cameron	Valley MUD 2	Advanced Municipal Water Conservation	Municipal Conservation
Hidalgo	Agua SUD	Advanced Municipal Water Conservation	Municipal Conservation
Hidalgo	Alamo	Advanced Municipal Water Conservation	Municipal Conservation
Hidalgo	Donna	Advanced Municipal Water Conservation	Municipal Conservation

COUNTY	SPONSOR	PROJECT NAME	PROJECT TYPE
Hidalgo	Edcouch	Advanced Municipal Water Conservation	Municipal Conservation
Hidalgo	Edinburg	Advanced Municipal Water Conservation	Municipal Conservation
Hidalgo	Elsa	Advanced Municipal Water Conservation	Municipal Conservation
Hidalgo	Hidalgo	Advanced Municipal Water Conservation	Municipal Conservation
Hidalgo	Hidalgo County MUD 1	Advanced Municipal Water Conservation	Municipal Conservation
Hidalgo	La Villa	Advanced Municipal Water Conservation	Municipal Conservation
Hidalgo	McAllen	Advanced Municipal Water Conservation	Municipal Conservation
Hidalgo	Mercedes	Advanced Municipal Water Conservation	Municipal Conservation
Hidalgo	Mission	Advanced Municipal Water Conservation	Municipal Conservation
Hidalgo	North Alamo WSC	Advanced Municipal Water Conservation	Municipal Conservation
Hidalgo	Pharr	Advanced Municipal Water Conservation	Municipal Conservation
Hidalgo	San Juan	Advanced Municipal Water Conservation	Municipal Conservation
Hidalgo	Sharyland WSC	Advanced Municipal Water Conservation	Municipal Conservation
Hidalgo	Weslaco	Advanced Municipal Water Conservation	Municipal Conservation
Jim Hogg	Jim Hogg County WCID 2	Advanced Municipal Water Conservation	Municipal Conservation
Maverick	Eagle Pass	Advanced Municipal Water Conservation	Municipal Conservation
Maverick	Maverick County	Advanced Municipal Water Conservation	Municipal Conservation
Starr	El Jardin WSC	Advanced Municipal Water Conservation	Municipal Conservation

COUNTY	SPONSOR	PROJECT NAME	PROJECT TYPE
Starr	El Sauz WSC	Advanced Municipal Water Conservation	Municipal Conservation
Starr	El Tanque WSC	Advanced Municipal Water Conservation	Municipal Conservation
Starr	La Grulla	Advanced Municipal Water Conservation	Municipal Conservation
Starr	La Joya	Advanced Municipal Water Conservation	Municipal Conservation
Starr	Rio Grande City	Advanced Municipal Water Conservation	Municipal Conservation
Starr	Rio WSC	Advanced Municipal Water Conservation	Municipal Conservation
Starr	Roma	Advanced Municipal Water Conservation	Municipal Conservation
Starr	Union WSC	Advanced Municipal Water Conservation	Municipal Conservation
Webb	Laredo	Advanced Municipal Water Conservation	Municipal Conservation
Webb	Mirando City WSC	Advanced Municipal Water Conservation	Municipal Conservation
Webb	Webb County	Advanced Municipal Water Conservation	Municipal Conservation
Willacy	Lyford	Advanced Municipal Water Conservation	Municipal Conservation
Willacy	Port Mansfield PUD	Advanced Municipal Water Conservation	Municipal Conservation
Willacy	Raymondville	Advanced Municipal Water Conservation	Municipal Conservation
Willacy	Sebastian MUD	Advanced Municipal Water Conservation	Municipal Conservation
Zapata	Falcon Rural WSC	Advanced Municipal Water Conservation	Municipal Conservation
Zapata	San Ygnacio MUD	Advanced Municipal Water Conservation	Municipal Conservation
Zapata	Siesta Shores WCID	Advanced Municipal Water Conservation	Municipal Conservation

COUNTY	SPONSOR	PROJECT NAME	PROJECT TYPE
Zapata	Zapata County	Advanced Municipal Water Conservation	Municipal Conservation
Zapata	Zapata County WCID-HWY 16 East	Advanced Municipal Water Conservation	Municipal Conservation
Cameron	Brownsville Public Utilities Board	Banco Morales Reservoir	Municipal Infrastructure Improvements
Cameron	Brownsville Public Utilities Board	Resaca Restoration	Municipal Infrastructure Improvements
Cameron	East Rio Hondo WSC	FM 2925 Transmission Line	Municipal Infrastructure Improvements
Cameron	East Rio Hondo WSC	Inter Basin Transfer of Surface Water and WTP	Municipal Infrastructure Improvements
Cameron	El Jardin WSC	Upgrade Existing Distribution System	Municipal Infrastructure Improvements
Hidalgo	McAllen	Raw Water Line Project	Municipal Infrastructure Improvements
Starr	Rio Grande City	Rio Grande City Water Meter Replacement	Municipal Infrastructure Improvements
Starr	Rio Hondo	Emergency Interconnect	Municipal Infrastructure Improvements
Starr	Roma	Regional Water Treatment plant	Municipal Infrastructure Improvements
Starr	San Juan	WTP No. 1 Upgrade and Expansion & Urbanized Water Rights	Municipal Infrastructure Improvements
Starr	Union WSC	Water Line Replacement and Meter Reading System	Municipal Infrastructure Improvements
Hidalgo	Donna	WTP Expansion & Urbanized Water Rights	Municipal Infrastructure Improvements
Hidalgo	North Alamo WSC	NAWSC Converted WR and Delta WTP Expansion	Municipal Infrastructure Improvements
Cameron	Brownsville Public Utilities Board	Non-Potable Water Reuse Pipeline	Reuse
Cameron	Brownsville Public Utilities Board	Southside WWTP Potable Reuse	Reuse
Cameron	Laguna Madre Water District	Potable Reuse Project	Reuse
Cameron	Rio Hondo	Reuse	Reuse

COUNTY	SPONSOR	PROJECT NAME	PROJECT TYPE
Hidalgo	Agua SUD	West WWTP Direct Potable Reuse - Phase 1	Reuse
Hidalgo	Agua SUD	East WWTP Direct Potable Reuse	Reuse
Hidalgo	Edinburg	Reuse Water (Reclaimed Wastewater) for Cooling Tower and Landscaping Usage	Reuse
Hidalgo	McAllen	North WWTP Potable Reuse	Reuse
Hidalgo	Mission	WWTP Potable Reuse Phase 1	Reuse
Hidalgo	Pharr	Potable Reuse	Reuse
Hidalgo	Weslaco	North WWTP Potable Reuse	Reuse
Webb	Laredo	Zacate Creek Laredo WWTP Potable Reuse	Reuse

Table 11-2 compares the number of each type of WMS that was recommended in the 2016 RWP and the 2021 RWP.

**Table 11-2 Comparison of Recommended WMS from 2021 and 2016 RWPs**

CATEGORY	NUMBER OF RECOMMENDED WMS	
	2021 RWP	2016 RWP
Acquisition of Water Rights	43	29
Brackish Groundwater	5	18
Brush Control	10	10
Municipal Distribution and Transmission	6	7
Fresh Groundwater	7	6
Industrial Conservation	24	24
ID Improvements	54	27
Municipal Conservation	58	72
Reuse	12	14
Seawater Desalination	2	0
Storage	2	4
Supply from Other Entity WMS	0	19
Surface Water Treatment	5	7

Several WMSs that were evaluated were not able to be recommended because of the limitations on the MAG, especially in Cameron County. Those and other strategies that are included as recommended alternatives are in Table 11-3.

**Table 11-3 2021 Recommended Alternative WMSs**

COUNTY	SPONSOR	PROJECT NAME	PROJECT TYPE
Maverick	Eagle Pass	ASR	ASR
Cameron	East Rio Hondo WSC and North Alamo WSC	North Cameron Regional WTP Wellfield Expansion	Brackish Groundwater
Cameron	La Feria	Brackish Groundwater Well and Desalination	Brackish Groundwater
Cameron	Primera	BGD	Brackish Groundwater
Cameron	Valley MUD No. 2	BGD	Brackish Groundwater
Hidalgo	Agua SUD	New Brackish Water Treatment Plant	Brackish Groundwater
Hidalgo	Weslaco	BGD	Brackish Groundwater
Cameron	Brownsville Public Utilities Board	Seawater Desalination Demonstration - Build-Out	Desalination
Cameron	Brownsville Public Utilities Board	Seawater Desalination Implementation - Pilot	Desalination
Cameron	County-Other, Cameron	Groundwater Well	Fresh Groundwater
Cameron	Rio Hondo	Groundwater Well	Fresh Groundwater
Cameron	San Benito	Groundwater Well	Fresh Groundwater
Hidalgo	McAllen	Groundwater Well	Fresh Groundwater
Hidalgo	Mercedes	Groundwater Well	Fresh Groundwater
Hidalgo	Military Highway WSC	Groundwater Well	Fresh Groundwater
Jim Hogg	Irrigation	Additional Groundwater Wells	Fresh Groundwater
Cameron	Brownsville Public Utilities Board	Brownsville Matamoros Weir and Reservoir	Municipal Infrastructure Improvements
Hidalgo	Elsa	WTP Expansion and Interconnect to Engelman ID	Municipal Infrastructure Improvements
Hidalgo	North Alamo WSC	Plant No. 5 - 16" Waterline Expansion	Municipal Infrastructure Improvements
Hidalgo	North Alamo WSC	NAWSC Converted WR and Water Treatment Plant No. 5 Expansion	Municipal Infrastructure Improvements
Hidalgo	North Alamo WSC	1 MG Water Tower, Edinburg/Pharr	Municipal Infrastructure Improvements
Hidalgo	North Alamo WSC	1 MG Water Tower, Mid Valley	Municipal Infrastructure Improvements

COUNTY	SPONSOR	PROJECT NAME	PROJECT TYPE
Webb	Laredo	Expansion of El Pico WTP	Municipal Infrastructure Improvements
Cameron	La Feria	Non-Potable Wastewater Reuse	Reuse
Cameron	San Benito	Non-Potable Reuse of Treated Effluent from City's Wastewater Treatment Plant	Reuse
Cameron	San Benito	Potable Reuse of Treated Effluent from City's Wastewater Treatment Plant	Reuse
Hidalgo	Agua SUD	Non-Potable Reuse	Reuse

### 11.4.1 Implementation of WMS

Several WMSs recommended in the 2016 RWP applied for and received TWDB funding. Table 11-4 presents 2016 RWP WMSs that have received funding from TWDB.

**Table 11-4 2016 RWP WMS that Received TWDB Funding**

ENTITY	COUNTY	PROJECT NAME	STATUS (2/2020)	PROJECT DESCRIPTION
McAllen	Hidalgo	Purchase of Water Rights	Completed	Purchase of 3,000 acft of water rights, completed in 2019.
United Irrigation District	Hidalgo	Off-Channel Storage Facility	Construction	Construction of off-channel storage to allow the District to divert during no-charge pumping, and better manage supplies.
Hidalgo County Irrigation District No. 1	Hidalgo	Irrigation District Improvements	Construction	Improvement of Irrigation District facilities.

An implementation survey will be completed prior to the submittal of the final RWP, which describes which of the WMSs recommended in the 2011 Region M Water Plan have been implemented, and to what extent. The survey is included in Appendix E.

## 11.5 DROUGHT RESPONSE

In an effort to provide relevant information for drought preparations and response in one place, the scope of the RWPs has expanded to include a new chapter, Chapter 7, that is dedicated to a discussion of each region's preparations for and response to drought. The previous requirements for the RWPs have been retained, aggregated into this chapter, clarified, and new requirements have been added.

Previous requirements include the following:

- Current preparations and responses to drought;
- Evaluation of drought management WMS for needs; and
- Recommendation of other drought management measures.

Modified requirements include the following:

- More information on the drought of record;
- Identification of existing and potential future interconnections;
- Consolidation of this information into one chapter; and
- Detailed information on drought action triggers.

New requirements include the following:

- Recommendations for each existing source (triggers and responses);
- Emergency responses to local conditions, especially for all County-Other and cities with a sole water source and population of less than 7,500;
- Region-specific model drought contingency plans for each type of WUG; and
- Recommendations to the State Drought Preparedness Council.