FINAL PLAN

EXECUTIVE SUMMARY

Rio Grande Regional Water Plan

B&V PROJECT NO. 411250

PREPARED FOR

Rio Grande Regional Water Planning Group

7 OCTOBER 2025

BLACK & VEATCH

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List of Abbreviations

ac-ft	Acre-Feet
ac-ft/yr	Acre-Feet per Year
ASR	Aquifer Storage and Recovery
BMP	Best Management Practices
DCP	Drought Contingency Plan
DMI	Domestic, Municipal, and Industrial
DOR	Drought of Record
DWDOR	Drought Worse than the Drought of Record
GCD	Groundwater Conservation District
GMA	Groundwater Management Area
HB	House Bill
ID	Irrigation District
LLM	Lower Laguna Madre
MAG	Modeled Available Groundwater
mg/L	Milligrams per Liter
mgd	Million Gallons per Day
MWP	Major Water Provider
psi	Pounds per Square Inch
PUB	Public Utilities Board
RO	Reverse Osmosis
RWP	Regional Water Plan
RWPG	Regional Water Planning Group
SB1	Senate Bill 1
SWP	State Water Plan
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
TDS	Total Dissolved Solids
TWDB	Texas Water Development Board
WAM	Water Availability Model
WCP	Water Conservation Plan
WID	Water Improvement District
WMS	Water Management Strategy
WSC	Water Supply Corporation
WWP	Wholesale Water Provider
WUG	Water User Group

Executive Summary

ES.1 Water Planning in Texas

The Texas Water Development Board (TWDB) is charged with preparing a comprehensive and flexible long-term plan for the development, conservation, and management of the state's water resources. Historically, the state water plan (SWP) had been prepared by the TWDB with input from other state and local agencies and the public. Senate Bill 1 (SB1) that was enacted in 1997 by the 75th Legislature established a "bottom up" approach whereby SWPs are based on regional water plans (RWPs) prepared and adopted by the 16 appointed Regional Water Planning Groups (RWPGs). SB1 states that the purpose of regional water planning is the following:

"… provide for the orderly development, management, and conservation of water resources and preparation for and response to drought conditions in order that sufficient water will be available at a reasonable cost to ensure public health, safety, and welfare; further economic development; and protect the agricultural and natural resources of that particular region."

SB1 also provides that future regulatory and financing decisions of the Texas Commission on Environmental Quality (TCEQ) and the TWDB be consistent with the current SWP. In 2013, House Bill 4 was enacted, which lends greater weight to the SWP by committing an additional funding pool to implementing projects recommended in the plan by way of the State Water Implementation Fund for Texas. In 2023, the Texas Legislature passed Senate Bill 28 and Senate Joint Resolution 75, which provided for the creation of the Texas Water Fund. Additionally, Senate Bill 30 authorized a $1 billion appropriation of revenue to the Texas Water Fund. In November 2023, Texas voters approved Proposition 6, which created the Texas Water Fund. Both funding appropriations have been important to moving water infrastructure projects forward in Texas.

Each RWPG member is appointed to serve without pay; the group represents a range of stakeholders and acts as the decision-making body for the regional water planning effort. The Rio Grande RWPG (Region M) members are listed in Table ES-1. The Lower Rio Grande Valley Development Council has served as the political subdivision to administer the regional water planning grant, and Black & Veatch Corporation was selected as the prime consultant for the planning and engineering tasks required to develop the plan.

Table ES-1 Region M Water Planning Group Members

Interest	Name	Resident County
Public	Tomas Rodriguez	Webb
	Laredo	
Counties	Joe Rathmell	Zapata
	County Judge, Zapata County	
	David L. Fuentes	Hidalgo
	Precinct 1 Commissioner, Hidalgo County	
Municipalities Industries	Jorge Flores	Maverick
	Eagle Pass Water Works	
	Marilyn Gilbert	Cameron
	Brownsville Public Utilities Board	
	Donald K. McGhee, Secretary*	Cameron
	Hydro Systems, Inc., Harlingen	
Agriculture	Neal Wilkins, Ph.D.	Jim Hogg
	East Wildlife Foundation	
Agriculture Environmental	Dale Murden	Hidalgo
	Texas Citrus Mutual, Mission	
	Jaime Flores	Hidalgo
	The Arroyo Colorado Watershed	
Small Business	Carlos Garza	Hidalgo
	AEC Engineering, LLC, Edinburg	
Small Business River Authorities	Nick Benavides*	Webb
	Nick Benavides Co., Laredo	
	Jim Darling, Chairman*	Hidalgo
	Rio Grande Regional Water Authority	
Water Districts	Sonny Hinojosa, Vice-Chairman*	Hidalgo
	Hidalgo County Irrigation District No. 2, San Juan	
Water Districts Water Utilities	Tom McLemore	Cameron
	Harlingen Irrigation District	
	Steven Sanchez	Hidalgo
	North Alamo Water Supply Corporation (WSC)	
Groundwater Management Area	Louie Peña	(GMA 16)
	Brush Country Groundwater Conservation District (GCD)	
Groundwater Management Area	Debbie Farmer	(GMA 13)
	Wintergarden GCD, Carrizo Springs	

Interest	Name	Resident County
Other	Glenn Jarvis	Hidalgo
	Attorney, McAllen	
	Frank Schuster*	Hidalgo
	Val Verde Vegetable Co., McAllen	
Electric Generating Utilities	Robert Latham	Hidalgo
*Executive Committee		

The RWPs are updated every 5 years, and a year after their adoption, an updated SWP is released. This RWP covers a 50-year planning horizon from 2030 to 2080.

The RWPGs work with the TWDB to evaluate current demands and project future water demands for each category of water user group (WUG): municipal, irrigation, livestock, steam-electric power generation, manufacturing, and mining. Measured quantities, conservation goals, and modeling are used to develop availability data for all major water resources which indicate how much water can be relied on in a drought year within the management goals for each resource. In Region M, these values are largely based on the firm yield from the Amistad-Falcon Reservoir system and the modeled available groundwater (MAG) and non-MAG values for the Gulf Coast, Yegua-Jackson, and Carrizo-Wilcox aquifers.

For each WUG, the currently available water supplies are evaluated and projected over the planning horizon. Estimated future needs are identified and quantified by comparing the reliable, drought year supplies with the drought year demands. These projections for needs drive the development of specific recommendations for water management strategies (WMSs). WMSs include approaches to reduce demands, increase supplies, and minimize losses.

The plan also contains policy recommendations at the state and local level as follows, including environmental protection, drought response, and resource management.

The chapters of the RWP are listed below:

- Chapter 1. Description of the Regional Water Planning Area
- Chapter 2. Population and Water Demand Projections
- Chapter 3. Water Supply Analysis
- Chapter 4. Identification of Water Needs
- Chapter 5. Water Management Strategies
- Chapter 6. Impacts of Regional Water Plan and Protection of Resource
- Chapter 7. Drought Response Information, Activities, and Recommendations
- Chapter 8. Policy Recommendations and Unique Sites
- Chapter 9. Implementation and Comparison to the Previous Regional Water Plan
- Chapter 10. Public Participation and Plan Adoption

The TWDB has a database that contains reports for all of the data described in this plan. The reports from the 2027 Regional and State Water Planning Database (DB27) are available at https://www3.twdb.texas.gov/apps/SARA/reports/list.

Additional instructions include:

1. Enter ‘2026 Regional Water Plan’ into the “Report Name” field to filter to all DB27 reports associated with the 2026 Regional Water Plans.
2. Click on the report name hyperlink to load the desired report.
3. Enter planning region letter parameter, click view report.

Reports available include:

1. Water User Group (WUG) Population
2. WUG Demand
3. Source Availability
4. WUG Existing Water Supply
5. WUG Identified Water Needs/Surplus
6. WUG Second Tier Identified Water Need
7. WUG Data Comparison to 2026 RWP
8. Source Data Comparison to 2026 RWP
9. WUG Unmet Needs
10. Recommended WUG Water Management Strategies (WMS)
11. Recommended Projects Associated with WMSs
12. Alternative WUG WMSs
13. Alternative Projects Associated with WMSs
14. WUG Management Supply Factor
15. Recommended Water Management Strategy Supply Associated with a New or Amended Interbasin Transfer (IBT) Permit
16. WUG Recommended WMS Supply Associated with a New or Amended IBT Permit and Total Recommended Conservation WMS Supply
17. Sponsored Recommended WMS Supplies Unallocated to WUGs
18. Major Water Provider (MWP) Existing Sales and Transfers
19. MWP WMS Summary

ES.2 The Rio Grande Regional Water Planning Area

ES.2.1 Population, Economy, and Natural Resources

The Rio Grande Regional Water Planning Area (Region M) consists of the eight counties along the middle and lower Rio Grande up to the river’s mouth at the Gulf of Mexico. From the earliest settlement, this area has been tied to the waters of the Rio Grande for domestic and agricultural uses. The tropical or subtropical climate allows a long growing season most years. The amount of rainfall varies across the Lower Rio Grande Region from an average of 28 inches at the coast to 18 inches in the northwestern portion of the region, primarily from thunderstorms in the spring and occasional hurricanes in the late summer and fall. These storms can generate tremendous amounts of rainfall over a short period of time and cause extensive flooding because of the region’s relatively flat terrain.

Figure ES-1 shows population centers in Region M. The population of the region is expected to grow to over 2.1 million people by the end of the current planning horizon, which represents a 11.8 percent population increase from 2030 to 2080. Chapter 2 describes the population and municipal demand projections in detail.

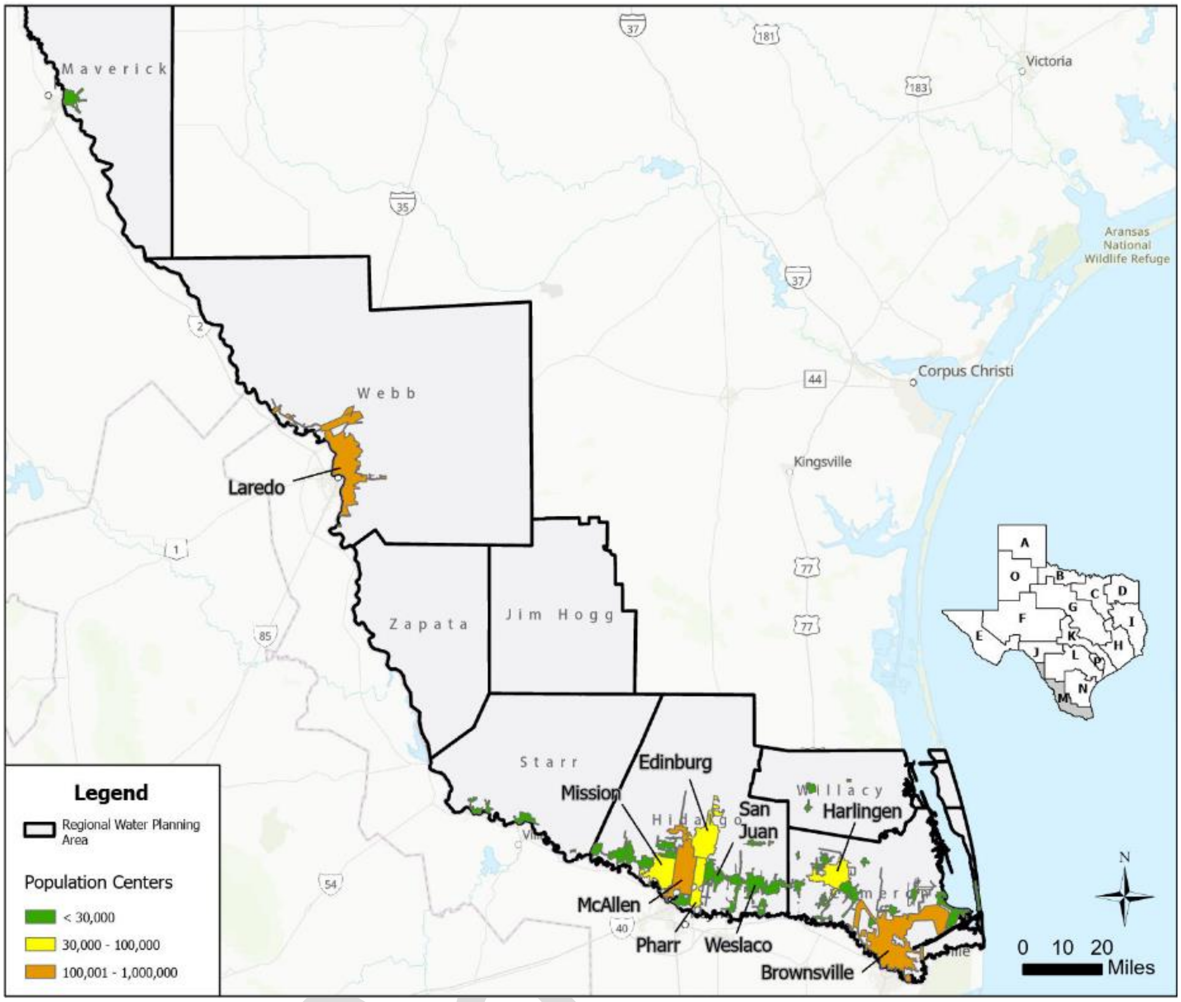

Figure ES-1 Population Centers of Region M

Region M's population is concentrated in Cameron, Hidalgo, and Webb counties, accounting for 90.5 percent of the regional total in 2020. The US Census Bureau estimates the total population of Region M in 2020 at 1,721,610, up 8.8 percent from 2010. Figure ES-2 shows historical and projected population in each county, according to US census historical data. Detailed population projections for each WUG are included in Appendix A.1.

An important factor driving rapid population growth in the Rio Grande Region is its cultural, social, and economic relationship with Mexico. Nationwide, Mexico's population growth rate in 2020 was 0.7 percent, compared with 1 percent for the United States.[1]

The Mexican portion of the Rio Grande watershed was home to approximately 12.61 million in 2017 and is anticipated to have 14.4 million by 2030. Using the growth rate identified by the National Water Commission of Mexico for the Rio Grande watershed, the population in 2080 would be over 20 million.

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[1] World Bank Population Growth Data. http://data.worldbank.org/indicator/SP.POP.GROW accessed 6/18/24.

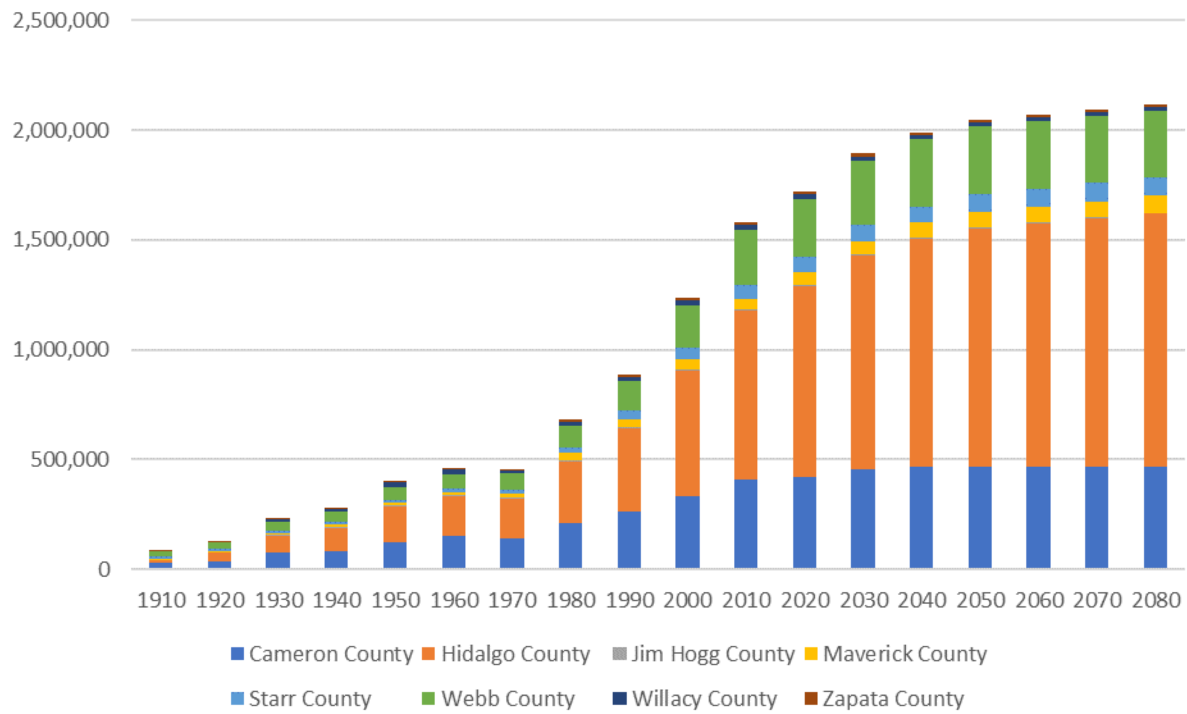

Figure ES-2 Region M Historical and Projected Population, US Census Bureau and TWDB

Table ES-2 shows Region M population projections by county.

Table ES-2 Population Projections by County

County	2030	2040	2050	2060	2070	2080
Cameron	453,325	465,039	469,300	468,071	466,828	465,573
Hidalgo	975,403	1,041,413	1,084,465	1,107,185	1,130,153	1,153,373
Jim Hogg	4,676	4,622	4,508	4,391	4,273	4,154
Maverick	62,424	66,814	70,294	72,996	75,728	78,490
Starr	70,499	75,394	79,002	81,275	83,573	85,896
Webb	292,999	304,635	308,179	305,094	301,977	298,824
Willacy	19,933	19,647	19,083	18,366	17,641	16,908
Zapata	14,075	14,288	14,295	14,158	14,019	13,878
Total	**1,893,334**	**1,991,852**	**2,049,126**	**2,071,536**	**2,094,192**	**2,117,096**

Aquifers in Mexico's Rio Grande watershed are overextended; the growth on both sides of the border will continue to put pressure on the capabilities of both surface and groundwater. Historically, agriculture has dominated the economy of the Rio Grande Region. Increased pressure on water available for irrigation, combined with the way that water is allocated in drought years, has been difficult for farmers across the region, especially those with perennial crops and citrus or pecan trees. A shift has occurred toward urbanization and diversification of the economy, but agriculture still plays a major role. Grain sorghum, sugarcane, cotton, citrus, and onions made up the bulk of the agriculture receipts in the region; agriculture is centered in Hidalgo and Cameron counties (Figure ES-3). Cattle and farmland accounted for just under 6 million acres, almost 80 percent of the region's land area. In 2024, the Rio Grande Valley Sugar Growers, Inc. decided to close the only sugar mill in Texas due to the lack of reliable water supply, including the reduced deliveries from Mexico. The mill supported hundreds of mill workers and over 100 local sugar cane growers, and its closure will have a significant impact on the economy in the Rio Grande Valley.

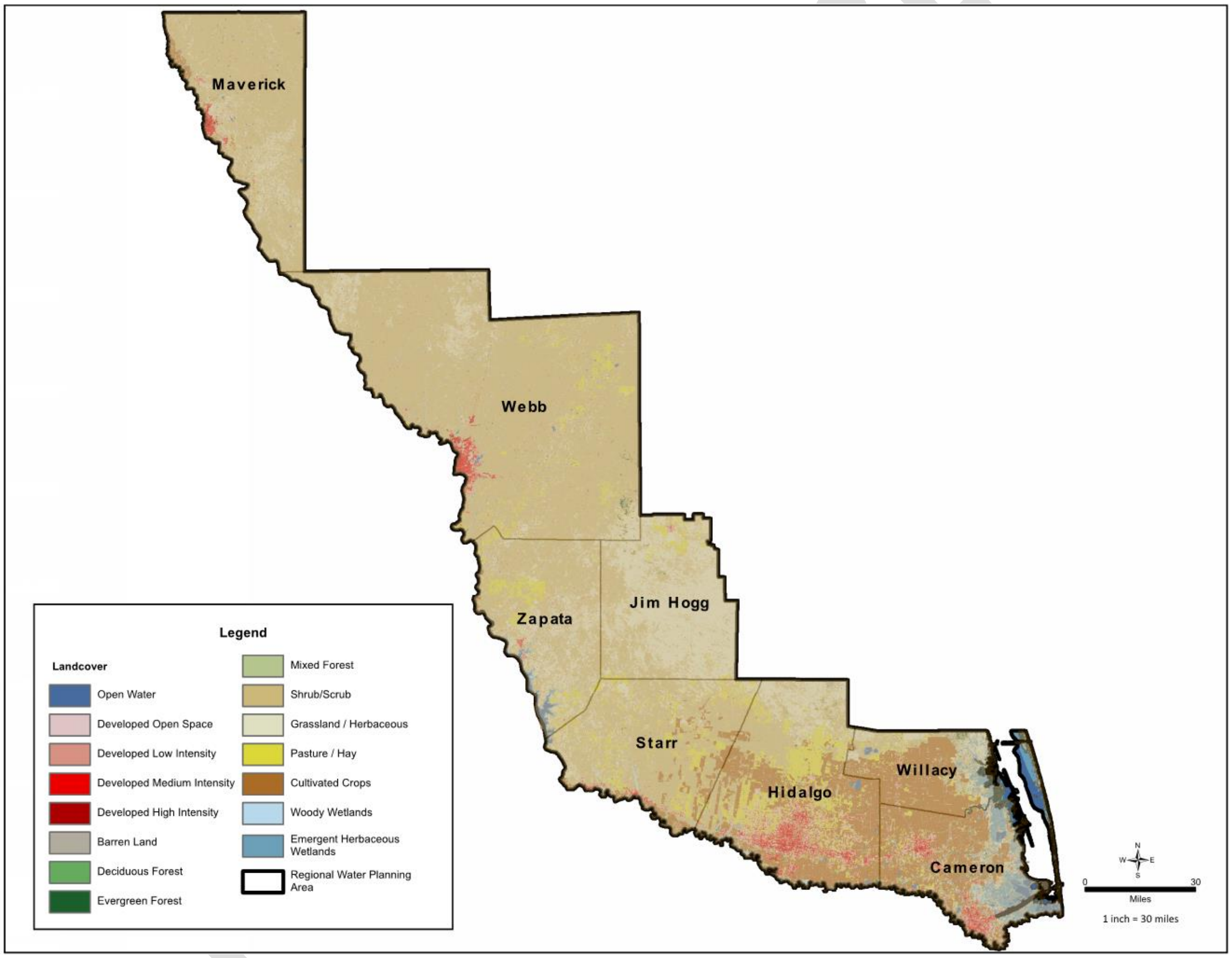

Figure ES-3 Region M Land Use Map

The Texas labor market forecasts for 2020 to 2030 predict 17 percent employment growth in the planning area. The major economic growth areas are construction, professional and business services, education and health services, and leisure and hospitality; information technology and mining show little to no growth.[2]

[2] Texas Labor Market and Career Information, Texas Workforce Commission. https://texaslmi.com/LMIbyCategory/Projections. Accessed 7/11/2024.

Some areas of Cameron and Willacy counties have seen recent growth of wind power generation, which may allow some farmers to maintain farmlands that were otherwise not economically viable.

Oil and gas production in the region have changed considerably from traditional oil drilling to hydraulic fracturing and nontraditional development, which has a significant impact on the regional economy and associated water demands. Webb and Maverick counties experienced significant oil and gas activity in the Eagle Ford Shale region. Mining water demands are discussed further in Chapter 2.

Region M experiences lower income and higher unemployment than the rest of Texas (Table ES-3). A clear division exists between the urban growth centers (Brownsville, McAllen, Harlingen, Laredo) and smaller rural towns and colonias. According to the TWDB, as of 2023, seven out of the eight counties in Region M are labeled as eligible for funds through the Economically Distressed Areas Program.

Table ES-3 Median Household Income, Poverty, and Unemployment Rate, by County

County	Median Household Income, 2022 ($/Year)[1]	Persons in Poverty Level, 2023 (%)[1]	Unemployment Rate, 2024 (in 2024 $) (%)[2]
Cameron	$47,435	22.60%	4.80%
Hidalgo	$49,371	27.40%	5.40%
Jim Hogg	$42,292	26.90%	4.40%
Maverick	$48,497	21.90%	8.00%
Starr	$35,979	32.80%	8.60%
Webb	$59,984	20.90%	3.70%
Willacy	$42,839	29.00%	6.60%
Zapata	$35,061	32.80%	6.10%

1. US Census Bureau State and County, QuickFacts. https://www.census.gov/quickfacts/fact/table/tx/INC110217. Accessed 6/26/2024.
2. Bureau of Labor Statistics, Unemployment. https://data.bls.gov/map/MapToolServlet. Accessed 6/26/2024.

Colonias are semirural subdivisions that are often developed with substandard or no potable water and sanitary sewer systems. Without potable waterlines, many colonia residents rely on buckets or drums of water, which may become contaminated. Improper wastewater disposal can add to the health and safety concerns.

Efforts have been made at the state, county, and local levels to provide basic services in many of the colonias in Region M. These efforts are complicated by the fact that, when sewer and waterlines are brought into a colonia, many of the homes do not meet building codes and are therefore unable to pass inspections to qualify for water or sewer hookups. Some areas of Region M have been successful in improving services to colonias, but growth in the colonia population is still a challenge to residents, state, county, and local government.[3]

[3] Texas Secretary of State website. https://www.sos.state.tx.us/border/. Accessed 2/25/2015.

ES.2.2 Surface Water Resources

ES.2.2.1 The Rio Grande

Region M draws most of its water from the Rio Grande, via the Amistad-Falcon Reservoir system, which is shared with Mexico. The waters of the Middle and Lower Rio Grande are managed by the International Boundary and Water Commission and the TCEQ's Rio Grande Watermaster.

Most of the inflows in this section of the river are from the Mexican watershed. Two major agreements between Mexico and the US (in 1906 and 1944) establish how these waters are shared. Annually, Mexico is to deliver a minimum of 350,000 acre-feet (ac-ft) to the United States, on average, over a 5-year cycle, except for years of extraordinary drought, when the watershed in Mexico cannot provide enough runoff water, or in cases of serious accident to hydraulic systems.

Releases from Amistad and Falcon reservoirs are coordinated to deliver water to users throughout the region. The US system of water rights is unique to the Rio Grande: a tiered system prioritizes domestic, municipal, and industrial (DMI) water rights and establishes two classes (A and B) of mining and irrigation water rights. Each tier of water rights has a dedicated "storage pool" in the reservoir accounting system, and at the end of each month, the DMI pool is replenished to ensure that those water rights can be delivered in full. After this and an operational reserve have been set aside, what remains, if any, is available to the Class A and B accounts. In a severe drought, there may be no water after the DMI and operational reserves are met, and Class A and B rights can be completely curtailed. This affects both farmers and the functionality of the delivery systems, many of which rely on irrigation water for the operational baseline flows.

Water in the Rio Grande is normally of suitable quality for irrigation, livestock, and industrial uses; however, salinity, nutrients, and fecal coliform bacteria are of concern throughout the basin. Salinity concentrations in the Rio Grande are the result of both human activities and natural conditions. Untreated or poorly treated discharges from inadequate wastewater treatment facilities, primarily in Mexico, and nonpoint source pollution on both sides of the river, including poorly constructed or malfunctioning septic and sewage collection systems and improperly managed animal wastes, contribute to fecal coliform levels. Nutrient levels are a concern in the Rio Grande, but current levels do not represent a severe threat to human health, nor have they supported excessive aquatic plant growth.

ES.2.2.1.1 Drought of Record

The Rio Grande Basin and the Amistad-Falcon Reservoir system refer to the drought spanning from June 1994 to August 2023 (US portion) as the drought of record (DOR). This period is the most severe hydrologic drought, according to the Rio Grande Water Availability Model (WAM), and is used to predict firm yield, the supply that could be expected in the most severe historical drought scenario, over the planning horizon, as shown in Table ES-4.

Table ES-4 Firm Yield Projections for the Amistad-Falcon Reservoir System 2030 to 2080 (ac-ft/yr)

Source	2030	2040	2050	2060	2070	2080
Amistad-Falcon Reservoir	1,001,776	1,001,268	1,000,760	999,553	997,821	995,863

The current period of record was updated this cycle in the WAM to extend through the year 2018. The model's previous period of record ended in the year 2000. Extending the period of record allowed for the DOR to be updated, which reduced the firm yield of the Amistad-Falcon Reservoir System, as compared to last cycle. The naturalized flow record that is used in the WAM is one way to evaluate the scale and duration of drought. Other measures and indicators of drought can be used to compare recent years with the historical record. In the past couple of years, reservoirs levels in the Amistad-Falcon Reservoir have been low. A lack of deliveries from Mexico are leading to drought restriction conditions, but it has yet to be determined whether this could result in a potential new DOR. The DOR is discussed in detail in Chapter 7.

ES.2.2.2 The Nueces-Rio Grande Basin and the Arroyo Colorado

Within the Rio Grande Region, the Nueces-Rio Grande Coastal Basin encompasses the southeastern portion of Webb County, nearly two-thirds of Jim Hogg County, the majority of Hidalgo and Cameron counties, and all of Willacy County (Figure ES-4). Two major drainage courses are in the basin: the main floodway and the Arroyo Colorado.

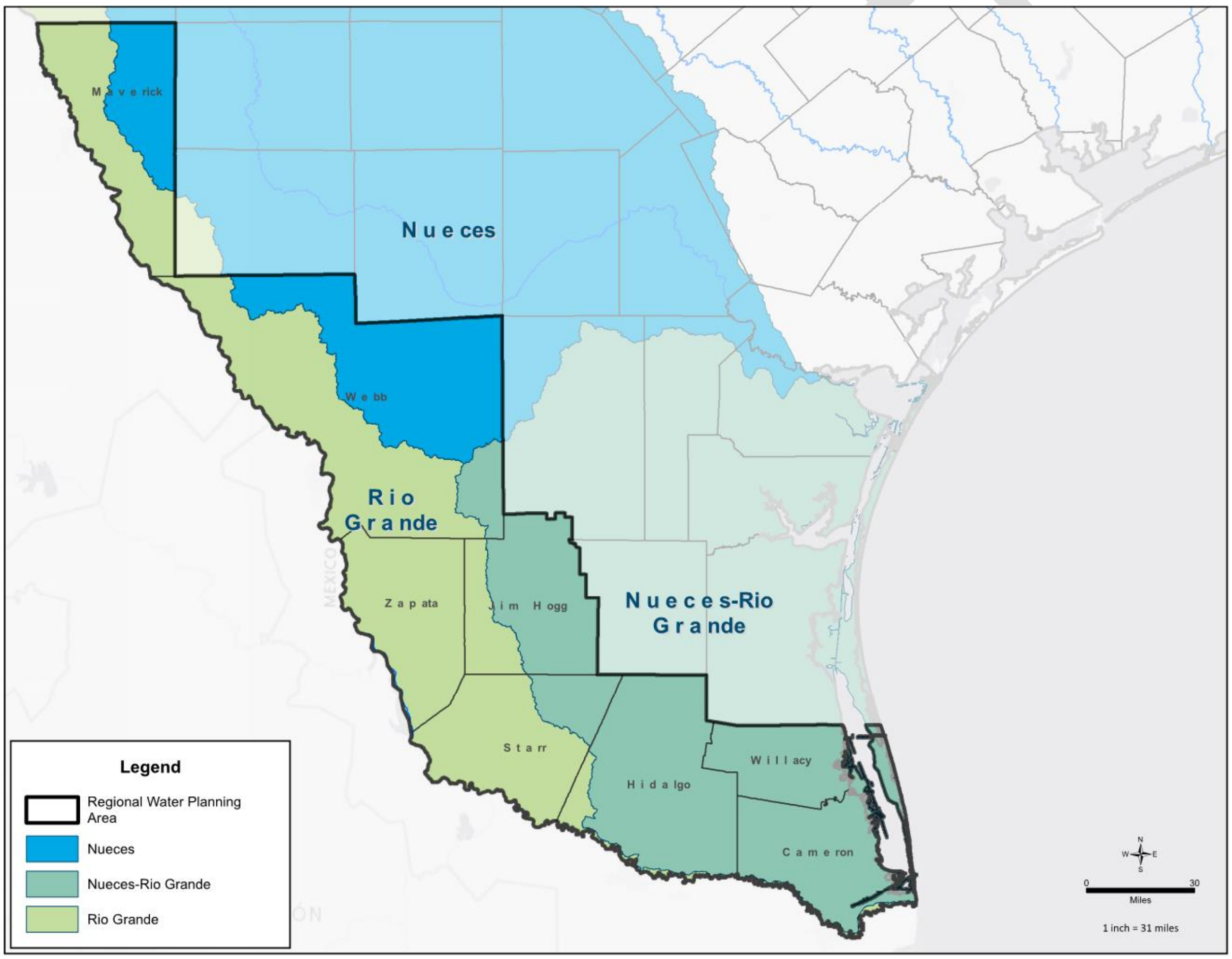

Figure ES-4 River Basins in Region M

The Arroyo Colorado is an ancient distributary channel of the Rio Grande River that drains an area of approximately 706 square miles, or 500,000 acres, covering portions of three Texas counties (Hidalgo, Cameron, and Willacy), and over 25 municipalities in the Lower Rio Grande Valley. In addition to natural drainage, most of the surface water diverted from the Lower Rio Grande is pumped into this basin and discharges into the Arroyo Colorado. The Arroyo Colorado River is the primary source of freshwater for the Lower Laguna Madre (LLM) estuary. It is imperative that adequate amounts of fresh water flow into the LLM and that water quality meets the needs of the various uses, including irrigation, recreation, industrial, municipal, and aquatic life uses.

ES.2.3 Groundwater Resources

The major aquifer underlying Region M is the Gulf Coast, which runs the extent of the Texas coast and Hidalgo, Starr, Jim Hogg, and the western portions of Willacy and Cameron counties. This aquifer is predominantly brackish, with irregular pockets of fresh and very saline water. The Carrizo-Wilcox Aquifer also spans Texas and extends through Webb and part of Maverick counties.

The joint groundwater planning process involves various stakeholders to determine how much water can be withdrawn annually and still meet desired future conditions. This process is undertaken for each of the groundwater management areas (GMAs) by representatives of GCDs and members of the public. The MAG values are the result of this process, which become the groundwater availabilities for the regional water planning process.

In some cases, aquifers or parts of aquifers within a GMA are locally important but are not planned for in the same way. Availabilities for these aquifers are developed through the aquifer models but are considered non-MAG availabilities because they are not included in the joint groundwater planning process. The minor and alluvial aquifers in the region, including the Yegua-Jackson aquifer, may produce significant quantities of water that supply relatively small areas.

Refer to Table ES-5 for the groundwater availability in the Region M aquifers.

Table ES-5 Groundwater Data for Significant Aquifers in Region M (ac-ft/yr)

Aquifer	County	Data	2030	2040	2050	2060	2070	2080
Carrizo-Wilcox	Maverick	MAG	545	547	545	545	276	276
Carrizo-Wilcox	Webb	MAG	910	912	910	910	910	910
Gulf Coast	Cameron	MAG	7,999	9,311	10,620	11,932	11,932	11,932
Gulf Coast	Cameron	Non-MAG	43,167	46,720	50,273	53,824	53,824	53,824
Gulf Coast	Hidalgo	MAG	93,462	99,105	104,721	110,363	110,431	110,431
Gulf Coast	Jim Hogg	MAG	6,167	6,167	6,167	6,167	7,084	7,084
Gulf Coast	Starr	MAG	4,797	5,797	6,794	7,795	7,795	7,795
Gulf Coast	Webb	MAG	789	959	1,129	1,299	1,299	1,299
Gulf Coast	Willacy	MAG	1,150	1,329	1,486	1,665	1,703	1,703
Gulf Coast	Willacy	Non-MAG	1,407	1,622	1,838	2,053	2,053	2,053
Yegua-Jackson	Starr	Non-MAG	33	38	43	48	48	48
Yegua-Jackson	Webb	Non-MAG	20,000	20,000	20,000	20,000	20,000	20,000
Yegua-Jackson	Zapata	Non-MAG	7,987	7,987	7,987	7,987	7,987	7,987
Total			**188,413**	**200,494**	**212,513**	**224,588**	**225,342**	**225,342**

Figure ES-5 shows the major and minor aquifers in the region.

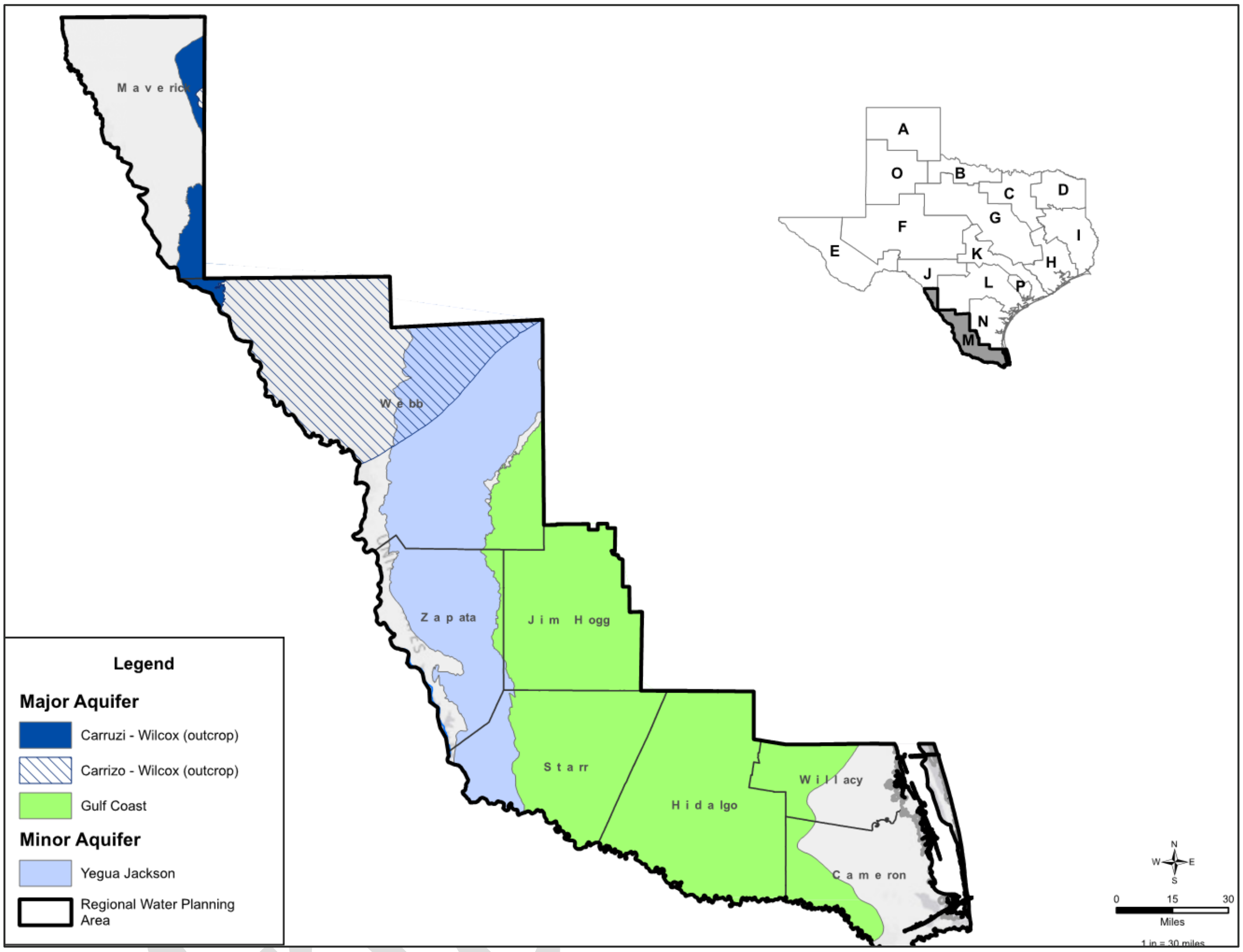

Figure ES-5 Major and Minor Aquifers in Region M

In general, groundwater from the major aquifers in the region has total dissolved solids concentrations exceeding 1,000 milligrams per liter (mg/L) (slightly saline) and often exceeds 3,000 mg/L (moderately saline). However, some areas of fresh and useable groundwater constitute a critical supply for many towns, domestic needs in rural areas, and livestock. Localized areas of high boron content occur throughout the study area.

A 2014 report from TWDB's Brackish Resource Aquifer Characterization System program presented information on the brackish groundwater resources of the Lower Rio Grande Valley, in response to increased development of these resources.[4] Chapter 3 presents a detailed description of groundwater quality in the Gulf Coast Aquifer, Carrizo Wilcox Aquifer, Yegua-Jackson Aquifer, and Rio Grande Alluvium in the Rio Grande Region.

[4] http://www.twdb.texas.gov/publications/reports/numbered_reports/doc/R383_BrackishGW.pdf?d=22146.57000000443.

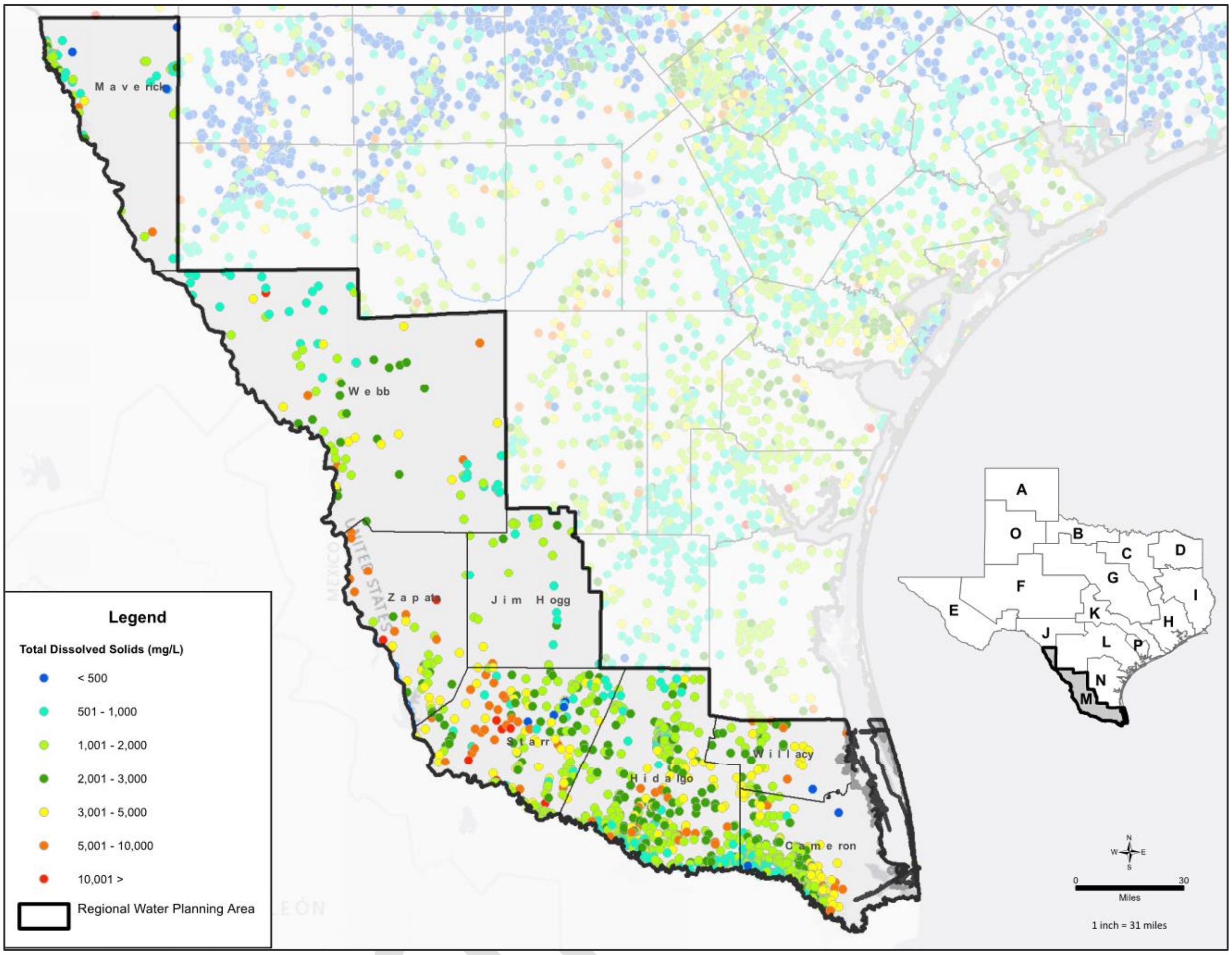

Figure ES-6 Brackish Groundwater Data in Region M (TWDB)

ES.3 Current and Projected Water Use

Both irrigation and municipal demands are greatest in the Lower Rio Grande, which is primarily served by a network of irrigation districts (IDs) that divert water to farmers and municipal utilities from the Rio Grande. Demand in other WUG types is comparatively small, as shown on Figure ES-7.

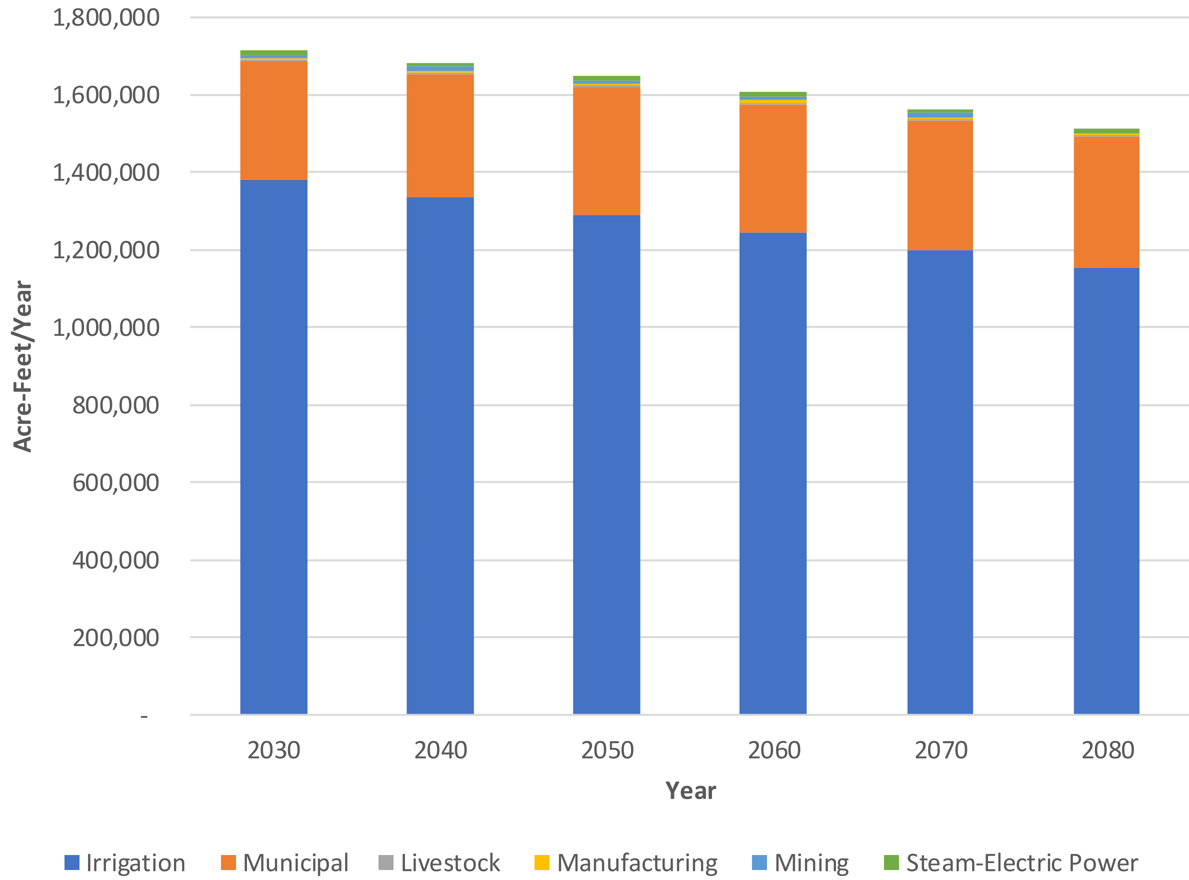

Figure ES-7 Water Demand Projections for Each WUG Type in Region M (ac-ft/yr)

ES.3.1 Major Water Providers

Region M has two general types of wholesale water providers (WWPs): those that provide raw water, mostly IDs, and those who provide treated water to municipal and industrial users.

IDs (Figure ES-8) divert and deliver raw water to irrigated farmland, municipalities, and industrial or livestock users. In Region M, 25 IDs operate under the Texas Water Code, but each one has its own internal operating policies. The districts are mostly earthen canal, some concrete lined canals, and some pipeline. The losses within IDs, as a result of seepage, evaporation, and operational losses, are anywhere between 10 percent and 40 percent. Water districts are discussed in more detail in Chapter 3.

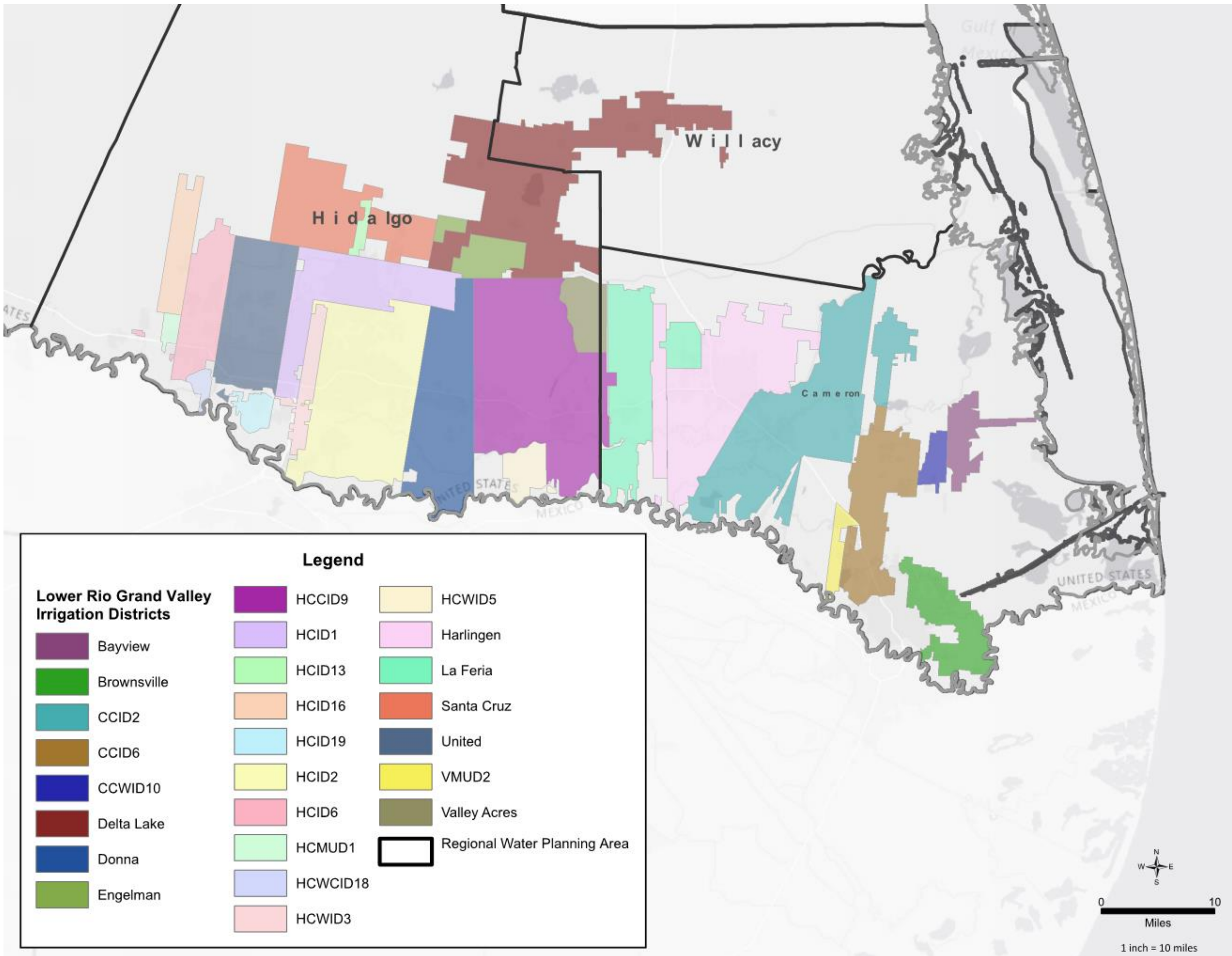

Figure ES-8 Lower Rio Grande Valley Irrigation Districts

WSCs cover most of the rural area in the Lower Rio Grande Valley. The largest are North Alamo WSC, East Rio Hondo WSC, Sharyland WSC, and Military Highway WSC, all of which treat and deliver both surface and groundwater to significant unincorporated and rural areas and edges of cities. Other WSCs in the region include Southmost Regional Water Authority, Valley Municipal Utility District 2, Webb County Water Utility, and Laguna Madre Water District. Brownsville, Eagle Pass, Harlingen, Laredo, Rio Grande City, and Weslaco also sell water to other WUGs in sufficient quantity to be considered WWPs.

Major Water Providers

Major Water Provider (MWP) was a new designation in the 2021 planning cycle; an MWP is any WUG or WWP of particular significance to the water supply of a region, as determined by the RWPG. At the February 21, 2024, Region M meeting, the planning group approved the same definition of an MWP as in the 2021 Plan, which is any entity that provides 3,000 ac-ft or more of municipal water per year, and then voted to add Mexico as a new MWP due to the region's unique international water-sharing situation. According to current estimates of 2030 municipal supplies, the entities listed in Table ES-6 have been designated as MWP in the 2026 RWP.

While technically not a WUG or WWP, and therefore not allowed to be classified as a MWP according to TWDB rules, Mexico is of particular significance to Region M because it provides water to the Amistad-Falcon Reservoir System that it shares with the United States, based on the 1944 Treaty, impacting water levels in the reservoirs and the water users on the United States' side.

Table ES-6 Region M Major Water Providers

Major Water Providers	
Agua Special Utility District	Hidalgo County Irrigation District No. 16
Alamo	Hidalgo County Irrigation District No. 2
Bayview Irrigation District No. 11	Hidalgo County Irrigation District No. 6
Brownsville	Hidalgo County Water Improvement District (WID) No. 3*
Brownsville Irrigation District	Laguna Madre Water District
Cameron County Irrigation District No. 2	Laredo
Cameron County Irrigation District No. 3 - La Feria	McAllen
Cameron County Irrigation District No. 6 - Los Fresnos	Military Highway Water Supply Corporation (WSC)
Cameron County WID No. 10	Mission
Delta Lake Irrigation District	North Alamo WSC
Donna Irrigation District-Hidalgo County No. 1	Pharr
Eagle Pass	Rio Grande City
East Rio Hondo WSC	San Benito
Edinburg	San Juan
Harlingen	Sharyland WSC
Harlingen Irrigation District-Cameron County No. 1	Southmost Regional Water Authority
Hidalgo and Cameron Counties Irrigation District No. 9	United Irrigation District
Hidalgo County Irrigation District No. 1	Weslaco

*In January 2025, Hidalgo County Water Improvement District No. 3 and Santa Cruz Water Control and Improvement District No. 15 consolidated into Hidalgo County Consolidated Water Control and Improvement District.

ES.3.2 Municipal Demands

Municipal demands (Figure ES-7) are expected to increase regionally from a projected 303,225 ac-ft/yr in 2030 to 340,085 ac-ft/yr in 2080. Demand projections have decreased significantly from last cycle, based on results from the 2020 US Census.

Table ES-7 Municipal Demand by County (ac-ft/yr)

County	2030	2040	2050	2060	2070	2080
Cameron	74,074	75,432	75,918	75,549	75,213	74,904
Hidalgo	157,628	168,725	176,995	180,732	184,515	188,335
Jim Hogg	613	603	587	573	556	541
Maverick	10,083	10,753	11,316	11,762	12,211	12,663
Starr	11,107	11,793	12,337	12,700	13,066	13,438
Webb	44,739	46,312	46,870	46,399	45,924	45,442
Willacy	2,494	2,477	2,443	2,403	2,368	2,340
Zapata	2,487	2,508	2,504	2,476	2,449	2,422
Total	**303,225**	**318,603**	**328,970**	**332,594**	**336,302**	**340,085**

Most of this demand is currently met by surface water from the Rio Grande, most commonly delivered by IDs. However, multiple brackish groundwater desalination plants have been built since 2000 and supply approximately 24,000 ac-ft/yr of potable water. Fresh groundwater availability is limited in the region and is used mostly as a backup water supply for utilities or for individual homes, particularly in rural and unincorporated areas, with a few exceptions.[5] Refer to Figure ES-9 for a comparison of municipal supplies to municipal demands.

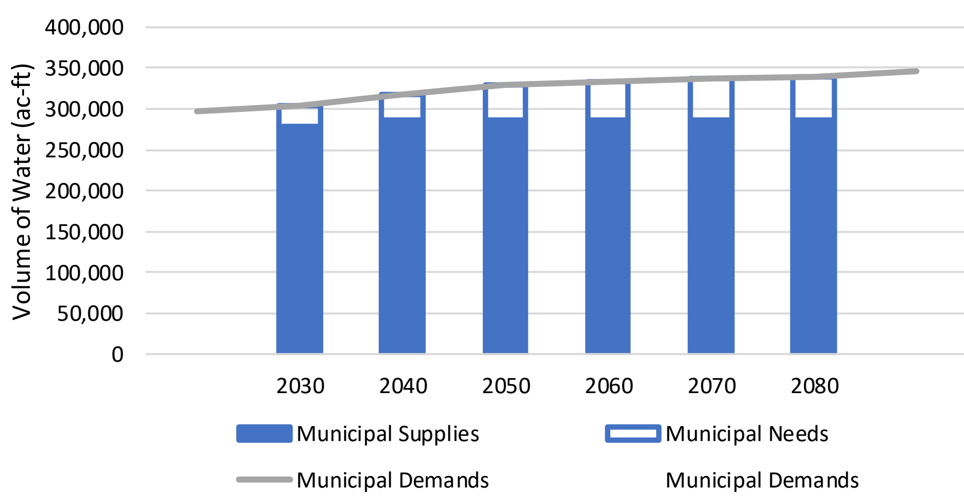

Figure ES-9 Municipal Supplies Shown as a Portion of Municipal Demands

[5] Military Highway WSC and the City of Hidalgo both have significant sources of well water.

The surface water rights of every municipal utility that is diverted by an ID are reduced by the estimated conveyance losses for that ID. These losses represent regular losses through seepage, evaporation, and operations in a drought year but not a scenario where push water is required. For those IDs that primarily serve irrigation users, long periods between irrigations in drought years are possible, especially when the district goes on allocation and limits irrigation water use. Because the ID conveyance systems generally require an operational minimum of water to charge the canals, periods of time when municipal water rights are not sufficient to meet operational requirements are possible and additional water, or push water, is required.

ES.3.3 Irrigation and Livestock Demands

Irrigation represents the largest water demand in Region M (1.4 million ac-ft/yr in 2030 and 1.15 million ac-ft/yr in 2080) but is projected to decrease as a result of both urbanization and increasing pressure on the region's water resources. Supplies available to irrigators are curtailed significantly in drought years because irrigation and mining water rights are treated as residual users of stored water from the reservoirs and, therefore, bear the brunt of water supply shortages. In essence, irrigation and mining water use must adjust to the available water supply. Refer to Figure ES-10 for a comparison of irrigation supplies to irrigation demands.

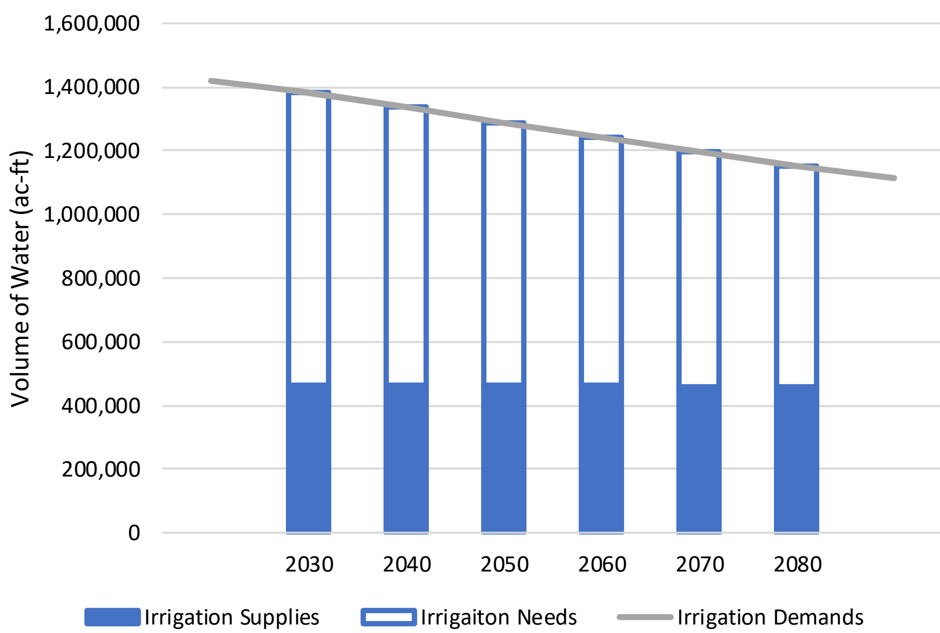

Figure ES-10 Irrigation Supplies as a Portion of Irrigation Demands (ac-ft/yr)

Irrigation demands shown in this plan represent the worst-case scenario, wherein the demands are based on a dry year, and the supplies are what can be expected in the worst drought year. The difference between drought year demand and actual use in a particular year for agricultural users can be significant. If a drought year is anticipated, farmers can prepare by planting crops and vegetables with lower water demands, which are often of lower value, but may require fewer or no irrigations. Increases in farming efficiency can also allow irrigators to maintain higher value crops or higher yields in times with less available water.

Livestock demands are shown as being 100 percent met by existing supplies. Livestock is managed so that drought year demands are limited to the supplies known to be available. Livestock demands are met with Rio Grande water, groundwater, and some local supplies of surface water reserved particularly for livestock.

ES.3.4 Industrial Demands

Mining, steam-electric power generation, and manufacturing demands make up a small portion of the region's water use. However, a localized analysis revealed that mining demands represent a fairly significant portion of water usage in Maverick and Webb counties. These industrial uses are illustrated on Figure ES-11 through Figure ES-13.

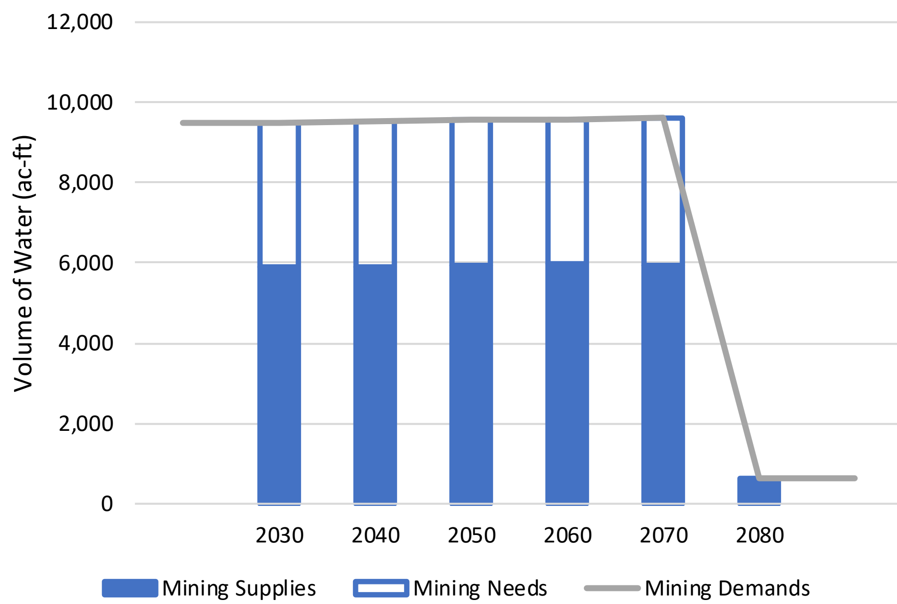

Figure ES-11 Mining Supplies as a Portion of Mining Water Demands (ac-ft/yr)

Mining water usage in Region M is dominated by hydraulic fracturing, with some aggregate operations. One of the major hurdles in evaluating mining water usage is the lack of consistent reporting, especially for groundwater usage. In Region M, the use of surface water from the Rio Grande allowed the Region M Planning Group to further inform water demand projections for mining.

Statewide, a major shift from gas to oil production significantly changed the spatial distribution of production in a relatively short time. Within Region M, accelerated development of the Eagle Ford Shale reflected this trend in Webb and Maverick counties. Adoption of operating practices that allowed for more water recycling and use of brackish water also changed patterns of water consumption and usage at the same time that overall water usage was increasing.

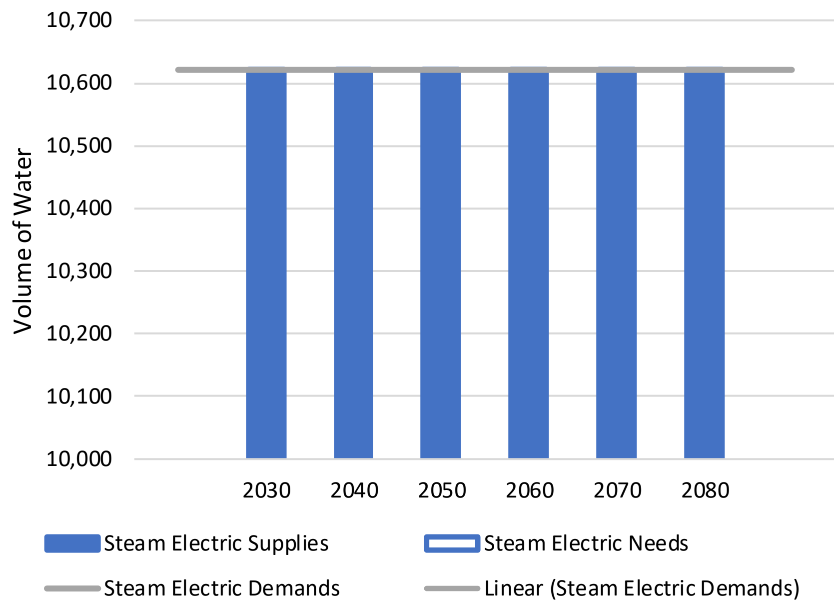

Figure ES-12 Steam-Electric Supplies as a Portion of Steam-Electric Water Demands (ac-ft/yr)

Steam-electric power water use estimates include volumes reported to the TWDB Annual Water Use Survey by large power generation plants that sell power on the open market but generally do not include cogeneration plants that generate power for manufacturing or mining processes. Steam-electric power water use volumes that were reported by surveyed municipal water sellers rather than the power generators are included in these estimates.

Steam-electric power generation water demand is projected to remain below 1 percent the overall non-municipal water demands in Region M throughout the planning horizon. The steam-electric water demands are projected to be a constant 10,621 ac-ft/yr from 2030 to 2080. The demand projections are lower than those in the 2021 Region M Water Plan, mainly due to the cancellation of two planned facilities associated with Coronado Power Ventures (La Paloma Energy Center). As shown on Figure ES-12, existing supplies meet the projected needs.

The primary manufacturing water users in Region M are related to the agriculture industry and the fishing industry, including sugar and vegetable processing. Manufacturing projections show an increase from 4,685 ac-ft/yr in decade 2030 to 5,619 ac-ft/yr in decade 2080. The increase in demand occurs primarily in Cameron and Hidalgo counties.

Water demand associated with manufacturing is met by both groundwater and surface water and comprises a relatively small portion of the regional demand and need. As shown on Figure ES-13, current supplies meet 100 percent of 2030-2050 projected demands, and nearly 100 percent for the other decades.

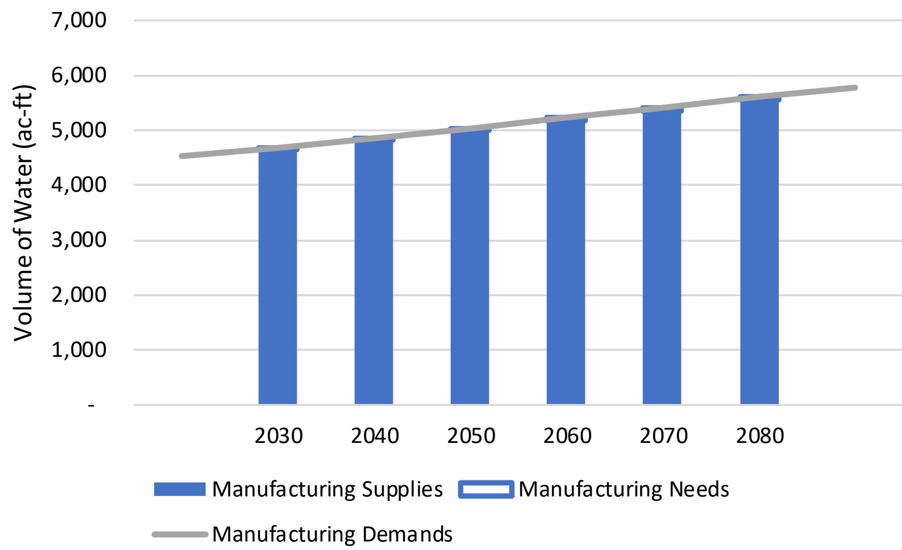

Figure ES-13 Manufacturing Supplies as a Portion of Manufacturing Water Demands (ac-ft/yr)

ES.4 Water Management Strategies

The RWPG is tasked with evaluating all potentially feasible WMSs and recommending selected strategies to meet current and future needs in the region. The potentially feasible WMSs came from three major sources:

1. The recommended WMS from the 2021 Region M Plan;
2. Responses to requests sent to all water providers and stakeholders for project and strategy descriptions; and
3. The list of WMS for consideration listed in the water planning guidance documents provided by the TWDB.

All of the WMSs received, and some developed by the RWPG, were compiled to form the list of potentially feasible WMSs. The costs, projected yield, feasibility, and impacts were evaluated for accuracy, consistency, and compliance with TWDB rules and guidance where that information was available; where information was not available, assumptions were made and documented.

The WMS components included in this RWP are limited to the infrastructure and costs that are required to develop and convey increased water supplies from water supply sources and to treat the water for end WUG requirements. Conservation WMSs that are needed to address water loss or infrastructure bottlenecks in an existing water supply conveyance system and result in increased supplies or decreased demands are also included. Infrastructure components associated with internal water distribution networks that do not convey an additional water supply volume or address current losses are not included in the RWP.

For every WUG, the projected water saved through drought management, ID Improvements, and Advanced Municipal Water Conservation that affects the WUG was subtracted from the original need to obtain a revised need after conservation. If a need still existed, additional WMSs were considered for the WUG.

The WMS or portfolio of strategies with sufficient yield to meet the needs after drought management and conservation, or that were requested by a WUG, WWP, or ID were recommended for each WUG, and any additional viable WMS that ranked well were listed as alternative recommended strategies. Only WMSs with insufficient information or major feasibility concerns were evaluated but not recommended.

Environmental impacts of each WMS were evaluated and categorized according to the type of WMS. The categories of impacts that were quantified include the following:

- Acres impacted permanently;
- Construction impacted acreage;
- Inundation acreage;
- Agricultural resources impacted;
- Wetland impact;
- Habitat impacted acreage;
- Threatened and endangered species count;
- Cultural resources impact;
- Environmental water needs;
- Effect of upstream development on bays, estuaries, and arms of the Gulf of Mexico;
- Reduction in WWTP effluent;
- Volume of brine;
- Total dissolved solids (TDS) of brine; and
- Reliability.

ES.4.1 Water Conservation, Assumptions and Methodology

Water Conservation addresses water use reduction and water loss reduction for municipal, irrigation, and industrial water uses.

ES.4.1.1 Advanced Municipal Water Conservation

Advanced Municipal Water Conservation is recommended for most municipal WUGs in Region M. A variety of conservation measures are recommended as described in the TWDB best management practices (BMPs), any combination of which can be used to meet the specific goals for a municipality or utility.[6]

For every municipal WUG with a projected need or a per capita water use rate greater than 140 gallons per capita per day, municipal conservation yield and costs were estimated. Entities with needs and a GPCD greater than 140 GPCD were assigned a 10 percent usage reduction per decade. After the 140 GPCD goal was achieved, or for entities with a need and a GPCD below 140, the decadal reduction was set to 5 percent. A minimum value of 80 GPCD was fixed. Once the minimum value was reached,

[6] Water Conservation Implementation Task Force. "Water Conservation Best Management Practices Guide." November 2004.

entities were projected to stop reducing their GPCD. Regardless of need, conservation is not recommended for WUGs with a GPCD less than 80. Two strategies – water loss mitigation and water use reduction – are recommended to reach the target GPCDs. The amount of water that can be conserved by implementing advanced municipal conservation measures and associated costs were estimated with the assistance of the Unified Costing Model tool.

ES.4.1.2 Irrigation District Conservation

IDs carry over 85 percent of the water that is used from the Rio Grande system in Region M. These districts were initially built to deliver water for agricultural use, but many districts now serve municipal and industrial users as well. Most of these systems have similar components, with initial pump stations to divert water from the river, some storage in either off-channel reservoirs or in the main canals, and canal or pipeline networks that deliver water to municipal utilities for treatment and distribution or to farmlands. Black & Veatch updated work that was done with Texas A&M AgriLife Research to develop expected water conservation and costs for conservation WMSs for all 25 IDs in Region M.

The ID conservation WMSs submitted via surveys over the past three planning cycles were used to form the basis of a general ID conservation WMS for all IDs. ID conservation strategies include the following:

- Canal lining (new linings and replacement of damaged linings);
- Installation or replacement of pipeline, including interconnects between IDs where IDs are capable of serving new WUG or measurable efficiency gains are achieved; and
- General repairs and improvements, including new metering and controls, which can include installation of automated system controls, meters and supervisory control and data acquisition (SCADA) systems where implementation leads to measurable efficiency gains.

All WMSs were assumed to apply to the first decade of planning, 2030, unless noted otherwise. The total annual estimated potential water savings in 2080 for all the WMSs submitted was 151,233 ac-ft. The amount of water that can be conserved per ID was calculated based on estimates of current conveyance efficiency and a maximum efficiency of 90 percent.

It is intended that these IDs could implement any water conservation or storage improvements, including, but not limited to, metering, control automation, gates, canal lining, repair of canal lining, pipeline installation, district interconnects, new reservoirs, reservoir improvements, or any other strategy that provides beneficial, measurable conservation improvements to the ID.

ES.4.1.3 On-Farm Conservation

On-Farm conservation measures can be grouped into the following categories: water use management practices, land management systems, on-farm water delivery systems, water district delivery systems, and tailwater recovery systems. Water district delivery system improvements, including conveyance infrastructure, metering, and telemetry, are addressed as a separate WMS, although the operational effectiveness and efficiency of the IDs are necessary to reap the full benefits of on-farm measures. On-farm efficiency depends on timely delivery of water, adequate head to push water across a field, and an available supply whether on farm or from the ID.

These measures are considered on-farm conservation measures, but in most cases, implementation in a drought year increases the potential yield of a crop per ac-ft of water but may not reduce the irrigator's overall demand for water. When water is available in a drought year, farmers are likely to use it. Making better use of the water that is available is critical to helping farmers through drought, and the Region M

Planning Group recommends continued research, education, demonstration, and large-scale implementation of these and any other irrigation conservation measures that farmers find to be appropriate.

A select subset of On-Farm Conservation strategies that were developed based on input from stakeholders and ID are discussed in detail in Chapter 5. These strategies are of particular interest to the region, although the full range of BMP described in TWDB literature is recommended where appropriate.[7] On-farm conservation is recommended for all irrigators in the planning area.

ES.4.1.4 Industrial Conservation

Implementation of BMPs for Industrial Users is recommended for every manufacturing, mining, and steam electric power user in Region M. The TWDB Water Implementation Task Force recommended strategies for industrial users to conserve water in the "Best Management Practices for Industrial Water Users" guidance.[8] The guide provides BMPs for specific industries, as well as general BMPs that are recommended for any type of industrial user.

ES.4.2 Conversion/Purchase of Surface Water Rights

Urbanization of agricultural lands within Region M is projected to increase throughout the planning period. As areas that are currently farmed are developed, the water associated with irrigating that land will become available for other uses. For the purpose of this plan, it was assumed that the increase in municipal water demand is proportional to the decrease in irrigation demand due to urbanization and estimates for urbanization rates were made for each county.

Purchase of water rights through urbanization was recommended for municipal WUGs with recommended strategies that required additional water rights to be feasible (such as expansion of a surface water treatment plant) to accompany those strategies. Additionally, the strategy for acquisition of water rights through urbanization was evaluated for most municipal WUGs that use surface water with or without needs prior to 2080.

ES.4.3 Wastewater Reuse

With increasing pressure statewide on water resources, Texas water users are considering and pursuing reuse or recycling of wastewater. Wastewater can be treated and reused for either potable or non-potable uses and can include a step that returns water to the environment for a period of time (indirect) or not (direct). All approaches to reuse have been evaluated, and the most appropriate alternatives recommended.

ES.4.3.1 Non-Potable Reuse

Wastewater reuse is most commonly used for agriculture, landscape, public parks, and golf course irrigation; industrial uses; dust control; and construction activities. This WMS is feasible if several factors are taken into consideration: (1) the location of wastewater treatment facilities relative to the location of potential users of reclaimed water, (2) the level of treatment and quality of the reclaimed water, (3) the water quality requirements of particular users, and (4) the public acceptance of reuse.

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[7] Texas Water Development Board. Best Management Practices for Agricultural Water Users. http://www.twdb.texas.gov/conservation/BMPs/Ag/index.asp. November 2013.
[8] Water Conservation Implementation Task Force. "Water Conservation Best Management Practices: Best Management Practices for Industrial Water Users." February 2013.

Non-potable reuse was evaluated for those entities that identified it as a desired WMS. In each case, the end user's demands were evaluated to verify that the supply was considered only where a demand would have otherwise been filled by municipal water, limited to meeting 25 percent of demands.

ES.4.3.2 Potable Reuse

Highly treated wastewater effluent can be used as a supplemental water supply for potable use. Indirect potable reuse is commonly practiced in Texas when surface water supplies are deliberately augmented with treated wastewater effluent. Direct potable reuse has become a feasible alternative in recent years, because of advances in technology and public acceptance as well as precedent in regulatory acceptance.

This WMS is feasible if several factors are taken into consideration: (1) the location of wastewater treatment facilities relative to the location of potential surface waters and water treatment facilities, (2) the level of treatment and quality of the reclaimed water, (3) the water quality requirements for potable water, and (4) the public acceptance of reuse.

Most of the potable reuse strategies recommended in this RWP are considered direct reuse because they do not have sufficient evidence that the reuse water would be retained in a natural environmental buffer for what would be considered an extended amount of time. By TWDB definition, indirect reuse refers to water that is returned to a natural water body so that an additional permit is required to access that water after buffering. A few indirect potable reuse projects are included, and one of those exceptions is a new indirect potable reuse project for Brownsville Public Utilities Board (PUB) that takes treated effluent through a pipeline and outfalls in a resaca before reaching the water treatment plant. In addition to the submitted potable reuse WMSs, an evaluation of wastewater treatment plants in the region was performed to determine other entities that could benefit from potable reuse.

Many of the locations where potable reuse was recommended are in the Nueces-Rio Grande Basin, but the source waters are predominantly from the Rio Grande. Wastewater reuse projects will primarily impact the flows into the drainage network, including the Arroyo Colorado. Water rights holders along the Arroyo Colorado and other drainage canals in the Nueces Rio-Grande Basin could potentially be impacted, including irrigators, some shrimp farming, and other aquaculture.

ES.4.4 Surface Water Treatment and Distribution/Transmission

Operational, treatment, and distribution/transmission projects that allow a WUG to either access a new supply or develop new supplies are included as municipal infrastructure improvements. Municipal infrastructure improvements focus on problem-specific WMSs that relate to treatment or distribution and transmission. Insufficient treatment capacity or capability can be a supply limitation and transmission and distribution projects may be required for entities that need to expand to new areas of the utility to support growth or are experiencing significant water losses due to eroded pipelines, or leaking water tanks. Because these projects are particular to the municipal utility systems, they were evaluated individually from the available information.

ES.4.5 Storage Reservoirs

Storage reservoirs include both on-channel and off-channel new storage in the region. In some cases, other strategy categories contain projects that also include small storage ponds/reservoirs that are included within the larger project. Descriptions of those are included in the other strategy categories.

Four off-channel reservoirs are included as recommended strategies in the 2026 Plan.

The Banco Morales Reservoir project was requested by Brownsville PUB and is for the construction of an off-channel raw water reservoir to capture excess water from the lower Rio Grande that currently flows into the Gulf of Mexico. The other three (Delta “Panchita” Reservoir, Santa Cruz Reservoir, and Engleman Reservoir) are included with water treatment plants and fall under a regional water facility type of strategy called the Delta Region Water Management Supply. This strategy was requested by the Hidalgo County Drainage District #1 and involves the construction of the three reservoirs in northeastern Hidalgo County to capture tailwaters and precipitation runoff for beneficial use.

One alternative storage reservoir strategy is requested by Brownsville PUB for the construction of a weir and on-channel reservoir to capture and store excess river flow for an additional water supply in the lower Rio Grande Valley. The weir and reservoir would be located about 4 miles southeast of Brownsville.

ES.4.6 Fresh Groundwater

Although Region M relies mostly on surface water, numerous entities and individuals rely on minimally treated groundwater to meet their needs. Utilities that are farther from the Rio Grande and surface water distribution networks have few alternative sources and have identified portions of the aquifer(s) that produce acceptable water for municipal use without advanced treatment technology.

In some cases, where there appears to be additional available fresh groundwater, further development of that source is recommended within the MAG values for the applicable aquifer. In some cases, this is the recommendation for County-Other entities, where domestic wells are distributed over a large area and pump small amounts for a single household.

ES.4.7 Desalination

Several desalination methods are used to treat brackish and saline groundwater and seawater, the most common of which is membrane technology. The most prevalent membrane technology is reverse osmosis (RO). Brackish or saline water is highly pressurized and pushed through semipermeable membranes that separate the brackish or saline water into fresh water and a concentrated byproduct. For higher TDS found in seawater, RO becomes significantly more energy intensive and has a lower yield of permeate, or fresh water. A typical pressure for seawater with 35,000 mg/L could be in excess of 1,000 pounds per square inch (psi). That compares to less than 200 psi for 3,000 mg/L TDS groundwater. The higher TDS plants yield less than 50 percent of the water supplied. The remaining 50 percent is the concentrated byproduct, which generally requires disposal and can add significant costs to a project. This compares to approximately 80 percent with the lower salinity brackish water facilities. Surface water intakes will require additional pretreatment of suspended solids prior to the RO treatment.

ES.4.7.1 Brackish Groundwater Development and Treatment

Texas currently has 53 municipal brackish desalination plants, with a combined capacity of about 157 million gallons per day (mgd). That includes 90 mgd of brackish groundwater desalination and 65 mgd of brackish surface water desalination.[9]

The disposal of concentrate from desalination facilities will increase levels of TDS in the receiving streams if it is not disposed of through deep well injection. Many of the facilities that are currently treating brackish groundwater dispose of concentrate in the drainage canal network in the Nueces-Rio

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[9] Texas Water Development Board Desalination Facts. Desalination Facts - Innovative Water Technologies | Texas Water Development Board Accessed 1/14/25.

Grande Basin, which is a part of why desalination is affordable for some utilities in the region. This network of canals is usually brackish and discharges into the Laguna Madre, parts of which are naturally hypersaline. The greatest recent threat to wildlife in the LLM has been increased inflows of low-salinity water.

As with any groundwater development project, there is potential to affect the quality of the aquifer as more water is drawn from it. While the recommended projects stay within the approved groundwater availability for each aquifer, land subsidence may be a byproduct of increased groundwater pumping.

ES.4.7.2 Seawater Desalination

Texas does not yet have a seawater desalination plant. Charged with developing the first seawater desalination plant in Texas, the TWDB has completed multiple feasibility studies and pilot-plant studies. To this date, two desalination plants have been proposed within Region M – one by the Brownsville PUB and the other by the Laguna Madre Water District.

Seawater desalination remains one of the higher cost WMSs, but costs have declined over the years as technology advances. When placed in conjunction with power generation facilities, power costs can be lower, and a combined water intake and discharge will lower, capital costs. Assessing the actual cost should be included in a feasibility analysis.

ES.4.8 Aquifer Storage and Recovery

HB807 requires that aquifer storage and recovery (ASR) be considered in each RWP. ASR is typically a way to capture water when there are excess surface water flows, similar to a surface reservoir. However, the water is then pumped to a confined aquifer where it can be pumped back out as needed. The benefits compared with surface water reservoirs include that there are no losses to evaporation, and that ASR is likely to be simpler in terms of permitting and construction. The drawbacks include very specific requirements for the local geology to make ASR feasible, and the potential for losses.

At this time, the region is not recommending an ASR project, although one project for Eagle Pass is included as an alternative strategy. Few entities have run-of-the-river water rights for the Rio Grande, which enable higher withdrawals when the river is full. It is possible that water right holders could potentially use water during “no-charge pumping” periods to charge an ASR system, but this would need to be evaluated. Additionally, much more information is required about the suitability of the geology and hydrogeology of the region.

ES.5 Drought Planning and Threats to Resources

TCEQ requires water conservation plans (WCPs) to be developed, implemented, and submitted by municipal, industrial/mining, and other non-agricultural water right holders of 1,000 ac-ft of water per year, and agricultural water right holders of 10,000 ac-ft/yr or more. Additionally, all wholesale and retail public water suppliers and IDs are required to develop a drought contingency plan (DCP). WCPs are required to include quantified 5- and 10-year targets for water savings, and DCPs outline entity responses to drought, including triggers for conservation stages and the restrictions of water use in each drought stage.

The drought response varies from entity to entity, primarily between those who serve customers, including irrigators, with raw water and those who deliver treated water. For those entities, such as IDs, that deliver water to irrigators, the response to drought is focused on the allocation system and how agricultural water rights are fulfilled when supplies are limited by the TCEQ Watermaster. Each water district responds slightly differently, in some cases allowing water to be sold between farmers in their district, or for farmers to consolidate their allocations on a portion of their land, leaving other areas for dry land farming or to fallow.

Those entities who deliver treated water generally developed triggers that were based either on the remaining municipal water rights available to the city for that year or the capacities of their treatment plants, so that high demands on the plants trigger a conservation stage. The conservation stages for cities included limitations on car washing and lawn watering, ranging from voluntary in early stages to some fines or other penalties in later stages.

The Rio Grande RWPG recognizes that there is known, unquantified uncertainty associated with estimating population, water demands, hydrologic conditions, and WMS firm yields, as well as the current trends of the reservoir firm yields and the decreased inflows from tributaries on both the US side and Mexican side. On a regionwide basis, the Rio Grande RWPG considered planning for uncertainty and Drought Worse than the Drought of Record (DWDOR), such as incorporation of forecasting tools and climate models to evaluate supplies or application of a safety factor. However, the Rio Grande RWPG chose not to plan for uncertainty or DWDOR on a regional scale at this time because forecasting tools have not been able to provide the resolution needed for water planning on a regional basis.

Additionally, the Rio Grande RWPG recognizes the uncertainty of the water deliveries from Mexico. On November 7, 2024, the United States and Mexico International Boundary Water Commissions signed Minute 331 which focused on improving reliability and predictability of Rio Grande water deliveries. The Minute, which comes amid growing water scarcity on both sides of the Rio Grande, recognizes the importance to the United States of incorporating Texas water deliveries in the annual allocation plans of Mexico's water managers. During the current cycle, which began on October 25, 2020, Mexico has delivered a total of 425,405 ac-ft. Mexico's obligation under the treaty is to deliver 1.75 million ac-ft by October 24, 2025, absent extraordinary drought or a serious infrastructure accident.

While planning measures to address a DWDOR have not been included on a regionwide basis, several entities have recommended strategies and projects in this plan that will provide them with a secondary source of water, such as potable reuse or groundwater, in order to continue to plan for times when surface water availability may be limited.

ES.5.1 Threats to Agricultural and Natural Resources

As described in detail in Chapter 3, under the existing water rights system, irrigation water use is a "residual" claimant to available water supplies from the Rio Grande. During periods of low inflows to the reservoir system, when there are little or no allocations made to irrigation and mining storage accounts, these users deplete their storage accounts and may suffer shortages.

An additional threat to the region's water supplies is unchecked development of groundwater resources. Only a small portion of the region is in a GCD. Without a GCD, the conservation goals described in the desired future conditions for each aquifer cannot be implemented or monitored.

Pumping groundwater in some locations may impact surface water, especially near the Amistad Dam. Water marketing companies are actively seeking water sources to be sold to entities in need of new water sources. In and around Val Verde County, there is strong evidence of interaction between groundwater and surface water. The pumping of groundwater in the Devils and Pecos River basins has been shown to directly impact these streamflows and the flows in Goodenough Springs, which play a significant role in supplying water for Region M. Any reduction in the water supply in the Amistad Reservoir presents a threat to the whole region.

Another threat to agricultural and natural resources of the region is the impact of urbanization on currently undeveloped areas and the loss of water and habitat availability for wildlife. This would have a negative impact on ecotourism. Urbanization plays a major role in determining how water resources will be used in the future. Particularly in Cameron and Hidalgo counties, projected urbanization is expected to significantly reduce the area of irrigable farmland. In addition to the direct reduction of irrigable farmland acreage due to change in land use, urbanization also impacts adjacent farmland by increasing property values and restricting some types of agricultural activities (e.g., use of pesticides).

The conservation WMSs discussed in this plan aim to assist water users in making the most of what water is available in drought years. IDs play a major role in the delivery of water, and improvements of their operations and efficiency represent a significant portion of the strategy for meeting future demands. Given the uncertainty associated with irrigation water rights for all of the reasons described above, it will become increasingly critical for all users in Region M to carefully manage their water.

ES.6 Policy Recommendations and Unique Sites

As in previous regional water planning cycles, the Rio Grande RWPG continues to choose not to designate any stream segments or reservoirs as unique.

Policy recommendations from the Rio Grande RWPG that address State, Federal, and international issues have been updated for this cycle and are included in Chapter 8 of the plan.

ES.7 Implementation and Comparison to the Previous Regional Water Plan

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 WMSs that can be used to meet projected needs. Comparing the current plan to the previous plan allows for an understanding of how things change within these 5-year cycles.

In addition, an implementation survey was conducted for the 2026 Rio Grande RWP, which describes the progress toward implementing projects that were recommended in the 2021 RWP.

ES.8 Public Participation

Public participation is the basis of the regional water planning process initiated by Senate Bill 2 in 1997. Under Texas Water Development Board (TWDB) rules laid out in 31 Texas Administrative Code (TAC) §357, regional water planning groups (RWPGs) must include a broad cross-section of stakeholder groups representing communities throughout the region.

The Rio Grande RWPG abides by the Open Meetings Act[10] and Public Information Act[11], which require members of governmental bodies to participate in education training and open records training pursuant to Sections 551.005 and 552.012 of the Texas Government Code, respectively. These Acts in conjunction determine how open meetings are operated and public information is made available to the public. More information can be found on the Office of the Texas Attorney General website (https://www.texasattorneygeneral.gov/). The Rio Grande RWPG met all requirements under the Texas Open Meetings Act and Public Information Act in accordance with Title 31 of the Texas Administrative Code (31 TAC) Sections 357.12, 357.21, and 357.50(f).

The group also identified key groups of stakeholders that represent utilities, irrigation districts (IDs), farmers, and environmental organizations, beyond the individual stakeholders on the planning group, that have participated in development of the plan. The Rio Grande RWPG held regular meetings throughout the planning process, generally on a monthly basis. Each meeting provided opportunity for public comment. Meeting schedules, agendas, and minutes were emailed to the planning group and posted on the Region M website, and the meeting dates were listed on the TWDB website. The Rio Grande RWPG's website: www.RioGrandeWaterPlan.org, is a resource for the public on issues of concern to regional water planning and information on the planning process.

[10] Office of the Texas Attorney General. "Open Meetings Act." https://www.texasattorneygeneral.gov/open-government/open-meetings-act-training.

[11] Office of the Texas Attorney General. "Public Information Act." https://www.texasattorneygeneral.gov/open-government/governmental-bodies/pia-and-oma-training-resources/public-information-act-training.