FINAL

SARASOTA COUNTY
"Dedicated to Quality Service"

Water Supply Master Plan Update

Technical Memorandum 1 - Water Demand Projections

June 2005

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SARASOTA COUNTY
"Dedicated to Quality Service"

WATER SUPPLY MASTER PLAN UPDATE

TECHNICAL MEMORANDUM 1

WATER DEMAND PROJECTIONS

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1.0   INTRODUCTION

Sarasota County (County) completed a Water Supply Master Plan (WSMP) in 2001. The purpose of that document was to address the County's water supply needs through 2030 as part of their comprehensive water supply planning efforts. The report outlined future water demand projections as well as current water supplies for the County. In addition, it described and evaluated several potential new ground and surface water sources, storage technologies and options, and associated costs.

Carollo Engineers was selected to work with the County to review, update, and expand the 2001 WSMP. The primary goal of the WSMP Update (WSMPU) is to document the County's existing system and its performance to provide a basis for the continuation of sustainable water supply development throughout Sarasota County.

Since the 2001 WSMP, the role of a regional planning group, the Water Planning Alliance (Alliance), has emerged as a player in the future of Southwest Florida's future water supply. The Alliance is a voluntary planning body comprised of the following entities: Charlotte, DeSoto, Manatee, and Sarasota Counties; the Cities of Arcadia, Bradenton, North Port, Palmetto, Punta Gorda, Sarasota, and Venice; the Town of Longboat Key; and the Englewood Water District. The Alliance's main goal it to identify long-term water supply projects for its members on a regional, four-county-wide basis. The regional perspective of water supply and demand will be considered in the WSMPU.

The major objectives of the WSMPU as developed by the County are to:

- Compile future demand projections for Sarasota County and all Alliance members.

- Prepare an inventory of all existing County water facilities, including water treatment plants, tanks, reservoirs, wellfields, pump stations, and major transmission lines.

- Identify and document specific problems in the system, water supply weaknesses, and planned future capital improvement projects through interviews with County personnel, including water treatment plant supervisors, maintenance managers, and other pertinent staff.

- Identify evaluation criteria for preliminary assessment of potential water supply projects.

- Screen potential projects according to these criteria and work with County staff to identify the ten most promising water supply projects.

- Investigate and document the feasibility and advantages and disadvantages of the selected projects.

- Develop a 10-year Capital Improvements Program (CIP) to best satisfy the County's future water supply needs.

The WSMPU will be comprised of five technical memoranda (TMs) and a final, comprehensive graphics-oriented executive summary. Two workshops also will be conducted to review results of selected tasks of the project: *Workshop 1 - Demand, Assets, and Water Supply Projects* and *Workshop 2 - 2050 Water Supply Scenarios*.

This document, Technical Memorandum 1 - Water Demand Projections (TM1), outlines the updated demand projections for the County and summarizes the demand projections for all Alliance members. Several water demand projection methodologies were utilized to project the future County average daily demands and peak month demands through the year 2050. Similar to the 2001 WSMP, a population-based demand projection was selected for future planning consideration for the other TMs, while the other demand projection methodologies were used for comparison and verification purposes.

1.1 WATER DEMAND PROJECTION METHODOLOGIES

Although several water demand projection methodologies exist, similar methodologies to those utilized in the 2001 WSMP were used in the calculation of the updated demand projections. The methodologies utilized as part of this WSMPU were based on population projections, housing growth trends, and historical water production. Various data was gathered to complete water demand projections using each methodology through the years 2030 or 2050, depending on the methodology. The following sections summarize the manner in which each type of demand projection was calculated.

1.1.1 Bureau of Economic and Business Research Population Demand Projections

Population-based demand projections were calculated using population projections provided by the Sarasota County Planning and Development Services Business Center (PDSBC) multiplied by a chosen gallon per capita per day (gpcd) demand factor. The PDSBC utilizes United States Census and Bureau of Economic and Business Research (BEBR) population projections for the County to develop population projections for the unincorporated portion of the County, part of which is the area served by the Sarasota County Utilities water system.

The demand factors utilized for population-based demand projections were based on the recent average water consumption in the County. Although the per capita demand factor was approximately 90 gpcd in 2000 (based on actual production and estimated County water service population), a demand factor of 100 gpcd was chosen for future planning considerations in order to maintain a conservative estimate. This demand projection methodology assumes that water consumption patterns, such as the ratio of residential to commercial users, water loss percentage, and residential water use habits, will remain relatively constant through 2050.

1.1.2 Housing Growth Trends Demand Projections

Although utilizing BEBR population projections for computing demand projections is a favorable methodology, it has some limitations. Therefore, the PDSBC considered recent housing growth trends (1992 through 2002) to determine the recent housing growth rate in the County. This information, in combination with past Census data of average number of persons per household, was used to determine another type of population projection based on recent trends. The population, calculated based on the projected number of future residential housing units, was multiplied by a demand factor of 100 gpcd to provide the second category of water demand projection. The demand projections based on housing growth trends were selected for future planning considerations because the data was well researched and this trend is considered to represent the most accurate measure of growth in the County at this time.

1.1.3 Historical Production Demand Projections

County Utilities annual average daily water production from 1997 to 2004 was extrapolated through 2050 using a linear regression methodology to produce another demand projection for comparison purposes. Although this method is based on actual data, it is not considered as accurate as the housing growth trends demand projection methodology due to the limited data set on which the projections were made. Demand projections based on this methodology are provided for comparison purposes only.

1.2 POPULATION PROJECTIONS

County population projections are calculated by the PDSBC using two types of information: BEBR data and recent housing growth trends. Each method was utilized to develop population projections for the unincorporated area of the County. Further adjustments to these population projections were then applied to determine the population of residents residing within the County potable water system service area. The population projection methods utilized for determining population-based water demand projections are described in the following sections.

1.2.1 BEBR Population Projections

The BEBR provides three levels of population projections: low-, medium-, and high-range. The medium-range population projections are believed to provide the most accurate forecast of future growth. The high- and low-range population projections indicate the uncertainty in the medium-range set of projections due to population forecast error. The most recent BEBR medium- and high-range population projections, published in February 2005, were used in this analysis. The high-range population projections were considered for comparative purposes, as medium-range population projections have underestimated population growth in Sarasota County in the past. The BEBR data published in February 2005 projected County population growth through 2030.

The PDSBC also estimates the portion of County residents that reside within the unincorporated areas of the County, part of which are served by the County Utilities potable water system. The PDSBC assumes that the population of the unincorporated area of the County is approximately 68% of the total County population. This ratio was based on the historical ratio of population residing within the unincorporated areas of the County. The medium- and high-range BEBR County population projections and unincorporated area population projections through 2030 are shown in Table 1.1.

It should be noted that the PDSBC develops two types of population projections - the functional population and the residential population. The residential population refers only to the number of full-time County residents, while the functional population includes seasonal residents and assumes all housing units are occupied. The residential population is considered the most representative average population, and therefore is used by the BEBR in determining population projections. As stated in Section 1.2.2, the seasonal population is considered when determining the total housing forecast for the County. Therefore, the functional population is utilized in determining the future housing forecast, and an adjustment is made to determine the residential population based on the future housing forecast. Peak month factors are used to account for the influence of seasonal demands due to seasonal population and other factors.

Table 1.1   Sarasota County BEBR Population Projections

Year	BEBR Medium-Range		BEBR High-Range	
	County Population Projection[1]	Unincorporated Area Population Projection[2]	County Population Projection[1]	Unincorporated Area Population Projection[2]
2005	365,000	248,200	379,600	258,128
2010	398,400	270,912	430,900	293,012
2015	428,900	291,652	483,300	328,644
2020	459,100	312,188	538,000	365,840
2025	488,000	331,840	594,600	404,328
2030	515,100	350,268	652,500	443,700

Notes: [1] Based on February 2005 BEBR population projections.
[2] The unincorporated area was assumed to comprise 68% of the County population.

1.2.2   Housing Development Trends Population Projections

The PDSBC has identified four major limitations to the BEBR-based population projections:

- Projections to 2050 are not available.

- City and sub-County area population projections are not available.

- Projections of the number of seasonal residents are not available.

- Demand for housing, as reflected in residential building construction data trends, may be higher than the BEBR medium-range projections indicate.

In addressing these limitations, the PDSBC created a second methodology to project population growth in the County. This method is based on historical trends in housing growth and development. Both methods were utilized and presented in the County's 2050 Comprehensive Plan Amendment and were updated for the 2004 Evaluation and Appraisal Report (EAR).

The PDSBC collected information from various sources to estimate the number of residential dwelling units in the unincorporated area expected to be built each year. Information was gathered from building permit data, the Sarasota County Property Appraiser, and the 2000 Census. Data indicated that from 1991 to 2000, building permits authorized the construction of an average of 2,404 units per year in the unincorporated area of the County. Property Appraiser's data indicated that an average of 2,136 new

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dwelling units were actually constructed each year in the unincorporated area. Census information reported an increase of 21,965 dwelling units from 1990 to 2000 in the unincorporated area, translating into an average of 2,197 new dwelling units per year during the 10-year period.

Therefore, an estimate of 2,200 units per year was selected for housing forecast projections for the 2050 Comprehensive Plan Amendment. This information was revised for the 2004 EAR update by analyzing data from 1992 to 2002 in the same fashion. Based on this data, an average of 2,341 dwelling units were constructed each year in the unincorporated area during the 10-year period. Therefore, the housing forecast used for determining demand projections was calculated by adding 2,341 dwelling units per year to the number of existing housing units in 2003.

The projected number of dwelling units in the unincorporated area was converted to a residential population projection based on several adjustment factors. The PDSBC provided this information to Carollo to develop a second set of population projections on which to base future water demand projections. The steps taken to determine residential population based on housing demand forecast are as follows:

1. In 2003, approximately 129,000 residential dwelling units existed in the unincorporated area of the County. To determine the future housing forecast, 2,341 dwelling units were added to the existing number of units per year.

2. The future housing demand considers the entire functional population; therefore, an adjustment was made to establish the residential population. Determining the residential population is desirable in order to be comparable with the BEBR population projections. The PDSBC analyzed 1990 and 2000 Census housing occupancy data to determine the fraction of housing that is occupied. This value was calculated by dividing the number of total housing units by the number of occupied housing units. Based on this analysis, a housing occupancy multiplier of 1.2 was established for the unincorporated area of the County. This multiplier is expected to remain constant in future planning years, but can be adjusted if future data indicates a change in the percent of occupied housing units. Consequently, the projected housing forecast for the unincorporated area was divided by a factor of 1.2 to determine the number of occupied housing units.

3. The resident population based on the number of occupied housing units was calculated. The PDSBC utilized 2000 Census data to establish the average number of persons per household in the unincorporated area of the County. Census data indicated 2.15 persons per household; therefore, the total number of occupied housing units was multiplied by a factor of 2.15 to determine the resident population.

The calculations utilized to determine the projected residential population based on housing growth trends are shown in Table 1.2. Similar to the BEBR-based projections, the resulting population projections for the unincorporated area of the County were then adjusted to determine the population of residents served by the County potable water system in the manner described in Section 1.2.3.

Table 1.2	Sarasota County Housing Growth Trends Population Projections		
Year	Unincorporated Area Housing Units Forecast (2,341 units/yr)	Adjusted by Housing Occupancy Factor (1.2 total/occupied)	Unincorporated Residential Population (2.15 person/household)
2005	133,682	111,402	239,514
2010	145,387	121,156	260,485
2015	157,092	130,910	281,457
2020	168,797	140,664	302,428
2025	180,502	150,418	323,399
2030	192,207	160,173	344,371
2035	203,912	169,927	365,342
2040	215,617	179,681	386,314
2045	227,322	189,435	407,285
2050	239,027	199,189	428,257

1.2.3   Sarasota County Water System Population Projections

Only areas within the unincorporated portion of Sarasota County are served by the County potable water utility. In addition, some residents in the unincorporated area of the County utilize individual well systems. To develop population projections for residents within the County water utility service area, a formula to account for incorporated and self-served areas was developed. The residents in the County water service area include all unincorporated areas of the County west of the Myakka River except for the area served by the Englewood Water District (EWD). The area east of the Myakka River is expected to be served by the City of North Port in the future. The Cities of Sarasota, Venice, and North Port have their own supplies and transmission systems and are not provided water by the County. A schematic of the water service areas within the County, as well as the incorporated areas, are shown in Figure 1.1.

Water Utilities Service Areas

CITY OF SARASOTA

FRUITVILLE RD

PHILLIPPI CREEK

BEE RIDGE RD

SARASOTA COUNTY UTILITIES

CLARK RD

SR-72

I-75

MYAKKA RIVER

SELF-SERVED UNINCORPORATED COUNTY AREA

TAMIAMI TR

SR-681

CITY OF VENICE

SARASOTA COUNTY UTILITIES

I-75

CITY OF NORTH PORT

ENGLEWOOD WATER DISTRICT

CITY OF NORTH PORT

NORTH

FIGURE 1.1

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Both PDSBC population projections (based on BEBR data and housing growth trends) were altered to account for the above conditions. The adjustments to attain population projections for residents served by the County potable water system were performed as follows:

1. The unincorporated population was reduced to account for the area served by the EWD. According to the PDSBC, approximately 7 percent of the residents in the unincorporated area of the County reside within the boundaries of the EWD.

2. A number of County residents rely on self-supplied water sources, usually individual wells, for their water supply. The County estimates that 14,000 Equivalent Dwelling Units (EDUs) are currently served by private wells. Based on the population density factor of 1.81 people per EDU, a population of 25,340 people was reduced from the County's service population each year.

3. The last adjustment to the County water service population was to account for some self-supplied water residents converting to the public water supply in the future. The County has estimated that approximately 200 EDUs will convert to the County system per year throughout the planning period of the Master Plan Update. Utilizing the same 1.81 population density factor, 362 people were added to the County's service area population per year. Including these probable new customers in the population projections provides a conservative estimate of future demands for the County's water service area.

The calculations for the housing growth trends population projections for the County water service area are shown in Table 1.3. The BEBR high- and medium-range population projections for the water service area were calculated in the same manner. Figure 1.2 illustrates a graphical representation of the projected BEBR medium- and high-range and housing growth trends County water service area populations.

Sarasota County Utilities Water Service Area
Population Projections

FIGURE 1.2

Water Service Area Population

450,000

400,000

350,000

300,000

250,000

200,000

150,000

2000 2005 2010 2015 2020 2025 2030 2035 2040 2045 2050

Year

Legend:
- ■ BEBR High
- ◆ BEBR Medium
- ▲ Housing Growth Trends
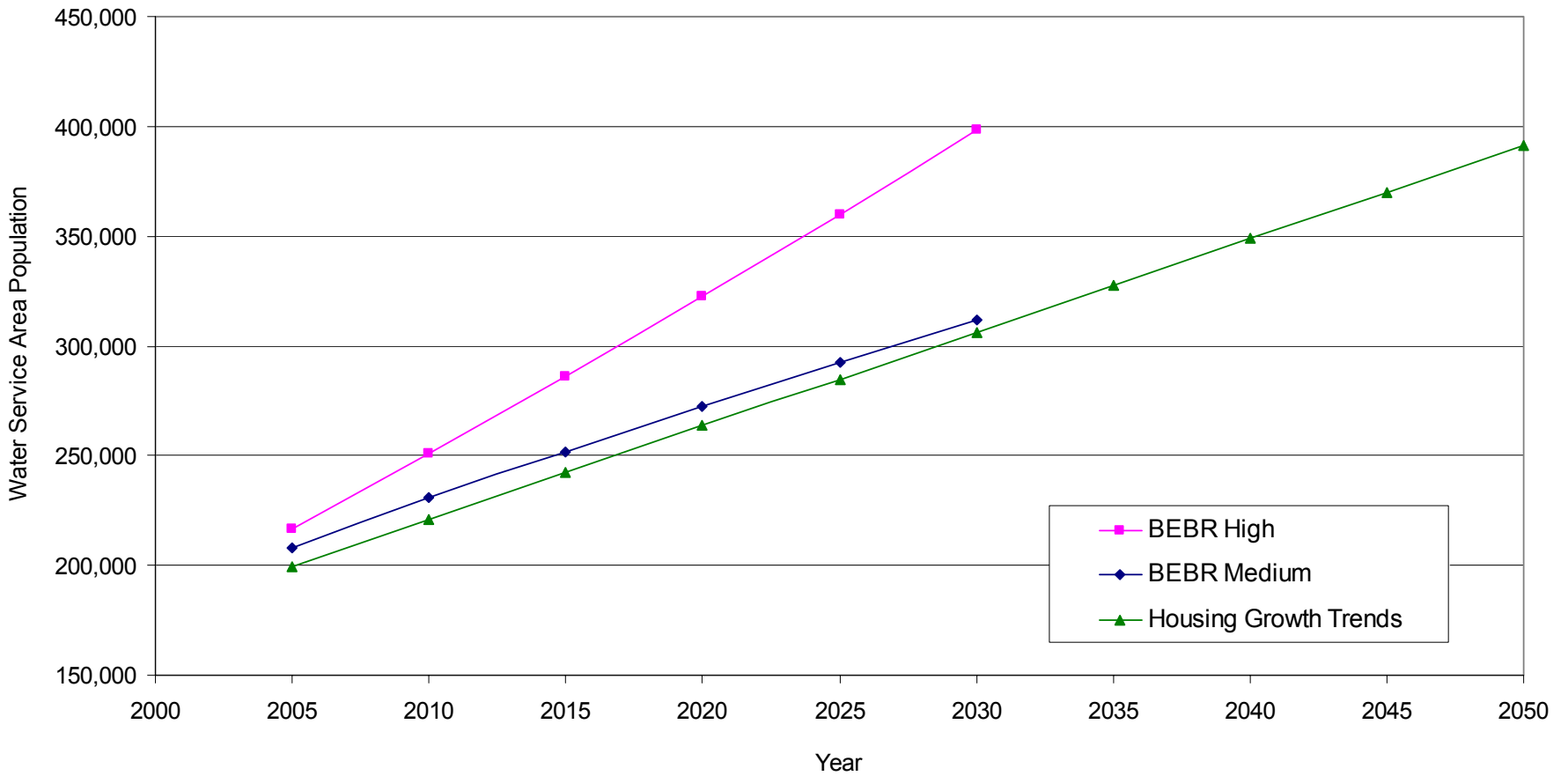
Notes: BEBR values based on February 2005 data.

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Table 1.3   County Water System Projected Population - Housing Growth Trends

Year	Unincorporated Area Population Projection	Population in EWD (-)	Population Using Private Wells (-)	Cumulative Population Converting from Private Wells (+)	Total Service Population
2005	239,514	16,766	25,340	2,172	199,580
2010	260,485	18,234	25,340	3,982	220,893
2015	281,457	19,702	25,340	5,792	242,207
2020	302,428	21,170	25,340	7,602	263,520
2025	323,399	22,638	25,340	9,412	284,833
2030	344,371	24,106	25,340	11,222	306,147
2035	365,342	25,574	25,340	13,032	327,460
2040	386,314	27,042	25,340	14,842	348,774
2045	407,285	28,510	25,340	16,652	370,087
2050	428,257	29,978	25,340	18,462	391,401

1.3   WATER DEMAND PROJECTIONS

Annual average daily demand and peak month demands were developed through 2030 or 2050, depending on the projection methodology. The population-based demand projections were considered the most thorough and accurate method. The average daily demand can be expected to increase to approximately 30.6 million gallons per day (mgd) by 2030 based on housing growth trends population projections.

1.3.1   Annual Average Day Demand Projections

Average daily demand projections determine the demand on an annual average basis. The annual projections are useful in determining general contract quantities and for future planning of new sources and treatment systems. The average daily demand projections were determined using the methodologies discussed in Section 1.1. The results of each analysis are outlined in the following sections.

1.3.1.1   BEBR Population Annual Average Demand Projections

Average daily demand projections were developed by applying various demand factors to the population projections developed in Section 1.2.1. According to the data received in this project, the per capita demand factor was approximately 91 gpcd in 2000 (determined based on actual production and estimated County water service area population). This

factor accounts for water use by commercial and industrial users, as well as for lost and unaccounted for water. Therefore, it was assumed that the County water system provides approximately 90 gpcd to its customers on average. However, a demand factor of 100 gpcd was used to project the future demands for the County to provide conservative estimates. In addition, a series of demand factors ranging from 80 gpcd to 120 gpcd were used to determine the range of potential water demands in the future. Table 1.4 summarizes the projected annual average daily demands for the County through 2030 using demand factors of 80, 90, 100, 110, and 120 gpcd on the BEBR medium-range population projections. Using the conservative demand factor of 100 gpcd, the annual average daily demand can be expected to increase to 27.3 mgd and 31.2 mgd by 2020 and 2030, respectively, according to this projection methodology.

Table 1.4	Annual Average Day Demand Projections - BEBR Medium					
Year	Water Service Population Projection	80 gpcd Demand (mgd)	90 gpcd Demand (mgd)	100 gpcd Demand[1] (mgd)	110 gpcd Demand (mgd)	120 gpcd Demand (mgd)
2005	205,219	16.61	18.69	20.77	22.84	24.92
2010	255,704	18.45	20.75	23.06	25.36	27.67
2015	245,947	20.14	22.65	25.17	27.69	30.20
2020	265,877	21.81	24.53	27.26	29.99	32.71
2025	284,957	23.41	26.34	29.27	32.20	35.12
2030	302,551	24.93	28.05	31.16	34.28	37.40
Notes: [1] 100 gpcd demands were selected for comparison with other demand projection methodologies.						

1.3.1.2 *Housing Growth Trends Annual Average Demand Projections*

Demand factors were applied to the water service area population projections developed based on the housing growth trends in a manner similar to the BEBR demand projections. The same demand factors (80, 90, 100, 110, and 120 gpcd) were applied to the growth trends population projections, and the 100 gpcd demand factor was chosen for comparison with the other demand projection methodologies. The water demand projections developed based on housing growth trends are listed in Table 1.5 and are shown graphically in Figure 1.3. Utilizing a demand factor of 100 gpcd, the average daily water demand can be expected to increase to 30.6 mgd and 39.1 mgd by 2030 and 2050, respectively, according to this projection methodology.

Annual Average Day Demand Projections Based on Housing Growth Trends

Water Demand (mgd) vs. Year

Legend:
- 120 gpcd Demand
- 110 gpcd Demand
- 100 gpcd Demand
- 90 gpcd Demand
- 80 gpcd Demand

FIGURE 1.3

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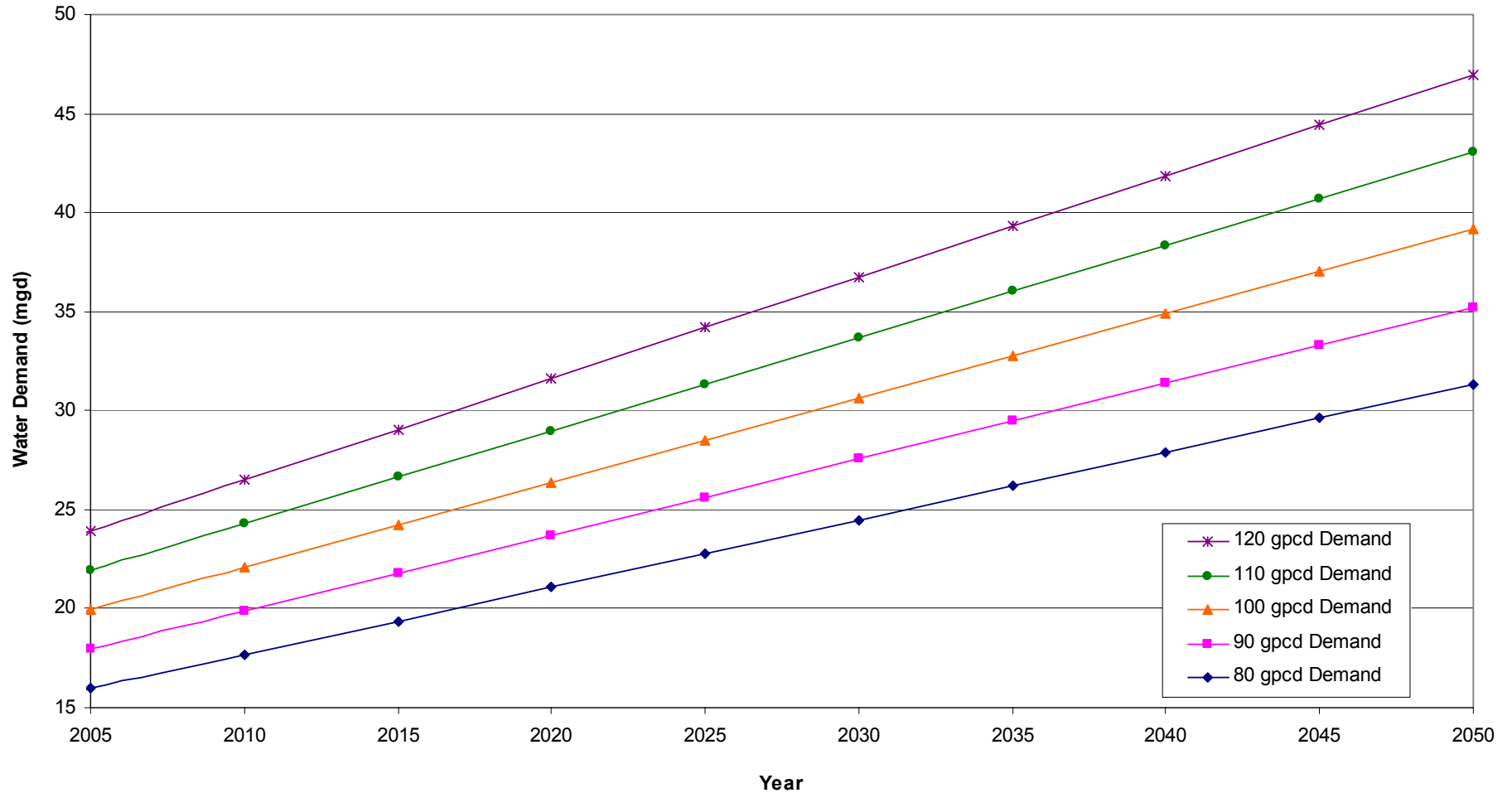
Table 1.5	Annual Average Day Demand Projections - Housing Growth Trends					
Year	Water Service Population Projection	80 gpcd Demand (mgd)	90 gpcd Demand (mgd)	100 gpcd Demand[1] (mgd)	110 gpcd Demand (mgd)	120 gpcd Demand (mgd)
2005	199,580	15.97	17.96	19.96	21.95	23.95
2010	220,893	17.67	19.88	22.09	24.30	26.51
2015	242,207	19.38	21.80	24.22	26.64	29.06
2020	263,520	21.08	23.72	26.35	28.99	31.62
2025	284,833	22.79	25.64	28.48	31.33	34.18
2030	306,147	24.49	27.55	30.61	33.68	36.74
2035	327,460	26.20	29.47	32.75	36.02	39.30
2040	348,774	27.90	31.39	34.88	38.37	41.85
2045	370,087	29.61	33.31	37.01	40.71	44.41
2050	391,401	31.31	35.23	39.14	43.05	46.97

Notes: [1] 100 gpcd demands were selected for future planning considerations.

1.3.1.3 Historical Production Annual Average Demand Projections

Historical average annual daily production since 1997 was used in the historical production water demand projections. Average annual production from 1997 to 2004 is listed in Table 1.6. This data was used in a linear regression analysis to determine projected future demands. Although this projection method can be used in some instances of long-term steady growth rates, it is not deemed as accurate in areas of rapid growth because this type of growth does not follow a linear pattern. Additionally, data prior to 1997 was not available for this analysis, and the limited data set reduces the accuracy of the linear regression prediction. The projected demands based on the linear regression analysis are shown in Table 1.6. Due to the limited data set, these demand projections are used for comparative purposes only.

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Table 1.6	Annual Average Day Demand Projections - Historical Production	
Year	**Historical Water Production**	**Projected Demand**
1997	15.22	
1998	15.42	
1999	16.14	
2000	17.06	
2001	17.28	
2002	17.49	
2003	18.30	
2004	19.34	
2005		19.5
2010		22.3
2015		25.2
2020		28.0
2025		30.9
2030		33.7
2035		36.5
2040		39.3
2045		42.2
2050		45.0

1.3.1.4 Comparison of Annual Average Day Demand Projection Methodologies

A comparison of the demand projection methodologies was used to determine the variability in the methods. These values were also compared with the demand projections prepared for the 2003 Water Planning Alliance *Regional System Planning and Engineering Study, Assessment of Existing Supplies Study Memorandum*.

A comparison of each demand projection is summarized in Table 1.7. For projections requiring a per capita demand factor, 100 gpcd was used. A graphical representation of each method is also shown in Figure 1.4. The housing growth trends demand projections were chosen for future planning consideration and will be used in the other TMs developed as part of this Water Supply Master Plan Update.

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It should be noted that Sarasota County staff members have held discussions to consider a wholesale agreement to the City of North Port and/or the Englewood Water District in the future. A wholesale agreement would increase the County's demand accordingly. The wholesale quantities have not been finalized; however, the sale to the EWD likely would provide 1.5 mgd for the portion of Thomas Ranch residing in the EWD service area.

Table 1.7	Comparison of Demand Projections Based on Various Methodologies				
Year	Medium-Range BEBR Population[1]	High-Range BEBR Population[1]	Housing Growth Trends Popultion[1]	Historical Production	Alliance Report (2001 WSMP)
2005	20.8	21.67	20.0	19.5	20.3
2010	23.1	25.1	22.1	22.4	22.0
2015	25.2	28.6	24.2	25.2	23.7
2020	27.3	32.3	26.4	28.0	25.4
2025	29.3	36.0	28.5	30.9	27.1
2030	31.2	39.9	30.6	33.7	28.6
2035	-	-	32.8	36.5	30.1
2040	-	-	34.9	39.3	31.6
2045	-	-	37.0	42.2	33.0
2050	-	-	39.1	45.0	34.3
Notes: [1] Calculated using a demand factor of 100 gpcd.					

Annual Average Day Demand Projection Methodology Comparison

Demand (mgd)

Year

Legend:
- BEBR High, 100 gpcd
- Historical Production
- BEBR Medium, 100 gpcd
- Housing Growth Trends, 100 gpcd
- Alliance Report (2001 Master Plan)
- Historical Water Production
- Linear (Historical Water Production)

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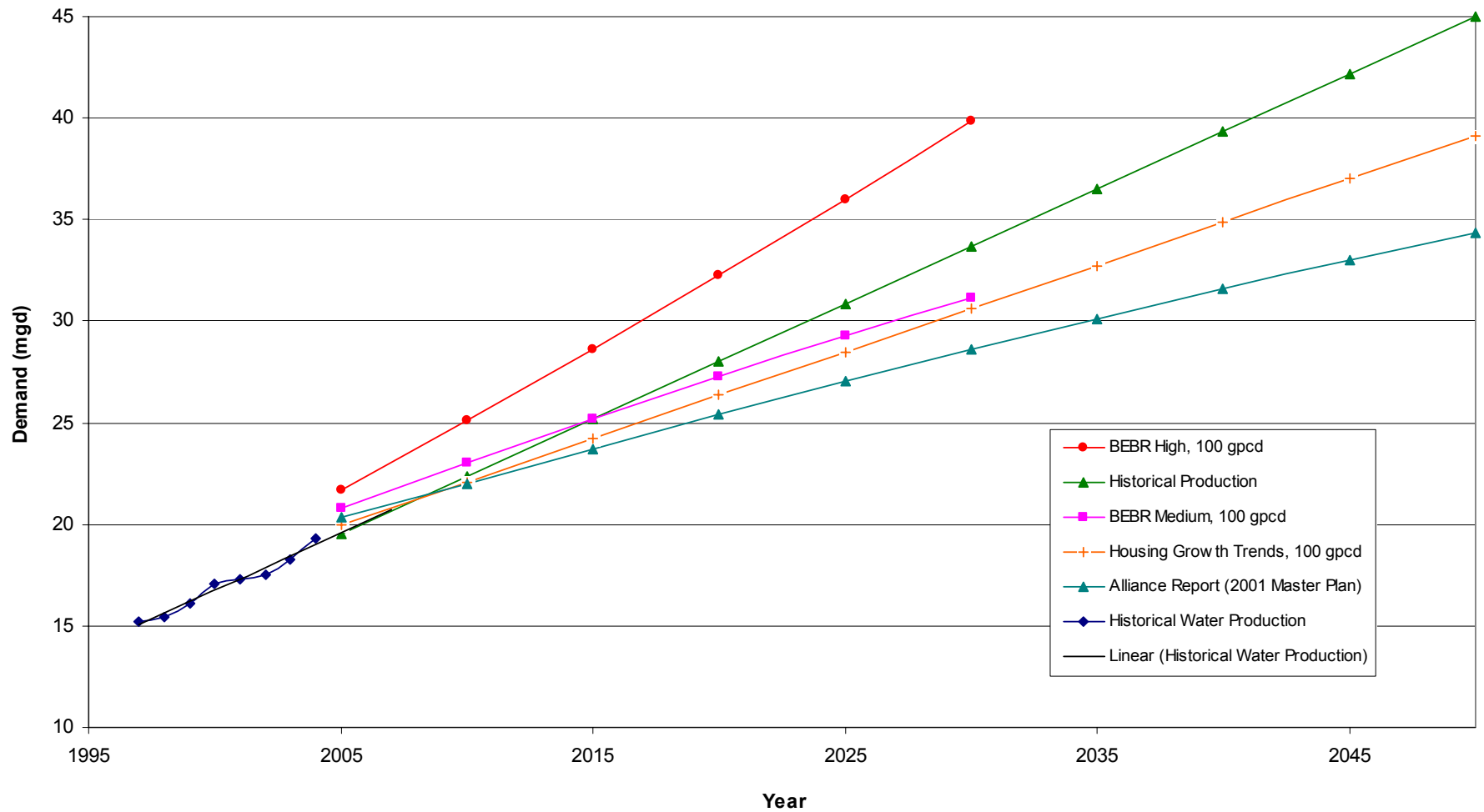
FIGURE 1.4

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1.3.2   Peak Month Demand Projections

Historical production water quantity data since 1997 was compiled to determine the average monthly peaking factors for peak month demand projections. The peak month demand is defined as the average daily demand during the highest demand month throughout a year. Figure 1.5 illustrates the average monthly peaking factors from 1997 to 2004. In 3 of the past 5 years, the highest average water demand has occurred in March. Additionally, the highest monthly peaking factor since 1997 occurred in March of that year at 1.19. The average maximum month peaking factor from 1997 to 2002 was 1.13. The monthly peaking factor met or exceeded 1.1 on twelve occasions since 1997. A peaking factor of 1.2 was chosen as a conservative estimate for determining peak monthly demands.

The monthly peaking factor developed from this analysis was applied to the BEBR medium-range and housing growth trends average daily demand projections to determine the peak month demands through 2030 and 2050, respectively. The resulting peak month demand projections are shown in Table 1.8 and Figure 1.6. Because the housing growth trends demand projections were selected for future planning scenarios, peak month demands were not calculated for the historical production demand projections.

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Average Monthly Peaking Factors (1997-2004)

FIGURE 1.5

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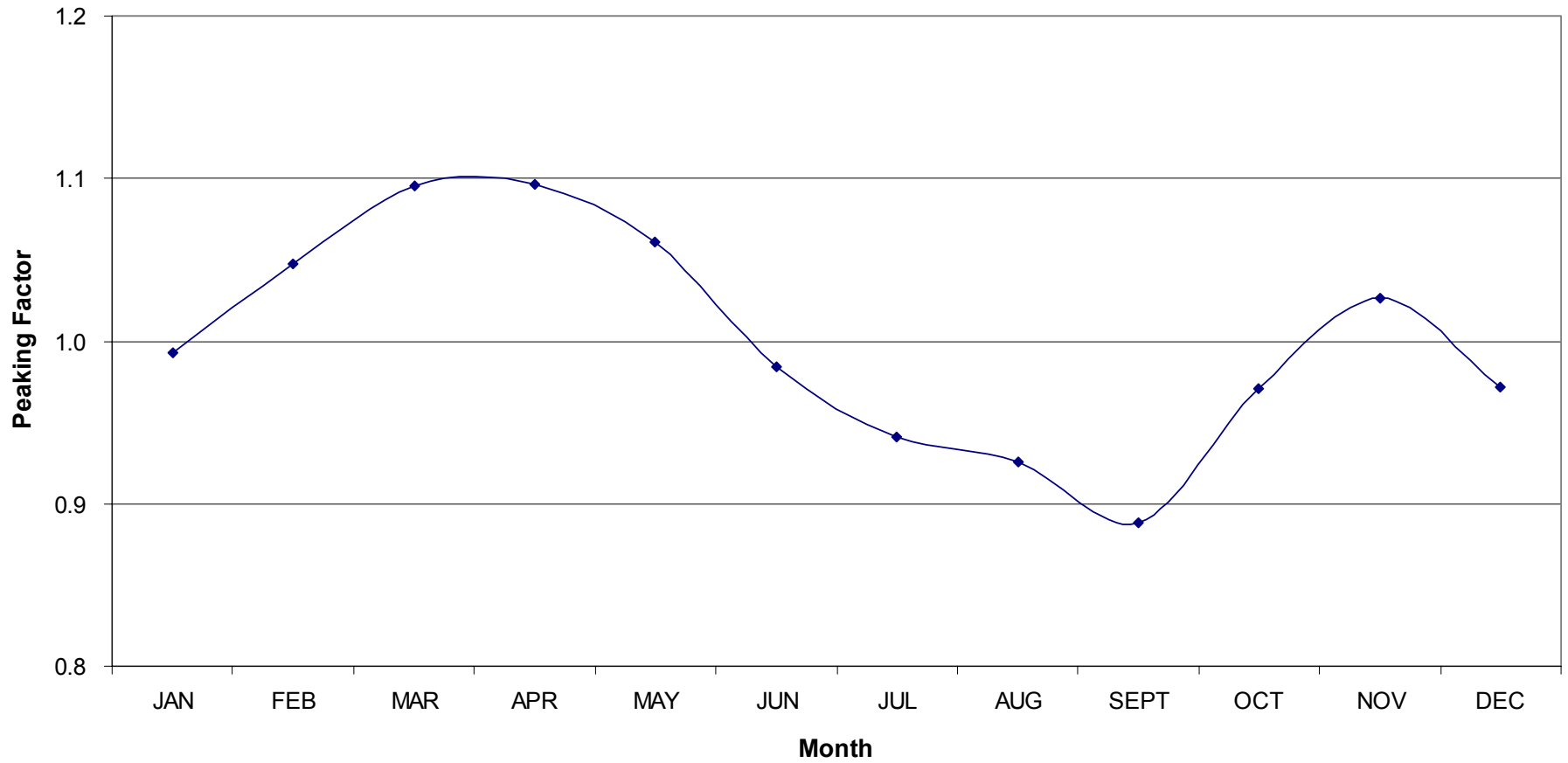
Table 1.8 County Water System Peak Month Demand Projections

Year	BEBR-Medium		Housing Growth Trends[1]	
	Annual Average Daily Demand (mgd)	Peak Month Demand (mgd)	Annual Average Daily Demand (mgd)	Peak Month Demand (mgd)
2005	20.8	24.9	20.0	24.0
2010	23.1	27.7	22.1	26.5
2015	25.2	30.2	24.2	29.1
2020	27.3	32.7	26.4	31.6
2025	29.3	35.1	28.5	34.2
2030	31.2	37.4	30.6	36.7
2035	-	-	32.8	39.3
2040	-	-	34.9	41.9
2045	-	-	37.0	44.4
2050	-	-	39.1	47.0

Notes: [1] Housing growth trends demand projections were chosen for future planning scenarios.

1.3.3 Peak Day Demand Projections

The historical water production data also was used to determine the maximum day peak demand factor. From 1997 to 2004, the maximum day peaking factor ranged from 1.24 to 1.49. Although peak day factors can be useful to determine potential peak day demands, they are not considered essential for planning, as the storage in the distribution system usually minimizes the impact of these demands.

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Average Annual Day and Peak Month Demand Projections

Demand (mgd) vs **Year**

Legend:
- Peak Month-BEBR Medium
- Peak Month-Housing Growth Trends
- Average Day-BEBR Medium
- Average Day-Housing Growth Trends
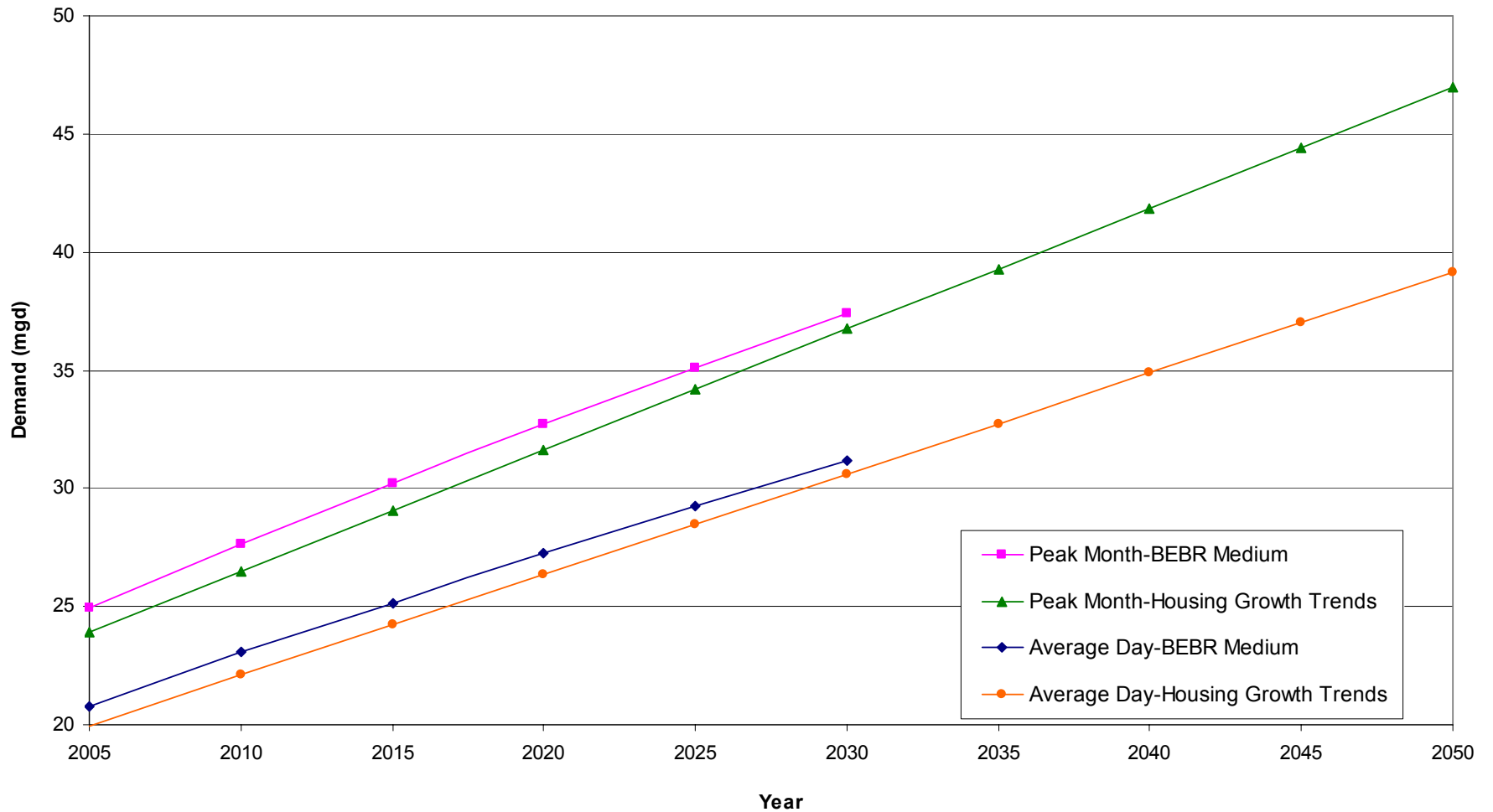
Note: Demand projections based on housing growth trends were chosen for future planning considerations. Demands calculated based on 100 gpcd and a 1.2 peak month factor.

FIGURE 1.6

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1.4   ALLIANCE MEMBER AND REGIONAL DEMANDS

As part of this project, the demands of all members of the Alliance were compiled and evaluated in order to estimate the total regional demand. The projections listed in Table 1.9 are the most recent demand projections provided by the Alliance's *Phase II Water Supply and Demand Study* in December of 2004. This table lists projected demands of each member, including the newly projected Sarasota County demands.

Table 1.9   Alliance Member Annual Average Daily Water Demands[1]

	2005	2010	2015	2020	2025
Charlotte County	10.5	12.9	16.0	19.4	23.4
DeSoto County	1.5	2.5	3.4	4.4	5.3
Manatee County	30.9	35.7	40.4	44.8	49.1
Sarasota County[2]	20.0	22.1	24.2	26.4	28.5
City of Arcadia	1.0	1.0	1.0	1.0	1.0
City of Bradenton	6.4	6.7	6.9	7.1	7.2
City of North Port	2.3	6.3	9.0	11.7	14.3
City of Palmetto	1.3	1.4	1.5	1.6	1.7
City of Punta Gorda	4.4	5.1	5.9	6.9	7.9
City of Sarasota	7.1	7.2	7.3	7.3	7.3
City of Venice	2.7	2.8	2.9	3.0	3.1
Town of Longboat Key	2.4	2.4	2.4	2.4	2.4
Englewood Water District	2.5	2.6	2.7	3.0	3.3
Regional Total	**93.0**	**108.7**	**123.6**	**139.0**	**154.5**

Notes: [1] Provided by the Water Planning Alliance *Phase II Supply and Demand Study*, December 2004.
[2] Sarasota County demands based on the new projections developed in TM1.

It should be noted that demand projections provided by the individual utilities to the Alliance were not all for the same planning period. Under these circumstances, data was linearly interpolated and/or extrapolated to determine the projected water demand for the years 2005, 2010, 2015, 2020, and 2025.

As mentioned in Section 1.3.1.4, Sarasota County staff members have held discussions to consider a wholesale agreement to the City of North Port and/or the Englewood Water

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District in the future. A wholesale agreement would increase the County's demand accordingly. The wholesale quantities have not been finalized; however, the sale to the EWD likely would provide 1.5 mgd for the portion of Thomas Ranch residing in the EWD's service area.

1.4.1   SWFWMD Regional Water Supply Plan

In August 2001, the Southwest Florida Water Management District (SWFWMD) published the *Regional Water Supply Plan*. This document was developed to assess the projected regional water demands and potential supply projects to meet demands through the year 2020. It should be noted that Florida State Statutes required SWFWMD to use BEBR medium-range population projections, with seasonal adjustment factors where necessary, to calculate the demand projections published in this document. The 1995 BEBR data was used as the base year for all projections. Considering the changing status of growth within the region and the fact that the report is four years old and was based on population projections that are ten years old, the water demand projections available in this document will be used for comparative purposes only.

A few differences in the water demand projection methodologies exist between the SWFWMD report and the methods used for the WSMPU and the Alliance Report.

- In some cases, the SWFWMD report utilized higher gpcd demand factors for its public supply category than the 100 gpcd demand factor chosen for the WSMPU in many cases. In the SWFWMD report, the per capita usage rate was determined individually for each utility based on historical data.

- The SWFWMD report factored treatment losses into their per capita rates to reflect total demand on the water supply. In other words, the rates in the SWFWMD report reflect water use from the point of withdrawal, which includes treatment losses.

- The SWFWMD report was developed based on countywide demands for the counties within the region, rather than individual utility service areas. Therefore, the demands provided in the SWFWMD report cannot be directly compared with the demands developed in the WSMPU, which developed demands for the Sarasota County water service area only. Thus, the demands for the Alliance members located within Sarasota County were tabulated and compared with SWFWMD public water supply demand projections for Sarasota County. The Alliance members located in Sarasota County include Sarasota County, the City of Sarasota, the City of North Port, the City of Venice, and the Englewood Water District.

Table 1.10 compares the projected water demands through 2020 for all utilities within Sarasota County based on the SWFWMD report and the most recent Alliance demand projections. A large amount of the discrepancy between the two projections can be attributed to the reasons described above, and primarily to the fact that the SWFWMD

projections included treatment losses in calculating their per capita rate factors. Although the percent difference between the two projections is approximately 26 percent in 2005, the percent difference decreases to only 9 percent in 2020.

Table 1.10 Comparison with 2001 SWFWMD Demand Projections				
	2005	**2010**	**2015**	**2020**
Sarasota County	20.0	22.1	24.2	26.4
City of Sarasota	7.1	7.2	7.3	7.3
City of North Port	2.3	6.3	9.0	11.7
City of Venice	2.7	2.8	2.9	3.0
Englewood Water District	2.5	2.6	2.7	3.0
Alliance County-Wide Total	**34.6**	**41.0**	**46.1**	**51.4**
SWFWMD Report - Sarasota County	**46.8**	**50.1**	**53.2**	**56.5**
Percent Difference	*26%*	*18%*	*13%*	*9%*

ADDENDUM

TO

Technical Memorandum No. 1 - Water Demand Projections

Sarasota County

November 4, 2005

Based on discussions with County staff in October 2005, the water demand projections presented in Technical Memorandum No. 1 - Water Demand Projections were modified due to recent permit and zoning changes. The housing growth demand projection methodology will still be used for remaining master planning activities; however, the number of housing units added per year was increased from 2,341 units per year to 3,000 units per year. This resulted in an increase in water demand of approximately 5 mgd in 2050. The updated demand projections that will be used for remaining master planning activities are as follows:

Year	Annual Average Daily Demand (mgd)	Peak Month Demand (mgd)
2010	23.2	27.9
2015	25.9	31.1
2020	28.6	34.3
2025	31.3	37.5
2030	34.0	40.7
2035	36.6	44.0
2040	39.3	47.2
2045	42.0	50.4
2050	44.7	53.6

Comparison of Sarasota County Average Daily Demand Projections

Note: October 2005 demand projection