

Section 3: Population and Historical Water Demands

This Section provides a general overview of the water demand projections for the areas inside the Department's service area. In addition, Department's historical water uses in terms of per capita flow for different land use categories as well as characteristics of the system that account for that demand are also covered as part of this Section. Characteristics addressed include land uses, connection volume, customer type, population etc. Discussions of future anticipated water use and development of future demand projections are within the latter portions of this Section.

3.1 Census/SCAG Population Projections

Inherent in the conduct of long-range planning studies is the need to consider alternative futures. This need is based on the reality that growth can't be precisely predicted and demands for services such as water that are driven by individual behavior are uncertain. It is for this reason that the projections derived herein utilized the best available data to quantify population, but attempted to frame or bracket these findings for the above purposes. To further frame the discussion of long-range population and growth, the results of several of the Department's previous planning efforts have been consolidated. The resulting population projections are shown in Figure 3-1 and Table 3-1.

As shown, the findings presented herein are very comparable with all previous planning studies performed for the Department since 2005. Final direction on the appropriate level of population and demand forecasting conservatism was evaluated as part of this master planning effort. This direction, coupled with the Department's water conservation program and SBx7-7 compliance plan, constitutes the total water demand projection plan for the Department as shown in the Sections that follow.

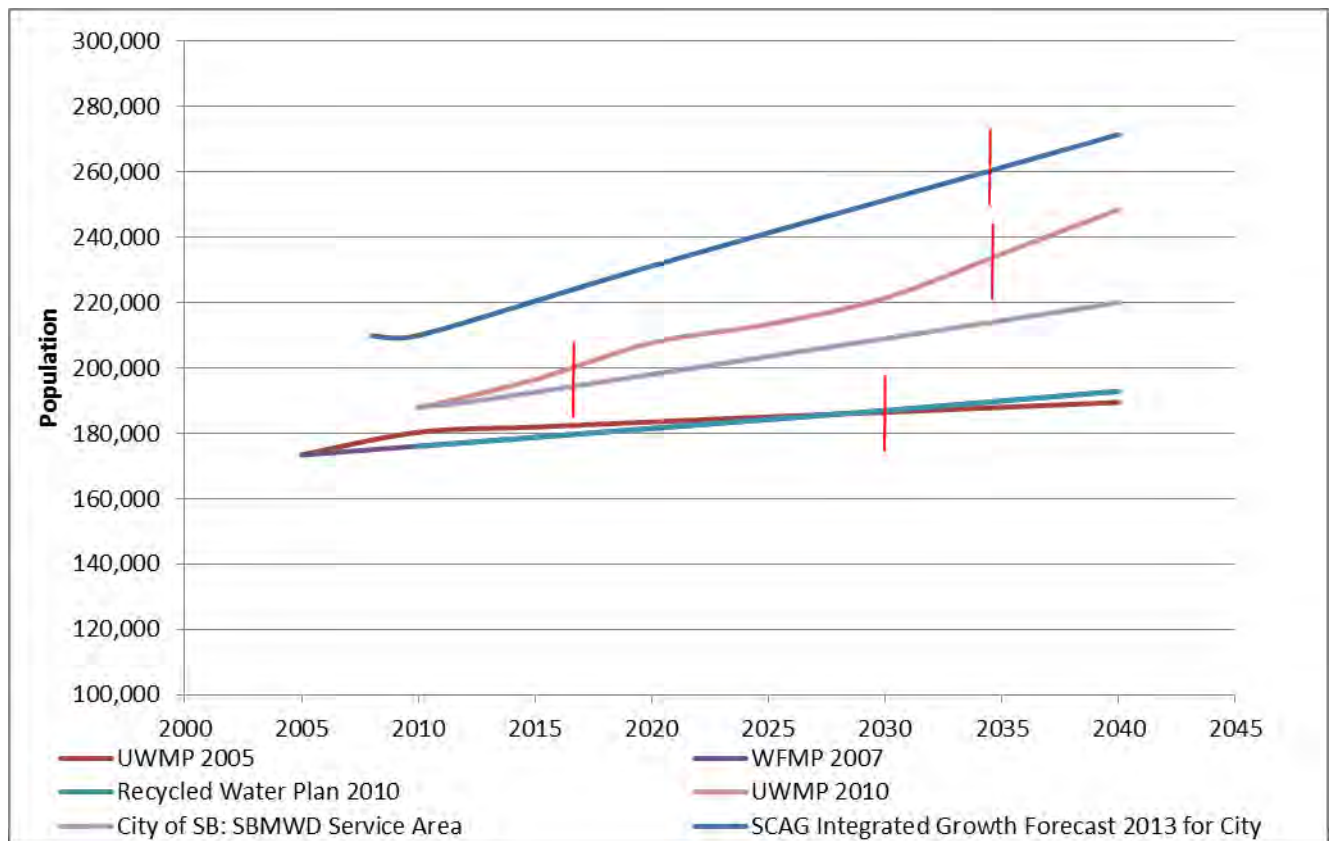


Figure 3-1: Comparison of SBMWD Population Projections

- (a) UWMP 2010 based on SCAG 2010
- (b) WFMP based on SCAG 2005
- (c) City of SB based on ESRI Population Projections
- (d) Integrated Growth forecast: SCAG 2013 for City of SB
- (e) Recycled Water Master Plan based on SCAG 2008
- (f) Values extrapolated until 2040. The red vertical lines show the extent of data available. The RHS are the extrapolated values.
- (g) Note that WFMP 2007 and Recycled Water Plan 2010 values are the same from 2010 onward in the above graph.

Table 3-1: Population Projections Based on Various Sources

	2005	2008	2010	2012	2015	2017	2020	2025	2030	2035*	2040*
UWMP 2005- City of San Bernardino	199,035	-	207,021	-	208,860	-	210,672	212,404	214,069	215,795	217,521
UWMP 2005- SBMWD (87% of City's)	173,359	-	180,315	-	181,917	-	183,495	185,004	186,454	187,957	189,461
WFMP 2007		-	-	-	-	-	-	-	187,000	189,943	192,886
Recycled Water Plan 2010	-	-	176,000	-	-	-	-	-	187,000	189,922	192,844
SCAG Integrated Growth Forecast 2013 for City	-	209,900	209,924	-	-	-	231,200	-	-	261,400	271,467
UWMP 2010	-	-	187,690	-	196,453	-	207,715	213,366	221,400	234,937	248,474
City of San Bernardino	-	-	209,033	210,492	-	216,416	-	-	-	238,343	244,433
Corresponding SBMWD (90% of City's)	-	-	188,130	189,443	-	194,774	-	-	-	214,508	219,990

“-”Values not available; *Values have been extrapolated using linear growth rate for datasets not extending to 2040.

3.2 Water Production

To address the adequacy of existing infrastructure and water supply, evaluation of current water demands and projections of future demands are necessary. These assessments are integral elements of future system planning and are necessary to evaluate the future water system facilities requirements. An analysis of the historical quantity of water produced is presented in Table 3-2 and the graphical representation is shown in Figure 3-2 below.

Table 3-2: Historical Water Production

Historical Water Production	
Calendar Year (CY)	Production (Acre-feet/Year)
2001	46,456
2002	48,504
2003	48,522
2004	50,223
2005	48,138
2006	57,392
2007	59,594
2008	57,238
2009	53,490
2010	47,822
2011	48,767
2012	48,757
2013	45,835

Source: SBMWD Water Production numbers

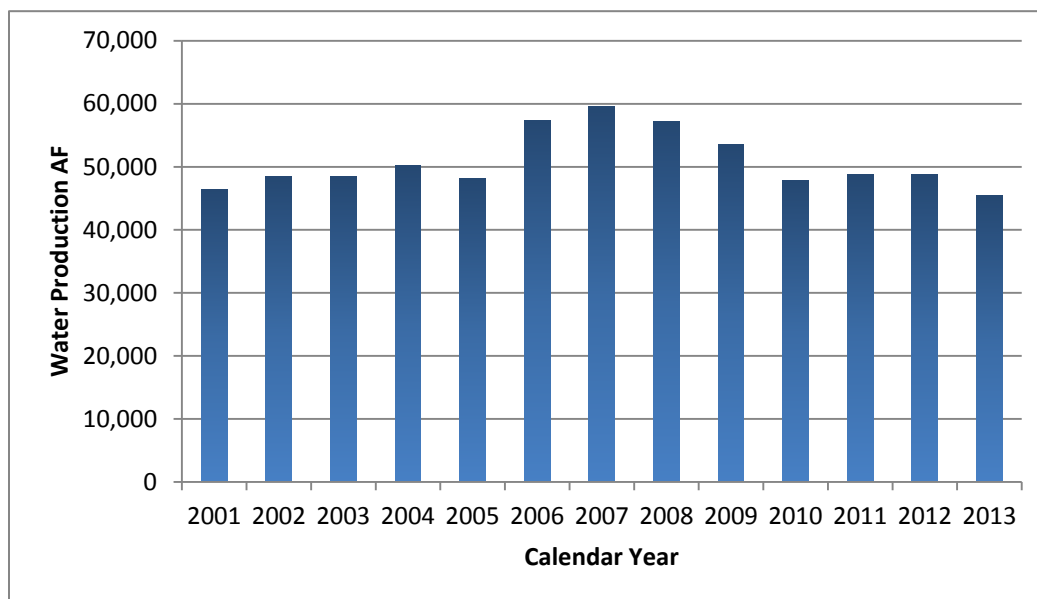


Figure 3-2: Annual Water Production 2001 to 2013

Source: SBMWD: DWR Annual Summary Reports, values are for Calendar Years.

As discussed in Sections 1 and 2 of the Master Plan report, groundwater is the main source of water supply for SBMWD. The Department has a total of 54 groundwater wells which supply

water to the distribution system. Most of the wells are located in the Bunker Hill groundwater basin. As shown in Table 3-2 and Figure 3-2, groundwater production has ranged from approximately 46,500 AFY in the early 2000's to a maximum of 59,600 during the dry periods of 2007. Following the downturn in the California economy, water demands declined to approximately 45,835 AFY in 2013.

Figure 3-3 shows the seasonal variation of well production for all Department wells for the year 2012. Water production is highest in the summer months due to increase in demands and ranges from 4,657 AF in May to a maximum value of 5,587 AF in August. During winter months well production decreases to an average of approximately 3,084 AF.

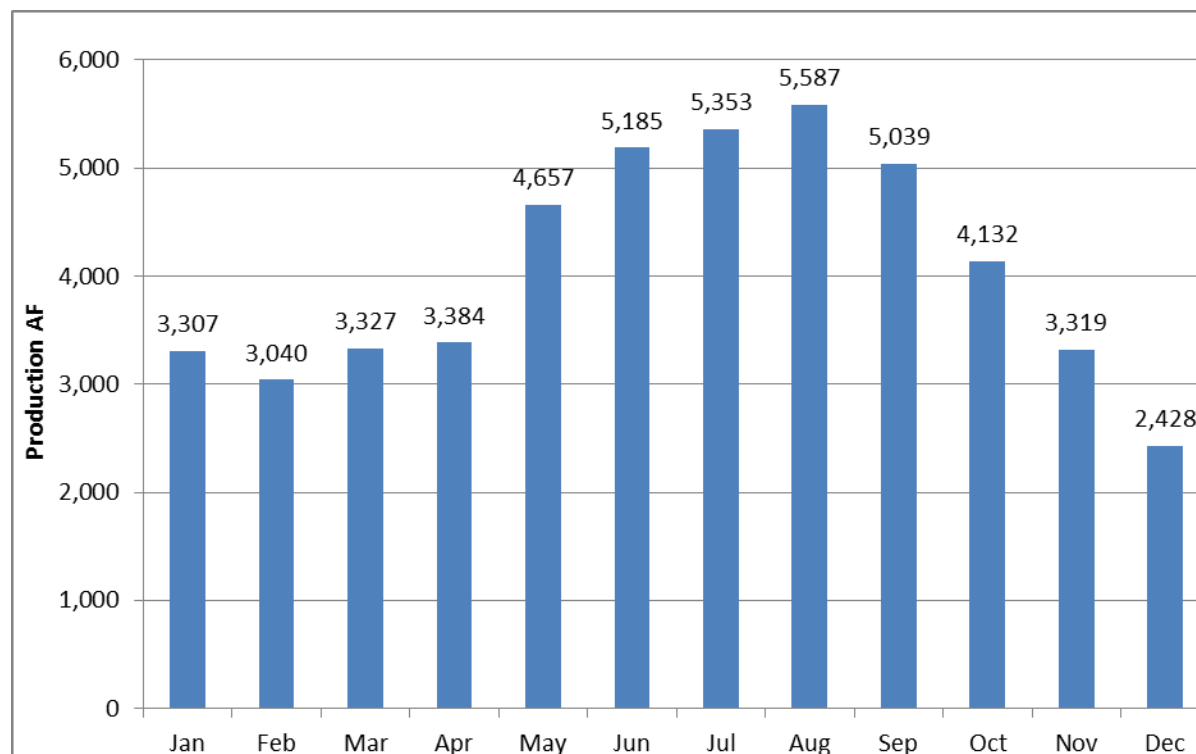


Figure 3-3: Total Monthly Well Production

Source: SBMWD Water Operations Data for Calendar Year (CY) 2012. Units are in AF.

3.3 Historical Water Demands

Water demands are metered potable water sales, and are always less than the amount of water produced or imported by a water utility. Since 2001, water use within the Department's service area has ranged from a low of 41,844, AF to as high as 55,135 AF as can be seen in Table 3-3. Water Demands include customer demands as well as water wholesale demands of other agencies being supplied by SBMWD. Typically the annual fluctuations are found to be primarily in response to weather conditions, economy, unemployment, etc. As shown, water demands increase during hotter, drier years because more water is needed for customer consumption and landscape irrigation, and demands are lower during cooler, wetter years when less irrigation is required.

Table 3-3: Historical Water Demands

Year	Water Demands (AF)
2001	43,566
2002	45,930
2003	44,397
2004	45,198
2005	44,384
2006	50,842
2007	55,135
2008	52,281
2009	49,725
2010	43,952
2011	45,694
2012	45,827
2013	41,844
Average	46,829

Source: SBMWD-DWR Annual Summary Reports. Includes wholesale water sales.

3.3.1 Water Demand Classification by Customer Type

As shown in Figure 3-4 and Table 3-4, the Department's single largest customer category and user class are single family residential customers. Single family homes account for nearly 51%. The Commercial/Industrial customer class accounted for the next largest portion of demand, accounting for 19%. Primary metered Multi-Family Residential, Landscape Irrigation and other customer classes accounted for the remaining demand categories. In the future these patterns of demand are expected to continue as single family residential and multifamily residential make up a large majority of the non-rural parcels in the Department's service area.

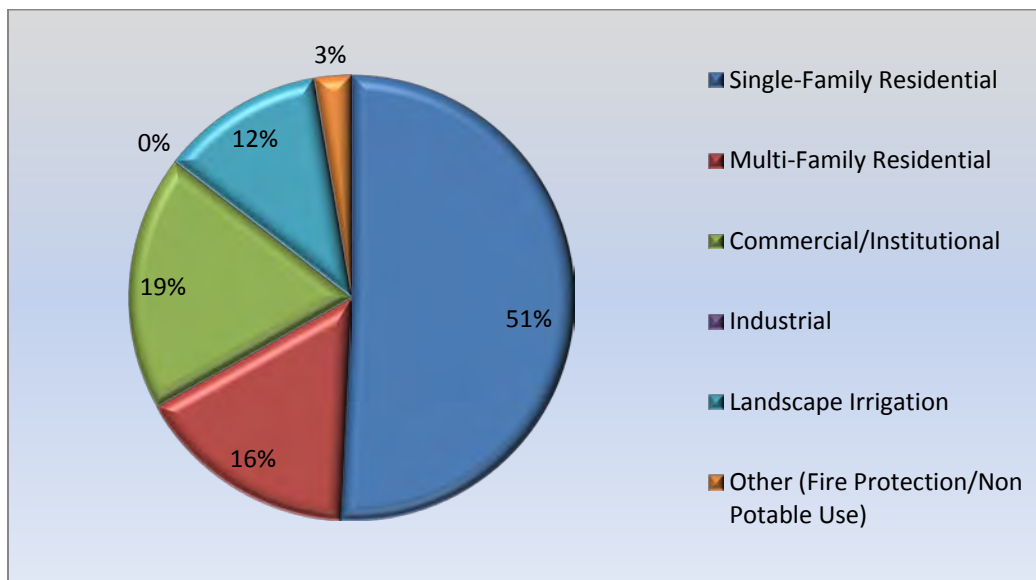


Figure 3-4: Water Demand by Customer Type

Table 3-4: Historical Water Demand by Customer Type (AF)

Customer Type	Demands (AF)													Average %
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	
Single Family Residential	20,962	23,000	22,613	23,318	22,621	24,285	24,209	22,722	21,698	19,849	19,502	20,719	20,316	51%
Multi-Family Residential	6,824	7,095	7,091	7,336	7,222	9,994	7,176	6,954	6,450	6,097	6,087	6,269	6,111	16%
Commercial/Institutional	6,689	8,481	8,156	8,510	8,500	8,599	9,149	8,056	7,143	6,652	7,932	8,574	8,168	19%
Industrial	0	0	0	0	0	0	0	0	0	0	0	0	0	0%
Landscape	5,377	4,492	4,620	4,474	4,479	5,194	5,267	5,563	5,432	5,666	4,858	5,540	5,423	12%
Other (Fire Protection/Non Potable Use)*	1,877	1,609	1,295	1,401	1,404	1,571	1,638	1,660	1,554	212	235	809	139	3%
Total*	41,729	44,678	43,775	45,039	44,226	49,643	47,439	44,954	42,277	38,475	38,615	41,912	40,157	100%

* Does not include reclaimed water, unaccountable water, and wholesale water demand.

3.3.2 Water Demand Classification by Number of Connections

The Department's 44,000 metered service connections serve a variety of different customer types, including residential, commercial, institutional, and landscape customers as shown in Table 3-5 and graphically in Figure 3-5. In Calendar Year (CY) 2012, 86 percent of the Department's total metered service connections were residential; 35,261 single family and 2,850 multi-family. Commercial and Institutional accounts made up about 11 percent of the total connections. Landscape irrigation and "other" accounts made up the remaining 3 percent of the customers.

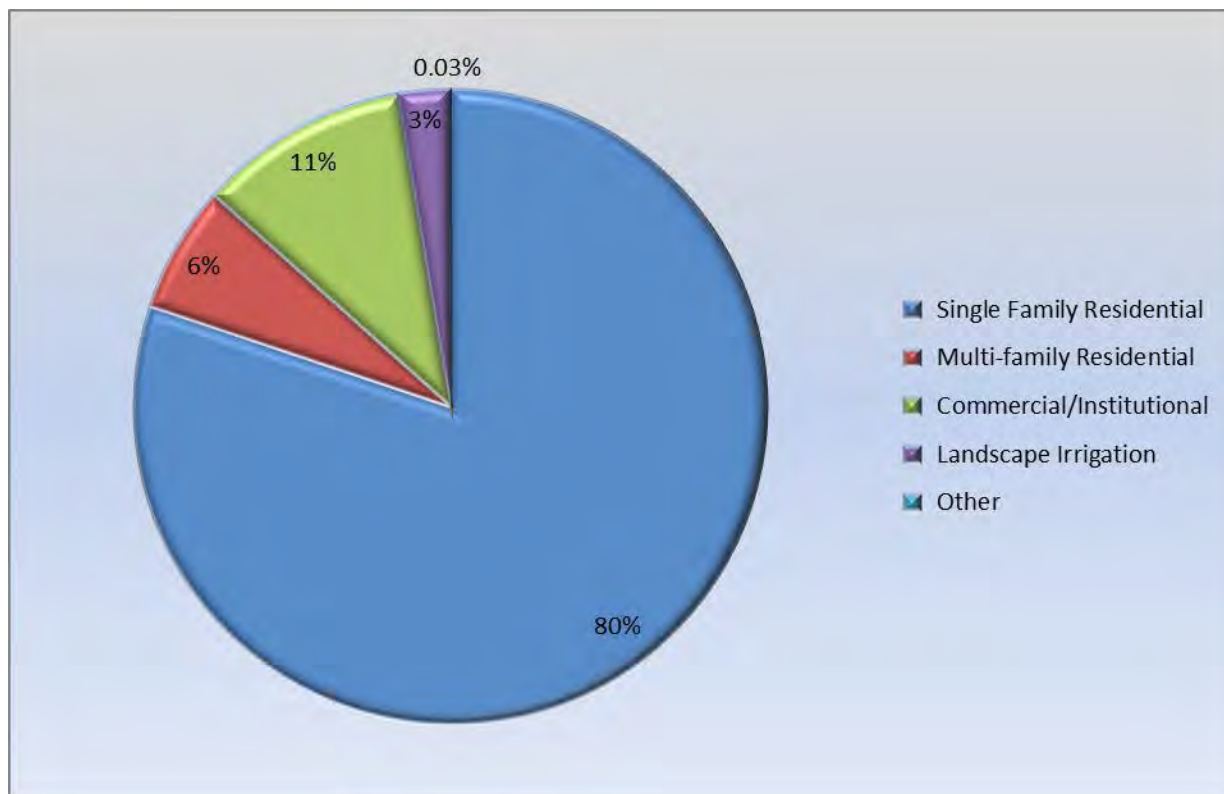


Figure 3-5: Number of Connections by Customer Type

As expected, the majority of the water use occurs within the residential sector. Typically, multi-family service connections serve multiple residences and therefore use more water per service connection. Figure 3-5 provides a graphical comparison of the percentage of service connections by major customer type.

Table 3-5: Summary of Number of Metered Connections by Customer Class

Customer Class	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Single Family Residential	34,123	33,610	33,745	34,389	34,697	35,853	35,360	35,172	35,077	34,886	35,085	35,261	35,491
Multi-family Residential	2,965	2,849	2,905	2,926	2,927	2,952	2,927	2,856	2,855	2,833	2,821	2,850	2,856
Commercial / Institutional	3,651	3,789	3,818	3,841	3,938	4,129	4,666	4,716	4,704	4,663	4,701	4,734	4,798
Landscape Irrigation	1,029	1,009	1,015	1,086	1,054	1,076	1,075	1,149	1,162	1,144	1,143	1,147	1,119
Other	130	64	93	112	112	121	11	11	11	13	13	12	12
Total	41,898	41,321	41,576	42,354	42,728	44,131	44,049	43,904	43,809	43,539	43,763	44,004	44,276

Source: SBMWD-HTE Data through CY 2013.

3.3.3 Non-Revenue Water

Unaccounted for water, also called non-revenue water is the difference between the amount of water that enters the Department's distribution system and the amount of water distributed to the Department's customers. Non-revenue water is water lost from the distribution system through a variety of ways, both authorized and unauthorized, including water for firefighting, pipe flushing, hydrant testing, leakage from pipelines, meter errors, and theft. Figure 3-6 provides a graphical perspective of the Department's historical non-revenue water trends.

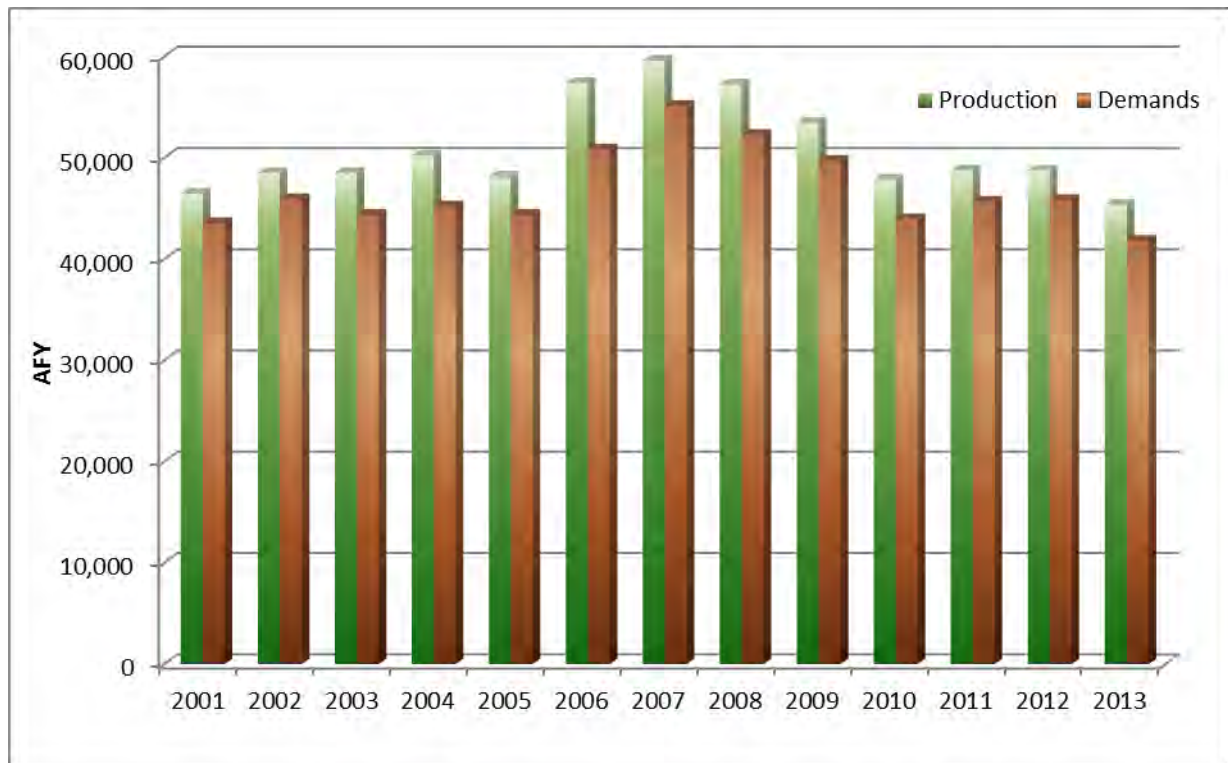


Figure 3-6: Historical Non-Revenue Water Trends

Table 3-6 shows the non-revenue water trend over the past decade as calculated from the Department's water production reports, customer billing data and water loss calculations from the Department's annual DWR reports. These DWR reports are included in Appendix A.

Table 3-6: Historic Production, Demand and Losses

Calendar Year	Water (AFY)		Non-Revenue Water (AFY)	Percent (%)
	Production	Demand (Sales)		
2001	46,456	43,566	2,890	6.22
2002	48,504	45,930	2,574	5.31
2003	48,522	44,397	4,125	8.50
2004	50,223	45,198	5,025	10.01
2005	48,138	44,384	3,754	7.80
2006	57,392	50,842	6,550	11.41
2007	59,594	55,135	4,459	7.48
2008	57,238	52,281	4,957	8.66
2009	53,490	49,725	3,765	7.04
2010	47,822	43,952	3,870	8.09
2011	48,767	45,694	3,073	6.30
2012	48,757	45,827	2,930	6.01
2013	45,835	41,844	3,545	7.81
Average				7.74

As shown, the percentage of water lost ranges from a low of 5.31 to as high as 11.41. Based on discussions with the Department, the running average of 7.74 percent non-revenue water is to be used as the basis of planning in this Master Plan report. This value will be incorporated in the future water demand projections derived in Section 4.