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CHAPTER 2.0 :CURRENT AND PROJECTED POPULATION & WATER DEMAND FOR THE RIO GRANDE REGION

The primary goal in preparing the Rio Grande Regional Water Plan is to estimate current and future water demands within the region. In following chapters, water demand projections are compared with estimates of currently available water supplies to identify the location, extent, and timing of any future water shortages or surpluses. Texas Water Development Board (TWDB) rules (357.7) require that the results of the analyses of current and projected population and water demands be reported by city, by county, by river basin, and by categories such as irrigation, mining, manufacturing, municipal, livestock, and steam electric. Exhibit B (1.1.2) provides updated guidelines:

“The development of new population and water demand projections will be the most relevant feature of the first phase of this next round of planning. TWDB staff will prepare draft population and water demand projections for all the regions and their water user groups.”

TWDB staff projections were approved by the board for use in regional water plans. These projections are the main reference tools for this chapter dealing specifically with population growth and associated water demands.

Table 2.1 summarizes the Rio Grande Regional Water Planning Area’s projected population and expected water demand through the year 2060, delineated by category of use. All tables and graphs are based on data provided by TWDB.

Table 2.1: Population and Water Demand Projections Summary for the Rio Grande Regional Water Planning Area (RGRPA)

Regional Total Projection	D2000	D2010	D2020	D2030	D2040	D2050	D2060
Population	1,236,246	1,581,207	1,973,188	2,401,223	2,854,613	3,337,618	3,826,001
Irrigation (AF/YR)	1,209,647	1,163,633	1,082,231	981,749	981,749	981,749	981,749
Livestock (AF/YR)	5,817	5,817	5,817	5,817	5,817	5,817	5,817
Manufacturing (AF/YR)	6,208	7,509	8,274	8,966	9,654	10,256	11,059
Mining (AF/YR)	3,869	4,186	4,341	4,433	4,523	4,612	4,692
Municipal (AF/YR)	226,536	279,633	338,716	403,511	472,632	547,747	625,743
Steam Electric (AF/YR)	6,780	13,463	16,864	19,716	23,192	27,430	32,598
Total Water Demand (AF/YR)	1,458,857	1,474,241	1,456,243	1,424,192	1,497,567	1,577,611	1,661,658

As indicated, the previous regional water plan projected the Rio Grande Region’s population to more than triple over the next 50 years, increasing from approximately 1.23 million people at present to 3.82 million by 2060. This dramatic growth is the principal factor underlying projected increases in municipal, manufacturing, and steam electric water demands. However, in terms of total demand within this region, projected increases in urban water demands are slightly offset by projected *decreases* in irrigation water demand. The result is a projected approximate *increase* of 14 percent in total water demand over the 50-year planning period.

The following sections of this chapter describe the methodology used to develop these projections. This chapter also presents projections of population and water demand for cities, for major providers of municipal and manufacturing water, and for categories of water use including municipal, manufacturing, irrigation, steam electric power generation, mining, and livestock. Projected demands are also provided for each of the two river basins and the one coastal basin partially located within this region.

2.1 TWDB Guidelines For Revisions To Population And Water Demand Projections

To have a better standard of guidelines for calculating accurate population and water demand projections, a second round of planning was conducted, resulting in development of Exhibit B – a new set of guidelines adopted by the TWDB in accordance with all provisions of 31 Texas Administrative Code (TAC) Chapter 357. Provisions set forth in the TAC or TWDB agency rules take precedence over guidelines set forth in Exhibit B. Exhibit B Section 4.2 explains the process:

“Population and water demand projections for 2010 through 2060 for the state, counties, cities, and county-other (including utility sub-components) will be reviewed through a process coordinated by the Executive Administrator of the TWDB with the Planning Groups, TNRCC [now TCEQ], TDA, and the TPWD.

New population projections, using a standard cohort-component procedure, will be developed using the 2000 Census and other pertinent sources. Projections will be developed first at the county level; then the projections will be allocated to municipal and county-other water user groups.”

TWDB met regularly with representatives of the various parties involved to achieve consensus. The projections were extensively evaluated before reaching final draft stage. Then, after lengthy analysis of population and water demand projections, TWDB approved these projections.

2.2 Population Projections

Population and water demand revisions incorporated up-to-date information. This section contains information on the planning group’s methodology – a four-step process based on TWDB guidelines.

The first step was to project the living population at the beginning of the year who are expected to survive to the target year. The second step was to determine approximate net migration of this population; net migration rates were multiplied by adjusted population figures in the launch year. The third step was to project number of births and net impact of mortality and migration on the youngest age group. The fourth step was to combine results from the mortality, migration, and fertility modules. (This methodology is further explained in SB1 and Exhibit B. Race and gender were considered in calculating these projections.)

Population is the main factor in calculating total municipal water demand, including residential and commercial uses, and this data was then used to calculate each city’s base per capita water use. Overall, municipal water demand projections are the product of three variables: current and projected population, per capita water use, and assumptions about the effects of certain water conservation measures. Therefore, future water savings resulting from installation of more water-efficient fixtures (according to the 1991 State Water-Efficient Plumbing Act) were also a consideration.

Population of the eight counties comprising the Rio Grande Regional Water Planning Area is projected to grow at an average rate of nearly 2 percent annually over the 50-year planning period. This suggests an increase from approximately 1.58 million residents in 2010 to over 3.82 million in 2060. Table 2.2 presents these projections, by county, for each decade of the planning period. Cameron and Hidalgo Counties lead with the highest total populations, while Webb County is forecast to experience the greatest proportionate annual increase for the region.

Figure 2.1: RGRWPA Population Projections (by decade)

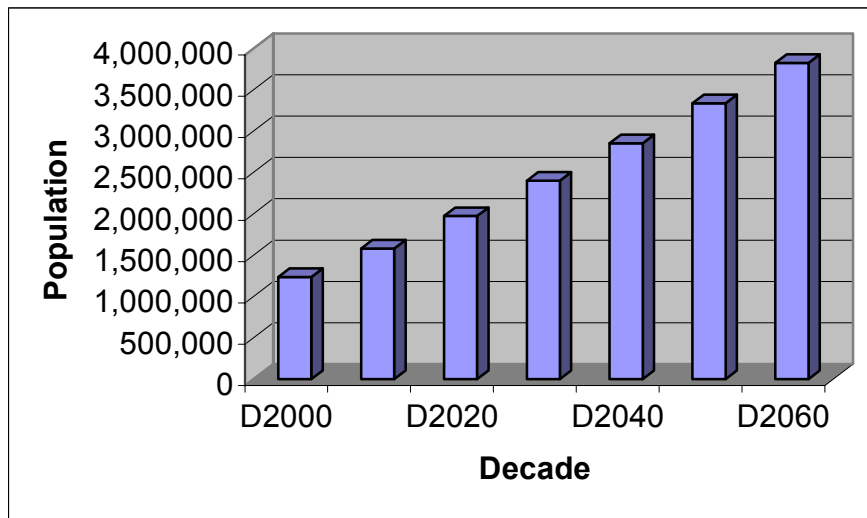
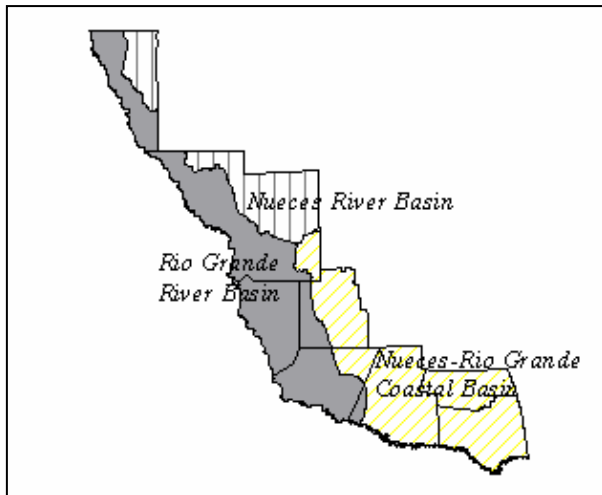


Table 2.2: RGRWPA Population - Projections by County

County Name	2000	2010	2020	2030	2040	2050	2060
CAMERON	335,227	415,136	499,618	586,944	673,996	761,073	843,894
HIDALGO	569,463	744,258	948,488	1,177,243	1,424,767	1,695,114	1,972,453
JIM HOGG	5,281	5,593	5,985	6,286	6,538	6,468	6,225
MAVERICK	47,297	55,892	64,984	73,581	81,032	87,850	93,381
STARR	53,597	66,137	79,538	93,338	107,249	120,959	134,115
WEBB	193,117	257,647	333,451	418,332	511,710	613,774	721,586
WILLACY	20,082	22,519	24,907	27,084	28,835	30,026	30,614
ZAPATA	12,182	14,025	16,217	18,415	20,486	22,354	23,733
Totals	1,236,246	1,581,207	1,973,188	2,401,223	2,854,613	3,337,618	3,826,001

Figure 2.2: River Basins in the RGRWPA



As discussed in Chapter 1, the Rio Grande Regional Water Planning Area covers a portion of the Nueces and Rio Grande River Basins as well as a portion of the Nueces-Rio Grande Coastal Basin. Figure 2.1 shows the approximate boundaries of these basins in relation to the region. Table 2.3 presents the population projections, by basin, for the region.

Table 2.3: Population Projection by River Basin and Decade

River Basin	1990	2000	2010	2020	2030	2040	2050	2060
NUECES-RIO GRANDE	661,367	922,204	1,176,504	1,464,313	1,778,744	2,110,863	2,464,534	2,820,050
RIO GRANDE	223,775	313,359	403,904	507,943	621,400	742,513	871,675	1,004,363
NUECES	751	683	799	932	1,079	1,237	1,409	1,588
Total	885,893	1,236,246	1,581,207	1,973,188	2,401,223	2,854,613	3,337,618	3,826,001

2.3 Water Demand Projections

Total annual water demand for the Rio Grande Regional Water Planning Area is projected to *increase* until 2010, then *decrease* until 2030, and then steadily *increase* until 2060. This trend is attributable to diminishing irrigated acreage and rising urban populations, especially in the Rio Grande Valley, as land use changes from agriculture to urbanization. (See Figure 2.3.)

Consequently, over time, total water demand for irrigation in the region is projected to fall from the current 82.9 percent to 59.1 percent by 2060. During the same period, municipal water demands are projected to increase from 15.5 percent at present to 37.7 percent in 2060. Figures 2.4 and 2.5 show the relative projected water demand, by type of use, for the years 2000 and 2060.

Figure 2.3: RGRWPA Total Water Demand Projections

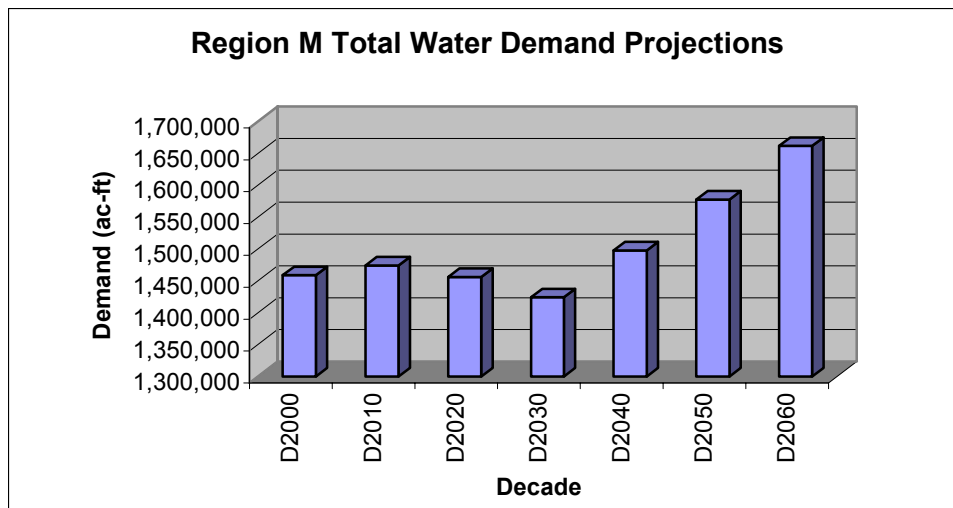


Figure 2.4: Year 2000 Total Water Demand by Type of Use

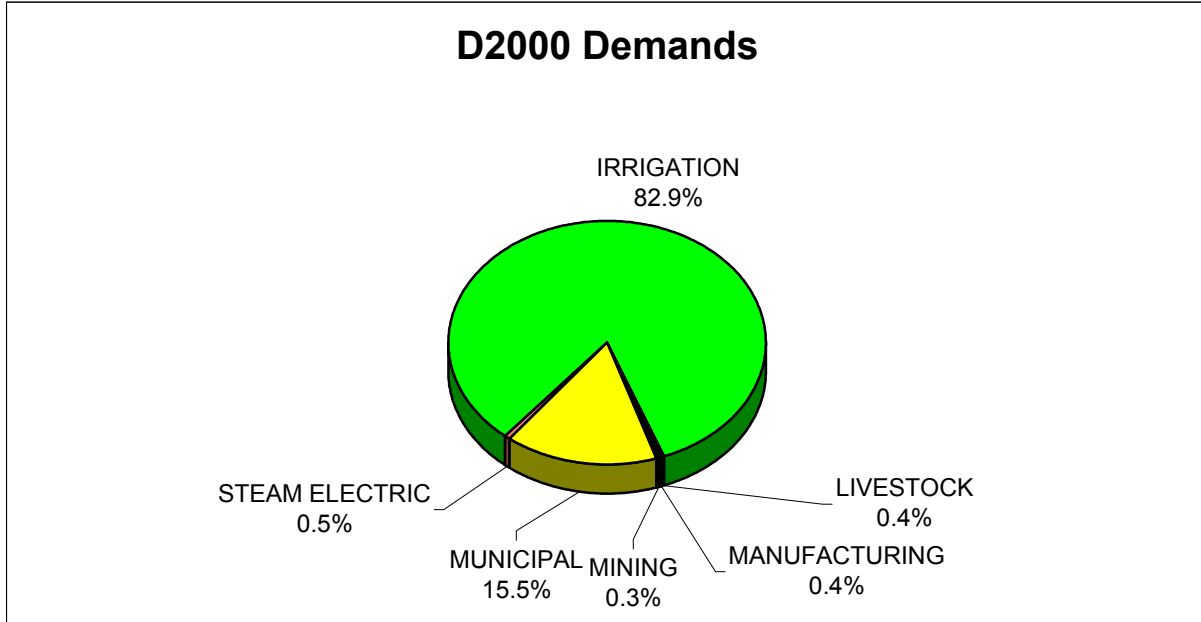
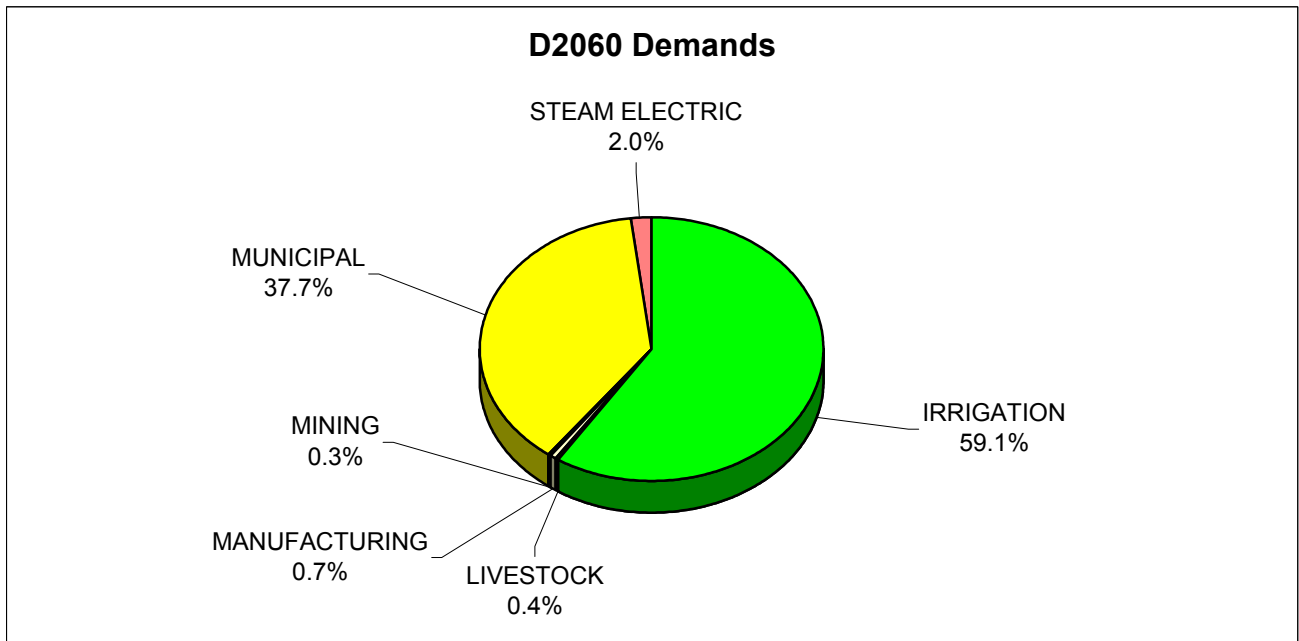


Figure 2.5: Year 2060 Total Water Demand by Type of Use

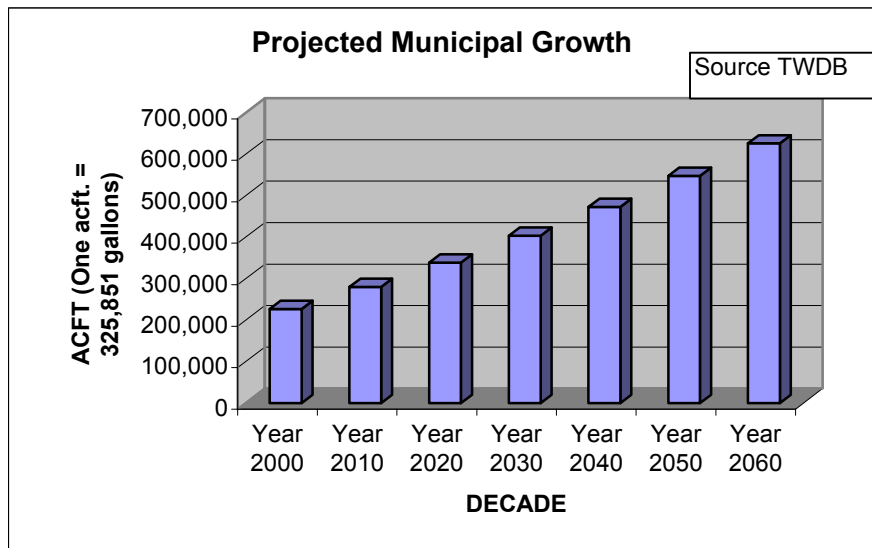


2.3.1 Projections for Municipal Water Demand

Municipal water consumption is calculated from data about residential, institutional, and commercial users. Factors affecting future municipal water use are population growth, climatic conditions, and water conservation practices. Because the region’s population is projected to at least triple over the next 50 years, growth in municipal water use is inevitable.

Overall, annual municipal water demand within the region is projected to almost double from 2010 to 2060. (See Figure 2.6.) While this represents a major increase over the planning period, growth in water usage is significantly slower than rate of population growth. These projections are attributable to anticipated improvements in municipal water use efficiency and in water savings associated with the adoption of various conservation measures such as those proposed in the 1991 State Water Efficient Plumbing Act.

Figure 2.6: Projected RGRWPA Municipal Demand



PROJECTIONS

Table 2.4: Municipal Water Demand Projections by County (in acre-feet per year)

County Name	Year 2000	Year 2010	Year 2020	Year 2030	Year 2040	Year 2050	Year 2060
CAMERON	71,792	86,496	102,264	118,321	134,693	151,275	167,665
HIDALGO	88,037	110,286	135,454	163,992	194,819	229,913	266,564
JIM HOGG	852	884	918	944	959	943	906
MA VERICK	7,911	8,912	9,939	10,911	11,751	12,552	13,274
STARR	10,677	12,648	14,726	16,898	19,095	21,293	23,513
WEBB	42,118	54,855	69,401	86,001	104,503	124,614	146,420
WILLACY	3,098	3,287	3,483	3,651	3,779	3,890	3,953
ZAPATA	2,051	2,265	2,531	2,793	3,033	3,267	3,448
TOTAL	226,536	279,633	338,716	403,511	472,632	547,747	625,743

The region's municipal water demand is projected to triple in the next 50 years, increasing from 279,633 acre-feet per year in 2010 to 625,743 acre-feet per year in 2060. Table 2.4 presents this projected growth, by county. As indicated, demand is concentrated in Cameron, Hidalgo, and Webb counties, which together account for nearly 89 percent of municipal water consumption in the region. Cameron County alone accounts for 38 percent, Hidalgo County accounts for 39 percent, and Webb County accounts for 19 percent of the region's municipal water use.

2.3.2 Projections for Manufacturing Water Demand

For SB 1 planning purposes, manufacturing water use is defined as the cumulative water demand on county and river basins for all industries within specified industrial classifications (SIC) determined by the TWDB. Projections of manufacturing water use developed by the TWDB and employed in the 1997 State Water Plan were used as default projections in this report except where better information warranted a revision. Exhibit B (4.2.4) states the following plan of research for calculating estimates of manufacturing water demand:

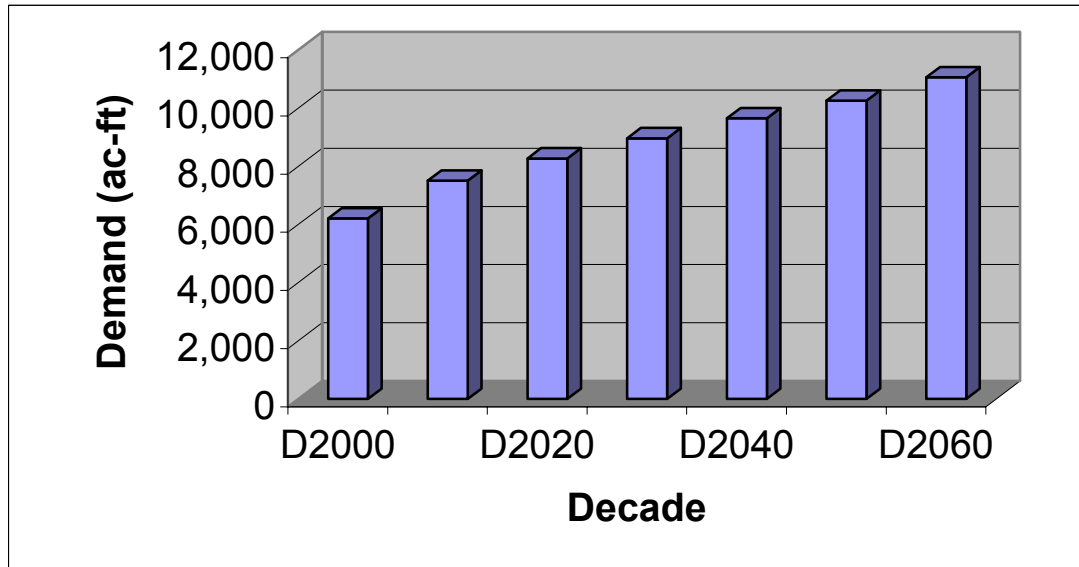
“Complete industry surveys to update water use efficiency estimates developed for the 2002 State Water Plan.

Analyze the impact of technology adoption, and input substitution on the relationship of water used to output.

Develop projections of industry output and associated water use by county.”

The region's demand for manufacturing water demand is projected to increase from approximately 7,509 acre-feet per year in 2010 to 11,059 acre-feet per year by 2060 (see Figure 2.7.), primarily due to projected population growth in Cameron and Hidalgo Counties. The TWDB has no data to enable similar projections for Jim Hogg, Starr, and Zapata Counties. Table 2.5 illustrates projected demand for manufacturing water in each of the counties and shows that Cameron and Hidalgo Counties will account for 98 percent of the total manufacturing need.

Figure 2.7: Projected RGRWPA Manufacturing Demand



PROJECTIONS

Table 2.5: Manufacturing Water Demand by County (in acre-feet per year)

COUNTY	2000	2010	2020	2030	2040	2050	2060
CAMERON	3,430	4,156	4,590	4,983	5,372	5,709	6,165
HIDALGO	2,674	3,236	3,559	3,851	4,143	4,403	4,742
JIM HOGG	0	0	0	0	0	0	0
MAVERICK	56	64	69	73	77	80	85
STARR	0	0	0	0	0	0	0
WEBB	23	28	31	34	37	39	42
WILLACY	25	25	25	25	25	25	25
ZAPATA	0	0	0	0	0	0	0
Total	6,208	7,509	8,274	8,966	9,654	10,256	11,059

2.3.3 Projections for Irrigation Water Demand

Irrigation water demand projections were determined by the Rio Grande RWPG with assistance from TCEQ. The numbers used differ from those recommended by the TWDB, which used a base year irrigation demand of 909,590 acre-feet. In researching the subject, the regional planning group realized that the base year value originally used by the TWDB is not accurate for actual irrigation demands. Data regarding annual rainfall, Amistad/Falcon reservoir levels, yearly allocations, and actual irrigation water usage was compiled from 1989 to 2004. (See the appendix.) The most accurate depiction of irrigation demand would take place in a year with normal rainfall and normal reservoir levels; based on these parameters, 1994 most accurately represented normal conditions. In 1994, rainfall totaled 20 inches, 2.5 inches below the average rainfall from 1989 to 2004. Also, the Amistad/Falcon reservoir system sat at 86.5% of total capacity. Total irrigation usage as reported by TCEQ was 1,180,278 acre-feet. This number is a combination of charged and no-charge water in the middle and lower Rio Grande River.

In addition to Amistad/Falcon source water, irrigation water also comes from Rio Grande tributaries, groundwater from various aquifers, local irrigation supplies, and reuse. These additional sources were treated as “supply equals demand” and totaled 29,377 acre-feet.

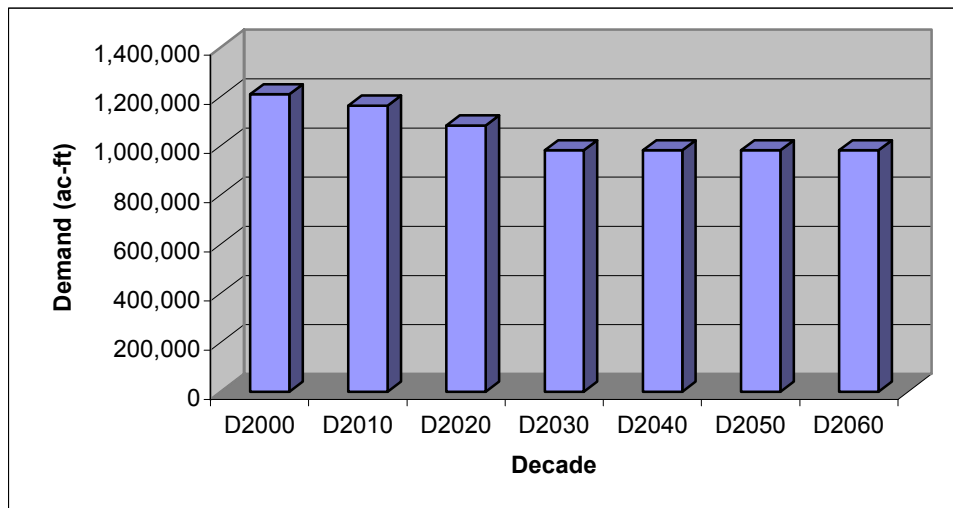
To summarize base year demand, 1994 was taken as a normal year with water usage from the Amistad/Falcon reservoir system totaling 1,180,278 acre-feet. Additionally, 29,377 acre-feet of irrigation supply/demand comes from other surface and groundwater sources. Summing these two figures gives a base year irrigation demand of 1,209,647 acre-feet.

In order to break down the irrigation demand from the Amistad/Falcon system (1,180,278 ac-ft) into by-county use, water rights associated with the Amistad/Falcon system were compiled and compared. For instance, irrigators in Cameron County hold 31.7 percent of all Region M irrigation water rights. This percentage was multiplied by the base year demand to arrive at the Cameron County base year demand for Amistad/Falcon water (374,585 ac-ft). The same methodology was used for each county in the region. As described earlier, additional water sources exist to provide irrigation water. They were treated as “supply equals demand” and were simply added to the Amistad/Falcon demands.

Projected irrigation demands for the extent of this planning study (2010-2060) were determined using the same percentage change in demand for each county as was used by the TWDB. (Reference Section 4.2.4.b of Exhibit B, provided as a supplement to this report.

The region’s annual demand for irrigation water is projected to decrease from 1,209,647 acre-feet per year in 2000 to 981,749 acre-feet per year in 2060 (see Figure 2.8). This lower demand estimate arises from spreading urbanization which reduces irrigable acreage, primarily in Cameron and Hidalgo Counties.

Figure 2.8: Projected RGRWPA Irrigation Water Demand



PROJECTIONS

Table 2.6: Irrigation Water Demand Projections by County (in acre-feet per year)

COUNTY	2000	2010	2020	2030	2040	2050	2060
CAMERON	377,925	367,404	347,771	325,144	325,144	325,144	325,144
HIDALGO	611,399	583,030	525,971	453,772	453,772	453,772	453,772
JIM HOGG	6,413	817	817	817	817	817	817
MAVERICK	93,145	95,040	91,693	87,863	87,863	87,863	87,863
STARR	30,693	31,191	30,108	29,070	29,070	29,070	29,070
WEBB	23,723	20,507	19,548	18,654	18,654	18,654	18,654
WILLACY	58,586	59,191	60,203	60,623	60,623	60,623	60,623
ZAPATA	7,763	6,454	6,121	5,805	5,805	5,805	5,805
TOTAL	1,209,647	1,163,633	1,082,231	981,749	981,749	981,749	981,749

Cameron County is projected to comprise 31.2 percent and 33.1 percent of the total demand for irrigation water in 2000 and 2060, respectively. Hidalgo currently accounts for 50.5 percent of the total irrigation demand, decreasing to 46.2 percent in 2060. Not coincidentally, these two counties have the highest percentage of water rights associated with the Amistad/Falcon system.

Important to note is that irrigation demands are highly variable from year to year. Overall agricultural economic conditions, weather conditions, and water availability are factors directly influencing the demand for irrigation water.

Market prices of agricultural commodities influence the amount of irrigated acreage planted each year and the types of crops planted. Also, above-normal or below-normal precipitation in irrigated areas can either suppress or increase irrigation demand, and because Amistad/Falcon irrigation rights are based on water availability, irrigation shortages can have the effect of suppressing water demand.

2.3.4 Projections for Steam Electric Water Demand

The TWDB [Exhibit B (4.2.4)] states a specific plan of research for estimating demand for steam electric water:

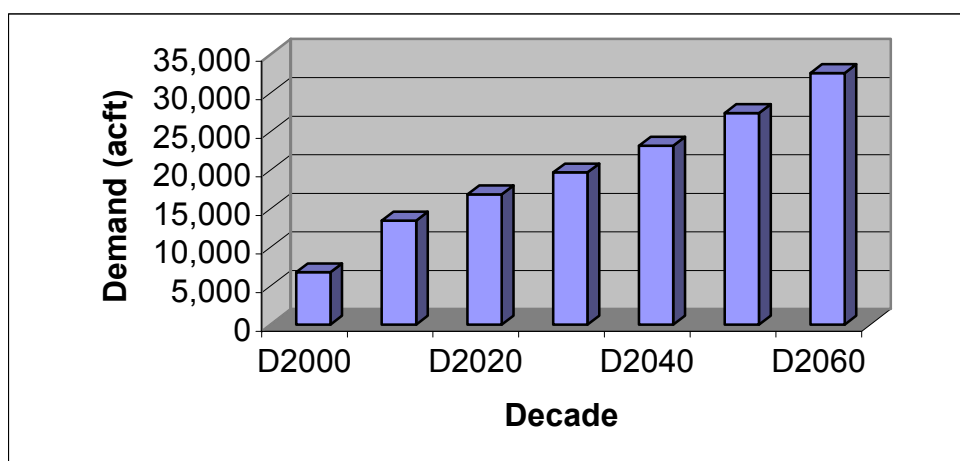
“The plan of research includes:

- *Description of water-consuming systems currently used in power generation facilities.*
- *Estimation of water consumption rates for each identified water-consuming system.*
- *Correlation of current state population with current electric use by region.*
- *Projection of electric power consumption requirements by county and for the state, based on population projections.*
- *Identification of current and potential water sources for demand by power generation.*
- *Estimation of future water use by power generation.*
- *Development and application of allocation methodology to derive demand projections by county.”*

Annual demand for steam electric water is projected to increase from 13,463 acre-feet per year in 2010 to 32,598 acre-feet per year in 2060. (See Figure 2.9.) Most of this increase is expected to occur between 2000 and 2010 as a result of adding new capacity for generating steam electric power in Cameron and Webb counties.

Table 2.7 presents the projected demand for steam electric water, by county, for each of the region’s eight counties. Cameron County makes up 12 percent of the demand. Hidalgo County accounts for 77 percent, and Webb County accounts for 11 percent. TWDB has no data about demand for steam electric water in Jim Hogg, Maverick, Starr, Willacy, and Zapata Counties.

Figure 2.9: Projected RGRWPA Steam Water Demand



PROJECTIONS

Table 2.7: Steam Electric Water Demand Projections by County (in acre-feet per year)

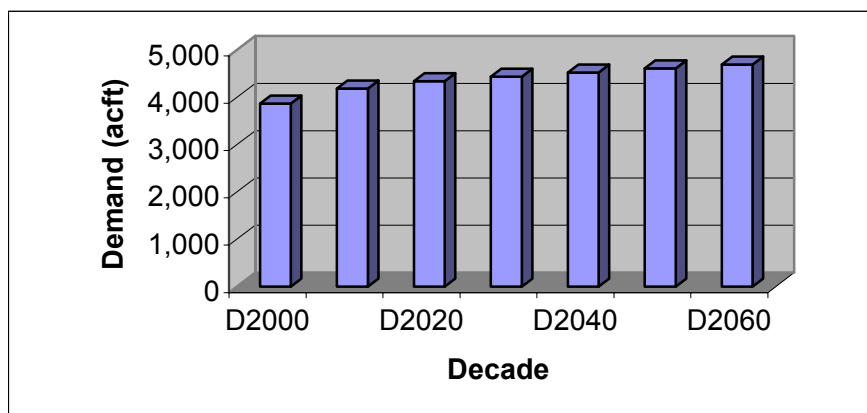
COUNTY	2000	2010	2020	2030	2040	2050	2060
CAMERON	1,498	1,616	1,523	1,780	2,094	2,477	2,944
HIDALGO	3,487	10,355	14,151	16,545	19,462	23,018	27,354
JIM HOGG	0	0	0	0	0	0	0
MAVERICK	0	0	0	0	0	0	0
STARR	0	0	0	0	0	0	0
WEBB	1,795	1,492	1,190	1,391	1,636	1,935	2,300
WILLACY	0	0	0	0	0	0	0
ZAPATA	0	0	0	0	0	0	0
TOTAL	6,780	13,463	16,864	19,716	23,192	27,430	32,598

2.3.5 Projections for Mining Water Demand

The state’s default demand projections for mining water were based on forecasts of future production levels (sorted by mineral category) and their water use rates. These production projections are derived from state and national historic water use rates and are constrained by accessible mineral reserves in the region. Demand for mining water represents less than 1 percent of the region’s total water needs and is expected to remain relatively constant over the 50-year planning period. (See Figure 2.10.) Use of mining

water is greatest in Webb County (32.6 percent), Starr County (31 percent), and Hidalgo County (30.9 percent). In contrast, Willacy County has the lowest demand (less than 1 percent). Table 2.8 represents projected demand for mining water, by county, for the region.

Figure 2.10: Projected RGRWPA Mining Water Demand



PROJECTIONS

Table 2.8: Mining Water Demand Projections by COUNTY (in acre-feet per year)

COUNTY	2000	2010	2020	2030	2040	2050	2060
CAMERON	8	6	6	6	6	6	6
HIDALGO	1,196	1,442	1,561	1,633	1,704	1,774	1,836
JIM HOGG	27	33	36	37	38	39	40
MAVERICK	140	156	162	166	169	172	175
STARR	1,203	1,315	1,355	1,373	1,390	1,407	1,426
WEBB	1,262	1,204	1,192	1,189	1,187	1,185	1,180
WILLACY	6	6	6	6	6	6	6
ZAPATA	27	24	23	23	23	23	23
TOTAL	3,869	4,186	4,341	4,433	4,523	4,612	4,692

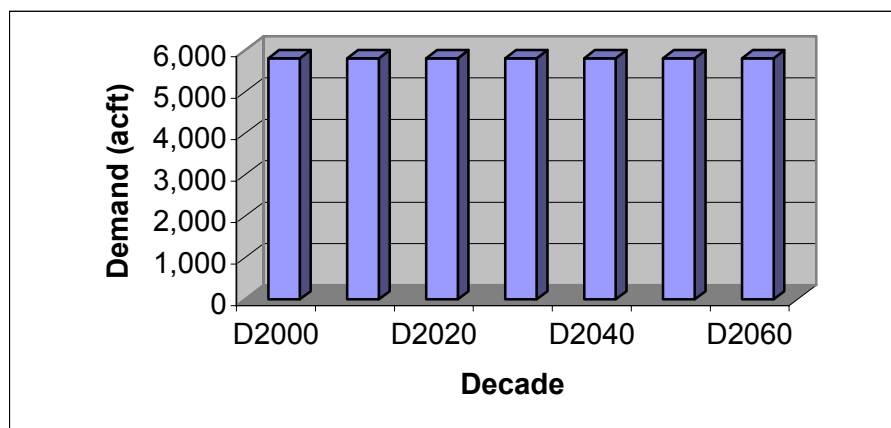
2.3.6 Projections for Livestock Water Demand

The TWDB’s livestock water use projections were developed using Texas Agricultural Statistics Service’s estimates of the numbers and types of livestock, and the Texas A&M Agricultural Extension Service’s estimates of water usage rates for each type of livestock. Total livestock water is determined by multiplying consumption for a given livestock type by the number of that type of livestock in each of the eight counties. Exhibit B (Section 4.2.4) states:

“The 2006 Regional Water Plan will maintain the same rates of change in livestock water demand as included in the 2002 State Water Plan. Base water use for 2000 will be adjusted using the 2000 livestock inventory along with adjustments in water use per unit, based on research by the Texas Agricultural Experiment Station.”

Livestock types are breeding cattle, dairy cattle, fed cattle, hogs, pigs, sheep, goats, hens, broilers, and horses. Surprisingly, demand for livestock water is low compared with other water demands, comprising only 1% of the region’s total water usage. By year 2060, the figure is projected to drop to 0.4% of total water demand.

Figure 2.11: Projected RGRWPA Livestock Water Demand



Livestock water demand is relatively uniform over the eight-county area and is projected to remain fairly constant over the 50-year planning period. (See Figure 2.11.) Table 2.9 presents these projected demands, by county.

PROJECTIONS

Table 2.9: Projected Livestock Water Demand by County (in acre-feet per year)

COUNTY	2000	2010	2020	2030	2040	2050	2060
CAMERON	1,103	1,103	1,103	1,103	1,103	1,103	1,103
HIDALGO	681	681	681	681	681	681	681
JIM HOGG	518	518	518	518	518	518	518
MAVERICK	260	260	260	260	260	260	260
STARR	1,117	1,117	1,117	1,117	1,117	1,117	1,117
WEBB	1,513	1,513	1,513	1,513	1,513	1,513	1,513
WILLACY	151	151	151	151	151	151	151
ZAPATA	474	474	474	474	474	474	474
TOTAL	5,817	5,817	5,817	5,817	5,817	5,817	5,817

2.3.7 Needs for Wholesale Water Providers

Texas Water Development Board guidelines in Exhibit B state that a wholesale water provider is any person or entity, including river authorities and irrigation districts, that has contracts to sell more than 1,000 acre-ft of water wholesale in any one year during the five years immediately preceding the adoption of the last regional water plan. Table 2.10 below indicates the water providers that follow the TWDB guidelines to designate them as Wholesale Water Providers for this region. Demand projection figures were compiled through the TWDB’s database for the region.

DEMAND PROJECTIONS**Table 2.10: Projected Wholesale Water Provider Demand (in acre-feet per year)**

	2010	2020	2030	2040	2050	2060
Brownsville Irrigation & Drainage District	6071	6071	6071	6071	6071	6071
Cameron County WCID #2	15198	15198	15198	15198	15198	15198
Delta Lake Municipal Authority	8200	8200	8200	8200	8200	8200
Donna Irrigation District Hidalgo County #1	6880	6880	6880	6880	6880	6880
City of Eagle Pass	7707	7707	7707	7707	7707	7707
Harlingen Irrigation District	4692	4692	4692	4692	4692	4692
Harlingen Waterworks System	19238	19238	19238	19238	19238	19238
Hidalgo County Irrigation District #6	8291	8291	8291	8291	8291	8291
Hidalgo County WCID#1	1437	1437	1437	1437	1437	1437
Hidalgo County WCID#16	1437	1437	1437	1437	1437	1437
Hidalgo County WCID#2	24667	24667	24667	24667	24667	24667
Hidalgo County WCID#3	13980	13980	13980	13980	13980	13980
Hidalgo County WCID#9	11500	11500	11500	11500	11500	11500
La Feria WCID#3	4852	4852	4852	4852	4852	4852
Laguna Madre WD	7480	7480	7480	7480	7480	7480
City of McAllen	33548	33548	33548	33548	33548	33548
Sharyland WSC	12140	12139	12139	12140	12139	12140
Southmost Regional Water Authority	11844	11844	11844	11844	11844	11844
United Irrigation District	24009	24009	24009	24009	24009	24009
Valley MUD#2	1382	1382	1382	1382	1382	1382
North Alamo WSC	21954	21954	21954	21954	21954	21960

* North Alamo WSC's demands were compiled using the data provided by the WUG database. A water demand analysis of North Alamo WSC as a Wholesale Water Provider was not available at time of print.

ATTACHMENT 2-1

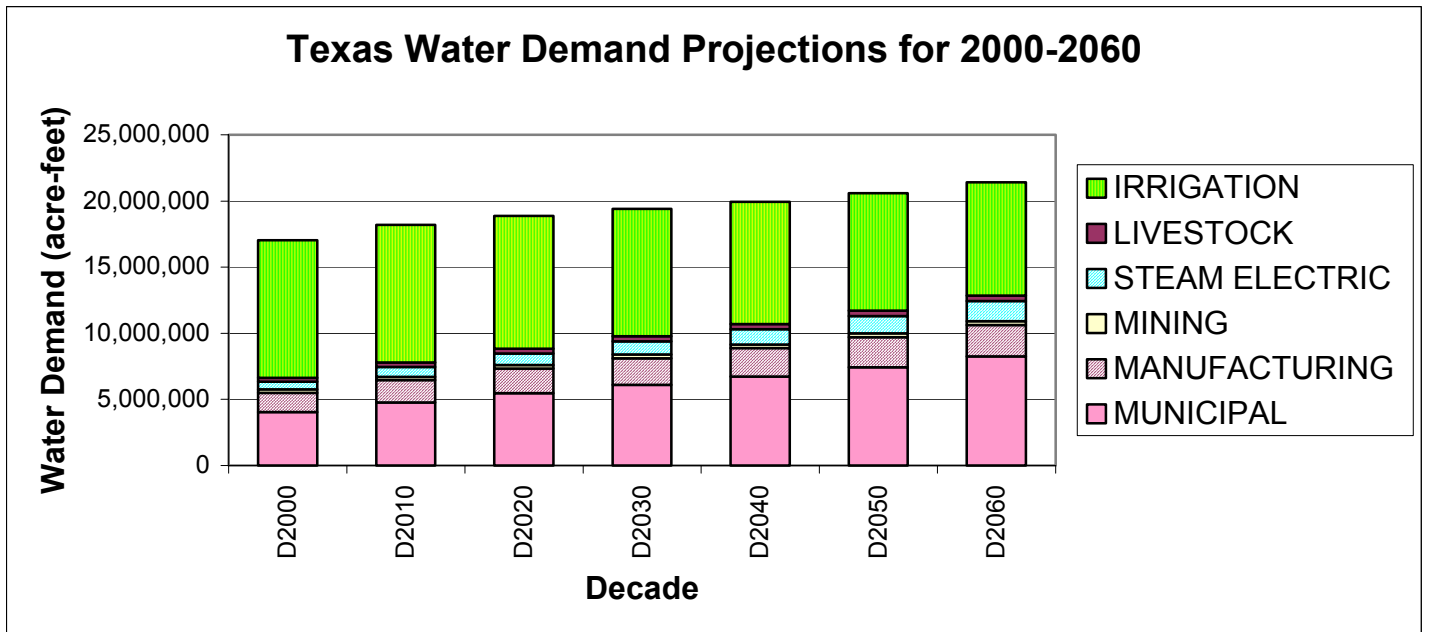
**2006 Regional Water Plan
Population and Water Demand Projections Summary for Region M**

	Regional Total Projection						
	D2000	D2010	D2020	D2030	D2040	D2050	D2060
Population	1,236,246	1,581,207	1,973,188	2,401,223	2,854,613	337,618	3,826,001
Irrigation (AF/YR)	1,209,647	1,163,633	1,082,231	981,749	981,749	981,749	981,749
Livestock (AF/YR)	5,817	5,817	5,817	5,817	5,817	5,817	5,817
Manufacturing (AF/YR)	6,208	7,509	8,274	8,966	9,654	10,256	11,059
Mining (AF/YR)	3,869	4,186	4,341	4,433	4,523	4,612	4,692
Municipal (AF/YR)	226,536	279,633	338,716	403,511	472,632	547,747	625,743
Steam Eelctric (AF/YR)	6,780	13,463	16,864	19,716	23,192	27,430	32,598
Total Water Demand (AF/YR)	1,458,857	1,474,241	1,456,243	1,424,192	1,497,567	1,577,611	1,661,658

	Region M Population Projection by County						
	D2000	D2010	D2020	D2030	D2040	D2050	D2060
Cameron	335,227	415,136	499,618	586,944	673,996	761,073	843,894
Hidalgo	569,463	744,258	948,488	1,177,243	1,424,767	1,695,114	1,972,453
Jim Hogg	5,281	5,593	5,985	6,286	6,538	6,468	6,225
Maverick	47,297	55,892	64,984	73,581	81,032	87,850	93,381
Starr	53,597	66,137	79,538	93,338	107,249	120,959	134,115
Webb	193,117	257,647	333,451	418,332	511,710	613,774	721,586
Willacy	20,082	22,519	24,907	27,084	28,835	30,026	30,614
Zapata	12,182	14,025	16,217	18,415	20,486	22,354	23,733
REGION M TOTAL	1,236,246	1,581,207	1,973,188	2,401,223	2,854,613	3,337,618	3,826,001

2006 Regional Water Plan
Summary of Water Demand Projections for the state of Texas (ac-ft/

	D2000	D2010	D2020	D2030	D2040	D2050	D2060
MUNICIPAL	4,047,322	4,761,887	5,473,988	6,109,591	6,727,858	7,438,852	8,245,271
MANUFACTURING	1,449,508	1,696,145	1,861,979	2,009,101	2,153,850	2,275,681	2,389,593
MINING	271,215	255,455	265,423	271,308	272,619	275,446	284,088
STEAM ELECTRIC	561,394	737,170	868,580	1,012,212	1,156,170	1,321,733	1,515,556
LIVESTOCK	300,441	344,495	374,724	381,241	388,243	395,945	404,397
IRRIGATION	10,416,100	10,401,624	10,035,674	9,637,689	9,250,160	8,878,320	8,587,930
TEXAS TOTAL	17,045,980	18,196,776	18,880,368	19,421,142	19,948,900	20,585,977	21,426,835



2006 Regional Water Plan									
Municipal Water Demand Projections for 2000 - 2060 (in acft1)									
Region M									
Region	WUG Name	County Name	D2000	D2010	D2020	D2030	D2040	D2050	D2060
M	BROWNSVILLE	CAMERON	35,840	43,655	52,038	60,475	69,270	77,985	86,577
M	COMBES	CAMERON	186	208	229	256	281	309	341
M	COUNTY-OTHER	CAMERON	6,226	6,970	7,812	8,709	9,572	10,485	11,424
M	EAST RIO HONDO WSC	CAMERON	1,739	2,408	3,107	3,862	4,555	5,323	6,052
M	EL JARDIN	CAMERON	1,514	1,910	2,332	2,771	3,216	3,656	4,095
M	HARLINGEN	CAMERON	10,059	11,374	12,780	14,175	15,604	17,109	18,643
M	INDIAN LAKE	CAMERON	40	49	57	66	76	85	95
M	LA FERIA	CAMERON	699	855	1,031	1,214	1,403	1,587	1,777
M	LAGUNA MADRE WD	CAMERON	1,288	2,310	3,386	4,516	5,622	6,744	7,812
M	LAGUNA VISTA	CAMERON	214	268	323	382	444	503	564
M	LOS FRESNOS	CAMERON	541	767	1,008	1,247	1,490	1,745	1,988
M	LOS INDIOS	CAMERON	193	230	271	311	354	396	439
M	MILITARY HIGHWAY WSC	CAMERON	1,214	1,486	1,780	2,066	2,378	2,683	2,993
M	OLMITO WSC	CAMERON	612	952	1,314	1,691	2,060	2,444	2,809
M	PALM VALLEY	CAMERON	390	413	440	468	494	525	555
M	PALM VALLEY ESTATES UD	CAMERON	63	85	108	132	155	180	203
M	PORT ISABEL	CAMERON	2,458	2,645	2,846	3,052	3,254	3,470	3,681
M	PRIMERA	CAMERON	433	525	628	730	838	945	1,053
M	RANCHO VIEJO	CAMERON	253	373	496	627	755	888	1,015
M	RIO HONDO	CAMERON	385	404	428	453	475	503	533
M	SAN BENITO	CAMERON	4,386	4,916	5,484	6,050	6,630	7,241	7,863
M	SANTA ROSA	CAMERON	286	331	376	429	478	531	588

Region M Regional Water Plan

M	ALAMO	HIDALGO	1,703	2,319	3,022	3,808	4,675	5,667	6,684
M	ALTON	HIDALGO	1,208	3,346	4,153	5,061	6,056	7,135	8,268
M	COUNTY-OTHER	HIDALGO	7,833	9,886	13,072	16,626	20,536	24,981	29,542
M	DONNA	HIDALGO	2,101	2,309	2,565	2,842	3,156	3,521	3,924
M	EDCOUCH	HIDALGO	460	499	547	604	668	744	828
M	EDINBURG	HIDALGO	6,460	8,274	10,428	12,967	15,528	18,583	21,717
M	ELSA	HIDALGO	1,063	1,099	1,134	1,182	1,232	1,303	1,383
M	HIDALGO	HIDALGO	730	1,058	1,444	1,859	2,316	2,841	3,380
M	HIDALGO COUNTY MUD #1	HIDALGO	1,116	1,703	2,387	3,161	3,994	4,915	5,860
M	LA JOYA	HIDALGO	359	408	471	538	613	700	797
M	LA VILLA	HIDALGO	240	234	230	225	221	218	218
M	MCALLEN	HIDALGO	24,436	28,697	33,551	39,226	45,267	52,032	59,213
M	MERCEDES	HIDALGO	1,835	1,890	1,956	2,048	2,142	2,285	2,453
M	MILITARY HIGHWAY WSC	HIDALGO	1,195	1,346	1,540	1,748	2,000	2,271	2,568
M	MISSION	HIDALGO	7,579	9,864	12,564	15,594	18,792	22,529	26,363
M	NORTH ALAMO WSC	HIDALGO	8,706	11,675	15,158	19,046	23,352	28,297	33,369
M	PALMHURST	HIDALGO	622	1,157	1,789	2,497	3,263	4,099	4,957
M	PALMVIEW	HIDALGO	589	869	1,199	1,570	1,967	2,414	2,873
M	PENITAS	HIDALGO	149	149	150	150	151	155	161
M	PHARR	HIDALGO	6,899	8,474	10,370	12,511	14,887	17,448	20,202
M	PROGRESSO	HIDALGO	456	576	717	867	1,037	1,234	1,436
M	SAN JUAN	HIDALGO	2,497	3,501	4,665	5,956	7,384	9,031	10,720
M	SHARYLAND WSC	HIDALGO	4,420	4,893	5,469	6,095	6,747	7,492	8,365
M	SULLIVAN CITY	HIDALGO	403	526	672	845	1,016	1,226	1,440
M	WESLACO	HIDALGO	4,978	5,534	6,201	6,966	7,819	8,792	9,843
		HIDALGO Total	88,037	110,286	135,454	163,992	194,819	229,913	266,564
M	COUNTY-OTHER	JIM HOGG	147	153	159	164	167	165	158
M	HEBBRONVILLE (CDP)	JIM HOGG	705	731	759	780	792	778	748
		JIM HOGG Total	852	884	918	944	959	943	906
M	COUNTY-OTHER	MAVERICK	2,223	2,727	3,249	3,742	4,183	4,573	4,926
M	EAGLE PASS	MAVERICK	4,720	4,932	5,123	5,314	5,460	5,644	5,818
M	EL INDIO WSC	MAVERICK	968	1,253	1,567	1,855	2,108	2,335	2,530
		MAVERICK Total	7,911	8,912	9,939	10,911	11,751	12,552	13,274

2006 Regional Water Plan								
Manufacturing Water Demand Projections for 2000 - 2060 (in acft ¹)								
Region M								
Region	County Name ²⁾	D2000	D2010	D2020	D2030	D2040	D2050	D2060
M	CAMERON	3,430	4,156	4,590	4,983	5,372	5,709	6,165
M	HIDALGO	2,674	3,236	3,559	3,851	4,143	4,403	4,742
M	JIM HOGG	0	0	0	0	0	0	0
M	MAVERICK	56	64	69	73	77	80	85
M	STARR	0	0	0	0	0	0	0
M	WEBB	23	28	31	34	37	39	42
M	WILLACY	25	25	25	25	25	25	25
M	ZAPATA	0	0	0	0	0	0	0
	Region M Total	6,208	7,509	8,274	8,966	9,654	10,256	11,059

¹⁾ An acft is an amount of water to cover one acre with one foot of water and equals 325,851 gallons.

²⁾ If the "(P)" is present for a county entry, then the county has been split by Regional boundaries and the data listed in the row represent only the county's water demands within the particular region, not the county's total.

2006 Regional Water Plan								
Mining Water Demand Projections for 2000 - 2060 (in acft ¹)								
Region M								
Region	County Name ²⁾	D2000	D2010	D2020	D2030	D2040	D2050	D2060
M	CAMERON	8	6	6	6	6	6	6
M	HIDALGO	1,196	1,442	1,561	1,633	1,704	1,774	1,836
M	JIM HOGG	27	33	36	37	38	39	40
M	MAVERICK	140	156	162	166	169	172	175
M	STARR	1,203	1,315	1,355	1,373	1,390	1,407	1,426
M	WEBB	1,262	1,204	1,192	1,189	1,187	1,185	1,180
M	WILLACY	6	6	6	6	6	6	6
M	ZAPATA	27	24	23	23	23	23	23
	Region M Total	3,869	4,186	4,341	4,433	4,523	4,612	4,692

¹⁾ An acft is an amount of water to cover one acre with one foot of water and equals 325,851 gallons.

²⁾ If the "(P)" is present for a county entry, then the county has been split by Regional boundaries and the data listed in the row represent only the county's water demands within the particular region, not the county's total.

Projections last updated on 11/19/03

2006 Regional Water Plan								
Steam Electric Water Demand Projections for 2000 - 2060 (in acft ¹)								
Region M								
Region	County Name ²⁾	D2000	D2010	D2020	D2030	D2040	D2050	D2060
M	CAMERON	1,498	1,616	1,523	1,780	2,094	2,477	2,944
M	HIDALGO	3,487	10,355	14,151	16,545	19,462	23,018	27,354
M	JIM HOGG	0	0	0	0	0	0	0
M	MAVERICK	0	0	0	0	0	0	0
M	STARR	0	0	0	0	0	0	0
M	WEBB	1,795	1,492	1,190	1,391	1,636	1,935	2,300
M	WILLACY	0	0	0	0	0	0	0
M	ZAPATA	0	0	0	0	0	0	0
	Region M Total	6,780	13,463	16,864	19,716	23,192	27,430	32,598

¹⁾ An acft is an amount of water to cover one acre with one foot of water and equals 325,851 gallons.

²⁾ If the "(P)" is present for a county entry, then the county has been split by Regional boundaries and the data listed in the row represent only the county's water demands within the particular region, not the county's total.

2006 Regional Water Plan								
Livestock Water Demand Projections for 2000 - 2060 (in acft ¹)								
Region M								
Region	County Name ²⁾	D2000	D2010	D2020	D2030	D2040	D2050	D2060
M	CAMERON	1,103	1,103	1,103	1,103	1,103	1,103	1,103
M	HIDALGO	681	681	681	681	681	681	681
M	JIM HOGG	518	518	518	518	518	518	518
M	MAVERICK	260	260	260	260	260	260	260
M	STARR	1,117	1,117	1,117	1,117	1,117	1,117	1,117
M	WEBB	1,513	1,513	1,513	1,513	1,513	1,513	1,513
M	WILLACY	151	151	151	151	151	151	151
M	ZAPATA	474	474	474	474	474	474	474
	Region M Total	5,817	5,817	5,817	5,817	5,817	5,817	5,817

¹⁾ An acft is an amount of water to cover one acre with one foot of water and equals 325,851 gallons.

²⁾ If the "(P)" is present for a county entry, then the county has been split by Regional boundaries and the data listed in the row represent only the county's water demands within the particular region, not the county's total.

**2006 Regional Water Plan
Irrigation Water Demand Projections by County (ac-ft/year)**

	D2000	D2010	D2020	D2030	D2040	D2050	D2060
Cameron	377,925	367,404	347,771	325,144	325,144	325,144	325,144
Hidalgo	611,399	583,030	525,971	453,772	453,772	453,772	453,772
Jim Hogg	6,413	817	817	817	817	817	817
Maverick	93,145	95,040	91,693	87,863	87,863	87,863	87,863
Starr	30,693	31,191	30,108	29,070	29,070	29,070	29,070
Webb	23,723	20,507	19,548	18,654	18,654	18,654	18,654
Willacy	58,586	59,191	60,203	60,623	60,623	60,623	60,623
Zapata	7,763	6,454	6,121	5,805	5,805	5,805	5,805
Total	1,209,647	1,163,633	1,082,231	981,749	981,749	981,749	981,749

Texas Water Development Board							
2006 Regional Water Plan							
Regional and State Total Population Projections for 2000 - 2060							
REGION	P2000	P2010	P2020	P2030	P2040	P2050	P2060
A - Panhandle	355,832	388,104	423,380	453,354	484,954	516,729	541,035
B - Region B	201,970	210,642	218,918	223,251	224,165	223,215	221,734
C - Region C	5,254,722	6,625,282	7,966,389	9,093,847	10,246,795	11,559,990	13,087,849
D - North East Texas	704,171	772,163	843,027	908,748	978,298	1,073,570	1,213,095
E - Far West Texas	705,399	855,466	1,018,479	1,161,232	1,283,725	1,405,966	1,527,713
F - Region F	578,814	618,889	656,480	682,132	700,806	714,045	724,094
G - Brazos G	1,621,961	1,882,896	2,168,682	2,458,075	2,739,717	3,034,798	3,332,100
H - Region H	4,848,918	5,775,097	6,707,045	7,679,397	8,653,377	9,739,109	10,897,526
I - East Texas	1,011,317	1,090,382	1,166,057	1,232,138	1,294,976	1,377,760	1,482,448
J - Plateau	114,742	135,723	158,645	178,342	190,551	198,594	205,910
K - Lower Colorado	1,132,228	1,359,677	1,657,025	1,936,324	2,181,851	2,447,058	2,713,905
L - South Central Texas	2,042,221	2,460,599	2,892,933	3,292,970	3,644,661	3,984,258	4,297,786
M - Rio Grande	1,236,246	1,581,207	1,973,188	2,401,223	2,854,613	3,337,618	3,826,001
N - Costal Bend	541,184	617,143	693,940	758,427	810,650	853,964	885,665
O - Llano - Estacado	453,997	486,311	512,405	528,437	535,967	537,255	527,210
P - Lavaca	48,068	49,491	51,419	52,138	51,940	51,044	49,663
Texas State Total	20,851,790	24,909,072	29,108,012	33,040,035	36,877,046	41,054,973	45,533,734