

SECTION 8

WATER DEMANDS

8.1 Historical Water Use

Caldwell County currently has 14 water user groups (WUG) that supply water for various types of uses. There are twelve (12) entities that hold CCN and are listed as Municipal, Specialty Utility Districts, and Water Supply Corporations. The two (2) remaining user groups are state agencies. Several of the WUG supply water to other counties in addition to Caldwell.

Caldwell County water use has been primarily for municipal purposes. It appeared that prior to 1980 municipal water use accounted for about half of the water consumed, with livestock and irrigation representing the remainder. Historical water use data made available through the TWDB website is shown in *Table 8-1* and illustrated in *Graph 8-1*. The water consumption for the county, at an average of 4,800 ac-ft, has historically been used to meet municipal demands, and the remainder to meet demands for mining, manufacturing, livestock, and irrigation.

Water utilization for livestock has remained, for the most part, within the range of 800-950 ac-ft annually with an average of 850 ac-ft. Water consumption averaged about 220 ac-ft per year for manufacturing before 1986, after which there is none recorded for a few years. In 1993, manufacturing water use started up again with fluctuation of use typically less than 20 ac-ft. Irrigation use varies and ranges with minimum use of 182 ac-ft to a maximum of 1742 ac-ft annually. Mining water use has historically been limited to less than 70 ac-ft with a gradual decline in use. There is no record of water consumption for steam electric.

TABLE 8-1
Caldwell County - TWDB Historical Water Use Summary
 Unit: Acre Feet (ac-ft)

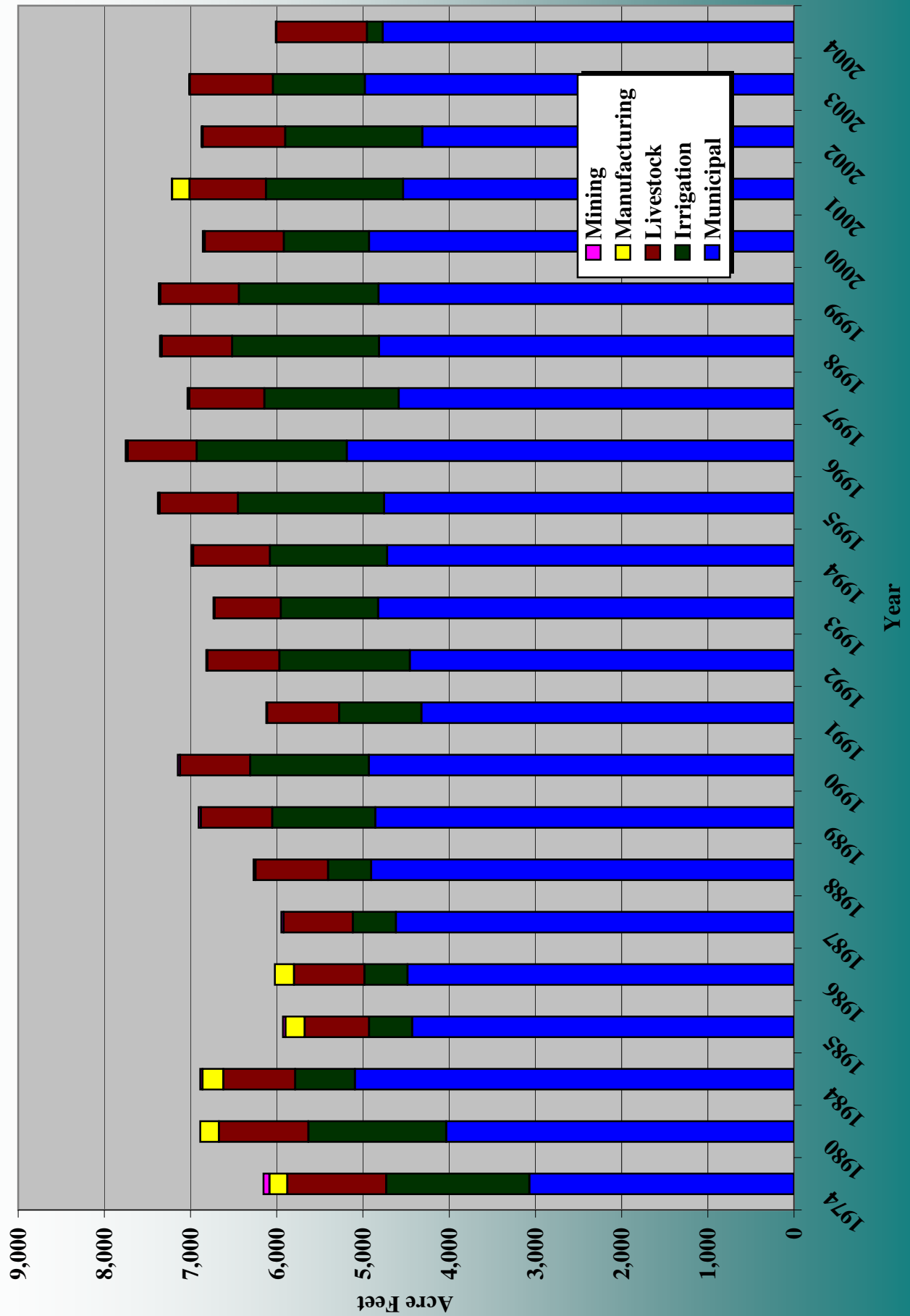
Year	Municipal	Manufacturing	Steam Electric	Irrigation	Mining	Livestock	Total
1974	3,069	206	0	1,660	70	1,149	6,154
1980	4,033	219	0	1,600	0	1,036	6,888
1984	5,092	240	0	694	27	834	6,887
1985	4,430	224	0	499	27	747	5,927
1986	4,483	223	0	500	0	817	6,023
1987	4,617	0	0	500	28	803	5,948
1988	4,904	0	0	500	25	841	6,270
1989	4,855	0	0	1,198	27	827	6,907
1990	4,931	0	0	1,375	27	816	7,149
1991	4,320	0	0	954	13	836	6,123
1992	4,456	0	0	1,513	13	835	6,817
1993	4,825	2	0	1,127	12	769	6,735
1994	4,718	11	0	1,361	12	890	6,992
1995	4,755	10	0	1,696	12	907	7,380
1996	5,186	12	0	1,742	12	801	7,753
1997	4,584	10	0	1,560	12	869	7,035
1998	4,813	8	0	1,705	12	816	7,354
1999	4,818	8	0	1,621	12	910	7,369
2000	4,929	11	0	989	12	917	6,858
2001	4,534	200	0	1,590	6	888	7,218
2002	4,311	6	0	1,590	6	958	6,871
2003	4,978	0	0	1,065	6	965	7,014
2004	4,770	1	0	183	6	1,051	6,011

Data Source: Texas Water Development Board

8.2 TWDB Water Use Projections

The future water demands in *Table 8-2* and *Graph 8-2* were developed by the TWDB for Caldwell County. The demands have been estimated up to 2060. The years beyond 2040 have been shaded in the table since this study is not considering the same planning horizon.

Graph 8-1
Caldwell County Historic Water Use



The municipal water demand projections show a consistent linear increase from 6,306 ac-ft in 2010 to 10,555 ac-ft in 2040. According to the TWDB, the municipal water demand is based on population and expected water consumption for each person with a reduction to account for conservation. The GPCD varied in the county for each water user group.

Water demands for mining are also expected to gradually increase about 1 ac-ft a decade from 14 ac-ft in 2010 to 17 ac-ft in 2040. Manufacturing increases about 3 ac-ft a decade from 15 ac-ft in 2010 to 24 ac-ft in 2040. The livestock water demands are projected to remain constant at 918 ac-ft. The constant demand implies no increase to the number or type of livestock in Caldwell County. A steady decrease is projected in irrigation from 1044 ac-ft in 2010 to 733 ac-ft in 2040. The decrease could signify a decrease in the acreage of crop land or crop type that requires less water application. The steam electric consumption is expected to remain zero as historical use has indicated.

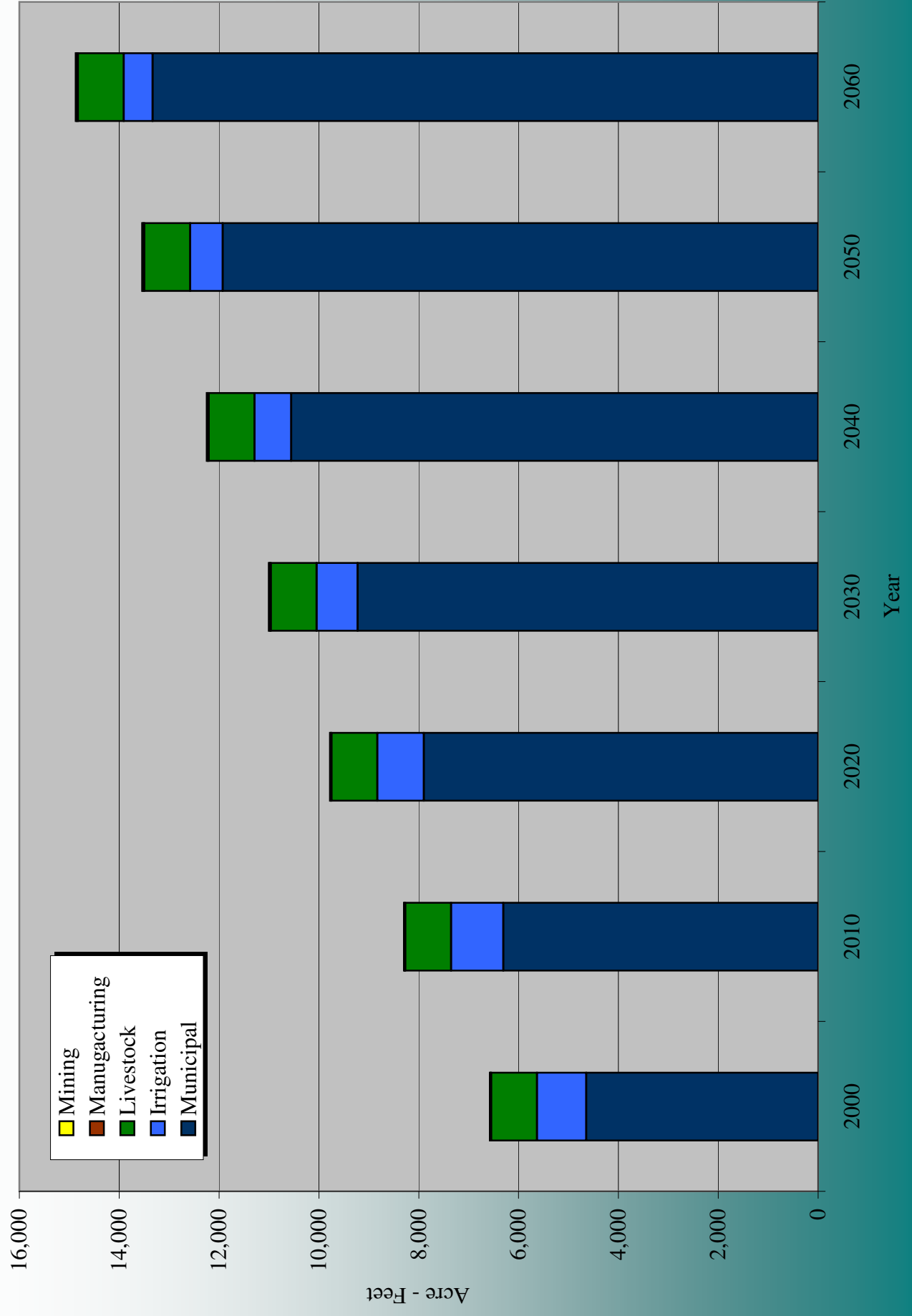
County Name	Category	2000	2010	2020	2030	2040	2050	2060
CALDWELL	Irrigation	989	1,044	928	824	733	651	578
CALDWELL	Livestock	918	918	918	918	918	918	918
CALDWELL	Manufacturing	11	15	18	21	24	27	29
CALDWELL	Mining	12	14	15	16	17	18	18
CALDWELL	Municipal	4,643	6,306	7,898	9,222	10,555	11,926	13,328
CALDWELL	Steam Electric	0	0	0	0	0	0	0
Total		6,573	8,297	9,777	11,001	12,247	13,540	14,871

Source: Texas Water Development Board

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

In addition to projecting water demands by use, the TWDB also determined county municipal water demands for each WUG in Caldwell County. The demands are shown in *Table 8-3*. According to the TWDB, the municipal water

Graph 8-2
Caldwell County Water Demands by Use Category



demands increase steadily with an amount no greater than 1,500 ac-ft for every decade after 2020. The demands are based on projections of their population estimates that were discussed in Section 6 of this report.

The water user groups presented by the TWDB were developed using the population projections for the WUG in Caldwell County. The population projection estimates up to the year 2060 have been included in **Table 8-4**. The water demand and population projections according to the TWDB were last updated September 17, 2004. The tables indicate a split in region or county when applicable. A “P” in the Region Split indicates that the WUG is located in more than one region. The values determined represent only the WUG population’s projections within that particular region. A “P” in the County Split column indicates the WUG is located in more than one county. The projections listed will be representative of the WUG’s population projections within Caldwell County only.

TABLE 8-3 Texas Water Development Board 2006 Regional Water Plan Municipal Water Demand Projections for 2000 - 2060 in acft¹⁾ for Cities, Utilities and County-Other by County and Region in Texas						
Water User Group	2010	2020	2030	2040	Region Split ²⁾	County Split ³⁾
Aqua WSC	267	339	396	458	P	P
County Line WSC	204	308	405	501		P
County-Other	237	223	199	176		
Creedmoor Maha WSC	234	304	367	431	P	P
Goforth WSC	184	269	342	417	P	P
Gonzales County WSC	63	79	94	108		P
Lockhart	2,451	3,094	3,629	4,180		
Luling	1,067	1,210	1,299	1,384		
Martindale	125	134	139	143		
Martindale WSC	142	153	158	162		P
Maxwell WSC	503	678	844	996		P
Mustang Ridge	135	178	215	253	P	P
Niederwald	26	43	61	78		P
Polonia WSC	668	886	1,074	1,268	P	P
Caldwell Total	6,306	7,898	9,222	10,555		

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

Water User Group	2010	2020	2030	2040	Region Split Pop. ²⁾	County Split Pop. ³⁾
Aqua WSC	1,782	2,313	2,764	3,217	P	P
County Line WSC	1,262	1,939	2,565	3,193		P
County-Other	1,229	1,172	1,066	968		
Creedmoor Maha WSC	2,217	3,015	3,717	4,423	P	P
Goforth WSC	1,770	2,636	3,429	4,226	P	P
Gonzales County WSC	215	277	329	381		P
Lockhart	16,328	21,083	25,111	29,154		
Luling	6,309	7,301	7,998	8,700		
Martindale	1,150	1,291	1,378	1,465		
Martindale WSC	1,307	1,468	1,566	1,666		P
Maxwell WSC	4,356	6,113	7,685	9,260		P
Mustang Ridge	555	746	911	1,077	P	P
Niederwald	203	349	489	629		P
Polonia WSC	7,275	10,019	12,451	14,891	P	P
Caldwell Total	45,958	59,722	71,459	83,250		

8.3 Development of Water Demands

Municipal water demands for the purpose of this study were based on information obtained from the TWDB, discussions with the Advisory Group and the State Demographer.

The TWDB population projections for each WUG in *Table 8-4* were further analyzed to determine percentages of the total population. The percentages calculated for each WUG, as shown in *Table 8-5*, indicated that Luling, Lockhart,

and Polonia were the greatest water users in the county and accounted for over 50% of the population. The TWDB percentages of the WUG were multiplied by the modified TSDC Scenario 1.0, shown in *Table 8-6*, to compare the growth estimates. The modification, as mentioned in Section 6, was to adjust the population projection in 2040 to 100,000. The product of *Table 8-5* and *Table 8-6* is given in *Table 8-7*.

Water User Group	2010	2020	2030	2040
Aqua WSC	0.039	0.039	0.039	0.039
County Line WSC	0.027	0.032	0.036	0.038
County - Other	0.027	0.020	0.015	0.012
Creedmoor Maha WSC	0.048	0.050	0.052	0.053
Goforth WSC	0.039	0.044	0.048	0.051
Gonzales County WSC	0.005	0.005	0.005	0.005
Lockhart	0.355	0.353	0.351	0.350
Luling	0.137	0.122	0.112	0.105
Martindale	0.025	0.022	0.019	0.018
Martindale WSC	0.028	0.025	0.022	0.020
Maxwell WSC	0.095	0.102	0.108	0.111
Mustang Ridge	0.012	0.012	0.013	0.013
Niederwald	0.004	0.006	0.007	0.008
Polonia WSC	0.158	0.168	0.174	0.179
Total	1.000	1.000	1.000	1.000

TSDC Scenario 1.0 Population	2010	2020	2030	*2040
<i>Projected Population</i>	46,308	65,057	86,902	100,000

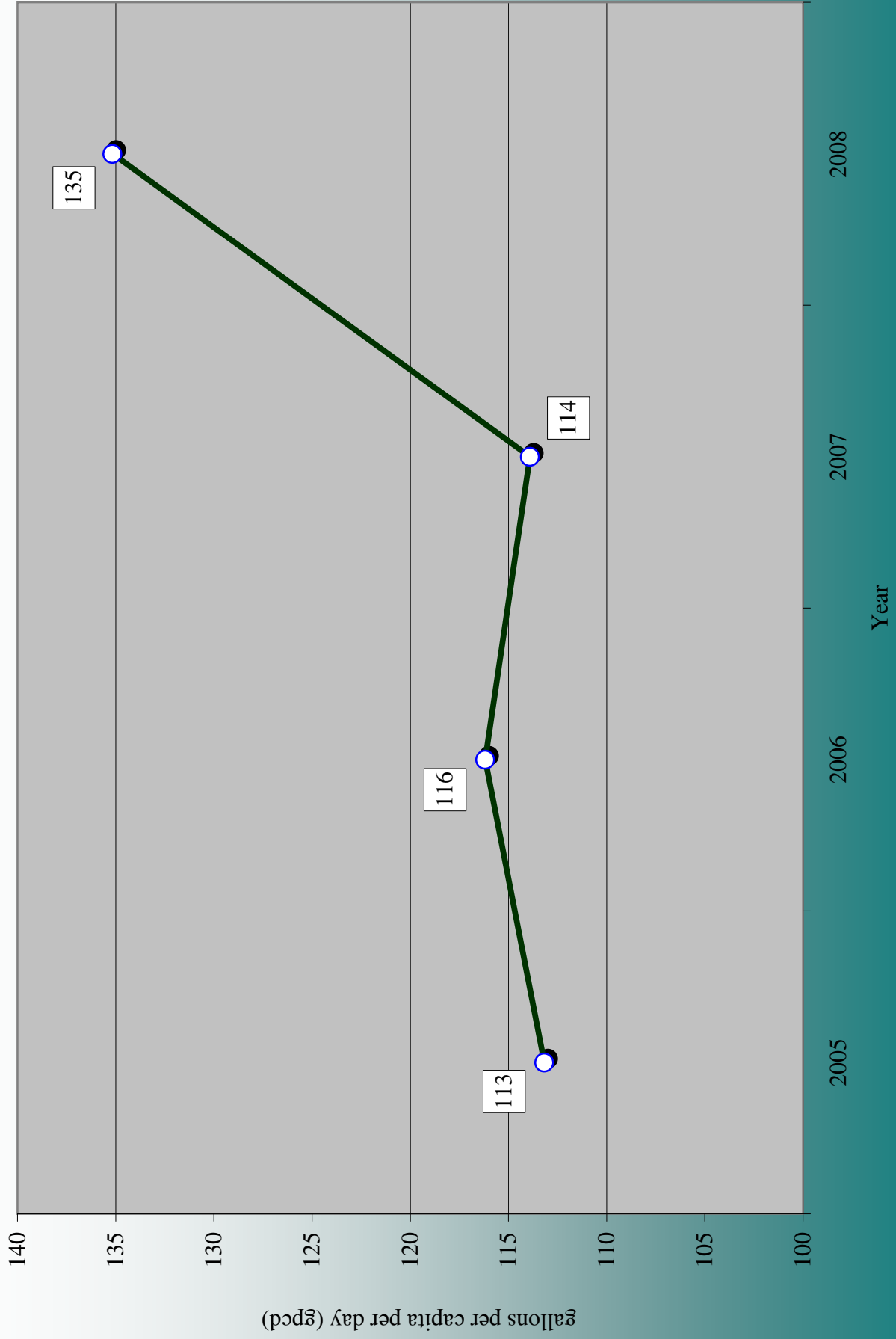
Table 8-7 provides a means to compare and examine the implications of the TSDC Population Scenario 1.0 with respect to population growth for each water user. Differences in WUG population range from 77-5866. The greatest difference is the population estimate for the Lockhart WUG.

In addition to calculating population projections for each WUG based on the TSDC Scenario 1.0, a per capita value was also determined to develop the water demands for this study. The per capita value has units of gallons per capita per day (gpcd). The value represents the average rate of water demand used per person per day for a given population within a distribution system. The per capita value will represent various types of uses.

Water User Group	2010	2020	2030	2040
Aqua WSC	1,796	2,520	3,361	3,864
County Line WSC	1,272	2,112	3,119	3,835
County - Other	1,238	1,277	1,296	1,163
Creedmoor Maha WSC	2,234	3,284	4,520	5,313
Goforth WSC	1,783	2,871	4,170	5,076
Gonzales County WSC	217	302	400	458
Lockhart	16,452	22,966	30,538	35,020
Luling	6,357	7,953	9,726	10,450
Martindale	1,159	1,406	1,676	1,760
Martindale WSC	1,317	1,599	1,904	2,001
Maxwell WSC	4,389	6,659	9,346	11,123
Mustang Ridge	559	813	1,108	1,294
Niederwald	205	380	595	756
Polonia WSC	7,330	10,914	15,142	17,887
Total	46,308	65,057	86,902	100,000

The water use and population data obtained from the surveys were factors in determining the per capita values for each utility. The per capita values determined from the surveys varied from about 84 gpcd in any one year to 160 gpcd. As shown in *Graph 8-3* the average water consumption per person has gradually increased since 2005. In 2005, the average for the utilities surveyed was 113 gpcd and increased in 2006 to 116 gpcd. There was a slight decrease in 2007 with an increase again 2008 to an average of 135 gpcd.

Graph 8-3
Caldwell County Survey Results of Per Capita Values



The compiled data was presented to the Technical Advisory Committee for a consensus on the daily per capita value to be used for the study. The Technical Advisory Committee, after discussion, agreed to proceed with a value of 150 gpcd to determine water demand projections for the county. The 150 gpcd rate was applied to the projected population figures to estimate average daily water demands. The estimated demands are shown in MGD and ac-ft respectively in *Table 8-8* and *Table 8-9*.

TABLE 8-8				
Municipal Average Daily Water Demands				
Million Gallons Per Day (MGD)				
Water User Group	2010	2020	2030	2040
Aqua WSC	0.269	0.378	0.504	0.580
County Line WSC	0.191	0.317	0.468	0.575
County - Other	0.186	0.192	0.194	0.174
Creedmoor Maha WSC	0.335	0.493	0.678	0.797
Goforth WSC	0.268	0.431	0.626	0.761
Gonzales County WSC	0.032	0.045	0.060	0.069
Lockhart	2.468	3.445	4.581	5.253
Luling	0.954	1.193	1.459	1.568
Martindale	0.174	0.211	0.251	0.264
Martindale WSC	0.198	0.240	0.286	0.300
Maxwell WSC	0.658	0.999	1.402	1.668
Mustang Ridge	0.084	0.122	0.166	0.194
Niederwald	0.031	0.057	0.089	0.113
Polonia WSC	1.100	1.637	2.271	2.683
Total	6.946	9.759	13.035	15.000

The municipal water demands based on population in Caldwell County are expected to increase from 7,781 ac-ft in 2010 to 16,803 ac-ft in 2040. These municipal water demands will need to be met through surface and groundwater resources. The demands can also be reduced through various conservation measures.

TABLE 8-9				
Municipal Average Water Demands				
Acre-Feet Per Year (Ac-ft/yr)				
Water User Group	2010	2020	2030	2040
Aqua WSC	302	423	565	649
County Line WSC	214	355	524	644
County - Other	208	215	218	195
Creedmoor Maha WSC	375	552	760	893
Goforth WSC	300	483	701	853
Gonzales County WSC	36	51	67	77
Lockhart	2,765	3,859	5,131	5,884
Luling	1,068	1,336	1,634	1,756
Martindale	195	236	282	296
Martindale WSC	221	269	320	336
Maxwell WSC	738	1,119	1,570	1,869
Mustang Ridge	94	137	186	217
Niederwald	34	64	100	127
Polonia WSC	1,232	1,834	2,544	3,006
Total	7,781	10,932	14,602	16,803

8.4 Conservation Measures

Conservation measures will be required from all WUG to reduce the expected water demands. A conservation measure of 10%, illustrated in *Graph 8-4*, will decrease expected water demands and is a recommended goal for all WUGs. Many water saving strategies to achieve this goal have been added in **Appendix H**. Several of the WUG have indicated that they are already implementing some conservation measures to reduce demands and will continue to develop new strategies. The strategies developed by the WUG are also discussed in the appendix.

**GRAPH 8-4
Caldwell County 10% Water Conservation**

