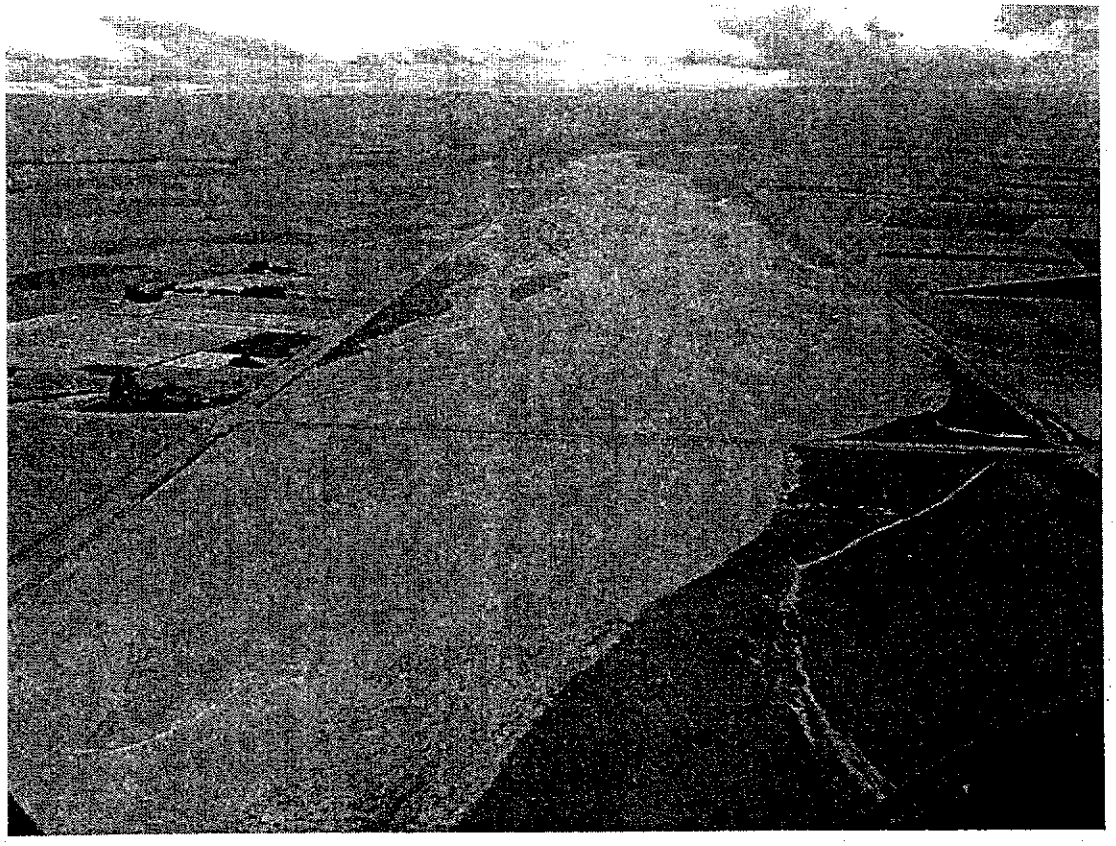

Santa Barbara County Water Supply and Demand Update

February 2003

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CSB #9

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I. Introduction and Purpose

The Santa Barbara County Water Agency (SBCWA) was established by the state legislature in 1945 to control and conserve storm, flood and other surface waters for beneficial use and to enter into contracts for water supply. In order to fulfill these obligations, the SBCWA investigates and provides regular reports on the county's water requirements, the water needs of projected development and the efficient use of water. The Santa Barbara County Water Supply and Demand 2002 Update Report is a continuation of these efforts and updates the information provided in *Santa Barbara County Growth Inducement Potential of State Water Importation* prepared by Ahlroth and Cosby, 1991.

Additionally, the information provided in this report has been incorporated into the County's strategic planning process. Each year, the County of Santa Barbara reviews selected conditions that define Santa Barbara County's social, cultural, economic, and physical characteristics that affect the County Government's programs and projects. The Strategic Scan includes information on population trends, land use, economic development and jobs, education, and health care and social services. For the first time, the 2002 report contained information regarding water supplies within the county and an estimate of how well those supplies will meet expected population growth as documented by this report.

The information provided may be used to consider general regional trends in water supply and demand projections through the year 2040. However, it should be noted that both demand and supply vary from year to year due to changes in weather patterns, water conservation practices, changes in land use, agricultural cropping patterns, and a wide variety of other factors. Therefore, this is a general assessment of water supply and demand and it should be reevaluated as factors change.

The focus of this report is regional water supply and demand trends rather than the water supply balance for individual water purveyors or groundwater basins. The groundwater supply data is aggregated for the Designated Analysis Units (DAUs) as defined by the California Department of Water Resources (DWR). Each DAU is watershed based and encompasses one or more rivers and their tributaries, and one or more groundwater basins. Within Santa Barbara County, there are 5 DAUs: the Santa Maria (DAU 71), the San Antonio (DAU 73), the Santa Ynez (DAU 74), the South Coast (DAU 75), and the Cuyama Valley (DAU 76). The boundary of each DAU considered is entirely within Santa Barbara County. For the purposes of this report, the safe yields for groundwater are not disaggregated by groundwater basin, but are summarized by each DAU (Table 6), so the water supply balance summarized in Table 8 is an overall assessment for all supplies and demands within a DAU. It should be noted that the groundwater supply for each water district within the DAU may come from more than one groundwater basin or subbasin.

Since this is a long-term assessment, the water supply and demand analysis contained in this report considers total average annual water supply and demand by DAU, but does not consider additional water production capacity that might be needed to meet peak day demand or improve water quality. Furthermore, the water quantity available from each source is evaluated for this report on an average annual basis. This simplification is useful for long-term water planning, but it does not consider the year-to-year water availability variations that occur due to droughts, system shutdowns for maintenance and similar events. Water supply planning by each water purveyor addresses these short-term variables, and a critique of these plans is beyond the scope of this report.

II. Infrastructure Changes Since the 1991 Report

The *Santa Barbara County Growth Inducement Potential of State Water Importation* by Ahlroth and Cosby was originally researched and prepared in 1991. Since that time, several changes have taken place including changes in the nature of local water supplies, changes in the number and type of water purveyors within the county, and the construction of new water and wastewater treatment facilities.

A. Water Supplies

During the drought of 1986 – 1991, the search for additional supplies to increase local water supply system reliability led to the importation of water from the State Water Project and the construction of the City of Santa Barbara's Charles Meyer Desalination Facility, as well as increased use of recycled water.

The yields of other supplies have changed as well due to sedimentation within reservoirs, federal and state laws reserving water for environmental purposes such as aquatic and riparian habitat, and groundwater basin safe yield recalculations after the wet years from 1991 to 2000.

B. Water Purveyors

Water purveyors in Santa Barbara County have undergone a number of organizational changes since the preparation of the 1991 water supply report. These changes include:

- **City of Buellton.** In 1991, the Buellton Community Services District (CSD) provided water for the town of Buellton. In 1995, when the City of Buellton was incorporated, the City took over this function.

- **Montecito Water District.** Montecito County Water District and Summerland County Water District merged their water supply functions in 1995, and became the Montecito Water District.

- **Carpinteria Valley Water District.** The Carpinteria County Water District changed its name to Carpinteria Valley Water District in 1996 to clearly indicate that the District is a political subdivision of the State separate and distinct from the County or City government, with a constituency extending throughout most of the incorporated and unincorporated areas Carpinteria Valley.

- **Morehart Land Company.** In the *Growth Inducement Potential of State Water Importation,* Morehart Land Company was designated as a water purveyor in an effort to consider all entities with an entitlement to State Water. Since the current report focuses on all local sources of water supply, Morehart Land Company data was merged with Private South Coast municipal and industrial (M&I) and Agricultural pumpers. In 1977, the Morehart Land Company acquired the majority of acreage within the Townsite of Naples, which is located along the ocean, 12 miles north of Santa Barbara, California. In the following years, the Morehart Land Company transferred its Naples lots to various Morehart-related entities and individuals. In 1995, the County approved an official map for Naples that recognized 233 legal lots within the Moreharts' ownership. In May 1998, the Moreharts entered into an option agreement with Santa Barbara Ranch, LLC, and related interests ("SBRI"), pursuant to which SBRI obtained the option to acquire in five phased acquisitions all of the Moreharts' various ownership interests in the Naples Townsite except for sixteen acres partially developed with employee residences, single family dwellings and a water filtration plant. SBRI has exercised its option on four of the phased acquisitions and is scheduled to takedown the last phase in early 2003. As a result, it will own approximately two hundred sixty-five (265) acres of the Naples Property north of Highway 101, sixty acres of which are inland of the coastal zone, and 222 acres in the coastal zone including property south of Hwy. 101. In 2002, the Moreharts, SBRI and the County entered into a Memorandum of Understanding under which the Moreharts and SBRI have agreed to limit applications to develop single family residences within the Moreharts' previous Naples ownership to no more than 55 lots, 39 within the coastal zone and 16 inland.

- **Raytheon Infrared Operations.** Raytheon Infrared Operations (Raytheon IO), formerly Santa Barbara Research Center, is a research and development company and a manufacturer of infrared sensing systems and components. Raytheon IO is included in the list of water purveyors because it has contracted for 50 acre-feet of water from the State Water Project for use in infrared components production. The 50

AFY of State Water will be used primarily as a supplemental supply for system reliability.

- **Central Coast Water Authority (CCWA).** In September 1991, following the voter authorization to finance the State Water Project Coastal Branch Phase II with revenue bonds, CCWA was formed to construct, manage and operate Santa Barbara and San Luis Obispo Counties' "local facilities" to treat and distribute State Water.

C. **Water Facilities**

- **State Water Project Coastal Branch Phase II.** In March 1994, the State commenced construction of the Coastal Branch Phase II facilities. The Coastal Branch Phase II pipeline is a 101-mile long buried pipeline extending from Devils Den to Tank 5 on Vandenberg Air Force Base in Santa Barbara County. The State Coastal Branch Phase II pipeline consists of 57-inch diameter pipe beginning at Devils Den, and then reducing to a 42-inch diameter south of the City of Arroyo Grande. There are three 10,500 horsepower pumping plants - the Devils Den, Bluestone and Polonio Pass Pumping Plants - to lift water 1,500 feet in elevation from Devils Den to Tank 1. The project also includes three other water tank sites. A few months later in July 1994, CCWA started construction of its facilities: a 42-mile extension of the Coastal Branch pipeline and the Polonio Pass Water Treatment Plant. The 39-30 inch diameter CCWA pipeline starts at Vandenberg Air Force Base, travels past Vandenberg Village and the City of Lompoc, through the cities of Buellton and Solvang and terminates at Lake Cachuma. CCWA also constructed a 43 million gallon per day water treatment plant at Polonio Pass. Overall project construction was completed in the summer of 1997. Initial deliveries to turnouts along the pipeline commenced on August 11, 1997. Additional deliveries to Lake Cachuma began on November 20, 1997. On June 25, 1998 the CCWA Board of Directors took formal action to declare the CCWA project complete. The estimated cost of the overall project was $575 million, including $461 million for the Coastal Branch Phase II project and $114 million for the CCWA facilities ($43 million for the Polonio Pass Water Treatment Plant and $71 million for the CCWA pipeline). In addition, CCWA provided $27 million financing for project participants' turnouts and local projects and miscellaneous other project related costs.
- **Los Alamos CSD.** In 1988, Los Alamos CSD constructed a wastewater treatment system to provide sewer service to the community of Los Alamos. In 1994 the system was expanded to allow disposal of up to 176,000 gallons effluent per day, which will provide adequate service for the planned build out conditions for this community. The District is currently discharging an average of 63% of their capacity. (Information for this treatment plant was not included in the 1991 report.)

- **Goleta Water District and Goleta Sanitary District.** In 1993, Goleta Water District partnered with the Goleta Sanitary District to fund a water reclamation plant that allows for the production of approximately 1,000 acre-feet per year of recycled water for irrigation at Goleta Beach, UC Santa Barbara, Goleta's post office, and various parks and golf courses. Construction on the three million gallon per day wastewater reclamation plant was completed in 1995. Located adjacent to the Goleta Sanitary District (GSD) wastewater treatment plant, the reclamation facility annually produces 1,000 acre-feet of recycled water for golf courses, school yards, commercial landscaping and toilet flushing.

- **Goleta Water District and Cachuma Operations and Maintenance Board (COMB).** COMB identified potential modifications to increase the operating capacity and reliability of the South Coast Conduit Goleta and Carpinteria Sections. The South Coast Conduit transports Lake Cachuma Water to the Goleta Water District, the City of Santa Barbara, the Montecito Water District and the Carpinteria Valley Water District. Goleta Water District completed an upgrade of the 7-mile long 33-inch diameter Goleta West Conduit section of the South Coast Conduit. The Goleta West Conduit brings water from Lake Cachuma to the District's Corona Del Mar Treatment Plant, which was recently upgraded from 24 to 32 MGD.

- **City of Santa Barbara's Charles Meyer Desalination Facility.** The City of Santa Barbara constructed a reverse osmosis seawater desalination facility as an emergency water supply during the drought of 1986-1991. The facility, now known as the Charles Meyer Desalination Facility, is incorporated into the City's long-term supply plan as a way of reducing shortages due to depleted surface supplies during droughts. When the facility was built, Montecito Water District and Goleta Water District also participated in the project for emergency supplies at the time of the 1986-1991 drought, but they have since dropped out of the project. Their portions of the reverse osmosis filtration capacity were subsequently sold, leaving a current capacity of 3,125 AF.

- **Casmalia CSD.** Union Oil Company provides drinking water to the town of Casmalia. This water is taken from the Santa Maria GWB.

III. Existing and Future Water Demand

A. Population Forecasts

Population forecasts provide essential pieces of data for determining future water demand. In an effort to provide the best estimates for future population within Santa Barbara County, several estimates of future population figures were consulted. Table 1 summarizes the historical and projected estimates for the incorporated cities within Santa Barbara County from a number of published

reports. Population forecasts used in this report were taken from a variety of sources including:

- U.S. Census Bureau Census 2000 reports;
- *Santa Barbara County State Water Project Alternatives Study* by DWR and Santa Barbara County Flood Control and Water Conservation District (1985);
- *Santa Barbara County Growth Inducement Potential of State Water Importation* (Ahlroth and Cosby, 1991);
- Santa Barbara County Planning and Development Department's *Santa Barbara County 2030 Land and Population Newsletter*, November 2000 (2030 Newsletter);
- *Regional Growth Forecast 2000 – 2030* (March 2002 Santa Barbara County Association of Governments);
- General Plans from each of the cities and Community Plans for each planning area within the county;
- Urban Water Management Plans for year 2000 prepared by the City of Santa Barbara, Goleta Water District, Montecito Water District, the City of Santa Maria, the Santa Ynez River Water Conservation District ID#1, Carpinteria Valley Water District and the City of Lompoc;
- California Department of Finance reports.

Table 2 summarizes population estimates for water districts developed for the purposes of this report. All population estimates used in the water demand forecasts were adjusted to account for water district boundaries. These adjustments are covered in detail in the footnotes for Table 2. 1970 through 1990 populations were taken from the *Santa Barbara County Growth Inducement Potential of State Water Importation* (Ahlroth and Cosby, 1991). Census 2000 data was determined for water districts by taking the U.S. Census Bureau data and using a Geographic Information Systems (GIS) analysis of Census Blocks to cross-reference the city or water district service area boundaries as appropriate.

B. M&I Water Demand

1. Historical and Current M&I Water Demand

Gross water production estimates and M&I per capita water demand figures for 1970 in Table 3 were taken from the *Santa Barbara County Growth Inducement Potential of State Water Importation* (Ahlroth and Cosby, 1991). The gross water production figures for 1980 and 1990 were taken from Appendix C of the *Santa Barbara County Groundwater Resources Report 1998* to provide calendar year water demands instead of the fiscal year demands included in the 1991 report. The per capita demand figures for these years are then calculated using the new gross

water production estimates subtracting any water served to agricultural customers by the water districts.

Year 2000 per capita estimates were based on the total municipal and industrial use reported in each water purveyor's 2000 Public Water System Statistics Survey Form and on the Census 2000 population numbers from Table 2. Average per capita demand figures for each DAU were determined using water district per capita figures in proportion to the district's population compared with the total DAU population.

In the year 2000 countywide water use was 175 GPCD, which is significantly lower than countywide water use was in 1980 (207 GPCD) (Table 3). This reduction in countywide use has resulted from significant reductions in per capita use figures for the Santa Maria, Santa Ynez, South Coast and Cuyama DAUs. In the San Antonio DAU, per capita water demand has increased primarily due to the decreased Air Force Base population and changing Base operations. The current per capita use figures are comparable to the national average, which is approximately 170 gallons per capita per day. Although water use has increased since the 1986 to 1992 drought, as indicated by the 1990 countywide average of 163 GPCD, water demand has not returned to pre-drought (1980) levels.

2. Water Conservation Potential

The California Urban Water Management Planning Act was enacted in 1985 and requires urban water suppliers serving 3,000 acre-feet or more of municipal/industrial water per year or 3,000 or more urban customers, to prepare a comprehensive urban water management plan (UWMP) addressing among many other things, water demand management (conservation) programs. In addition, water purveyors within Santa Barbara County that are contractors in the Cachuma and Twitchell Projects are required to meet the urban Best Management Practices (BMPs) set forth by the California Urban Water Conservation Council (adopted by the US Bureau of Reclamation for reporting purposes) and the Efficient Water Management Practices (EWMPs) for water purveyors that serve agricultural customers. In the near future, all water purveyors that receive water from the State Water Project will be required to meet the Council's BMPs through a certification process in development by CALFED to protect the Bay-Delta. Due to these requirements and the apparent success of water efficiency programs throughout the county, this report includes estimates of water demand based on varying degrees of water conservation as shown in Table 4.

For the purposes of this report, baseline water demand is assumed to be equal to 1970 figures since 1970 was an average water year and water efficiency programs were not well established at that time. During the

1986 – 1991 drought, water efficiency measures and emergency drought measures resulted in 5 to 50 percent decreases in demand throughout the county. Many of the efficiency programs developed in response to the drought are still realizing benefits, especially those that installed water efficient fixtures like faucets, showerheads, ultra low flow toilets and landscaping plants with low water requirements. Although per capita water use has increased slightly since the drought, it has not returned to pre-drought (1980) levels.

It is likely that water use in the county will not return to pre-drought (1980) levels due to continued promotion of water use efficiency by water districts to assist in maintaining sufficient supplies, improved technology for water efficient fixtures and increasingly stringent review of water conservation plans by state and federal agencies. Therefore, water conservation of up to 20% from the estimated 1970 pre-conservation level is included in the estimates for future water demand.

The 1970 pre-conservation per capita figures were used in the "0% Conservation" column in Table 4 and are used to estimate per capita use figures for each level of conservation up to 20%.

3. Future M&I Water Demand Estimates

Total Municipal and Industrial water use for 2000 (Tables 3 and 5b) was based on the total municipal and industrial water deliveries reported in each water purveyor's 2000 Public Water System Statistics Survey Form. Estimated Total Municipal and Industrial Demand projections for 2020, 2030 and 2040 listed in Table 4 of this report were based on assumed per capita water conservation rates of 10%, 15%, and 20% respectively relative to the 1970 pre-conservation figures or from the 2000 per capita use figure (whichever was less) multiplied by the modified population forecast for each year.

Projected per capita water demand figures for each district for 2020, 2030 and 2040 were based on the 1970 pre-conservation per capita figures at a 10%, 15% and 20% conservation level respectively. If 2000 per capita use was less than the per capita water demand forecast with conservation for 2020, 2030 or 2040; the 2000 GPCD number was used instead.

C. Agricultural Water Demand

1. Historical and Current Agricultural Water Demand

Table 5b provides estimates of current and future agricultural acreages and water demand by water purveyor and DAU. Agricultural acreage is based primarily on a 1995 field survey DWR conducted to identify Santa

Barbara County agricultural land use by crop type for each DAU. DWR also updated the crop acreages to 1998 estimates based on the County Agricultural Production Report and annual agricultural sales figures by crop. Agricultural water duty factors and agricultural return flows are based on DWR's 1997 field survey of applied water rates and irrigation efficiency rates by DAU for Santa Barbara County. Using these factors and DWR's 1998 Santa Barbara County land use estimate of acreage by crop for each DAU, weighted averages for applied water rate and irrigation efficiency were calculated.

2. Water Conservation Potential

As mentioned above, water purveyors within Santa Barbara County that are contractors in the Cachuma and Twitchell Projects are required to meet the urban Best Management Practices (BMPs) set forth by the California Urban Water Conservation Council (adopted by the US Bureau of Reclamation (USBR) for reporting purposes) and the Efficient Water Management Practices (EWMPs) for USBR for water purveyors that serve agricultural customers. In the near future, all water purveyors of a certain size category that receive water from the State Water Project will be required to meet the Council's BMPs through a certification process in development by CALFED to protect the Bay-Delta. Due to these requirements and the apparent success of water efficiency programs throughout the county, this report includes estimates of water demand based on varying degrees of water conservation as shown in Table 4.

Future potential water conservation and water efficiency improvements for agricultural users depend on the development and acceptance of agricultural irrigation technologies and practices. If farmers do adopt more efficient water conservation practices, the benefits will vary from one groundwater basin to another.

3. Future Agricultural Water Demand Estimates

Future agricultural acreages, irrigation rates and return flows were held constant in the analysis for several reasons. First, agricultural land use is difficult to predict. For example, 1990 land use forecasts predicted conversion of agricultural land to urban development. In direct contrast to the forecast, total planted acres in Santa Barbara County in 2000 have increased since 1990. Although some agricultural areas were urbanized, formerly fallow lands are now planted in grapes, row crops, berries or other crops and irrigated. In addition, future cropping patterns are also extremely hard to predict because planted acres of each crop type could increase or decrease based on agricultural crop prices and demand, weather conditions, land development and other factors. Furthermore, shifting from one crop type to another could mean that the actual applied

water rates could remain the same or even increase even with the use of efficient technology.

IV. Water Supplies

This section provides an overview of available water supplies and a discussion of the issues and assumptions relevant to this report. The current and future available water supplies are summarized in Table 6.

A. Local Surface Water Supplies

In Santa Barbara County, there are two river systems that contribute significantly to water supplies for local communities.

1: Santa Ynez River

Within the Santa Ynez River Watershed, three reservoirs have been constructed to provide surface water to the South Coast area. When the United States Bureau of Reclamation (USBR) constructed Bradbury Dam in the early 1950s, the dam created Lake Cachuma the largest reservoir on the Santa Ynez River. Currently five water purveyors: Montecito Water District, the City of Santa Barbara, Carpinteria Valley Water District, Goleta Water District, and Santa Ynez RWCD ID#1, take water from Lake Cachuma. The sixth original Cachuma Project member was Summerland Water District, which has now merged with Montecito Water District.

In addition to the Lake Cachuma water transported to the South Coast communities through the Tecolote Tunnel and South Coast Conduit, and historically to ID #1 via a 30-inch pipeline, the United States Bureau of Reclamation (USBR) releases stored water from Lake Cachuma to the Santa Ynez River in accordance with adopted criteria to maintain the reservoir's long-term yield while satisfying water release requests from parties holding adjudicated downstream Santa Ynez River water rights. Currently, the 30-inch pipeline to ID #1 is mostly used as the last leg for transporting State Water Project water destined for the South Coastal area into Lake Cachuma. In accordance with a water exchange agreement between ID#1 and the South Coast purveyors, ID#1 obtains State Water Project (SWP) water from the State Project water line instead of its Cachuma Project water from Lake Cachuma. In exchange, the South Coast purveyors, receive ID#1's Cachuma water in lieu of receiving State Project Water. This exchange agreement decreased the total capital facilities and operational costs for both ID#1 and the South Coast purveyors.

During this report's 40-year water forecast period, the average annual Lake Cachuma yield is assumed to remain constant at approximately 25,400 AFY. This forecast was based on the Santa Ynez River Model version SYRM1101, which was last updated by the SBCWA in November 2001. The model run used assumed a modest cloud seeding program and includes Tecolote Tunnel infiltration water in the operational yield value.

Farther upstream on the Santa Ynez River are the Gibraltar Dam and Reservoir and the Juncal Dam, which created Jameson Reservoir. The City of Santa Barbara completed construction of the Gibraltar Dam in 1920 and the Mission Tunnel connection to the City in 1912. Construction of Juncal Dam and Jameson Reservoir was completed by Montecito Water District in 1930. Siltation has significantly reduced the storage capacity of Gibraltar Reservoir and will also impact Jameson yields during the period forecasted in this report. For the water supply forecast period, the Gibraltar Reservoir-Mission Tunnel average yield is expected to drop from about 5,400 AFY in 2000 to 5,100 AFY in 2040 as shown in Table 6. During the same period, Table 6 indicates that the average Jameson Reservoir-Doulton Tunnel yield is expected to drop from about 2,320 AFY to about 2,280 AFY. Under an agreement dating to the construction of Juncal Dam in 1930, the City of Santa Barbara receives 300 AFY of the Jameson Reservoir yield, since Juncal Dam was constructed on property owned by the City of Santa Barbara.

2. Santa Maria River

The Twitchell Reservoir on the Santa Maria River provides flood control protection as well as about 18,000 AFY of groundwater recharge to the Santa Maria Groundwater Basin. This yield is not included as a surface water source in Table 6 since it has been included in the Santa Maria Groundwater perennial safe yield. However, it should be noted that the character of water from the Twitchell Reservoir is in dispute in pending litigation and the decision in that case could limit the availability of this water supply to some pumpers in the Santa Maria Valley.

A more detailed discussion of the safe yields, water models and assumptions for Santa Barbara County's surface water sources is provided in the footnotes to Table 6.

B. State Water Project

In 1963, the Santa Barbara County Flood Control and Water Conservation District contracted with DWR to deliver SWP water. At that time, the County began

payments to DWR to retain an entitlement to the SWP for 57,700 AFY, but funds were not allocated to construct the necessary facilities to deliver water to the county.

In 1979, a bond measure was placed before local voters to secure funds to construct the local delivery system to distribute SWP water throughout the county. Fear of growth, environmental concerns, and opposition to high water costs caused a majority of voters to vote against this measure. In 1981, the original contract was amended to reduce the County's State Water entitlement to 45,486 AFY.

In 1991, after six years of extremely dry conditions, voters in several service areas in Santa Barbara County voted to import SWP water. This included the communities of Carpinteria, Summerland, Montecito, Santa Barbara, Hope Ranch, Goleta, Buellton, Solvang, Santa Ynez, Orcutt and Guadalupe. The Santa Maria City Council and Vandenberg Air Force Base also decided to participate in the SWP. The communities of Lompoc, Vandenberg Village, and Mission Hills voted not to participate in the SWP.

After the bond elections, water purveyors participating in the SWP formed the Central Coast Water Authority (CCWA) to finance, construct, manage, and operate Santa Barbara County's 42-mile extension of the SWP water pipeline and a regional treatment plant to treat SWP water for both San Luis Obispo and Santa Barbara Counties. The CCWA is made up of eight member agencies, one associate member, and four additional participants. An eight-member Board of Directors that includes a representative from each member agency governs the CCWA.

Table III-1 presents the allocated entitlement of SWP water to each project participant. Existing entitlements range from 50 AFY (Raytheon IO) to as high as 16,200 AFY (City of Santa Maria), though actual water deliveries may be less than the entitlement in any given year depending on a number of factors, primarily customer demand and droughts in northern California. Factors other than drought that may cause short-term delivery reductions of SWP water include equipment failure and natural disasters such as floods and earthquakes.

Factors that affect the State Water Project's long-term reliability include timing of additional SWP storage facility construction, ongoing environmental challenges to the SWP, and eventual utilization of full SWP entitlement by other SWP water contractors. Current expectations are that some of the originally conceived SWP facilities will not be constructed so the final overall SWP yield will be reduced. In addition, since recent laws have required that more water than originally planned must be retained in the rivers to preserve aquatic and riparian habitats, the overall SWP yield will be reduced still further. In 2001, the federal government, DWR, the State Water contractors, Central Valley Project (CVP) representatives, agricultural water users and environmental interest group representatives reached

an agreement known as the CALFED agreement. The agreement specifies, among other things, operating criteria for the State Water Project and Central Valley Project that provide for leaving sufficient water in the rivers to support critical wildlife habitat. According to the CALSIM I SWP yield model developed by DWR, the long-term average SWP deliveries will be about 70 percent of the SWP entitlements with existing (2002) facilities and current operational constraints. Each CCWA participant has a 10% "Drought Buffer" intended to further increase SWP reliability. Therefore, in this report, the long-term average annual deliveries are assumed to be 75% of each purveyor's entitlement. Table III-1 indicates what the long-term average annual SWP deliveries will be for each Santa Barbara County State Water contractor. These reduced deliveries have been used in Table 6 as the reliable (i.e., long-term average) SWP water supply.

Table III-1
State Water Entitlements in Santa Barbara County

Project Participant	SWP Allocation (AFY)	Long-Term Average SWP Deliveries* (AFY)
California Cities Water Co (Southern California Water Company).	500	375
Carpinteria Valley Water District	2,000	1,500
City of Buellton	578	434
City of Guadalupe	550	413
City of Santa Barbara	3,000	2,250
City of Santa Maria	16,200	12,150
City of Solvang	1,500	1,125
Goleta Water District**	4,500	4,500**
La Cumbre Mutual Water Co.	1,000	750
Montecito Water District	3,000	2,250
Morehart Land Company	200	150
Raytheon Infrared Operations	50	38
Santa Ynez River Water Conservation District ID#1	500	375
Vandenberg Air Force Base	5,500	4,125
Total:	**39,078**	**30,434**

* *Assumed to be 75 percent of entitlement due to the 2002 reliability percentages provided by the Department of Water Resources.*

** *Goleta Water District has an additional drought buffer that allows their long-term average to equal their entitlement.*

C. Recycled Water

Properly treated wastewater can provide a cost effective alternative to potable (drinking) water for a wide variety of uses. The process of treating wastewater for reuse is called recycling. Water recycling is becoming a more important resource

as local water purveyors seek ways to stretch their existing water supplies. Because recycled water can be safely and legally substituted for potable water in agricultural and landscape irrigation, flushing toilets, as well as dust control and compaction on construction sites, it replaces potable water and makes it available for other uses. This effectively creates a new water source.

Three wastewater treatment plants in the county: the City of Santa Barbara's El Estero Wastewater Treatment Plant, the Goleta Sanitary District Wastewater Treatment Plant, and the Lompoc Regional Wastewater Reclamation Plant produce water that is directly reused in the community as summarized in Table 6. These communities expect to increase the amounts of recycled water used in the future. In addition, Laguna Sanitation District is currently designing wastewater treatment and recycled water distribution facilities that will be used to serve a golf course and several other irrigation water customers within the City of Santa Maria. The remaining treatment facilities produce water that is discharged directly or indirectly to the ocean or percolates into the groundwater from ponds and/or pasture irrigation.

D. Groundwater and Return Flow Credits

Groundwater supply projections are given in Table 6 by regional groundwater basins rather than by individual water purveyors. This approach is used for two reasons. First, groundwater supply is not generally allocated among users since few groundwater basin water rights in Santa Barbara County have been adjudicated. Secondly, such allocation does not provide a useful function in this report since the report's focus is regional water supply forecasts.

- **DAU 71 - Santa Maria:** DAU 71 covers the Santa Maria Groundwater Basin, which covers approximately 80,000 acres in Santa Barbara County. The analyses for this DAU only include the Santa Barbara County portion of the Santa Maria Groundwater Basin, even though this basin extends into San Luis Obispo County. The reason for this focus is because the entities in San Luis Obispo County that are responsible for water service and management north of the Santa Maria River recognize the importance of maintaining hydrologic balance between their share of the water supply and demand and appear to be evaluating future water supplies in addition to groundwater to maintain that balance. Therefore, for the purposes this report we have assumed there is no significant net deficit in that portion of the basin. When ongoing litigation is settled, we will have the ability to look at the whole groundwater basin in both counties and reevaluate this assumption, as well as the perennial yield estimate, if necessary.

  For the purposes of this assessment, this DAU is treated as a single groundwater unit. Groundwater in this DAU is utilized by City of Santa Maria, California Cities Water Company – Southern California Water Company, City of Guadalupe, Casmalia Community Services District,

and Santa Maria Valley industrial and private municipal and agricultural water users.

The current perennial safe yield estimated by the SBCWA model is approximately 75,000 AFY. Under current levels of demand, the Santa Maria Valley Groundwater Basin water budget deficit is estimated to be approximately 2,368 AFY according to Water Agency models. Hopkins (2002) has reviewed the methodology for this estimate and suggests that it is reasonable. In addition, this number is also verified by groundwater basin water level measurements conducted by the SBCWA and the U.S. Geological Survey. However, some evaluators suggest that no overdraft exists (Luhdorff and Scalmanini, 2000). To date, insufficient evidence has been provided to support these evaluations.

Agricultural uses in the Santa Maria basin are essentially static and the City of Santa Maria water use activities are resulting in a net recharge to the basin (from State Water Project Water importation and return flows). Therefore, any new consumptive uses that are introduced in the basin, like new development in the Orcutt area, will contribute to the overdraft of the basin, unless new supplies are imported.

In determining return flows for this DAU, as shown in Table 5a, the percentage of treated wastewater effluent allocated to groundwater recharge is 25% for pasture irrigation, 100% for groundwater recharge and septic systems, 0% for discharge to riparian surface water, and 0% for recycled water because recycled water is counted as a new water supply in Table 6. Wastewater that is recycled for M&I purposes is not included in the return flow percentage for wastewater, but is counted as a new water source in Table 6. Private pumpers are considered to discharge 31% of their water to septic systems and 25% of their urban irrigation is assumed to be recharged to the groundwater basin.

Santa Maria WWTP return flow estimates are based on the assumption that after deduction for recycled water use, 75% of remaining effluent is injected into groundwater basin and 25% is used for pasture irrigation. This return flow estimate also allows for evaporation from 40 acres of infiltration ponds. Santa Maria Valley Industrial users assumes a combined return flow average of 15% wastewater return flow based on assumed return flow rates of 5% for oil field operations and 25% for vegetable processing cooling towers. The Laguna Sanitation District treats wastewater from portions of the Southern California Water Company (SCWC) service area. Treated effluent is disposed of by pasture irrigation. Some effluent is lost to evaporation from the 0.8 acre holding pond. Future plans in 2020 through 2040 call for using WWTP effluent as a new water supply (see Table 6) to irrigate a golf course and other facilities within the City of Santa Maria, so the groundwater

recharge will be reduced. Most SCWC parcels outside the Laguna Sanitation District boundary are on septic systems but do not overlay the Santa Maria GWB; consequently, only some of these parcels contribute to groundwater recharge. Casmalia CSD obtains its water from the Santa Maria GWB (DAU 71) although it is physically located in DAU 73. All homes are on septic systems. Since Casmalia CSD is NOT within the San Antonio Creek GWB, and not within the Santa Maria GWB, the town wastewater return flows do not constitute a reusable form of groundwater recharge.

- **DAU 73 - San Antonio:** DAU 73 encompasses the San Antonio Groundwater Basin, which is approximately 70,400 acres in size. For purposes of this assessment, this DAU is treated as a single groundwater unit. Groundwater from this basin is utilized by Los Alamos Community Services District, Vandenberg Air Force Base, and private municipal and agricultural water users. The current perennial safe yield estimate is approximately 9,000 AFY.

  In determining return flows for this DAU as shown in Table 5a, the percentage of treated wastewater effluent allocated to groundwater recharge is 25% for pasture irrigation (including Los Alamos CSD wastewater), 100% for groundwater recharge and septic systems, 0% for discharge to riparian surface water, and 0% for recycled water. Recycled water is counted as a new water supply in Table 6. Wastewater that is recycled for M&I purposes is not included in the return flow percentage for wastewater. Instead, it is counted as a new water source in Table 6. Private pumpers are considered to discharge 31% of their water to septic systems. 25% of their urban irrigation is assumed to recharge the groundwater basin.

  Vandenberg AFB in San Antonio DAU is outside the San Antonio groundwater basin, so no credit is given for VAFB urban irrigation return flows in this DAU. The wastewater is treated at the Lompoc Regional Wastewater Reclamation Plant, so the wastewater return flow credit is transferred to the portion of VAFB within the Santa Ynez DAU 74. Only about 25% of the Vandenberg AFB urban irrigation within the Santa Ynez DAU is within the Lompoc Terrace basin and contributes to urban irrigation groundwater recharge at a 25% rate. No credit is given for the remaining 75% of urban irrigation that recharges shallow surface aquifers only.

- **DAU 74 - Santa Ynez:** DAU 74 is divided into four sub-areas: 1) the Lompoc Groundwater Basin, 2) Buellton Uplands GWB, 3) Santa Ynez Uplands Groundwater Basin, and 4) Santa Ynez Riparian Alluvial Basin, which includes the Nojoqui and Salsipuedes sub-areas.

The perennial safe yield and gross perennial yield for the basins in this DAU are aggregated in the calculations for this report. Therefore the current perennial safe yield for this DAU is approximately 47,000 AFY.

For the purposes of this report, the base 2000 condition for supply/safe yield of the Santa Ynez Uplands basin is treated as being approximately in balance. This assumption agrees with the findings of Hopkins 2002.

In determining return flows for this DAU as shown in Table 5a, the percentage of treated wastewater effluent allocated to groundwater recharge is 25% for pasture irrigation, 100% for groundwater recharge and septic systems, 0% for discharge to riparian surface water, and 0% for recycled water. Recycled water is counted as a new water supply in Table 6. Wastewater that is recycled for M&I purposes is not included in the return flow percentage for wastewater. Instead, it is counted as a new water source in Table 6. Private pumpers are considered to discharge 31% of their water to septic systems. 25% of their urban irrigation is assumed to recharge the groundwater basin.

The Lompoc Regional Wastewater Reclamation Plant treats wastewater from the City of Lompoc, Vandenberg Village CSD, and all of Vandenberg Air Force Base including the sections within both DAUs 73 and 74. After deducting 657,500 gpd of wastewater flow for VAFB, remaining wastewater flows were allocated between the City of Lompoc and Vandenberg Village CSD as a percentage of M&I water demand. Wastewater flows from the City of Solvang and most of the sewered parts of Santa Ynez River Water Conservation District ID#1 have been allocated between the two water purveyors as a percentage of M&I water demand for households connected to the sewer. Both communities send their collected wastewater to the Solvang Wastewater Treatment Plant. Wastewater effluent from this plant discharges to the Santa Ynez River riparian alluvial basin, so no return flow credit is given to the Santa Ynez Uplands groundwater basin.

Return flows from the 1571 parcels on septic systems within ID#1 are also credited to the Santa Ynez Uplands Basin. A family size of 2.68 persons per household from the Forecast 2000 report was used to estimate the population living on these parcels on septic systems. ID #1 also provides water to the Lake Cachuma County Park, which treats its own wastewater (32 AFY) at the Cachuma Sanitation District WWTP.

The Buellton WWTP discharges its effluent to the Santa Ynez River riparian alluvial basin, so no credit is given for groundwater recharge to the Buellton Uplands Basin. Demands on the Santa Ynez River riparian supply are considered to stay in balance by varying Lake Cachuma releases.

For Mission Hills CSD, the wastewater return flow rate assumes that Mission Hills La Purisima WWTP recharges 100% of its wastewater to the groundwater except for the evaporation from 10 acres of wastewater infiltration ponds. The Lompoc Federal Penitentiary treats its own wastewater. Since the Penitentiary's Wastewater Treatment Plant is located within the Santa Ynez basin, the entire groundwater return flow credit is given to the Santa Ynez Basin.

Most of the City of Solvang is outside the Santa Ynez Uplands basin, so urban irrigation return flow is set at 1%. Most of the urban irrigation groundwater return flow goes to the Santa Ynez River alluvial basin, which is considered to be in balance. Santa Ynez River WCD #1 urban irrigation return flow is credited to the Santa Ynez Uplands Basin. Only about 25% of the Vandenberg AFB urban irrigation within the Santa Ynez DAU is within the Lompoc Terrace basin and contributes to urban irrigation recharge. No credit is given for the remaining VAFB urban irrigation that recharges shallow surface aquifers only.

- **DAU 75 - South Coast:** The South Coast DAU is also divided into several groundwater units including: Carpinteria basin, Montecito basin, Santa Barbara basins (storage units I and II and the Foothill Basin), and the Goleta Basin (North, Central, and West sub-basins), and consolidated rock aquifer areas from Rincon to Point Arguello.

  The perennial safe yield and gross perennial yield for the basins in this DAU are aggregated in the calculations for this report. Therefore the current perennial safe yield for this DAU is approximately 15,600 AFY.

  In determining return flows for this DAU as shown in Table 5a, the percentage of treated wastewater effluent allocated to groundwater recharge is 25% for pasture irrigation, 100% for groundwater recharge and septic systems, 0% for discharge to riparian surface water, and 0% for recycled water. Recycled water is counted as a new water supply in Table 6. Wastewater that is recycled for M&I purposes is not included in the return flow percentage for wastewater. Instead, it is counted as a new water source in Table 6.

  Private pumpers are considered to discharge 31% of their water to septic systems. Most of these private pumpers are located in the area west of Goleta where they pump their water from several groundwater basins. 25% of their urban irrigation is assumed to recharge the groundwater basin.

  Goleta WD, La Cumbre MWC (the 620 homes connected to the sewer), and Raytheon IO wastewater is treated at the Goleta Sanitary District

wastewater treatment plant. After deducting the metered LCMWC wastewater that goes to the WWTP, the remaining wastewater flows have been allocated between the Goleta and Raytheon IO districts as a percentage of M&I water demand. Since the Goleta Sanitary District WWTP has an ocean outfall, no groundwater return flow is provided. About 70% of La Cumbre MWC customers have septic systems. La Cumbre MWC is located outside of the Santa Barbara and Goleta Basins that are evaluated in this report, so no return flow credit is given for the homes with septic systems or urban irrigation. The urban irrigation flows have been reduced for the 70% of LCMWC homes that are on septic systems.

Wastewater for the Montecito WD is split between the Montecito Sanitary District and the Summerland Sanitary District. The treated effluent from these two WWTPs, the City of Santa Barbara's El Estero Wastewater Treatment Plant and the Carpinteria Sanitary District's WWTP either flows directly to the ocean through an outfall or quickly reaches the ocean. Consequently, no groundwater return flow credit is given.

- **DAU 76 - Cuyama Valley:** For the purposes of this assessment, this DAU is treated as a single groundwater unit. The current perennial safe yield estimate is approximately 6,600 AFY. These numbers represent 60% of the groundwater basin yield, which is estimated to be the portion of the basin, recharge-wise, which lies within Santa Barbara County. In determining return flows for this DAU as shown in Table 5a, the percentage of treated wastewater effluent allocated to groundwater recharge is 25% for pasture irrigation, and 100% for groundwater recharge and septic systems. The combined groundwater recharge rate for the Cuyama WWTP plant is 90% of the effluent. Private pumpers are considered to discharge 31% of their water to septic systems. 25% of their urban irrigation is assumed to recharge the groundwater basin.

E. Desalination

The City of Santa Barbara owns and operates the Charles Meyer Desalination Facility. Water produced from the facility is incorporated into the City's long-term supply plan as a way of reducing shortages due to depleted surface supplies during droughts. The facility is currently in long-term storage, which is more economical than standby maintenance mode, but can be made operable within 6 to 12 months if the need arises.

F. Conjunctive Use

Water purveyors that have access to more than one water source typically use the water sources conjunctively to increase the overall reliability of their district water supplies. For instance, some purveyors use SWP water whenever it is available and rely on groundwater supplies to supplement the State Water during periods of high demand or drought years. Water purveyors can also increase their water supply reliability by purchasing "drought buffers" of additional SWP water, signing drought year water supply agreements or banking water in a groundwater basin. Similarly some purveyors may manage, possibly in accordance with an AB 3030 Groundwater Management Plan, the groundwater pumped and stored in groundwater basins in order to optimize the basin's overall long-term working yield.

Conjunctive use plans incorporate all the water sources available to a water purveyor including surface and groundwater, SWP water, recycled water, and desalinated water. Since this report focuses on regional water supplies, average annual water supply yield estimates have been used throughout the report and tables. The actual water available from each water source may vary considerably from year-to-year; however, the water supply yield estimates provide a reasonable long-term assessment of available regional water supplies.

V. Water Supply and Demand Balance

A. Countywide

Water supply estimates generated for this report (Tables 7 and 8) indicate that countywide water supplies will meet demand at present. However, by the year 2020, these estimates indicate a countywide shortfall of approximately 7,600 acre-feet per year. This deficit will continue to increase through 2040, with a shortfall of 9,100 acre-feet per year by 2030 and a shortfall of 10,700 acre-feet per year by 2040.

B. Designated Analysis Units

This report provides water supply and demand estimates totaled by DAU. Within each DAU, some water purveyors may need to develop additional water supplies in order to provide sufficient and reliable water supplies for their current and/or future service area populations. The detailed analysis necessary to make the groundwater allocations and water supply and demand assessments and evaluate each water purveyor's water supply balance individually is beyond the scope of this regional water supply report.

- **DAU 71 - Santa Maria:** Projections for Santa Maria DAU 71 indicate that water supplies for this area are not sufficient to meet current or projected demands. The current shortfall is approximately 4,200 acre-feet per year. The shortfall will continue to increase through 2040 to 7,700 acre-feet per year. Importing State Water Project water has significantly reduced the overall DAU water supply shortfall; however, additional water supplies are still needed. Notably, continuing water conservation improvements and per capita water demand declines have already been incorporated into the future water supply demands.

- **DAU 73 - San Antonio:** Projections for San Antonio DAU indicate that water supplies for this area are not sufficient to meet current or projected demand. The current shortfall is approximately 3,900 acre-feet per year and will decrease over time to a shortfall of 3,800 acre-feet per year. Importing State Water Project water has significantly reduced the overall DAU water supply shortfall; however, additional water supplies are still needed. The shortfall will be reduced over time due to expected water conservation efforts to reduce the per capita water demand by Los Alamos CSD, Vandenberg AFB and the private M&I and agricultural water pumpers.

- **DAU 74 - Santa Ynez:** The projections for Santa Ynez DAU indicate that the current water supplies for this area are almost sufficient to meet current demand (a small overall deficit of 300 AFY), but by 2020 there will be a shortfall in supply of 1,600 acre-feet per year. This shortfall will remain at approximately this level through 2040. This assumes that future water demand increases due to population growth will be partially offset by increased water conservation and groundwater return flow credits. Important differences may also exist in the water supply and demand balance within specific groundwater basins and subbasins.

- **DAU 75 - South Coast:** Projections for the South Coast DAU indicated that this area has sufficient water supplies through the year 2040. This is due to the variety of supplies available to South Coast purveyors including State Water, groundwater, desalination, recycled water, and Cachuma, Gibraltar, and Jameson Reservoirs, along with the active conservation programs conducted by these purveyors. Important differences may exist in the water supply and demand balance within specific groundwater basins and subbasins.

- **DAU 76 - Cuyama Valley:** Water supply projections for the Cuyama Valley DAU indicate that this area is already experiencing a severe water supply shortfall with respect to meeting current demands. The current shortfall is approximately 7,900 acre-feet per year. This shortfall will decline somewhat through 2040 to a value of 6,600 acre-feet per year, primarily due to expected decreases in groundwater basin subsurface outflows and continued water conservation efforts.

C. Uncertainty

This report provides a long-term forecast of the regional water supply and demand balance for Santa Barbara County. A certain amount of uncertainty exists in the estimates for current and future water supply and demand. This uncertainty is based on the difficulty of accurately predicting changes in numerous factors including:

- Population growth rates
- Land use changes
- Level of participation in residential, commercial, industrial and agricultural water efficiency programs
- Weather changes year-to-year and long-term trends
- Environmental regulatory changes, including requirements that reduce the assumed yield of surface and groundwater water supplies
- Groundwater basin and surface water model revisions to reflect improved geotechnical data, assumed rainfall or other factors
- Changes in irrigated agricultural acreage and types of crops planted
- Outcome of water rights litigation
- Development of new water supplies and drought year contingency supplies by water purveyors

Furthermore, the level of uncertainty is compounded as the forecast time horizon extends from 10 years to 40. To minimize the uncertainty that will always exist, this report is based on the most recently available current and future population estimates, land use plans, water supply master plans, water models and agricultural data were used to develop the Santa Barbara County water supply and demand estimates. Nevertheless, significant changes may occur that cannot be anticipated at this time. Consequently, the water supply and demand forecasts should be considered as trends rather exacting forecasts. In addition, the water supply and demand forecasts should be reevaluated periodically to reflect new baseline conditions that arise.

VI. Conclusions

1. During the period from 2000 to 2040, the population of Santa Barbara County is expected to increase from about 399,000 to 606,000. This is a 52 percent increase. During the same 40-year period, the total water demand is expected to increase from 314,000 AFY to 345,000 AFY, which is just a 9 percent increase.

2. Agricultural water demand countywide comprises almost 75 percent of the current total water demand. In the future overall agricultural water demand is expected to remain about the same, although there may be significant shifts in the irrigated acreage, types of crops and applied water rates.

3. Countywide M&I water demand is forecast to rise from 81,000 AFY in 2000 to about 112,000 AFY in 2040. This 38 percent water demand increase assumes that

water efficiency programs will be meeting the 20 percent reduction in water demand from pre-conservation levels (1970).

4. Average countywide per capita water use in 2000 was 175 gallons per capita per day. This represents a more than 15 percent decrease since 1980, a year when only limited conservation programs were being implemented. Although this is a slight increase from the 163 gpcd in 1990, a drought year when several communities had mandatory water rationing, per capita water demand has not returned to pre-conservation (1970) levels. Long-term forecasts assume that countywide water conservation rates will reach 20 percent by 2040.

5. During the last decade, Santa Barbara County water purveyors have made significant strides to develop new water supplies and increase water supply reliability during droughts. Some of the new supplies developed include:

    - Importation of State Water Project water
    - Construction of a seawater desalination plant in Santa Barbara that can be activated during a long-term drought
    - Increased use of recycled water for urban and agricultural irrigation
    - Regional cloud seeding program for Santa Barbara County
    - Formal and informal groundwater basin management programs that allow water purveyors to increase the working yield of some groundwater basins
    - State and federal requirements for continued adoption of M&I and agricultural water conservation technologies

6. Current average annual water supplies for Santa Barbara County total about 223,000 AFY plus about 90,000 AFY in return flows to useable groundwater basins. Water supplies include local surface water, groundwater, imported SWP water, recycled water and desalinated water. By 2040, these total water supplies are expected to increase to 233,000 AFY plus about 100,000 AFY in return flow credits to the groundwater basins. Although this is about a 6 percent increase, it is insufficient to meet the expected 9 percent increase in water demand over the same 40-year period.

7. At present, Santa Barbara County water supplies are sufficient to meet demand countywide. However, water purveyors in the county will need to develop an additional 12,400 AFY of water by 2040 or rely on mining of groundwater in certain areas in order to meet future demand.

8. Only one of the five Designated Analysis Units in Santa Barbara County, DAU 75 South Coast, has a water supply that exceeds the current water demand. The other basins have existing shortfalls in water supply that will increase in the future.

    - DAU 71 Santa Maria – The current 4,200 AFY water supply shortfall will increase to 6,800 AFY by 2040 although water conservation efforts are expected to continue.

- DAU 73 San Antonio – The current 3,900 AFY shortfall will decrease slightly to 3,800 AFY by 2040 primarily due to limited population growth and increased conservation.
- DAU 74 Santa Ynez – Although this DAU has a slight overall current water supply deficit of only 300 AFY, the water supply shortfall is expected to reach 1,600 AFY by 2040.
- DAU 75 South Coast – This DAU has a current overall water supply surplus of about 15,000 AFY that will decline to about 7,000 AFY by 2040. Since most of this surplus is from imported State Water, some water purveyors may need to acquire additional water supplies.
- DAU 76 Cuyama Valley – This DAU is already experiencing a water supply shortfall of about 7,900 AFY of its total average water demand of 20,700 AFY. This water shortfall is expected to decline slightly to about 6,600 AFY in 2040; however, significant new water supplies will be required to balance average annual water supply and demand.

9. Significant uncertainty exists when forecasting water supply and demand for a 40-year period. Some of the factors that could change include: population growth rates, land use, agricultural cropping patterns and acreage, climatic conditions, environmental regulations, groundwater basin hydrogeologic conditions, water rights litigation, and water conservation technology and acceptance. For these reasons, these water supply and demand forecasts should be reevaluated periodically.

10. This report focuses on long-term average water supply and demand. The actual water supply and demand in any given year can vary considerably based on conditions like drought or wet weather conditions, land use changes, and periodic State Water pipeline shutdowns for maintenance. Analyzing these variable water supply questions is beyond the scope of this report. Each water purveyor needs to develop their own plans to deal with these annual water supply and demand variations as well as provide the capital facilities to meet peak day demands.

VII. References

Ahlroth, J. *Memorandum to Brain Baca regarding Santa Barbara County Planning and Development Department's Buellton Uplands Basin Report.* Santa Barbara County Water Agency. 1995.

Ahlroth, J. and Cosby, P. *Santa Barbara County Growth Inducement Potential of State Water Importation.* Santa Barbara County Water Agency. 1991.

Baca, B. *Buellton Uplands Basin Report.* Santa Barbara County Planning and Development Department. 1991.

Buellton Planning Department. *City of Buellton General Plan.* 1993.

Carpinteria Valley Water District. *Carpinteria Valley Water District Urban Water Management Plan and Water Shortage Contingency Plan.* April 2001.

City of Lompoc. *City of Lompoc General Plan.* 2000.

City of Lompoc. *City of Lompoc 2000 Urban Water Management Plan.* 2000.

City of Santa Barbara Community Development Department. *The City of Santa Barbara General Plan, Housing Element.* February 14, 1995.

City of Santa Barbara Community Development Department. *The City of Santa Barbara General Plan, Land Use Element.* 1995.

City of Santa Barbara Public Works Department. *City of Santa Barbara Urban Water Management Plan.* 2000.

City of Santa Maria. *Santa Maria General Plan.* 1997.

City of Santa Maria Public Works Department Utilities Division. *City of Santa Maria Urban Water Management Plan Update.* 2000.

County of Santa Barbara Planning and Development Department. *County of Santa Barbara Planning and Development Department Housing Element Implementation Guidelines.* May 2001.

County of Santa Barbara Planning and Development Department. *Final Los Alamos Community Plan.* 1994.

County of Santa Barbara Resource Management Department. *Goleta Community Plan.* 1993 – 1995.

County of Santa Barbara Resource Management Department. *Montecito Community Plan Update.* 1995.

Crawford Multari & Clark Associates. *City of Carpinteria General Plan/Local Coastal Plan & Environmental Impact Report.* April 2001.

Crawford, Multari & Clark Association. *City of Guadalupe General Plan.*

Environmental Science Associates. *City of Lompoc General Plan Revision/Environmental Impact Report.* June 1996.

Goleta Water District. *Goleta Water District Urban Water Management Plan.* 2001.

Hopkins Groundwater Consultants. *Draft Hydrological Review of Santa Maria Valley Groundwater Basin Water Budget Models.* May 2002.

Interface Planning and Counseling Corporation. *Final Summerland Community Plan.* 1992.

Laguna County Sanitation District. *Market Assessment for Recycled Water, Final Report.* 2000.

Luhdorff and Scalmanini. *Development of a Numerical Ground-Water Flow Model and Assessment of Ground-Water Basin Yield, Santa Maria Valley Ground-Water Basin.* 2000.

Phillips Brandt Reddick. *City of Solvang General Plan Program Environmental Impact Report.* October 1988.

Rodriguez, L. *Montecito Water District Final Urban Water Management Plan.* 2001.

Santa Barbara County Association of Governments. *Regional Growth Forecast 2000-2030.* 2002.

Santa Barbara County Planning and Development Department. *Analysis of Vacant Residential Land and Potential Buildout.* 2001.

Santa Barbara County Planning and Development Department Comprehensive Planning Division. *Orcutt Community Plan.* July 1997.

Santa Barbara County Resource Management Department. *Santa Barbara County Comprehensive Plan, Agricultural Element.* September 1991.

Santa Ynez River Water Conservation District Improvement District No. 1. *Santa Ynez River Water Conservation District Improvement District No. 1 Urban Water Management Plan.* 2000.

Solvang City Council. *City of Solvang General Plan*. 1998.

Southern California Water Company. *Urban Water Management Plan for Sisquoc, Orcutt, Lake Marie, Tanglewood.* 2000.

VIII. List of Persons Contacted

City of Buellton
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Casmalia CSD
- Cassie Bush (Unocal)

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- Charles Hamilton

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Cuyama CSD
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Five years of experience in resource conservation program implementation for Santa Barbara County.

TABLE 1

SANTA BARBARA COUNTY POPULATION DATA AND FORECASTS

CITY	1980 Census	1990 Census	2000 DOF	2000 Forecast 00	2000 GenPlan	2000 Census 00	GPBO	2020 DOF	2020 Forecast 00	2020 2030 NWSLTR	2030 DOF	2030 Forecast 00	2030 2030 NWSLTR	2040 DOF
City of Carpinteria	10,835	13,747	14,194	14,200	14,618	14,194	17,518		15,500	18,385		16,000	19,978	
City of Santa Barbara	74,414	85,571	89,600	89,600	92,800	92,325	99,880		97,200	109,283		101,700	117,525	
City of Solvang	3,106	4,741	5,332	5,300	5,375	5,332	6,005		6,300	6,983		6,300	7,787	
City of Buellton	2,242	3,688	3,828	3,800	3,906	3,828	5,148		5,800	5,993		5,900	7,034	
City of Lompoc	26,267	37,649	41,103	41,100	41,076	41,103	49,963		47,200	57,255		49,900	64,232	
City of Santa Maria	39,685	61,284	77,423	77,400	82,400	77,423	123,700		110,800	106,694		113,700	123,591	
City of Guadalupe	3,629	5,479	5,659	5,700	6,754	5,659	8,250		6,400	NA		6,700	NA	
Unincorporated Areas	138,738	157,449	162,208	162,300	NA	159,483	NA		215,300	217,772		220,500	236,301	
County Totals	298,916	369,608	399,347	399,400	NA	399,347	NA	552,846	504,500	522,365	658,223	520,700	576,448	779,247

1) Population estimates are for cities. If water district boundaries are not coincident with city boundaries, estimates may differ significantly from the water district population shown in Table 2.

3) California Dept. of Finance (DOF) population estimates are taken from State of California, Department of Finance, *Revised Historical City, County and State Population Estimates, 1991-2000, with 1990 and 2000 Census Counts*, Sacramento, California, March 2002 for 2000 numbers and Report # 98 P-1 for 2020, 2030 and 2040.

5) "GPBO" signifies General Plan Build Out.

7) GPBO forecasts for the City of Santa Maria were taken from personal communication with Bill Shipsey of the Community Development Department.

9) Population Forecasts for 2020 (2030 NWSLTR Column) were interpolated using the 2030 figures in the Santa Barbara County Planning and Development Department's *Santa Barbara County 2030 Land and Population Newsletter*, November 2000, Appendix C. Population Forecasts for 2030 (2030 NWSLTR Column) were taken from the 2030 figures in the Santa Barbara County Planning and Development Department's *Santa Barbara County 2030 Land and Population Newsletter*, November 2000, Appendix C.

TABLE 2

POPULATION FORECASTS BY WATER PURVEYOR SERVICE AREAS AND DESIGNATED ANALYSIS UNITS

DAU and Subareas	1970 Census	1980 Census	1990 Census	2000 Forecast 00	2000 GenPlan	2000 Census 00	2020 Forecast 00	2020 Plng Forecast	2020 Gen Plan	2020 Modified	2030 Forecast 00	2030 Plng Forecast	2030 Modified	2040 Modified
DAU 71:														
City of Santa Maria	32,340	39,685	60,229	75,350	80,350	75,667	108,700	104,600	115,900	109,700	111,500	121,400	116,500	123,300
Southern Calif. Water Co.	13,608	23,215	31,469	31,480	37,840	31,670	49,600	47,400	47,400	48,500	51,000	52,100	51,600	54,700
City of Guadalupe	3,115	3,700	5,695	5,700	6,754	5,659	6,400		10,800	6,400	6,700		6,700	7,000
S. M. Valley Industrial	0	0	0		0	0			0	0			0	0
Private SMV M&I and Ag	472	836	984	3,320	3,323	3,323	5,400		5,400	5,400	5,500		5,500	5,600
Casmalia CSD	230	226	164	160	170	151	200		170	200	200		200	200
SANTA MARIA TOTALS	49,765	67,662	98,541	116,010	128,437	116,470	170,300		179,670	170,200	174,900		180,500	190,800
DAU 73:														
Los Alamos CSD	722	734	890	1,372	1,330	1,372	2,000		3,100	2,800	2,000	3,500	2,800	3,000
Vandenberg AFB	10,705	5,421	6,544	3,450	3,465	3,450	3,400		3,465	3,400	3,400		3,400	3,400
Private San Ant. M&I, Ag	346	460	543	790	788	788	1,300			1,300	1,300		1,300	1,300
SAN ANTONIO TOTALS	11,773	6,615	7,977	5,612	5,583	5,610	6,700		6,565	7,300	6,700		7,500	7,700
DAU 74:														
City of Lompoc	24,084	26,270	35,711	41,210	41,180	41,208	47,300	57,400	52,800	52,500	50,000	64,400	57,200	61,900
Vandenberg Village CSD	4,523	5,839	6,793	5,470	5,140	5,802	8,000			8,000	8,100		8,100	8,200
Mission Hills CSD	3,000	2,755	3,121	3,300	3,450	3,142	4,800			4,800	4,800		4,800	4,800
Vandenberg AFB	5,362	2,715	3,277	4,350	4,383	4,351	4,400		4,400	4,400	4,400		4,400	4,400
City of Buellton	1,500	2,242	3,688	3,800	3,906	3,828	5,800	5,993	5,993	5,900	5,900	7,034	6,500	7,100
City of Solvang	2,100	2,899	4,755	5,300	5,375	5,332	6,300	6,983	6,983	6,600	6,300	7,787	7,000	7,400
Santa Ynez RWCD ID#1	5,500	7,712	8,298	6,950	6,952	6,952	8,300		11,913	10,100	8,400		10,200	10,300
Private SY-Lompoc M&I, Ag	1,376	1,824	2,192	4,900	4,070	4,070	9,200			9,200	9,300		9,300	9,400
SANTA YNEZ TOTALS	47,445	52,256	67,835	75,280	74,436	74,686	94,100		82,089	101,500	97,200		107,500	113,500
DAU 75:														
Carpinteria VWD	9,400	13,410	17,102	15,640	16,060	15,943	18,200	23,800	22,500	21,500	18,000	24,600	21,300	21,100
Montecito WD	9,900	11,209	13,161	10,500	9,450	11,545	12,900		14,300	13,800	13,200	15,700	14,500	15,400
City of Santa Barbara	69,700	76,705	84,170	92,210	96,628	91,648	99,900	112,000	112,000	106,000	104,500	120,300	112,400	118,800
La Cumbre Mutual Water Co.	3,363	4,000	4,141	3,800	3,780	3,157	4,000		3,900	4,000	4,100	4,000	4,100	4,200
Goleta WD	61,000	64,503	70,348	74,790	73,244	74,903	91,300	83,100	91,500	88,600	92,600	118,200	105,400	122,200
Private South Coast M&I, Ag	1,003	1,330	4,951	4,160	4,162	4,162	5,700			5,700	7,900		7,900	10,100
Raytheon Infrared Operations	0	0	0		0	0	0		0	0			0	0
SOUTH COAST TOTALS	154,366	171,157	193,873	201,100	203,324	201,358	232,000		244,200	239,400	240,300		265,600	291,800
DAU 76:														
Cuyama CSD	1,114	625	662	653	653	653	700			700	800		800	900
Private Cuyama Valley M&I, Ag	452	601	718	747	747	570	700			700	800		800	900
CUYAMA VALLEY TOTALS	1,566	1,226	1,380	1,400	1,400	1,223	1,400			1,400	1,600		1,600	1,800
SANTA BARBARA COUNTY	264,915	298,916	369,608	399,402	413,181	399,347	504,500	522,385	512,524	519,800	520,700		562,700	605,600

NOTES ON TABLE 2:

1) These Detailed Analyses Units (DAU's) include only the watershed portion within Santa Barbara County.

3) All population estimates have been adjusted to account for water district boundaries. Reports used as referenced for this document use city boundaries for population numbers. If water district boundaries are not coincident with city boundaries, estimates in the referenced reports may differ significantly from the water district populations shown in Table 2.

5) PPH is the abbreviation for persons per household.

7) General Plan and Planning Forecast population numbers were taken from recent General Plans (GP) or the Santa Barbara County Planning and Development Department's Santa Barbara County 2030 Land and Population Newsletter, November 2000 (2030 Newsletter). Specific modifications to these numbers are listed under the footnote for each water purveyor.

9) The Modified column numbers for 2020 and 2030 were based on the average of the best estimates for population in the Forecast 00, General Plan or Census columns, rounded to the nearest significant digit. All private area forecasts are based on the Census 2000 numbers multiplied by the appropriate growth rate derived from the subregion forecasts in the RGF.

11) In the *Santa Barbara County Growth Inducement Potential of State Water Importation* by Ahiroth and Cosby, 1991, Morehart Land Company was listed as a water purveyor because they hold an entitlement to State Water. Since the focus of this report is on all available supplies, and not specifically on State Water, Morehart Land Company figures are merged into the South Coast Private M&I and Ag.

13) **So. Cal. Water**: Please read footnotes 5-9. Southern California Water Company service areas include Orcutt, Tanglewood, Lake Marie, and Sisquoc unincorporated developments. Modifications to So. Cal. Water population numbers were as follows: So. Cal. Water serves 650 connections within the City of Santa Maria. In order to add the population living in these units to So. Cal. Water's population, the 650 connections were multiplied by the persons per household estimate for the appropriate year from the RGF (pg. 91) and added to the population estimates used for this district. The Forecast 00 2000 population number was derived from the combination of the population numbers for Santa Maria Valley Unincorporated 2000 plus the Guadalupe Valley Unincorporated 2000 of the RGF (pg. 34) plus the 650 connections within the City, minus the 2000 population for Casmalia, the Santa Maria Valley Private M&I and Ag from the Census and the Los Alamos Private M&I and Ag for 2000 and the 158 people estimated for the Waller Park area. The General Plan 2000 population number was derived using the 2000 Orcutt population taken from the 2030 Newsletter plus the 650 units served within the City multiplied by the appropriate PPH for the City of Santa Maria from the RGF page 91 plus the population of Sisquoc from the 2000 Census. The Census 2000 number was modified by subtracting 158 people in Waller Park area.

15) **Santa Maria Valley Industrial** is numerous industrial operations including oil and gas drilling, vegetable processing plants, and several feedlots.

17) **Casmalia CSD**: Please read footnotes 5-9. The Forecast 00 population number for 2000 for Casmalia CSD was derived from the average of the estimates for the Census 2000 and the General Plan 2000. The General Plan 2000 and 2020 population estimates were derived from 51 units (personal conversation with the Public Health Department) multiplied by the appropriate persons per household for Santa Maria Valley Subregion in the RGF pg. 91. All additional population forecasts are simply the 2000 populations rounded to the nearest 100. Growth in Casmalia was projected to be flat due to limits in the number of connections that the CSD can have.

19) **Vandenberg Air Force Base**: Please read footnotes 5-9. VAFB derives its water supply from the State Water Project and about 400 AFY is pumped from the San Antonio Ground Water Basin. VAFB provides domestic water supplies to the Lompoc Federal Prison, which is located within DAU 74, so the prison population (1650 for 2000) is included in the VAFB population figure in that DAU. For the purpose of assessing return flows for the basins, the population has been allocated between DAU's 73 & 74 based the proportions determined by the GIS Census determination described in footnote 7 but using the population published by the U.S. Census Bureau in Table DP-1 for Vandenberg AFB CDP for the year 2000 (6151). For all other forecasts the population of the Base was assumed not to change (except for rounding) since forecasts for an Air Force Base are subject to change. No significant increases or decreases are anticipated in the VAFB or Lompoc Federal Prison population at this time.

21) **City of Lompoc**: Please read footnotes 5-9. Modifications to City population numbers were as follows: The City of Lompoc served 37 connections outside the City limits in 2000. So the estimated population for the 37 connections was determined using the appropriate PPH from the RGF. This modification was applied to the Forecast 00 2000, GP 2000 and Census 2000 numbers. Future forecasts used 43 connections for this modification (and the appropriate pph from the RGF) as this was the highest number served outside the City limits from 1998 to 2000. The General Plan 2000 population number is taken from 1997 General Plan and modified for 37 units. The Forecast 00 2020 number used the RGF 2020 number modified it by 43 units outside the City limits. General Plan pop. 2020 equals 52640 using the growth rate from their General Plan plus the 43 unit modification. The Planning Forecast 2020 and 2030 numbers are taken from the 2030 Newsletter and is modified by 43 units.

23) **Mission Hills CSD**: Please read footnotes 5-9. Modifications to CSD population numbers were as follows: The Forecast 00 number was derived from the average of the population estimates for the Census 2000 and the General Plan 2000. The General Plan 2000 number was derived from the residential service connections from the 2000 Public Water Systems Statistics Form multiplied by the persons per household from the U.S. Census Bureau Profile of General Demographic Characteristics for the geographic area of Mission Hills. The Census 2000 number for Mission Hills Community Services District was taken from the U.S. Census Bureau Profile of General Demographic Characteristics for the geographic area of Mission Hills. Forecast 00 2020 and 2030 were derived from the Forecast 00 2000 number multiplied by the growth rate for the Lompoc Unincorporated areas as listed in the RGF pg. 34.

25) **City of Solvang:** Please read footnotes 5-9. Modifications to City population numbers were as follows: The General Plan 2000 population number for the City of Solvang equals the City population 2000 forecast from the 1988 General Plan. The Census 2000 number is the population published by the U.S. Census Bureau for the year 2000. The General Plan 2020 number is taken from the 2030 Newsletter. The Planning forecast 2020 and 2030 numbers are taken from the 2030 Newsletter. All other population numbers follow the rules outlined in footnotes 5 - 9.

27) **Private Santa Ynez, Lompoc Valley M&I and Ag:** Please read footnotes 5-9. Modifications to Private Area population numbers were as follows: Forecast 2000 population number for the Private SY-Lompoc M&I and Ag was derived from the Unincorporated areas of Santa Ynez and Lompoc from the RGF added together minus the populations for Los Alamos, VAFB, Vandenberg Village, Mission Hills, and Santa Ynez RWCD ID#1 and minus the estimated population of the connections the City of Lompoc serves outside of the City limits. General Plan 2000 is the same as the Census 2000 number. The Census 2000 number for the Santa Ynez/Lompoc Private M&I and Ag was determined using Geographic Information Systems analysis of Census Blocks from the U.S. Census Bureau cross-referencing water district boundaries and subtracting the water district populations from the DAU total to get all individuals living outside water district boundaries. All private area forecasts are based on the Census 00 numbers multiplied by the appropriate growth rate derived from the subregion forecasts in the RGF.

29) **Montecito Water District:** Please read footnotes 5-9. Modifications to District population numbers were as follows: MWD 1970, 1980 and 1990 Census data information includes previous estimates for Summerland CSD because MWD and Summerland CSD merged in 1995. The Forecast 00 2000 estimate was derived from the average of the Census 2000 and General Plan 2000 numbers. The General Plan 2000 population number is derived from 3,923 residential units reported on the District's 2000 Public Water Systems Statistic Form multiplied by 2.41 PPH from the U.S. Census 2000. The Census 2000 number for MWD was taken from the U.S. Census Bureau Profile of General Demographic Characteristics for the geographic areas of Montecito and Summerland. Forecast 00 2020 equals the Forecast 00 2000 number multiplied by the growth rate for the Santa Barbara Unincorporated area in the RGF pg. 34 and adjusted by an increase of 39 connections per year as estimated in the District's 2000 Urban Water Management Plan. The Forecast 00 2030 number was derived from the Forecast 00 2020 number multiplied by the growth rate for the Santa Barbara Unincorporated area in the RGF pg. 34. The Planning Forecast 2030 number was derived from the GP 2020 number multiplied by the growth rate for the Santa Barbara Unincorporated area in the RGF pg. 34.

31) **La Cumbre Mutual Water Company:** Please read footnotes 5-9. Modifications to District population numbers were as follows: Forecast 2000 was derived from the General Plan 2000 number rounded to the nearest 100. The General Plan 2000 population number is derived from 1,389 residential units reported on their 2000 Public Water Systems Statistic Form multiplied by 2.72 persons per household for Goleta from the U.S. Census 2000. Forecast 00 2020 and General Plan 2020 equal 1389 residential connections (We assumed that 1,389 represented the built out number of units) multiplied by the appropriate PPH for Santa Barbara Unincorporated areas in the RGF pg. 91. Forecast 00 2030 and Planning Forecast 2030 were derived from the number of service connections from 2000 multiplied by the appropriate household size from the RGF pg. 91.

33) **Private South Coast M&I and Ag:** Please read footnotes 5-9. Modifications to Private area population numbers were as follows: Forecast 2000 and General Plan 2000 are the same as Census 00. The Census 2000 number was determined using Geographic Information Systems analysis of Census Blocks from the U.S. Census Bureau cross-referencing water district boundaries and subtracting the water district populations from the DAU total to get all individuals living outside water district boundaries. In addition, the 38 people that are in Santa Barbara County but did not fall in a DAU in the analysis due to variations in GIS data sets, were added to the Census 2000 figure. All private area forecasts are based on the Census 2000 numbers multiplied by the appropriate growth rate derived from the subregion forecasts in the Regional Growth Forecast 2000 - 2030.

35) **Private Cuyama Valley M&I and Ag:** Please read footnotes 5-9. Modifications to District population numbers were as follows: The Forecast 2000 and General Plan 2000 numbers are the same as Census 00.The Census 2000 number for the Cuyama Private M&I and Ag was determined using Geographic Information Systems analysis of Census Blocks from the U.S. Census Bureau cross-referencing water district boundaries and subtracting the water district populations from the DAU total to get all individuals living outside water district boundaries. All additional forecasts are based on the subregion totals listed in the RGF page 34 minus the estimates for Cuyama CSD.

TABLE 3
HISTORICAL WATER PRODUCTION AND DEMAND

DAU and Subareas	1970 Populatn	1970 Gross Wtr	1970 GPCD	1980 Populatn	1980 Gross Wtr	1980 GPCD	1990 Populatn	1990 Gross Wtr	1990 GPCD	2000 Populatn	2000 Gross Wtr	2000 GPCD
DAU 71:												
City of Santa Maria	32,340	7,391	204	39,721	8,739	196	60,229	12,058	179	75,667	12,713	150
Southern Calif. Water Co.	13,608	NA	275	23,215	5,608	216	31,469	8,691	247	31,670	9,341	263
City of Guadalupe	3,115	NA	200	3,700	762	184	5,695	723	113	5,659	735	116
S. M. Valley Industrial	0	7,200	NA	0	7,120	NA	0	6,000	NA	0	2,000	NA
Private SMV M&I and Ag	472	NA	156	800	89,739	155	984	122,379	155	3,323	113,895	155
Casmalia CSD	230	NA	75	226	16.4	65	164	13.3	72	151	25	148
SANTA MARIA TOTALS	49,765	NA	NA	67,662	111,984	201	98,541	149,864	196	116,470	138,709	179
DAU 73:												
Los Alamos CSD	722	NA	280	734	230	280	890	251	252	1,372	304	198
Vandenberg AFB	10,705	NA	515	5,421	2,140	352	6,544	1,671	228	3,450	2,148	556
Private San Ant. M&I, Ag	346	NA	162	460	16,260	155	543	17,405	155	788	18,850	155
SAN ANTONIO TOTALS	11,773	NA	NA	6,615	18,630	331	7,977	19,327	226	5,610	21,302	412
DAU 74:												
City of Lompoc	24,084	3,511	130	26,270	3,753	128	35,711	4,930	123	41,208	5,249	114
Vandenberg Village CSD	4,523	1,408	278	5,839	1,527	233	6,793	1,438	189	5,802	1,511	232
Mission Hills CSD	3,000	NA	200	2,755	583	189	3,121	633	181	3,142	804	228
Vandenberg AFB	5,362	NA	500	2,715	1,886	620	3,277	1,730	471	4,351	2,252	462
City of Buellton	1,500	NA	300	2,242	752	299	3,688	1,083	262	3,828	975	227
City of Solvang	2,100	919	391	2,899	1,231	379	4,755	1,963	369	5,332	1,556	261
Santa Ynez RWCD ID#1	5,500	4,341	211	7,712	6,527	227	8,298	6,337	200	6,952	5,892	425
Private SY-Lompoc M&I, Ag	1,376	NA	164	1,824	55,120	157	2,192	56,334	155	4,070	61,358	155
SANTA YNEZ TOTALS	47,445	NA	NA	52,256	71,379	205	67,835	74,448	184	74,686	79,597	196
DAU 75:												
Carpinteria VWD	9,400	4,303	139	13,410	5,129	137	17,102	5,362	109	15,943	4,379	131
Montecito WD	9,900	4,522	340	11,209	4,099	271	13,161	5,034	293	11,545	5,356	378
City of Santa Barbara	69,700	14,486	179	76,705	14,543	158	84,170	9,849	94	91,648	14,968	145
La Cumbre Mutual Water Co.	3,363	1,846	424	4,000	1,533	312	4,141	1,297	260	3,157	1,813	484
Goleta WD	61,000	14,863	170	64,503	16,034	164	70,348	10,013	86	74,903	13,680	135
Private South Coast M&I, Ag	1,003	NA	158	1,330	10,125	151	4,951	20,315	155	4,162	13,546	155
Raytheon Infrared Operations	0	NA	NA	0	100	NA	0	100	NA	0	126	NA
SOUTH COAST TOTALS	154,366	NA	NA	171,157	51,563	169	193,873	51,970	111	201,358	53,869	159
DAU 76:												
Cuyama CSD	1,114	NA	282	625	292	417	662	189	255	653	195	266
Private Cuyama Valley M&I, Ag	452	NA	130	601	28,604	125	718	20,925	155	570	20,479	155
CUYAMA VALLEY TOTALS	1,566	NA	NA	1,226	28,896	274	1,380	21,114	203	1,223	20,674	215
SANTA BARBARA COUNTY	264,915	NA	NA	298,916	282,452	207	369,606	316,722	163	399,347	314,151	175

For 365 day year: 892.74364 gals per day = 1 ac.-ft. per regular year = ((1728 in.^3 / 1 ft.^3) * (43560 ft.^3 / 1 ac.-ft.)) / ((231 in.^3 / 1 gal.) * (365 days / 1 yr.)).
For 366 day year: 892.74364 gals per day = 1 ac.-ft. per leap year = ((1728 in.^3 / 1 ft.^3) * (43560 ft.^3 / 1 ac.-ft.)) / ((231 in.^3 / 1 gal.) * (366 days / 1 yr.)).

NOTES ON TABLE 3

1) All Population figures are derived from the appropriate column of TABLE 2.

[illegible]

3) Agricultural water demand has been excluded from per capita water calculations. The only districts which serve agricultural customers are Santa Ynez RWCD ID #1, Carpinteria VWD, Montecito WD, City of Santa Barbara, La Cumbre MWC, and Goleta WD. Agricultural water demand for 1970 was unavailable and has been left out of the Santa Ynez River Water Conservation District ID #1 1970 gross water estimates. Agricultural consumption for 1980 and 1990 is taken from Table 4 of *Santa Barbara County Growth Inducement Potential of State Water Importation* by Ahlroth and Cosby, 1991. Agricultural consumption for later years is in Table 4 of this report and is taken from water district sales records or water use data provided by the Department of Water Resources.

[illegible]

5) Private area use was derived using the number of acres in production multiplied by the 1995 applied water irrigation rates survey completed by the California Department of Water Resources and an average per capita use multiplied by the population estimates from Census 00 in TABLE 2. This figure assumes that most private pumpers are residential water users only with no allowance for commercial and industrial water uses. Historical per capita private pumper water demand was based, in part, on total groundwater basin pumping estimates.

[illegible]

7) Where insufficient data is available to calculate 1970 per capita water demand to represent the pre-conservation condition, a value that approximates a zero percent conservation water demand has been assumed. Districts where 1970 gpcd estimates are assumed include: Southern California Water Company, Guadalupe, Casmalia, Los Alamos, Vandenberg AFB, Mission Hills CSD, Buellton CSD, and the private well areas outside the water districts.

[illegible]

9) The 1990 GPCD figures may be lower than 2000 GPCD figures because many districts had voluntary or mandatory water rationing in 1990 due to the extended drought. Water use in 2000 was higher than average due to less than average rainfall.

[illegible]

11) Several districts have drought buffer or safety margins which are a part of their water supply they hold in reserve as district policy. Forecasted water demand should be increased by the safety margin for these districts and all others to account for uncertainty in predicting droughts, water supply reliability and population growth.

[illegible]

TABLE 4
M&I WATER CONSERVATION POTENTIAL

DAU and Subareas	GPCD for M&I					M&I Projected 2020		M&I Projected 2030		M&I Projected 2040				
	2000	0% Cons	10% Cons	15% Cons	20% Cons	GPCD	Est. Tot Dem (AF)	GPCD	Est. Tot Dem (AF)	AF w/ 0%Cons	AF w/ 10%Cons	AF w/ 15%Cons	AF w/ 20%Cons	W/ 2000 GPCD
DAU 71:														
City of Santa Maria	150	204	184	173	163	150	18,400	150	19,600	28,200	25,400	24,000	22,500	20,700
Southern Calif. Water Co.	263	275	248	234	220	248	13,400	234	13,500	16,800	15,200	14,300	13,500	16,100
City of Guadalupe	116	200	180	170	160	116	800	116	900	1,600	1,400	1,300	1,300	900
S. M. Valley Industrial	NA	NA	NA	NA	NA	NA	NA	NA	NA	2,000	1,900	1,800	1,600	2,000
Private SMV M&I and Ag	155	155	140	132	124	140	800	132	800	1,000	900	800	800	1,000
Casmalia CSD	148	148	133	126	118	133	30	126	30	30	30	30	30	30
SANTA MARIA TOTALS	179	222	200	189	178	176	33,430	172	34,830	49,630	44,830	42,230	39,730	40,730
DAU 73:														
Los Alamos CSD	198	280	252	238	224	198	600	198	600	900	800	800	800	700
Vandenberg AFB	556	556	500	473	445	500	1,900	473	1,800	2,100	1,900	1,800	1,700	2,100
Private San Ant. M&I, Ag	155	162	146	138	130	146	200	138	200	200	200	200	200	200
SAN ANTONIO TOTALS	412	527	475	448	422	329	2,700	312	2,600	3,200	2,900	2,800	2,700	3,000
DAU 74:														
City of Lompoc	114	140	126	119	112	114	6,700	114	7,300	9,700	8,700	8,300	7,800	7,900
Vandenberg Village CSD	232	278	250	236	222	232	2,100	232	2,100	2,600	2,300	2,200	2,000	2,100
Mission Hills CSD	228	228	206	194	183	206	1,100	194	1,000	1,200	1,100	1,000	1,000	1,200
Vandenberg AFB	462	500	450	425	400	450	2,200	425	2,100	2,500	2,200	2,100	2,000	2,300
City of Buellton	227	300	270	255	240	227	1,500	227	1,700	2,400	2,100	2,000	1,900	1,800
City of Solvang	261	391	352	332	313	261	1,900	261	2,000	3,200	2,900	2,800	2,600	2,200
Santa Ynez RWCD ID#1	425	425	382	361	340	382	4,300	361	4,100	4,900	4,400	4,200	3,900	4,900
Private SY-Lompoc M&I, Ag	155	164	148	139	131	148	1,500	139	1,500	1,700	1,600	1,500	1,400	1,600
SANTA YNEZ TOTALS	196	249	224	212	199	188	21,300	181	21,800	28,200	25,300	24,100	22,600	24,000
DAU 75:														
Carpinteria VWD	131	139	125	118	111	125	3,000	118	2,800	3,300	3,000	2,800	2,600	3,100
Montecito WD	378	378	340	322	303	340	5,200	322	5,200	6,500	5,900	5,500	5,200	6,500
City of Santa Barbara	145	179	161	152	143	145	17,200	145	18,200	23,600	21,500	20,300	19,100	19,300
La Cumbre Mutual Water Co.	484	484	435	411	387	435	1,900	411	1,900	2,300	2,000	1,900	1,800	2,300
Goleta WD	135	170	153	144	136	135	13,400	135	15,900	23,300	20,900	19,800	18,600	18,400
Private South Coast M&I, Ag	155	158	142	134	126	142	900	134	1,200	1,800	1,600	1,500	1,400	1,800
Raytheon Infrared Operations	NA	NA	NA	NA	NA	NA	100	NA	100	100	100	100	100	100
SOUTH COAST TOTALS	159	192	173	163	154	155	41,700	152	45,300	61,100	55,000	51,900	48,800	51,500
DAU 76:														
Cuyama CSD	266	282	254	240	226	254	200	240	200	300	300	200	200	300
Private Cuyama Valley M&I, Ag	155	155	140	132	124	140	100	132	100	200	100	100	100	200
CUYAMA VALLEY TOTALS	215	245	221	209	196	197	300	186	300	500	400	300	300	500
SANTA BARBARA COUNTY	175	223	201	190	179	171	99,430	166	104,830	142,630	128,430	121,330	114,130	119,730

NOTES ON TABLE 4:

1) All population figures are derived from the appropriate column of TABLE 2. The 2040 projected population figures from TABLE 2 are used to generate the 2040 water demand and values.

2) [illegible]

3) Lompoc's 0% conservation GPCD is listed at 140 because it correlates with their current (2000) GPCD of 114 equaling about a 20% conservation level. This assumes that Lompoc residents are using water at a 20% conservation level in the year

4) [illegible]

Table 5a

MUNICIPAL AND INDUSTRIAL RETURN FLOW ESTIMATES IN ACRE-FEET PER YEAR

DAU and Purveyor	2000 WWT Flow	2000 M&I Water	Percent WWTP	WWTP Return Flow	% Water Consumed	Unaccounted Water	WWTP Return Flow	2000 M&I Return Flow	2020 M&I Return Flow	2040 M&I Return Flow	2060 M&I Return Flow
DAU 71:											
City of Santa Maria	8,569	12,713	67%		10%	23%		71.90%	72.26%	72.30%	72.34%
Southern Calif. Water Co.	2,819	9,341	30%		10%	57%		24.58%	24.77%	25.00%	25.05%
City of Guadalupe	480	735	65%		10%	25%		22.50%	22.50%	22.50%	22.50%
S. M. Valley Industrial		2,000	0%		10%	0%		15.00%	15.00%	15.00%	15.00%
Private SMV M&I and Ag		577	0%		10%	59%		45.75%	45.75%	45.75%	45.75%
Casmalia CSD		25	0%		10%	90%		0.00%	0.00%	0.00%	0.00%
DAU 73:											
Los Alamos CSD	111	304	37%		10%	53%		22.50%	22.50%	22.50%	22.50%
Vandenberg AFB	446	2,148	21%		10%	69%		0.00%	0.00%	0.00%	0.00%
Private San Ant. M&I, Ag		137	0%		10%	59%		45.75%	45.75%	45.75%	45.75%
DAU 74:											
City of Lompoc	2,967	5,249	57%		10%	33%		46.01%	46.05%	46.06%	46.06%
Vandenberg Village CSD	854	1,511	57%		10%	33%		46.07%	46.07%	46.07%	46.07%
Mission Hills CSD	240	804	30%		10%	60%		40.33%	40.33%	40.33%	40.33%
Vandenberg AFB	1,101	2,252	49%		10%	41%		48.41%	48.41%	48.41%	48.41%
City of Buellton	421	975	43%		10%	47%		11.71%	11.71%	11.71%	11.71%
City of Solvang	644	1,556	41%		10%	49%		0.49%	0.49%	0.49%	0.49%
Santa Ynez RWCD ID#1	363	3,307	11%		10%	60%		33.84%	33.84%	33.84%	33.84%
Private SY-Lompoc M&I, Ag		707	0%		10%	59%		45.75%	45.75%	45.75%	45.75%
DAU 75:											
Carpinteria VWD	1,717	2,336	37%		10%	53%		13.31%	13.31%	13.31%	13.31%
Montecito WD	1,356	4,892	28%		10%	62%		15.57%	15.57%	15.57%	15.57%
City of Santa Barbara	8,772	14,855	59%		10%	31%		7.74%	7.74%	7.74%	7.74%
La Cumbre Mutual Water Co.	231	1,710	14%		10%	55%		0.00%	0.00%	0.00%	0.00%
Goleta WD	4,959	11,300	44%		10%	46%		11.53%	11.53%	11.53%	11.53%
Private South Coast M&I, Ag		734	0%		10%	59%		45.75%	45.75%	45.75%	45.75%
Raytheon Infrared Operations	55	126	44%		10%	46%		11.53%	11.53%	11.53%	11.53%
DAU 76:											
Cuyama CSD	48	195	25%		10%	65%		38.61%	38.61%	38.61%	38.61%
Private Cuyama Valley M&I, Ag		99	0%		10%	59%		45.75%	45.75%	45.75%	45.75%

NOTES ON TABLE 5

1) The percentage of wastewater effluent allocated to groundwater recharge is 25% for pasture irrigation, 100% for groundwater recharge and septic systems, 0% for discharge to riparian surface water, and 0% for recycled water. Recycled water is counted as a new water supply in Table 6.

3) Wastewater that is recycled for M&I purposes is not included in the return flow percentage for wastewater. Instead, it is counted as a new water source in Table 6a.

5) The Laguna Sanitation District treats wastewater from portions of the Southern California Water Company service area. Treated effluent is disposed of by pasture irrigation. Some effluent is lost to evaporation from the 0.8 acre holding pond. Future plans in 2020 through 2040 call for using WWTP effluent as a new water supply (see Table 6a) to irrigate a golf course and other facilities within the City of Santa Maria, so the groundwater recharge will be reduced. Most SCWC parcels outside the Laguna Sanitation District boundary are on septic systems but do not overly the Santa Maria GWB; consequently, only some of these parcels contribute to groundwater recharge.

7) Casmalia CSD obtains its water from the Santa Maria GWB (DAU 71) although it is physically located in DAU 73. All homes are on septic systems. Since Casmalia CSD is NOT within the San Antonio Creek watershed, there is not useable groundwater recharge.

9) Vandenberg AFB in San Antonio DAU is outside the San Antonio groundwater basin, so no credit is given for urban irrigation return flows in this DAU. The wastewater is treated at the Lompoc WWTP, so the wastewater return flow is credited to the portion of the AFB within the Santa Ynez DAU. Only about 25% of the Vandenberg AFB urban irrigation within the Santa Ynez DAU is within the Lompoc Terrace basin and contributes to urban irrigation recharge. No credit is given for the remaining urban irrigation which recharges shallow surface aquifers only.

11) The Lompoc Federal Penitentiary treats its own wastewater. Since their Wastewater Treatment Plant is located within the Santa Ynez Basin, the entire groundwater return flow credit is given to the Santa Ynez Basin.

13) Buellton WWTP discharges its effluent to the Santa Ynez River riparian alluvial basin, so no credit is given for groundwater recharge to the Buellton Uplands Basin. Demands on the Santa Ynez River riparian supply are considered to be balanced by varying Lake Cachuma releases.

15) Wastewater from the City of Solvang and most of the sewered parts of Santa Ynez River Water Conservation District ID#1 are treated at the Solvang Wastewater Treatment Plant. Wastewater effluent from this plant discharges to the Santa Ynez River riparian alluvial basin, so no return flow credit is given to the Santa Ynez Uplands groundwater basin. ID #1 also provides water to the Lake Cachuma County Park, which treats its own wastewater (32 AFY) at the Cachuma Sanitation District WWTP. Wastewater flows have been allocated between the two water purveyors as a percentage of M&I water demand for households connected to the sewer.

17) Wastewater for the Montecito WD is split between the Montecito Sanitary District and the Summerland Sanitary District.

19) La Cumbre MWC is located outside of the Santa Barbara and Goleta Basins that are evaluated in this report, so no return flow credit is given for the homes with septic systems or urban irrigation. The urban irrigation flows have been reduced for the homes that are on septic systems. Wastewater from sewered homes is treated by Goleta Sanitary District, which has outflow to the ocean that does not provide return flow credits.

TABLE 5b

EXISTING AND PROJECTED M&I AND AGRICULTURAL APPLIED WATER USE AND RETURN FLOWS

DAU and Subareas	2000 M&I		2000 Agriculture				2020 M&I		2020 Agriculture				2030 M&I		2030 Agriculture				2040 M&I		2040 Agriculture			
	Total AF	% Returns	Acres	ac - ft / ac	Total AF	% Returns	Total AF	% Returns	Acres	ac - ft / ac	Total AF	% Returns	Total AF	% Returns	Acres	ac - ft / ac	Total AF	% Returns	Total AF	% Returns	Acres	ac - ft / ac	Total AF	% Returns
DAU 71:																								
City of Santa Maria	12,713	71.9%	0		0		18,431	72.3%	0		0		19,573	72.3%	0		0		20,700	72.3%	0		0	
Southern Calif. Water Co.	9,341	24.6%	0		0		13,446	24.8%	0		0		13,511	25.0%	0		0		13,500	25.1%	0		0	
City of Guadalupe	735	22.5%	0		0		831	22.5%	0		0		870	22.5%	0		0		900	22.5%	0		0	
S. M. Valley Industrial	2,000	15.0%	0		0		2,000	15.0%	0				2,000	15.0%	0				2,000	15.0%	0			
Private SMV M&I and Ag	577	45.8%	59,020	1.92	113,318	30.4%	844	45.8%	59,020	1.92	113,318	30.4%	812	45.8%	59,020	1.92	113,318	30.4%	800	45.8%	59,020	1.92	113,318	30.4%
Casmalia CSD	25	0.0%	0		0		30	0.0%	0				28	0.0%	0				30	0.0%	0			
SANTA MARIA TOTALS	25,391	47.9%	59,020	1.92	113,318	30.4%	35,682	49.2%	59,020	1.92	113,318	30.4%	36,794	50.0%	59,020	1.9	113,318	30.4%	37,930	50.7%	59,020	1.9	113,318	30.4%
DAU 73:																								
Los Alamos CSD	304	22.5%	0		0		576	22.5%	0		0		620	22.5%	0		0		700	22.5%	0		0	
Vandenberg AFB	2,148	0.0%	0		0		1,905	0.0%	0		0		1,800	0.0%	0		0		1,700	0.0%	0		0	
Private San Ant. M&I, Ag	137	45.8%	9,310	2.01	18,713	34.4%	212	45.8%	9,310	2.01	18,713	34.4%	201	45.8%	9,310	2.01	18,713	34.4%	200	45.8%	9,310	2.01	18,713	34.4%
SAN ANTONIO TOTALS	2,589	5.1%	9,310	2.01	18,713	34.4%	2,694	8.4%	9,310	2.01	18,713	34.4%	2,621	8.8%	9,310	2.0	18,713	34.4%	2,600	9.6%	9,310	2.0	18,713	34.4%
DAU 74:																								
City of Lompoc	5,249	46.0%	0		0		6,687	46.1%	0		0		7,286	46.1%	0		0		7,800	46.1%	0		0	
Vandenberg Village CSD	1,511	46.1%	0		0		2,083	46.1%	0		0		2,109	46.1%	0		0		2,000	46.1%	0		0	
Mission Hills CSD	804	40.3%	0		0		1,105	40.3%	0		0		1,044	40.3%	0		0		1,000	40.3%	0		0	
Vandenberg AFB	2,252	48.4%	0		0		2,218	48.4%	0		0		2,095	48.4%	0		0		2,000	48.4%	0		0	
City of Buellton	975	11.7%	0		0		1,503	11.7%	0		0		1,656	11.7%	0		0		1,800	11.7%	0		0	
City of Solvang	1,556	0.5%	0		0		1,926	0.5%	0		0		2,043	0.5%	0		0		2,200	0.5%	0		0	
Santa Ynez RWCD ID#1	3,307	33.8%	1,231	2.10	2,585	28.0%	4,324	33.8%	1,231	2.10	2,585	28.0%	4,125	33.8%	1,231	2.10	2,585	28.0%	3,900	33.8%	1,231	2.10	2,585	28.0%
Private SY-Lompoc M&I, Ag	707	45.8%	29,159	2.08	60,651	28.0%	1,521	45.8%	29,159	2.08	60,651	28.0%	1,452	45.8%	29,159	2.08	60,651	28.0%	1,400	45.8%	29,159	2.08	60,651	28.0%
SANTA YNEZ TOTALS	16,361	37.2%	30,390	2.08	63,236	28.0%	21,366	37.0%	30,390	2.08	63,236	28.0%	21,809	36.8%	30,390	2.1	63,236	28.0%	22,100	36.5%	30,390	2.1	63,236	28.0%
DAU 75:																								
Carpinteria VWD	2,336	13.3%	1,908	1.07	2,043	14.0%	3,007	13.3%	1,908	1.07	2,043	14.0%	2,814	13.3%	1,908	1.07	2,043	14.0%	2,600	13.3%	1,908	1.07	2,043	14.0%
Montecito WD	4,892	15.8%	850	0.55	464	14.0%	5,187	15.8%	850	0.55	464	14.0%	5,223	15.8%	850	0.55	464	14.0%	5,200	15.8%	850	0.55	464	14.0%
City of Santa Barbara	14,855	7.7%	205	0.55	113	14.0%	17,181	7.7%	205	0.55	113	14.0%	18,218	7.7%	205	0.55	113	14.0%	19,100	7.7%	205	0.55	113	14.0%
La Cumbre Mutual Water Co.	1,710	0.0%	119	0.87	103	0.0%	1,950	0.0%	119	0.87	103	0.0%	1,888	0.0%	119	0.87	103	0.0%	1,800	0.0%	119	0.87	103	0.0%
Goleta WD	11,300	11.5%	3,938	0.60	2,380	14.0%	13,366	11.5%	3,938	0.60	2,380	14.0%	15,901	11.5%	3,938	0.60	2,380	14.0%	16,400	11.5%	3,938	0.60	2,380	14.0%
Private South Coast M&I, Ag	734	45.8%	5,720	2.24	12,813	14.0%	908	45.8%	5,720	2.24	12,813	14.0%	1,186	45.8%	5,720	2.24	12,813	14.0%	1,400	45.8%	5,720	2.24	12,813	14.0%
Raytheon Infrared Operations	126	11.5%	0		0		126	11.5%	0		0		126	11.5%	0		0		126	11.5%	0		0	
SOUTH COAST TOTALS	35,953	10.8%	12,740	1.41	17,916	13.9%	41,726	10.8%	12,740	1.41	17,916	13.9%	45,358	11.0%	12,740	1.4	17,916	13.9%	48,625	11.1%	12,740	1.4	17,916	13.9%
DAU 76:																								
Cuyama CSD	195	38.6%	0		0		199	38.6%	0		0		215	38.6%	0		0		200	38.6%	0		0	
Private Cuyama Valley M&I, Ag	99	45.8%	9,180	2.22	20,380	29.6%	109	45.8%	9,180	2.22	20,380	29.6%	118	45.8%	9,180	2.22	20,380	29.6%	100	45.8%	9,180	2.22	20,380	29.6%
CUYAMA VALLEY TOTALS	294	41.0%	9,180	2.22	20,380	29.6%	308	41.1%	9,180	2.22	20,380	29.6%	333	41.1%	9,180	2.2	20,380	29.6%	300	41.0%	9,180	2.2	20,380	29.6%
SANTA BARBARA COUNTY	80,588	27.8%	120,640	1.9	233,563	28.7%	101,678	29.6%	120,640	1.94	233,563	28.7%	106,815	29.7%	120,640	1.9	233,563	28.7%	111,556	29.6%	120,640	1.9	233,563	28.7%

For 365 day year: 892.74364 gals per day = 1 ac.-ft. per regular year = ((1728 in.^3 / 1 ft.^3) * (43560 ft.^3 / 1 ac.-ft.)) / ((231 in.^3 / 1 gal.) * (365 days / 1 yr.)).
For 366 day year: 892.74364 gals per day = 1 ac.-ft. per leap year = ((1728 in.^3 / 1 ft.^3) * (43560 ft.^3 / 1 ac.-ft.)) / ((231 in.^3 / 1 gal.) * (366 days / 1 yr.)).

NOTES:

1) 2000 M & I water use figures for each water purveyor are based on Urban uses listed in the 2000 Public Water System Statistics forms for each water purveyor and include Urban and Recycled water. Private area 2000 M&I water use figures were derived based on the Modified 2000 population estimates in Table 2 multiplied by the average water use estimate of 155 GPCD.

3) DWR conducted a 1995 field survey of Santa Barbara County agricultural land use by crop type for each DAU and updated the crop acreages to 1998 estimates based on the County Agricultural Production Report and annual agricultural sales figures by crop. Agricultural water duty factors and Ag return flows are based on DWR's 1997 field survey of applied water rates and irrigation efficiency rates by DAU for Santa Barbara County. Using these factors and DWR's 1998 Santa Barbara County land use estimate of acreage by crop for each DAU, weighted averages for applied water rate and irrigation efficiency were calculated. For DAU 75, the agricultural return flow rates were reduced by 50% since about half of the return flows enter small, unusable groundwater basins or quickly reach the ocean. The La Cumbre Mutual Water Co. service area agricultural return flow rate was set at 0% since the small underlying groundwater basin yield has limited pumping and is not being tracked.

5) Future agricultural irrigation rates and return flows are held constant for the analysis for several reasons: a) Future cropping patterns are extremely hard to predict. Planted acres of each crop type could increase or decrease based on agricultural crop prices and demand, weather conditions, land development and other factors. Since 1990, total planted acres in Santa Barbara County have increased although 1990 land use forecasts predicted conversion of agricultural land to urban development. b) Likely future potential water conservation improvements would reduce the return flow rates, so the combined impact on gross and net groundwater pumping is difficult to predict.

7) The Santa Maria Valley Industrial uses mostly consist of oil operations. Water use was assumed to remain flat due to lack of options for increasing efficiency.

9) The VAFB 2000 water use estimate was provided by the VAFB Civil Engineer and the population has been allocated between DAU's 73 & 74 based the proportions determined by the GIS Census determination described in Table 2, Footnote 7 using the population published by the U.S. Census Bureau in Table DP-1 for Vandenberg AFB CDP for the year 2000. An additional 400 AFY was added to DAU 73 to represent an average quantity of water pumped from the basin for industrial uses on the base. Since VAFB provides water to the Lompoc Prison, the prison's 2000 water demand of 883 AFY was added to DAU 74.

TABLE 6

ESTIMATED SAFE YIELD WATER SUPPLY IN ACRE FEET PER YEAR

DAU and Subareas	Estimated GWB Perennial Safe Yield Avail 2000	2020	2030	2040	Riparian Sources 2000	2020	2030	2040	Jameson Lake Yield for Year: 2000	2020	2030	2040	Gibraltar Lake Yield for Year: 2000	2020	2030	2040	Cachuma Next 50 Yrs	SWP Entitlemt 75.0%	Desal Plant	Recycled Water 2000	2020	2030	2040	Tot Avail Avg Ann Safe Supply w/o GWlr 2000	2020	2030	2040
DAU 71:																											
City of Santa Maria																		12,150		0	1,960	1,960	1,960	12,150	14,110	14,110	14,110
Southern Calif. Water Co.																		375		0	0	0	0	375	375	375	375
City of Guadalupe																		413		0	0	0	0	413	413	413	413
S. M. Valley Industrial																		0		0	0	0	0	0	0	0	0
Private SMV M&I and Ag																		0		0	0	0	0	0	0	0	0
Casmalia CSD																		0		0	0	0	0	0	0	0	0
SANTA MARIA TOTALS	75,000	75,000	75,000	75,000														12,938		0	1,960	1,960	1,960	12,938	14,898	14,898	14,898
DAU 73:																											
Los Alamos CSD																		0		0	0	0	0	0	0	0	0
Vandenberg AFB																		1,873		0	0	0	0	1,873	1,873	1,873	1,873
Private San Ant. M&I, Ag																		0		0	0	0	0	0	0	0	0
SAN ANTONIO TOTALS	9,000	9,000	9,000	9,000														1,873		0	0	0	0	1,873	1,873	1,873	1,873
DAU 74:																											
City of Lompoc																		0		5	2	2	2	5	2	2	2
Vandenberg Village CSD																		0		0	0	0	0	0	0	0	0
Mission Hills CSD																		0		0	0	0	0	0	0	0	0
Vandenberg AFB																		2,252		0	0	0	0	2,252	2,252	2,252	2,252
City of Buellton																		434		0	0	0	0	704	988	1,045	1,117
City of Solvang					271	535	611	683										1,125		0	0	0	0	1,556	1,926	2,043	2,200
Santa Ynez RWCD ID#1					431	801	918	1,075										375		0	0	0	0	3,994	3,994	3,994	3,994
Private SY-Lompoc M&I, Ag					1,000	1,000	1,000	1,000										0		0	0	0	0	0	0	0	0
SANTA YNEZ TOTALS	47,001	46,244	46,480	46,623	1,702	2,336	2,529	2,758									2,619	4,185		5	2	2	2	8,511	9,142	9,336	9,565
DAU 75:																											
Carpinteria VWD									2,024	2,000	1,988	1,976					2,619	1,500		0	0	0	0	4,119	4,119	4,119	4,119
Montecito WD									300	300	300	300	5,414	5,299	5,221	5,122	2,777	2,250		0	0	0	0	7,051	7,027	7,015	7,003
City of Santa Barbara																	8,174	2,250	3,125	741	1,200	1,200	1,200	20,004	20,348	20,270	20,171
La Cumbre Mutual Water Co.																	330	750		0	0	0	0	1,080	1,080	1,080	1,080
Goleta WD																	8,875	4,500		1,000	1,670	2,515	3,360	14,375	15,045	15,890	16,735
Private South Coast M&I, Ag																		150		0	0	0	0	150	150	150	150
Raytheon Infrared Operations																		38		0	0	0	0	38	38	38	38
SOUTH COAST TOTALS	15,395	15,303	16,032	16,381					2,324	2,300	2,288	2,276	5,414	5,299	5,221	5,122	22,775	11,438		1,741	2,870	3,715	4,560	46,817	47,907	48,562	49,296
DAU 76:																											
Cuyama CSD																		0		0	0	0	0	0	0	0	0
Private Cuyama Valley M&I, Ag																		0		0	0	0	0	0	0	0	0
CUYAMA VALLEY TOTALS	6,600	7,260	7,590	7,920														0		0	0	0	0	0	0	0	0
SANTA BARBARA COUNTY	152,997	154,807	156,102	156,924	1,702	2,336	2,529	2,758	2,324	2,300	2,288	2,276	5,414	5,299	5,221	5,122	25,394	30,434		1,746	4,832	5,677	6,522	70,138	73,719	74,867	75,631

AUXILIARY DATA TABLE B SANTA YNEZ AND SOUTH COAST GWB SAFE YIELD SHARES				
SANTA YNEZ GWB BASINS SAFE YIELD SHARE COMPONENTS:				
Lompoc GWB Private M&I+Ag	13,315	13,334	13,257	13,198
Lompoc GWB Yield Elasticity	0.0	1,244.7	1,481.3	1,624.4
Buellton Uplands Prvte M&I+Ag	2,250.4	2,023.7	1,967.1	1,916.9
SY Uplands Private M&I+Ag	8,945.2	8,399.3	8,501.2	8,618.5
SOUTH COAST GWB BASINS SAFE YIELD SHARE:				
Carp. GWB Private M&I+Ag	3,236.9	2,117.7	2,352.2	2,680.3
Mont. GWB Private M&I+Ag	1,832.3	1,832.5	1,832.5	1,832.5
SB City GWB Private M&I+Ag	1,642.8	1,678.3	1,678.3	1,678.2
Goleta GWB Private M&I+Ag	2,720	1,670.2	1,028.5	755.1

NOTES FOR TABLE 6

1) In this and the following notes, the term "GWB" means groundwater basin. "District" means major local water purveyor (smaller purveyors are included in basin-wide totals). In the "Estimated GWB Perennial Safe Yield Available" columns on Table 6, the DAU TOTALS represent each GWB's estimated total perennial yield exclusive of return flows. In general, each DAU's "Estimated GWB Perennial Safe Yield Available" is the sum of the estimated perennial yields for the major groundwater basins and sub-basins located within the DAU. Some smaller groundwater basins that provide only non-potable water or do not provide water used regularly by a water district or more than a few private small pumpers have not been included. When these footnotes reference the "groundwater safe yield" or "perennial safe yield", it means the natural recharge not including the return flows from pumped groundwater or imported water used in the basin. The "consumptive use" is the gross water that is pumped from the basin minus the return flows from all water sources. In other words, "consumptive use" is the net groundwater permanently removed from the groundwater basin. The term "pumpage yield" equals the perennial yield plus any return flows due to human activities to the groundwater basin. "Net groundwater pumping" is the gross groundwater pumpage minus the return flows from pumped groundwater only.

3) In Table 6, the average available surface water, State Water Project (SWP), recycled water and desalination water may be more or less than the water actually used by a purveyor or private water pumper in any one year. This may be because water supplies exceed demand, because the water supply and demand fluctuate during wet and dry years or because of other factors. In general, however, the Table 6 water supply estimates are the average available annual water supply over the years for which water records are available.

5) The Groundwater Basin firm yield within the DAUs is developed in the following way (by DAU):

a) For DAU 71 (Santa Maria Basin), the firm average annual groundwater safe yield is 75,000 acre-feet per year (AFY). The 75,000 AFY is estimated to be the Santa Barbara County portion of the 87,000 AFY perennial yield (without imported water return flows) for consumptive use calculated by an SBCWA 2001 water budget analysis of the Santa Maria GWB. Imported waters to the basin are from the State Water Project.

b) The DAU 73 (San Antonio Basin) perennial yield for consumptive use is 9,000 AFY. This is based on USGS Open File Report 80-750, pg. 40: 9,800 AFY plus an upward adjustment of 2,500 AFY, by extending the base period for recharge evaluation to the year 2000, giving a total recharge of 12,300 AFY, from which is subtracted a 3,000 AFY loss at Barka Slough, and a 300 AFY Basin outflow. For Vandenberg AFB, there is assumed an average pumping from the Barka Slough well field of 400 AFY. (The base reports pumping its well annually to confirm production rates.) It is assumed that this water is used in DAU 73, but outside of the limits of the San Antonio GWB. Thus the return flows (to the GWB) for groundwater pumped from Barka Slough are set to zero. Imported State Project Water used by Vandenberg AFB in DAU 73 does not return to the San Antonio GWB. Wastewater flow from the AFB is discharged to the Lompoc Regional Wastewater Treatment Plant in DAU 74.

c) The DAU 74 (Santa Ynez Basin) "Estimated GWB Perennial Safe Yield Available" is made up of the following components:

i) (Lompoc Basin including Lompoc Uplands, Plain, and Terrace areas) The Lompoc Groundwater Basin average annual safe yield is 16,141 AFY. This value is empirically determined so that the overall Lompoc GWB consumptive use deficit is 913 AFY (meaning the consumptive use of groundwater by all M&I and Ag pumpers exceeds the available groundwater supplies by 913 AFY). This deficit for the Lompoc area GWB (Lompoc Plain, Terrace, and Uplands, including Santa Rita Valley) has been calculated based upon observed long-term groundwater level trends. In Table 6, water purveyor M&I consumptive groundwater pumping is more accurately known than the private M&I and Agricultural net pumping. The Lompoc area private M&I and Agricultural groundwater consumptive use employed in the calculations for Table 6 may be adjusted at some future point in time. If such an adjustment is made, then the 16,141 AFY average annual safe yield figure noted above will have to be adjusted with the new M&I and Agricultural public and private net pumping numbers so that the available groundwater deficit still equals 913 AFY (or some other future GWB water budget figure). Return flows into the Lompoc GWB from Vandenberg Air Force Base operations are Santa Ynez River percolation via discharge from the Lompoc Regional Wastewater Treatment Plant, and percolation from various facilities located in the Lompoc Terrace part of the GWB. Two thirds (67%) of the flows to the regional wastewater plant are assumed to return to the Lompoc GWB. Increased water use in the Lompoc GWB will decrease average groundwater levels in the Santa Ynez River recharge area of the Lompoc Plain; therefore, increased recharge from the river will occur during high flow periods. The increased recharge is assumed to equal the increased demand anticipated within the Lompoc Basin through the term of this analysis. Thus, in the Lompoc area GWB, the basin water budget deficit is expected to remain at 913 AFY over the 40 year planning horizon embraced by this study.

ii) (City of Buellton and Buellton Uplands area) The City of Buellton is assumed to take about one half (50%) of its pumped water from the Santa Ynez River Riperian strip, which is considered to be a "safe yield" source based on current water rights decisions. The remaining 50% of its pumped supply is taken from the Buellton Uplands Groundwater Basin, which is estimated to be in a balanced (or surplus) state (Ahlroth, 1995) for this analysis. Private groundwater consumptive use is estimated to be 1,620 AFY (Baca, 1991), and perennial safe yield set at 2,768 AFY. The excess water leaves the Buellton Upland GWB as underflow and surface outflow (via Santa Rosa Creek). For this table we limit the usable portion of the 2,768 AFY recharge to 2,500 AFY (assuming some natural basin outflow is a desirable condition). The City of Buellton receives an average of 462 AFY of imported SWP water. The City's Upland Basin pumping equals one half of its total demand minus its average import. The remaining one half of its pumped water comes from the Santa Ynez River riparian alluvial basin, and thus, is treated as an import (see Table 5b) for the purposes of return flows to the uplands basin. Buellton wastewater first flows into ponds and then percolates into the Santa Ynez River riparian alluvial basin. The remaining urban return flows (11.7%; see Table 5b) are assumed to enter the Buellton Uplands GWB.

iii) (City of Solvang) The City of Solvang has the capability to provide all of its demand from the State Water Project and the Santa Ynez River riparian alluvial basin, which, as noted above, is considered to be a safe yield supply. In this Table, it is assumed that the City, because of chemical and aesthetic considerations, will use all of the available State Project Water and minimize blending with local groundwater to meet demands. Because of the City's service area location, it is estimated that only 0.7% of Solvang's deliveries percolate into the Santa Ynez Uplands GWB.

iv) (Santa Ynez River Water Conservation District Improvement District Number One, "ID#1") ID#1 is a user of water pumped from the Santa Ynez Upland Groundwater Basin. ID#1 also imports water into the Uplands Basin from the State Water Project, from Lake Cachuma, and from the Santa Ynez River Riparian alluvial basin. While the amount of State Water Project yield is assumed to be 75% of entitlement, the local imports from the Santa Ynez River riparian strip are considered to be "safe yield" supplies because they are sufficient to meet demand through the period of this analysis and are recharged through water rights releases from Lake Cachuma. The total for these imports is 400 AFY (SWP), 2,619 AFY (Cachuma), and 1,000 AFY (Santa Ynez River riparian wells). One half of the ID#1 M&I return flows do not return to the Uplands GWB, but are returned to the riparian basin near Solvang as wastewater flows. The Santa Ynez Uplands GWB safe yield (not counting imported water return flows) is set empirically to 9,000 AFY to achieve, as was done for the Lompoc GWB analysis noted above, an approximate GWB water budget balance. The District plus private agricultural consumptive use is left at 10,600 AFY (Ahlroth and Cosby, 1991). The effect of these numbers places the Uplands GWB just in balance under year 2000 conditions (20 AFY surplus). The 10,600 AFY total Uplands GWB Ag consumptive use figure is a somewhat dated value. Even though the private pumpage figure is dated, were a new figure developed for agricultural consumptive use in the year 2000, we would simply adjust the Uplands GWB perennial "safe yield" for consumptive use of 9,000 AFY estimate upward or downward to achieve the GWB balance for the year 2000 conditions so that the basin water supply and demand balance would have about the same 20 AFY surplus. This is to say that the basin supply and demand balance is based upon observed long-term groundwater level trends and not simply on previously published groundwater recharge and consumptive use figures.

v) The majority of the Private SY-Lompoc M&I and Ag groundwater perennial safe yield is included in the groundwater basin budget formulas for the three GWBs described above (i.e., Lompoc, Buellton Uplands, and Santa Ynez Uptands basins). The remaining water use in DAU 74 is all private M&I and Ag consumptive use occurring in the Santa Ynez River alluvial basins and in the Nojoqui, Salsipuedes Creek, and other Santa Ynez River tributary watershed areas. The groundwater consumptive use share allotted to these remaining areas is empirically determined to be 19,388 AFY. This estimate was derived by finding the remaining pumping after accounting for the pumping by water districts. This is the same method that was used for the Lompoc and Santa Ynez Uplands GWBs. The 19,388 AFY added to all the remaining groundwater consumptive use in DAU 74 puts the DAU in a 249 AFY deficit condition for the year 2000. This result is calculated by taking the total DAU 74 groundwater consumptive use demand, subtracting the area deficits (i.e., Lompoc GWB, -913 AFY), and adding any area GWB surpluses (i.e., Buellton Uplands GWB, +736 AFY; and Santa Ynez Uplands, +20 AFY). This yields a net year 2000 deficit for DAU 74 of –249 AFY as indicated in Table 7. Note that for this analysis, the Buellton Uplands basin has a net groundwater surplus of 736 AFY while the Santa Ynez Uplands Basin is considered to be, under year 2000 conditions, in a state of balance (i.e., tiny surplus of 20 AFY). The remaining areas (Santa Ynez River riparian alluvial basins, Nojoqui, and Salsipuedes sub-areas) are considered to have enough groundwater basin yield to meet the remaining private pumping needs into the foreseeable future. The estimated perennial safe yield for this groundwater basin is assumed to increase over the 40 year planning horizon from 47,001 AFY to 48,623 AFY due to additional return flows into the basin from imported water.

d) The DAU 75 (South Coast) calculations for "GWB yields" use the same approach as for the north county areas. From east to west the calculations are as follows:

i) Carpinteria area: The Carpinteria Valley Water District (VWD) GWB perennial yield is estimated to be 3,865 AFY. Private consumptive GWB pumping is estimated to be 870 AFY.

ii) Montecito area (including Summerland): The Montecito WD GWB perennial safe yield is estimated to be 1,485 AFY. Private consumptive pumping is estimated to be 809 AFY.

iii) Santa Barbara City and La Cumbre MWC area: The City of Santa Barbara GWB perennial yield is estimated to be 1,710 AFY plus return flows from SWP and recycled water. The private consumptive pumping from the Foothill Basin is estimated to be 443 AFY (143 AFY by various private pumpers plus 300 AFY by La Cumbre Mutual Water Company). In addition to their SWP and Cachuma supplies, La Cumbre MWC is assumed to have an available safe yield groundwater supply of up to 1,300 AFY (300 AFY from the Foothill Basin, which is assumed to be pumped every year by LCMWC, and up to 1,000 AFY from the Goleta Central Basin). La Cumbre MWC's Goleta Central Basin wells are available and could be used during droughts when SWP deliveries are reduced.

iv) Goleta Area: The Goleta (North, Central, and West sub-basins) GWB perennial yield is estimated to be 3,850 AFY. Private consumptive pumping (not including Raytheon Infrared Operations) is estimated to be 777 AFY.

v) The DAU 75 Private South Coast M&I and Ag groundwater safe yield supply is estimated to satisfy all private pumping requirements (primarily agricultural) from Rincon to Point Arguello. Of this private pumping, 2,599 AFY is estimated to occur within the Carpinteria, Montecito, Santa Barbara, and Goleta GWB's (this private pumping does not include LCMWC and Raytheon Infrared Operations which are separate line items in the table). The estimated perennial safe yield for this groundwater basin is assumed to increase over the 40 year planning horizon from 15,395 AFY to 16,381 AFY due to additional return flows into the basin from imported water.

e) DAU 76 (Cuyama Valley): For the purposes of this report, the portion of the Cuyama Valley GWB that lies within Santa Barbara County comprises DAU 76. The portion of GWB total net natural recharge available to Santa Barbara County pumpers is assumed to be 60 percent. The available groundwater recharge and resulting estimated perennial yield is assumed to increase over the 40 year planning horizon from 6,800 AFY to 7,920 AFY because of assumed decreases in surface and sub-surface outflows from the western part of the GWB brought about by continuing declines in groundwater levels. No imported waters are envisioned during the period covered by these Tables.

7) The 75% factor used for State Water Project supplies was based on the California Department of Water Resources estimate provided to the Santa Barbara County Board of Supervisors in November 2002. This factor will be adjusted in the future as amendments to the CALFED and other water supply agreements for the State Water Project are revised as groundwater banking opportunities arise, and as new facilities are constructed for the State Water Project.

TABLE 8
WATER SUPPLY OUTLOOK

DESIGNATED ANALYSIS UNITS	AVERAGE AVAILABLE TOTAL WATER SUPPLY (NO RETURN FLOWS)	AVERAGE AVAILABLE TOTAL WATER SUPPLY WITH RETURN FLOWS	AVERAGE ESTIMATED GROSS WATER DEMAND				NEW WATER SUPPLY NEEDS
			2000	2020	2030	2040	
DAU 71: SANTA MARIA			138,709	148,900	150,112	151,248	
DAU 73: SAN ANTONIO			21,302	21,407	21,334	21,313	
DAU 74: SANTA YNEZ			79,597	84,604	85,045	85,336	
DAU 75: SOUTH COAST			53,869	59,642	63,274	66,542	
DAU 76: CUYAMA VALLEY			20,674	20,688	20,712	20,680	
SANTA BARBARA COUNTY			314,151	335,241	340,478	345,119	

NOTES ON TABLE:

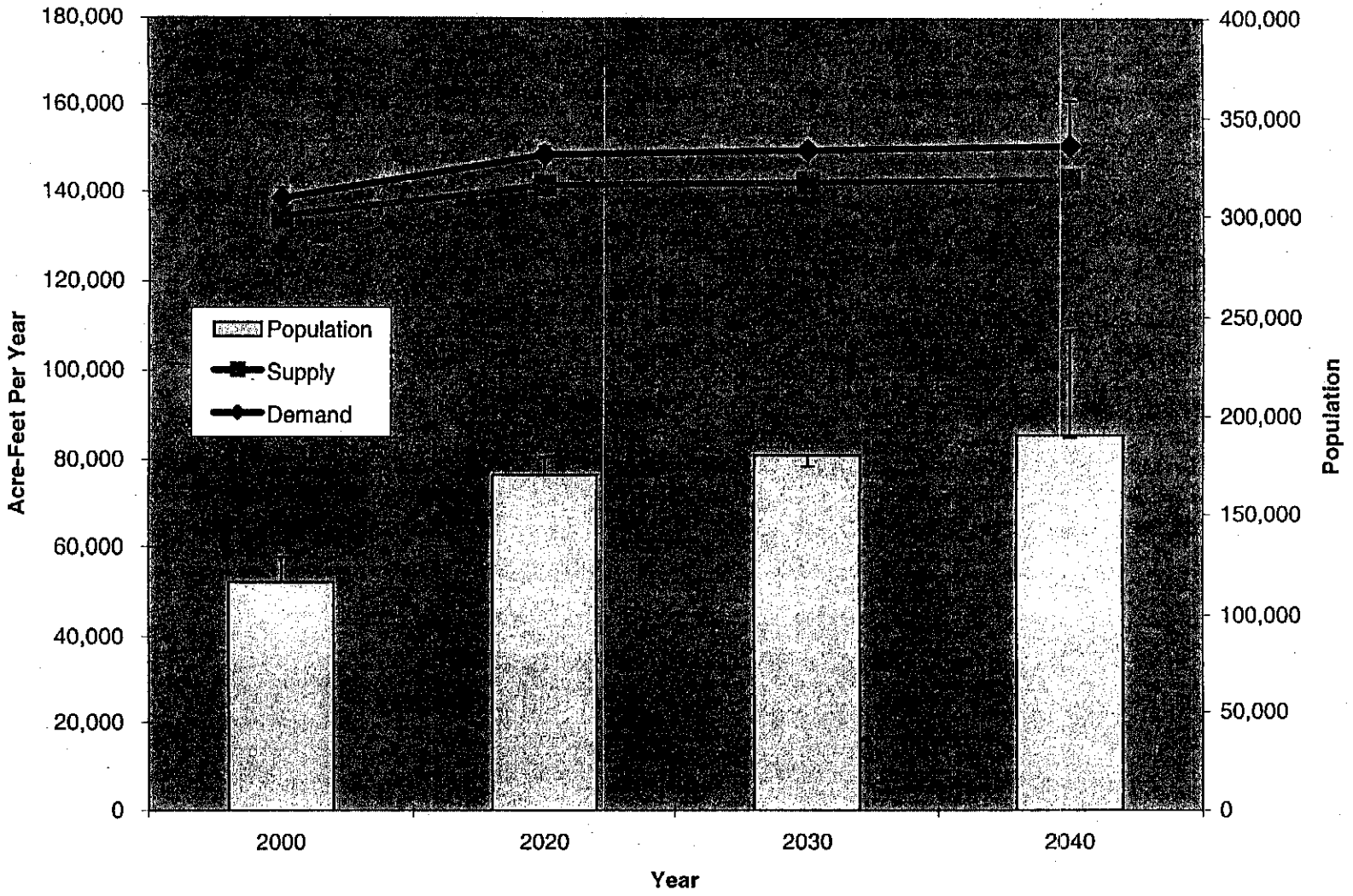
1. Average Annual Water Supply (with no return flows) is the sum of the surface water, state water, developed recycled water, and the average groundwater perennial yield. It does not include the return flows from M&I or agricultural water use. (From Table 7)

3. Average Available Total Water Supply With Return Flows is the average available water supply plus the total return flows for each DAU.

5. New Water Supply Needs is additional water that will be needed to balance water supply and demand. A positive number indicates new water needed to serve anticipated water demand. This demand could be met by importing additional water, managing the groundwater basin storage, overdrafting the groundwater basin(s) or developing a new water supply. A negative number indicates that the overall DAU water supply currently exceeds the demand. In any year, the actual water supply will vary depending on annual rainfall, potential state water delivery reductions, agricultural cropping patterns, and other factors. These calculations assume that the water conservation goals outlined in Table 4 of this report will be met.

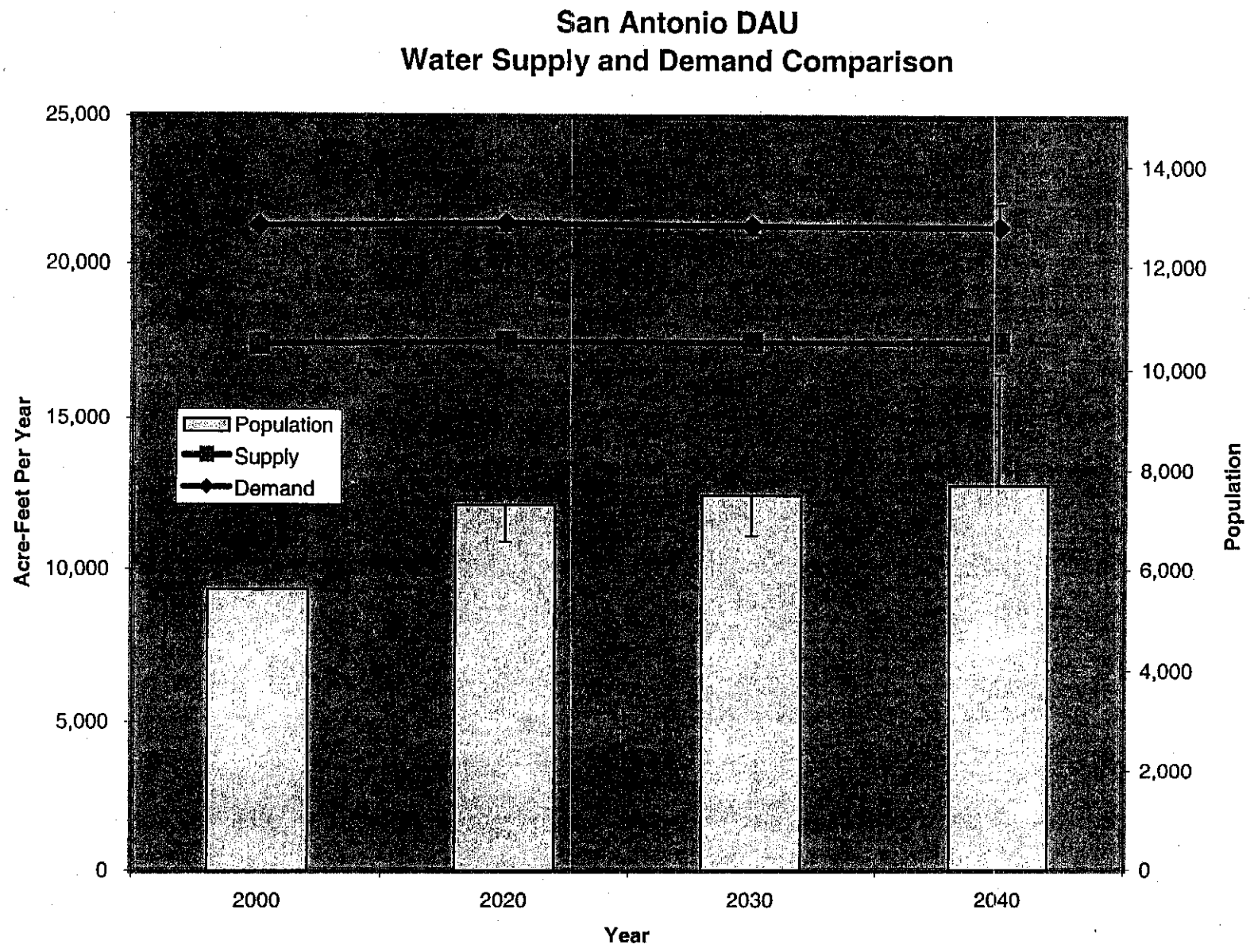
Graph 1

Santa Maria DAU
Water Supply and Demand Comparison



NOTE: Error Bars in this graph designate High and Low estimates for Population and Water Demand based on population forecasts listed in Table 2 of this report. They do not indicate standard deviation.

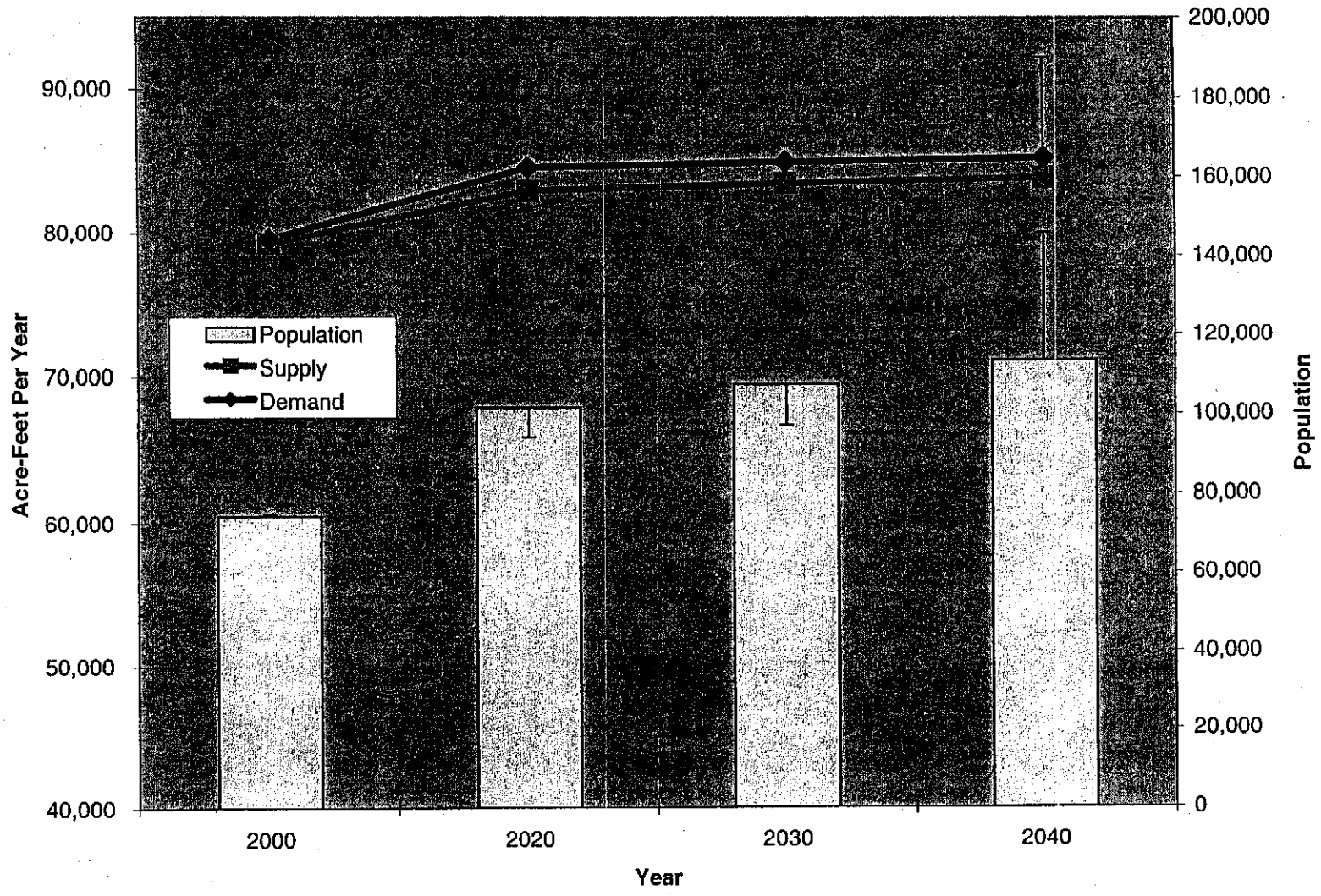
Graph 2



NOTE: Error Bars in this graph designate High and Low estimates for Population and Water Demand based on the population forecasts listed in Table 2 of this report. They do not designate standard deviation.

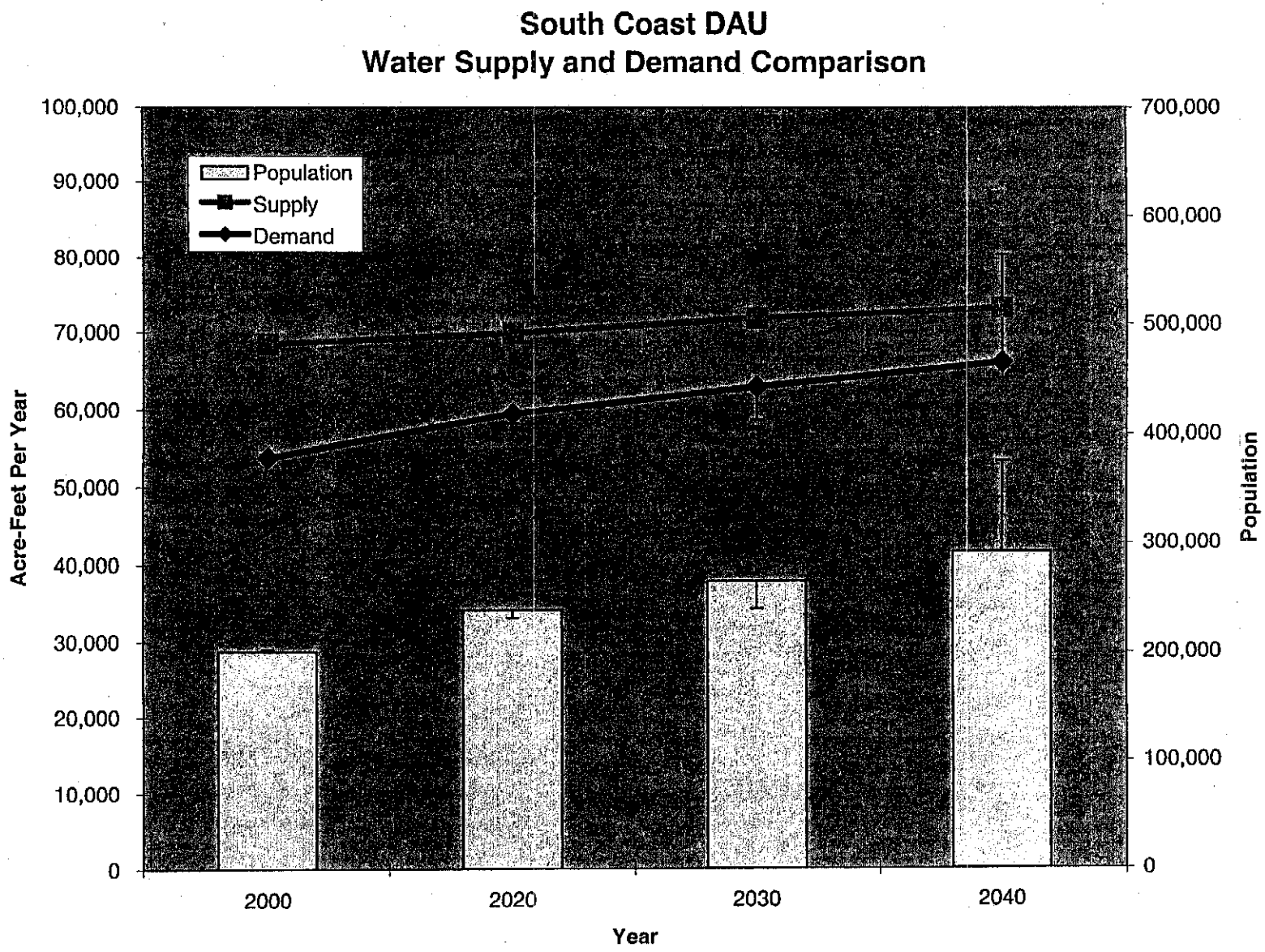
Graph 3

Santa Ynez DAU
Water Supply and Demand Comparison



NOTE: Error Bars in this graph designate High and Low estimates for Population and Water Demand based on the population forecasts listed in Table 2 of this report. They do not indicate standard deviation.

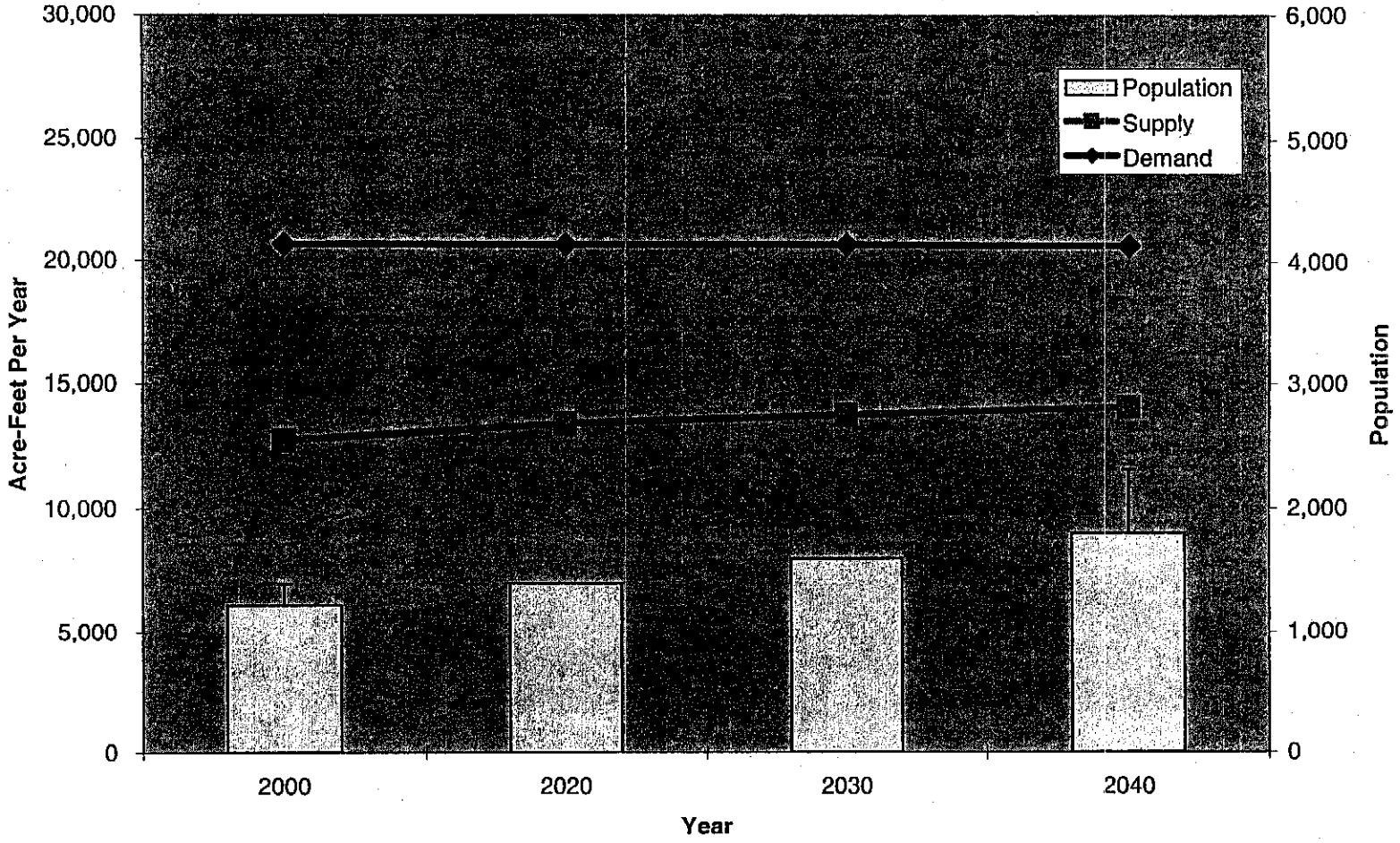
Graph 4



NOTE: Error Bars in this graph designate High and Low estimates for Population and Water Demand based on the population forecasts listed in Table 2 of this report. They do not indicate standard deviation.

Graph 5

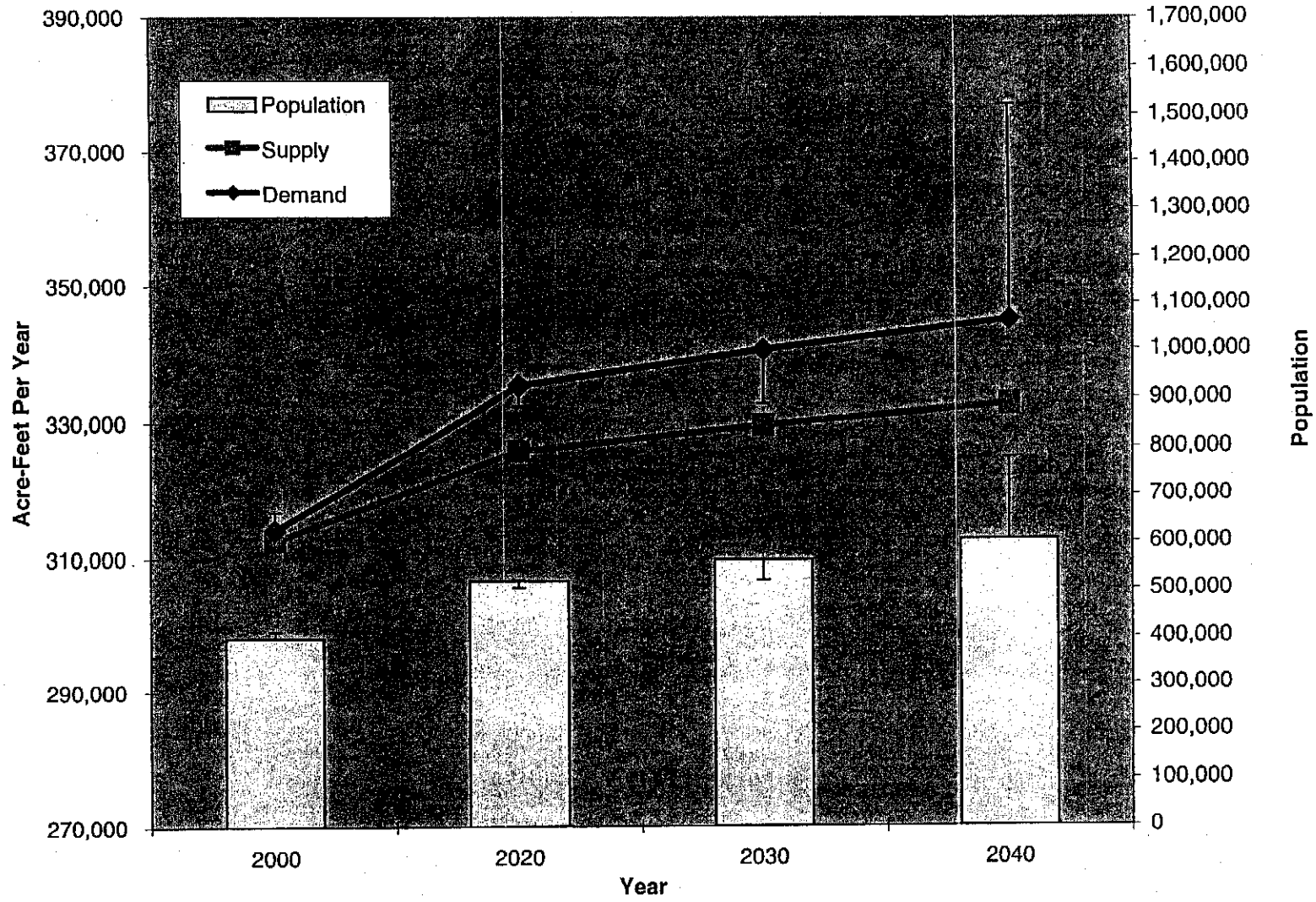
Cuyama Valley DAU
Water Supply and Demand Comparison



NOTE: Error Bars in this graph designate High and Low estimates for Population and Water Demand based on the population forecasts listed in Table 2 of this report. They do not indicate standard deviation.

Graph 6

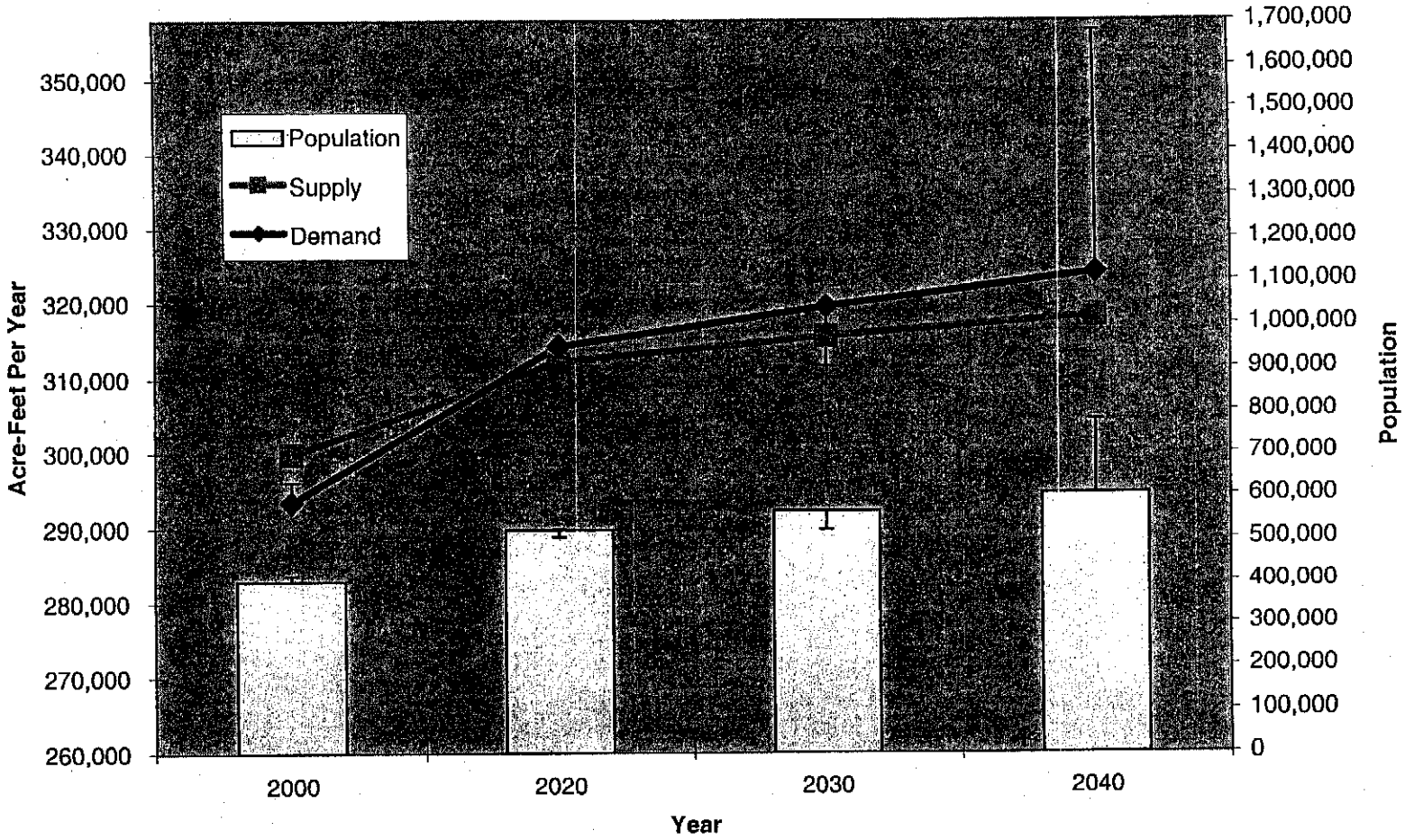
Santa Barbara County
Water Supply and Demand Comparison
(Cuyama DAU Information Included)



NOTE: Error Bars in this graph designate High and Low estimates for Population and Water Demand based on population forecasts listed in Table 2 of this report. They do not indicate standard deviation.

Graph 7

Santa Barbara County
Water Supply and Demand Comparison
(Cuyama DAU Information NOT Included)



NOTE: Error Bars for this graph designate High and Low estimates for Population and Water Demand based on population forecasts listed in Table 2 of this report. They do not indicate standard deviation.