2.0 Population Projections and Water Demand Projections

A key task in the preparation of the water plan for the North East Texas Region is to estimate current and future water demands within the region. In subsequent chapters of this plan, these projections are compared with estimates of currently available water supply to identify the location, extent, and timing of future water shortages.

The following is a summary of regional population and water demand projections for the North East Texas Region.

Table 2.1 – Population and Water Demand Projections for the North East Texas Region

Regional Total Projection	2000	2010	2020	2030	2040	2050
Population	**687,105**	**757,522**	**821,294**	**887,169**	**952,818**	**1,017,477**
Water Demand (ac-ft)						
Municipal Water Demand	118,802	124,561	128,928	135,498	141,548	149,108
Manufacturing Water Demand	355,258	385,363	390,601	392,864	409,173	427,613
Irrigation Water Demand	12,566	12,734	12,684	12,637	12,471	12,127
Steam Electric Water Demand	52,432	72,033	74,033	82,033	82,033	89,533
Mining Water Demand	10,365	24,191	23,470	22,964	21,923	10,220
Livestock Water Demand	29,671	29,899	29,951	30,006	29,714	29,273
Total Water Demand (ac-ft)	**579,094**	**648,781**	**659,667**	**676,002**	**696,862**	**717,874**

As shown, the population in the North East Texas Region is projected to grow from approximately 690,000 people at present to over 1 million in 2050. This projected population growth is directly responsible for large increases in municipal and manufacturing water demands. The result is a projected increase in total water demand of approximately 140,000 ac-ft (about 24 percent) from the year 2000 to the year 2050.

The following sections of this chapter describe the methodology used to develop regional population and water demand projection. This chapter also presents projections of population and water demand for cities, major providers of municipal and manufacturing water, and for categories of water use including municipal, manufacturing, irrigation, steam electric power generation, mining, and livestock watering. Projected demands are also provided for each of the six river basins located within the North East Texas Region.

2.1 TWDB Guidelines For Revisions to Population and Water Demand Projections

Senate Bill 1 and associated rules of the Texas Water Development Board (TWDB) require the use of population and water demand projections from the 1997 State Water Plan. Specifically, Section 357.5 of TWDB rules for regional water planning state:

> *"In developing regional water plans, regional water planning groups shall use:*
> *(1) State population and water demand projections contained in the state water plan or adopted by the board after consultation with the Texas Natural Resource Conservation Commission and the Texas Parks and Wildlife Department, in preparation for revision of the state water plan; or*

(2) In lieu of paragraph (1) of this subsection, population and water demand projection revisions that have been adopted by the board, after coordination with the Texas Natural Resource Conservation Commission and the Texas Parks and Wildlife Department, based on changed conditions and availability of new information."

In essence, TWDB rules require that the state's projections be used as the "default" for regional water planning unless there are substantiated reasons to revise those projections. The TWDB established guidelines to be used in developing proposed revisions. Based on these guidelines, a number of revisions to the state's "default" projections were proposed by the North East Texas Regional Water Planning Group and adopted by the TWDB.

2.2 Population Projections

The population and water demand projections presented in this chapter were developed by revising the state "default" projections to reflect more current information, in accordance with TWDB guidelines. This section describes the methodology applied by the planning group to develop the approved population projections for the North East Texas Region.

2.2 (a) Methodology

The population projections are provided at county level for the 19 counties in Region D. The proposed projections were made using the most reasonable results of four different population projection methods. These four methods are explained below:

1. The historical population data (1960 to 1998) of the counties was used to project populations through 2050 using a function in Microsoft Excel called "FORECAST." "FORECAST" utilizes linear regression calculations of existing population values to determine future population values. All available historical data points from 1960 were considered while using this method. In the cases that the "FORECAST" method was chosen for county population projections, then all the city populations within that county were projected based on the "FORECAST" method. These projections were then distributed at the same ratio of city to total county population as the State Data Center (SDC) population distribution for the year 1996.

2. Texas Water Development Board (TWDB) population estimates are taken from "Population and Water Use Projections-Region D from TWDB" and are based on 1990 U.S. Census Bureau data. The TWDB projected populations beyond 1990 for separate demographic groups with the population changes based on fertility rates, survival rates and migration for each group. These numbers were then used to project the populations for each municipality and "county other" category. Projections were made for each 10 year interval from the year 2000 to 2050.

3. Texas State Data Center (SDC) population estimates were taken from "Population Estimates and Projections Programs from Texas State Data Center" dated February 1998 and were made using a simple ratio correlation method of births, deaths, elementary school enrollment, vehicle registration, and voter registration variables. The 1998 estimates were compared to the 1990 census data for a straight-line projection of the year 2000 population. Population changes for each 10 year cycle from the year 2000 to 2050 were projected using the same population change as was determined in the TWDB projections.

4. Each of the 268 public water systems in the North East Texas Region were surveyed. These surveys were completed based on interviews with a responsible representative of each public

water system where possible or by existing data from TWDB if the information was not available. The survey population projections were based on the number of residential water service connections reported by the survey participants multiplied by the census tract household populations. The residents from additional multifamily units were incorporated into the data. Population changes for each 10 year cycle from the year 2000 to 2050 were projected using the same population change as was projected in the TWDB projections.

The results of each of the four population projection methods were evaluated to determine a proposed population projection through the planning period to 2050. If the populations indicated a declining population, then for planning purposes, the populations were held steady at the peak population level for the remainder of the planning period. Because these population projections will be used to develop water demands for the region, the more conservative, reasonable projection was proposed for use throughout the remainder of the plan development. These population projections are summarized below.

2.2 (b) Regional Population Projection

The population of the nineteen counties that comprise the North East Texas Region is projected to grow over the 50 year planning period. This projected growth will result in an increase of population from 687,105 in year 2000 to 1,017,477 in 2050 (about 48 percent increase). Table 2.2 presents these projections by county for each decade of the 50 year planning period.

Table 2.2 – Population Projection by County

County	1996	2000	2010	2020	2030	2040	2050
Bowie	84,973	91,749	99,801	107,853	115,905	123,957	132,009
Camp	10,692	10,849	13,668	14,488	15,307	16,127	16,946
Cass	30,725	32,185	34,409	36,634	38,858	41,082	43,307
Delta	5,014	6,091	6,127	6,148	6,148	6,148	6,148
Franklin	8,724	9,242	10,760	12,263	13,950	14,886	15,885
Gregg	111,509	113,989	125,032	136,075	147,119	158,162	169,205
Harrison	60,449	61,214	67,305	71,646	76,587	81,804	86,850
Hopkins	31,013	31,995	35,467	38,938	42,410	45,881	49,353
Hunt	69,176	72,519	80,814	89,110	97,406	105,702	113,997
Lamar	45,656	47,536	51,865	55,467	59,083	62,572	66,095
Marion	10,405	10,964	11,671	12,378	13,085	13,792	14,499
Morris	13,485	14,446	14,659	14,763	14,813	14,813	14,812
Rains	7,457	7,765	9,033	10,300	11,567	12,834	14,101
Red River	14,662	14,761	14,792	14,807	14,840	14,889	14,937
Smith	23,377	24,357	27,517	30,678	33,838	36,999	40,159
Titus	26,264	26,574	29,293	32,012	34,731	37,449	40,168
Upshur	34,520	33,215	36,733	38,236	41,102	44,379	46,742
Van Zandt	42,067	44,352	51,014	57,676	64,338	71,000	77,661
Wood	33,312	33,302	37,562	41,822	46,082	50,342	54,603
Total	**663,480**	**687,105**	**757,522**	**821,294**	**887,169**	**952,818**	**1,017,477**

** Population projections by City, County, and River Basin for each of the nineteen counties in the North East Texas Region are provided in the Appendix.*

As discussed in Chapter 1, the North East Texas Region covers portions of the Red, Sulphur, Sabine, Trinity, Neches, and Cypress River basins. Table 2.3 below presents the population projections by basin for the North East Texas Region.

Table 2.3 – Population Projection by River Basin

River Basin	1996	2000	2010	2020	2030	2040	2050
Cypress	131,621	134,065	147,342	156,521	166,898	177,362	187,223
Neches	10,821	11,406	13,120	14,833	16,545	18,257	19,973
Red	38,287	39,315	43,073	46,095	49,150	52,120	55,146
Sabine	309,394	317,768	353,358	387,147	421,733	456,525	490,892
Sulphur	164,819	175,533	190,274	205,006	219,811	234,182	248,533
Trinity	8,538	9,018	10,355	11,692	13,032	14,372	15,710
Total	**663,480**	**687,105**	**757,522**	**821,294**	**887,169**	**952,818**	**1,017,477**

2.3 Water Demand Projections

Annual total water demand for the North East Texas Region is projected to increase by approximately 140,000 acre-feet over the 50 year planning period. This increase in total water demand is due to a projected increase in municipal, manufacturing, and steam electric water demands.

2.3 (a) Municipal Water Demand Projections

Methodology

As with the population projections, the planning group generated municipal water demand projections by starting with the state default projections and making updates on the basis of better, more current information. The following procedure describes the methodology used for generating these projections:

> Municipal water demand was determined by multiplying the projected per capita municipal use by the projected population. The TWDB data from "Population and Water Use Projections-Region D from TWDB" was used for the projected year 2000 daily per capita water use rate. The State Data Center populations and the populations generated by the "FORECAST" method were multiplied times the TWDB calculated water use rates. In the case of the survey data, the total community water use divided by the calculated population determined the proposed per capita daily water use rate.

The regulations, in "Water Conservation Impacts on Per Capita Water Use," issued by TWDB, prescribe a methodology for estimating water use conservation. This method was used to determine the projected per capita daily water conservation for each decade throughout the planning period. The projected daily per capita water use rate was calculated by subtracting the expected conservation from the reported/projected per capita use for the year 2000. The NETRWPG proposed a minimum per capita water use rate of 115 gal/cap/day be used since this appeared to be a reasonably expected minimum for successful communities. The 115 gal/cap/day minimum use selected is the 95 percent confidence limit of the existing water use rates. Although each community desires to achieve maximum conservation, the historical records indicate communities use more water as they become more affluent and as a steady supply of water is available.

After review by the TWDB, the NETRWPG established 115 gal/cap/day as a minimum starting value for the year 2000 water use rate, and then applies the conservation rates of four gal/cap/decade to this value. In rapidly growing communities, a minimum starting water use rate of 120 gal/cap/day was used and a conservation of four gal/cap/decade was applied to this value.

Regional Municipal Water Demand Projections

Annual municipal water demand within the North East Texas Region is projected to increase by about 30,000 ac-ft from the year 2000 to the year 2050. Table 2.4 presents the projected municipal water demand by county for each of the nineteen counties in the North East Texas Region. This table shows that municipal water demand in the North East Texas Region is concentrated in Bowie, Gregg, and Hunt counties.

Table 2.4 – Municipal Water Demand Projections by County (in ac-ft/yr)

County	1996	2000	2010	2020	2030	2040	2050
Bowie	11,937	15,657	16,128	16,606	17,313	18,005	18,907
Camp	1,602	1,747	2,048	2,086	2,139	2,191	2,250
Cass	4,248	5,014	5,120	5,201	5,321	5,413	5,530
Delta	639	926	898	866	838	810	790
Franklin	1,524	2,005	2,216	2,413	2,689	2,830	3,002
Gregg	16,496	21,682	22,487	23,315	24,628	25,874	27,493
Harrison	8,452	9,877	10,384	10,588	10,976	11,361	11,855
Hopkins	6,041	5,531	5,835	6,078	6,455	6,782	7,238
Hunt	10,241	13,475	14,394	15,185	16,178	17,127	18,163
Lamar	7,205	10,609	10,947	11,150	11,607	12,018	12,569
Marion	1,385	1,696	1,737	1,774	1,813	1,854	1,896
Morris	1,578	1,937	1,880	1,807	1,746	1,681	1,638
Rains	1,219	1,374	1,513	1,637	1,787	1,940	2,111
Red River	1,954	2,018	1,941	1,863	1,795	1,744	1,691
Smith	4,278	3,759	3,992	4,206	4,489	4,786	5,154
Titus	5,629	4,727	4,994	5,240	5,529	5,816	6,129
Upshur	4,530	5,067	5,365	5,354	5,583	5,846	6,001
Van Zandt	5,629	6,513	7,179	7,779	8,403	8,946	9,548
Wood	5,155	5,188	5,503	5,780	6,209	6,524	7,143
Total	**99,742**	**118,802**	**124,561**	**128,928**	**135,498**	**141,548**	**149,108**

**Municipal water demand projections by city, county, and river basin for each of the 19 counties in the North East Texas Region are provided in Appendix A.*

As with population, all river basins showed an increase in water demand. Table 2.5 presents these municipal water demand projections by river basin.

Table 2.5 – Municipal Water Demand Projections by River Basin (in ac-ft/yr)

River Basin	1996	2000	2010	2020	2030	2040	2050
Cypress	19,891	21,360	22,451	22,880	23,708	24,467	25,302
Neches	1,538	1,655	1,832	1,989	2,148	2,286	2,428
Red	5,646	7,690	7,970	8,171	8,452	8,741	9,144
Sabine	46,542	55,491	58,532	60,987	64,753	68,191	72,544
Sulphur	25,104	31,388	32,433	33,344	34,878	36,207	37,938
Trinity	1,021	1,218	1,343	1,557	1,559	1,656	1,752
Total	**99,742**	**118,802**	**124,561**	**128,928**	**135,498**	**141,548**	**149,108**

2.3 (b) Manufacturing Water Demand Projections

Methodology

For Senate Bill 1 regional water planning purposes, manufacturing water use is considered to be the cumulative water demand by county and river basin for all industries within specified industrial classifications (SIC) determined by the TWDB. Manufacturing water demand was predicted based on the information provided by the major manufacturing industries. Surveys were conducted and revisions made to the TWDB manufacturing water demand projections. The proposed revisions to the TWDB projections were then incorporated.

Regional Manufacturing Water Demand Projections

Manufacturing water demand for the North East Texas Region is projected to increase by 72,355 ac-ft from year 2000 to year 2050. This increase in manufacturing water demand is predominantly due to the projected growth in Harrison County and Gregg County. The projected increases in Harrison and Gregg counties are from TWDB (1997 state plan) default numbers for manufacturing water demand. The water demand increase in Camp County from the year 2010 is due to the expected construction a poultry processing facility. Table 2.6 presents the projected manufacturing water demand for each of the 19 counties in the North East Texas Region.

Table 2.6 – Manufacturing Water Demand Projections by County (in ac-ft/yr)

County	1996	2000	2010	2020	2030	2040	2050
Bowie	1,885	1,944	2,152	2,366	2,590	2,826	3,071
Camp	33	10	2,242	2,242	2,242	2,242	2,242
Cass	79,123	80,129	76,867	76,871	74,569	77,555	80,664
Delta	0	8	8	8	8	8	8
Franklin	0	6	6	6	6	6	6
Gregg	3,826	16,538	18,576	20,934	23,507	26,515	29,716
Harrison	49,692	110,588	135,166	141,913	147,949	161,370	176,471
Hopkins	627	2,654	2,853	3,016	3,148	3,410	3,669
Hunt	803	740	818	903	998	1,129	1,276
Lamar	5,179	5,422	6,213	6,932	7,575	8,590	9,608
Marion	35	20	20	20	20	20	20
Morris	96,271	132,451	135,264	129,869	124,443	119,127	113,929
Rains	1	2	2	2	2	2	2
Red River	9	11	15	17	19	21	25
Smith	181	262	298	325	346	377	403
Titus	2,832	3,734	3,997	4,199	4,357	4,722	5,079
Upshur	161	215	232	241	243	277	314
Van Zandt	607	280	344	396	451	508	566
Wood	149	244	290	341	391	468	544
Total	**241,414**	**355,258**	**385,363**	**390,601**	**392,864**	**409,173**	**427,613**

**Manufacturing water demand projections by city, county, and river basin for each of the 19 counties in the North East Texas Region are provided in Appendix A.*

Manufacturing water demand in the North East Texas Region is located predominantly in the Sabine River Basin. Table 2.7 presents these demands by river basin for the North East Texas Region.

Table 2.7 - Manufacturing Water Demand Projections by River Basin (in ac-ft/yr)

RIVER BASIN	1996	2000	2010	2020	2030	2040	2050
Cypress	99,817	137,727	143,370	138,254	133,055	128,303	123,691
Neches	0	0	0	0	0	0	0
Red	627	562	574	586	596	638	690
Sabine	54,749	127,205	153,681	162,869	171,559	188,027	206,330
Sulphur	86,221	89,764	87,738	88,892	87,654	92,205	96,902
Trinity	0	0	0	0	0	0	0
TOTAL	**241,414**	**355,258**	**385,363**	**390,601**	**392,864**	**409,173**	**427,613**

2.3 (c) Irrigation Water Demand Projections

Methodology

The irrigation water use projections that were developed by the TWDB and used in the 1997 State Water Plan were used as the default projections except where better, more current information was submitted. The TWDB projections were determined with assistance from the Texas Agricultural Extension Service and assume expected case conservation practices and no reduction in federal farm program subsidies. Letters were mailed to the county extension agents in each county of the region requesting their review of

TWDB irrigation water demand projections. Written or verbal input was received from all county agents in the region. The proposed revisions to the TWDB projections were then incorporated based on the information provided by the county agents.

Regional Irrigation Water Demand Projections

Annual irrigation water demand for the North East Texas Region is projected to decrease by 439 ac-ft from the year 2000 to the year 2050. Irrigation water demand in the North East Texas Region is most heavily concentrated in Bowie and Lamar counties. A decrease in irrigation demand is projected due to improvements in irrigation efficiency, and in some cases, the encroachment of urbanization on irrigable lands. Table 2.8 presents the projected irrigation water demands by county for the North East Texas Region.

Table 2.8 - Irrigation Water Demand Projections by County (in ac-ft/yr)

County	1996	2000	2010	2020	2030	2040	2050
Bowie	5,025	4,400	4,620	4,620	4,620	4,500	4,200
Camp	32	87	87	87	87	87	87
Cass	13	0	0	0	0	0	0
Delta	4	1,978	1,956	1,934	1,913	1,891	1,870
Franklin	44	33	33	33	33	33	33
Gregg	25	0	0	0	0	0	0
Harrison	106	100	100	100	100	100	100
Hopkins	25	0	0	0	0	0	0
Hunt	618	271	271	271	271	271	271
Lamar	4,700	4,368	4,319	4,271	4,223	4,176	4,129
Marion	98	0	0	0	0	0	0
Morris	121	190	188	186	184	182	180
Rains	27	20	20	20	20	20	20
Red River	3,480	99	98	97	96	95	94
Smith	86	446	468	491	516	542	569
Titus	0	0	0	0	0	0	0
Upshur	20	0	0	0	0	0	0
Van Zandt	1,015	220	220	220	220	220	220
Wood	219	354	354	354	354	354	354
TOTAL	**15,658**	**12,566**	**12,734**	**12,684**	**12,637**	**12,471**	**12,127**

**Irrigation water demand projections by city, county, and river basin for each of the 19 counties in the North East Texas Region are provided in Appendix A.*

Irrigation water demand is mainly concentrated in the Red River Basin. Table 2.9 presents the projected irrigation water demands for the North East Texas Region.

Table 2.9 - Irrigation Water Demand Projections by River Basin (in ac-ft/yr)

River Basin	1996	2000	2010	2020	2030	2040	2050
Cypress	474	458	456	454	452	450	448
Neches	1,015	0	0	0	0	0	0
Red	10,525	8,822	8,993	8,944	8,896	8,728	8,381
Sabine	793	1,022	1,044	1,067	1,092	1,118	1,145
Sulphur	2,851	2,044	2,021	1,999	1,977	1,955	1,933
Trinity	0	220	220	220	220	220	220
Total	**15,658**	**12,566**	**12,734**	**12,684**	**12,637**	**12,471**	**12,127**

2.3 (d) Steam Electric Water Demand Projections

Methodology

Steam electric water use projections that were developed by TWDB and used in the 1997 State Water Plan were used as the default projections except where better, more current information indicated the need for revision. Corporation names and points of contact were received from the Public Utility Commission of Texas for steam electric power generators in the region. Letters were sent to 10 power generation plants in eight counties. Demand and source, as well as future requirements, were determined and used to project modifications to the TWDB figures in seven counties.

Regional Steam Electric Water Demand Projections

Annual steam electric water demand is projected to increase from 52,432 ac-ft/yr in the year 2000 to 89,533 ac-ft/yr in the year 2050. The majority of this increase is expected to occur in Red River, Titus, Upshur, and Wood counties. Table 2.10 presents the projected steam electric water demand by county for each of the 19 counties in the North East Texas Region. Steam electric water demand was not projected for Hopkins County prior to development of these tables. Hopkins County has now been identified as a possible site for a merchant power plant, which if constructed, would add an additional 7,126 ac-ft/yr demand beyond that tabulated herein.

Table 2.10 - Steam Electric Water Demand Projections by County (in ac-ft/yr)

County	1996	2000	2010	2020	2030	2040	2050
Bowie	0	0	0	0	0	0	0
Camp	0	0	0	0	0	0	0
Cass	0	0	0	0	0	0	0
Delta	0	0	0	0	0	0	0
Franklin	0	0	0	0	0	0	0
Gregg	1,723	1,251	1,251	1,251	1,251	1,251	1,251
Harrison	8,972	5,760	5,760	5,760	5,760	5,760	5,760
Hopkins	0	0	0	0	0	0	0
Hunt	405	516	516	516	516	516	516
Lamar	0	12,209	12,209	12,209	12,209	12,209	12,209
Marion	3,321	2,868	2,868	2,868	2,868	2,868	2,868
Morris	16	48	48	48	48	48	48
Rains	0	0	0	0	0	0	0
Red River	227	1,500	5,000	7,000	10,000	10,000	10,000
Smith	0	0	0	0	0	0	0
Titus	31,388	28,280	31,280	31,280	36,280	36,280	36,280
Upshur	0	0	5,601	5,601	5,601	5,601	5,601
Van Zandt	0	0	0	0	0	0	0
Wood	0	0	7,500	7,500	7,500	7,500	15,000
Total	**46,052**	**52,432**	**72,033**	**74,033**	**82,033**	**82,033**	**89,533**

**Steam electric water demand projections by city, county, and river basin for each of the 19 counties in the North East Texas Region are provided in Appendix A.*

The Cypress, Red, Sabine, and Sulphur River basins contain all of the current and projected steam electric water demand for the region. Table 2.11 shows the projected steam electric water demand by basin.

Table 2.11 - Steam Electric Water Demand Projections by River Basin (in ac-ft/yr)

River Basin	1996	2000	2010	2020	2030	2040	2050
Cypress	34,725	31,196	39,797	39,797	44,797	44,797	44,797
Neches	0	0	0	0	0	0	0
Red	0	12,209	12,209	12,209	12,209	12,209	12,209
Sabine	11,100	7,527	15,027	15,027	15,027	15,027	22,527
Sulphur	227	1,500	5,000	7,000	10,000	10,000	10,000
Trinity	0	0	0	0	0	0	0
Total	**46,052**	**52,432**	**72,033**	**74,033**	**82,033**	**82,033**	**89,533**

2.3 (e) Mining Water Demand Projections

Methodology

The TWDB mining water use projections that were used in the 1997 State Water Plan were developed based on projected future production levels by mineral category and expected water use rates. These production projections were derived from state and national historic rates and were constrained by accessible mineral reserves in each region. The TWDB–1997 State Water Plan mining water demands

projections were used except where better, more current information was available. A list of the mining operations in the North East Texas Region was obtained from the Texas Railroad Commission. Six major mining operations were identified in six counties. Letters and questionnaires were sent to each mine. Even though there were no mines in 12 of the 19 counties, significant demand was indicated. The origin and validity of the mining demands for this group of counties could neither be confirmed nor denied. It should be noted however, that mining water demand can include fuels, including oil and gas drilling operations, and nonfuels components and therefore mining water demands in counties without mines would not be unusual.

Regional Mining Water Demand Projections

Annual mining water demand for the North East Texas Region is projected to double from 2000 to 2010, and then remain relatively constant over the next 30 years before decreasing by 2050. Mining water demand represents a very small portion (about 1.4 percent) of the region's total water demand. Mining demand is largest in Titus County until year 2010 after which Wood County takes the first place. Table 2.12 presents the projected mining water demand by county for each of the counties in the North East Texas Region.

Table 2.12 - Mining Water Demand Projections by County (in ac-ft/yr)

County	1996	2000	2010	2020	2030	2040	2050
Bowie	41	53	52	53	56	61	66
Camp	24	132	131	131	131	131	131
Cass	1,045	1,254	990	942	902	872	496
Delta	0	0	0	0	0	0	0
Franklin	1,354	1,479	1,384	1,338	1,278	1,297	1,359
Gregg	129	96	67	46	37	29	27
Harrison	492	370	370	370	370	370	370
Hopkins	148	125	122	120	117	116	116
Hunt	67	70	71	73	75	77	79
Lamar	22	25	24	24	25	25	25
Marion	99	71	43	30	24	20	34
Morris	39	31	16	12	10	10	11
Rains	0	0	0	0	0	0	0
Red River	0	0	0	0	0	0	0
Smith	203	425	178	91	32	18	6
Titus	3,349	2,772	1,991	1,796	1,722	1,705	1,744
Upshur	1	1	1	1	1	1	0
Van Zandt	1,421	1,359	1,167	1,099	1,077	1,084	1,115
Wood	562	2,102	17,584	17,344	17,107	16,107	4,641
Total	**8,996**	**10,365**	**24,191**	**23,470**	**22,964**	**21,923**	**10,220**

**Mining water demand projections by city, county, and river basin for each of the 19 counties in North East Texas Region are provided in Appendix A.*

Table 2.13 presents the mining water demand projections by river basin.

Table 2.13 - Mining Water Demand Projections by River Basin (in ac-ft/yr)

River Basin	1996	2000	2010	2020	2030	2040	2050
Cypress	4,689	4,361	3,521	3,310	3,205	3,198	2,943
Neches	48	80	48	28	19	14	14
Red	36	37	36	36	37	38	38
Sabine	2,572	4,116	19,151	18,753	18,424	17,422	5,977
Sulphur	1,606	1,725	1,389	1,298	1,235	1,206	1,202
Trinity	45	46	46	45	44	45	46
Total	**8,996**	**10,365**	**24,191**	**23,470**	**22,964**	**21,923**	**10,220**

2.3 (f) Livestock Water Demand Projections

Methodology

For all the counties in the North East Texas Region, the livestock water use projections developed by the TWDB and used in the 1997 State Water Plan were used as the default projections. These projections were developed using Texas Agricultural Statistics Service projections of number of livestock by type, county, and Texas Agricultural Extension Service estimates of water use rates by type of livestock. Letters were mailed to the county extension agents requesting their review of TWDB livestock water demand projections. Written or verbal input was received from all county agents in the region. The proposed revisions to the TWDB projections were then incorporated based on the information provided by the county agents.

Regional Livestock Water Demand Projections

Annual livestock water demand for the North East Texas Region represents about 4 percent of the total regional water demand. Livestock water demand is projected to remain more or less constant over the 50 year planning period. Livestock water demand is spread relatively evenly over the 19 counties in the region. Table 2.14 presents these projected demands by county for the region.

After the water demand and population numbers were approved by TWDB, new information came to light. This information has not been included in the approved projections, but it should be considered in the next plan update. According to this information, the water demand in Titus County is 34,494 ac-ft instead of 29,671 ac-ft in the year 2000, an increase of 4,823 ac-ft. If this increase was included and projected, it would result in an increase of 15,367 ac-ft by 2050. Since these numbers result in an increase of over 50 percent by year 2050, they should be included in the next plan update.

Table 2.14 - Livestock Water Demand Projections by County (in ac-ft/yr)

County	1996	2000	2010	2020	2030	2040	2050
Bowie	1,941	3,671	3,850	3,850	3,850	3,500	3,000
Camp	982	800	800	800	800	800	800
Cass	820	851	851	851	851	851	851
Delta	344	770	770	770	770	770	770
Franklin	1,418	1,595	1,595	1,595	1,595	1,595	1,595
Gregg	215	265	265	265	265	265	265
Harrison	712	991	1,040	1,092	1,147	1,205	1,264
Hopkins	6,744	7,100	7,100	7,100	7,100	7,100	7,100
Hunt	1,779	1,237	1,237	1,237	1,237	1,237	1,237
Lamar	1,970	1,523	1,523	1,523	1,523	1,523	1,523
Marion	165	182	182	182	182	182	182
Morris	490	624	624	624	624	624	624
Rains	721	700	700	700	700	700	700
Red River	1,929	1,180	1,180	1,180	1,180	1,180	1,180
Smith	383	453	453	453	453	453	453
Titus	1,111	858	858	858	858	858	858
Upshur	2,407	1,928	1,928	1,928	1,928	1,928	1,928
Van Zandt	2,311	2,381	2,381	2,381	2,381	2,381	2,381
Wood	2,728	2,562	2,562	2,562	2,562	2,562	2,562
Total	**29,170**	**29,671**	**29,899**	**29,951**	**30,006**	**29,714**	**29,273**

**Livestock water demand projections by city, county, and river basin for each of the 19 counties in the North East Texas Region are provided in Appendix A.*

Table 2.15 presents these demands by river basin for the North East Texas Region.

Table 2.15 - Livestock Water Demand Projections by River Basin (in ac-ft/yr)

River Basin	1996	2000	2010	2020	2030	2040	2050
Cypress	5,796	5,491	5,520	5,549	5,581	5,615	5,648
Neches	638	657	657	657	657	657	657
Red	2,728	2,775	2,840	2,840	2,840	2,712	2,530
Sabine	9,009	8,710	8,730	8,753	8,776	8,800	8,826
Sulphur	10,380	11,404	11,518	11,518	11,518	11,296	10,978
Trinity	619	634	634	634	634	634	634
Total	**29,170**	**29,671**	**29,899**	**29,951**	**30,006**	**29,714**	**29,273**

2.4 Major Water Providers

The North East Texas Regional Water Planning Group has designated 13 entities as "major water providers." This distinction was made to satisfy the TWDB guidelines that require each RWPG to identify and designate "major water providers." Major water providers are defined by the TWDB as an entity "…which delivers and sells a significant amount of raw or treated water for municipal and/or manufacturing use on a wholesale and/or retail basis."

The intent of TWDB requirements is to ensure that there is an adequate future supply of water for each entity that receives all or a significant portion of its current water supply from another entity. This requires an analysis of projected water demands and currently available water supplies for the primary supplier, each of its wholesale customers, and all of the suppliers in the aggregate as a "system." For example, a city that serves both retail customers within its corporate limits, as well as other nearby public water systems, would need to have a supply source(s) that is adequate for the combined total of future retail water sales and future wholesale water sales. If there is a "system" deficit currently or in the future, then recommendations are to be included in the regional water plan with regard to strategies for meeting the "system" deficit.

2.4 (a) Cherokee Water Company

The Cherokee Water Company provides water for municipal, and steam electric uses. The existing service area of the water company covers portions of Gregg and Harrison counties. Table 2.16 presents the aggregated demands of all users supplied by Cherokee Water Company.

Table 2.16 – Projected Water Demand for Cherokee Water Company (in ac-ft/yr)

System Name	County	2000	2010	2020	2030	2040	2050
City of Longview	Gregg	15,360	15,360	15,360	15,360	15,360	15,360
City of Longview	Harrison	640	640	640	640	640	640
Steam Electric	Gregg	2,000	2,000	2,000	2,000	2,000	2,000
Total		**18,000**	**18,000**	**18,000**	**18,000**	**18,000**	**18,000**

2.4 (b) Franklin County Water District

The Franklin County Water District provides water for municipal water use. The water district's service area covers portions of Franklin, Hopkins, Titus, and Wood counties. Table 2.17 presents the aggregated demands of all users supplied by the water district.

Table 2.17 – Projected Water Demand for Franklin County Water District (in ac-ft/yr)

System Name	County	2000	2010	2020	2030	2040	2050
City of Mount Vernon	Franklin	3,000	3,000	3,000	3,000	3,000	3,000
City of Winnsboro	Franklin	450	450	450	450	450	450
Cypress Springs WSC	Franklin	3,045	3,045	3,045	3,045	3,045	3,045
Cypress Springs WSC	Hopkins	350	350	350	350	350	350
Cypress Springs WSC	Titus	35	35	35	35	35	35
City of Winnsboro	Wood	4,550	4,550	4,550	4,550	4,550	4,550
Cypress Springs WSC	Wood	70	70	70	70	70	70
Total		**11,500**	**11,500**	**11,500**	**11,500**	**11,500**	**11,500**

2.4 (c) Northeast Texas Municipal Water District

The Northeast Texas Municipal Water District (NETMWD) provides water for municipal, manufacturing, and steam electric water uses. NETMWD's service area covers portions of Camp, Cass, Gregg, Harrison, Marion, Morris, Titus, and Upshur counties. Table 2.18 presents the aggregated water demands of all users supplied by NETMWD.

Table 2.18 – Projected Water Demand for Northeast Texas Municipal Water Demand (in ac-ft/yr)

System Name	County	2000	2010	2020	2030	2040	2050
City of Pittsburg	Camp	13,633	13,633	13,633	13,633	13,633	13,633
City of Hughes Springs	Cass	4,748	4,748	4,748	4,748	4,748	4,748
City of Avinger	Cass	1,551	1,551	1,551	1,551	1,551	1,551
Mims WSC	Cass	168	168	168	168	168	168
City of Longview	Gregg	19,200	19,200	19,200	19,200	19,200	19,200
City of Longview	Harrison	800	800	800	800	800	800
System Electric	Harrison	18,000	18,000	18,000	18,000	18,000	18,000
City of Ore City	Marion	83	83	83	83	83	83
City of Ore City	Marion	625	625	625	625	625	625
Mims WSC	Marion	6,700	6,700	6,700	6,700	6,700	6,700
Steam Electric	Marion	9,776	9,776	9,776	9,776	9,776	9,776
City of Jefferson	Marion	4,841	4,841	4,841	4,841	4,841	4,841
City of Lone Star	Morris	243	243	243	243	243	243
City of Daingerfield	Morris	1,002	1,002	1,002	1,002	1,002	1,002
City of Hughes Springs	Morris	8	8	8	8	8	8
Mims WSC	Morris	32,400	32,400	32,400	32,400	32,400	32,400
Manufacturing	Morris	10,329	10,329	10,329	10,329	10,329	10,329
City of Daingerfield	Morris	31	31	31	31	31	31
City of Hughes Springs	Morris	12,000	12,000	12,000	12,000	12,000	12,000
Steam Electric	Titus	10,000	10,000	10,000	10,000	10,000	10,000
Steam Electric	Upshur	2,690	2,690	2,690	2,690	2,690	2,690
Total		**148,828**	**148,828**	**148,828**	**148,828**	**148,828**	**148,828**

2.4 (d) Sabine River Authority

The Sabine River Authority (SRA) provides water for municipal and manufacturing uses. SRA's service area covers portions of Gregg, Harrison, Hopkins, Hunt, Rains, Van Zandt, and Wood counties. Table 2.19 presents the aggregated water demands of all users supplied by SRA. Its largest customers are City of Greenville followed by Longview.

Table 2.19 – Projected Water Demand for Sabine River Authority (in ac-ft/yr)

System Name	County	2000	2010	2020	2030	2040	2050
City of Longview	Gregg	19,200	19,200	19,200	19,200	19,200	19,200
City of Kilgore	Gregg	6,721	6,721	6,721	6,721	6,721	6,721
City of Longview	Harrison	800	800	800	800	800	800
Manufacturing	Harrison	3,500	3,500	3,500	3,500	3,500	3,500
Mining	Harrison	7,000	7,000	7,000	7,000	7,000	7,000
Cash WSC	Hopkins	107	107	107	107	107	107
City of Commerce	Hunt	8,396	8,396	8,396	4,481	4,481	4,481
City of Greenville	Hunt	21,283	21,283	21,283	21,283	21,283	21,283
City of West Tawakoni	Hunt	1,120	1,120	1,120	1,120	1,120	1,120
Cash WSC	Hunt	3,207	3,207	3,207	3,207	3,207	3,207
Combined Consumers WSC	Hunt	2,240	2,240	2,240	2,240	2,240	2,240
Mac Bee WSC	Hunt	2,240	2,240	2,240	2,240	2,240	2,240
City of Emory	Rains	2,016	2,016	2,016	2,016	2,016	2,016
City of Point	Rains	448	448	448	448	448	448
City of Wills Point	Van Zandt	2,540	2,540	2,540	2,540	2,540	2,540
Mac Bee WSC	Van Zandt	3,159	3,159	3,159	3,159	3,159	3,159
South Tawakoni WSC	Van Zandt	560	560	560	560	560	560
City of Quitman	Wood	1,120	1,120	1,120	1,120	1,120	1,120
City of Edgewood	Van Zandt	840	840	840	840	840	840
Total		**86,497**	**86,497**	**86,497**	**82,582**	**82,582**	**82,582**

2.4 (e) Titus County Fresh Water Supply District No. 1

The Titus County Fresh Water Supply District No. 1 provides water for municipal and steam electric uses. The water supply district's service area covers portions of Titus County. Table 2.20 presents the aggregated water demands of all users supplied by the water district.

Table 2.20 – Projected Water Demand for Titus County Fresh Water Supply District (in ac-ft/yr)

System Name	County	2000	2010	2020	2030	2040	2050
City of Mount Pleasant	Titus	10,000	10,000	10,000	10,000	10,000	10,000
Texas Utilities	Titus	38,500	38,500	38,500	38,500	38,500	38,500
Total		**48,500**	**48,500**	**48,500**	**48,500**	**48,500**	**48,500**

2.4 (f) City of Greenville

The City of Greenville provides water for municipal, manufacturing, mining, and steam electric water uses. The city's service area covers portions of Hunt County. Table 2.21 presents the aggregated water demands of all users supplied by the City of Greenville.

Table 2.21 – Projected Water Demand for City of Greenville (in ac-ft/yr)

System Name	County	2000	2010	2020	2030	2040	2050
City of Caddo Mills	Hunt	166	166	174	183	191	197
City of Greenville	Hunt	6,291	6,689	7,021	7,520	8,034	8,620
Jacobia WSC	Hunt	336	336	336	336	336	336
Shady Grove	Hunt	336	336	336	336	336	336
Manufacturing	Hunt	740	818	903	998	1,129	1,276
Mining	Hunt	24	25	27	33	35	45
Steam Electric	Hunt	800	800	800	800	800	800
Total		**8,693**	**9,170**	**9,597**	**10,206**	**10,861**	**11,610**

2.4 (g) City of Longview

The City of Longview provides water for municipal use. The city's service area covers portions of Gregg, Harrison, and Upshur counties. Table 2.22 presents the aggregated water demands of all users supplied by the City of Longview.

Table 2.22 – Projected Water Demand for City of Longview (in ac-ft/yr)

System Name	County	2000	2010	2020	2030	2040	2050
City of White Oak	Gregg	1,088	1,088	1,088	1,088	1,088	1,088
C & C Mobile Home Park	Gregg	18	18	18	18	18	18
Elderville WSC	Gregg	516	516	516	570	646	744
Tryon Road WSC	Gregg	928	928	928	928	928	928
City of White Oak	Gregg	12	12	12	12	12	12
City of Hallsville	Harrison	368	368	368	368	368	368
Gum Springs WSC	Harrison	415	591	754	906	1,041	1,161
Tryon Road WSC	Harrison	103	103	103	103	103	103
City of White Oak	Upshur	20	20	20	20	20	20
City of Longview	Gregg	18,519	19,306	20,308	21,487	22,732	24,275
City of Longview	Harrison	6,590	7,990	8,379	8,736	9,510	10,384
Total		**28,577**	**30,940**	**32,494**	**34,237**	**36,467**	**39,102**

2.4 (h) City of Marshall

The City of Marshall provides water for municipal use. The city's service area covers portions of Harrison County. Table 2.23 presents the aggregated water demands of all users supplied by the City of Marshall.

Table 2.23 – Projected Water Demand for City of Marshall (in ac-ft/yr)

System Name	County	2000	2010	2020	2030	2040	2050
Cypress Valley WSC	Harrison	5	5	5	5	5	5
Gill WSC	Harrison	125	125	125	125	125	125
Leigh WSC	Harrison	184	184	184	184	184	184
Talley WSC	Harrison	31	49	65	79	90	103
City of Marshall	Harrison	4,906	5,113	5,177	5,393	5,609	5,955
Total		**5,251**	**5,476**	**5,556**	**5,786**	**6,013**	**6,372**

2.4 (i) City of Mount Pleasant

The City of Mount Pleasant provides water for municipal, mining and manufacturing uses. The city's service area covers portions of Franklin, Morris, and Titus counties. Table 2.24 presents the aggregated water demands of all users supplied by the City of Mount Pleasant.

Table 2.24 – Projected Water Demand for City of Mount Pleasant (in ac-ft/yr)

System Name	County	2000	2010	2020	2030	2040	2050
Tri WSC	Franklin	45	48	54	61	68	76
Tri WSC	Morris	122	124	125	126	127	127
System Name	**County**	**2000**	**2010**	**2020**	**2030**	**2040**	**2050**
City of Winfield	Titus	153	153	153	153	153	153
Tri WSC	Titus	1,268	1,304	1,445	1,543	1,648	1,732
Manufacturing	Titus	3,421	3,421	3,421	3,421	3,650	3,882
City of Mt. Pleasant	Titus	3,012	3,167	3,312	3,512	3,722	3,970
Lake Bob Sandlin State Park	Titus	1	1	1	1	1	1
Mining	Titus	1,098	450	315	272	275	324
Total		**9,120**	**8,668**	**8,826**	**9,089**	**9,644**	**10,265**

2.4 (j) City of Paris

The City of Paris provides water for municipal, manufacturing, and steam electric use. The city's service area covers portions of Lamar and Red River counties. Table 2.25 presents the aggregated water demands of all users supplied by the City of Paris.

Table 2.25 – Projected Water Demand for City of Paris (in ac-ft/yr)

System Name	County	2000	2010	2020	2030	2040	2050
City of Paris	Lamar	8,583	8,750	8,904	9,237	9,552	9,973
Lamar County WSD	Lamar	4,000	4,000	4,000	4,000	4,000	4,000
M-J-C WSC	Lamar	92	92	92	92	92	92
Manufacturing	Lamar	5,422	6,213	6,932	7,575	8,590	9,608
Steam Electric	Lamar	12,209	12,209	12,209	12,209	12,209	12,209
Lamar County WSD	Red River	1,601	1,601	1,601	1,601	1,601	1,601
Total		**31,907**	**32,865**	**33,738**	**34,714**	**36,044**	**37,483**

2.4 (k) City of Sulphur Springs

The City of Sulphur Springs provides water for municipal, manufacturing, and livestock use. The city's service area covers portion of Franklin and Hopkins county. Table 2.26 presents the aggregated water demands of all users supplied by the City of Sulphur Springs.

Table 2.26 – Projected Water Demand for City of Sulphur Springs (in ac-ft/yr)

System Name	County	2000	2010	2020	2030	2040	2050
Manufacturing	Hopkins	5,640	5,640	5,640	5,640	5,640	5,640
City of Sulphur Springs	Hopkins	4,836	5,234	5,167	5,104	4,975	4,845
Brashear WSC	Hopkins	173	123	120	120	119	121
Brinker WSC	Hopkins	70	114	221	275	281	294
Gafford Chapel WSC	Hopkins	62	109	130	234	254	280
Martin Springs WSC	Hopkins	223	376	402	452	463	481
North Hopkins WSC	Hopkins	713	778	831	893	954	1,030
Pleasant Hill WSC # 2	Hopkins	28	30	31	33	35	37
Shady Grove # 2 WSC	Hopkins	72	76	79	84	88	94
Manufacturing	Hopkins	2,666	2,861	3,024	3,151	3,409	3,668
Livestock	Hopkins	2,221	2,310	2,431	2,696	2,711	3,000
Total		**16,704**	**17,651**	**18,076**	**18,682**	**18,929**	**19,490**

2.4 (l) City of Texarkana

The City of Texarkana provides water for municipal and manufacturing use. The city's service area covers portions of Bowie, Cass and Red River counties. Table 2.27 presents the aggregated water demands of all users supplied by the City of Texarkana.

Table 2.27 – Projected Water Demand for City of Texarkana (in ac-ft/yr)

System Name	County	2000	2010	2020	2030	2040	2050
City of Dekalb	Bowie	470	470	470	470	470	470
City of Hooks	Bowie	500	500	500	500	500	528
City of Maud	Bowie	246	246	246	246	246	246
City of Nash	Bowie	368	368	368	368	368	368
City of New Boston	Bowie	784	1,164	1,217	1,280	1,346	1,425
City of Redwater	Bowie	147	335	345	506	587	673
City of Texarkana	Bowie	7,350	7,587	7,814	8,162	8,476	8,890
City of Wake Village	Bowie	358	690	718	743	764	781
Central Bowie WSC	Bowie	258	258	1,099	1,121	1,294	1,765
Federal Correction Inst.	Bowie	230	235	240	250	261	275
Macedonia-Elyau MUD # 1	Bowie	552	552	552	1,151	1,312	1,412
Oak Grove WSC	Bowie	74	74	100	125	140	157
Manufacturing	Bowie	1,916	2,124	2,338	2,562	2,798	3,043
City of Atlanta	Cass	1,904	1,904	1,904	1,904	1,904	1,904
City of Queen City	Cass	365	365	365	365	365	385
City of Domino	Cass	55	55	55	55	55	55
Manufacturing	Cass	80,082	76,814	76,814	74,508	77,487	80,589
City of Annona	Red River	68	68	68	68	68	68
City of Avery	Red River	92	92	92	122	133	141
Oak Grove WSC	Red River	8	8	12	14	16	18
Red River County WSC	Red River	110	110	110	110	110	110
Total		**95,937**	**94,019**	**95,427**	**94,630**	**98,700**	**103,303**