



Task 2
Review and Revision of
Population and Water
Demand Projections

2.1 Current and Projected Population and Water Demand for the Region

Population projections for the Panhandle regional water plan are developed from consensus-based population and water demand projections provided by the Texas Water Development Board (TWDB) and are based on data collected by the 2000 U.S. Census. These consensus-based population projections are distributed and quality controlled by the State Data Center and TWDB in coordination with the Texas Commission on Environmental Quality (TCEQ) and the Texas Parks Wildlife Department (TPWD). The PWPG has developed revised population and water demand projections that are based on changed conditions and the availability of new information. Several water user groups water demand projections were also revised to account for drought of record conditions. TWDB-adopted population and demand projections can be found at the end of this chapter.

The PWPG has compiled a database containing municipal, industrial, and agricultural water demands for the region. Municipal demands were identified and verified using a survey questionnaire that was distributed to more than 47 public water supply entities identified as municipal suppliers and stakeholders in the region. The 95% response rate that was received from the questionnaire indicates the willingness of regional entities to participate in the planning process and an interest in providing accurate information for the Panhandle Regional Water Plan. The demands identified by stakeholders were compared to the consensus-based projections previously adopted by the TWDB and were used to develop several revisions to TWDB population and water use projections. Gallons per capita per day (gpcd) consumption rates for several municipalities were adjusted according to historical TWDB water use survey records to more accurately reflect current demands. The most common method of reporting municipal water use is through an assessment of per capita water use. While this measurement appears to be straightforward, the calculations and meanings of these values are widely debated. The TWDB has historically calculated per capita water use as: $(\text{Total water pumped} - \text{wholesale water sales} - \text{industrial sales}) / \text{population} / 365 \text{ days}$.

Industrial and manufacturing use projections were supplied from TWDB under separate state-contracted reports to characterize the distribution and document changed conditions. These reports indicated that although manufacturing has shifted between counties, the overall regional demand has not changed significantly from the previous regional plan. Manufacturing use remains as a small component of the overall use in the future. Steam electric use was also characterized and developed by the TWDB and reflects growth in the future. The projections were adopted by the planning group with anticipation that these numbers will be reviewed during the next round of planning.

Demographers and agricultural experts from the local Texas Agricultural Experiment Station and the Texas Agricultural Extension Service reviewed and recommended adjustments to agricultural water demand projections for the region. These experts examined methodologies used by the TWDB to develop projections for livestock and

irrigation water use. New methodologies were developed and proposed and revised agricultural water demand projections were adopted by the PWPA.

This chapter documents historical and projected estimates of population and water demands of cities and counties in the PWPA, as well as the demands on designated wholesale water providers. Discussions of population and water demands are contained in the following sections, with detailed data located in the appendices. Revisions to population and water demand projections discussed in this chapter have been approved by the TWDB.

2.1.1 Population

In 1990, the population of the State of Texas was approximately 17,000,000. By 2000, the state had grown to over 20,000,000 people. The PWPA represents approximately 1.7 percent of the state’s population during those years. Figure 2-1a compares the population projections from the previous round of planning to the population numbers used in this plan. Figure 2-1b shows populations of counties in the PWPA in 2000. The population of the region was estimated to be 355,832, with 61 percent of the total region’s population located in Potter and Randall Counties surrounding Amarillo. Approximately 39 percent of the population in the PWPA is distributed among the remaining 19 counties, ranging from 887 in Roberts County to 23,857 in Hutchinson County.

Total Regional Population Comparison

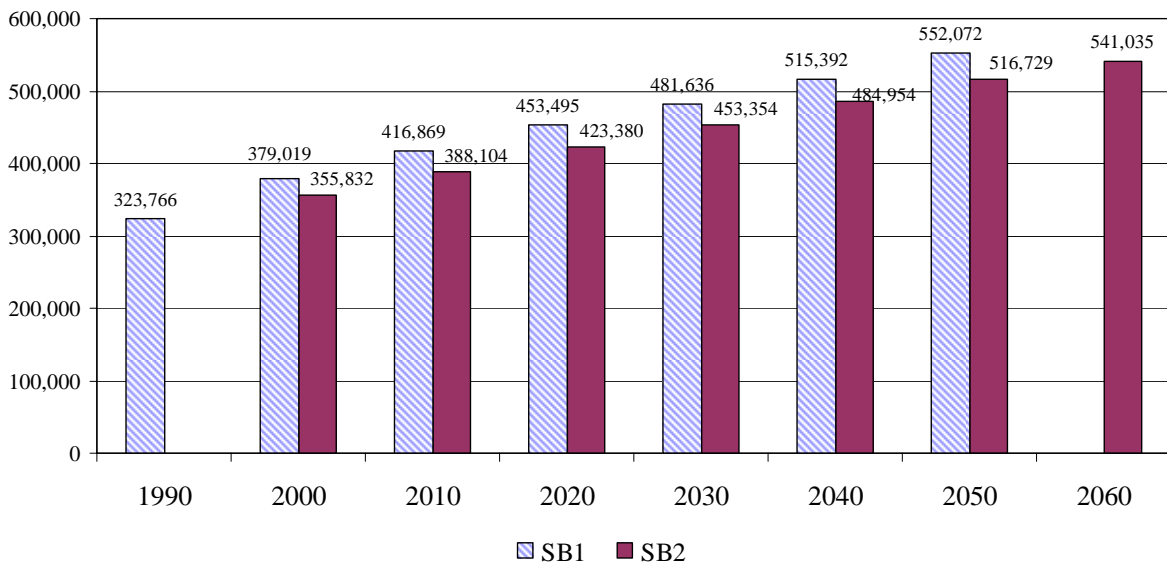


Figure 2-1a: 2000 Populations for Counties in the PWPA

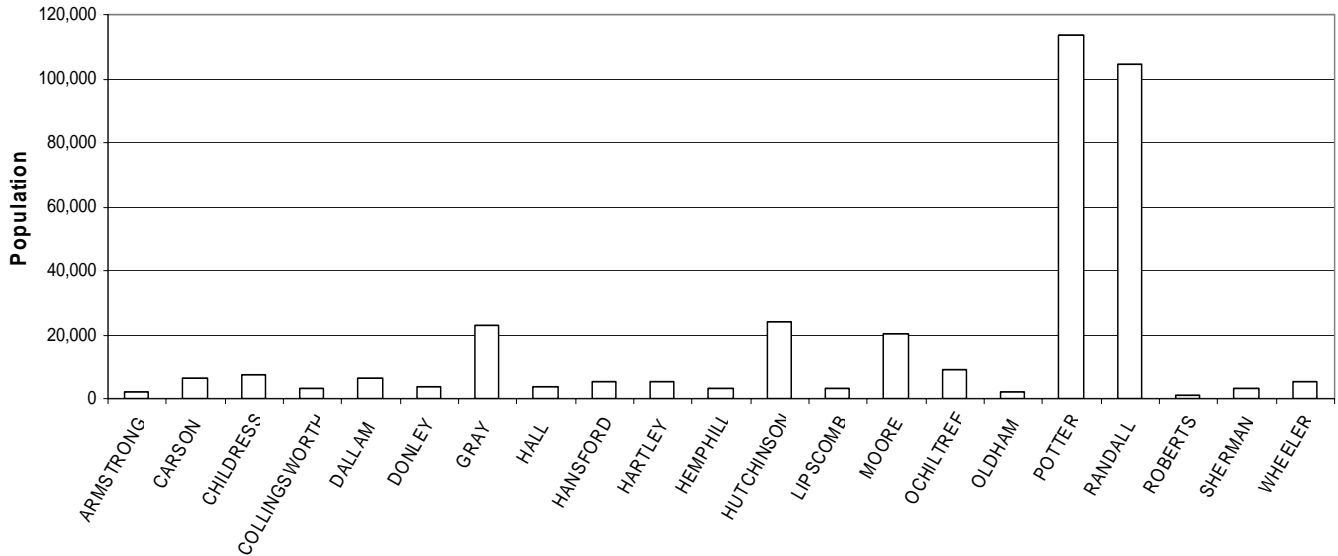
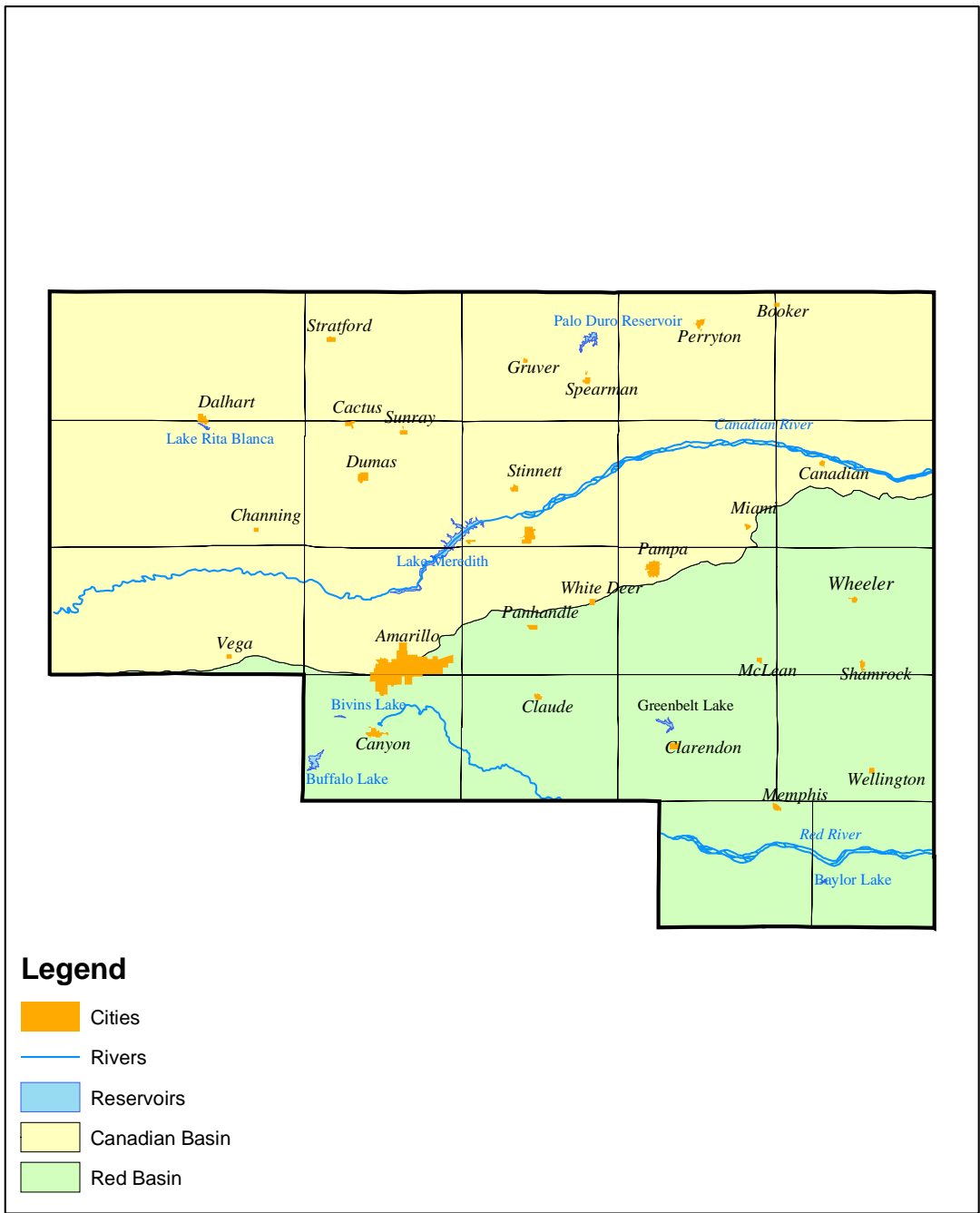


Figure 2-1b: 2000 Populations for Counties in the PWSA

TWDB population growth projections based on the 2000 Census (U.S. Census, 2000) and analyzed by the State Data Center indicate that by 2060 the population of Texas will more than double, reaching over 45,500,000. Population for the PWSA is projected to be 541,035 in 2060, or approximately 1.2 percent of the projected state population for that decade.



Panhandle Water Planning Area Map



Figure 2-2: PWPA Regional Map

No revisions were requested by the PWPG to the overall regional population and projections presented by the TWDB, although several county and city population distribution adjustments were made. The only municipal entity that adjusted population projections due to current or anticipated development is the City of Cactus which asked that its population be capped at 3,000 beginning in 2020. This adjustment also required appropriate adjustment to Moore County-Other populations in order to maintain the overall county and regional total distribution. The redistribution does not change the overall population projections as presented by the TWDB.

Total PWPA population is projected to increase from 355,832 in 2000 to 541,035 people in 2060. This represents an increase of 35 percent over the course of the planning period but a 7% decrease in population projections from the previous planning cycle. The data indicate that a major portion of the projected increase occurs in counties with larger communities, such as Amarillo. Increases in population are projected for Childress, Hansford, Moore, Ochiltree, Potter, Randall and Sherman counties. Decreases in population are projected for Collingsworth, Donley, Gray, and Wheeler counties. The counties of Armstrong, Carson, Dallam, Hall, Hartley, Hemphill, Hutchinson, Lipscomb, Oldham, and Roberts are projected to have an initial increase followed by a decrease, or are expected to have no significant change in population during the planning period. Figure 2-3a illustrates the current projected populations by county for the planning period.

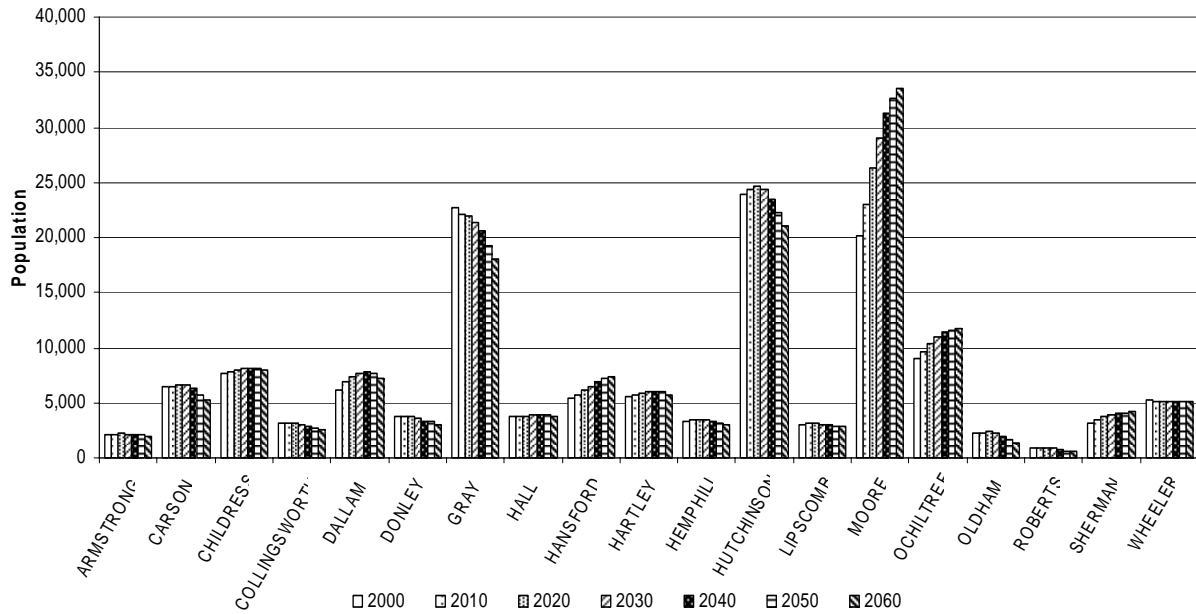


Figure 2-3a: Projected Populations for Counties in the PWSA, excluding Potter and Randall Counties

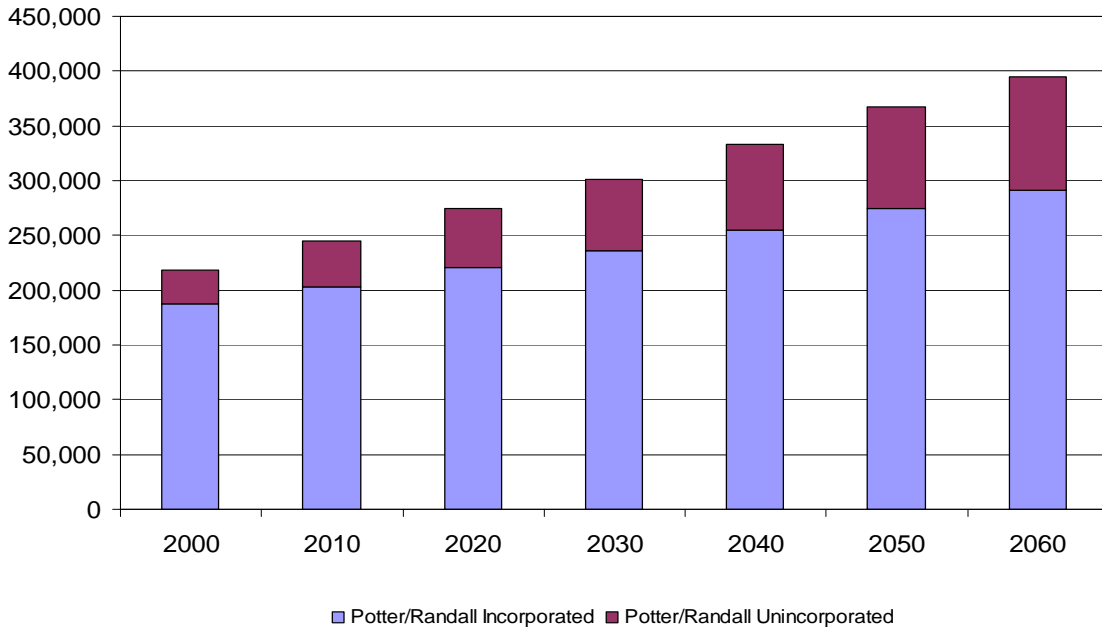


Figure 2-3b: Projected Populations for Potter and Randall Counties

Figure 2-3b shows the aggressive growth of unincorporated areas within Potter and Randall counties. Population in the County-Other municipal water user group is

growing at nearly twice the rate of the population within the city of Amarillo. Since most of these users are not supplied by municipal water supply systems but domestic wells, water user shortages in these areas need to be carefully considered.

2.2 Historical Water Use and Projected Water Demand

Total water use in the PWPA during 2000 totaled over 1,943,551 acre-feet, or approximately 12 percent of the state total. Five counties in the PWPA, Dallam, Hansford, Hartley, Moore, and Sherman, reported a combined water use of more than 1.2 million acre-feet in 2000, ranging from 144,411 acre-feet in Hansford County to 328,128 acre-feet in Dallam County. Water use by these five counties represents approximately 65 percent of the total water use in the PWPA during 2000. Total water use of the remaining 16 counties totaled over 600,000 acre-feet and ranged from 2,729 acre-feet in Hemphill County to 110,783 acre-feet in Ochiltree County.

Figure 2-4 illustrates the 2000 reported water use for counties in the PWPA and compares these values with county populations.

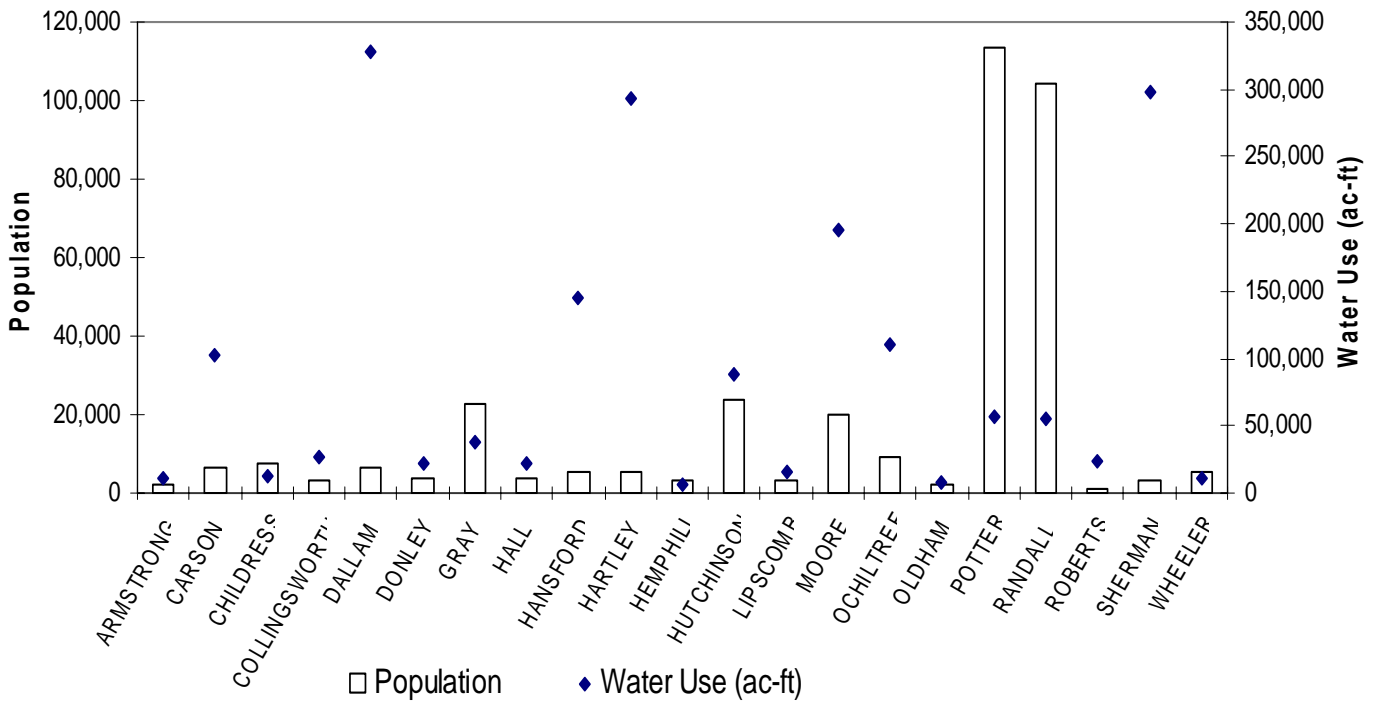


Figure 2-4: 2000 Water Use and Population for Counties in the PWPA

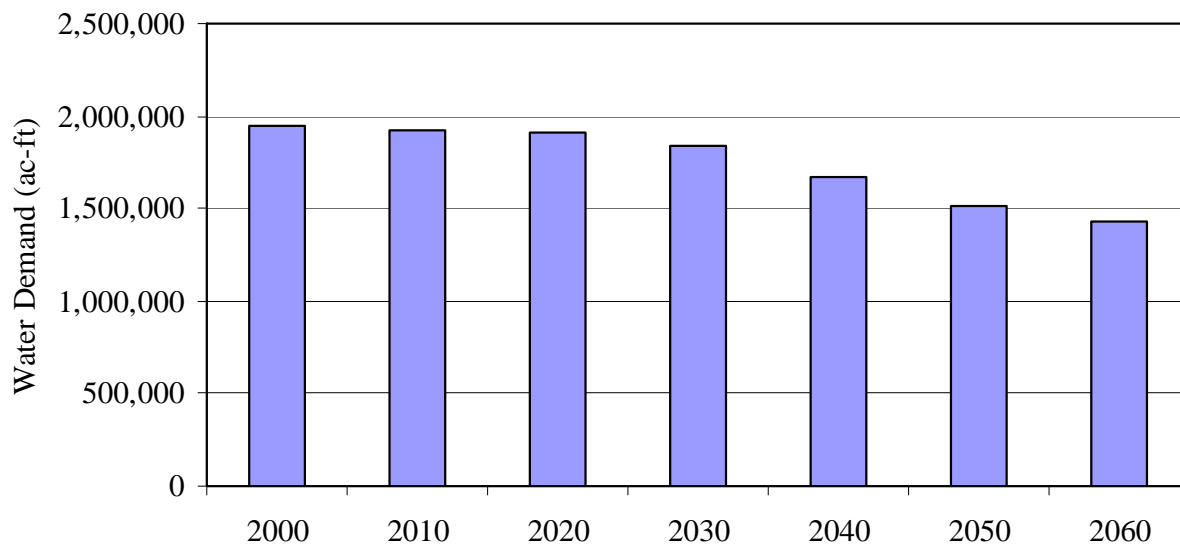


Figure 2-5: Total Water Use for PWPA 2000-2060

Projections for water demand indicate that total water usage in the PWPA will decrease from 1,881,696 acre-feet in 2000 to 1,399,412 acre-feet in 2060. (Figure 2-5) Revisions to projected water demands for municipal, irrigation, power generation, and industrial uses were developed based on available data provided by the TWDB and input from regional water users. Tables at the end of this chapter contain detailed information on previous and current TWDB projected water use by municipal, agricultural, steam-electric, and industrial water users and the impact on projected demands.

Figure 2-6 shows the current TWDB-approved revised projected water demands for counties in the PWPA. A listing of PWPA projected WUG demands can be found at the end of this chapter. The county with the highest projected water demand is Dallam County, with a use of 328,128 acre-feet in 2000 decreasing to 229,497 acre-feet by 2060. This is approximately 30,000 acre-feet more than Sherman County, the county with the next highest demands. Counties with projected increases in demand during the planning period include Potter and Hemphill. The remaining 19 counties are projected to have slight decreases or no significant change in projected water demand during the planning period.

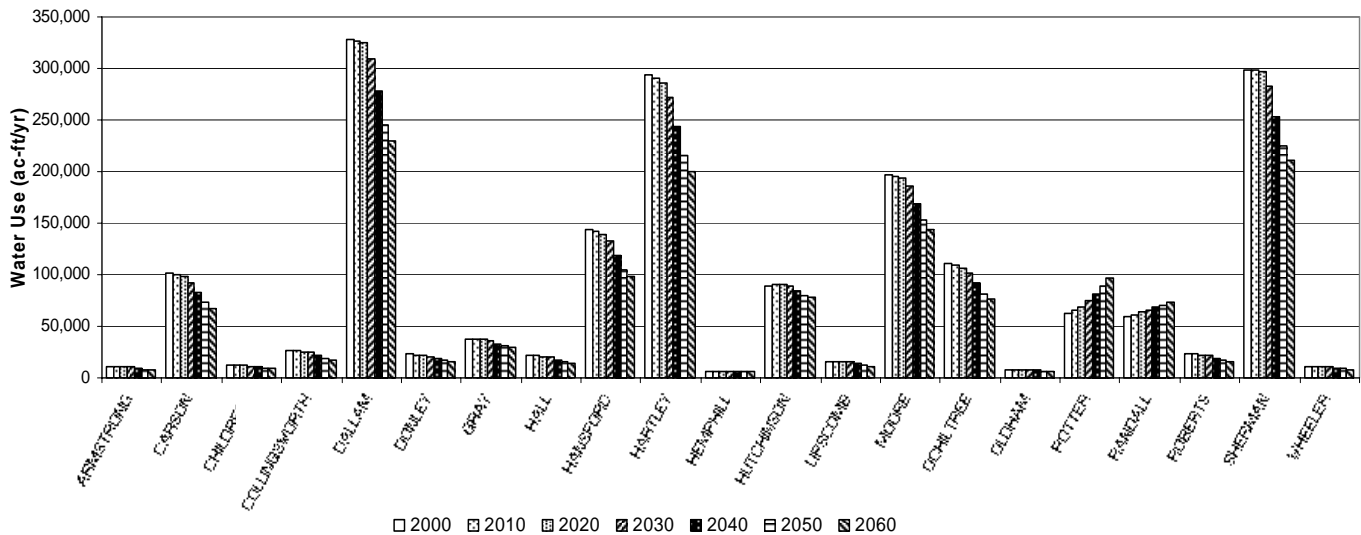


Figure 2-6: Projected Total PWSA Water Demand by County

2.2.1 Municipal Water Demands

The distribution of municipal water use in the PWSA corresponds closely to the distribution of population centers in the PWSA. Projections of municipal water demands are calculated based on estimated changes in populations for cities and rural areas and on estimates of daily per capita water use. Through implementation of the Plumbing Code Fixture Act, per capita water use is estimated to decrease for each decade of the planning period under the assumption that conservation measures will be implemented and result in lower water use. These conservation savings will be further explored and discussed in the subsequent chapter highlighting conservation efforts in the region.

Revisions to previous TWDB projections for municipal water use were made for those cities and counties for which population projections were revised and those which did not match their 2000 gpcd with a 20-year historical average from 1980 to 2000. The median gpcd consumption for the PWSA is 185 gpcd with a high of 333 and a low of 75 gallons per capita per day.

Municipal water use in the PWSA was reported to be 85,193 acre-feet in 2000, or approximately four percent of total water use in the PWSA for that year. The municipal water demand for the PWSA is projected to increase from 85,193 acre-feet in 2000 to 104,242 acre-feet in 2060. This represents approximately a 20 percent increase in water demand, of which Potter and Randall Counties represent 77 percent of the increase for the 2000 – 2060 planning period.

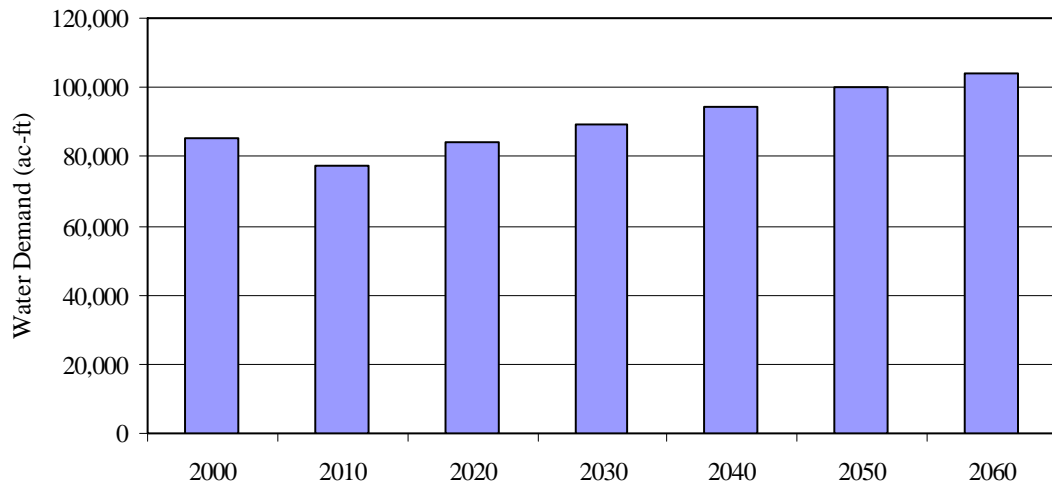


Figure 2-7: Projected Municipal Water Use for Counties in the PWSA

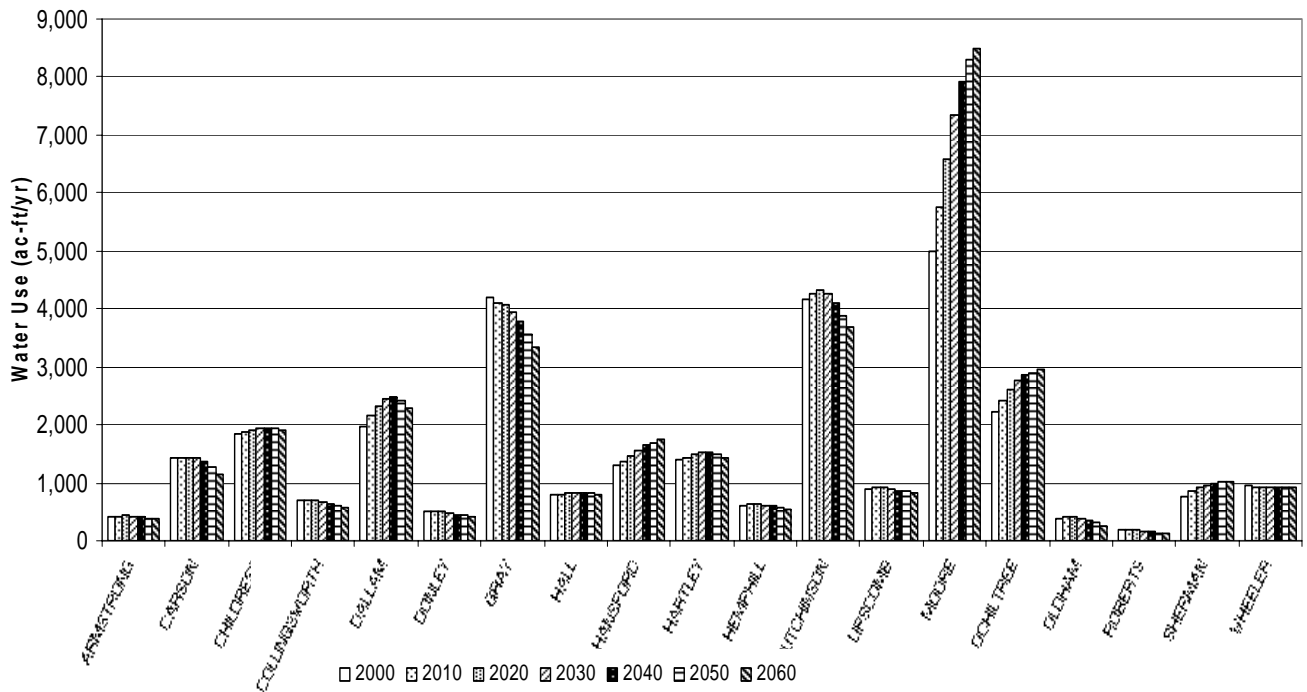


Figure 2-8: Projected Municipal Water Use for Counties in the PWSA, excluding Potter and Randall Counties

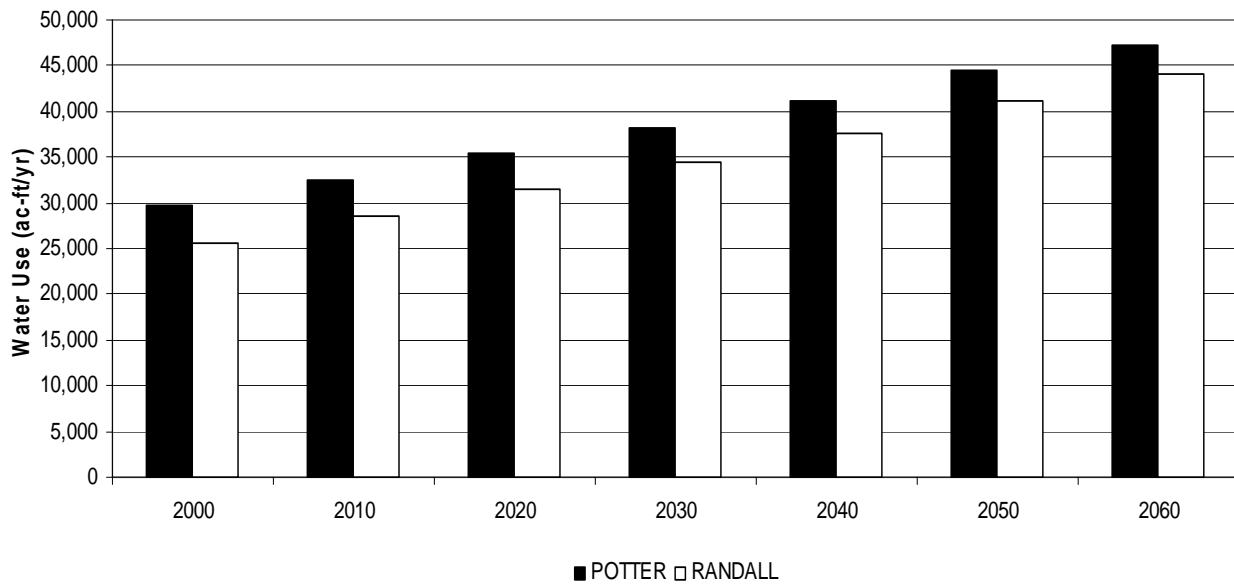


Figure 2-9: Projected Municipal Water Demand for Potter and Randall Counties

2.2.2 Industrial Water Demands

The TWDB defines industrial water use as water required in the production process of manufactured products, including water used by employees for drinking and sanitation purposes. The industrial use category includes manufacturing, steam power generation, and mining.

2.2.2.1 Manufacturing

Manufacturing water use in 2000 was 37,808 acre-feet for the ten counties with documented manufacturing water usage. Manufacturing water use in these counties ranged from one acre-foot in Hemphill County to 20,143 acre-feet in Hutchinson County. Hutchinson County accounted for 53 percent of the manufacturing water use in the PWPA reported for 2000.

Manufacturing water demand numbers were taken from the TWDB projections which were developed under a separate state contract. The report did not contain county specific documentation on changes and although cumulative totals closely match previous regional totals, individual county uses may not have been accurately represented. Figure 2-11 shows the 2000 water use and the projected water demand of manufacturing users. Total manufacturing water demand for the PWPA is projected to increase from 37,808 acre-feet in 2000 to 58,231 acre-feet by 2060. This represents 2 percent of the total water use in the PWPA in 2000, increasing to 4.2 percent by 2060.

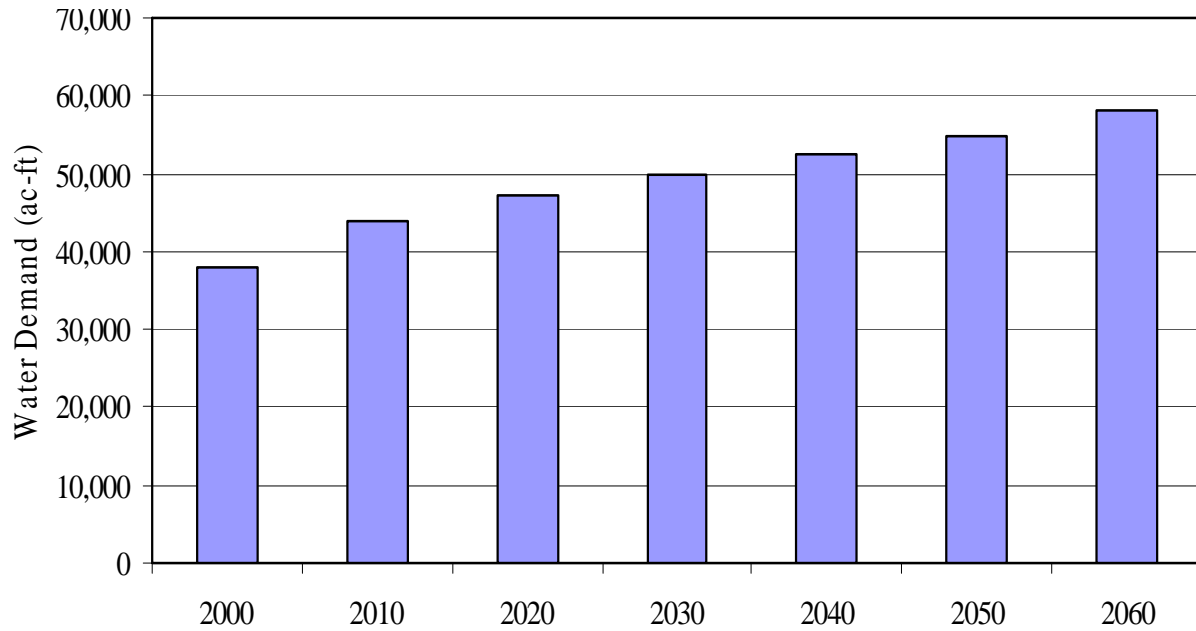


Figure 2-10: Projected Manufacturing Water Use for Counties in the PWPA

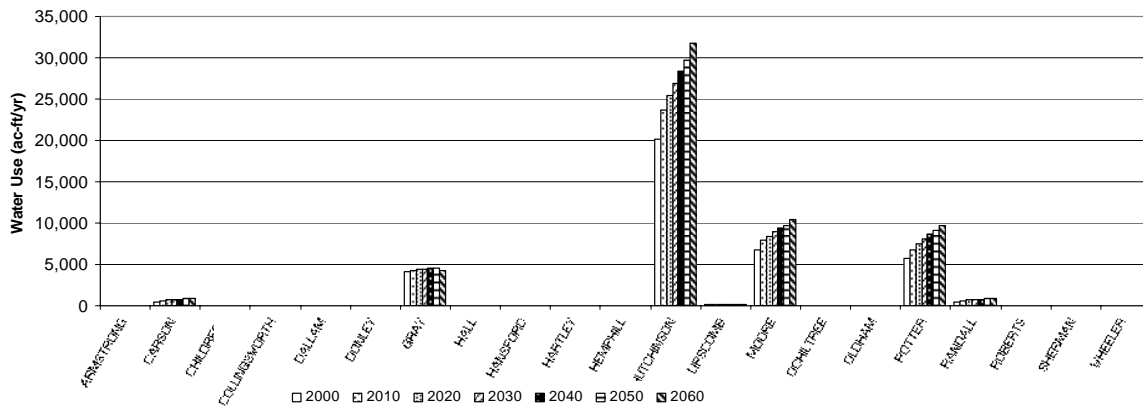


Figure 2-11: Historical and Projected Manufacturing Water Use for Counties in the PWPA

2.2.2.2 Steam Electric Power

Xcel Energy has power generation plants located in Moore and Potter counties that account for all of the water use by power generators in the PWPA. In 2000, a reported 18,255 acre-feet were used for steam power generation. In conjunction with regional water planning efforts, Xcel performed a detailed analysis of steam electric generation and water use for their facilities in the PWPA. The TWDB presented power generation projections that were developed under a separate state contract and results closely match previous regional projections.

Water demand for power generation is projected to increase from 18,255 acre-feet in 2000 to 34,328 acre-feet by 2060. This represents approximately 1 percent of the total water use in the PWWA in 2000 and 1.7 percent by 2060. Figure 2-12 shows projected steam electric power water use for counties in the PWWA. Figure 213 illustrates the historical water needs and projected water demands of steam power generators in the PWWA. All future demands for power generation are expected to be supplied from reuse sources.

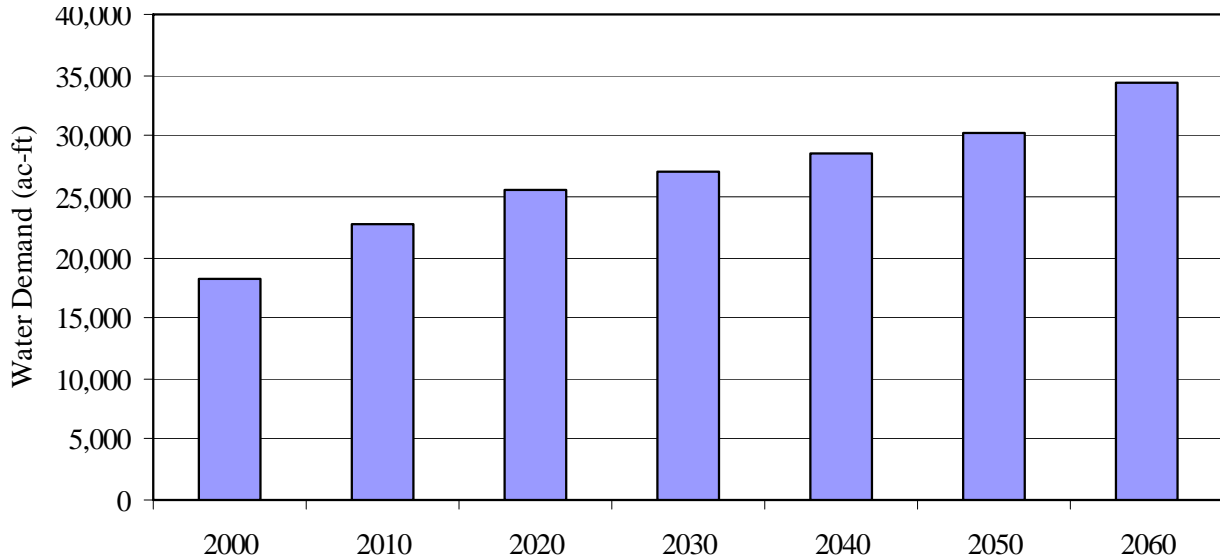


Figure 2-12: Projected Steam Power Water Use for Counties in the PWWA

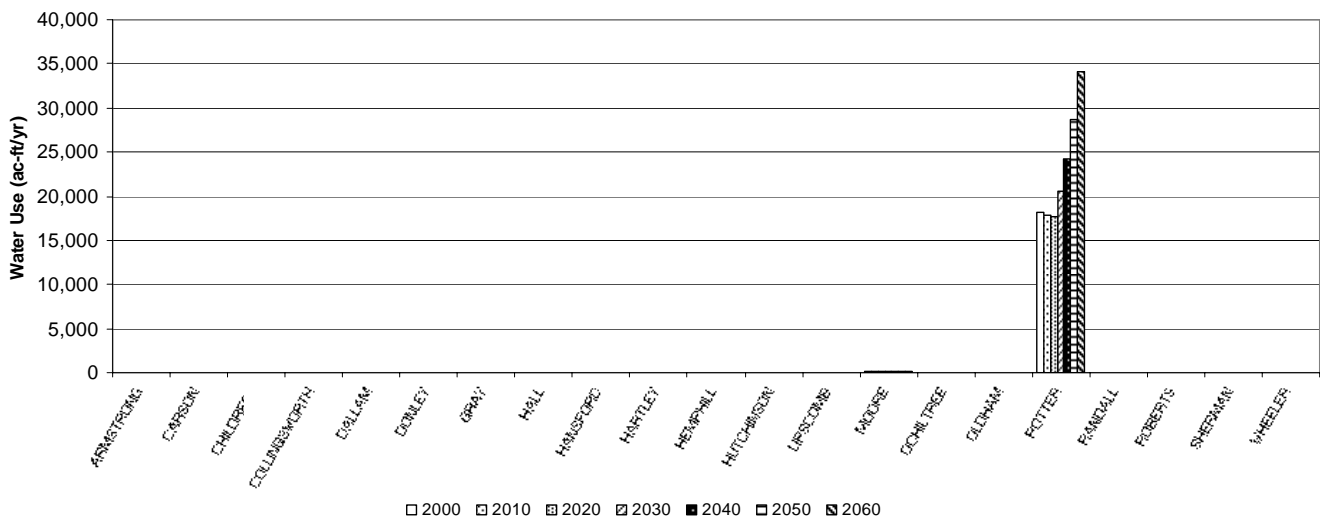


Figure 2-13: Historical and Projected Steam Power Water Use for Counties in the PWWA

2.2.2.3 Mining

Mining activities in the PWSA consist primarily of oil and gas extraction and removal of industrial minerals such as sand, gravel, and gypsum. Mining water use was reported in 2000 for 17 counties in the PWSA, totaling 7,229 acre-feet, or 0.4 percent of the total water use in the PWSA. No revisions were proposed to TWDB projections for the planning period. It is estimated that mining water demand will increase slightly from 7,229 acre-feet in 2000 to 7,310 acre-feet by 2060. Figures 2-14 and 2-15 illustrate historical water use and projected water demands by mining in the PWSA.

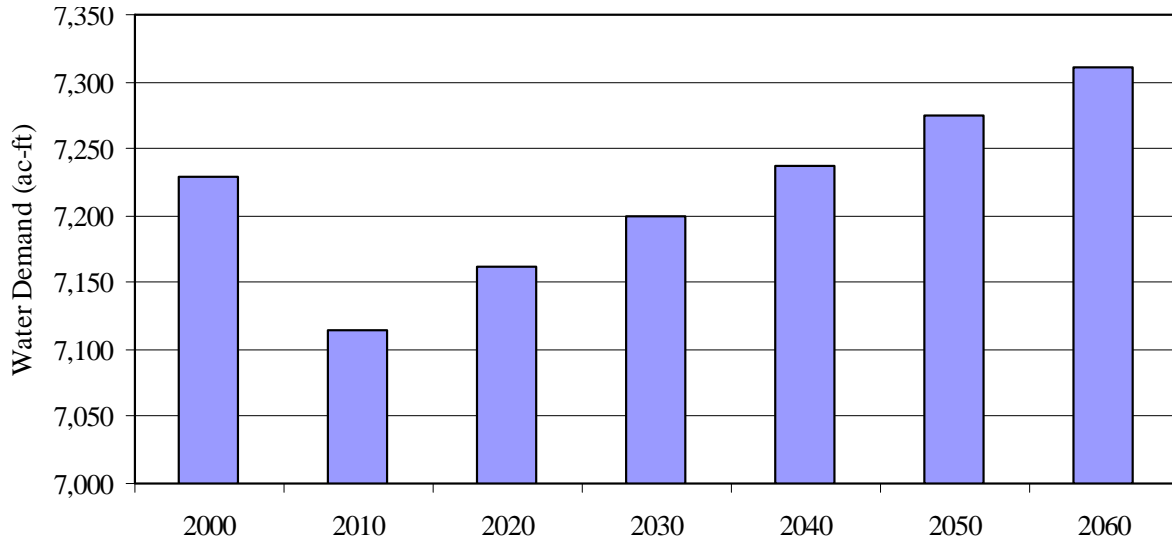


Figure 2-14 Projected Mining Water Use for Counties in the PWSA

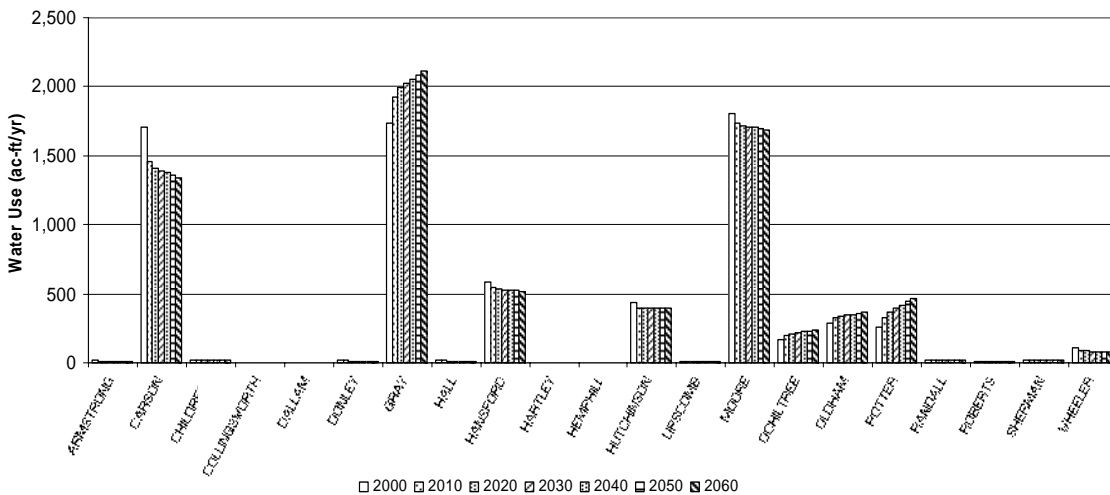


Figure 2-15: Historical and Projected Mining Water Use for Counties in the PWSA

2.2.3 Agricultural Water Demands

2.2.3.1 Irrigation Water Demands

During the SB2 planning cycle, the TAES/TAEX team began by developing and documenting a methodology for estimating the amount of irrigation water pumped in a county during a given year based on the Agricultural Census, which is conducted every five years. The revised methodology included estimates of water usage by irrigated crops based on optimal water use (based on potential evapotranspiration), sub optimal water application by producers (determined by agri-partner demonstration data), effective rainfall received during the growing season, and seasonal usable soil moisture from the soil profile. Projections of annual future water use were made using planted irrigated acreage (pia) and the long-term averages for rainfall and potential evapotranspiration (PET) by county. The crop mix and acreage was assumed to remain unchanged from what was reported in 2000 for the Agricultural Census. Where available, demonstration data and well depletion data was used to verify the model estimates.

The results of the evaluation and modeling efforts represent a comparison based on best available current data and have been included in the planning process as projections through 2060. The irrigation water use projections should be re-evaluated as more data becomes available to accurately reflect changes in the farming community due to new technologies, economic considerations, or crop acreages. The current annual projections for the 2000 – 2060 planning period show a 35 percent reduction in the demand for water. Methodologies used in the development of the irrigation water use projections are discussed in greater detail in Appendix N. Figures 2-16 & 2-17 illustrate the TWDB reported 2000 water use and TWDB-approved projections of irrigation water demand for counties in the PWPA.

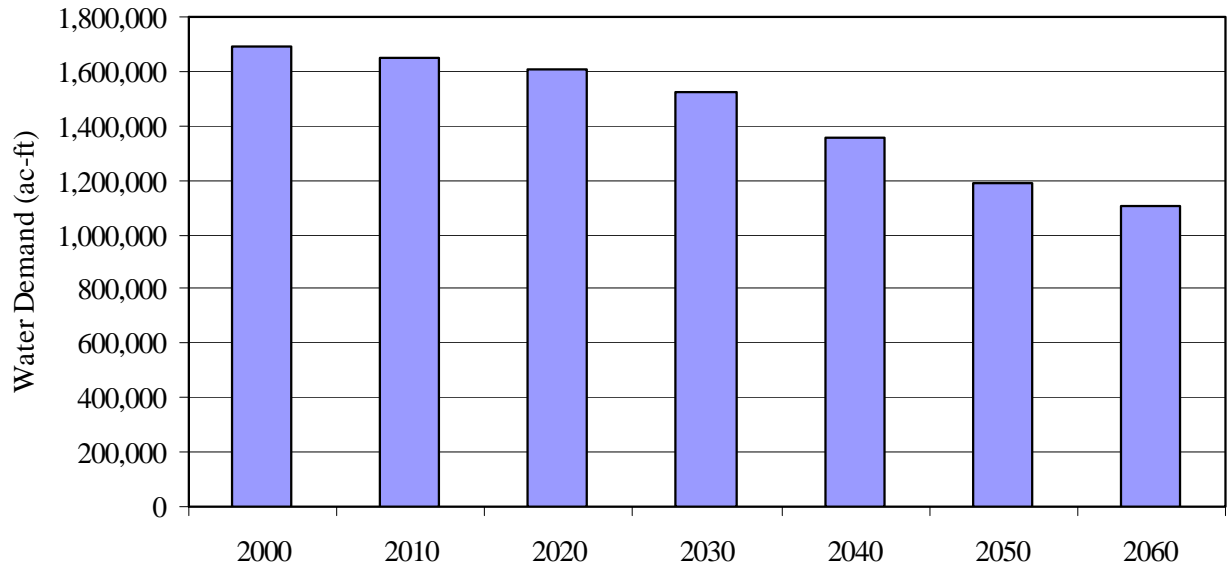


Figure 2-16: Projected Water Use for Irrigation for Counties in the PWPA

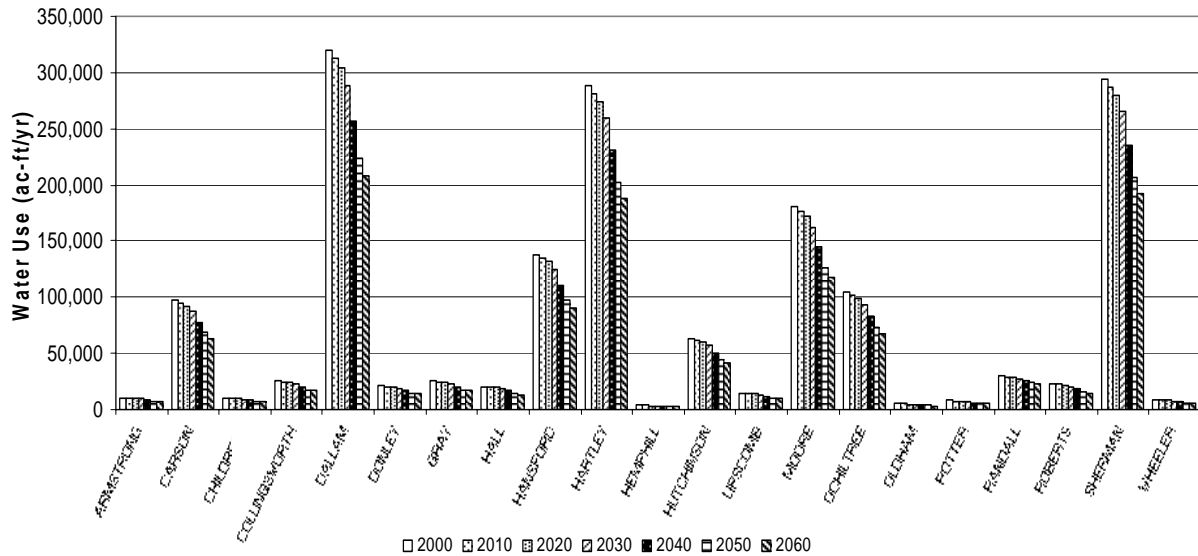


Figure 2-17: Historical Water Use and Projected Demands for Irrigation Water Use for Counties in the PWSA

2.2.3.2 Livestock Water Demands

According to research conducted by TAES, water used for livestock totaled 38,197 acre-feet in 2000 and ranged from a low value of 288 acre-feet in Childress County to a high value of 5,689 acre-feet in Dallam County. This represents approximately 2 percent of the total water used in the PWSA in the year 2000. As in the case of irrigation water demands, the methodologies used by the TWDB were evaluated and revised as part of the regional water planning process. Concerns expressed by commodity groups and producers include the under estimation of future livestock water demands.

New projections were developed by TAES/TAEX which included the most recent inventories of various livestock species for each county, estimates of annual industry growth rates, and regional species-level water use estimates as recorded in the 2000 Agricultural Census. TAES/TAEX staff developed estimates of livestock inventories and water use for beef cattle feedlots, summer and winter stockers, beef cows, swine, horses, dairy cattle, and poultry for each county in the PWSA. Water use values were obtained from regional and national studies and were used to determine the relative water demand for each livestock category.

Figures 2-18& 2-19 illustrate the projected livestock water demand by livestock category for the planning period. Detailed livestock population and water demand data is contained in tables at the end of this chapter. Annual growth rates were determined by TAES/TAEX staff based on published studies, knowledge of the local agricultural economy and environment, and in consultation with industry sources. This methodology incorporates a larger body of information for the determination of projected water uses than the more traditional methodology utilized by the TWDB. Methodologies used in the development and evaluation of current livestock water use projections are found in tables at the end of this chapter.

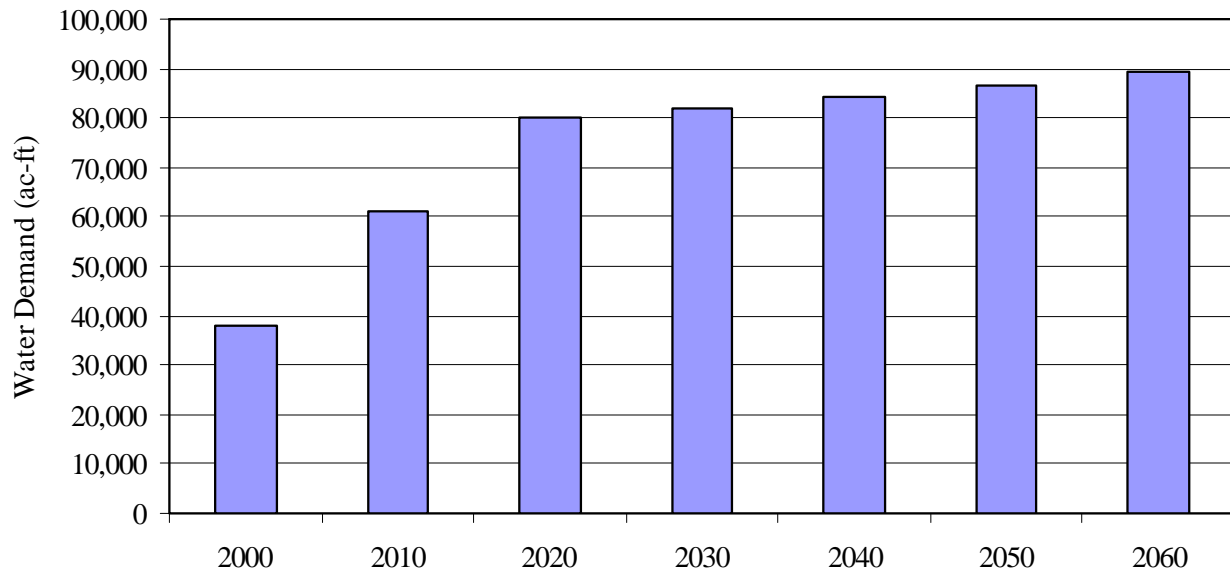


Figure 2-18: Projected Livestock Water Demands for PWPA

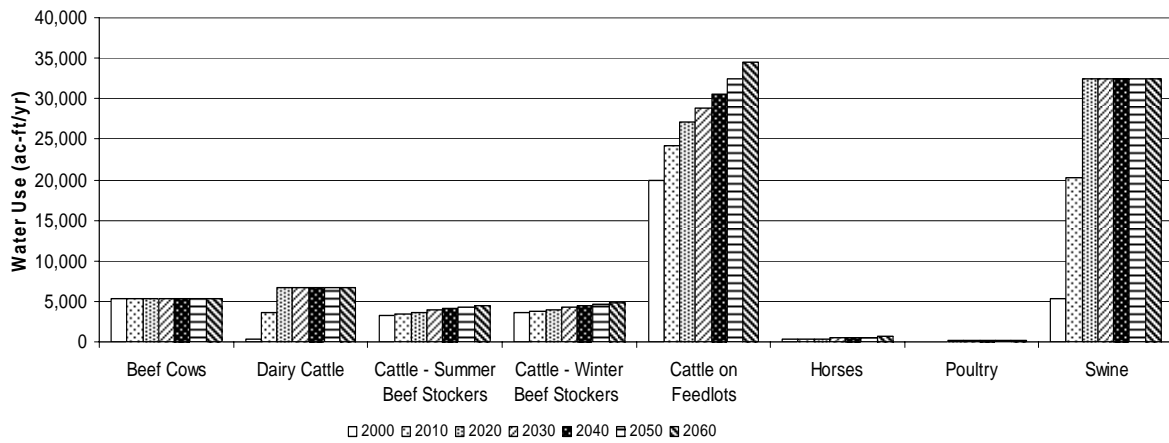


Figure 2-19: Projected Livestock Water Demands by Animal Category

Livestock water demands are projected to increase from 38,180 acre-feet in 2000 to 89,267 acre-feet by 2060. This represents approximately 2 percent of the total water use in the PWPA in 2000, increasing steadily to approximately 4.8 percent of the total projected water use by 2060. Figure 2-21 illustrates the historical water use and projected water demands for livestock use in the PWPA. Increases in livestock water demands are projected for every county in the PWPA, with the largest increases projected for Dallam and Sherman Counties.

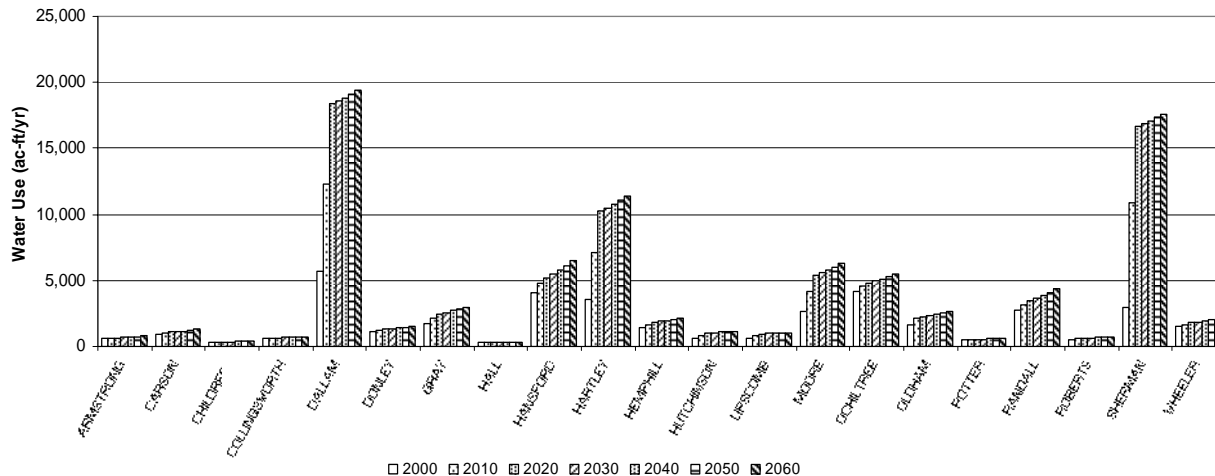


Figure 2-20: Historical and Projected Livestock Water Use for Counties in the PWSA

2.3 Wholesale Water Providers

The term Wholesale Water Provider (WWP) was created within Senate Bill 2 in order to include major providers of water for municipal and manufacturing use in the regional planning process. The PWPG has designated 8 WWPs in the region. Coordination with adjoining planning Region B and the Llano Estacado Water Planning Region (Region O) was necessary to develop projections for CRMWA and GM&IWA because several member cities are located in those regions.

In 2000, the combined water sales of the designated WWPs for municipal and manufacturing use was approximately 137,961 acre-feet. In 2000, the city of Amarillo accounted for approximately 42 percent, GM&IWA for three percent, and CRMWA for 55 percent of the combined demand on WWPs in the PWSA. Demands on these WWPs are projected to increase from 136,799 acre-feet in 2010 to 150,890 acre-feet by 2060. These numbers include demands outside this planning area. Total demands on Amarillo as a WWP are projected to increase from 77,602 acre-feet in 2010 to 104,995 acre-feet in 2060; CRMWA’s total demands are projected to stay nearly constant from 103,855 acre-feet in 2010 to 103,388 acre-feet in 2060. GM&IWA is expected to see a slight decrease in demands as a WWP from 3,792 acre-feet to 3,599 acre-feet during the planning period. Figure 2-21 illustrates the historical and projected water demands for each of the eight designated WWPs during the planning period.

2.3.1 City of Amarillo

In 2010, the City of Amarillo is projected to supply a total of 72,602 acre-feet of water for municipal use by the city of Amarillo, the city of Canyon, Texas Parks and Wildlife Department (Palo Duro State Park), and industrial use by ASARCO, IBP, Inc., and Xcel Energy. Projected demands on the city of Amarillo were developed based on each recipient’s projected water demand and what percentage of their

historical water demands the city of Amarillo had supplied. Water demand for municipal and manufacturing use within Amarillo is anticipated to increase from 44,374 acre-feet in 2000 to 62,621 acre-feet in 2060.

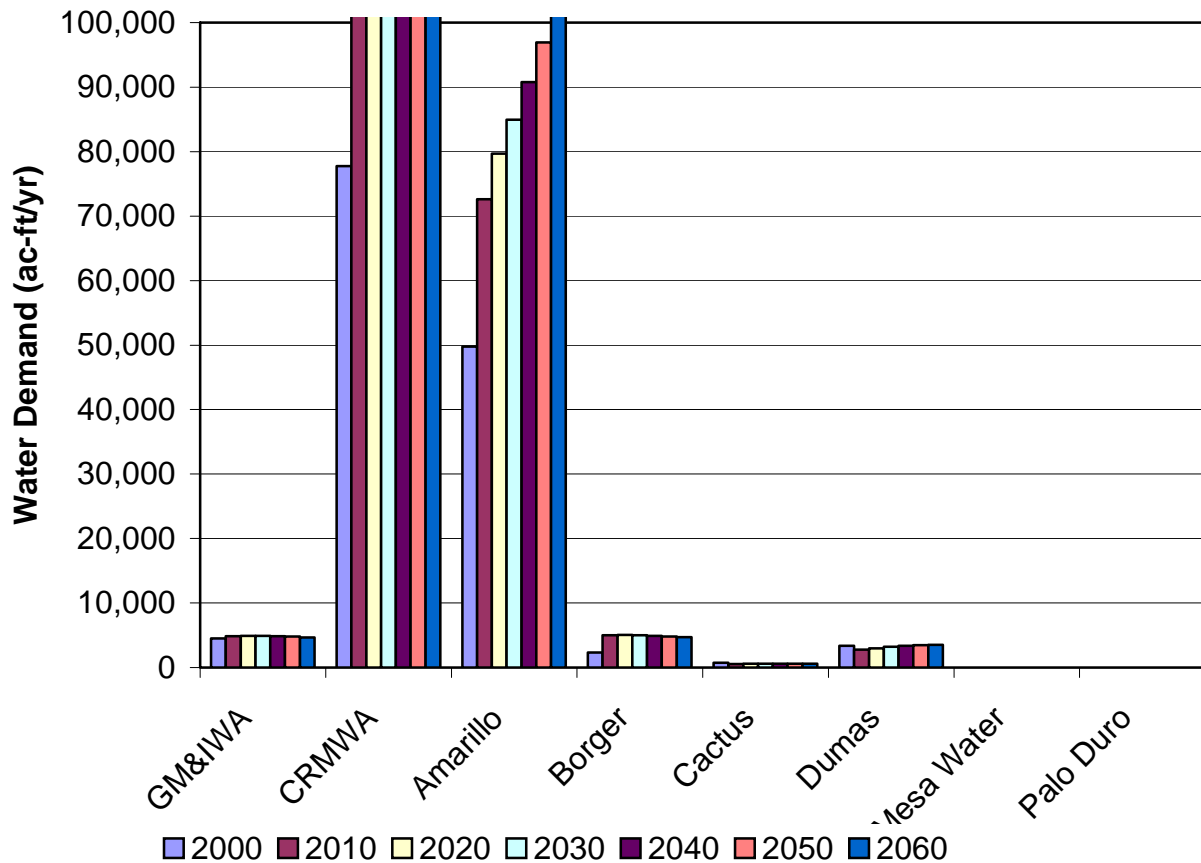


Figure 2-21: Historical and Projected Water Demands on Major Water Providers in the PWPA

2.3.2 Greenbelt Municipal and Industrial Water Authority

In 2000, GM&IWA supplied 3,905 acre-feet to four cities in the PWPA, three cities in Region B, and to the Red River Authority for subsequent sales in both regions (TWDB, 1998). Approximately 59 percent of the sales by GM&IWA were to the cities of Childress, Clarendon, Hedley, and Memphis, and to the RRA for sales in the PWPA. The remaining sales were to the cities of Chillicothe, Crowell, and Quanah, and to the RRA in Region B. Demand projections for GM&IWA as a MWP were developed based on each recipient’s projected water demand and what percentage of their historical water demands the GM&IWA had supplied. The percentage of the projected demand that is anticipated to remain in the PWPA is expected to remain at approximately 58 percent throughout the planning period.

2.3.3 Canadian River Municipal Water Authority

In 2000, CRMWA supplied 76,631 acre-feet of water, of which approximately 51 percent was delivered to three cities in the PWPA, Amarillo, Borger, and Pampa. In 2010, CRMWA is projected to supply 103,855 AFY to all 11 member cities. Deliveries directly to and through member cities also include several industries including Xcel Energy, ASARCO, Wrangler, and Agrium. The remaining 49 percent was sold to eight cities in the Llano Estacado Water Planning Region. These include Brownfield, Lamesa, Levelland, Lubbock, O'Donnell, Plainview, Slaton, and Tahoka. Projected demands for recipients of CRMWA water were developed based on historical demands by recipients, projected demands of recipients, and increased availability of new ground water sources to supplement CRMWA's surface water supply. Approximately 47 percent of water supplied by CRMWA is projected to remain in the PWPA through 2060.

TWDB Population and Demand Projections

Texas Water Development Board
2006 Regional Water Plan Population Projections for 2000 - 2060:
Region A - Panhandle

REGION	WATER USER GROUP	COUNTY NAME	P2000 ¹⁾	P2010	P2020	P2030	P2040	P2050	P2060
A	CLAUDE	ARMSTRONG	1,313	1,327	1,369	1,322	1,268	1,255	1,219
A	COUNTY-OTHER	ARMSTRONG	835	844	871	841	806	798	775
ARMSTRONG									
Total			2,148	2,171	2,240	2,163	2,074	2,053	1,994
A	COUNTY-OTHER	CARSON	1,178	1,182	1,195	1,186	1,147	1,043	947
A	GROOM	CARSON	587	589	595	591	572	520	472
A	HI TEXAS WATER COMPANY	CARSON	492	494	499	495	479	435	395
A	PANHANDLE	CARSON	2,589	2,599	2,626	2,605	2,521	2,291	2,081
A	SKELLYTOWN	CARSON	610	612	619	614	594	540	490
A	WHITE DEER	CARSON	1,060	1,065	1,076	1,066	1,032	938	852
CARSON Total			6,516	6,541	6,610	6,557	6,345	5,767	5,237
A	CHILDRESS	CHILDRESS	6,778	6,918	7,033	7,132	7,167	7,170	6,987
A	COUNTY-OTHER	CHILDRESS	910	929	944	958	962	963	938
CHILDRESS Total			7,688	7,847	7,977	8,090	8,129	8,133	7,925
A	COUNTY-OTHER	COLLINGSWORTH	931	895	898	842	766	709	613
A	WELLINGTON	COLLINGSWORTH	2,275	2,239	2,241	2,187	2,114	2,058	1,965
COLLINGSWORTH									
Total			3,206	3,134	3,139	3,029	2,880	2,767	2,578
A	COUNTY-OTHER	DALLAM	1,063	1,170	1,262	1,320	1,334	1,306	1,245
A	DALHART	DALLAM	4,648	5,118	5,518	5,770	5,833	5,711	5,447
A	TEXLINE	DALLAM	511	563	607	634	641	628	599
DALLAM Total			6,222	6,851	7,387	7,724	7,808	7,645	7,291
A	CLARENDON	DONLEY	1,974	1,974	1,974	1,974	1,974	1,974	1,974
A	COUNTY-OTHER	DONLEY	1,854	1,790	1,720	1,562	1,401	1,264	1,052
DONLEY Total			3,828	3,764	3,694	3,536	3,375	3,238	3,026
A	COUNTY-OTHER	GRAY	3,468	3,379	3,354	3,259	3,132	2,941	2,755
A	LEFORS	GRAY	559	545	540	525	505	474	444
A	MCLEAN	GRAY	830	809	802	780	750	704	659
A	PAMPA	GRAY	17,887	17,430	17,292	16,807	16,155	15,167	14,206
GRAY Total			22,744	22,163	21,988	21,371	20,542	19,286	18,064
A	COUNTY-OTHER	HALL	1,303	1,267	1,358	1,416	1,368	1,388	1,303
A	MEMPHIS	HALL	2,479	2,483	2,474	2,468	2,473	2,471	2,480
HALL Total			3,782	3,750	3,832	3,884	3,841	3,859	3,783
A	COUNTY-OTHER	HANSFORD	1,186	1,388	1,663	1,898	2,152	2,301	2,433
A	GRUVER	HANSFORD	1,162	1,169	1,178	1,186	1,195	1,200	1,204
A	SPEARMAN	HANSFORD	3,021	3,142	3,307	3,448	3,601	3,690	3,769
HANSFORD Total			5,369	5,699	6,148	6,532	6,948	7,191	7,406
A	COUNTY-OTHER	HARTLEY	2,948	3,033	3,135	3,189	3,208	3,168	3,006
A	DALHART	HARTLEY	2,589	2,664	2,754	2,800	2,818	2,782	2,640
HARTLEY Total			5,537	5,697	5,889	5,989	6,026	5,950	5,646
A	CANADIAN	HEMPHILL	2,233	2,330	2,340	2,262	2,178	2,120	2,015
A	COUNTY-OTHER	HEMPHILL	1,118	1,166	1,171	1,132	1,091	1,061	1,009
HEMPHILL Total			3,351	3,496	3,511	3,394	3,269	3,181	3,024
A	BORGER	HUTCHINSON	14,302	14,580	14,780	14,574	14,096	13,314	12,641
A	COUNTY-OTHER	HUTCHINSON	303	308	314	310	299	283	268
A	FRITCH	HUTCHINSON	2,226	2,269	2,300	2,268	2,194	2,072	1,968
A	HI TEXAS WATER COMPANY	HUTCHINSON	3,020	3,079	3,121	3,077	2,976	2,811	2,669
A	STINNETT	HUTCHINSON	1,936	1,974	2,001	1,973	1,908	1,802	1,711
A	TCW SUPPLY INC	HUTCHINSON	2,070	2,110	2,139	2,109	2,040	1,927	1,830
HUTCHINSON Total			23,857	24,320	24,655	24,311	23,513	22,209	21,087

Texas Water Development Board
2006 Regional Water Plan Population Projections for 2000 - 2060:
Region A - Panhandle

REGION	WATER USER GROUP	COUNTY NAME	P2000 ¹⁾	P2010	P2020	P2030	P2040	P2050	P2060
A	BOOKER	LIPSCOMB	1,306	1,318	1,345	1,305	1,267	1,250	1,189
A	COUNTY-OTHER	LIPSCOMB	1,751	1,766	1,804	1,749	1,699	1,675	1,595
LIPSCOMB Total			3,057	3,084	3,149	3,054	2,966	2,925	2,784
A	CACTUS	MOORE	2,538	2,600	3,000	3,000	3,000	3,000	3,000
A	COUNTY-OTHER	MOORE	1,877	3,307	4,534	5,970	7,110	7,805	8,223
A	DUMAS	MOORE	13,747	14,884	16,123	17,216	18,084	18,613	18,931
A	FRITCH	MOORE	9	21	34	45	54	59	62
A	SUNRAY	MOORE	1,950	2,237	2,550	2,826	3,045	3,178	3,258
MOORE Total			20,121	23,049	26,241	29,057	31,293	32,655	33,474
A	BOOKER	OCHILTREE	9	9	9	9	9	9	9
A	COUNTY-OTHER	OCHILTREE	1,223	1,223	1,223	1,223	1,223	1,223	1,223
A	PERRYTON	OCHILTREE	7,774	8,453	9,208	9,769	10,148	10,334	10,571
OCHILTREE Total			9,006	9,685	10,440	11,001	11,380	11,566	11,803
A	COUNTY-OTHER	OLDHAM	1,249	1,327	1,356	1,260	1,110	965	780
A	VEGA	OLDHAM	936	995	1,017	944	832	724	584
OLDHAM Total			2,185	2,322	2,373	2,204	1,942	1,689	1,364
A	AMARILLO	POTTER	99,833	107,316	115,380	122,922	131,510	140,882	148,564
A	COUNTY-OTHER	POTTER	13,713	20,264	27,323	33,924	41,440	49,644	56,369
POTTER Total			113,546	127,580	142,703	156,846	172,950	190,526	204,933
A	AMARILLO	RANDALL	73,794	80,688	88,117	95,065	102,976	111,611	118,760
A	CANYON	RANDALL	12,875	14,227	15,684	17,047	18,599	20,293	21,695
A	COUNTY-OTHER	RANDALL	16,783	21,446	26,471	31,169	36,520	42,359	47,194
A	HAPPY	RANDALL	35	66	100	132	168	207	239
A	LAKE TANGLEWOOD	RANDALL	825	993	1,174	1,344	1,537	1,748	1,923
RANDALL Total			104,312	117,420	131,546	144,757	159,800	176,218	189,811
A	COUNTY-OTHER	ROBERTS	299	313	322	289	242	210	189
A	MIAMI	ROBERTS	588	617	633	568	477	412	372
ROBERTS Total			887	930	955	857	719	622	561
A	COUNTY-OTHER	SHERMAN	1,195	1,297	1,405	1,447	1,490	1,528	1,547
A	STRATFORD	SHERMAN	1,991	2,172	2,365	2,439	2,515	2,582	2,617
SHERMAN Total			3,186	3,469	3,770	3,886	4,005	4,110	4,164
A	COUNTY-OTHER	WHEELER	1,877	1,795	1,796	1,785	1,805	1,799	1,766
A	SHAMROCK	WHEELER	2,029	1,963	1,963	1,954	1,970	1,966	1,941
A	WHEELER	WHEELER	1,378	1,374	1,374	1,373	1,374	1,374	1,373
WHEELER Total			5,284	5,132	5,133	5,112	5,149	5,139	5,080
Region A Total			355,832	388,104	423,380	453,354	484,954	516,729	541,035

- 1) The year 2000 population for cities and county totals are from the 2000 Census. For utilities, TWDB staff estimated the population served by the utility in 2000. Some of the 2000 population estimates for utilities were revised by the Regional Water Planning Groups. The County-Other population was derived by summing all of the city and utility population within a county and subtracting it from the county total population.
- 2) If "P" is present in this column, the Water User Group (WUG) is located in more than one Region and the projections listed in the row represent only the WUG's population projections within that particular Region, not the WUG's total population projections. If the "P" is present for a county total entry, then the county has been split by Regional boundaries and the projections listed in the row represent only the county's populations within the particular Region, not the county's total population projections.
- 3) If "P" is present in this column, the Water User Group (WUG) is located in more than one county and the projections listed in the row represent only the WUG's population projections within that particular county, not the WUG's total population projections.

2006 Regional Water Plan
Irrigation Water Demand Projections for 2000 - 2060 (in acft¹)

Region A

County Name²⁾	D2000	D2010	D2020	D2030	D2040	D2050	D2060
ARMSTRONG	10,544	10,280	10,017	9,490	8,435	7,381	6,854
CARSON	97,345	94,912	92,478	87,611	77,876	68,142	63,274
CHILDRESS	10,304	10,046	9,789	9,273	8,243	7,213	6,698
COLLINGSWORTH	25,607	24,967	24,327	23,046	20,486	17,925	16,645
DALLAM	320,475	312,463	304,452	288,428	256,380	224,333	208,309
DONLEY	21,019	20,493	19,968	18,917	16,815	14,713	13,662
GRAY	25,499	24,862	24,224	22,949	20,399	17,850	16,576
HALL	20,789	20,269	19,749	18,710	16,631	14,552	13,513
HANSFORD	138,389	134,929	131,470	124,550	110,711	96,872	89,953
HARTLEY	289,008	281,783	274,557	260,107	231,206	202,306	187,855
HEMPHILL	3,779	3,637	3,496	3,354	3,212	3,070	2,929
HUTCHINSON	63,208	61,628	60,048	56,887	50,567	44,246	41,085
LIPSCOMB	14,789	14,419	14,049	13,310	11,831	10,352	9,613
MOORE	180,594	176,079	171,564	162,535	144,475	126,416	117,386
OCHILTREE	104,220	101,615	99,009	93,798	83,376	72,954	67,743
OLDHAM	5,223	5,092	4,962	4,700	4,178	3,656	3,395
POTTER	8,009	7,809	7,608	7,208	6,407	5,606	5,206
RANDALL	30,302	29,166	28,029	26,893	25,757	24,620	23,484
ROBERTS	22,890	22,318	21,746	20,601	18,312	16,023	14,879
SHERMAN	294,703	287,336	279,968	265,233	235,763	206,292	191,557
WHEELER	8,335	8,127	7,919	7,502	6,668	5,835	5,418
Region A Total	1,695,031	1,652,230	1,609,429	1,525,102	1,357,728	1,190,357	1,106,034

¹⁾ An acft is an amount of water to cover one acre with one foot of water and equals

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 9/20/05

2006 Regional Water Plan

Livestock Water Demand Projections for 2000 - 2060 (in acft¹)

Region A

Region	County Name ²⁾	D2000	D2010	D2020	D2030	D2040	D2050	D2060
A	ARMSTRONG	573	612	645	673	703	734	768
A	CARSON	945	1,016	1,074	1,120	1,168	1,219	1,272
A	CHILDRESS	288	292	348	353	359	366	372
A	COLLINGSWORTH	578	592	656	672	688	705	723
A	DALLAM	5,689	12,287	18,390	18,614	18,851	19,102	19,369
A	DONLEY	1,100	1,206	1,283	1,332	1,385	1,440	1,500
A	GRAY	1,706	2,183	2,485	2,589	2,700	2,871	2,942
A	HALL	297	300	302	305	309	311	316
A	HANSFORD	4,088	4,744	5,218	5,509	5,817	6,144	6,490
A	HARTLEY	3,572	7,088	10,236	10,506	10,792	11,096	11,418
A	HEMPHILL	1,408	1,635	1,811	1,889	1,972	2,061	2,155
A	HUTCHINSON	596	814	1,018	1,051	1,086	1,123	1,163
A	LIPSCOMB	589	831	958	976	996	1,016	1,037
A	MOORE	2,684	4,172	5,379	5,575	5,783	6,004	6,283
A	OCHILTREE	4,168	4,538	4,787	4,938	5,098	5,268	5,450
A	OLDHAM	1,635	2,116	2,258	2,358	2,460	2,569	2,685
A	POTTER	478	503	527	550	574	599	626
A	RANDALL	2,752	3,173	3,489	3,683	3,888	4,106	4,338
A	ROBERTS	534	609	628	649	671	694	718
A	SHERMAN	2,996	10,880	16,701	16,903	17,118	17,347	17,589
A	WHEELER	1,504	1,645	1,793	1,852	1,915	1,982	2,053
Region A Total		38,180	61,236	79,986	82,097	84,333	86,757	89,267

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 9/17/03

2006 Regional Water Plan
Manufacturing Water Demand Projections for 2000 - 2060 (in acft¹)

Region A

Region	County Name²⁾	D2000	D2010	D2020	D2030	D2040	D2050	D2060
A	ARMSTRONG	0	0	0	0	0	0	0
A	CARSON	491	591	669	735	797	849	920
A	CHILDRESS	0	0	0	0	0	0	0
A	COLLINGSWORTH	0	0	0	0	0	0	0
A	DALLAM	0	0	0	0	0	0	0
A	DONLEY	0	0	0	0	0	0	0
A	GRAY	4,088	4,264	4,383	4,451	4,497	4,515	4,334
A	HALL	0	0	0	0	0	0	0
A	HANSFORD	42	49	52	54	56	58	62
A	HARTLEY	5	5	5	5	5	5	5
A	HEMPHILL	1	1	1	1	1	1	1
A	HUTCHINSON	20,143	23,659	25,482	26,969	28,399	29,640	31,708
A	LIPSCOMB	76	89	95	100	104	108	116
A	MOORE	6,718	7,879	8,450	8,914	9,371	9,773	10,436
A	OCHILTREE	0	0	0	0	0	0	0
A	OLDHAM	0	0	0	0	0	0	0
A	POTTER	5,755	6,788	7,468	8,043	8,604	9,090	9,757
A	RANDALL	489	605	670	726	778	821	892
A	ROBERTS	0	0	0	0	0	0	0
A	SHERMAN	0	0	0	0	0	0	0
A	WHEELER	0	0	0	0	0	0	0
Region A Total		37,808	43,930	47,275	49,998	52,612	54,860	58,231

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 9/17/03

2006 Regional Water Plan
Mining Water Demand Projections for 2000 - 2060 (in acft¹)

Region A

Region	County Name²⁾	D2000	D2010	D2020	D2030	D2040	D2050	D2060
A	ARMSTRONG	19	13	12	12	12	12	12
A	CARSON	1,710	1,461	1,412	1,393	1,376	1,360	1,339
A	CHILDRESS	20	17	16	16	16	16	16
A	COLLINGSWORTH	0	0	0	0	0	0	0
A	DALLAM	0	0	0	0	0	0	0
A	DONLEY	22	15	14	14	14	14	14
A	GRAY	1,734	1,929	1,999	2,028	2,056	2,083	2,118
A	HALL	22	15	14	14	14	14	14
A	HANSFORD	588	543	533	529	525	521	516
A	HARTLEY	0	0	0	0	0	0	0
A	HEMPHILL	0	0	0	0	0	0	0
A	HUTCHINSON	432	398	393	394	395	396	396
A	LIPSCOMB	6	6	6	6	6	6	6
A	MOORE	1,802	1,733	1,716	1,709	1,703	1,697	1,689
A	OCHILTREE	164	198	213	220	226	232	240
A	OLDHAM	292	328	341	347	352	357	364
A	POTTER	261	329	367	392	417	442	462
A	RANDALL	15	18	19	20	21	22	23
A	ROBERTS	9	6	6	6	6	6	6
A	SHERMAN	20	17	16	16	16	16	16
A	WHEELER	113	89	85	83	82	81	79
Region A Total		7,229	7,115	7,162	7,199	7,237	7,275	7,310

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 9/17/03

2006 Regional Water Plan
Municipal Water Demand Projections for 2000 - 2060 (in acft¹)

Region A

Region	WUG Name	County Name	D2000	D2010	D2020	D2030	D2040	D2050	D2060
A	CLAUDE	ARMSTRONG	306	262	270	261	250	247	240
A	COUNTY-OTHER	ARMSTRONG	108	109	112	108	104	103	100
		ARMSTRONG Total	414	371	382	369	354	350	340
A	COUNTY-OTHER	CARSON	256	256	259	258	249	227	206
A	GROOM	CARSON	160	142	143	142	138	125	114
A	HI TEXAS WATER COMPANY	CARSON	55	55	55	55	53	48	44
A	PANHANDLE	CARSON	647	574	579	575	556	506	459
A	SKELLYTOWN	CARSON	105	106	107	106	102	93	85
A	WHITE DEER	CARSON	199	164	165	164	159	144	130
		CARSON Total	1,422	1,297	1,308	1,300	1,257	1,143	1,038
A	CHILDRRESS	CHILDRRESS	1,655	1,457	1,481	1,502	1,509	1,510	1,471
A	COUNTY-OTHER	CHILDRRESS	192	196	199	202	203	203	198
		CHILDRRESS Total	1,847	1,653	1,680	1,704	1,712	1,713	1,669
A	COUNTY-OTHER	COLLINGSWORTH	243	234	234	220	200	185	160
A	WELLINGTON	COLLINGSWORTH	464	456	457	446	431	420	401
		COLLINGSWORTH Total	707	690	691	666	631	605	561
A	COUNTY-OTHER	DALLAM	164	181	195	204	206	202	192
A	DALHART	DALLAM	1,609	1,319	1,422	1,487	1,503	1,471	1,403
A	TEXLINE	DALLAM	191	211	227	237	240	235	224
		DALLAM Total	1,964	1,711	1,844	1,928	1,949	1,908	1,819
A	CLARENDON	DONLEY	290	440	440	440	440	440	440
A	COUNTY-OTHER	DONLEY	226	219	210	191	171	154	128
		DONLEY Total	516	659	650	631	611	594	568
A	COUNTY-OTHER	GRAY	524	511	507	493	473	444	417
A	LEFORS	GRAY	104	86	85	83	80	75	70
A	MCLEAN	GRAY	190	185	183	178	171	161	151
A	PAMPA	GRAY	3,386	3,300	3,273	3,182	3,058	2,871	2,689
		GRAY Total	4,204	4,082	4,048	3,936	3,782	3,551	3,327
A	COUNTY-OTHER	HALL	363	353	379	395	382	387	363
A	MEMPHIS	HALL	442	442	441	440	440	440	442
		HALL Total	805	795	820	835	822	827	805
A	COUNTY-OTHER	HANSFORD	227	266	319	364	412	441	466
A	GRUVER	HANSFORD	333	325	327	329	332	333	334
A	SPEARMAN	HANSFORD	744	707	745	776	811	831	849
		HANSFORD Total	1,304	1,298	1,391	1,469	1,555	1,605	1,649
A	COUNTY-OTHER	HARTLEY	509	523	541	550	553	546	519
A	DALHART	HARTLEY	896	686	710	721	726	717	680
		HARTLEY Total	1,405	1,209	1,251	1,271	1,279	1,263	1,199
A	CANADIAN	HEMPHILL	455	475	477	461	444	432	411
A	COUNTY-OTHER	HEMPHILL	152	158	159	153	148	143	137
		HEMPHILL Total	607	633	636	614	592	575	548
A	BORGER	HUTCHINSON	2,307	2,352	2,384	2,351	2,274	2,148	2,039
A	COUNTY-OTHER	HUTCHINSON	55	56	57	57	55	52	49
A	FRITCH	HUTCHINSON	439	407	412	406	393	371	353
A	HI TEXAS WATER COMPANY	HUTCHINSON	335	341	346	341	330	312	296
A	STINNETT	HUTCHINSON	447	365	370	365	353	333	316
A	TCW SUPPLY INC	HUTCHINSON	591	603	611	602	583	550	523
		HUTCHINSON Total	4,174	4,124	4,180	4,122	3,988	3,766	3,576

**2006 Regional Water Plan
Municipal Water Demand Projections for 2000 - 2060 (in acft¹)**

Region A

Region	WUG Name	County Name	D2000	D2010	D2020	D2030	D2040	D2050	D2060
A	BOOKER	LIPSCOMB	509	354	362	351	341	336	320
A	COUNTY-OTHER	LIPSCOMB	390	394	402	390	379	373	356
		LIPSCOMB Total	899	748	764	741	720	709	676
A	CACTUS	MOORE	745	533	615	615	615	615	615
A	COUNTY-OTHER	MOORE	397	700	960	1,264	1,505	1,652	1,741
A	DUMAS	MOORE	3,357	2,734	2,962	3,163	3,322	3,419	3,478
A	FRITCH	MOORE	2	4	6	8	10	11	11
A	SUNRAY	MOORE	478	534	608	674	727	758	777
		MOORE Total	4,979	4,505	5,151	5,724	6,179	6,455	6,622
A	BOOKER	OCHILTREE	4	2	2	2	2	2	2
A	COUNTY-OTHER	OCHILTREE	181	181	181	181	181	181	181
A	PERRYTON	OCHILTREE	2,046	1,960	2,135	2,265	2,353	2,396	2,451
		OCHILTREE Total	2,231	2,143	2,318	2,448	2,536	2,579	2,634
A	COUNTY-OTHER	OLDHAM	164	174	178	165	146	126	102
A	VEGA	OLDHAM	228	242	247	229	202	176	142
		OLDHAM Total	392	416	425	394	348	302	244
A	AMARILLO	POTTER	28,628	24,162	25,978	27,675	29,609	31,719	33,449
A	COUNTY-OTHER	POTTER	1,152	1,703	2,295	2,850	3,482	4,171	4,736
		POTTER Total	29,780	25,865	28,273	30,525	33,091	35,890	38,185
A	AMARILLO	RANDALL	21,161	18,167	19,839	21,404	23,185	25,129	26,739
A	CANYON	RANDALL	2,207	2,438	2,688	2,922	3,188	3,478	3,718
A	COUNTY-OTHER	RANDALL	2,124	2,715	3,351	3,945	4,623	5,361	5,973
A	HAPPY	RANDALL	6	11	17	22	27	33	38
A	LAKE TANGLEWOOD	RANDALL	147	160	189	217	248	282	310
		RANDALL Total	25,645	23,491	26,084	28,510	31,271	34,283	36,778
A	COUNTY-OTHER	ROBERTS	42	44	45	41	34	30	27
A	MIAMI	ROBERTS	138	145	149	134	112	97	88
		ROBERTS Total	180	189	194	175	146	127	115
A	COUNTY-OTHER	SHERMAN	201	218	236	243	250	257	260
A	STRATFORD	SHERMAN	575	628	683	705	727	746	756
		SHERMAN Total	776	846	919	948	977	1,003	1,016
A	COUNTY-OTHER	WHEELER	290	277	278	276	279	278	273
A	SHAMROCK	WHEELER	345	312	312	311	313	313	309
A	WHEELER	WHEELER	307	291	291	291	291	291	291
		WHEELER Total	942	880	881	878	883	882	873
		Region A Total	85,193	77,605	83,890	89,188	94,683	100,130	104,242

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

Projections last updated on 9/17/03

2006 Regional Water Plan
Steam Electric Water Demand Projections for 2000 - 2060 (in acft¹)
Region A

Region	County Name ²⁾	D2000	D2010	D2020	D2030	D2040	D2050	D2060
A	ARMSTRONG	0	0	0	0	0	0	0
A	CARSON	0	0	0	0	0	0	0
A	CHILDRESS	0	0	0	0	0	0	0
A	COLLINGSWORTH	0	0	0	0	0	0	0
A	DALLAM	0	0	0	0	0	0	0
A	DONLEY	0	0	0	0	0	0	0
A	GRAY	0	0	0	0	0	0	0
A	HALL	0	0	0	0	0	0	0
A	HANSFORD	0	0	0	0	0	0	0
A	HARTLEY	0	0	0	0	0	0	0
A	HEMPHILL	0	0	0	0	0	0	0
A	HUTCHINSON	0	0	0	0	0	0	0
A	LIPSCOMB	0	0	0	0	0	0	0
A	MOORE	167	200	200	200	200	200	213
A	OCHILTREE	0	0	0	0	0	0	0
A	OLDHAM	0	0	0	0	0	0	0
A	POTTER	18,088	22,432	25,387	26,804	28,408	30,011	34,115
A	RANDALL	0	0	0	0	0	0	0
A	ROBERTS	0	0	0	0	0	0	0
A	SHERMAN	0	0	0	0	0	0	0
A	WHEELER	0	0	0	0	0	0	0
Region A Total		18,255	22,632	25,587	27,004	28,608	30,211	34,328

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 9/17/03