



TEXAS WATER DEVELOPMENT BOARD



James E. Herring, *Chairman*
Lewis H. McMahan, *Member*
Edward G. Vaughan, *Member*

J. Kevin Ward
Executive Administrator

Jack Hunt, *Vice Chairman*
Thomas Weir Labatt III, *Member*
Joe M. Crutcher, *Member*

TO: Board Members

THROUGH: Carolyn L. Brittin, Deputy Executive Administrator, Water Resources Planning and Information

Dan Hardin, Director, Water Resources Planning

FROM: Stuart D. Norvell, Manager, Water Planning Research and Analysis

DATE: January 13, 2010

SUBJECT: Consider approval by minute order of revised population and water demand projections for regional water planning areas E (Far West Texas), M (Rio Grande), and I (East Texas), and revised water demand projections for the Region H and Region J (Plateau) regional water planning areas.

ACTION REQUESTED

Consider approval by minute order of revised population and water demand projections for regional water planning areas E (Far West Texas), M (Rio Grande), and I (East Texas), and revised water demand projections for the Region H and Region J (Plateau) regional water planning areas.

BACKGROUND

The Texas Water Development Board (TWDB) is responsible for adopting population and water demand projections for the regional and state water planning processes [31 TAC, §357.5 (d)(1-2)]. With the exception of steam-electric water demands, Board-approved water demand projections from the 2007 State Water Plan are serving as default projections for the current planning cycle (2007-2012) unless a regional water planning group formally requests revisions based on changed conditions in a given planning area.

Upon receiving a formal request to revise population or water demand projections, TWDB staff review the changes in conjunction with staff from the Texas Commission on Environmental Quality, the Texas Parks and Wildlife Department, and the Texas Department of Agriculture to assess whether the changes are valid for use in regional and state water planning and comply with statutory and administrative rule requirements.

Our Mission

To provide leadership, planning, financial assistance, information, and education for the conservation and responsible development of water for Texas.

P.O. Box 13231 • 1700 N. Congress Avenue • Austin, Texas 78711-3231
Telephone (512) 463-7847 • Fax (512) 475-2053 • 1-800-RELAYTX (for the hearing impaired)
www.twdb.state.tx.us • info@twdb.state.tx.us

TNRIS - Texas Natural Resources Information System • www.tnris.state.tx.us
A Member of the Texas Geographic Information Council (TGIC)



TWDB staff and representatives of coordinating agencies have reviewed the requests in this memorandum and have determined that the changes are valid and consistent with criteria for demand revisions specified in statute and administrative rules, and are hereby recommended for approval (staff agency review memorandum is included in Attachment A).

REGION E

Population and Municipal Water Demands

Representatives of several political subdivisions have requested that the Region E planning group revise 2006 population and corresponding municipal water demand projections. Higher than projected populations are based largely on expected increases in the number of troops stationed at Fort Bliss. At a regional level, population increases are one percent (Table 1).

Revised municipal water demands are significantly lower (by a factor of 20 percent in 2010 and 15 percent in 2060). The large decline results primarily from a lower per capita municipal water use estimate for El Paso (180 gallons per person per day in 2011 versus 213 in the 2006 regional plan), which is attributed to the city's aggressive water conservation campaign over the past decade. Attachment A to this memorandum shows population and municipal demands changes at the local level.

Table 1: Proposed Changes to Population and Municipal Water Demand Projections for the Region E 2011 Water Plan (2010-2060)						
	2010	2020	2030	2040	2050	2060
Population						
2006	855,466	1,018,479	1,161,232	1,283,725	1,405,966	1,527,713
2011	863,190	1,032,970	1,175,743	1,298,436	1,420,877	1,542,824
Change	+7,724	+14,491	+14,511	+14,711	+14,911	+15,111
% Change	+1%	+1%	+1%	+1%	+1%	+1%
Municipal Water Demands (acre-feet per year)						
2006	162,132	183,558	202,057	217,668	234,216	251,974
2011	129,476	151,308	169,054	183,864	198,872	214,139
Change	-32,656	-32,250	-33,003	-33,804	-35,344	-37,835
% Change	-20%	-18%	-16%	-16%	-15%	-15%

Irrigation Water Demands

Increased irrigation water demands in Region E are associated with higher use in recent years in Culbertson, Jeff Davis, and Presidio counties. The increases are based on data provided by Groundwater Conservation Districts and local businesses. With the changes, irrigation demands in Region E rise by four percent in each decade (Table 2).

Table 2: Proposed Changes to Irrigation Water Demand Projections for the Region E 2011 Water Plan						
	2010	2020	2030	2040	2050	2060
2006	481,042	471,910	465,241	452,152	443,827	435,657
2011	499,092	489,579	482,538	469,087	460,402	451,882
Change	+18,050	+17,669	+17,297	+16,935	+16,575	+16,225
% Change	+4%	+4%	+4%	+4%	+4%	+4%

Mining Water Demands

Based on an analysis of data from the Railroad Commission of Texas, Region E estimates that approximately 1,418 acre-feet of mining water has been used in Terrell County over the past decade at an average rate of 142 acre-feet per year. However, the 2006 regional plan lists only 18 acre-feet per year for mining operations in the county. To ensure future mining water demands are more accurately accounted for, the region requests that mining demands increase to 125 acre-feet per year. With the change, regional totals rise by five percent in each decade (Table 3).

Table 3: Proposed Changes to Mining Water Demands for the Region E 2011 Water Plan (acre-feet per year)						
	2010	2020	2030	2040	2050	2060
2006	2,273	2,292	2,299	2,307	2,314	2,326
2011	2,397	2,417	2,424	2,432	2,439	2,451
Change	+125	+125	+125	+125	+125	+125
% Change	+5%	+5%	+5%	+5%	+5%	+5%

REGION H

Municipal Water Demands

In November of 2009, the Board approved large-scale revisions to population projections for Water User Groups within Region H. The tables which showed the revised municipal demand resulting from these population revisions contained an error, in which an incorrect gallons per capita per day value was applied to the revised population for San Jacinto County-Other (Trinity Basin portion). The corrected calculation for revised municipal demand for this Water User Group is shown in Table 4. The corrected total municipal demand for Region H is shown in Table 5.

Table 4: Corrected Municipal Water Demands for County-Other, San Jacinto County for the 2011 Region H Water Plan (acre-feet per year)						
Water User Group	2010	2020	2030	2040	2050	2060
Approved by Board in November 2009						
2011 County-other (San Jacinto County, Trinity Basin)	1,339	1,513	1,607	1,463	1,372	1,240
Corrected						
2011 County-other (San Jacinto County, Trinity Basin)	497	538	555	496	461	415

Table 5: Corrected Municipal Water Demand Projections for the Region H 2011 Water Plan						
Municipal Water Demands						
2006	980,544	1,116,660	1,253,607	1,391,710	1,552,375	1,732,608
2011	1,042,864	1,192,912	1,338,586	1,485,843	1,655,262	1,844,817
Change	+62,320	+76,252	+84,979	+94,133	+102,887	+112,209
% Change	+6.4%	+6.8%	+6.8%	+6.8%	+6.6%	+6.5%

REGION I

Population and Municipal Water Demands

Representatives of several political subdivisions in the East Texas Regional Water Planning Area (Region I) have requested that the planning group revise 2006 population and municipal water demand projections to reflect the addition of five new water user groups. Projections for each of these water user groups were subtracted from County-other projections. As a result, there is no net change to regional totals. Changes for individual cities and utilities are listed in Attachment A.

Irrigation Water Demands

Requested irrigation demands in Region I are approximately 72,000 acre-feet lower. The most significant reduction is in Jefferson County (68,035 acre-feet), and is due primarily to declines in rice farming. With the changes, irrigation demands in the region decrease by 32 percent (Table 6).

Table 6: Proposed Changes to Irrigation Water Demands for the Region I 2011 Water Plan (acre-feet per year)						
	2010	2020	2030	2040	2050	2060
2006	222,846	223,163	223,517	223,899	224,321	224,786
2011	151,100	151,417	151,771	152,153	152,575	153,040
Change	-71,746	-71,746	-71,746	-71,746	-71,746	-71,746
% Change	-32%	-32%	-32%	-32%	-32%	-32%

Manufacturing Demands

Region I has also requested changes to manufacturing demands in Angelina and Jefferson counties. In Angelina County, demands have fallen due to the closure of the Abitibi paper mill in Lufkin. Changes in Jefferson County are based in part on a special study generated under contract with the TWDB as part of Phase I of the 2011 planning cycle. According to the study and information provided by the Lower Neches Valley Authority (LNVA), two liquefied natural gas (LNG) facilities owned by Golden Pass LNG and Sempra Energy are under construction. Both are expected to be operational within five years. LNVA expects that they will need to provide both facilities with water for use as a heat transfer fluid for warming the liquefied gas. It should be noted that the East Texas Regional Water Planning Group’s request for revised projections also included a qualifying statement with regard to the Jefferson County manufacturing demand projections, “with the limitation that these demands can be met by LNVA’s existing water rights without modification or addition.” With the requested change, manufacturing demands in Region I increase by 32 percent in 2020 and 51 percent in 2060 (Table 7).

Table 7: Proposed Changes to Manufacturing Water Demands for the Region I 2011 Water Plan (acre-feet per year)						
	2010	2020	2030	2040	2050	2060
2006	401,790	446,939	485,692	524,491	558,594	593,454
2011	299,992	591,904	784,140	821,841	857,902	893,476
Change	-101,798	+144,965	+298,448	+297,350	+299,308	+300,022
% Change	-25%	+32%	+61%	+57%	+54%	+51%

Mining Demands

Several energy companies recently asked that the Angelina and Neches River Authority provide water to support current and future oil and gas production in the Haynesville Shale and its outcrop areas (Angelina, Cherokee, Nacogdoches, Shelby and San Augustine counties). Mining water demands in each county are requested to be adjusted accordingly. With the changes, mining demands in the region rise by 48 percent in 2010 and 129 percent in 2020 (Table 8).

Table 8: Proposed Changes to Mining Water Demands for the Region I 2011 Water Plan (acre-feet per year)						
	2010	2020	2030	2040	2050	2060
2006	14,662	16,297	17,331	18,385	19,432	20,314
2011	21,662	37,297	17,331	18,385	19,432	20,314
Change	+7,000	+21,000	0	0	0	0
% Change	+48%	+129%	0%	0%	0%	0%

Region J

As part of a special study generated under contract with the TWDB as part of Phase I of the 2011 regional water planning cycle, Region J determined that current mining water use exceeds volumes reported in their 2006 regional water plan for Edwards County by 84 acre-feet (Table 9). To ensure that mining activity in Edwards County is accurately reflected in the 2011 Region J plan, the planning group requests that demands increase by 84 acre-feet (26 percent).

Table 9: Proposed Changes to Mining Water Demand Projections for the Region J 2011 Water Plan (acre-feet per year)						
Planning Cycle	2010	2020	2030	2040	2050	2060
2006	319	310	305	301	297	294
2011	403	394	389	385	381	378
Difference	+84	+84	+84	+84	+84	+84
% Change	+26%	+27%	+28%	+28%	+28%	+29%

Region M

Population and Municipal Water Demands

Political subdivisions in the Region M have requested changes to 2006 population and municipal water demands. Recent data published by the Texas State Demographer show that in 2007, population levels in Region M exceeded levels predicted for the 2006 Region M plan by three percent. To account for this faster than expected growth, Region M requests increases in population and municipal water demands of about three percent in each decade (Table 10). Changes for individual cities and utilities are listed in Attachment A.

Table 10: Proposed Changes to Population and Municipal Water Demand Projections for the Region M 2011 Water Plan (acre-feet per year)						
	2010	2020	2030	2040	2050	2060
Population						
2006	1,581,207	1,973,188	2,401,223	2,854,613	3,337,618	3,826,001
2011	1,628,278	2,030,994	2,470,814	2,936,748	3,433,188	3,935,223
Change	+47,071	+57,806	+69,591	+82,135	+95,570	+109,222
% Change	+3%	+3%	+3%	+3%	+3%	+3%
Municipal Water Demands						
2006	279,633	338,716	403,511	472,632	547,747	625,743
2011	288,323	349,410	416,396	487,858	565,475	646,006
Change	+8,690	+10,694	+12,885	+15,226	+17,728	+20,263
% Change	+3%	+3%	+3%	+3%	+3%	+3%

CUMULATIVE CHANGES TO STATE TOTALS

TWDB staff expects that the revisions in this memorandum will complete the projections revision process for the 2011 regional water planning cycle. Table 11 compares state totals from the 2006 regional water plans to the Board-approved changes to date for regions A, C, E, G, H, K, N and P for the current planning cycle, and changes requested in this memorandum for regions E, H, I, J and M. At the state level, the changes will:

- increase state population and municipal water demands by about two percent;
- decrease irrigation demands by two to three percent;
- increase mining demands by two to 10 percent;
- decrease livestock demands by seven to 11 percent;
- increase manufacturing demands by seven to 11 percent; and
- increase steam-electric by six to 14 percent.

Table 11: Comparison of State Level Population and Water Demand Projections for the 2006 and 2011 Regional Water Planning Cycles (2010-2060)						
	2010	2020	2030	2040	2050	2060
Population Projections						
2006	24,915,388	29,117,537	33,052,506	36,893,267	41,071,409	45,558,282
2011*	25,388,403	29,650,387	33,712,019	37,734,422	41,924,169	46,323,725
Change	+473,015	+532,850	+659,513	+841,155	+852,760	+765,443
% Change	+2%	+2%	+2%	+2%	+2%	+2%
Municipal Water Demands (acre-feet per year)						
2006	4,770,501	5,483,790	6,120,377	6,739,592	7,450,792	8,258,942
2011	4,851,202	5,580,980	6,254,785	6,917,723	7,630,809	8,414,493
Change	+80,701	+97,190	+134,408	+178,131	+180,017	+155,551
% Change	+2%	+2%	+2%	+2%	+2%	+2%

Irrigation Water Demands (acre-feet per year)						
2006	10,345,131	9,980,301	9,585,833	9,206,620	8,843,094	8,556,224
2011	10,079,215	9,643,908	9,299,464	9,024,869	8,697,560	8,370,554
Change	-265,916	-336,393	-286,369	-181,751	-145,534	-185,670
% Change	-3%	-3%	-3%	-2%	-2%	-2%
Livestock Water Demands (acre-feet per year)						
2006	344,495	374,724	381,241	388,243	395,945	404,397
2011	322,965	336,634	344,243	352,535	361,701	371,922
Change	-21,530	-38,090	-36,998	-35,708	-34,244	-32,475
% Change	-7%	-11%	-11%	-10%	-9%	-9%
Mining Water Demands (acre-feet per year)						
2006	270,845	280,815	285,964	276,054	276,931	285,573
2011	296,230	313,427	296,472	285,002	284,640	292,294
Change	+25,385	+32,612	+10,508	+8,948	+7,709	+6,721
% Change	+9%	+10%	+4%	+3%	+3%	+2%
Manufacturing Water Demands (acre-feet per year)						
2006	1,825,686	2,004,666	2,163,421	2,319,913	2,452,107	2,578,582
2011	1,727,808	2,153,551	2,465,789	2,621,183	2,755,335	2,882,524
Change	-97,878	+148,885	+302,368	301,270	303,228	303,942
% Change	-6%	+7%	+12%	+11%	+11%	+11%
Steam-electric Demands (acre-feet per year)						
2006	755,170	886,580	1,030,212	1,174,170	1,339,733	1,533,556
2011	733,379	1,013,256	1,163,102	1,319,281	1,463,187	1,623,116
Change	-21,791	+126,676	+132,890	+145,111	+123,454	+89,560
% Change	-3%	+14%	+13%	+12%	+9%	+6%
Total Water Demands for Texas (acre-feet per year)						
2006	18,311,828	19,010,876	19,567,048	20,104,592	20,758,602	21,617,274
2011	18,011,661	19,042,738	19,824,915	20,521,567	21,194,155	21,955,694
Change	-300,167	+31,862	+257,867	+416,975	+435,553	+338,420
% Change	-2%	+0.2%	+1%	+2%	+2%	+2%
* 2011 projections include revisions approved by the Board as of December 2009 (regions A, C, G, H, K, N, O and P).						

RECOMMENDATION

Approve population and water demand projections shown in Tables 1 through 9 of this memorandum for use in developing 2011 regional water plans and the 2012 State Water Plan.

ANTICIPATED OPPOSITION

None at this time.

This recommendation has been reviewed by legal counsel and is in compliance with applicable statutes and Board rules.

Ken Petersen
General Counsel

ATTACHMENT A

Staff Review of the Proposed Projections for Regions E, H, I, J and M and Staff Recommendations to the Executive Administrator.

ATTACHMENT A

**Staff Review of the Proposed Projections for Regions E, H, I, J and M and Staff
Recommendations to the Executive Administrator**



TEXAS WATER DEVELOPMENT BOARD



E. G. Rod Pittman, *Chairman*
William W. Meadows, *Member*
Dario Vidal Guerra, Jr., *Member*

J. Kevin Ward
Executive Administrator

Jack Hunt, *Vice Chairman*
Thomas Weir Labatt III, *Member*
James E. Herring, *Member*

To: Kevin Ward, Executive Administrator

Through: Carolyn L. Brittin, Deputy Executive Administrator, Water Resources Planning and Information

Dan Hardin, Director, Water Resources Planning

From: Stuart D. Norvell, Texas Water Development Board
Steve Densmore, Texas Commission on Environmental Quality
Cindy Loeffler, Texas Parks and Wildlife Department
Kelley Stripling, Texas Department of Agriculture

Date: 30 December, 2009

Re: Revised population and water demand projections for regional water planning areas E, I, and M; and revised water demand projections for Regions H and J (2007-2012 planning cycle).

Background

Population and water demand projections from the 2006 regional water plans are serving as the basis for projections in the current planning cycle. However, the Texas Water Development Board (TWDB) may consider requests to amend 2006 population and water demand projections if conditions in a planning region have changed significantly.

As specified in Section 357.5 (d)(2), Title 31 of the Texas Administrative Code (TAC), entities wishing to revise projections address their requests through their respective regional water planning group. If a planning group concurs, they submit requests to the Executive Administrator of the TWDB.

TWDB staff coordinates reviews of each request with the Texas Commission on Environmental Quality, the Texas Parks and Wildlife Department, and the Texas Department of Agriculture. Designated representatives from each agency must recommend each revision. The Board is responsible for approving and adopting population and water demand projections as specified in (§357.5 (d)(1), 31 TAC).

Our Mission

To provide leadership, planning, financial assistance, information and education for the conservation and responsible development of water for Texas.

P.O. Box 13231 • 1700 N Congress Avenue • Austin, Texas 78711-3231
Telephone (512) 463-7847 • Fax (512) 475-2053 • 1-800-RELAYTX (for the hearing impaired)
www.twdb.state.tx.us • info@twdb.state.tx.us

TNRIS – Texas Natural Resources Information System • www.tnris.state.tx.us
A Member of the Texas Geographic Information Council (TGIC)



Region E

Population

Representatives of several political subdivisions in Region E have requested that the Region E planning group revise 2006 population and municipal water demand projections.

To ensure consistency and to maintain public credibility in Board projections, population estimates published by the Texas State Data Center served as the primary benchmark for assessing the accuracy of requests. The base year for TWDB projections in the 2002-2007 planning cycle was 2000, which is the same year that the U.S. Department of Commerce released results of the U.S. Census. In years in between census releases, the State Data Center generates annual estimates for each county in Texas. Using these estimates, requested changes were evaluated using the following standards:

- 1) if State Data Center population estimates for 2007 exceed TWDB projected values for the same year, increases in regional totals in an amount comparable to the difference were considered justifiable (Table A-1); and
- 2) if State Data Center estimates were less than TWDB projections, requested increases to regional level totals were not considered valid; however, in some cases localized sub-regional adjustments and redistributions of projected populations were considered reasonable as long as regional totals did not increase.

To maintain county and regional level totals, planning groups offset increases by redistributing population at the sub-county level. For example, if increased projections for a given county were not justified, increases for a city could be offset by reducing “county-other” populations.

In addition, some planning groups included “new” Water User Groups (WUGs) previously included in the category of county-other. To qualify as new WUGs, a city must now have a population of at least 500 and non-city WUGs (e.g., utilities, water supply corporations) must provide on average 250,000 gallons per day to residential, commercial or institutional customers (i.e., municipal water use). For cities or utilities with changes in population, the TWDB adjusted corresponding water demands by multiplying revised populations by per capita use values from the 2007 State Water Plan.

On average, across all regions TSDC estimates exceed TWDB projections by around 1.2 percent. For Region E, TWDB projections were 3.6 percent higher than January 2007 State Data Center estimates. However, in early 2008 the Department of Defense announced significant increases in troop levels stationed at Fort Bliss in El Paso. According to information provided by Fort Bliss public affairs officers, the base’s population is expected to rise by 14,208 by 2018.

Other developments affecting population in Region E include:

- increases in population for El Paso County-other because the Homestead Municipal Water Utility District has disbanded, and therefore these projections will move to El Paso County-other;
- higher populations for Fort Davis based on faster than expected growth since 2000; and
- Horizon City and El Paso County Water Authority have merged to form the Horizon Regional Municipal Utility District.

With the changes regional totals increase by about one percent in each decade - an additional 7,724 people in 2010 and 15,111 in 2060 (Table A-1).

Table A-1: Proposed Changes to Population Projections for the Region E 2011 Water Plan (2010-2060)							
El Paso County							
Water User Group	Planning Cycle	2010	2020	2030	2040	2050	2060
County-Other	2006	53,795	83,893	110,308	133,092	155,876	178,660
	2011	58,693	90,716	118,821	143,062	167,303	191,544
	Difference	4,898	6,823	8,513	9,970	11,427	12,884
	% Change	9%	8%	8%	8%	7%	7%
El Paso County Water Authority	2006	13,817	21,973	29,131	35,304	41,477	47,650
	2011	0	0	0	0	0	0
	Difference	-13,817	-21,973	-29,131	-35,304	-41,477	-47,650
	% Change	-100%	-100%	-100%	-100%	-100%	-100%
Fort Bliss	2006	13,422	13,422	13,422	13,422	13,422	13,422
	2011	21,000	27,630	27,630	27,630	27,630	27,630
	Difference	7,578	14,208	14,208	14,208	14,208	14,208
	% Change	56%	106%	106%	106%	106%	106%
Homestead MUD	2006	4,898	6,823	8,513	9,970	11,427	12,884
	2011	0	0	0	0	0	0
	Difference	-4,898	-6,823	-8,513	-9,970	-11,427	-12,884
	% Change	-100%	-100%	-100%	-100%	-100%	-100%
Horizon City	2006	9,360	14,045	18,157	21,703	25,249	28,795
	2011	0	0	0	0	0	0
	Difference	-9,360	-14,045	-18,157	-21,703	-25,249	-28,795
	% Change	-100%	-100%	-100%	-100%	-100%	-100%
Horizon Regional MUD	2006	0	0	0	0	0	0
	2011	23,177	36,018	47,288	57,007	66,726	76,445
	Difference	23,177	36,018	47,288	57,007	66,726	76,445
	% Change	NA	NA	NA	NA	NA	NA
Total El Paso County	2006	826,062	986,443	1,127,206	1,248,609	1,370,012	1,491,415
	2011	833,640	1,000,651	1,141,414	1,262,817	1,384,220	1,505,623
	Difference	7,578	14,208	14,208	14,208	14,208	14,208
	% Change	1%	1%	1%	1%	1%	1%
Jeff Davis County							
Fort Davis	2006	1,554	1,717	1,897	1,897	1,897	1,897

Table A-1: Proposed Changes to Population Projections for the Region E 2011 Water Plan (2010-2060)							
County Total	2011	1,700	2,000	2,200	2,400	2,600	2,800
	Difference	146	283	303	503	703	903
	% Change	9%	16 %	16%	27%	37%	48%
	2006	2,789	2,966	3,146	3,146	3,146	3,146
	2011	2,935	3,249	3,449	3,649	3,849	4,049
	Difference	146	283	303	503	703	903
	% Change	5%	10%	10%	16%	22%	29%
Region E Total							
Region E	2006	855,466	1,018,479	1,161,232	1,283,725	1,405,966	1,527,713
	2011	863,190	1,032,970	1,175,743	1,298,436	1,420,877	1,542,824
	Difference	7,724	14,491	14,511	14,711	14,911	15,111
	% Change	1%	1%	1%	1%	1%	1%

Municipal Water Demands

For cities or utilities with changes in population, corresponding municipal water demands were adjusted by multiplying revised populations by per capita use values from the 2006 plan. However, Region E has requested several changes to per capita use values including:

- decreased per capita use for Fort Davis is based on a combination of weather and a successful conservation program over the past decade (180 gallons per person per day in 2011 versus 213 in the 2006 regional plan); and
- decreased per capita use for the City of El Paso is based on successful water conservation efforts over the last decade (133 gallons per person per day in 2011 versus 184 in the 2006 regional plan).

At the regional level, decreases in municipal water demands range from 20 percent (32,656 acre-feet) in 2010 to 15 percent over in 2060 (37,835 acre-feet).

**Table A-2: Proposed Changes to Municipal Water Demands Projections for the Region E 2011 Water Plan
(2010-2060, acre-feet per year)**

El Paso County							
Water User Group	Planning Cycle	2010	2020	2030	2040	2050	2060
County-Other	2006	5,664	8,551	10,873	12,672	14,492	16,610
	2011	6,278	9,392	11,903	13,867	15,862	18,154
	Difference	614	841	1,030	1,195	1,370	1,544
	% Change	11%	10%	9%	9%	9%	9%
El Paso	2006	127,996	140,698	151,719	161,402	171,836	183,205
	2011	92,829	104,503	114,750	123,586	132,423	141,260
	Difference	-35,167	-36,195	-36,969	-37,816	-39,413	-41,945
	% Change	-27%	-26%	-25%	-24%	-23%	-23%
Fort Bliss	2006	8,419	8,419	8,404	8,404	8,389	8,389
	2011	10,953	12,359	12,359	12,359	12,359	12,359
	Difference	2,534	3,940	3,955	3,955	3,970	3,970
	% Change	30%	47%	47%	47%	47%	47%
El Paso County Water Authority	2006	2,136	3,372	4,438	5,378	6,319	7,259
	2011	0	0	0	0	0	0
	Difference	-2,136	-3,372	-4,438	-5,378	-6,319	-7,259
	% Change	-100%	-100%	-100%	-100%	-100%	-100%
Homestead MUD	2006	614	841	1,030	1,195	1,370	1,544
	2011	0	0	0	0	0	0
	Difference	-614	-841	-1,030	-1,195	-1,370	-1,544
	% Change	-100%	-100%	-100%	-100%	-100%	-100%
Horizon City	2006	1,457	2,155	2,786	3,306	3,846	4,387
	2011	0	0	0	0	0	0
	Difference	-1,457	-2,155	-2,786	-3,306	-3,846	-4,387
	% Change	-100%	-100%	-100%	-100%	-100%	-100%
Horizon Regional MUD*	2006	0	0	0	0	0	0
	2011	3,593	5,527	7,224	8,684	10,165	11,646
	Difference	3,593	5,527	7,224	8,684	10,165	11,646
	% Change	NA	NA	NA	NA	NA	NA
County Total	2006	155,795	176,736	194,882	210,360	226,764	244,450
	2011	123,162	144,481	161,868	176,499	191,321	206,475
	Difference	-32,633	-32,255	-33,014	-33,861	-35,443	-37,975
	% Change	-21%	-18%	-17%	-16%	-16%	-16%
Jeff Davis County							
Fort Davis	2006	366	398	433	427	425	425
	2011	343	403	444	484	524	565
	Difference	-23	5	11	57	99	140
	% Change	-6%	1%	3%	13%	23%	33%
County Total	2006	528	557	588	578	575	575
	2011	505	562	599	635	674	715
	Difference	-23	5	11	57	99	140
	% Change	-4%	1%	2%	10%	17%	24%
Region E Total							
Region E	2006	162,132	183,558	202,057	217,668	234,216	251,974
	2011	129,476	151,308	169,054	183,864	198,872	214,139
	Difference	-32,656	-32,250	-33,003	-33,804	-35,344	-37,835
	% Change	-20%	-18%	-16%	-16%	-15%	-15%

Irrigation Water Demands

Increased irrigation water demands in Region E are associated with higher estimated use in Culbertson, Jeff Davis, and Presidio Counties based on data provided by Groundwater Conservation Districts and local businesses.

- **Culbertson County:** The Culbertson County Groundwater Conservation District annually meters all irrigation use in the county. Water used for irrigation in the county is from groundwater sources. Based on metering, an average year of irrigation application totals 46,759 acre-feet versus the 28,960 acre-foot estimate used in the 2006 regional plan. Most metered water is applied to alfalfa, pecan, and forage crops.
- **Jeff Davis County:** The Jeff Davis County Underground Water Conservation District provided three years of metered water data for Village Farms (tomato production). Average annual use for the facility is 299 acre-feet, which is 15 acre-feet more than reported in the 2006 plan.
- **Presidio County:** The Presidio County Underground Water Conservation District provided three years of metered data for the Village Farms unit in Presidio County. Average annual use over the period is 633 acre-feet (236 acre-feet more than reported in the 2006 plan).

With the changes outlined above, Region E’s irrigation demands rise by four percent in each decade (Table A-3).

Table A-3: Proposed Changes to Irrigation Water Demand Projections for the Region E 2011 Water Plan (2010-2060, acre-feet per year)							
County	Planning Cycle	2010	2020	2030	2040	2050	2060
Culbertson	2006	28,960	28,340	27,733	27,140	26,559	25,991
	2011	46,759	45,758	44,779	43,821	42,883	41,965
	Difference	17,799	17,418	17,046	16,681	16,324	15,974
	% Change	61 %	61%	61%	61%	61%	61%
Jeff Davis	2006	576	572	569	566	563	559
	2011	591	587	584	581	578	574
	Difference	15	15	15	15	15	15
	% Change	3%	3%	3%	3%	3%	3%
Presidio	2006	20,068	19,670	19,279	18,893	18,521	18,154
	2011	20,304	19,906	19,515	19,132	18,757	18,390
	Difference	236	236	236	239	236	236
	% Change	1%	1%	1%	1%	1%	1%
Region E Total	2006	481,042	471,910	465,241	452,152	443,827	435,657
	2011	499,092	489,579	482,538	469,087	460,402	451,882
	Change	18,050	17,669	17,297	16,935	16,575	16,225
	% Change	4%	4%	4%	4%	4%	4%

Mining Water Demands

Oil and gas records from the Texas Railroad Commission show that 460 wells were drilled in Terrell County from 1999 through 2008. Given that initial drilling and completion of a well requires an average of one million gallons of water, Region J estimates that drilling consumed 460 million gallons (1,412 acre-feet) of water over the 10-year period. Railroad Commission files also indicate that in 2007 18,588,990 gallons of fluids were injected into wells in Terrell County for enhanced oil recovery operations. Recent research suggests that a statewide average of one percent of injected fluids used for enhanced recovery is fresh water. Thus, 1,858,899 gallons (six acre-feet) is assumed to have been injected over a 10-year period. Combining drilling (1,412 acre-feet) and injection activities (six acre-feet), approximately 1,418 acre-feet of fresh water is estimated to have been used in Terrell County over a 10-year period (an average of 142 acre-feet per year). The 2006 plan reports only 18 acre-feet for mining operations in Terrell County. With the requested changes, Region E’s mining demands rise by approximately five percent (125 acre-feet) in each decade (Table A-4).

Table A-4: Proposed Changes to Mining Water Demand Projections for the Region E 2011 Water Plan (2010-2060, acre-feet per year)							
County	Planning Cycle	2010	2020	2030	2040	2050	2060
Terrell	2006	18	17	17	17	17	17
	2011	142	142	142	142	142	142
	Change	125	125	125	125	125	125
	%Change	689%	735%	735%	735%	735%	735%
Region E Total	2006	2,273	2,292	2,299	2,307	2,314	2,326
	2011	2,397	2,417	2,424	2,432	2,439	2,451
	Change	125	125	125	125	125	125
	% Change	5%	5%	5%	5%	5%	5%

Region H

Municipal Water Demands

In November of 2009, the TWDB's governing Board approved large-scale revisions to population projections for Region H. Subsequent processing of revised data by the TWDB revealed an error in corresponding calculations of municipal water demands for one water user group (County-other in San Jacinto County). Table A-5 shows the revised figure.

Water User Group	2010	2020	2030	2040	2050	2060
Approved by Board in November 2009						
2011 County-other (San Jacinto County)	1,339	1,513	1,607	1,463	1,372	1,240
Requested Revision						
2011 County-other (San Jacinto County)	497	538	555	496	461	415

Region I

Population and Municipal Water Demands

Representatives of several political subdivisions in the East Texas Regional Water Planning Area (Region I) have requested that the planning group revise 2006 population and corresponding municipal water demand projections to reflect the addition of five water user groups not previously identified in the regional water plan. Projections for each of these water user groups were subtracted from County-other population and demand projections; and as a result, there is no net change to regional totals (Tables A-6 and A-7).

Angelina County (population)							
Water User Group	Planning Cycle	2010	2020	2030	2040	2050	2060
County-Other	2006	21,111	22,526	24,269	26,466	29,479	33,473
	2011	15,180	16,197	17,451	19,031	21,197	24,069
	Difference	-5,931	-6,329	-6,818	-7,435	-8,282	-9,404
	% Change	-28%	-28%	-28%	-28%	-28%	-28%
Angelina WSC	2006	0	0	0	0	0	0
	2011	3,537	3,774	4,066	4,434	4,939	5,608

Table A-6: Proposed Changes to Population Projections for the Region I 2011 Water Plan (2010-2060)							
Redland WSC	Difference	3,537	3,774	4,066	4,434	4,939	5,608
	% Change	NA	NA	NA	NA	NA	NA
	2006	0	0	0	0	0	0
	2011	2,394	2,555	2,752	3,001	3,343	3,796
	Difference	2,394	2,555	2,752	3,001	3,343	3,796
County Total	% Change	NA	NA	NA	NA	NA	NA
	2006	91,399	104,853	120,936	140,497	165,783	197,878
	2011	91,399	104,853	120,936	140,497	165,783	197,878
	Difference	0	0	0	0	0	0
	% Change	0%	0%	0%	0%	0%	0%
Nacogdoches County (population)							
County-Other	2006	21,463	23,669	25,755	28,054	32,380	36,944
	2011	9,802	10,810	11,762	12,812	14,788	16,872
	Difference	-11,661	-12,859	-13,993	-15,242	-17,592	-20,072
	% Change	-54%	-54%	-54%	-54%	-54%	-54%
	D&M WSC	2006	0	0	0	0	0
2011		5,742	6,331	6,890	7,506	8,662	9,883
Difference		5,742	6,331	6,890	7,506	8,662	9,883
% Change		NA	NA	NA	NA	NA	NA
Melrose WSC		2006	0	0	0	0	0
	2011	3,381	3,729	4,057	4,419	5,101	5,820
	Difference	3,381	3,729	4,057	4,419	5,101	5,820
	% Change	NA	NA	NA	NA	NA	NA
	Woden WSC	2006	0	0	0	0	0
2011		2,538	2,799	3,046	3,317	3,829	4,369
Difference		2,538	2,799	3,046	3,317	3,829	4,369
% Change		NA	NA	NA	NA	NA	NA
County Total		2006	67,357	75,914	84,183	92,628	108,753
	2011	67,357	75,914	84,183	92,628	108,753	124,453
	Difference	0	0	0	0	0	0
	% Change	0%	0%	0%	0%	0%	0%
	Region I						
Region I Totals	2006	189,559	196,828	202,761	208,193	218,705	233,622
	2011	189,559	196,828	202,761	208,193	218,705	233,622
	Difference	0	0	0	0	0	0
	% Change	0%	0%	0%	0%	0%	0%

Table A-7: Proposed Changes to Water Demand Projections for the Region I 2011 Water Plan (acre-feet per year, 2010-2060)							
Angelina County (water demands)							
Water User Group	Planning Cycle	2010	2020	2030	2040	2050	2060
County-Other	2006	2,530	2,624	2,746	2,905	3,203	3,637
	2011	1,819	1,886	1,975	2,089	2,303	2,616
	Difference	-711	-738	-771	-816	-900	-1,021
	% Change	-28%	-28%	-28%	-28%	-28%	-28%
	Angelina WSC	2006	0	0	0	0	0
2011		424	440	460	487	537	609
Difference		424	440	460	487	537	609
% Change		NA	NA	NA	NA	NA	NA

Table A-7: Proposed Changes to Water Demand Projections for the Region I 2011 Water Plan (acre-feet per year, 2010-2060)							
Redland WSC	2006	0	0	0	0	0	0
	2011	287	298	311	329	363	412
	Difference	287	298	311	329	363	412
	% Change	NA	NA	NA	NA	NA	NA
County Total	2006	13,650	15,224	17,080	19,302	22,359	26,315
	2011	13,650	15,224	17,080	19,302	22,359	26,315
	Difference	0	0	0	0	0	0
	% Change	0%	0%	0%	0%	0%	0%
Nacogdoches County (water demands)							
County-Other	2006	2,452	2,625	2,770	2,954	3,373	3,849
	2011	1,120	1,199	1,265	1,350	1,541	1,758
	Difference	-1,332	-1,426	-1,505	-1,604	-1,832	-2,091
	% Change	-54%	-54%	-54%	-54%	-54%	-54%
D&M WSC	2006	0	0	0	0	0	0
	2011	656	702	741	790	902	1,030
	Difference	656	702	741	790	902	1,030
	% Change	NA	NA	NA	NA	NA	NA
Melrose WSC	2006	0	0	0	0	0	0
	2011	386	414	436	465	531	606
	Difference	386	414	436	465	531	606
	% Change	NA	NA	NA	NA	NA	NA
Woden WSC	2006	0	0	0	0	0	0
	2011	290	310	328	349	399	455
	Difference	290	310	328	349	399	455
	% Change	NA	NA	NA	NA	NA	NA
County Total	2006	12,024	13,375	14,670	15,974	18,589	21,098
	2011	12,024	13,375	14,670	15,974	18,589	21,098
	Difference	0	0	0	0	0	0
	% Change	0%	0%	0%	0%	0%	0%
Region I (water demands)							
Region I Totals	2006	189,559	196,828	202,761	208,193	218,705	233,622
	2011	189,559	196,828	202,761	208,193	218,705	233,622
	Difference	0	0	0	0	0	0
	% Change	0%	0%	0%	0%	0%	0%

Irrigation Water Demands

Region I has requested changes in irrigation water demands with the most significant adjustment in Jefferson County. Based on discussions with officials from the Lower Neches Valley Authority, the planning group determined that irrigation demands should be 30 percent lower than figures used in their 2006 regional plan (68,035 acre-feet per year). As a result, the final proposed projections for Jefferson County irrigation are 140,000 acre-feet per year, which more closely conforms to 10-year historical TWDB estimates for the county. TWDB estimates for Jefferson County average roughly 120,000 acre-feet with a maximum of 187,000 acre-feet and a minimum of 55,000 feet. TWDB data also show that there has been a

significant downward trend in rice acreage in the county in recent years. Another factor affecting the decline is the impact of Hurricane Ike in 2008. The storm surge from Ike inundated many rice fields with saltwater, which has taken these fields out of production for an extended period.

The decline in Hardin County also leads to a more precise figure for planning purposes (7,213 acre-feet in the 2006 plan versus 3,502 in the current plan). Historical TWBD estimates for Hardin County average 1,620 acre-feet per year with a maximum of 3,467 acre-feet and a minimum of 312 acre-feet.

With the requested changes in both counties, irrigation demands in Region I decrease by 32 percent in each decade (Table A-8).

County	Planning Cycle	2010	2020	2030	2040	2050	2060
Hardin	2006	7,213	7,213	7,213	7,213	7,213	7,213
	2011	3,502	3,502	3,502	3,502	3,502	3,502
	Difference	-3,711	-3,711	-3,711	-3,711	-3,711	-3,711
	% Change	-51%	-51%	-51%	-51%	-51%	-51%
Jefferson	2006	208,035	208,035	208,035	208,035	208,035	208,035
	2011	140,000	140,000	140,000	140,000	140,000	140,000
	Difference	-68,035	-68,035	-68,035	-68,035	-68,035	-68,035
	% Change	-33%	-33%	-33%	-33%	-33%	-33%
Region I Total	2006	222,846	223,163	223,517	223,899	224,321	224,786
	2011	151,100	151,417	151,771	152,153	152,575	153,040
	Difference	-71,746	-71,746	-71,746	-71,746	-71,746	-71,746
	% Change	-32%	-32%	-32%	-32%	-32%	-32%

Manufacturing Water Demands

Region I has also requested changes to manufacturing demands in Angelina and Jefferson counties. In Angelina County, demands have fallen substantially due to the closure of the Abitibi paper mill in the City of Lufkin. Changes in Jefferson County are based in part on a special study generated under contract with the TWDB as part of Phase I of the 2011 regional water planning cycle. According to the study and information provided by the Lower Neches Valley Authority (LNVA), two liquefied natural gas (LNG) facilities owned by Golden Pass LNG and Sempra Energy are under construction. LNVA is proposing to provide water to these facilities as a heat transfer fluid for warming the gas rather than heating the LNG with natural gas. Although, there is still some uncertainty as to whether the new facilities would use water for heat transfer in the long-term; TWDB staff believe that the increases are reasonable for current planning purposes; however, if adopted TWDB staff will reevaluate the necessity of these demands during the next water

planning cycle (2012-2017). With the requested changes, manufacturing demands in Region I decrease by 25 percent in 2010 and increase by 51 percent in 2060 (Table A-9).

County	Planning Cycle	2010	2020	2030	2040	2050	2060
Angelina	2006	30,266	34,359	37,982	41,642	44,887	48,356
	2011	14,750	23,500	25,980	28,490	30,720	33,100
	Difference	-15,516	-10,859	-12,002	-13,152	-14,167	-15,256
	% Change	-51%	-32%	-32%	-32%	-32%	-32%
Jefferson	2006	237,954	267,434	292,871	318,669	341,559	365,636
	2011	151,672	423,258	603,321	629,171	655,034	680,914
	Difference	-86,282	155,824	310,450	310,502	313,475	315,278
	% Change	-36%	58%	106%	97%	92%	86%
Region I	2006	401,790	446,939	485,692	524,491	558,594	593,454
	2011	299,992	591,904	784,140	821,841	857,902	893,476
	Difference	-101,798	144,965	298,448	297,350	299,308	300,022
	% Change	-25%	32%	61%	57%	54%	51%

Mining Water Demands

The Angelina and Neches River Authority (ANRA) recently received requests for water used to extract natural gas in the Haynesville Shale and its outcrop areas that comprise portions of Angelina, Cherokee, Nacogdoches, Shelby, and San Augustine counties. According to ANRA, two energy companies with interests in the above counties intend drill at levels consistent with market demand over the next 20 years. Mining water demands in each county have been adjusted accordingly. With the requested changes, Region I's mining demands increase by 48 percent in 2010 and 129 percent in 2020 (Table A-10).

County	Planning Cycle	2010	2020	2030	2040	2050	2060
Angelina	2006	18	17	17	17	17	17
	2011	2,018	4,017	17	17	17	17
	Difference	2,000	4,000	0	0	0	0
	% Change	11,111%	23,529%	0%	0%	0%	0%
Cherokee	2006	93	97	99	101	103	105
	2011	593	1,597	99	101	103	105
	Difference	500	1,500	0	0	0	0
	% Change	538%	1,546%	0%	0%	0%	0%
Nacogdoches	2006	215	213	212	211	210	209
	2011	2,715	7,213	212	211	210	209
	Difference	2,500	7,000	0	0	0	0

Table A-10: Proposed Changes to Mining Water Demand Projections for the Region I 2011 Water Plan (2010-2060, acre-feet per year)							
County	Planning Cycle	2010	2020	2030	2040	2050	2060
Shelby	% Change	1163%	3286%	0%	0%	0%	0%
	2006	0	0	0	0	0	0
	2011	500	1,500	0	0	0	0
	Difference	500	1,500	0	0	0	0
San Augustine	% Change	NA	NA	0%	0%	0%	0%
	2006	0	0	0	0	0	0
	2011	1,500	7,000	0	0	0	0
	Difference	1,500	7,000	0	0	0	0
Region I	% Change	NA	NA	0%	0%	0%	0%
	2006	14,662	16,297	17,331	18,385	19,432	20,314
	2011	21,662	37,297	17,331	18,385	19,432	20,314
	Difference	7,000	21,000	0	0	0	0
	% Change	48%	129%	0%	0%	0%	0%

Region J

Mining Water Demands

As part of a special study generated under contract with the TWDB as part of Phase I of the 2011 regional water planning cycle, Region J determined that mining water use exceeds volumes reported in their 2006 regional water plan for Edwards County.

A review of Railroad Commission data showed that 263 wells were drilled in Edwards County from 1999 through 2008. The initial drilling and completion of a well requires an average of one million gallons of water. Thus, 263 wells used an estimated 263 million gallons (807 acre-feet) over the 10-year period. Railroad Commission files also indicate that 2,668,764 gallons of fluids were injected into wells in 2007 in Edwards County for enhanced oil recovery in the Glen Rose Formation. Water used for enhanced recovery in these wells is assumed to have originated from the Trinity Aquifer. Thus, 26,687,640 gallons (82 acre-feet) is assumed to have been injected over the 10-year period. Combining drilling, completion, and injection, roughly 889 acre-feet of fresh water is estimated to have been used in Edwards County over the 10-year period (an average of 89 acre-feet per year).

The 2006 Region J plan reports only 5 acre-feet of water for mining in Edwards County. To ensure that mining activity in Edwards County is accurately reflected in the 2011 Region J plan, the planning group requests that demands increase to 89 acre-feet per year. With the requested change, Region J's mining demands rise by about 27 percent in each decade (Table A-11).

Table A-11: Proposed Changes to Mining Water Demand Projections for the Region J 2011 Water Plan (2010-2060, acre-feet per year)							
County	Planning Cycle	2010	2020	2030	2040	2050	2060
Edwards	2006	5	5	5	5	5	5
	2011	89	89	89	89	89	89
	Difference	84	84	84	84	84	84
	% Change	1,680%	1,680%	1,680%	1,680%	1,680%	1,680%
Region J	2006	319	310	305	301	297	294
	2011	403	394	389	385	381	378
	Difference	84	84	84	84	84	84
	% Change	26%	27%	28%	28%	28%	29%

Region M

Population and Municipal Water Demands

Representatives of several political subdivisions in the Rio Grande Regional Water Planning Area (Region M) have requested revisions to 2006 population and municipal water demand projections. Recent data published by the Texas State Demographer indicate that in 2007 population levels in Region M exceeded levels predicted for the 2006 Region M plan by three percent. To account for this faster than expected growth, Region M has requested increases in population and municipal water demands of three percent in each decade (Table A-12). Changes for individual cities and utilities are listed in Appendix 1 and 2.

Table A-12: Proposed Changes to Population and Demand Projections for the Region M 2011 Water Plan (2010-2060, acre-feet per year)						
Population						
	2010	2020	2030	2040	2050	2060
2006	1,581,207	1,973,188	2,401,223	2,854,613	3,337,618	3,826,001
2011	1,628,278	2,030,994	2,470,814	2,936,748	3,433,188	3,935,223
Change	47,071	57,806	69,591	82,135	95,570	109,222
% Change	3%	3%	3%	3%	3%	3%
Municipal Water Demands						
2006	279,633	338,716	403,511	472,632	547,747	625,743
2011	288,323	349,410	416,396	487,858	565,475	646,006
Change	8,690	10,694	12,885	15,226	17,728	20,263
% Change	3%	3%	3%	3%	3%	3%

Conclusion

After satisfying required public notice and public hearing requirements, regions E, H, I, J and M have requested that the TWDB Executive Administrator review and approve these changes. TWDB staff and representatives of coordinating agencies have reviewed the amendments and have determined that the changes comply with criteria for demand revisions as specified in administrative rules and the TWDB's *Guidelines for Regional Water Plan Development (2007-2012)*.

Steve Densmore _____ Date _____
Texas Commission on Environmental Quality

Cindy Loeffler _____ Date _____
Texas Parks and Wildlife Department

Stuart Norvell _____ Date _____
Texas Water Development Board

Kelley Stripling _____ Date _____
Texas Department of Agriculture

Appendix 1 Changes to Region M Population Projections by County and Water User Group

Cameron County (population)							
Water User Group	Planning Cycle	2010	2020	2030	2040	2050	2060
Brownsville	2006	173,986	210,210	247,653	284,979	322,316	357,828
	2011	180,444	218,268	257,460	296,637	335,947	373,453
	Difference	6,458	8,058	9,807	11,658	13,631	15,625
	% Change	3.71%	3.83%	3.96%	4.09%	4.23%	4.37%
Harlingen	2006	66,805	76,575	86,674	96,741	106,811	116,389
	2011	69,214	79,581	90,333	101,090	111,896	122,218
	Difference	2,409	3,006	3,659	4,349	5,085	5,829
	% Change	3.61%	3.93%	4.22%	4.50%	4.76%	5.01%
Laguna Vista	2006	2,174	2,719	3,282	3,844	4,406	4,940
	2011	2,651	3,314	4,008	4,705	5,413	6,094
	Difference	477	595	726	861	1,007	1,154
	% Change	21.94%	21.88%	22.12%	22.40%	22.86%	23.36%
Palm Valley	2006	1,402	1,512	1,625	1,738	1,851	1,959
	2011	1,400	1,400	1,400	1,400	1,400	1,400
	Difference	-2	-112	-225	-338	-451	-559
	% Change	-0.14%	-7.41%	-13.85%	-19.45%	-24.37%	-28.53%
Primera	2006	3,449	4,217	5,011	5,802	6,593	7,346
	2011	3,973	4,871	5,806	6,748	7,699	8,613
	Difference	524	654	795	946	1,106	1,267
	% Change	15.19%	15.51%	15.87%	16.30%	16.78%	17.25%
Rancho Viejo	2006	2,665	3,628	4,623	5,615	6,607	7,551
	2011	2,300	2,350	2,400	2,450	2,500	2,550
	Difference	-365	-1,278	-2,223	-3,165	-4,107	-5,001
	% Change	-13.70%	-35.23%	-48.09%	-56.37%	-62.16%	-66.23%
Rio Hondo	2006	2,098	2,263	2,434	2,604	2,774	2,936
	2011	2,223	2,419	2,623	2,829	3,037	3,238
	Difference	125	156	189	225	263	302
	% Change	5.96%	6.89%	7.76%	8.64%	9.48%	10.29%
County Total	2006	415,136	499,618	586,944	673,996	761,073	843,894
	2011	424,762	510,697	599,672	688,532	777,607	862,511
	Difference	9,626	11,079	12,728	14,536	16,534	18,617
	% Change	2.32%	2.22%	2.17%	2.16%	2.17%	2.21%

Hidalgo County (population)							
Water User Group	Planning Cycle	2010	2020	2030	2040	2050	2060
Donna	2006	16,757	19,080	21,682	24,498	27,574	30,729
	2011	17,830	20,419	23,311	26,435	29,839	33,325
	Difference	1,073	1,339	1,629	1,937	2,265	2,596
	% Change	6.40%	7.02%	7.51%	7.91%	8.21%	8.45%
Edcouch	2006	3,778	4,287	4,858	5,475	6,149	6,841
	2011	4,076	4,659	5,311	6,013	6,778	7,562
	Difference	298	372	453	538	629	721
	% Change	7.89%	8.68%	9.32%	9.83%	10.23%	10.54%
Edinburg	2006	64,792	83,869	105,237	128,358	153,611	179,517
	2011	71,940	92,789	116,092	141,263	168,699	196,813
	Difference	7,148	8,920	10,855	12,905	15,088	17,296
	% Change	11.03%	10.64%	10.31%	10.05%	9.82%	9.63%

Hidalgo County (population)							
Water User Group	Planning Cycle	2010	2020	2030	2040	2050	2060
Elsa	2006	5,838	6,175	6,553	6,962	7,408	7,866
	2011	6,267	6,710	7,204	7,736	8,313	8,904
	Difference	429	535	651	774	905	1,038
	% Change	7.35%	8.66%	9.93%	11.12%	12.22%	13.20%
Hidalgo	2006	11,109	15,534	20,491	25,854	31,711	37,720
	2011	11,675	16,240	21,350	26,875	32,905	39,089
	Difference	566	706	859	1,021	1,194	1,369
	% Change	5.09%	4.54%	4.19%	3.95%	3.77%	3.63%
La Joya	2006	3,960	4,727	5,587	6,518	7,534	8,576
	2011	4,312	5,167	6,122	7,154	8,278	9,428
	Difference	352	440	535	636	744	852
	% Change	8.89%	9.31%	9.58%	9.76%	9.88%	9.93%
La Villa	2006	1,305	1,305	1,305	1,305	1,305	1,305
	2011	1,361	1,374	1,389	1,405	1,422	1,439
	Difference	56	69	84	100	117	134
	% Change	4.29%	5.29%	6.44%	7.66%	8.97%	10.27%
McAllen	2006	127,458	152,045	179,586	209,386	241,933	275,322
	2011	132,267	158,046	186,889	218,068	252,084	286,959
	Difference	4,809	6,001	7,303	8,682	10,151	11,637
	% Change	3.77%	3.95%	4.07%	4.15%	4.20%	4.23%
Mercedes	2006	14,546	15,595	16,770	18,041	19,429	20,853
	2011	15,775	17,129	18,636	20,260	22,023	23,827
	Difference	1,229	1,534	1,866	2,219	2,594	2,974
	% Change	8.45%	9.84%	11.13%	12.30%	13.35%	14.26%
Mission	2006	61,154	79,551	100,157	122,454	146,807	171,790
	2011	68,351	88,532	111,086	135,447	161,998	189,204
	Difference	7,197	8,981	10,929	12,993	15,191	17,414
	% Change	11.77%	11.29%	10.91%	10.61%	10.35%	10.14%
Penitas	2006	1,201	1,241	1,285	1,333	1,385	1,439
	2011	1,261	1,316	1,376	1,441	1,511	1,584
	Difference	60	75	91	108	126	145
	% Change	5.00%	6.04%	7.08%	8.10%	9.10%	10.08%
Pharr	2006	59,571	74,656	91,553	109,836	129,805	150,291
	2011	65,969	82,640	101,269	121,386	143,309	165,772
	Difference	6,398	7,984	9,716	11,550	13,504	15,481
	% Change	10.74%	10.69%	10.61%	10.52%	10.40%	10.30%
Weslaco	2006	30,878	35,485	40,645	46,229	52,328	58,584
	2011	32,862	37,961	43,658	49,811	56,516	63,385
	Difference	1,984	2,476	3,013	3,582	4,188	4,801
	% Change	6.43%	6.98%	7.41%	7.75%	8.00%	8.20%
County Total	2006	744,258	948,488	1,177,243	1,424,767	1,695,114	1,972,453
	2011	775,858	987,920	1,225,227	1,481,812	1,761,810	2,048,911
	Difference	31,599	39,432	47,984	57,045	66,696	76,458
	% Change	4.25%	4.16%	4.08%	4.00%	3.93%	3.88%

Maverick County (population)							
Water User Group	Planning Cycle	2010	2020	2030	2040	2050	2060
Eagle Pass	2006	23,800	25,267	26,654	27,856	28,956	29,849
	2011	26,160	28,212	30,238	32,116	33,937	35,559
	Difference	2,360	2,945	3,584	4,260	4,981	5,710
	% Change	9.92%	11.66%	13.45%	15.29%	17.20%	19.13%

Maverick County (population)							
Water User Group	Planning Cycle	2010	2020	2030	2040	2050	2060
County Total	2006	55,892	64,984	73,581	81,032	87,850	93,381
	2011	58,252	67,929	77,165	85,292	92,831	99,091
	Difference	2,360	2,945	3,584	4,260	4,981	5,710
	% Change	4.22%	4.53%	4.87%	5.26%	5.67%	6.11%

Starr County (population)							
Water User Group	Planning Cycle	2010	2020	2030	2040	2050	2060
La Grulla	2006	1,211	1,211	1,211	1,211	1,211	1,211
	2011	1,640	1,746	1,862	1,985	2,116	2,249
	Difference	429	535	651	774	905	1,038
	% Change	35.43%	44.18%	53.76%	63.91%	74.73%	85.71%
Rio Grande City	2006	13,061	14,277	15,529	16,791	18,035	19,229
	2011	14,982	16,674	18,447	20,259	22,090	23,878
	Difference	1,921	2,397	2,918	3,468	4,055	4,649
	% Change	14.71%	16.79%	18.79%	20.65%	22.48%	24.18%
Roma City	2006	11,097	12,678	14,306	15,948	17,566	19,118
	2011	11,989	13,791	15,661	17,559	19,449	21,277
	Difference	892	1,113	1,355	1,611	1,883	2,159
	% Change	8.04%	8.78%	9.47%	10.10%	10.72%	11.29%
County Total	2006	66,137	79,538	93,338	107,249	120,959	134,115
	2011	69,379	83,583	98,262	113,102	127,802	141,961
	Difference	3,242	4,045	4,924	5,853	6,843	7,846
	% Change	4.90%	5.09%	5.28%	5.46%	5.66%	5.85%

Willacy County (population)							
Water User Group	Planning Cycle	2010	2020	2030	2040	2050	2060
Lyford	2006	2,091	2,207	2,313	2,398	2,456	2,485
	2011	2,335	2,512	2,684	2,839	2,972	3,076
	Difference	244	305	371	441	516	591
	% Change	11.67%	13.82%	16.04%	18.39%	21.01%	23.78%
County Total	2006	22,519	24,907	27,084	28,835	30,026	30,614
	2011	22,763	25,212	27,455	29,276	30,542	31,205
	Difference	244	305	371	441	516	591
	% Change	1.08%	1.22%	1.37%	1.53%	1.72%	1.93%

Appendix 2 Changes to Region M Demand Projections by County and Water User Group

Cameron County (demand in acre-feet)							
Water User Group	Planning Cycle	2010	2020	2030	2040	2050	2060
Brownsville	2006	43,655	52,038	60,475	69,270	77,985	86,577
	2011	45,312	54,105	62,990	72,260	81,481	90,584
	Difference	1,657	2,067	2,515	2,990	3,496	4,007
	% Change	3.80%	3.97%	4.16%	4.32%	4.48%	4.63%
Harlingen	2006	11,374	12,780	14,175	15,604	17,109	18,643
	2011	11,795	13,306	14,814	16,364	17,998	19,662
	Difference	421	526	639	760	889	1,019
	% Change	3.70%	4.12%	4.51%	4.87%	5.20%	5.47%
Laguna Vista	2006	268	323	382	444	503	564
	2011	329	399	476	554	633	713
	Difference	61	76	94	110	130	149
	% Change	22.76%	23.53%	24.61%	24.77%	25.84%	26.42%
Palm Valley	2006	413	440	468	494	525	555
	2011	412	407	400	393	389	387
	Difference	-1	-33	-68	-101	-136	-168
	% Change	-0.24%	-7.50%	-14.53%	-20.45%	-25.90%	-30.27%
Primera	2006	525	628	730	838	945	1,053
	2011	609	732	856	989	1,121	1,255
	Difference	84	104	126	151	176	202
	% Change	16.00%	16.56%	17.26%	18.02%	18.62%	19.18%
Rancho Viejo	2006	373	496	627	755	888	1,015
	2011	320	311	305	297	295	292
	Difference	-53	-185	-322	-458	-593	-723
	% Change	-14.21%	-37.30%	-51.36%	-60.66%	-66.78%	-71.23%
Rio Hondo	2006	404	428	453	475	503	533
	2011	429	459	490	520	556	593
	Difference	25	31	37	45	53	60
	% Change	6.19%	7.24%	8.17%	9.47%	10.54%	11.26%
County Total	2006	86,496	102,264	118,321	134,693	151,275	167,665
	2011	88,690	104,850	121,342	138,190	155,290	172,211
	Difference	2,194	2,586	3,021	3,497	4,015	4,546
	% Change	2.54%	2.53%	2.55%	2.60%	2.65%	2.71%

Hidalgo County (demand in acre-feet)							
Water User Group	Planning Cycle	2010	2020	2030	2040	2050	2060
Donna	2006	2,309	2,565	2,842	3,156	3,521	3,924
	2011	2,461	2,755	3,073	3,431	3,843	4,293
	Difference	152	190	231	275	322	369
	% Change	6.58%	7.41%	8.13%	8.71%	9.15%	9.40%
Edcouch	2006	499	547	604	668	744	828
	2011	540	599	666	743	831	927
	Difference	41	52	62	75	87	99
	% Change	8.22%	9.51%	10.26%	11.23%	11.69%	11.96%
Edinburg	2006	8,274	10,428	12,967	15,528	18,583	21,717
	2011	9,227	11,617	14,414	17,248	20,594	24,023
	Difference	953	1,189	1,447	1,720	2,011	2,306
	% Change	11.52%	11.40%	11.16%	11.08%	10.82%	10.62%

Hidalgo County (demand in acre-feet)							
Water User Group	Planning Cycle	2010	2020	2030	2040	2050	2060
Elsa	2006	1,099	1,134	1,182	1,232	1,303	1,383
	2011	1,181	1,237	1,306	1,380	1,476	1,582
	Difference	82	103	124	148	173	199
	% Change	7.46%	9.08%	10.49%	12.01%	13.28%	14.39%
Hidalgo	2006	1,058	1,444	1,859	2,316	2,841	3,380
	2011	1,114	1,515	1,945	2,419	2,961	3,517
	Difference	56	71	86	103	120	137
	% Change	5.29%	4.92%	4.63%	4.45%	4.22%	4.05%
La Joya	2006	408	471	538	613	700	797
	2011	447	519	596	682	781	890
	Difference	39	48	58	69	81	93
	% Change	9.56%	10.19%	10.78%	11.26%	11.57%	11.67%
La Villa	2006	234	230	225	221	218	218
	2011	244	242	241	239	239	242
	Difference	10	12	16	18	21	24
	% Change	4.27%	5.22%	7.11%	8.14%	9.63%	11.01%
McAllen	2006	28,697	33,551	39,226	45,267	52,032	59,213
	2011	29,801	34,930	40,903	47,260	54,363	61,885
	Difference	1,104	1,379	1,677	1,993	2,331	2,672
	% Change	3.85%	4.11%	4.28%	4.40%	4.48%	4.51%
Mercedes	2006	1,890	1,956	2,048	2,142	2,285	2,453
	2011	2,055	2,163	2,298	2,440	2,634	2,852
	Difference	165	207	250	298	349	399
	% Change	8.73%	10.58%	12.21%	13.91%	15.27%	16.27%
Mission	2006	9,864	12,564	15,594	18,792	22,529	26,363
	2011	11,065	14,063	17,419	20,960	25,064	29,269
	Difference	1,201	1,499	1,825	2,168	2,535	2,906
	% Change	12.18%	11.93%	11.70%	11.54%	11.25%	11.02%
Pentitas	2006	149	150	150	151	155	161
	2011	157	160	161	165	171	180
	Difference	8	10	11	14	16	19
	% Change	5.37%	6.67%	7.33%	9.27%	10.32%	11.80%
Pharr	2006	8,474	10,370	12,511	14,887	17,448	20,202
	2011	9,420	11,550	13,948	16,595	19,445	22,491
	Difference	946	1,180	1,437	1,708	1,997	2,289
	% Change	11.16%	11.38%	11.49%	11.47%	11.45%	11.33%
Weslaco	2006	5,534	6,201	6,966	7,819	8,792	9,843
	2011	5,901	6,658	7,523	8,481	9,566	10,731
	Difference	367	457	557	662	774	888
	% Change	6.63%	7.37%	8.00%	8.47%	8.80%	9.02%
County Total	2006	110,286	135,454	163,992	194,819	229,913	266,564
	2011	115,410	141,851	171,773	204,070	240,730	278,964
	Difference	5,124	6,397	7,781	9,251	10,817	12,400
	% Change	4.65%	4.72%	4.74%	4.75%	4.70%	4.65%

Maverick County (demand in acre-feet)							
Water User Group	Planning Cycle	2010	2020	2030	2040	2050	2060
Eagle Pass	2006	4,932	5,123	5,314	5,460	5,644	5,818
	2011	5,429	5,743	6,069	6,358	6,693	7,020
	Difference	497	620	755	898	1,049	1,202
	% Change	10.08%	12.10%	14.21%	16.45%	18.59%	20.66%

Maverick County (demand in acre-feet)							
Water User Group	Planning Cycle	2010	2020	2030	2040	2050	2060
County Total	2006	8,912	9,939	10,911	11,751	12,552	13,274
	2011	9,409	10,559	11,666	12,649	13,601	14,476
	Difference	497	620	755	898	1,049	1,202
	% Change	5.58%	6.24%	6.92%	7.64%	8.36%	9.06%

Starr County (demand in acre-feet)							
Water User Group	Planning Cycle	2010	2020	2030	2040	2050	2060
La Grulla	2006	639	635	631	627	624	624
	2011	867	919	976	1,038	1,104	1,175
	Difference	228	284	345	411	480	551
	% Change	35.68%	44.72%	54.68%	65.55%	76.92%	88.30%
Rio Grande City	2006	2,575	2,751	2,957	3,141	3,353	3,576
	2011	2,962	3,234	3,545	3,840	4,171	4,513
	Difference	387	483	588	699	818	937
	% Change	15.03%	17.56%	19.89%	22.25%	24.40%	26.20%
Roma City	2006	2,722	3,053	3,397	3,751	4,112	4,476
	2011	2,946	3,333	3,737	4,156	4,585	5,017
	Difference	224	280	340	405	473	541
	% Change	8.23%	9.17%	10.01%	10.80%	11.50%	12.09%
County Total	2006	12,648	14,726	16,898	19,095	21,293	23,513
	2011	13,487	15,773	18,171	20,610	23,064	25,542
	Difference	839	1,047	1,273	1,515	1,771	2,029
	% Change	6.63%	7.11%	7.53%	7.93%	8.32%	8.63%

Willacy County (demand in acre-feet)							
Water User Group	Planning Cycle	2010	2020	2030	2040	2050	2060
Lyford	2006	297	307	313	317	322	326
	2011	333	351	368	382	398	412
	Difference	36	44	55	65	76	86
	% Change	12.12%	14.33%	17.57%	20.50%	23.60%	26.38%
County Total	2006	3,287	3,483	3,651	3,779	3,890	3,953
	2011	3,323	3,527	3,706	3,844	3,966	4,039
	Difference	36	44	55	65	76	86
	% Change	1.10%	1.26%	1.51%	1.72%	1.95%	2.18%