

**2005**

**Urban Water Management Plan**

**Camrosa Water District**

**7385 Santa Rosa Road**

**Camarillo, California 93012**



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## Introduction

### Purpose and Need

One of the strategic objectives of the Department of Water Resources and the State is to encourage integrated regional water management planning to ensure adequate resources to meet future water needs. The Urban Water Management Planning Act (Act) encapsulates that objective and requires urban water suppliers to describe and evaluate sources of water supply, efficient uses of water, demand management measures and implementation strategies relative to each agencies service area. The resulting Urban Water Management Plan is intended to form the foundation for integrated regional planning for urban water supplies.

The Act requires that the Urban Water Management Plan (UWMP) developed by each agency be updated every five years and submitted to the Department of Water Resources for review. The required content of the UWMP specified by the Act is quite specific. The Department of Water Resources has added to the specificity by developing fifty-seven (57) tables for use in evaluating individual plans. An Urban Water Management Plan is required to be on file in order for a water supplier to be eligible for DWR administered State grants and loans and drought assistance.

This most recent Urban Water Management Plan prepared by the District was adopted by the Board of Directors on April 20, 2006. The purpose of this plan is to:

- update the data contained in the Urban Water Management Plan 2000,
- extend the planning horizon of that plan for an additional 5-year period,
- provide comprehensive assessment of Camrosa's water resource needs for a 20-year planning period, and
- provide the Department of Water Resources with information on present and future water sources and demands.

The plan has been coordinated with a number of agencies to ensure that data and issues are presented accurately. It fully complies with the content requirements of the Urban Water Management Planning Act and is integrated with the District's *Integrated Facilities Master Plan*.



## Agency Coordination

### Law

California Water code, Division 6, Part 2.6 Urban Water Management Planning, Section 10610 et seq.

10620 (d) (2) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable

10621. (b) Every urban water supplier required to prepare a plan pursuant to this part shall notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.

(c) The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640).

10642. Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan. Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of hearing to any city or county within which the supplier provides water supplies. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing, the plan shall be adopted as prepared or as modified after the hearing.

### Section Contents:

- ▶ Agency Coordination is outlined
- ▶ Proof of public hearing is provided
- ▶ A copy of the adoption resolution is attached

### Coordination within the District

This plan was developed within Camrosa Water District to coincide with the update of the District's *Integrated Facilities Master Plan*. It reflects the most recent Water Supply and Water Demand Analyses completed for the Master Plan and relies upon relevant information on the District's groundwater resources contained in the *Santa Rosa Groundwater Basin Management Plan Update*, prepared in 1997, a CSU, Northridge master's thesis by Joseph P. Schaaf entitled *Hydrogeology of the Tierra Rejada Groundwater Basin, Ventura County, California* as well as groundwater information for the Pleasant Valley, Santa Rosa and Tierra Rejada groundwater basins available from various sources within Ventura County. This plan has also been coordinated with *Draft Environmental Impact Report for the Renewable Water Resources Management Plan* currently under preparation by the District.

## Interagency Coordination

Of the approximately 30 square miles within the Camrosa Water District's boundaries, about 7 square miles lie within the City of Camarillo city limits, approximately 1.5 square miles lie within the boundaries of the City of Thousand Oaks and 21.5 square miles lie within the unincorporated area of Ventura County.

In 2005, approximately two-thirds of the total water supply available to the District is pumped from local groundwater aquifers (4,300 A/F) or is recycled water (9,300 A/F) available to meet irrigation demand. Nearly 85% of the recycled water was purchased from the City of Thousand Oaks and diverted from surface flows in Conejo Creek. The remaining one-third of the supply is imported through the Metropolitan Water District and its wholesale agency, Calleguas Municipal Water District. Two of the aquifers relied upon for groundwater supply (the Tierra Rejada Groundwater Basin and the Santa Rosa Groundwater Basin) lie wholly within the District's boundaries while the Fox Canyon aquifer system, which the District accesses for both water storage and recovery, is managed by the Fox Canyon Groundwater Management Agency.

Within the broader context of updating the Camrosa Water District *Integrated Facilities Master Plan*, the District conducted a series of public meetings with groups of constituents beginning more than 5 years ago for the purpose of discussing priorities relative to water quality, reliability and cost and of determining public opinion regarding issues related to water conservation and water recycling opportunities. Key information, pertinent to the development of the Urban Water Management Plan was extracted from these sessions and used in the preparation of this Plan.

In addition, the District has been engaged as a lead agency in the preparation of a Regional Watershed Management Plan for the Calleguas Creek Watershed. The broader Watershed Plan seeks to reduce reliance on imported water and overdrafted confined groundwater aquifers by expanding water recycling and reclaiming poor quality, unconfined groundwater supplies.

The Watershed Plan is being developed by a broad cross-section of stake holders and provides an umbrella under which this Urban Water Management Plan was developed. A *Renewable Water Resources Management Plan (RWRMP)*, prepared through consensus of the stakeholders involved in the Watershed planning effort, outlines an integrated set of facilities necessary to achieve the regional goals contained in that plan. The facilities envisioned in the plan reduce reliance on imported water supplies while improving water quality through the managed transport of salts out of the watershed. The goals and objectives of the RWRMP are reflected in the projections and projects incorporated in this UWMP.

Copies of the draft Urban Water Management Plan were circulated and coordinated with the following agencies with direct interests in District's plan:

- Calleguas Municipal Water District (wholesaler)
- City of Camarillo
- City of Thousand Oaks
- California State University - Channel Islands
- County of Ventura
- Pleasant Valley County Water District

Table 1 below summarizes the efforts Camrosa Water District has taken to include various agencies and citizens in its planning process.

|   | Participated in UWMP Development | Contacted for Assistance | Received Copy of Draft | Commented on the Draft | Sent a Notice of Intention to adopt | Attended public meetings |
|---|----------------------------------|--------------------------|------------------------|------------------------|-------------------------------------|--------------------------|
| <b>Wholesaler</b> (Calleguas MWD)                 |                                  | X                        | X                      |                        | X                                   |                          |
| <b>Retailer</b> (City of Camarillo)               |                                  | X                        | X                      |                        | X                                   |                          |
| <b>Retailer</b> (City of Thousand Oaks)           |                                  |                          | X                      |                        | X                                   |                          |
| <b>Wastewater Agency</b> (City of Camarillo WWTP) |                                  |                          | X                      |                        | X                                   |                          |
| <b>Wastewater Agency</b> (Camrosa WRF)            |                                  |                          | X                      |                        | X                                   |                          |
| <b>County of Ventura</b>                          |                                  |                          | X                      |                        | X                                   |                          |
| <b>CSUCI</b>                                      |                                  |                          | X                      |                        | X                                   |                          |
| <b>Pleasant Valley CWD</b>                        |                                  |                          | X                      |                        | X                                   |                          |
| <b>Public Library</b> (Camarillo)                 |                                  |                          | X                      |                        | X                                   |                          |

## Public Hearing and Plan Adoption

Camrosa Water District prepared this update to its Urban Water Management Plan over a period of several months during the same period that a new District *Integrated Facilities Master Plan* was being developed. Prior to the public hearing to review the plan and accept public input, notices were properly published in a local newspaper of general circulation within the District on April 5, 2006 and April 12, 2006 pursuant to Section 6066 of the Government Code

The updated UWMP was adopted by the Board of Directors on April 20, 2006 and submitted to the California Department of Water Resources, the California State Library, the County of Ventura and cities within the District's service area within 30 days of adoption as required by the Urban Water Management Planning Act. A copy of the resolution adopting the Urban Water Management Plan is attached as Appendix A. This plan includes all information necessary to meet the requirements of California Water Code Division 6, Part 2.6 (Urban Water Management Planning).



## Supplier Service Area

### Law

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:

10631. (a) Describe the service area of the supplier, including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in 5-year increments to 20 years or as far as data is available.

### Section Contents

- ▶ The water distribution systems are described.
- ▶ Climate characteristics are summarized.
- ▶ Demographic factors are outlined.
- ▶ Population projections are provided.

### Location and Facilities

Camrosa Water District was formed in 1962 under the California Water Law section 30000 et. seq. as the Camarillo County Water District. Its original purpose was to supply potable water within its established boundaries. Subsequently, the District expanded its boundaries and also its operations to include wastewater treatment services. The District's name has changed twice, first,



*Figure 1 – Potable Water Service Area – Camrosa Water District*

to the Camrosa County Water District in 1965 and then to its present name in 1987. Camrosa is among the largest water districts in Ventura County in number of connections and population served.

Camrosa Water District is located, as shown in Figure 1, in the southern portion of Ventura County, surrounded by the Cities of Camarillo, Simi Valley, Moorpark and Thousand Oaks. In terms of geographic features, the District is bounded by Calleguas Creek on the west, the Las Posas Hills on the north, the Simi Hills on the east and the Conejo Hills on the south. Some of these features help define the Terra Rejada, Santa Rosa and Pleasant Valleys. The District serves three classes of water and provides wastewater services to various portions of this area.

### **Potable Water Service**

Potable Water Service that meets all primary drinking water standards set forth by the California Department of Health Services is provided throughout the District as outlined in Figure 1. Potable water is primarily a blend of State Water Project water imported through Calleguas Municipal Water District and well water obtained from the Tierra Rejada, Santa Rosa and Fox Canyon groundwater basins. The backbone of the potable water system was constructed in the late 1960's and service has been extended into newly developed areas, primarily by developers, in the ensuing years.

Service was extended by agreement to CSUCI in 1981. Water is provided to CSUCI through a master meter located at the CSUCI property line. CSUCI owns and operates its own storage tanks and distribution system for the campus property.

In 2000, Camrosa acquired the distribution system of the Santa Rosa Mutual Water Company and began providing both potable and non-potable service to approximately 240 large parcels in Santa Rosa Valley. With the exception of the CSUCI system, Camrosa owns and operates all potable water distribution facilities within the District boundaries.

Camrosa's potable water distribution system consists of 130 miles of buried pipeline, with diameters up to 24 inches. The District also operates 10 reservoirs with a total storage capacity of 15.25 million gallons (or about 47 acre-feet). The elevation differences within the District's service area necessitate the use of five pumping stations to provide service to some customers. Roughly 74% of the potable water served by the District is used for residential, commercial, and industrial uses while the remaining water is used to serve agricultural and other irrigation needs. The District serves approximately 10,600 residential, municipal and industrial water connections and about 210 potable agricultural connections.

### **Non-Potable Recycled Water Service**

Non-potable water service, either Recycled Water from the Camrosa's Water Reclamation Facility (WRF) or Recycled Surface Water originating at the Hill Canyon Wastewater Treatment Plant and diverted from Conejo Creek is provided to portions of the District as outlined in Figures 2 and 3.

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Note: "Non-potable Recycled Water" originates from one or more of the following sources – (1) Recycled Water from Camrosa's Water Reclamation facility, (2) Recycled Water from the Camarillo Wastewater Treatment Plant, or (3) Non-potable Surface water diverted from the Conejo Creek which includes recycled water from the Hill Canyon Wastewater Treatment Plant several miles upstream from the diversion. For purposes of the discussion contained in this document, the sources are referred to collectively as "Non-potable Recycled Water".

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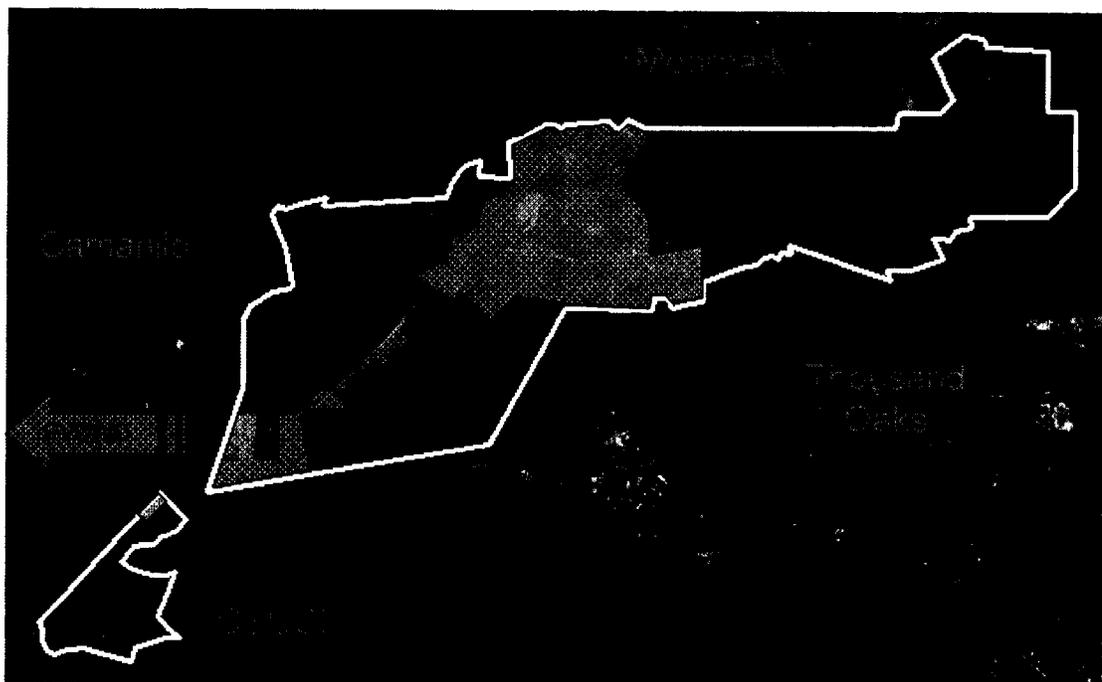


*Figure 2 –Recycled WRF Water Service Area - Camrosa Water District*

Non-potable Recycled water from the WRF is tertiary treated wastewater directly produced by the Camrosa Water Reclamation Facility. The water is disinfected using a sodium hypochlorite and is regulated by the State of California. The current service area for recycled water from this source, outlined in Figure 2, includes all of the parcels within the District which are located near the Camrosa Water Reclamation Facility including the CSUCI Campus as well as neighboring farmland, but does not include the parcels owned by the County of Ventura. Surplus recycled water from the WRF is also served outside the District boundaries to farmland in the intervening area between the main areal footprint of the District and the discontinuous area surrounding CSUCI.

Non-potable Recycled Surface Water became available to the District for the first time in 2002 upon completion of the Conejo Creek Diversion Project. Camrosa purchases the recycled surface water diverted from Conejo creek from the City of Thousand Oaks who discharges the tertiary treated water into the creek from their Hill Canyon Treatment Plant well upstream of the diversion. Recycled Surface Water diverted from Conejo creek for irrigation purposes is sometimes augmented with groundwater in some areas of the District to meet irrigation peak demand.

Under terms of the SWRCB water rights decision, recycled water diverted from Conejo Creek at the Camrosa Diversion structure is only available for use in the Camrosa and Pleasant Valley County Water District service areas. Figure 3 outlines the areas within the Camrosa service area that benefit from the availability of diverted water. The areas include the County-owned property near CSUCI, farmland surrounding the Adolfo Industrial Park, farmland near the diversion structure and adjacent to the non-potable irrigation system pipeline into Santa Rosa Valley and the large agricultural area that lies within the Santa Rosa Valley Greenbelt area. In addition, approximately 240 residential parcels formerly a part of the Santa Rosa Mutual Water Company are served with dual services and enjoy non-potable surface water to meet outdoor irrigation needs. Recycled surface water surplus to the District's needs is delivered to PVCWD and stored in the PVCWD reservoir located near Camarillo airport.



*Figure 3 - Recycled Surface Water Service Area – Camrosa Water District*

## Topography and Climate

The majority of the developed area within the District is in three connected valleys. The Tierra Rejada Valley connects to the Santa Rosa Valley through a narrow gap in the hills cut by Arroyo Santa Rosa. From there, the floor of the Santa Rosa Valley slopes gently down in a westerly direction to meet the broader Pleasant Valley near the western edge of the District. The Conejo Hills, which run along the Southern edge of the District, reach elevations of over 1,000 feet (about 700-800 feet higher than the adjoining valley floor). Owing to their steep nature, much of this hilly area remains undeveloped. To the north, the Las Posas Hills are not quite as steep as the Conejo Hills and have been subject to substantially more development.

The climate within Camrosa's service area is typical of Ventura County, Mediterranean in nature with generally mild temperatures and moderate rainfall. Based on precipitation stations maintained by Ventura County Flood Control District, Camrosa's service area receives an average of almost 15 inches of rainfall per year, varying from less than six inches in the driest years to more than 30 inches in the wettest years. On average, more than 90 percent of the annual rainfall occurs during the six-month period extending from November through April.

The average temperature fluctuates between an average low of about 44 degrees (January) and an average high of about 75 degrees (August). Table 2, based on the period of record 7/1/1948 through 7/31/2003 for Oxnard California, lists the monthly average climatic data for the Camrosa Water District Service area.

The Evapotranspiration averages for the service area are also contained in Table 2. These monthly averages are based on historical data obtained from Station 156 – Camarillo, CA for the period 2000 through 2005.

**Table 2.  
Monthly Average Climatic Data**

| Month        | Standard<br>Monthly Average<br>ET <sub>o</sub> | Monthly<br>Average<br>Maximum<br>Temperature<br>(F) | Monthly<br>Average<br>Minimum<br>Temperature<br>(F) | Monthly<br>Average Total<br>Precipitation<br>(in) |
|--------------|--|---|---|---|
| January      | 1.83   | 65.4  | 44.3  | 3.34  |
| February     | 2.20   | 66.3  | 45.3  | 3.35  |
| March        | 3.42   | 66.2  | 46.5  | 2.49  |
| April        | 4.49   | 67.8  | 48.7  | 1.03  |
| May          | 5.25   | 68.8  | 52.0  | 0.17  |
| June         | 5.67   | 71.2  | 55.1  | 0.05  |
| July         | 5.86   | 74.0  | 58.0  | 0.02  |
| August       | 5.61   | 75.0  | 58.8  | 0.05  |
| September    | 4.49   | 75.1  | 57.3  | 0.23  |
| October      | 3.42   | 74.1  | 53.4  | 0.29  |
| November     | 2.36   | 70.5  | 48.3  | 1.64  |
| December     | 1.83   | 66.6  | 44.6  | 2.11  |
| <b>Total</b> | <b>46.43</b>                                   | <b>70.1</b>   | <b>51.0</b>   | <b>14.77</b>                                      |

## Demographic Factors

The number of connections and volume of water served within the District has grown slowly, but steadily since the formation of the District. Ventura County was predominantly an agricultural area when the District was formed and has struggled to maintain a viable agricultural economy in spite of pressures to develop agricultural acreage into more intensive urban uses. Primarily in response to these pressures, the voters of Ventura County and the City of Camarillo approved separate Save OpenSpace and Agricultural Resources (SOAR) initiatives designed to protect and preserve the community's agricultural and greenbelt resources. In accordance with the initiatives and the resulting adopted ordinances, any lands designated as Agricultural, Open Space or rural on Ventura County's General Plan or on the City of Camarillo General Plan Map will remain so designated at least until December 31, 2020, unless the re-designation is approved by a vote of the people. Within Camrosa Water District SOAR will have its greatest impact by preserving the Santa Rosa Valley and Tierra Rejada Greenbelt areas. This plan assumes that existing zoning designations and land uses will continue through the year 2020 and, even if the SOAR initiative lapses the existing land use and zoning designations will not change appreciably in the five years between 2020 and 2025

### Development within the City of Camarillo

In 1981, voters in the City of Camarillo approved a ballot measure limiting residential development to 400 units per year. In November 2005, the City Council took action to extend the growth ordinance for a period of 10 years, to expire in 2015. Since there still appears to be broad support for this annual growth restriction within the Camarillo city limits and there is no reason to believe the ordinance will not be extended again when it nears expiration.

During the planning horizon of this Urban Water Management Plan, the City of Camarillo is expected to reach full buildout. While projected growth rate within the City limits is bound by the City's growth ordinance, as a practical matter few parcels remain to be developed in that portion of

the City that lies within the District service area and it is assumed that those parcels will be fully developed within the timeline of this UWMP.

### **Population Growth within the City of Camarillo**

Overall, the growth rate for the City of Camarillo is projected by the Ventura Council of Governments (VCOG) to average approximately 1.2% per year over the 20 year forecast period. On the whole, the City of Camarillo is growing at a slightly faster pace than the County of Ventura in its entirety. The pace is expected to slow considerably as the City approaches build-out. Growth in the unincorporated area of Ventura County is projected to be slightly less at 1.0 % per year while growth in the County as a whole, including all incorporated cities and the unincorporated areas, is projected to be slightly less than 0.9% per year.

### **Population Growth on the CSUCI Campus**

California State University is developing a new campus at the former Camarillo State Hospital south of Camarillo. Camrosa Water District serves the existing campus. Since its inception in 1999, the University has aggressively pursued a program of renovation and new development to support the establishment of a four-year educational institution. Over the next twenty-five years, the campus is expected to grow from about 2,500 full time equivalent students to 15,000 FTES.

In addition to redeveloping and expanding the former state hospital site into the core academic campus, CSU Channel Islands is constructing on-campus student housing and 350,000 square feet of research and development facilities for private companies interested in partnering with the University. A 344 bed dormitory has already been completed and an additional 460 bed dormitory is scheduled to be completed by 2007. The dormitory facilities will ultimately be expanded to a total of 2,000 beds over the next 20 years. Construction is underway on the University property north of the core campus to develop 900 units of rental and "for sale" housing, a 100,000 square foot retail town square, parks, a K-8 school for 600 children and other similar facilities. In 2005, 358 rental and "for sale" housing units have been constructed and completion of the remaining 542 units, the retail town square and similar facilities is expected to occur by November 2006.

Some private development is expected to occur near the new CSU Channel Islands campus to serve the students, faculty and employees at the on-campus research and development facilities. SOAR development restrictions will limit how much, if any, of the related services are built on the unincorporated rural land immediately surrounding the new campus. As a consequence, most of the additional private development will probably occur within the Camarillo city limits. Given the limited land available for development within Camarillo, the main impact will probably be to accelerate Camarillo's ultimate build-out.

### **Population Growth within the District**

The principal residential demand served by Camrosa comes from the eastern portion of the City of Camarillo. Only a portion of the City lies within the boundaries of the District; much of the District's service area is in the unincorporated Santa Rosa Valley. It is reasonable to assume, then, that the rate of growth within Camrosa Water District urban areas outside of the CSUCI campus will mirror projected urban growth rates for the City of Camarillo.

One might make a case for using the 1.0% growth rate projected for the unincorporated area of the County as well in estimating the non-urban growth within the District. However, the large greenbelt areas within Santa Rosa Valley and Tierra Rejada Valley will likely result in rural growth rates substantially less than that projected for the unincorporated areas of the County as a whole. It is expected that the growth rate for unincorporated areas within the District as a whole will likely average 0.75% or less as the Countywide SOAR initiative dampens growth in the Santa Rosa

Valley for the foreseeable future. An even lower growth rate of 0.25% for the greenbelt areas will be assumed for the 20-year planning horizon.

**District Population Projections**

Census information in GIS format was obtained from the County of Ventura to establish the actual District population as of the 2000 Census. That data provided population counts and average parcel density for those parcels included in each census tract.

Because the census tracts do not coincide with District boundaries, the census tract boundaries were overlaid with the service boundaries and, using a count of parcels contained both within the service area and the Census tract multiplied by the average parcel densities for that census tract, the estimated population for the District service area in the year 2000 was obtained.

Finally, actual development within each census tract that occurred between 2000 and 2005 was documented, and, using the same density factors, the population estimates were adjusted to derive 2005 population figures. Table 3 below contains the resulting population determinations and, using the expected annual growth rate for each area of the District, Population Projections for the District were determined as presented in Table 3.

| <b>Table 3.<br/>Population Projections</b> |             |             |             |             |             |             |
|--|-------------|-------------|-------------|-------------|-------------|-------------|
|  | <b>2005</b> | <b>2010</b> | <b>2015</b> | <b>2020</b> | <b>2025</b> | <b>2030</b> |
| Service Area Population                    | 27,851      | 31,733      | 33,928      | 35,225      | 36,523      | 37,000      |



## Water Sources

### Law

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:

10631 (b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a). If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:

(1) A copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management.

(2) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree.

For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.

(3) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

### Section Contents

- ▶ Water supply sources are identified
- ▶ Existing water supply volumes are quantified
- ▶ Planned water supply volumes are quantified
- ▶ Groundwater basins and their respective overdraft status are identified
- ▶ Groundwater pumping is quantified
- ▶ The Santa Rosa Basin Groundwater Management Plan is provided

### Water Supply Sources

The current sources of water supply for the customers and properties within the Camrosa Water District service area are a complex mix of public and private sources including imported state water; public and private wells in three groundwater basins; surface water diverted from Conejo Creek, recycled water from two wastewater treatment facilities. A single parcel, particularly agricultural parcels, may have more than one source of supply.

Approximately 85% of the water supply for Camrosa Water District residents and property owners is provided by Camrosa Water District. The remaining supply is provided by property owners who own their own wells. During the drought period that peaked in 1990, Camrosa Water District found that agricultural customers moved from public to private water sources to obtain sufficient supplies and to avoid restrictions imposed by public water supply agencies. Since that experience, the District has adopted a more comprehensive approach to water resource planning with many of the District's water analyses accounting for both public and private sources and demands.

Having multiple water sources gives the District considerable flexibility and improved reliability when compared to other nearby purveyors. Sources available to Camrosa Water District include imported water from Metropolitan Water District of Southern California (imported through Calleguas Municipal Water District), local groundwater and non-potable recycled water from various sources.

Camrosa has wells in the Tierra Rejada, Santa Rosa and Pleasant Valley groundwater basins. The Woodcreek well in the Pleasant Valley groundwater basin was completed in 1996 and has recently been operated as an Aquifer Storage and Recovery (ASR) facility that can inject discounted imported water in years when the water is available and pump out the injected water and local groundwater during months when District demand is high.

Imported and groundwater supplies have recently been expanded by adding surface water diverted by the Conejo Creek Project as well as the expanded use of recycled water from the Camrosa Water Reclamation Facility and, in the near future, recycled water from the Camarillo Sanitation District. These new sources of water have been developed to eliminate the need to restrict irrigation during times of potable water shortages.

In the year 2000, Camrosa supplied approximately 14,832 acre-feet/year of potable and non-potable water through its public distribution system. By 2005, the Conejo Creek Diversion Project had been placed in service by the District and private water diversions from Conejo Creek were eliminated. As a result, water supplied by Camrosa increased proportionately to approximately 22,557 acre-feet/year. This significant transfer of demand onto the District's public distribution system increased the proportion of water supplied by the District from approximately 57% percent in the year 2000 to approximately 85% percent of the total water used within the District boundaries in the years 2005.

## **Imported Water**

Imported water has been used to supplement the available local water supplies since 1965. Camrosa Water District has 12 active water turnouts that receive water by gravity feed from Calleguas Municipal Water District's Oxnard-Santa Rosa Feeder transmission lines. Blending imported water with local groundwater supplies has improved the water quality significantly. Camrosa blends imported water with groundwater to control the level of nitrates and Total Dissolved Solids (TDS) that would otherwise limit the use of groundwater.

Camrosa Water District purchases of imported water peaked in 1990, a drought year when the District purchased 12,900 acre-feet of imported water from Calleguas MWD. Faced with dramatically rising water costs, several large agricultural customers shifted from Camrosa to alternative private sources such as wells or private surface water diversions. Even though the

drought continued into early 1992, imported water purchases in 1991 totaled only 7,100 acre-feet. Since 1991, imported water purchases have stayed below 8,900 acre-feet per year with the exception of FY 1998-99 a particularly dry year locally.

During the 1986-1992 drought, the State Water Project was not able to meet the total water demand of all its contract member agencies. Calleguas Municipal Water District, like all of Metropolitan Water District member wholesalers, instituted a rationing program to reduce purchases by 30 percent. Calleguas chose to charge significant surcharges for water purchases greater than 80 percent of the 1989-90 domestic levels and greater than 50 percent of the 1989-90 agricultural levels. Since the last major drought, Metropolitan Water District and its member wholesale purveyors such as Calleguas MWD have developed local water sources to insulate their customers from such large cutbacks during future droughts. Recent projects completed by Calleguas MWD include a treatment plant to treat water stored in Lake Bard, the Las Posas Aquifer Storage and Recovery well field, an interconnection with the Los Angeles Department of Water and Power, and Camrosa's Conejo Creek Diversion Project.

## **Groundwater**

Camrosa Water District covers three major groundwater basins including Tierra Rejada Basin in the eastern portion of the District, the centrally located Santa Rosa Basin and the Pleasant Valley Basin in the western portions of the District. A fourth groundwater source is the shallow perched groundwater aquifer of poorer quality at the base of the Conejo and Santa Monica Mountains adjacent to the Pleasant Valley Basin.

### **Tierra Rejada Basin**

The Tierra Rejada Basin is about 1,900 acres in size. The watershed area recharging the basin is about 4,500 acres. About two-thirds of the basin is within the Camrosa Water District boundaries. One of the few studies conducted in the Tierra Rejada basin was a 1998 Master's thesis written by Joseph Schaaf. In his studies, Schaaf estimated the available storage in the Tierra Rejada Basin to be approximately 82,000 acre-feet. Inflows and outflows for the Tierra Rejada Basin currently total about 6,200 acre-feet in an average rainfall year. Current pumping rates of 1,900 acre-feet/year for private agricultural wells and an additional 500 acre-feet/year for Camrosa Water District brings the current groundwater production to approximately 2,400 acre-feet/year for the Tierra Rejada Basin. In the most recent year of record, Camrosa pumped 497 acre-feet from the basin;. Pumping is expected to continue to average 500 acre-feet per year during the planning period.

### **Santa Rosa Basin**

The Santa Rosa Groundwater Basin underlies about 3,800 acres (5.9 square miles) and is wholly contained within the District boundaries. In 1975, the California Department of Water Resources (DWR) estimated the total groundwater storage capacity of the Santa Rosa Basin to be 94,000 acre-feet. In 1994, a detailed groundwater basin model was developed in conjunction with the implementation of the Santa Rosa Groundwater Management Plan. That model estimated the groundwater capacity to be 170,000 acre-feet and recoverable storage to be about 69,000 acre-feet. While the model estimated the basin safe yield at 4,700 acre-feet/year based on well records for 1989 to 1995, the Santa Rosa Basin Groundwater Management Plan Council adopted a more conservative safe yield estimate of 4,200 acre-feet/year since it was not readily apparent at the time that inflows would be sustained at the rate assumed in the model. In his 1998 dissertation, however, Schaaf estimated the outflow from the Tierra Rejada Basin into the Santa Rosa Basin was 540 acre-feet per year, which is significantly higher than the 300 acre-feet/year assumed in the 1997 model.

In the westernmost one-third, the Santa Rosa Basin overlies the Fox Canyon Aquifer and, in this area, comes under the jurisdiction of the Fox Canyon Groundwater Management Agency. The Fox Canyon GMA has established a program to bring basin pumping and recharge into balance within the over-drafted Fox Canyon Aquifer. Allocations have been established for each well based upon historical pumping records for 1985 to 1989. The allocations are reduced by 5% every five years until they reach 75 percent of historical extraction levels in the year 2010. An alternative to historical allocations has been adopted for agricultural pumpers. Agricultural wells are allowed to pump more than their historical allocations as long as the water pumped does not exceed the required irrigation water at an 80 percent efficiency rate for the crop under cultivation.

While Camrosa Water District does not have any wells within the lower Santa Rosa Basin, each of the private well owners report their pumped volumes to the GMA semiannually. Because high penalties are applied to extractions above allowed levels, pumpers normally stay within their allocations.

### **Pleasant Valley Basin**

The western portion of the Camrosa Water District is within the Pleasant Valley Groundwater Basin. Camrosa has one well, the Woodcreek Well, completed in the Fox Canyon Aquifer within the basin. In 1975, DWR estimated the total groundwater storage capacity of the Pleasant Valley Basin to be 1,886,000 acre-feet. Between 198,000 and 247,000 acre-feet are recoverable. Although the perennial yield of this basin has not yet been determined, the Fox Canyon GMA estimates the annual basin overdraft was 3,500 acre-feet in 1990 and that the overdraft would be reduced to 2,800 acre-feet by 2000 as a result of mandatory reductions in pumping. The basin plan under which the Fox Canyon Aquifer is managed is under revision. New estimates of annual overdraft are expected to be incorporated in the revision scheduled for completion sometime in 2006.

The Fox Canyon GMA's allocation for the Woodcreek Well is based on an allowance for the residential development overlying the Fox Canyon Aquifer at a rate of 1 acre-foot per acre of land developed. As of July 2000, Camrosa's allocation was 407 acre-feet/year. This allocation increased to approximately 807 acre-feet/year by the end of 2005. It is expected to slowly increase to a maximum of 900 acre-feet/year as a result of additional development and then remain relatively stable through 2030. Because this is an annual allocation, water not pumped cannot be carried over from one year to the next.

| <b>Basin Name</b>  | <b>AF/Y</b> |
|--------------------|-------------|
| Fox Canyon Aquifer | 807         |

The District has also operated the Woodcreek Well as an aquifer storage and recovery (ASR) facility whenever surplus state water is available during the winter months. Although not available every year, Camrosa has injected up to 300 acre-feet of imported water a year. The injected water is later pumped during the high water demand months or left stored for future years. As of January 1, 2000, Camrosa had banked 588 acre-feet of injected imported water in the Fox Canyon aquifer but has used most of the banked supply in the intervening years. At the end of 2005, 23 acre-feet remained in storage. As the cost of imported water continues to rise, operating the Woodcreek Well as an ASR facility has become uneconomical. It is not likely that any significant quantity of additional water will be injected until such an enterprise becomes economical again.

**Perched Aquifer**

During the late 1930's through 1979, Camarillo State Hospital, with a patient population of nearly 1000, relied exclusively upon water from a perched aquifer located at the base of the Conejo Hills, outside the boundaries of the Pleasant Valley Basin. The water provided for extensive irrigation needs of the 634-acre site, and potable supplies to the hospital and onsite residential area. In 1979, the state contracted with Camrosa Water District to supply water to the site when state mandated water quality standards became difficult to meet. The supply has not been used regularly in the interim.

Water quality tests have shown that the quality of the water in the perched aquifer has not improved in the intervening years. Camrosa has determined, however, the water could be put to beneficial use if blended with reclaimed water or if desalinated for potable use. Accordingly, the District has entered into an agreement with the California State University – Channel Islands, the new owner of the former state hospital site, to lease a perched zone well owned by the University. Plans are underway to develop a project to rehabilitate the well and begin desalinating the brackish water contained in the perched zone as an alternate supply for the University Campus. It is expected that by 2010, a 1MGD desalination facility will be fully functional and delivering a new supply of potable water within the District.

Table 6 provides a summary of groundwater pumping for the 5-year period ending in 2005.

| <b>Basin</b>    | <b>2000</b> | <b>2001</b> | <b>2002</b> | <b>2003</b> | <b>2004</b> |
|-----------------|-------------|-------------|-------------|-------------|-------------|
| Tierra Rejada   | 359         | 375         | 359         | 545         | 512         |
| Santa Rosa      | 2334        | 2537        | 2860        | 3546        | 2801        |
| Fox Canyon      | 539         | 627         | 792         | 1375        | 1341        |
| Perched Aquifer | 0           | 0           | 0           | 0           | 0           |

Table 7 summarizes projected pumping, in 5-year increments, for the period 2010 to 2030. The projected pumping incorporates the growth in allocation available in the Fox Canyon Aquifer discussed above, the implementation of the 1MGD desalination plant to put brackish groundwater in the perched aquifer to beneficial use and a 1MGD desalination plant to improve the supplies available from the Santa Rosa Basin.

| <b>Basin</b>                   | <b>2010</b>  | <b>2015</b>  | <b>2020</b>  | <b>2025</b>  | <b>2030</b>  |
|--------------------------------|--------------|--------------|--------------|--------------|--------------|
| Tierra Rejada                  | 500          | 500          | 500          | 500          | 500          |
| Santa Rosa                     | 3233         | 3758         | 4283         | 4283         | 4283         |
| Fox Canyon                     | 800          | 850          | 900          | 900          | 900          |
| Perched Aquifer                | 1050         | 1050         | 1050         | 1050         | 1050         |
| <b>% of Total Water Supply</b> | <b>17.9%</b> | <b>18.4%</b> | <b>18.8%</b> | <b>18.6%</b> | <b>18.4%</b> |

Groundwater will remain an important water supply, representing roughly 18 percent of the total supply used within the District.

### **Recycled Water from Camrosa WRF**

Camrosa Water District owns and operates a 1.5 million-gallon-per-day Wastewater Reclamation Facility (WRF). The plant effluent is discharged to Camrosa's storage ponds which have a storage capacity of 300 acre-feet. From there the water is delivered as recycled irrigation water.

The WRF discharged about 1,650 acre-feet of effluent in calendar year 2005. Almost half of the flow, (or about 715 acre-feet of recycled water) was distributed to several agricultural properties near the plant and to CSUCI. In addition, Camrosa provides surplus recycled water to properties outside the District boundaries; the remaining effluent is discharged to Conejo Creek. In 2005, approximately 90 Acre/feet of effluent was discharged into the creek during the severe storms experienced in January and February 2005. This was the only discharge during the 5-year period between 2001 and 2005.

In 2000, effluent flow from the WRF was 1407 acre-feet. That flow has grown to 1650 acre-feet (17%) largely because of the growth at the CSUCI campus. Development on the campus is expected to continue at a relatively fast pace and plant flows can be expected to reach 2,200 acre-feet/year by the year 2020. The WRF is being expanded to accommodate 2.25 MGD. Accordingly forecasts for recycled water contained in this document project a recycled water availability of 2,200 acre-feet per year by the year 2030. The District intends to use all of the plant effluent with no discharges to the creek except in the wettest years. Recycled water is discussed in more detail in the following section.

### **Recycled Water from CamSan**

On December 15, 2005, an the District executed an agreement with the Camarillo Sanitation District (CamSan) to allow delivery of up to 7,500 acre-feet per year of tertiary treated recycled water Camrosa's Non-potable Recycled Water distribution system. The agreement is contingent upon construction of additional facilities by CamSan to treat the effluent to "tertiary" levels and to deliver the water to Camrosa. Construction is underway to upgrade the CamSan WWTP with tertiary filtration equipment and equip the plant with pumping facilities and pipelines to deliver the recycled water. Initial deliveries are expected to occur in 2007. It is expected that as much as 5,000 acre-feet will be available initially and the flows will gradually build over the planning period to 7,500 acre-feet as the City of Camarillo nears build-out.

### **Recycled Surface Water**

In 2002, recycled surface water from the Hill Canyon Waste Water Treatment Plant became available to the District for the first time. In 2005, the District diverted 7,862 acre-feet of recycled surface water for delivery through the Non-potable Recycled Water Distribution System. These quantities are expected to grow, mirroring growth in the Conejo Valley with attendant increases in wastewater discharges from the Hill Canyon WWTP. By 2030, it is expected that 11,529 acre-feet of non-potable recycled surface water will be available to the District. A more detailed discussion of the District's extensive use of recycled water is contained in the section entitled "Recycled Water Plan".

## **Summary of Current and Projected Water Supplies**

The total water supply potentially available to Camrosa Water District are estimated to be approximately 22,557 acre-feet in 2005. These sources reflect the completion of the Conejo Creek project, an increase in Camrosa's Fox Canyon GMA credit allocation as a result of lands being converted from agriculture to urban use, and additional recycled water as sewer flows have increased with new development. By 2010, Camarillo Sanitation District will have completed installing tertiary treatment at its WWTP and, by agreement, will begin supplying an additional 5,000 acre-feet of recycled water to the District. Small pockets of additional urban growth will increase GMA credits by another 100 acre-feet during the planning period. Potential new supplies will be developed by treating water pumped from Santa Rosa Groundwater Basin and desalinating brackish groundwater in the Perched Zone. Water supplies are projected to grow to 36,662 acre-feet by the year 2030. Table 3 summarizes the current and projected water supplies available within the District.

**Table 7.  
Current and Projected Water Supplies  
AF/Year**

| <b>Water Supply Sources</b>                 | <b>2000</b> | <b>2005</b> | <b>2010</b> | <b>2015</b> | <b>2020</b> | <b>2025</b> | <b>2030</b> |
|---|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| <b>Purchased from wholesaler</b>            |             |             |             |             |             |             |             |
| Calleguas MWD - Direct Delivery             | 8,900       | 8,703       | 8,700       | 8,700       | 8,700       | 8,700       | 8,700       |
| <b>Supplier produced groundwater</b>        |             |             |             |             |             |             |             |
| Tierra Rejada Basin                         | 410         | 497         | 500         | 500         | 500         | 500         | 500         |
| Santa Rosa Basin                            | 3,118       | 2,866       | 3,233       | 3,758       | 4,283       | 4,283       | 4,283       |
| Pleasant Valley Basin                       | 697         | 979         | 800         | 850         | 900         | 900         | 900         |
| Perched Zone                                | 0           | 0           | 1,050       | 1,050       | 1,050       | 1,050       | 1,050       |
| <b>Supplier produced surface diversions</b> |             |             |             |             |             |             |             |
| Recycled HCWWTP                             | 0           | 7,862       | 9,939       | 10,336      | 10,734      | 11,131      | 11,529      |
| Transfers                                   | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| Exchanges In                                | 0           | 0           | 0           | 0           | 0           | 0           | 0           |
| <b>Recycled Water</b>                       |             |             |             |             |             |             |             |
| Camrosa WRF                                 | 1,407       | 1,650       | 1,900       | 2,000       | 2,100       | 2,150       | 2,200       |
| CamSan WWTP                                 |             |             | 5,000       | 6,250       | 7,500       | 7,500       | 7,500       |
| <b>Desalination</b>                         |             |             |             |             |             |             |             |
| Other                                       |             |             |             |             |             |             |             |
| <b>Total</b>                                | 14,832      | 22,557      | 31,122      | 33,444      | 35,767      | 36,214      | 36,662      |



## Transfer or Exchange Opportunities

### Law

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:

10631 (d) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

### Section Contents

- ▶ Opportunities for water exchange or transfer is discussed.

### Pumping Allocation in the Fox Canyon Aquifer

As Camrosa Water District accepts new properties for potable service, existing ordinances require that groundwater wells on the property be abandoned and water rights dedicated to the District. If the well is completed in the Fox Canyon Aquifer, historical allocations in the Fox Canyon can be transferred to the District. The District's pumping entitlement in the Fox Canyon could be adjusted upward as development occurs and is projected to increase by approximately 100 AF by the end of the planning period.

| <b>Table 8.<br/>Transfer &amp; Exchange Opportunities</b> |            |
|---|------------|
| <b>Opportunity</b>  | <b>A/F</b> |
| Assumption of Fox Canyon GMA Credits                      | 100        |

The potential of developing new sources of supply through both short term and long-term potable water exchanges or potable water transfers is recognized. The District remains vigilant to exchange and transfer opportunities and would incorporate feasible strategies into its long range plan should such opportunities present themselves.



## Planned Water Supply Projects and Programs

### Law

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:

(h) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program

(i) Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply

### Section Contents

- ▶ Water supply projects and programs that may be undertaken by the District are outlined.
- ▶ Opportunities for future development of desalinated water are described

For the past several years, Camrosa Water District has made a concerted effort to bring non-potable water online to replace the use of imported water for irrigation purposes. In doing so, the District has become less dependent upon imported sources and has become more “drought-proof” in the process. In 2005, more than 9,500 acre-feet of non-potable recycled water was delivered to both M&I and Agricultural irrigators. Those deliveries represent a 7-fold increase over the non-potable water recycled water available for delivery just 5 years earlier. During the next 25 years, that number is expected to more than double as the District optimizes the distribution of available recycled water.

By 2030, Camrosa expects to integrate nearly 7,500 acre-feet of tertiary treated recycled water produced by the CamSan WWTP into its non-potable recycled water supply and expansion of Camrosa’s WRF to accommodate growth at CSUCI and elsewhere in the District will add an additional 1,200 acre-feet per year. Growth in the City of Thousand Oaks, with the attendant increase in wastewater discharges, will increase diversions from Conejo Creek by an additional 3,000 acre-feet.

Development of new potable sources is also a priority. Design of a brackish water desalination facility to put otherwise unusable water in a perched aquifer near CSUCI will provide more than 1,000 acre-feet per year of potable water. The water represents a new source of potable water at the southern-most reaches of the District and will serve as an alternate supply to CSUCI. Desalination of high TDS water in the Santa Rosa Basin will reduce the demand for imported water for blending purposes. Both of these sources will be a valuable addition to the potable supply available to the District.

Table \_\_ below provides a summary of projects that are expected to be completed during the planning horizon of this document along with their expected completion dates and expected yield.

| Project Name<br>(Projected<br>Implementation Year)   | Normal<br>Water Year                | Single Dry<br>Water<br>Year         | Multiple Dry Water Years            |                                     |                                     |
|--|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
|  |                                     |                                     | Year 1                              | Year 2                              | Year 3                              |
| 1.* Integration of Camarillo Sanitary District Recycled Water with Camrosa Recycled Water Distribution System (2007) <sup>(1)</sup>  | 5000 to 7500<br>(Year 2007 to 2020) |
| 2.* Eastern Pleasant Valley Basin Brackish Groundwater Reclamation (2007) <sup>(2)</sup>   | 1000                                | 1000                                | 700                                 | 700                                 | 700                                 |
| 3.* Expansion of the Camrosa Water Reclamation Facility Expansion (2006-2010) <sup>(3)</sup>   | 1200                                | 1200                                | 1200                                | 1200                                | 1200                                |
| 4.* Santa Rosa Basin Groundwater Reclamation (2020) <sup>(4)</sup>   | 1000                                | 1000                                | 700                                 | 700                                 | 700                                 |
| Notes on Supply Projects:<br>(1) The range of supply reflects current flows and future design capacity of the Camarillo Water Reclamation Plant, 4.5 MGD and 6.75 MGD respectively, rounded to the nearest 100 acre-feet.<br>(2) This supply represents the development of a brackish water treatment facility for an existing well in the vicinity of California State University, Channel Islands, with a capacity for 1 MGD product water.<br>(3) This supply represents the phased expansion of capacity in the Camrosa Water Reclamation Facility from its current capacity of 1.5 MGD (~1600 AF/Y) to a future design capacity of 2.5 MGD (~2800 AF/Y). The additional 1200 AF/y will be realized by the end of the planning horizon as flows to the plant increase in proportion to development at CSUCI and in the District in general.<br>(4) Santa Rosa Basin Groundwater Reclamation: This supply represents ~1 MGD of additional supply that will be available when advanced treatment of Santa Rosa Basin groundwater is implemented in conjunction with construction of a brine disposal facilities. |                                     |                                     |                                     |                                     |                                     |

## Water Supply Reliability

### Law

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:

10631 (c) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following:

(1) An average water year, (2) A single dry water year, (3) Multiple dry water years.

For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.

10631 (k) Urban water suppliers that rely upon a wholesale agency for a source of water, shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water -year types in accordance with subdivision (c). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c).

### Section Contents

- ▶ Projected District demands for Wholesale Water are provided.
- ▶ Existing and planned sources for Wholesale Water are identified.
- ▶ Reliability of wholesale water supplies are described.
- ▶ The reliability and vulnerability of the water supply to seasonal or climatic shortages is described.
- ▶ Water supply volumes for average, single dry, and multiple dry water years are provided.
- ▶ Plans to replace inconsistent sources with alternative sources or water demand management measures are discussed.

The District is fortunate in having multiple supplies of highly reliable water to draw upon to meet demands. The District uses water from wells completed in three separate aquifers, State Water Project water imported from Calleguas Municipal Water District, surface water diverted from Conejo Creek and recycled water from the District's Water Reclamation Facility.

### Potable Supplies

Approximately one-third of the potable water distributed within the District is pumped from wells while the remaining two-thirds is imported water purchased from the Metropolitan Water District through its wholesaler Calleguas Municipal Water District. At the peak of the drought in the early

1990's, 30% cutbacks were implemented by Metropolitan and Calleguas to deal with shortages realized during the drought. Demand side management was necessary to deal with the cutbacks imposed.

Since 1991, however, Metropolitan has made significant investments in conservation, water recycling, storage and improved supplies. Groundwater storage programs with Semitropic Water Storage District and Arvin-Edison Water Storage District increase Metropolitan's out-of-region storage capacity of state water project water by 600,000 acre-feet. Additional groundwater storage programs have been established with the San Bernardino Valley MWD, and Kern-Delta Water District that will expand that capacity further. The completion of Diamond Valley Reservoir has added 800,000 acre-feet of supply to southern California's mix of resources available to meet dry year needs. The adoption of a "Water Surplus and Drought Management" (WSDM) Plan in 1999 by the Metropolitan Board of Directors has resulted in more effective management of water resources to further improve the reliability of water deliveries by Metropolitan Water District. As a result of these investments and others like them, Metropolitan has indicated in its 2005 Urban Water Master Plan that it fully expects to be 100 percent reliable in meeting all non-discounted non-interruptible demands throughout the next twenty five years.

The following table outlines the projected reserves for Metropolitan Water District for Average, Dry Year and Multiple Dry Year conditions:

| <b>Normal Year</b>                | <b>2005</b> | <b>2010</b> | <b>2015</b> | <b>2020</b> | <b>2025</b> | <b>2030</b> |
|-----------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Supply Totals                     | 2,542.8     | 2,733.9     | 2,986.4     | 2,920.1     | 2,918.6     | N/A         |
| Demand totals                     | 2,169.3     | 2,096.1     | 2,266.5     | 2,487.9     | 2,618.7     | N/A         |
| <b>Reserves</b> (Supply – Demand) | 373.5       | 637.8       | 719.9       | 462.2       | 299.9       | N/A         |
| <b>Reserves as a % of Demand</b>  | <b>17%</b>  | <b>30%</b>  | <b>31%</b>  | <b>17%</b>  | <b>9%</b>   | <b>N/A</b>  |
|                                   |             |             |             |             |             |             |
| <b>Single Dry Year</b>            |             | <b>2010</b> | <b>2015</b> | <b>2020</b> | <b>2025</b> | <b>2030</b> |
| Supply Totals                     | 2,489.7     | 2,957.0     | 3,392.8     | 3,420.2     | 3,396.6     |             |
| Demand totals                     | 2,169.3     | 2,096.1     | 2,266.5     | 2,487.9     | 2,618.7     |             |
| <b>Reserves</b> (Supply – Demand) | 320.4       | 860.9       | 1,126.3     | 932.3       | 777.9       |             |
| <b>Reserves as % of Demand</b>    | <b>14%</b>  | <b>41%</b>  | <b>50%</b>  | <b>37%</b>  | <b>30%</b>  | <b>N/A</b>  |
|                                   |             |             |             |             |             |             |
| <b>Multiple Dry Years</b>         |             | <b>2010</b> | <b>2015</b> | <b>2020</b> | <b>2025</b> | <b>2030</b> |
| Supply Totals                     | 2,507.6     | 3,077.5     | 3,459.2     | 3,473.3     | 3,459.5     |             |
| Demand totals                     | 2,245.2     | 2,175.6     | 2,320.9     | 2,534.1     | 2,688.5     |             |
| <b>Reserves</b> (Supply – Demand) | 262.4       | 901.9       | 1,138.3     | 939.2       | 771.0       |             |
| <b>Reserves as % of Demand</b>    | <b>12%</b>  | <b>41%</b>  | <b>49%</b>  | <b>37%</b>  | <b>29%</b>  | <b>N/A</b>  |

Since 1991, Calleguas Municipal Water District, also, has implemented a strategy for meeting rising water demands in its service area by implementing both regional and local supply augmentation and demand management programs. The Las Posas Aquifer Storage and Recovery Project has been an ongoing project that will store up to 300,000 AF of imported water for use during drought. The project is approximately 70% complete and has an extraction capacity of approximately 70 cubic feet per second (CFS). It is anticipated that a maximum extraction rate of 100 CFS will be available upon completion of the project. Expansion of Lake Bard Water

Treatment Plant to 100 CFS has been completed. Finally, Calleguas has invested in regional recycling projects to reduce demand on imported water.

The following table outlines the projected reserves for Calleguas Municipal Water District for Average, Dry Year and Multiple Dry Year conditions:

| <b>Table 11.<br/>Projected Reserves for Calleguas Municipal Water District<br/>(Thousands of Acre-Feet)</b> |               |             |             |             |             |             |
|---|---------------|-------------|-------------|-------------|-------------|-------------|
| <b>Normal Year</b>  | <b>2005</b>   | <b>2010</b> | <b>2015</b> | <b>2020</b> | <b>2025</b> | <b>2030</b> |
| Supply Totals   | 174.7         | 185.4       | 199.2       | 213.2       | 224.8       | 236.9       |
| Demand totals   | 171.2         | 184.1       | 198.7       | 210.3       | 221.9       | 232.4       |
| <b>Reserves</b> (Supply – Demand)   | <b>3.5</b>    | <b>1.3</b>  | <b>0.5</b>  | <b>2.9</b>  | <b>2.9</b>  | <b>4.5</b>  |
| <b>Reserves as a % of Demand</b>  | <b>2.0%</b>   | <b>0.7%</b> | <b>0.2%</b> | <b>1.4%</b> | <b>1.3%</b> | <b>1.9%</b> |
|   |               |             |             |             |             |             |
| <b>Single Dry Year</b>  | <b>2005</b>   | <b>2010</b> | <b>2015</b> | <b>2020</b> | <b>2025</b> | <b>2030</b> |
| Supply Totals   | 170.9         | 194.3       | 215.4       | 235.1       | 246.4       | N/A         |
| Demand totals   | 177.0         | 190.6       | 205.4       | 217.5       | 228.3       | 240.0       |
| <b>Reserves</b> (Supply – Demand)   | <b>(6.1)</b>  | <b>3.7</b>  | <b>10.0</b> | <b>17.6</b> | <b>18.1</b> | <b>N/A</b>  |
| <b>Reserves as % of Demand</b>  | <b>(3.4%)</b> | <b>1.9%</b> | <b>4.9%</b> | <b>8.1%</b> | <b>7.9%</b> | <b>N/A</b>  |
|   |               |             |             |             |             |             |
| <b>Multiple Dry Years</b>   | <b>2005</b>   | <b>2010</b> | <b>2015</b> | <b>2020</b> | <b>2025</b> | <b>2030</b> |
| Supply Totals   | 172.2         | 201.2       | 221.3       | 240.7       | 252.7       | N/A         |
| Demand totals   | 179.4         | 193.6       | 208.9       | 221.4       | 232.5       | 244.6       |
| <b>Reserves</b> (Supply – Demand)   | <b>(7.2)</b>  | <b>7.6</b>  | <b>12.4</b> | <b>19.3</b> | <b>20.2</b> | <b>N/A</b>  |
| <b>Reserves as % of Demand</b>  | <b>(4.0%)</b> | <b>3.9%</b> | <b>5.9%</b> | <b>8.7%</b> | <b>8.7%</b> | <b>N/A</b>  |

Calleguas expects to be able to meet all normal year demands for imported water throughout the 25-year planning period. In the initial 5 years of the planning, CMWD is forecasting a 6,100 A/F Deficit (3.4%) for single dry years and a 7,200 A/F (4.0%) deficit for multiple dry years. Until completion of the Las Posas Storage and Recovery Project, CMWD expects to make up those shortfalls from reserves available through Metropolitan Water District. For the remainder of the planning period beginning in 2010, CMWD expects to be able to meet all demands including demands during a single dry year and multiple dry years.

As a result, the wholesale supply available to the District is considered to be 100% reliable for normal, single dry and multiple dry years. There are no known inconsistencies in the supply that would reduce the amount of water available under non-emergency conditions..

| <b>Table 12.<br/>Wholesale Supply Reliability (% of normal Supply)</b> |   |                                      |                                 |               |               |
|--|---|--------------------------------------|---------------------------------|---------------|---------------|
|  |   |                                      | <b>Multiple Dry Water Years</b> |               |               |
|  | <b>Average/<br/>Normal<br/>Water Year</b> | <b>Single Dry<br/>Water<br/>Year</b> | <b>Year 1</b>                   | <b>Year 2</b> | <b>Year 3</b> |
| Calleguas MWD  | 8700                                      | 100%                                 | 100%                            | 100%          | 100%          |

In 1991, the District was importing more than 12,000 acre-feet of State Water Project per year. In developing the inventory of water supplies (Table 7), quantities expected to be imported for 2010 through 2030 are only 8,700 acre-feet per year. This represents a conscious effort on the part of the District to develop alternate water supplies in order to reduce dependence upon imported supplies. However, in some years, the District may increase its use of imported water by up to 3,300 acre-feet to meet increases in demands not otherwise met by available local supplies or to meet water quality requirements.

### **Non-Potable Supplies**

In addition, to potable water supplies recycled water from the Camrosa Water Reclamation Facility and surface water diversions from the Conejo Creek Diversion is available for landscape and agricultural purposes. Sufficient quantity of non-potable water is available during normal years to sell surplus water outside the District boundaries.

#### **Recycled Water**

In 2005, the District produced 1,650 acre-feet of recycled water from the District's Water Reclamation facility. While approximately 800 acre-feet was sold for agricultural irrigation, the remainder was used outside the District. Only 90 AF was discharged into Conejo Creek during the extremely wet months of January and February 2005. No other discharge to the creek occurred during the 5 year period between 2001 and 2005.

In 2005, the District completed a project to expand its use of recycled water to landscape irrigation on the California State University - Channel Islands campus. The project will displace potable water now used for irrigation. While many sources of water are dependent upon weather patterns, recycled water flows remain relatively constant. The supply of recycled water will grow, too, in proportion to overall growth in the District and will reach 2,500 acre-feet by the year 2025.

#### **Non-potable Surface Water**

The Conejo Creek Diversion Project completed in 2002 has added a new source of irrigation water for agricultural customers. The project produced an average of 7,800 acre-feet per year from surface flows in Conejo Creek in the first two full years of its operation. Diversions are expected to increase gradually with population growth to approximately 11,131 acre-feet per year in a normal water year by 2025.

The surface water being diverted is primarily tertiary treated wastewater from the Hill Canyon Wastewater plant. The Supply is considered an extremely reliable source even during dry years. During the planning period 2005-2030, it is expected that the diversion will consistently produce more water than needed to satisfy demands within the District and the surplus water will be delivered to the Pleasant Valley County Water District under an existing agreement. In 2005, a very wet year, approximately 5,500 A/F of surplus water was delivered to PVCWD. However, during dry years, much of the surplus water could be utilized within the District to meet increased agricultural and landscaping demands.

### **Basis of Water Year Data**

The water supply of many Districts is quite dependent upon watershed runoff and, as a result, the supplies will vary widely in conjunction with variations in annual rainfall. Since the drought years of the early 1990's, the District has developed alternate supplies of non-potable water and has additional projects in the design stages that will further insulate the district from inconsistencies in supply brought on by climate.

Camrosa imports 2/3's of the potable water sold within the district from CMWD, which is, in turn, supplied from Metropolitan. Hence, the dry year projections used by Metropolitan and CMWD were also used for Camrosa's projections. The single-driest hydrologic year occurred in 1977 with 1990 to 1992 being the multiple driest hydrologic years to date.

| <b>Water Year Type</b>  |      |      |      |
|-------------------------|------|------|------|
| Normal Water Year       | 1998 |      |      |
| Single-Dry Water Year   | 1977 |      |      |
| Multiple-Dry Water Year | 1991 | 1992 | 1993 |

During the most recent update of the District Facilities master Plan, the District did a comprehensive analysis to correlate demand and rainfall patterns within the past 15 years. It was determined by that analysis, that the demand that was experienced in Fiscal Year 1998-99 was most representative demand in a normal rainfall year.

Using the data in that analysis, an extreme high water demand year was constructed by assembling the highest demand recorded for each season during the study period. The most extreme potable demand is expected to be 1.18 times the demand experienced in a normal year. This was defined as a critically dry year in the analysis and will be used in this document as the demand factor for multiple dry years. Single dry year demand was established a 1.09 times the demand expected in a normal year and is used as the demand factor for a single dry year in following analyses. The annual Demand factors developed for the District Master Plan, and used in the analyses in this plan are outlined in the following table.

| <b>Year</b>    | <b>Rainfall</b> | <b>Demand Factor</b> | <b>Gals/day/Con<br/>nection</b> |
|----------------|-----------------|----------------------|---------------------------------|
| Very Wet       | 30" and up      | .82                  | 604                             |
| Wet            | 22" > < 30"     | .91                  | 671                             |
| Normal         | 10" > < 22"     | 1.00                 | 737                             |
| Dry            | 6" > < 10"      | 1.09                 | 803                             |
| Critically Dry | Less than 6"    | 1.18                 | 870                             |

An analysis of agricultural demands in the District's dual agricultural system indicated that water sales from the Dual AG water system follow the same pattern as M&I in response to seasonal variations and rainfall. It was determined that the demand peaking factors could be used to yield close approximations of expected agricultural demand under various rainfall conditions given the typical year demand.

### **Inconsistencies in Local Supply**

Over the next 10 years, shortages in local supplies will have little impact upon the District's water supply since Camrosa normally relies on reduced imported water deliveries (from historical levels) to meet normal year demands. Metropolitan has maintained they will be 100% reliable for the next 20 years and Camrosa will rely upon augmentation of its imported supply up to historical levels to meet dry year demands.

Camrosa will continue to import State Water Project water to blend with well water to meet potable demand. However, the quantities may be subject to increases in the future if water quality in the Santa Rosa Basin or the Fox Canyon Aquifer were to deteriorate. Similarly, if chlorides precipitously rise in imported State Water Project water, greater quantities may be necessary to achieve an acceptable blend for potable water quality purposes.

## Recycled Water Plan

### Law

10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater and planning agencies that operate within the supplier's service area, and shall include all of the following:

10633 (a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.

10633 (b) A description of the quantity of treated wastewater that meets recycled water standards. Is being discharged, and is otherwise available for use in a recycled water project.

10633 (c) A description of the recycled water currently being used in the supplier's service area, including but not limited to, the type, place and quantity of use.

10633 (d) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.

10633 (e) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.

10633 (f) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.

10633 (g) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems and to promote recalcitrating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use

### Section Contents

- ▶ The wastewater collection and treatment systems in the supplier's service area are described.
- ▶ The volume of wastewater collected, treated and discharged is quantified.
- ▶ The technical and economic feasibility of serving potential recycled water uses are discussed.
- ▶ Actions taken to promote expanded use of recycled water are identified.
- ▶ Projected use of recycled water is provided.

## Camrosa Water District and Camarillo Sanitation District Service Areas

Wastewater service areas for the Camrosa Water District and the City of Camarillo are the result of an agreement negotiated between the agencies more than 45 years ago. Both City and District boundaries have changed several times in the intervening years resulting in service areas which do not necessarily comport to political boundaries. Portions of the Camrosa water service area fall within the City boundaries. In the Mission Oaks area in particular, Camrosa is responsible for both potable water delivery and wastewater collection even though these areas are now within the City of Camarillo political boundaries. The City of Camarillo is responsible, through the Camarillo Sanitary District, for wastewater service in most of the unincorporated area of Camrosa south of the Highway 101 with the exception of annexed County and California State University property in the vicinity of the Camrosa Wastewater Reclamation Plant. The graphic below depicts the service areas in more detail.

The recycled water plan for Camrosa Water District is a cooperative effort among the City of Thousand Oaks, Calleguas Municipal Water District, Pleasant Valley County Water District, CSUCI, the City of Camarillo, and the Camarillo Sanitation District and is largely documented in the form of agreements between Camrosa and those agencies. These agreements for the use and distribution of recycled water produced by the various waste treatment plants provide the basis for the plan.



Figure 4 – Camrosa and Camarillo Sanitation District Service Areas

## Camrosa Water Reclamation Facility

Commissioned in 1997, Camrosa operates a state-of-the-art Water Reclamation Facility. With a capacity of 1.5 Million Gallons per Day, the facility reclaims wastewater collected from approximately 9,200 connections in the central portion of the District.

The District uses an anaerobic process to breakdown and consume the organic material in the incoming wastewater. A portion of this mixture flows through an anoxic zone where

microorganisms denitrify the water biologically by consuming additional organic matter and reducing nitrates to nitrogen gas.

The water moves through both Secondary clarifiers and Tertiary filters to remove the remaining suspended solids to produce a clean, clear effluent. Disinfection is achieved through the addition of sodium hypochlorite to the filtered water to destroy harmful bacteria. The chlorinated water achieves the required contact time in the chlorine contact basin to ensure maximum bacterial reduction before the final product is pumped off-site to storage ponds for reuse.

Once disinfected, the tertiary treated water is stored in holding ponds and distributed to both agricultural and public landscape users through the recycled water distribution system. The ponds have a storage capacity of nearly 300 acre-feet. During extremely wet periods, when there is no irrigation demand, surplus recycled water is discharged to Conejo Creek where it runs to the ocean.

The plant is being expanded to 2.25 MGD to accommodate growth at CSUCI as well as elsewhere within the District. Construction is expected to be complete by late summer, 2006. In 2005, Camrosa collected and treated approximately 547 million gallons of wastewater and produced approximately 1,650 acre-feet of tertiary treated recycled water. It is expected that plant production will continue to increase to approximately 2,200 acre-feet by 2030.

### **Camarillo Sanitary District Wastewater Treatment Plant**

The Camarillo Sanitary District (CSD) was formed in 1955 to provide wastewater treatment for most of what is now the City of Camarillo. The treatment plant occupies a 20-acre site on Howard Road next to Conejo Creek within the Camrosa Water District boundaries.

After primary treatment the wastewater undergoes secondary treatment using an "activated sludge treatment" process and is then sent into secondary clarifiers and ultimately disinfected in a contact basin using chlorine. Dechlorination is accomplished with sulfur dioxide before the effluent is delivered for agricultural purposes or discharged to Conejo Creek. Last year about 840 acre-feet of secondary effluent was recycled for agricultural irrigation

Over the years the treatment plant has undergone several modifications to increase its capacity and to incorporate new technologies. Construction is underway to install tertiary filtration to the treatment train to produce recycled water that meets all DHS Title 22 requirements. The plant currently treats about 4.0 million gallons of wastewater each day, with a maximum capacity of 6.75 million gallons.

Camrosa has entered into an agreement with Camarillo Sanitation District that would allow Camrosa to purchase treated effluent for resale as recycled water. The purchases would allow Camrosa to fully meet existing recycled water demand and expand recycled water service to farmlands near the District boundaries that now rely heavily on local aquifers to meet irrigation demands.

In 2005, Camarillo Sanitation District collected and treated more than 1,420 million gallons of wastewater producing 4,368 acre-feet of secondary effluent. As growth occurs in the area, it is anticipated that production will increase to 7,500 acre-feet per year by 2030.

### **City of Thousand Oaks – Hill Canyon Wastewater Treatment Plant**

Backed by a voter-approved bond issue in 1966, the City of Thousand Oaks purchased the Hill Canyon Treatment Plant from the Conejo Valley Sanitary Company and began providing

wastewater treatment within the city boundaries. Today, this facility provides treatment for wastewater from about 90 percent of the City.

The Hill Canyon Treatment Plant currently treats an average of 11.0 Million gallons of wastewater per day. The water is treated to a tertiary level that complies with a wide variety of operational permits and is eventually discharged to Conejo Creek. Over time, the volume is expected to increase to 14.5 MGD and produce nearly 16,200 acre-feet of recycled water per year.

The recycled water serves a number of purposes including support of a wetlands mitigation project, aquifer replenishment in the Santa Rosa Valley, serving riparian needs along Conejo Creek and serving irrigation needs in the Santa Rosa Valley and on the Oxnard Plain.

In 1997, the State Water Resources Control Board (SWRCB) issued Water Rights Decision 1638 granting a water right of up to 21.7 cubic feet per second (CFS) to the City of Thousand Oaks. Under a series of agreements between the City of Thousand Oaks, Calleguas Municipal Water District, the Pleasant Valley County Water District, and Camrosa; the Camrosa Water District purchases the water granted under the water right. Camrosa also built and operates the surface water diversion and associated pipelines, the "Conejo Creek Diversion Project," to distribute the water. Under agreements reached with private diverters, all of the private diverters have connected to the Camrosa potable water or non-potable recycled water distribution systems since the Conejo Creek Diversion Project became operational.

The Conejo Creek Diversion Project diverts all but 6.0 CFS base flow from the Conejo Creek for delivery for irrigation purposes. The diversion is located approximately 6.8 miles downstream from the Hill Canyon Wastewater Treatment Plant. Diverted water is transported by pipeline to the Camrosa Storage Ponds and stored separately from the effluent from the Water Reclamation Facility. More than 7,800 acre-feet was diverted in 2005. The water available for diversion in the creek will increase gradually to 11,529 acre-feet/year by 2030.

Surplus Water from the Conejo Creek Project not used within the Camrosa Water District is sent from the Camrosa Storage Ponds to the Pleasant Valley County Water District which overlies the overdrafted Fox Canyon Groundwater Basin. That water is used to replace groundwater otherwise pumped from the Fox Canyon Basin.

Table 15 below provides the estimated wastewater collections from the three plants and estimates, based upon plant capacity, of ultimate recycled water availability.

| <b>Table 15.<br/>Wastewater Collected and Treated<br/>AF/Year</b> |             |             |             |             |             |             |
|---|-------------|-------------|-------------|-------------|-------------|-------------|
|   | <b>2005</b> | <b>2010</b> | <b>2015</b> | <b>2020</b> | <b>2025</b> | <b>2030</b> |
| Camrosa WRF   | 1,560       | 1,900       | 2,000       | 2,100       | 2,150       | 2,200       |
| CamSan WWTP   | 4,368       | 5,200       | 5,800       | 6,500       | 7,300       | 7,500       |
| Hill Canyon WWTP  | 12,300      | 13,100      | 13,900      | 14,700      | 15,500      | 16,200      |

### **Current Recycled Water Use**

In 2005, a very wet year, Camrosa Water District recycled all but approximately 90 acre-feet of tertiary treated effluent produced at the Water Reclamation Facility. This water was used primarily for agricultural irrigation in the farmlands near the facility that lie within the District and an additional 463 acres of farmland, just outside the District boundaries. Approximately 90 acre-feet of effluent

was discharged into Conejo Creek during the wettest months when demand was weak and the effluent storage facility was at capacity.

In the same year, the CamSan WWTP provided approximately 840 acre-feet of secondary-treated effluent to agricultural use on properties near that plant. The remainder of the effluent from the CamSan WWTP was discharged into Conejo Creek.

All of the effluent from the Hill Canyon Treatment Plant was discharged to Conejo Creek. Of that amount, Camrosa Water District diverted 7,862 acre-feet to meet irrigation demand within the District and on the Oxnard plain. Approximately 3,550 acre-feet was sold within the district with the remainder being delivered to Pleasant Valley County Water District.

| <b>Method of Disposal</b>           | <b>2005</b> | <b>2010</b> | <b>2015</b> | <b>2020</b> | <b>2025</b> | <b>2030</b> |
|-------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| CWRF – Disch. to Creek              | 90          | 0           | 0           | 0           | 0           | 0           |
| - Recycle                           | 1560        | 1,900       | 2,000       | 2,100       | 2,150       | 2,200       |
| CamSan – Disch. to Creek            | 3,528       | 0           | 0           | 0           | 0           | 0           |
| - Recycle                           | 0           | 4,360       | 4,960       | 5,660       | 6,460       | 6,660       |
| - Ag Dely                           | 840         | 840         | 840         | 840         | 840         | 840         |
| HCWWTP – Disch to Creek             |             | 3,167       | 3,564       | 3,966       | 4,369       | 4,671       |
| - Recycle                           | 7862        | 9,939       | 10,336      | 10,734      | 11,131      | 11,529      |
| Estimates based upon plant capacity |             |             |             |             |             |             |

### **Potential Non-Potable Surface Water Use**

It is expected that recycled water use will greatly expand in the years ahead. Nearby California State University - Channel Islands (CSUCI) has an aggressive schedule to establish 4-year university at the former Camarillo State Hospital site. The University's Master Plan calls for conversion of existing buildings to classroom and administrative facilities, construction of new classroom facilities and a Library, conversion of existing dormitory facilities to student use and construction of extensive on-campus housing in the form of single family dwellings, townhouses and apartments.

Throughout the preparation of the University's Master Plan, the District has encouraged CSUCI to install non-potable irrigation systems on campus. As a result, non-potable piping has been installed to irrigate more than 40 acres of East Campus common areas with an annual demand nearly 100 acre-feet per year. Landscape irrigation systems in the older portion of the core campus are being converted to use non-potable supplies. Construction of a pumping station to meet all of the non-potable recycled water demand on campus has been completed. Demand is estimated to be nearly 450 acre-feet per year on 126 acres of irrigated landscaping. Turf areas on more than 40 acres of ball fields will have the greatest demand.

The District has extensive plans to expand delivery of non-potable recycled water to agricultural properties near the Conejo Creek diversion, to expand the non-potable water distribution system into Leisure Village and Mission Oaks and to extend the system into Santa Rosa and Tierra Rejada Valleys. In a phased expansion over the next 20 years the District could realize an additional 5013 acre-feet of recycled water use within the District.

Phase one includes expansion into Leisure Village, to Adolfo Camarillo High School, to Wildwood estates and up the hillsides to Priscilla Road. Much of the construction for this phase is already

underway or scheduled for completion before 2010. Phase 2 expands the system to large-lot developments above Upland Road and into the Santa Rosa Valley to the base of the Norwegian Grade. Phase 3 would expand the system into industrial areas near Poncho Road and Verdugo Way as well as to residential areas between Upland Road and Santa Rosa Road. Finally, Phase 4 would expand the system into Tierra Rejada Valley to relieve agricultural pumping in the Tierra Rejada aquifer.

Table 17 below outlines the phased approach to expand the Non-potable Recycled Water Distribution System. It is estimated that nearly 2,265 acre-feet of potential M&I use and 2,748 acre-feet of potential agricultural use could be realized by 2030.

|                | <b>M&amp;I AF</b> | <b>Ag A/F</b> | <b>Total</b> |
|----------------|-------------------|---------------|--------------|
| Phase 1 - 2010 | 872.7             | 223.7         | 1096.4       |
| Phase 2 - 2015 | 1108.0            | 0             | 1108.0       |
| Phase 3 - 2020 | 284.7             | 229.5         | 514.2        |
| Phase 4 - 2025 |                   | 2295.0        | 2295.0       |
| Total          | 2265.4            | 2748.2        | 5013.6       |

The Camarillo Sanitation District (CSD) has entered into an agreement with Camrosa Water District to deliver tertiary treated water from the CSD WWTP to the District's Non-potable Recycled Water Distribution System. The agreement reserves the right for CSD to accept delivery in the future of recycled water from the system. New development within the City of Camarillo in proximity of the Non-potable Recycled Water Distribution System is expected to make use of recycled water for irrigation needs.

Camrosa, Calleguas Municipal Water District and the Pleasant Valley Water District (PVCWD) have entered into an agreement to serve surplus non-potable recycled water to nearly 10,500 acres of agricultural property on the Oxnard Plain. Estimated demand within the PVCWD was estimated at 34,600 AFY in the most recent Agricultural Water Management Plan prepared for the District. To supply that demand, it was estimated that, on average, approximately 10,900 AFY is supplied from Santa Clara River Diversions by United Water Conservation District, 7,800 AFY comes from private pumping, 10,000 AFY is supplied from PVCWD wells, and the remainder (approximately 5,900 AFY) is supplied by effective precipitation.

PVCWD has 11 deep wells completed in the over-drafted Fox Canyon Aquifer. To reduce pumping, a distribution line has been completed to allow Camrosa to provide Non-potable Recycled Surface Water diverted from Conejo Creek to PVCWD's 210 acre-foot terminal reservoir. In 2005, approximately 5,503 acre-feet of non-potable recycled water was delivered to PVCWD to off-set groundwater pumping. It is estimated that sufficient recycled water could be made available to meet most of the demand placed on PVCWD's wells.

In order to encourage use of Non-potable recycled water within the District, significant price incentives have been established. The price established for potable water used to satisfy M&I irrigation needs is approximately \$653 per acre-foot. Potable water used for Agricultural irrigation costs \$523 per acre-foot. Non-potable recycled water served from the Non-potable Recycled Water Distribution System costs \$209 per acre-foot and provides needed incentive to use this alternate source of supply.

The Board of Directors has adopted a policy which would require new developers to install dual piping systems for all new developments. While the results of such an action are difficult to quantify and are tied tightly to the market for housing, it would increase demand for non-potable recycled water to serve M&I irrigation needs.

**Potential Future Use of Recycled Water**

In the 2000 Urban Water Management Plan, the District projected that demand for Non-potable Recycled Water would increase from 5,300 to 10,400 acre-feet per year by the year 2005. Actual use in 2005, a very wet year with reduced demand, was 9,512 acre-feet. Table 18 summarizes actual 2005 use and potential future use for Non-potable Recycled Water during the planning horizon of this plan.

| <b>Table 18.<br/>Actual &amp; Potential Recycled Water Use<br/>AF/Year</b> |                        |             |             |             |             |             |             |
|--|------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| <b>Type of Use</b>   | <b>Treatment Level</b> | <b>2005</b> | <b>2010</b> | <b>2015</b> | <b>2020</b> | <b>2025</b> | <b>2030</b> |
| Agriculture & Landscape  | Tertiary               | 4009        | 6,800       | 8,670       | 9,300       | 11,800      | 11,900      |
| Surplus Deliveries   | Tertiary               | 5503        | 5,039       | 9,916       | 11,034      | 8,981       | 9,329       |

The greatest demand for non-potable service is clearly for agricultural purposes but substantial quantities will be used by large irrigators such as CSUCI and area parks and golf courses. Residential (large lot) demands are a smaller but still a significant portion of the total mix.



## Water Use

### Law

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:

10631 (e) (1) Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors including, but not necessarily limited to, all of the following uses:

(A) Single-family residential; (B) Multifamily; (C) Commercial; (D) Industrial; (E) Institutional and governmental; (F) Landscape; (G) Sales to other agencies; (H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof; and (I) Agricultural.

(2) The water use projections shall be in the same 5-year increments described in subdivision (a).

### Section Contents

- ▶ Past and current water use is quantified.
- ▶ Water uses among water use classifications is identified.
- ▶ Future water demand is projected.

### Water Demand Analysis

Camrosa Water District serves potable water to many different types of customers including golf courses, parks, schools, large estate-style homes, smaller single family homes, condominiums, apartments, business parks agricultural growers and other uses. It is a complex matter to determine the distribution of potable water demand over the District's service area.

The total current water demand within Camrosa Water District was estimated in the most recent *Water Supply and Demand Analysis (June 2005)* for all water users served by Camrosa Water District. The estimated demand considered point demands from large users and demands based on calculated demand factors and zoning designations. The analysis estimating future demand is contained in the supply and demand analysis contained in the District Facilities Master Plan.

**2005 Total Demand:** The total 2005 demand by customers served by the Camrosa Water District is approximately 19,826 acre-feet/year as shown in Table 19 below. This includes all of the demand for water within the District, including potable water (imported and groundwater wells), diverted non-potable surface water and non-potable recycled water and includes surplus deliveries outside the boundaries of the District.

**Table 19.**  
**2005 Water Demand by Water Class**

| <b>Water Class</b>                      | <b>District<br/>M&amp;I Sales</b> | <b>District<br/>Agricultural<br/>Sales</b> | <b>Surplus<br/>Water</b> | <b>Total<br/>Demand</b> |
|---|-----------------------------------|--|--------------------------|-------------------------|
| Potable Water                           | 9,015                             | 1,299                                      | 0                        | 10,314                  |
| Non Potable Surface Water               | 566                               | 2,984                                      | 4,312                    | 7,862                   |
| Recycled Water                          | 0                                 | 459  | 1,191                    | 1,650                   |
| <b>Total</b>                            | <b>9,581</b>                      | <b>4,742</b>                               | <b>5,503</b>             | <b>19,826</b>           |
| Units of Measure: <b>Acre-feet/Year</b> |                                   |  |                          |                         |

**District M&I Demand** Potable Municipal and industrial (M&I) demands include demand by all non-agricultural types of users including residential, public, landscape, and commercial and industrial users. Included in this category is the customer classification "Domestic-Agriculture" which represents water used for small personal agricultural endeavors that more closely fit to the category of landscape irrigation than commercial agriculture irrigation. The M&I service area is generally concentrated in the western end of the District, within the City of Camarillo. There are also golf courses and large residential lots in the eastern end of the District that are part of this category.

As the District expands its non-potable water distribution systems, additional neighborhoods will be able to take advantage of non-potable surface water for landscape irrigation. The area formerly served by Santa Rosa Mutual Water Company is already a dual-plumbed neighborhood and service will commence within the year to Leisure Village in Eastern Camarillo and Wildwood Estates in Santa Rosa Valley. District ordinances require that new developments be plumbed for non-potable outdoor water use.

While there is no 2005 M&I demand for recycled water, recent completion of a recycled distribution system to the California State University – Channel Islands will transfer a significant portion of the University's future landscape irrigation demand from potable to recycled water supply.

**District Agricultural Demand** There is a demand for all three water classes by agricultural customers within the District. The three primary areas within the District where agricultural demand exists is in the Eastern end of the District in Tierra Rejada Valley, in the Central Greenbelt area just east of the Camarillo City limits and extending into Santa Rosa Valley, and in the vicinity of the CSUCI campus in the Southwestern portion of the District.

Agricultural lands in the vicinity of the University and Camrosa's Water reclamation facility are the primary users of recycled water produced by the WRF. Recycled water is the primary source of supply for these customers and is used almost exclusively due to its low cost, abundance and superior quality to local groundwater in the perched aquifer.

Non-potable recycled surface water is supplied to agricultural users in the Central Greenbelt area. This surface water is augmented with untreated groundwater to meet demands in the eastern-most extremes of the service area. For some Avocado growers in the northern-most portion of the Greenbelt, this water is blended with imported water to reduce the chloride level in the finished water.

Finally, imported water is used to supply agricultural users in the upper pressure zones in Santa Rosa Valley and the Tierra Rejada Valley as well as some agricultural customers in the lower pressure zones who demand the higher quality water and are willing to pay the much higher cost for water. For some of these customers, non-potable surface water is not available at the present time. It is expected that some of the demand for potable agricultural water will decline as the non-potable distribution system is expanded further and the cost of imported water continues to rise.

### **Surplus Water Demand**

Demand for surplus water by out-of-bounds agricultural irrigators is discussed in detail in the section entitled "Recycled Water Plan" presented previously. In 2005, 5503 acre-feet of surplus water was delivered. Water available for delivery out-of-bounds will vary based upon demand inside the District but is expected to approach 9 000-10,000 acre-feet per year after 2010

### **Future Water Demands**

Future demands in the District for 2010 through 2030 were projected based on an evaluation of existing zoning, planning data and land use maps for the various areas within the District, population projections, and discussions with City, County, and various special district staff. Anticipated land use changes from current zoning were incorporated into the analysis. It must be noted that the demand projections depend on the long-term accuracy of the available planning documents. If the Cities, County, or special districts, significantly revise their land use maps or general plans, the population projections and corresponding demands may also change significantly.

It was assumed land designated on current land-use maps for commercial or residential use would be "fully developed" over the next 20 years and would reflect the population projections contained in Table 3. It was assumed that parcels currently in agricultural but zoned for M&I use would be developed over the next 20 years.

It was assumed that parcels currently zoned agricultural will remain in agriculture during the planning period, primarily due to the impacts of SOAR and the apparent desire of the community to maintain the greenbelt and agricultural aspect of the undeveloped land within the District. There is little undeveloped land suitable for agricultural use within the District boundaries and there is little likelihood there will be significant increases to the base irrigation demands.

The current water use for 2005 is presented in Table 20 below. This data is for a very wet year and reflects lower than normal usage patterns. The usage appears anomalous in comparison to usage in the year 2000 and projected usage for 2010. As indicated above, the annual demand factor for a very wet year is .82. If the usage presented in table 12 below were normalized using this demand factor, Residential use would have been closer to 7,900 acre-feet and total potable water use would be closer to 13,600 acre-feet. Similarly the normal-year total demand for 2005 would be closer to 18,400 acre-feet and would reflect new normal-year deliveries of nearly 5,000 acre-feet of non-potable water from the Conejo Creek Diversion Project.

Based upon the future growth within the District, the total water demand within the District by 2010 is expected to increase to 18,825 acre-feet/year including imported, recycled, groundwater and Conejo Creek surface water. This is an increase of about 7.5 percent over the existing total demand for water within the service area and reflects increased use of non-potable water as the non-potable distribution system is expanded. M&I demands in 2010, which include all residential, public, commercial and industrial and landscape uses of both potable and non-potable water, were projected to be approximately 12,425 acre-feet.

By 2030, the M&I Demand is expected to increase to 14,875 acre-feet per year. This represents an increase of approximately 18% over current normal-year demand and reflects the general population growth expected in the District.

During the same period, Agricultural demands placed upon the District will increase by approximately 2000 A/F. Some reduction in agricultural demand is expected as parcels are developed. However, the significant increase in projected non-potable demand is primarily a result of making non-potable water available to Tierra Rejada Valley to displace pumping of high quality groundwater from the Tierra Rejada Basin. Table 20 below provides Past, Current and Projected Water Demand within the District.

| <b>Potable Water Sectors</b>   | <b>2000</b>   | <b>2005</b>   | <b>2010</b>   | <b>2015</b>   | <b>2020</b>   | <b>2025</b>   | <b>2030</b>   |
|--|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Residential (all*)   | 6713          | 6478          | 7400          | 7000          | 7100          | 7400          | 7400          |
| Commercial/Industrial  | 1,080         | 1036          | 1440          | 1540          | 1600          | 1655          | 1680          |
| Institutional and governmental   | 414           | 781           | 885           | 590           | 630           | 680           | 695           |
| Landscape  | 640           | 624           | 800           | 800           | 750           | 700           | 650           |
| Agriculture  | 2630          | 1299          | 800           | 400           | 400           | 400           | 400           |
| Other (Misc)   | 126           | 94            | 100           | 100           | 100           | 100           | 100           |
| Other (line Loss)  | 996           | 843           | 600           | 550           | 550           | 550           | 550           |
| <b>Total Potable</b>   | <b>12599</b>  | <b>11155</b>  | <b>12025</b>  | <b>10980</b>  | <b>11130</b>  | <b>11485</b>  | <b>11475</b>  |
| <b>Non-Potable Recycled Water</b>  | <b>2000</b>   | <b>2005</b>   | <b>2010</b>   | <b>2015</b>   | <b>2020</b>   | <b>2025</b>   | <b>2030</b>   |
| Municipal & Industrial (all*)  | 0             | 566           | 1600          | 3070          | 3500          | 3700          | 3800          |
| Agriculture  | 0             | 3,443         | 5200          | 5600          | 5800          | 8100          | 8100          |
| <b>Total Non-Potable Recycled</b>  | <b>0</b>      | <b>4,009</b>  | <b>6800</b>   | <b>8670</b>   | <b>9300</b>   | <b>11800</b>  | <b>11900</b>  |
| <b>Total District Demand</b>   | <b>13,405</b> | <b>15,164</b> | <b>18,825</b> | <b>19,650</b> | <b>20,430</b> | <b>23,285</b> | <b>23,375</b> |
| Units of Measure: <b>Acre-feet/Year</b> (*Breakdown between single-family and multi-family residences not available) |               |               |               |               |               |               |               |

### **Additional Water Uses:**

In addition to demand forecast for the various classes of water delivered within the District, some line-loss is experienced. Line loss is the difference between the total meter readings for water produced or imported, and the aggregated meter readings of water delivered and billed. Historically, line loss has averaged approximately 4.8% of production. However, in 2005, it approached 7.5%. Some of the increased line loss was a result of ruptured pipes brought on by severe winter storms. The District has initiated action to evaluate the existing delivery systems to ensure line losses are minimized. Line loss for future years has been projected at about 5% and is included in Table 20 above.

Finally, surplus non-potable water is delivered to users outside the District Boundaries and is accounted for in Table 21 below. These sales include surplus recycled water from the Camrosa WRF sold to nearby agricultural users and non-potable recycled surface water sold to the Pleasant

Valley County Water District. Sales of surplus water are considered interruptible to satisfy demands within the District's service area. Table 21 below reflects the excess non-potable supplies available to delivery to satisfy demand outside the district after all District non-potable demands have been met. In past years, all surplus non-potable recycled water has been sold. For the foreseeable future it is expected that all surplus non-potable water will continue to be sold to agricultural use outside the district.

| <b>Table 21.<br/>Deliveries to Other Agencies</b> |             |             |             |             |             |             |
|---|-------------|-------------|-------------|-------------|-------------|-------------|
| <b>Name of Agency</b>                             | <b>2005</b> | <b>2010</b> | <b>2015</b> | <b>2020</b> | <b>2025</b> | <b>2030</b> |
| Pleasant Valley CWD                               | 5,503       | 10,039      | 9,916       | 11,034      | 8,981       | 9,329       |
| Units of Measure (Acre-feet/Year)                 |             |             |             |             |             |             |

Table 22, then, sums the total water uses expected from supplies available to the District.

| <b>Table 22.<br/>Total Water Use</b> |             |             |             |             |             |             |             |
|--------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| <b>Water Use</b>                     | <b>2000</b> | <b>2005</b> | <b>2010</b> | <b>2015</b> | <b>2020</b> | <b>2025</b> | <b>2030</b> |
| Sum of Tables 20 and 21              | 14,221      | 20,667      | 28,864      | 29,566      | 31,464      | 32,266      | 32,704      |
| Units of Measure (Acre-feet/Year)    |             |             |             |             |             |             |             |



## District-wide Water Service Reliability

### Law

10635 (a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional or local agency population projections within the service area of the urban water supplier.

10634. The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.

### Section Contents

- ▶ An assessment of reliability of water service during normal, dry and multiple-dry water years is provided.
- ▶ The quality of water received from existing sources is characterized.
- ▶ The manner in which water quality affects water management strategies and supply reliability is described.

### Supply and Demand – All Water Combined

The total water supply, from both potable and non-potable sources in 2010 is expected to be 31,122 acre-feet. That quantity is expected to grow to 36,662 acre-feet by 2030. In terms of current year supply, the supplies available to the District will increase by 22% by 2010 and will be nearly 44% above the supply available in 2005 by 2030.

|                | <b>2010</b> | <b>2015</b> | <b>2020</b> | <b>2025</b> | <b>2030</b> |
|----------------|-------------|-------------|-------------|-------------|-------------|
| Supply         | 31,122      | 33,444      | 35,767      | 36,214      | 36,662      |
| % of Year 2005 | <b>122%</b> | <b>132%</b> | <b>141%</b> | <b>143%</b> | <b>144%</b> |

Demand within the District will grow at a slower rate, allowing surplus water to be made available for delivery outside the District boundaries. Agreements are already in place to provide surplus recycled surface water to PVCWD and out-of-bounds deliveries are expected to expand as additional non-potable demands are brought online. In terms of the normalized demand for 2005, demand is expected to be about 2% higher in 2010 and grow to about 27% above 2005 demand as the University grows and the non-potable system is expanded to Tierra Rejada Valley.

**Table 24.  
Projected Normal Water Year Total Demand  
All Water Combined (AF/Y)**

|                                | 2010   | 2015   | 2020   | 2025   | 2030   |
|--------------------------------|--------|--------|--------|--------|--------|
| Demand                         | 18,825 | 19,650 | 20,430 | 23,285 | 23,375 |
| % of Year 2005<br>(Normalized) | 102%   | 107%   | 111%   | 126%   | 127%   |

Tables 25 through 27 below, summarize and compares the supply and demand data previously presented in Tables 7,20 and 21 for normal, single-dry and multiple-dry year scenarios. The Supply totals reflect the sum of all sources from Table 7 and include both recycled water from both Camrosa's WRF and CamSan's WWTP as well as and non-potable recycled surface water from the Hill Canyon WWTP. Demand totals reflect all normal demands including line loss. The resulting difference represents projected water surplus for each 5-year increment of the planning period.

Using demand factors previous established, single-dry year demand is expected to increase by 6% over normal-year demand and multiple-dry year demand is expected to increase by 18% over normal-year demand. Imported water supply is expected to remain the same in all scenarios but a 30% reduction in local groundwater supplies is assumed in multiple-dry years. In all scenarios, the availability of recycled water is flat and represents no change in expected indoor demand.

**Table 25.  
Projected Normal Water Year Total Supply/Demand  
All Water Combined (AF/Y)**

|                              | 2010   | 2015   | 2020   | 2025   | 2030   |
|------------------------------|--------|--------|--------|--------|--------|
| Supply Totals                | 31,122 | 33,444 | 35,767 | 36,214 | 36,662 |
| Demand totals                | 18,825 | 19,650 | 20,430 | 23,285 | 23,375 |
| Difference (Supply – Demand) | 12,297 | 13,794 | 15,337 | 12,929 | 13,287 |
| Difference as % of Supply    | 40%    | 41%    | 43%    | 36%    | 36%    |
| Difference as % of Demand    | 65%    | 70%    | 75%    | 56%    | 57%    |

**Table 26.  
Projected Single Dry Year Total Supply/Demand  
All Water Combined (AF/Y)**

|                              | 2010   | 2015   | 2020   | 2025   | 2030   |
|------------------------------|--------|--------|--------|--------|--------|
| Supply Totals                | 31,122 | 33,444 | 35,767 | 36,214 | 36,662 |
| Demand totals                | 19,955 | 20,829 | 21,656 | 24,682 | 24,778 |
| Difference (Supply – Demand) | 11,168 | 12,615 | 14,111 | 11,532 | 11,885 |
| Difference as % of Supply    | 36%    | 38%    | 39%    | 32%    | 32%    |
| Difference as % of Demand    | 56%    | 61%    | 65%    | 47%    | 48%    |

|                              | <b>2010</b> | <b>2015</b> | <b>2020</b> | <b>2025</b> | <b>2030</b> |
|------------------------------|-------------|-------------|-------------|-------------|-------------|
| Supply Totals                | 29,447      | 31,597      | 33,747      | 34,194      | 34,642      |
| Demand totals                | 22,214      | 23,187      | 24,107      | 27,476      | 27,583      |
| Difference (Supply – Demand) | 7,234       | 8,410       | 9,640       | 6,718       | 7,060       |
| Difference as % of Supply    | <b>25%</b>  | <b>27%</b>  | <b>29%</b>  | <b>20%</b>  | <b>20%</b>  |
| Difference as % of Demand    | <b>33%</b>  | <b>36%</b>  | <b>40%</b>  | <b>24%</b>  | <b>26%</b>  |

### Supply and Demand – Potable Water

Because the supply of non-potable water available to the District cannot be readily substituted for potable supplies to serve potable demand, the projected supply and demand for potable water under various weather scenarios is provided.

|                             | <b>2010</b> | <b>2015</b> | <b>2020</b> | <b>2025</b> | <b>2030</b> |
|-----------------------------|-------------|-------------|-------------|-------------|-------------|
| Supply                      | 14,283      | 14,858      | 15,433      | 15,433      | 15,433      |
| % of Year 2005 (normalized) | <b>90%</b>  | <b>93%</b>  | <b>97%</b>  | <b>97%</b>  | <b>97%</b>  |

The supply of imported water available to the district is not fixed. Rather, the District imports sufficient water to blend with local supplies to meet expected demand. During the drought that peaked in 1990, that demand was nearly 12,900 acre-feet but has not exceeded 8,900 acre-feet in intervening years. In developing all of the scenarios, the District has limited imported water to 8,700 acre-feet per year.

With increasing amounts of non-potable supply available to satisfy irrigation demand and an aggressive program to expand the non-potable distribution system, demand for potable water is expected to decline from historical levels and remain relatively level, even though growth will add to the demand. This demand trend reflects continued expansion of non-potable recycled water use within the District.

|                             | <b>2010</b> | <b>2015</b> | <b>2020</b> | <b>2025</b> | <b>2030</b> |
|-----------------------------|-------------|-------------|-------------|-------------|-------------|
| Demand                      | 12,025      | 10,980      | 11,130      | 11,485      | 11,475      |
| % of Year 2005 (Normalized) | <b>89%</b>  | <b>81%</b>  | <b>82%</b>  | <b>85%</b>  | <b>85%</b>  |

Tables 30 through 32 that follow provide a supply and demand comparison for normal, single-dry and multiple-dry year scenarios. Again, demand factors are used to determine expected demands. Imported water supply is expected to remain constant in all scenarios but a 30% reduction in local groundwater supplies is assumed in multiple-dry years. All three scenarios have a goal of limiting imported water to 8,700 acre-feet, an artificial constraint that can be exceeded if necessary.

|                                  | <b>2010</b> | <b>2015</b> | <b>2020</b> | <b>2025</b> | <b>2030</b> |
|----------------------------------|-------------|-------------|-------------|-------------|-------------|
| Supply Totals                    | 14,283      | 14,858      | 15,433      | 15,433      | 15,433      |
| Demand totals                    | 12,025      | 10,980      | 11,130      | 11,485      | 11,475      |
| Difference (Supply – Demand)     | 2,258       | 3,878       | 4,303       | 3,948       | 3,958       |
| <b>Difference as % of Supply</b> | <b>16%</b>  | <b>26%</b>  | <b>28%</b>  | <b>26%</b>  | <b>26%</b>  |
| <b>Difference as % of Demand</b> | <b>19%</b>  | <b>35%</b>  | <b>39%</b>  | <b>34%</b>  | <b>34%</b>  |

|                                  | <b>2010</b> | <b>2015</b> | <b>2020</b> | <b>2025</b> | <b>2030</b> |
|----------------------------------|-------------|-------------|-------------|-------------|-------------|
| Supply Totals                    | 14,283      | 14,858      | 15,433      | 15,433      | 15,433      |
| Demand totals                    | 12,747      | 11,639      | 11,798      | 12,174      | 12,164      |
| Difference (Supply – Demand)     | 1,537       | 3,219       | 3,635       | 3,259       | 3,270       |
| <b>Difference as % of Supply</b> | <b>11%</b>  | <b>22%</b>  | <b>24%</b>  | <b>21%</b>  | <b>21%</b>  |
| <b>Difference as % of Demand</b> | <b>12%</b>  | <b>28%</b>  | <b>31%</b>  | <b>27%</b>  | <b>27%</b>  |

|                                  | <b>2010</b> | <b>2015</b> | <b>2020</b> | <b>2025</b> | <b>2030</b> |
|----------------------------------|-------------|-------------|-------------|-------------|-------------|
| Supply Totals                    | 12,608      | 13,011      | 13,413      | 13,413      | 13,413      |
| Demand totals                    | 14,190      | 12,956      | 13,133      | 13,552      | 13,541      |
| Difference (Supply – Demand)     | -1,581      | 54          | 280         | -139        | -127        |
| <b>Difference as % of Supply</b> | <b>-13%</b> | <b>0%</b>   | <b>2%</b>   | <b>-1%</b>  | <b>-1%</b>  |
| <b>Difference as % of Demand</b> | <b>-11%</b> | <b>0%</b>   | <b>2%</b>   | <b>-1%</b>  | <b>-1%</b>  |

Sufficient supply is available to meet expected potable demand in all years. In the multiple-dry year scenario, the District would need to exceed its goal of holding imported water to 8,700 acre-feet per year. In that scenario, supplies fall short of demand in year 2010 by 13% and by 1% in the years 2025 and beyond when this artificial constraint is met. This occurs in 2010 primarily because the additional desalinated supply from the Santa Rosa Basin is not yet online and the expansion of the potable system has not yet relieved sufficient irrigation demand on the potable water supply to allow full service without increasing demand on imported water above the goal set by the District.

In the multiple-dry year scenario, the District would simply increase the volume of imported water to a sufficient level above the 8,700 acre-foot goal to expand potable supplies to meet expected

demand. Table 33 below illustrates supplies that could be employed in 2010 (as an example) to meet normal, single-dry and multiple dry year potable water demands.

| <b>Table 33.<br/>Potable Supply Reliability - 2010</b> |   |                                      |                                 |               |               |
|--|---|--------------------------------------|---------------------------------|---------------|---------------|
|  | <b>Average/<br/>Normal<br/>Water Year</b> | <b>Single Dry<br/>Water<br/>Year</b> | <b>Multiple Dry Water Years</b> |               |               |
|  |   |                                      | <b>Year 1</b>                   | <b>Year 2</b> | <b>Year 3</b> |
| Imported Water   | 8,700                                     | 8,700                                | 8,700                           | 8,700         | 8,700         |
| Imported Augment                                       |   |                                      | 1,581                           | 1,581         | 1,581         |
| Groundwater  | 5,583                                     | 5,583                                | 3,908                           | 3,908         | 3,908         |
| Total Supply   | 14,283                                    | 14,283                               | 14,190                          | 14,190        | 14,190        |
| Total Demand   | 12,025                                    | 12,747                               | 14,190                          | 14,190        | 14,190        |
| Units of Measure (Acre-feet/Year)                      |   |                                      |                                 |               |               |

Because of the multiple supplies available to the District, and because of the high reliability of all supplies available, the District has determined that it will be 100% reliable in serving the full projected demand for potable water in normal, single-dry and multiple-dry year scenarios.

**Supply and Demand – Non-potable Recycled water**

Ample supplies of non-potable recycled water are available to meet expected irrigation demands within the District. As new supplies are brought on line, the district will more than double the volume of non-potable water available for distribution.

| <b>Table 34.<br/>Projected Normal Water Year Supply<br/>Recycled Water (AF/Y)</b> |             |             |             |             |             |
|---|-------------|-------------|-------------|-------------|-------------|
|   | <b>2010</b> | <b>2015</b> | <b>2020</b> | <b>2025</b> | <b>2030</b> |
| Supply  | 16,839      | 18,586      | 20,334      | 20,781      | 21,229      |
| % of Year 2005  | 177%        | 195%        | 213%        | 218%        | 223%        |

Demand for non-potable supplies are expected to grow as well as this economical supply is made available to ever-widening areas within the District.

| <b>Table 35.<br/>Projected Normal Water Year Total Demand<br/>Recycled Water (AF/Y)</b> |             |             |             |             |             |
|---|-------------|-------------|-------------|-------------|-------------|
|   | <b>2010</b> | <b>2015</b> | <b>2020</b> | <b>2025</b> | <b>2030</b> |
| Demand  | 6,800       | 8,670       | 9,300       | 11,800      | 11,900      |
| % of Year 2005 (Normalized)   | 139%        | 177%        | 190%        | 241%        | 243%        |

Sufficient non-potable recycled water is available to serve expected demands in even the driest scenarios. It is expected that surplus water will continue to be available for delivery outside the district boundaries in even the driest years.

|                                  | 2010        | 2015        | 2020        | 2025       | 2030       |
|----------------------------------|-------------|-------------|-------------|------------|------------|
| Supply Totals                    | 16,839      | 18,586      | 20,334      | 20,781     | 21,229     |
| Demand totals                    | 6,800       | 8,670       | 9,300       | 11,800     | 11,900     |
| Difference (Supply – Demand)     | 10,039      | 9,916       | 11,034      | 8,981      | 9,329      |
| <b>Difference as % of Supply</b> | <b>60%</b>  | <b>53%</b>  | <b>54%</b>  | <b>43%</b> | <b>44%</b> |
| <b>Difference as % of Demand</b> | <b>148%</b> | <b>114%</b> | <b>119%</b> | <b>76%</b> | <b>78%</b> |

|                                  | 2010        | 2015        | 2020        | 2025       | 2030       |
|----------------------------------|-------------|-------------|-------------|------------|------------|
| Supply Totals                    | 16,839      | 18,586      | 20,334      | 20,781     | 21,229     |
| Demand totals                    | 7,208       | 9,190       | 9,858       | 12,508     | 12,614     |
| Difference (Supply – Demand)     | 9,631       | 9,396       | 10,476      | 8,273      | 8,615      |
| <b>Difference as % of Supply</b> | <b>57%</b>  | <b>51%</b>  | <b>52%</b>  | <b>40%</b> | <b>41%</b> |
| <b>Difference as % of Demand</b> | <b>134%</b> | <b>102%</b> | <b>106%</b> | <b>66%</b> | <b>68%</b> |

|                                  | 2010        | 2015       | 2020       | 2025       | 2030       |
|----------------------------------|-------------|------------|------------|------------|------------|
| Supply Totals                    | 16,839      | 18,586     | 20,334     | 20,781     | 21,229     |
| Demand totals                    | 8,024       | 10,231     | 10,974     | 13,924     | 14,042     |
| Difference (Supply – Demand)     | 8,815       | 8,355      | 9,360      | 6,857      | 7,187      |
| <b>Difference as % of Supply</b> | <b>52%</b>  | <b>45%</b> | <b>46%</b> | <b>33%</b> | <b>34%</b> |
| <b>Difference as % of Demand</b> | <b>110%</b> | <b>82%</b> | <b>85%</b> | <b>49%</b> | <b>51%</b> |

### **Water Quality Impacts on Reliability**

The quality of the District's water supply is relatively stable and is not currently threatened by contaminants. The quality of imported water is excellent and relatively constant although a trend of increasing chlorides in the water has been noted in recent years. Increasing chlorides in recycled water, as a result, may cause some concern for growers who may irrigate salt sensitive crops. It is difficult, however, to determine if the trend will continue and, because cropping patterns can change, it is equally difficult to determine if there will be any impact as a result.

Increasing nitrate levels in groundwater may require short-term increases in imported water to blend the nitrates levels down to acceptable DHS levels. However, in the long-term, desalination

of supplies pumped from the Santa Rosa Aquifer will ensure that supply. There are no other contaminant issues involving District groundwater supplies.



## Demand Management Measures

### Law

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:

(f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:

(1) A description of each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following:

(A) Water survey programs for single-family residential and multifamily residential customers. (B) Residential plumbing retrofit. (C) System water audits, lead detection and repair. (D) Metering with commodity rates for all new connections and retrofit of existing connections. (E) Large Landscape conservation programs and incentives. (F) High-efficiency washing machine rebate programs. (G) public information programs. (H) School education programs. (I) Conservation programs for commercial, industrial and institutional accounts. (J) Wholesale agency programs. (K) Conservation pricing. (L) Water conservation coordinator. (M) Water waste prohibition. (N) Residential ultra-low-flush toilet replacement programs.

(g) An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, that offer lower incremental costs than expanded or additional water supplies.

(j) Urban water suppliers that are members of the California Urban Water Conservation Council and submit annual reports to that council in accordance with the "Memorandum of Understanding Regarding Urban Water Conservation in California," dated September 1991, may submit the annual reports identifying water demand management measures currently being implemented, or scheduled for implementation, to satisfy the requirements of subdivisions (f) and (g).

### Section Contents

- ▶ The District's water demand management measures are described.
- ▶ CUWCC annual reports identifying water demand management measures currently being implemented or scheduled for implementation are provided.
- ▶ An evaluation of any Demand Management Measures not currently being implemented or not scheduled for implementation is provided.

Improving reliability while keeping water affordable has been an ongoing goal of the District. During the most recent drought, the District was subjected to 30% cutbacks in imported water deliveries and immediately began developing alternative water sources. Camrosa has been a leader among local water Districts in promoting recycled water use and has placed 12,000 acre-feet of non-potable water on-line to reduce demand on imported water. In addition to developing new supplies, the District has found it prudent to implement demand management measures as well to ensure long-term reliability.

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## Conservation Programs

Camrosa Water District is committed to implementing water conservation and water recycling programs. As a signatory to the California Urban Water Conservation Council's (CUWCC) Memorandum of Understanding, the District is actively involved in implementing a prescribed set of urban water conservation best management practices (BMPs).

Camrosa Water District has implemented or plans to implement all of the required Demand Management Measures outlined in the CUWCC BMP's. Annual reports are filed with the CUWCC on activities conducted by the District to effect implementation. The annual reports, in conjunction with the bi-annual Coverage Reports, are provided in detail in appendix B.

### BMP Summary

The following is a brief summary some of the implementation actions initiated by the District.

#### **BMP 1 Water Survey Programs for Single-family Residential and Multi-family Residential Customers.**

Camrosa has performed interior and exterior water surveys which included installing low-flow shower heads, aerators on kitchen faucets, aerators on bathroom faucets and supplying toilet flappers where needed. Exterior surveys have been done for outside landscape irrigation systems.

#### **BMP 2 Residential Plumbing Retrofit.**

Low-flow showerheads are supplied with each ULFT giveaway and are available upon request at the District office at no cost. The District also supplies toilet flappers upon request at no cost.

#### **BMP 3 System Water Audits, Lead Detection and Repair.**

The historical average for unaccounted water for Camrosa Water District is 4.8%, substantially under the observed range of 10-15% as stated in AWWA Manual M32. The District is conscientious about locating and repairing main and service connection leaks when they occur. While the 2005 observed water-loss was 7.5%, this was partially due to pipe ruptures which occurred as a result of severe winter storms. The District has initiated a process to reduce unaccounted-for water-loss to less than 5% for the planning period covered by this plan.

#### **BMP 4 Metering with Commodity Rates**

Camrosa has a two tier rate structure and all connections are metered.

#### **BMP 5 Large Landscape Conservation Programs and Incentives.**

The District implemented the Protector del Agua (PDA) Residential and Professional landscape training programs sponsored by Metropolitan Water District of Southern California in 1998. To-date Camrosa has hosted 25 Residential classes and trained 368 people. In addition, the District has hosted 35 Spanish speaking and 21 English speaking professional landscape classes and trained a total of 202 professional landscapers.

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Camrosa was the recipient of a \$20,000 grant for the City Make Over Program from Metropolitan Water District. In June of 2004 a Native California Garden was planted at a cost of \$77,000. This demonstration garden of native plants has been an enhancement to the PDA classes and has resulted in a number of customers using native plants as well in their own gardens.

Two large Landscape surveys have been completed. For every acre-foot of water saved by large landscapes over a 12-month period, the Metropolitan Water District will provide a \$154 per acre-foot per month incentive for up to 3 years. Audits are available to new commercial and industrial landscape customers.

Metropolitan Water District of Southern California selected Camrosa to participate in a pilot program for weather-based landscape irrigation controllers. Twenty-five customers participated and 16 chose to install the controllers. The weather based controllers were supplied at no cost to the customers. The District will again participate in a 2006 program with another manufacturer of weather-based landscape irrigation controllers and will expand the program to include more customers.

#### **BMP 6 High-efficiency Washing Machine Rebate Programs.**

The District has conducted three washing machine rebate programs offering a total of \$55,175 to 232 customers. The first two rebate programs were for \$300 per machine with Camrosa, Calleguas Municipal Water District and Metropolitan Water District of Southern California each contributing \$100. The 2005/06 program provides \$225 per machine with Camrosa and Metropolitan each contributing \$100 and Calleguas contributing \$25.

#### **BMP 7 Public Information Programs**

Camrosa conducts District tours for school children, speakers for school visits and age appropriate literature to school children. Protector del Agua (PDA) classes are hosted several times each year. The Water Conservation Coordinator has been a director on the Camarillo Chamber of Commerce Board for the past 9 years and the District has hosted chamber meetings that allowed presentation of topics related to water.

The District actively participates in associations such as the Association of Water Agencies of Ventura County, the Water Education Foundation and the California Urban Water Conservation Council and uses literature and programs sponsored by those associations in educating the public.

Camrosa has distributed water information in its monthly bills, at special events and on the District's internet homepage at [www.camrosa.com](http://www.camrosa.com).

#### **BMP 8 School Education Programs**

The District has conducted teacher in-service workshops to promote water awareness as part of the school curriculum. Brochures are distributed on various water issues, and the District participates in Metropolitan programs to promote water awareness at the student level. A number of teachers have included water conservation as part of the class curriculum.

#### **BMP 9 Commercial, Industrial and Institutional Water Conservation Programs**

The District has conducted large landscape water surveys and will be offering rebates in the near future for various retrofits.

**BMP 10 Wholesale Agency Programs**

This BMP does not apply to Camrosa

**BMP 11 Conservation Pricing**

The District has implemented a rate structure that includes a meter service fee that is fixed by meter size and a tiered commodity rate which increases in proportion to the amount of water used.

**BMP 12 Water Conservation Coordinator**

Camrosa has one full-time Water Conservation/Public Information Coordinator who is responsible for all conservation related programs and implementing the BMP formulated by the CUWCC. The water conservation program is a line item in the District's budget.

**BMP 13 Water Prohibition**

Camrosa Water District has an ordinance that prohibits wasteful water practices.

**BMP 14 Residential Ultra Low Flush Toilet (ULFT) Replacement Program**

The District has distributed approximately 3,000 ULFT's utilizing the rebate and direct distribution programs. The next program will include direct drop shipment to the customer's door.

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## Water Shortage Contingency Plan:

### Law

10632. The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier:

(a) Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions which are applicable to each stage.

(b) An estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.

(c) Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.

(d) Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.

(e) Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.

(f) Penalties or charges for excessive use, where applicable.

(g) An analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.

(h) A draft water shortage contingency resolution or ordinance.

(i) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.

### Section Contents

- ▶ Stages of action taken in the event of a shortage of supply are identified.
- ▶ Water supply conditions for each stage are provided.
- ▶ Mandatory prohibitions against specific water use practices during water shortages are listed.
- ▶ Excessive use penalties are identified.
- ▶ Consumption reduction methods the District will use to reduce water use in the most restrictive stages are provided.
- ▶ Actions and conditions that impact revenues and expenditures are

described.

- Mechanisms for determining actual reductions are identified.

### **Water Supply Shortage Stages & Conditions**

On January 13, 2005, the Camrosa Water District adopted Ordinance 40-05, "Rules and Regulations Governing the Provision of Water and Sanitary Services." Among other things, the ordinance establishes conditions of service for all classes of water and establishes prohibitions against water waste and provisions for staged reductions in water service during water shortage emergencies. The Ordinance is included as Appendix C in its entirety; applicable portions are quoted below:

#### **"5.13 Prohibition of Water Waste**

*The following prohibitions are in effect at all times, regardless of whether any declared shortage condition is in effect:*

- 1. Gutter Flooding - No person shall cause or permit any water furnished to any property within the District to run or to escape from any hose, pipe, valve, faucet, sprinkler or irrigation device into any gutter or to otherwise escape from the property, if such running or escaping can reasonably be prevented.*
- 2. Leaks - No person shall permit leaks of water that he/she has the authority to eliminate.*
- 3. Waste - No person shall cause or permit water under his/her control to be wasted."*

#### **"5.16 Water Shortage Emergencies**

*"Water Shortage Emergency" is a condition resulting from some catastrophic event or events, which cause or threaten to cause an impairment, reduction, or severance of the district's water supply or access to its water supplies in a manner that may result in district's inability to meet ordinary water demands for potable water service.*

*In the event of a imminent inability of the district to meet ordinary water demands for a period beyond what can reasonably be considered routine system repairs the General Manager shall report to the Board of Directors on the extent, estimated duration, cause, and estimated severity of the event or events leading to the emergency and by resolution the Board of Directors may declare a Water Shortage Emergency and activate one or more of the following emergency provisions of this ordinance:*

##### Stage One Emergency

*The goal of a stage one emergency is a 10% potable water demand reduction to preserve water supplies for district and or the region until the emergency has ended. The district shall notify its customers via newspaper, radio, television and direct mail or by any other means determined by the district to be prudent that a Water Shortage Emergency has been declared and that the District is requesting all customers to voluntarily reduce water use by 10%.*

##### Stage Two Emergency

*The goal of a stage two emergency is a 20-30% reduction in potable water demands to prevent the loss of property and to protect the health and safety of the community and region. The district shall notice all of its customers via newspaper, radio, television and direct mail or by any other means determined by the district to be prudent that a Water Shortage Emergency has been declared and that the District is prohibiting the use outdoor use of potable water where non-potable or recycled water is available, all dust abatement, car washing,*

washing of sidewalks and driveways. The district shall request that all landscape and agricultural irrigation with potable water be monitored and carried out prudently to preserve water supplies. Failure to comply with the emergency requirements may result in fees and charges prescribed in the district's schedule of rates, fees, and charges of stage emergency conditions and/or termination of service.

Stage Three Emergency

The goal of a Stage three emergency is to reduce potable water demands by 50% to protect the health and safety of the community and the region. In addition to the actions and requirements of a stage two emergency, the district shall prohibit all outdoor potable water use with the exception that perennial plants may be irrigated only to prevent the loss of the plant or tree not to enhance crop yield or appearance until the emergency has ended. Violation of any provision of a stage three emergency may result in fees and charges prescribed in the districts schedule of rates, fees and charges. Repeated violations shall result in water capacity restrictions to the property or termination of service.

The Board of Directors may move from stage to stage as necessary to best manage the emergency. Once the emergency conditions have subsided and water supplies returned to normal the Board shall by resolution declare an end to the emergency and restore service to pre-emergency conditions."

Table 39 below summaries the shortage stages and conditions and expected response in each case.

| <b>Table 39.<br/>Water Supply Shortage Stages &amp; Conditions</b> |   |                        |
|--|---|------------------------|
| <b>Stage</b>   | <b>Water Supply Condition and Staged Responses</b>  | <b>%<br/>Reduction</b> |
| One  | <u>Condition:</u> Total net supply potable supply (imported and local sources) at 90% of firm supply (e.g. loss of a local groundwater source).<br><u>Response:</u> Voluntary reduction to preserve water supplies.   | 10%                    |
| Two  | <u>Condition:</u> Total net supply potable supply (imported and local sources) at 70% to 80% of firm supply (e.g. loss of multiple groundwater sources or a limitation in the availability of imported water).<br><u>Response:</u> Mandatory reduction to prevent property loss & protect health & safety of community. | 20-30%                 |
| Three  | <u>Condition:</u> Total net supply potable supply (imported and local sources) below 70% of firm supply (e.g. loss of all groundwater sources or significant reduction in the availability of imported water).<br><u>Response:</u> Mandatory reduction to protect health and safety of community.                       | 50%                    |

The ordinance allows the Board of Directors to progress through three stages of action in the event of a water shortage emergency. Each stage conserves progressively more water from 10% in Stage 1 to 50% in Stage 3. Since all water delivered by the District is metered both as production supply and as delivered to customers, actual reductions can be measured over time.

Emergency stages are declared by resolution of the Board. An attached draft resolution is attached as Appendix D. The ordinance is specifically written to preserve the Board's discretion to prescribe rates, fees, charges and penalties at the time the emergency is declared. This ensures that the charges will be set appropriately considering the circumstances of the emergency and prevailing factors that would influence the effectiveness of such measures.

### **Estimated three-year Minimum Water Supply**

A three-year minimum water supply is estimated using a 30% reduction in local groundwater pumping and an 18% increase in irrigation demand. Because sufficient water is available from imported sources to make up the difference in groundwater pumping reductions, and because the levels of recycled water available remain constant, little effect is evident.

| <b>Source</b>  | <b>Year 1</b> | <b>Year 2</b> | <b>Year 3</b> | <b>Normal</b> |
|----------------|---------------|---------------|---------------|---------------|
| Imported Water | 10281         | 10281         | 10281         | 8700          |
| Groundwater    | 3908          | 3908          | 3908          | 5583          |
| Recycled Water | 16839         | 16839         | 16839         | 16839         |
| Total          | 31,082        | 31,082        | 31,082        | 31,122        |

### **Emergency Response Plan**

The District maintains an Emergency Response Plan, separate from this Urban Water Management Plan that outlines procedures necessary to respond to emergency disasters. The purpose of that plan is to:

- Minimize damaging effects of natural or man-made disasters on the water production, water distribution, sewage collection and sewage treatment systems of Camrosa Water District;
- Restore those systems to working order as quickly as possible in the event of disasters,
- Provide local, area and state assistance where and when required during and after disasters as directed by the Ventura Operational Area Emergency Operations Center; and,
- Implement training procedures by going through mock exercises to make certain all employees are well versed in their roles.

Pursuant to the Public Health Security and Bio-Terrorism Preparedness and Response Act of 2002, Camrosa Water District conducted a vulnerability assessment and submitted a certified copy of that assessment to the U.S. Environmental Protection Agency in June 2004. The confidential report identified known vulnerabilities and countermeasures and responses to be implemented to safeguard against this potential threat.

The District's emergency procedures are fully integrated with the Standard Emergency Management System (SEMS) to ensure effective multi-agency and multi-jurisdictional responses to emergencies. Internally, Camrosa uses the Incident Command System (ICS) structure to provide a scalable, flexible response to emergencies.

The ICS provides procedures for designation of an Incident Commander who is ultimately responsible for all operations, planning, logistics, finance and public interface associated with any given emergency. Employee recall lists are published and contact lists for emergency assistance from outside contractors, utility companies, and other agencies have been pre-prepared. The plan fully contemplates full and open cooperation with the public media and individual customers throughout any emergency condition.

In terms of facilities and equipment to meet catastrophic emergencies, early 16 million gallons of tank storage is available within the District to provide immediate gravity powered water service for most of the District in the event of a power outage. The District has pre-staged power generation equipment at well sites and pumping stations sufficient to meet essential water demands within the District for extended periods. In addition, the District deploys two trailer-mounted portable power generation units that can be utilized to provide additional flexibility or to address localized problems. The Camrosa Water Reclamation Facility has installed electrical generation equipment to ensure continued operations for extended periods of time and uninterrupted recycled water service. Each District vehicle is equipped with emergency food and water supplies for extended deployment as well as a full set of system plans. An emergency response trailer is also equipped with supplies and equipment to manage emergency field operations. The water system's SCADA system is set up on an independent radio system with solar-powered instrumentation and radio transmission to maintain system monitoring independent of the electrical grid.

The District maintains sufficient reserves to fund most contemplated emergencies. Extensive replacement of infrastructure, in the most catastrophic circumstances, would require additional funding from sources that would need to be determined at the time of the emergency.

Table 41 below summarizes actions in response to emergency conditions that might reasonably occur in the District.

| <b>Table 41.<br/>Response Actions for a Catastrophe</b>                           |  |
|---|--|
| <b>Possible Catastrophe</b>   | <b>Summary of Actions</b>  |
| Regional Power Outage   | <ul style="list-style-type: none"> <li>▪ Evaluate need to initiate the Incident Command System</li> <li>▪ Lock off large interruptible service meters</li> <li>▪ Shift to fixed electrical generators</li> <li>▪ Position portable electrical generators</li> <li>▪ Evaluate need to implement water shortage contingency plan</li> </ul>                                  |
| Earthquake, Flood, or Fire - Caused Catastrophic Damage to Camrosa's Water System | <ul style="list-style-type: none"> <li>▪ Evaluate need to initiate the Incident Command System</li> <li>▪ Isolate damaged sections of system</li> <li>▪ Lock off large interruptible service meters</li> <li>▪ Fill system storage</li> <li>▪ Shift to electrical generators as necessary</li> <li>▪ Evaluate need to implement water shortage contingency plan</li> </ul> |
| Interruption of Supply from Water Wholesaler                                      | <ul style="list-style-type: none"> <li>▪ Evaluate need to initiate the Incident Command System</li> <li>▪ Fill system storage</li> <li>▪ Lock off large interruptible service meters</li> <li>▪ Evaluate need to implement water shortage contingency plan</li> </ul>  |

## Mandatory Prohibitions

Pursuant to Camrosa Ordinance 40-05, the following table summarizes existing mandatory prohibitions that are part of the existing water shortage contingency plan. Additional measures may be implemented at the discretion of the District Board of Directors.

| <b>Table 42.<br/>Mandatory Prohibitions</b>                                       |  |
|---|--|
| <b>Examples of Prohibitions</b>   | <b>Stage when Prohibition is Mandatory</b> |
| Potable water for street washing  | Stages 2 and above                         |
| Outdoor potable water use where recycled water is available                       | Stages 2 and above                         |
| Dust abatement, car washing, driveway and sidewalk washing                        | Stages 2 and above                         |
| Outdoor potable water use except to prevent the loss of perennial plants or trees | Stage 3                                    |

## Consumption Reduction Methods

Pursuant to Ordinance 40-05, the following table summarizes consumption reduction methods that would be instituted in the staged water shortage contingency planning by the District. Additional measures may be implemented at the discretion of the District Board of Directors.

| <b>Table 43.<br/>Consumption Reduction Methods</b>          |                                       |                                |
|---|---------------------------------------|--------------------------------|
| <b>Consumption Reduction Method</b>                         | <b>Stage When Method takes Effect</b> | <b>Projected Reduction (%)</b> |
| Voluntary Reductions, Public Information                    | Stage 1                               | 10%                            |
| Aesthetic outdoor use                                       | Stage 2                               | 20% to 30%                     |
| All outdoor use except to maintain perennial plants & trees | Stage 3                               | 50%                            |

## Penalties and Charges

In the event of a water shortage emergency, Ordinance 40-05 contemplates that special rates, fees, and/or penalty fees may be required to meet demand reductions necessary to preserve water supply. Since the circumstances prevailing at the time of the water shortage emergency will affect the management of the emergency, the existing ordinance does not presume that such fees will be applicable nor does it attempt to establish the basis for such penalties or charges in advance of the circumstances of the emergency.

| <b>Table 44.<br/>Penalties &amp; Charges</b> |   |
|--|---|
| <b>Penalty or Charge</b>                     | <b>Stage When Penalty Takes Effect</b>                                    |
| Penalty for excess use                       | TBD at Stages 2 or 3 at the discretion of the District Board of Directors |
| Charge for excess use                        | TBD at Stages 2 or 3 at the discretion of the District Board of Directors |

### **Non-Potable Water Service**

As discussed above, some classes of interruptible water service would be curtailed to meet potable water supply reductions. This section discusses the basis for interruptible water service. All Classes on non-potable service and certain classes of potable water service are interruptible as outlined in the following excerpts from Ordinance 40-05:

#### **"4.2.1.2 Agricultural Water Service Classifications**

*Agricultural Water Service is a class of [potable] service intended to serve commercial agriculture. To qualify for this class of service, the "Property" must qualify for the Agricultural Water Program available from Metropolitan Water District of Southern California and Calleguas Municipal Water District. This service, unlike Municipal Water Service is interruptible. Agricultural services may be interrupted for extended periods as a result of general water shortages, drought, maintenance requirements, and operational requirements. Agricultural Water Service may not be promptly restored following emergencies"*

#### **"4.2.2 "Non-Potable Water" Service**

*Camrosa provides "Non-potable Water" for a variety of irrigation, industrial, and commercial purposes. All non-potable service is interruptible due to non-availability of water, system maintenance requirements or operational requirements."*

Approximately 5,300 acre-feet (35%) of the district's 15,164 acre-feet of demand in the year 2005 is interruptible. Approximately 4000 acre-feet is non-potable recycled water delivered to agricultural irrigation use. More importantly, 1,299 acre-feet of potable water was served to agricultural use. This latter category would likely be a prime candidate for significant reductions.

### **Economic Considerations**

Any reductions in water use will certainly reduce revenues projected by the District to meet planned expenses. Production costs may increase as a result of higher rates and/or penalties placed on pumped or imported water.

The impact of Stage 1, 2 and 3 emergencies upon revenues was examined in detail and is outlined in Table 45 below.

**Table 45.  
Revenue Impact from Reduced Potable Sales**

|                                  | Average/<br>Normal<br>Water Year | Stages of Emergency       |                           |                           |
|----------------------------------|----------------------------------|---------------------------|---------------------------|---------------------------|
|                                  |                                  | Stage 1<br>10%<br>Cutback | Stage 2<br>30%<br>Cutback | Stage 3<br>50%<br>Cutback |
| <b>Water Production Costs</b>    |                                  |                           |                           |                           |
| Import Purchases                 | \$ 5,208,400                     | \$ 4,705,160              | \$ 3,698,680              | \$ 2,692,200              |
| Recycled Purchases               | 1,445,000                        | 1,445,000                 | 1,445,000                 | 1,445,000                 |
| Energy Costs                     | 818,000                          | 818,000                   | 818,000                   | 818,000                   |
| <b>Total Water Costs</b>         | <b>\$ 7,471,400</b>              | <b>\$ 6,968,160</b>       | <b>\$ 5,961,680</b>       | <b>\$ 4,955,200</b>       |
| <b>Water Revenues</b>            |                                  |                           |                           |                           |
| Potable Water Sales              | \$ 6,379,800                     | \$ 5,741,820              | \$ 4,465,860              | \$ 3,189,900              |
| Meter Service Charge             | 809,750                          | 809,750                   | 809,750                   | 809,750                   |
| Non-Potable Sales                | 1,212,200                        | 1,212,200                 | 1,212,200                 | 1,212,200                 |
| Non-Potable Meter Charge         | 55,200                           | 55,200                    | 55,200                    | 55,200                    |
| Recycled Sales                   | 85,000                           | 85,000                    | 85,000                    | 85,000                    |
| Recycled Meter Serv. Charge      | 500                              | 500                       | 500                       | 500                       |
| <b>Total Water Revenues</b>      | <b>\$ 8,542,450</b>              | <b>\$ 7,904,470</b>       | <b>\$ 6,628,510</b>       | <b>\$ 5,352,550</b>       |
| <b>Net from Water Operations</b> | <b>\$ 1,071,050</b>              | <b>\$ 936,310</b>         | <b>\$ 666,830</b>         | <b>\$ 397,350</b>         |
| (Year 2000 Revenues/Expenses)    |                                  |                           |                           |                           |

Substantial reductions in revenues resulting from reduced water sales are dampened to a large extent by reductions in imported water purchases. While revenues may be reduced during a Stage 3 Water Emergency by more than \$3 Million compared to a Normal Water Year, water purchase costs are reduced by nearly \$2.5 Million as well. The net revenue reduction would be approximately \$675,000. In a single year of water delivery cutbacks, the revenue reductions could be accommodated by suspending the contribution to capital replacement and funding the remaining budgeted expenses with a special Variation in Water Sales reserve.

The Board of Directors has several options available to maintain financial stability in the event an emergency lasted more than one accounting period.

- Non-capital expenses may be reduced in an attempt to balance with reduced revenues.
- The Variation in Water Sales reserve, established to dampen price fluctuations driven by changes in delivered volumes of water and increased production costs, may be used to offset added expenses attributable to a stage 2 or stage 3 water shortage emergency.
- Additional reserves, beyond the Variation in Water Sales reserve may be used to meet costs.
- Agricultural discount rates may be suspended in more severe emergencies.
- Rates may be restructured to reflect increased costs and/or reduced deliveries.
- Added capital investment may allow accelerated expansion of non-potable supplies or may allow development of lower quality supplies to dampen the need to enter more severe emergency stages.

In all cases, the Board will assess the financial impacts at the point an emergency is declared and will apply the appropriate measures to overcome those impacts.

### **Draft Water Shortage Contingency Resolution**

Consistent with Ordinance 40-05, a draft resolution to serve as a model of the Board of Directors declaration of a water shortage emergency and establishing an appropriate emergency stage is attached as Appendix D.

### **Water Use Monitoring Mechanisms**

The District meters all water production sources and customer water services. In the event of a water shortage emergency, metering would be the primary means to monitor whether reductions are being met. Production metering is automated, real-time, and measured to the nearest gallon. Given the volume of supply, the metering is converted to acre-feet under normal operations. Production metering would provide a broad measure of overall quantity of use in generalized zones. Customer service metering provides quantification of water use by customer. Meters are typically read monthly, but could be read on a more frequent basis as necessary. Customer meter reads are read to the nearest HCF.

| <b>Table 46.<br/>Water Use Monitoring Mechanisms</b> |  |
|--|--|
| <b>Mechanisms for Monitoring Actual Reductions</b>   | <b>Type and Quality of Data Expected</b>   |
| Production Metering                                  | Production Metering: Real time production metering for all sources of supply, computer compiled and generated trend graphs with quantities measured to the gallon and reported in acre-feet                            |
| Service Metering                                     | Customer service meters: All water use is metered and in normal operations read monthly. More frequent reading could be implemented to evaluate response to staged reduction plan. Metered services calibrated in HCF. |
| Interruptible Service                                | Visual confirmation as needed that locked off meters remain locked off and not providing service   |
| Prohibited Uses                                      | Community monitoring   |



## **Appendix A - Resolution adopting the 2005 Urban Water Management Plan**

- Resolution 06-01 A resolution of the Board of Directors of Camrosa Water District Adopting the Urban Water Management Plan 2005
  
- Proof of Public Hearing



*A Resolution of the Board of Directors  
of Camrosa Water District*

*Adopting the  
Urban Water Management Plan 2005*

**Board of Directors**

Al E. Fox  
Division 1  
Jeffrey C. Brown  
Division 2  
Timothy H. Hoag  
Division 3  
Ronald J. Vogel  
Division 4  
Terry L. Foreman  
Division 5

**General Manager**

Richard H. Hajas

*Whereas, The Urban Water Management Planning Act (Water Code Sections 10631-10633, 10635, 10642 et seq.) requires urban water suppliers providing municipal water directly or indirectly to more than 3,000 customers, or who supply more than 3,000 acre-feet of water annually, to adopt an Urban Water Management Plan; and,*

*Whereas, The Urban Water Management Planning Act further requires review of the Urban Water Management Plan at least once every five years; and,*

*Whereas, The Act mandates that the Urban Water Management Plan and amended versions be filed with the California Department of Water Resources; and,*

*Whereas, The District is an urban supplier of water, serving a population of 27,800; and,*

*Whereas, the District has therefore, prepared and circulated for public review a draft Urban Water Management Plan; and,*

*Whereas, a properly noticed public hearing regarding said Plan was held by the Board of Directors on April 20, 2006; and,*

*Whereas, Camrosa Water District did prepare and shall file said Plan with the California Department of Water Resources by April 30, 2006;*

*Now, Therefore, Be It Resolved* by the Camrosa Water District Board of Directors that the attached Urban Water Management Plan is hereby adopted this date.

*Adopted, Signed, and Approved* this 20<sup>th</sup> day of April, 2006.

---

*Al E. Fox, President  
Board of Directors  
Camrosa Water District*

*ATTEST:*

---

*Richard H. Hajas, Secretary  
Board of Directors  
Camrosa Water District*

# Certificate of Publication

Ad #977849

In Matter of Publication of:

Notice of Public Hearing

State of California)

))§

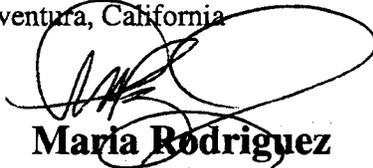
County of Ventura)

I, **Maria Rodriguez**, hereby certify that the **Ventura County Star, Thousand Oaks Star, Oxnard Star, Simi Valley Star, Moorpark Star, Camarillo Star** has been adjudged a newspaper of general circulation by the Superior Court of California, County of Ventura within the provisions of the Government Code of the State of California, printed and published in the City of San Buenaventura, County of Ventura, State of California; that I am the a clerk of the printer of said paper; that the annexed clipping is a true printed copy and publishing in said newspaper on the following dates to wit

April 5, 12, 2006

I, Maria Rodriguez certify under penalty of perjury, that the foregoing is true and correct.

Dated this April 12, 2006, in San Buenaventura, California

  
**Maria Rodriguez**  
(Signature)

## NOTICE OF PUBLIC HEARING

NOTICE IS HEREBY GIVEN that a Public Hearing with the Camrosa Water District Board of Directors will be held:

—Thursday, April 20, 2006 at 5:00pm—  
CAMROSA WATER DISTRICT  
7385 Santa Rosa Rd. Camarillo, CA. 93012  
(805) 482-4677

The purpose of this Public Hearing is to give the public the opportunity to submit written and or verbal comments regarding the 2005 Urban Water Management Plan (UWMP) for the Camrosa Water District. The UWMP provides a comprehensive assessment of Camrosa's water resource needs for a 20-year planning period and provides the Department of Water Resources with information on present and future water sources and demands.

This document was developed in response to Water Code Sections 10620, 10621, 10631-10635, and 10642 of the Urban Water Management Planning Act.  
Copies of the UWMP are available for public review at the following locations:

- Camarillo Public Library
- Camrosa Water District office
- [www.camrosa.com](http://www.camrosa.com) (Camrosa Water District website)

Written comments on the plan should be submitted by April 14, 2006 to Mr. Frank Royer, Assistant General Manager at the above address.

Richard H. Hajas  
Secretary / General Manager  
CAMROSA WATER DISTRICT BOARD OF DIRECTORS  
Publish: April 5, 12, 2006 Ad No.VC977849

## **Appendix B – CUWCC Annual Report (BMPs)**

- 2003 Annual CUWCC Annual Report
- 2004 Annual CUWCC Annual Report
- 2003-04 CUWCC Coverage Reports

Reported as of 1/26/06

**Water Supply & Reuse**

Reporting Unit:  
**Camrosa Water District**

Year:  
**2003**

**Water Supply Source Information**

| Supply Source Name | Quantity (AF) Supplied | Supply Type |
|--------------------|------------------------|-------------|
|--------------------|------------------------|-------------|

**Total AF:**

Reported as of 1/26/06

**Accounts & Water Use**Reporting Unit Name:  
**Camrosa Water District**Submitted to  
CUWCC  
12/01/2004Year:  
**2003****A. Service Area Population Information:**

1. Total service area population 30000

**B. Number of Accounts and Water Deliveries (AF)**

| Type                    | Metered         |                       | Unmetered       |                       |
|-------------------------|-----------------|-----------------------|-----------------|-----------------------|
|                         | No. of Accounts | Water Deliveries (AF) | No. of Accounts | Water Deliveries (AF) |
| 1. Single-Family        | 8765            | 6540                  | 0               | 0                     |
| 2. Multi-Family         | 834             | 129                   | 0               | 0                     |
| 3. Commercial           | 91              | 1242                  | 0               | 0                     |
| 4. Industrial           | 0               | 0                     | 0               | 0                     |
| 5. Institutional        | 13              | 626                   | 0               | 0                     |
| 6. Dedicated Irrigation | 192             | 594                   | 0               | 0                     |
| 7. Recycled Water       | 30              | 979                   | 0               | 0                     |
| 8. Other                | 170             | 3514                  | 0               | 0                     |
| 9. Unaccounted          | NA              | 0                     | NA              | 0                     |
| <b>Total</b>            | 10095           | 13624                 | 0               | 0                     |

**Metered****Unmetered**

Reported as of 1/26/06

## BMP 01: Water Survey Programs for Single-Family and Multi-Family Residential Customers

Reporting Unit: **Camrosa Water District**      BMP Form Status: **100% Complete**      Year: **2003**

### A. Implementation

- 1. Based on your signed MOU date, 12/15/1994, your Agency STRATEGY DUE DATE is: 12/14/1996
- 2. Has your agency developed and implemented a targeting/marketing strategy for SINGLE-FAMILY residential water use surveys? yes
  - a. If YES, when was it implemented? 4/2/1995
- 3. Has your agency developed and implemented a targeting/marketing strategy for MULTI-FAMILY residential water use surveys? no
  - a. If YES, when was it implemented?

### B. Water Survey Data

| Survey Counts:                  | Single Family Accounts | Multi-Family Units |
|---------------------------------|------------------------|--------------------|
| 1. Number of surveys offered:   | 0                      | 0                  |
| 2. Number of surveys completed: | 0                      | 0                  |

### Indoor Survey:

- 3. Check for leaks, including toilets, faucets and meter checks yes      no
- 4. Check showerhead flow rates, aerator flow rates, and offer to replace or recommend replacement, if necessary yes      no
- 5. Check toilet flow rates and offer to install or recommend installation of displacement device or direct customer to ULFT replacement program, as necessary; replace leaking toilet flapper, as necessary yes      no

### Outdoor Survey:

- 6. Check irrigation system and timers yes      no
- 7. Review or develop customer irrigation schedule no      no
- 8. Measure landscaped area (Recommended but not required for surveys) yes      no
- 9. Measure total irrigable area (Recommended but not required for surveys) no      no
- 10. Which measurement method is typically used (Recommended but not required for surveys) Odometer Wheel
- 11. Were customers provided with information packets that included evaluation results and water savings recommendations? yes      no
- 12. Have the number of surveys offered and completed, survey results, and survey costs been tracked? yes      no
  - a. If yes, in what form are surveys tracked? spreadsheet
  - b. Describe how your agency tracks this information.

Customer service work orders

### C. Water Survey Program Expenditures

**This Year      Next Year**

|                          |      |      |
|--------------------------|------|------|
| 1. Budgeted Expenditures | 1000 | 1000 |
| 2. Actual Expenditures   | 0    |      |

**D. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**E. Comments**

Looking to contract out in 2004/2005

## BMP 02: Residential Plumbing Retrofit

Reporting Unit: **Camrosa Water District**      BMP Form Status: **100% Complete**      Year: **2003**

### A. Implementation

- 1. Is there an enforceable ordinance in effect in your service area requiring replacement of high-flow showerheads and other water use fixtures with their low-flow counterparts? no
  - a. If YES, list local jurisdictions in your service area and code or ordinance in each:
  
- 2. Has your agency satisfied the 75% saturation requirement for single-family housing units? no
- 3. Estimated percent of single-family households with low-flow showerheads: 60%
- 4. Has your agency satisfied the 75% saturation requirement for multi-family housing units? no
- 5. Estimated percent of multi-family households with low-flow showerheads: 56%
- 6. If YES to 2 OR 4 above, please describe how saturation was determined, including the dates and results of any survey research.

### B. Low-Flow Device Distribution Information

- 1. Has your agency developed a targeting/ marketing strategy for distributing low-flow devices? yes
  - a. If YES, when did your agency begin implementing this strategy? 2/7/1997
  - b. Describe your targeting/ marketing strategy.

Distribute with ULFT's and as requested by customer's. Also hand out to the general public when we attend special functions.

| Low-Flow Devices Distributed/ Installed                                  | SF Accounts | MF Units    |
|--|-------------|-------------|
| 2. Number of low-flow showerheads distributed:                           | 17          | 32          |
| 3. Number of toilet-displacement devices distributed:                    | 0           | 0           |
| 4. Number of toilet flappers distributed:                                | 2           | 25          |
| 5. Number of faucet aerators distributed:                                | 0           | 0           |
| 6. Does your agency track the distribution and cost of low-flow devices? |             | yes         |
| a. If YES, in what format are low-flow devices tracked?                  |             | Spreadsheet |
| b. If yes, describe your tracking and distribution system :              |             |             |

Excel spreadsheet, technical services staff.

### C. Low-Flow Device Distribution Expenditures

|                          | This Year | Next Year |
|--------------------------|-----------|-----------|
| 1. Budgeted Expenditures | 0         | 0         |
| 2. Actual Expenditures   | 0         |           |

### D. "At Least As Effective As"

- 1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**E. Comments**

No expenses, product in stock.

Reported as of 1/26/06

**BMP 03: System Water Audits, Leak Detection and Repair**

Reporting Unit: **Camrosa Water District**      BMP Form Status: **100% Complete**      Year: **2003**

**A. Implementation**

1. Has your agency completed a pre-screening system audit for this reporting year? yes
2. If YES, enter the values (AF/Year) used to calculate verifiable use as a percent of total production:
  - a. Determine metered sales (AF) 12681
  - b. Determine other system verifiable uses (AF) 0
  - c. Determine total supply into the system (AF) 13001.04
  - d. Using the numbers above, if (Metered Sales + Other Verifiable Uses) / Total Supply is < 0.9 then a full-scale system audit is required. 0.98
3. Does your agency keep necessary data on file to verify the values used to calculate verifiable uses as a percent of total production? yes
4. Did your agency complete a full-scale audit during this report year? yes
5. Does your agency maintain in-house records of audit results or the completed AWWA audit worksheets for the completed audit? yes
6. Does your agency operate a system leak detection program? yes
  - a. If yes, describe the leak detection program:

System is checked on an on going basis by all field staff.

**B. Survey Data**

1. Total number of miles of distribution system line. 130
2. Number of miles of distribution system line surveyed. 130

**C. System Audit / Leak Detection Program Expenditures**

|                          | This Year | Next Year |
|--------------------------|-----------|-----------|
| 1. Budgeted Expenditures | 0         | 0         |
| 2. Actual Expenditures   | 0         |           |

**D. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? yes
  - a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

Routine system checks by field staff.

**E. Comments**



Reported as of 1/26/06

## BMP 05: Large Landscape Conservation Programs and Incentives

Reporting Unit: **Camrosa Water District**      BMP Form Status: **100% Complete**      Year: **2003**

### A. Water Use Budgets

- |  |     |
|--|-----|
| 1. Number of Dedicated Irrigation Meter Accounts:  | 422 |
| 2. Number of Dedicated Irrigation Meter Accounts with Water Budgets:                       | 0   |
| 3. Budgeted Use for Irrigation Meter Accounts with Water Budgets (AF):                     | 0   |
| 4. Actual Use for Irrigation Meter Accounts with Water Budgets (AF):                       | 0   |
| 5. Does your agency provide water use notices to accounts with budgets each billing cycle? | no  |

### B. Landscape Surveys

- |  |    |
|--|----|
| 1. Has your agency developed a marketing / targeting strategy for landscape surveys? | no |
| a. If YES, when did your agency begin implementing this strategy?                    |    |
| b. Description of marketing / targeting strategy:                                    |    |
| 2. Number of Surveys Offered.  | 0  |
| 3. Number of Surveys Completed.  | 0  |
| 4. Indicate which of the following Landscape Elements are part of your survey:       |    |
| a. Irrigation System Check   | no |
| b. Distribution Uniformity Analysis  | no |
| c. Review / Develop Irrigation Schedules   | no |
| d. Measure Landscape Area  | no |
| e. Measure Total Irrigable Area  | no |
| f. Provide Customer Report / Information   | no |
| 5. Do you track survey offers and results?   | no |
| 6. Does your agency provide follow-up surveys for previously completed surveys?      | no |
| a. If YES, describe below:   |    |

### C. Other BMP 5 Actions

- |   |     |
|---|-----|
| 1. An agency can provide mixed-use accounts with ETo-based landscape budgets in lieu of a large landscape survey program. Does your agency provide mixed-use accounts with landscape budgets? | no  |
| 2. Number of CII mixed-use accounts with landscape budgets.   | 0   |
| 3. Do you offer landscape irrigation training?  | yes |
| 4. Does your agency offer financial incentives to improve landscape water use efficiency?   | no  |

| Type of Financial Incentive: | Budget<br>(Dollars/<br>Year) | Number Awarded<br>to Customers | Total<br>Amount<br>Awarded |
|------------------------------|------------------------------|--------------------------------|----------------------------|
| a. Rebates                   | 0                            | 0                              | 0                          |
| b. Loans                     | 0                            | 0                              | 0                          |

|           |   |   |   |
|-----------|---|---|---|
| c. Grants | 0 | 0 | 0 |
|-----------|---|---|---|

|  |  |  |     |
|--|--|--|-----|
| 5. Do you provide landscape water use efficiency information to new customers and customers changing services? |  |  | yes |
|--|--|--|-----|

a. If YES, describe below:

Brochures and Protector del Agua training.

|  |  |  |     |
|--|--|--|-----|
| 6. Do you have irrigated landscaping at your facilities? |  |  | yes |
|--|--|--|-----|

|                                   |  |  |    |
|-----------------------------------|--|--|----|
| a. If yes, is it water-efficient? |  |  | no |
|-----------------------------------|--|--|----|

|  |  |  |    |
|--|--|--|----|
| b. If yes, does it have dedicated irrigation metering? |  |  | no |
|--|--|--|----|

|   |  |  |    |
|---|--|--|----|
| 7. Do you provide customer notices at the start of the irrigation season? |  |  | no |
|---|--|--|----|

|   |  |  |    |
|---|--|--|----|
| 8. Do you provide customer notices at the end of the irrigation season? |  |  | no |
|---|--|--|----|

#### D. Landscape Conservation Program Expenditures

|                          | This Year | Next Year |
|--------------------------|-----------|-----------|
| 1. Budgeted Expenditures | 10000     | 10000     |
| 2. Actual Expenditures   | 0         |           |

#### E. "At Least As Effective As"

|   |  |    |
|---|--|----|
| 1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? |  | No |
|---|--|----|

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

#### F. Comments

Reported as of 1/26/06

## BMP 06: High-Efficiency Washing Machine Rebate Programs

Reporting Unit: **Camrosa Water District**      BMP Form Status: **100% Complete**      Year: **2003**

### A. Implementation

1. Do any energy service providers or waste water utilities in your service area offer rebates for high-efficiency washers? yes

a. If YES, describe the offerings and incentives as well as who the energy/waste water utility provider is.

Southern California Gas Co. \$75.00. Southern California Edison has suspended their rebate program due to lack of funds.

2. Does your agency offer rebates for high-efficiency washers? yes

3. What is the level of the rebate? 300

4. Number of rebates awarded. 95

### B. Rebate Program Expenditures

|                          | This Year | Next Year |
|--------------------------|-----------|-----------|
| 1. Budgeted Expenditures | 2500      | 2500      |
| 2. Actual Expenditures   | 5000      |           |

### C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

### D. Comments

Total rebate to customer was \$300 \$100 each from Camrosa, Calleguas & Metropolitan Water Districts. Camrosa initially budgeted for 25 rebates and increased it to 50.

**BMP 07: Public Information Programs**

Reporting Unit: **Camrosa Water District**      BMP Form Status: **100% Complete**      Year: **2003**

**A. Implementation**

1. Does your agency maintain an active public information program to promote and educate customers about water conservation? yes
- a. If YES, describe the program and how it's organized.

Advertising in publications Protector del Agua residential landscape classes as well as PDA for the professional landscaper.

2. Indicate which and how many of the following activities are included in your public information program.

| Public Information Program Activity  | Yes/No | Number of Events |
|--|--------|------------------|
| a. Paid Advertising  | no     | 2                |
| b. Public Service Announcement   | no     | 0                |
| c. Bill Inserts / Newsletters / Brochures  | yes    | 2                |
| d. Bill showing water usage in comparison to previous year's usage                                     | yes    |                  |
| e. Demonstration Gardens   | no     | 0                |
| f. Special Events, Media Events  | yes    | 0                |
| g. Speaker's Bureau  | no     | 0                |
| h. Program to coordinate with other government agencies, industry and public interest groups and media | yes    |                  |

**B. Conservation Information Program Expenditures**

|                          | This Year | Next Year |
|--------------------------|-----------|-----------|
| 1. Budgeted Expenditures | 20000     | 48000     |
| 2. Actual Expenditures   | 22000     |           |

**C. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No
- a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**D. Comments**

**BMP 08: School Education Programs**

Reporting Unit:  
**Camrosa Water District**

BMP Form Status:  
**100% Complete**

Year:  
**2003**

**A. Implementation**

1. Has your agency implemented a school information program to promote water conservation? yes

2. Please provide information on your school programs (by grade level):

| Grade          | Are grade-appropriate materials distributed? | No. of class presentations | No. of students reached | No. of teachers' workshops |
|----------------|--|----------------------------|-------------------------|----------------------------|
| Grades K-3rd   | yes  | 0                          | 0                       | 0                          |
| Grades 4th-6th | yes  | 0                          | 0                       | 0                          |
| Grades 7th-8th | yes  | 0                          | 0                       | 0                          |
| High School    | yes  | 0                          | 0                       | 0                          |

3. Did your Agency's materials meet state education framework requirements? yes

4. When did your Agency begin implementing this program? 06/01/1995

**B. School Education Program Expenditures**

|                          | This Year | Next Year |
|--------------------------|-----------|-----------|
| 1. Budgeted Expenditures | 0         | 0         |
| 2. Actual Expenditures   | 0         |           |

**C. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**D. Comments**

Have brochures on hand and web site. Give tours of the district to students.

Reported as of 1/26/06

**BMP 09: Conservation Programs for CII Accounts**

Reporting Unit: **Camrosa Water District**      BMP Form Status: **100% Complete**      Year: **2003**

**A. Implementation**

- |  |     |
|--|-----|
| 1. Has your agency identified and ranked COMMERCIAL customers according to use?    | yes |
| 2. Has your agency identified and ranked INDUSTRIAL customers according to use?    | yes |
| 3. Has your agency identified and ranked INSTITUTIONAL customers according to use? | yes |

**Option A: CII Water Use Survey and Customer Incentives Program**

4. Is your agency operating a CII water use survey and customer incentives program for the purpose of complying with BMP 9 under this option? no

| CII Surveys  | Commercial<br>Accounts | Industrial<br>Accounts      | Institutional<br>Accounts     |
|--|------------------------|-----------------------------|-------------------------------|
| a. Number of New Surveys Offered   | 0                      | 0                           | 0                             |
| b. Number of New Surveys Completed   | 0                      | 0                           | 0                             |
| c. Number of Site Follow-ups of Previous Surveys (within 1 yr)                                 | 0                      | 0                           | 0                             |
| d. Number of Phone Follow-ups of Previous Surveys (within 1 yr)                                | 0                      | 0                           | 0                             |
| CII Survey Components  | Commercial<br>Accounts | Industrial<br>Accounts      | Institutional<br>Accounts     |
| e. Site Visit  |                        | no                          | no                            |
| f. Evaluation of all water-using apparatus and processes                                       | no                     | no                          | no                            |
| g. Customer report identifying recommended efficiency measures, paybacks and agency incentives | no                     | no                          | no                            |
| Agency CII Customer Incentives   | Budget<br>(\$/Year)    | No. Awarded to<br>Customers | Total \$<br>Amount<br>Awarded |
| h. Rebates   | 0                      | 0                           | 0                             |
| i. Loans   | 0                      | 0                           | 0                             |
| j. Grants  | 0                      | 0                           | 0                             |
| k. Others  | 0                      | 0                           | 0                             |

**Option B: CII Conservation Program Targets**

5. Does your agency track CII program interventions and water savings for the purpose of complying with BMP 9 under this option? no

6. Does your agency document and maintain records on how savings were realized and the method of calculation for estimated savings?

7. Estimated annual savings (AF/yr) from site-verified actions taken by agency since 1991. 0

8. Estimated annual savings (AF/yr) from non-site-verified actions taken by agency since 1991. 0

### **B. Conservation Program Expenditures for CII Accounts**

|                          | This Year | Next Year |
|--------------------------|-----------|-----------|
| 1. Budgeted Expenditures | 0         | 0         |
| 2. Actual Expenditures   | 0         |           |

### **C. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

### **D. Comments**

Audits & Rebates to start in 2004/2005

**BMP 09a: CII ULFT Water Savings**

Reporting Unit: **Camrosa Water District**      BMP Form Status: **100% Complete**      Year: **2003**

1. Did your agency implement a CII ULFT replacement program in the reporting year? No  
 If No, please explain why on Line B.  
 10.

**A. Targeting and Marketing**

1. What basis does your agency use to target customers for participation in this program? Check all that apply.  
 a. Describe which method you found to be the most effective overall, and which was the most effective per dollar expended.

2. How does your agency advertise this program? Telephone  
 Check all that apply.  
 a. Describe which method you found to be the most effective overall, and which was the most effective per dollar expended.

**B. Implementation**

1. Does your agency keep and maintain customer participant information? (Read the Help information for a complete list of all the information for this BMP.) Yes

2. Would your agency be willing to share this information if the CUWCC did a study to evaluate the program on behalf of your agency? Yes

3. What is the total number of customer accounts participating in the program during the last year ? 0

| CII Subsector         | Number of Toilets Replaced |              |                   |                  |  | Type Not Specified |
|-----------------------|----------------------------|--------------|-------------------|------------------|--|--------------------|
|                       | Standard Gravity Tank      | Air Assisted | Valve Floor Mount | Valve Wall Mount |  |                    |
| 4. a. Offices         |                            |              |                   |                  |  | 0                  |
| b. Retail / Wholesale |                            |              |                   |                  |  | 0                  |
| c. Hotels             |                            |              |                   |                  |  | 0                  |
| d. Health             |                            |              |                   |                  |  | 0                  |
| e. Industrial         |                            |              |                   |                  |  | 0                  |
| f. Schools: K to 12   |                            |              |                   |                  |  | 0                  |
| g. Eating             |                            |              |                   |                  |  | 0                  |
| h. Government         |                            |              |                   |                  |  | 0                  |

- i. Churches 0
- j. Other 0

5. Program design.

6. Does your agency use outside services to implement this program? No

a. If yes, check all that apply.

7. Participant tracking and follow-up.

8. Based on your program experience, please rank on a scale of 1 to 5, with 1 being the least frequent cause and 5 being the most frequent cause, the following reasons why customers refused to participate in the program.

- a. Disruption to business
- b. Inadequate payback
- c. Inadequate ULFT performance
- d. Lack of funding
- e. American's with Disabilities Act
- f. Permitting
- g. Other. Please describe in B. 9.

9. Please describe general program acceptance/resistance by customers, obstacles to implementation, and other issues affecting program implementation or effectiveness.

10. Please provide a general assessment of the program for this reporting year. Did your program achieve its objectives? Were your targeting and marketing approaches effective? Were program costs in line with expectations and budgeting?

No activity for 2003

**C. Conservation Program Expenditures for CII ULFT**

1. CII ULFT Program: Annual Budget & Expenditure Data

|                              | <b>Budgeted</b> | <b>Actual Expenditure</b> |
|------------------------------|-----------------|---------------------------|
| a. Labor                     |                 |                           |
| b. Materials                 |                 |                           |
| c. Marketing & Advertising   |                 |                           |
| d. Administration & Overhead |                 |                           |
| e. Outside Services          |                 |                           |
| f. Total                     | 0               | 0                         |

2. CII ULFT Program: Annual Cost Sharing

- a. Wholesale agency contribution
- b. State agency contribution
- c. Federal agency contribution
- d. Other contribution

e. Total

0

**D. Comments**

Reported as of 1/26/06

**BMP 11: Conservation Pricing**

|  |   |                      |
|--|---|----------------------|
| Reporting Unit:<br><b>Camrosa Water District</b> | BMP Form<br>Status:<br><b>100% Complete</b> | Year:<br><b>2003</b> |
|--|---|----------------------|

**A. Implementation****Rate Structure Data Volumetric Rates for Water Service by Customer Class****1. Residential**

|  |                          |
|--|--------------------------|
| a. Water Rate Structure  | Increasing Block         |
| b. Sewer Rate Structure  | Non-volumetric Flat Rate |
| c. Total Revenue from Volumetric Rates                                       | \$3606676                |
| d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources | \$1421496                |

**2. Commercial**

|  |                          |
|--|--------------------------|
| a. Water Rate Structure  | Increasing Block         |
| b. Sewer Rate Structure  | Non-volumetric Flat Rate |
| c. Total Revenue from Volumetric Rates                                       | \$656809                 |
| d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources | \$55188                  |

**3. Industrial**

|  |                          |
|--|--------------------------|
| a. Water Rate Structure  | Increasing Block         |
| b. Sewer Rate Structure  | Non-volumetric Flat Rate |
| c. Total Revenue from Volumetric Rates                                       | \$0                      |
| d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources | \$0                      |

**4. Institutional / Government**

|  |                          |
|--|--------------------------|
| a. Water Rate Structure  | Increasing Block         |
| b. Sewer Rate Structure  | Non-volumetric Flat Rate |
| c. Total Revenue from Volumetric Rates                                       | \$330321                 |
| d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources | \$195665                 |

**5. Irrigation**

|  |                          |
|--|--------------------------|
| a. Water Rate Structure  | Increasing Block         |
| b. Sewer Rate Structure  | Non-volumetric Flat Rate |
| c. Total Revenue from Volumetric Rates                                       | \$477967                 |
| d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources | \$0                      |

**6. Other**

|  |                          |
|--|--------------------------|
| a. Water Rate Structure  | Increasing Block         |
| b. Sewer Rate Structure  | Non-volumetric Flat Rate |
| c. Total Revenue from Volumetric Rates                                       | \$1289245                |
| d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources | \$0                      |

**B. Conservation Pricing Program Expenditures**

|                          | <b>This Year</b> | <b>Next Year</b> |
|--------------------------|------------------|------------------|
| 1. Budgeted Expenditures | 0                | 0                |
| 2. Actual Expenditures   | 0                |                  |

**C. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**D. Comments**

**BMP 12: Conservation Coordinator**

Reporting Unit: **Camrosa Water District**      BMP Form Status: **100% Complete**      Year: **2003**

**A. Implementation**

- 1. Does your Agency have a conservation coordinator? yes
- 2. Is this a full-time position? yes
- 3. If no, is the coordinator supplied by another agency with which you cooperate in a regional conservation program ?
- 4. Partner agency's name:
- 5. If your agency supplies the conservation coordinator:
  - a. What percent is this conservation coordinator's position? 100%
  - b. Coordinator's Name Mary Jo Mitchell
  - c. Coordinator's Title Water Conservation/Public Information Coordinator
  - d. Coordinator's Experience and Number of Years On the job training, attend seminars, work shops, PDA class - 5 years experience
  - e. Date Coordinator's position was created (mm/dd/yyyy) 7/1/1997
- 6. Number of conservation staff, including Conservation Coordinator. 1

**B. Conservation Staff Program Expenditures**

|                          | This Year | Next Year |
|--------------------------|-----------|-----------|
| 1. Budgeted Expenditures | 34500     | 38500     |
| 2. Actual Expenditures   | 22894     |           |

**C. "At Least As Effective As"**

- 1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no
  - a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**D. Comments**

Reported as of 1/26/06

**BMP 13: Water Waste Prohibition**

Reporting Unit: **Camrosa Water District**      BMP Form Status: **100% Complete**      Year: **2003**

**A. Requirements for Documenting BMP Implementation**

1. Is a water waste prohibition ordinance in effect in your service area? yes

a. If YES, describe the ordinance:

Rules & Regulations adopted February 22, 2001

2. Is a copy of the most current ordinance(s) on file with CUWCC? yes

a. List local jurisdictions in your service area in the first text box and water waste ordinance citations in each jurisdiction in the second text box:

None

None

**B. Implementation**

1. Indicate which of the water uses listed below are prohibited by your agency or service area.

a. Gutter flooding yes

b. Single-pass cooling systems for new connections no

c. Non-recirculating systems in all new conveyor or car wash systems no

d. Non-recirculating systems in all new commercial laundry systems no

e. Non-recirculating systems in all new decorative fountains no

f. Other, please name no

2. Describe measures that prohibit water uses listed above:

Visual checks by Service personnel during their daily work routine.

**Water Softeners:**

3. Indicate which of the following measures your agency has supported in developing state law:

a. Allow the sale of more efficient, demand-initiated regenerating DIR models. yes

b. Develop minimum appliance efficiency standards that:

i.) Increase the regeneration efficiency standard to at least 3,350 grains of hardness removed per pound of common salt used. yes

ii.) Implement an identified maximum number of gallons discharged per gallon of soft water produced. yes

c. Allow local agencies, including municipalities and special districts, to set more stringent standards and/or to ban on-site regeneration of water softeners if it is demonstrated and found by the agency governing board that there is an adverse effect on the reclaimed water or groundwater supply. yes

4. Does your agency include water softener checks in home water audit programs? no

5. Does your agency include information about DIR and exchange-type water softeners in educational efforts to encourage replacement of less efficient timer models? no

**C. Water Waste Prohibition Program Expenditures**

**This Year**      **Next Year**

|                          |   |   |
|--------------------------|---|---|
| 1. Budgeted Expenditures | 0 | 0 |
| 2. Actual Expenditures   | 0 |   |

**D. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**E. Comments**

**BMP 14: Residential ULFT Replacement Programs**

Reporting Unit: **Camrosa Water District**      BMP Form Status: **100% Complete**      Year: **2003**

**A. Implementation**

|  | <b>Single-Family<br/>Accounts</b> | <b>Multi-Family<br/>Units</b> |
|--|-----------------------------------|-------------------------------|
| 1. Does your Agency have program(s) for replacing high-water-using toilets with ultra-low flush toilets? | yes                               | yes                           |

**Number of Toilets Replaced by Agency Program During Report Year**

| <b>Replacement Method</b> | <b>SF<br/>Accounts</b> | <b>MF Units</b> |
|---------------------------|------------------------|-----------------|
| 2. Rebate                 | 12                     | 3               |
| 3. Direct Install         | 16                     | 33              |
| 4. CBO Distribution       | 0                      | 0               |
| 5. Other                  | 0                      | 0               |
| <b>Total</b>              | <b>28</b>              | <b>36</b>       |

6. Describe your agency's ULFT program for single-family residences.

Advertised on our web site and as customers call in to inquire if we have a program. Future distributions are planned.

7. Describe your agency's ULFT program for multi-family residences.

Same as residential

8. Is a toilet retrofit on resale ordinance in effect for your service area? no

9. List local jurisdictions in your service area in the left box and ordinance citations in each jurisdiction in the right box:

**B. Residential ULFT Program Expenditures**

|                          | <b>This Year</b> | <b>Next Year</b> |
|--------------------------|------------------|------------------|
| 1. Budgeted Expenditures | 1000             | 1000             |
| 2. Actual Expenditures   | 960              |                  |

**C. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**D. Comments**

Reported as of 1/26/06

**Water Supply & Reuse**

Reporting Unit:

**Camrosa Water District**

Year:

**2004**

**Water Supply Source Information**

**Supply Source Name**

**Quantity (AF) Supplied**

**Supply Type**

**Total AF:**

Reported as of 1/26/06

**Accounts & Water Use**

Reporting Unit Name:  
**Camrosa Water District**

Submitted to  
 CUWCC  
 12/01/2004

Year:  
**2004**

**A. Service Area Population Information:**

1. Total service area population 31874

**B. Number of Accounts and Water Deliveries (AF)**

| Type                    | Metered         |                       | Unmetered       |                       |
|-------------------------|-----------------|-----------------------|-----------------|-----------------------|
|                         | No. of Accounts | Water Deliveries (AF) | No. of Accounts | Water Deliveries (AF) |
| 1. Single-Family        | 9010            | 7187                  | 0               | 0                     |
| 2. Multi-Family         | 834             | 178                   | 0               | 0                     |
| 3. Commercial           | 102             | 1258                  | 0               | 0                     |
| 4. Industrial           | 0               | 0                     | 0               | 0                     |
| 5. Institutional        | 14              | 651                   | 0               | 0                     |
| 6. Dedicated Irrigation | 200             | 655                   | 0               | 0                     |
| 7. Recycled Water       | 32              | 2710                  | 0               | 0                     |
| 8. Other                | 241             | 3659                  | 0               | 0                     |
| 9. Unaccounted          | NA              | 0                     | NA              | 0                     |
| <b>Total</b>            | 10433           | 16298                 | 0               | 0                     |

**Metered**

**Unmetered**

Reported as of 1/26/06

## BMP 01: Water Survey Programs for Single-Family and Multi-Family Residential Customers

Reporting Unit: **Camrosa Water District**      BMP Form Status: **100% Complete**      Year: **2004**

### A. Implementation

- 1. Based on your signed MOU date, 12/15/1994, your Agency STRATEGY DUE DATE is: 12/14/1996
- 2. Has your agency developed and implemented a targeting/marketing strategy for SINGLE-FAMILY residential water use surveys? yes
  - a. If YES, when was it implemented? 4/2/1995
- 3. Has your agency developed and implemented a targeting/marketing strategy for MULTI-FAMILY residential water use surveys? no
  - a. If YES, when was it implemented?

### B. Water Survey Data

| <b>Survey Counts:</b>           | <b>Single Family Accounts</b> | <b>Multi-Family Units</b> |
|---------------------------------|-------------------------------|---------------------------|
| 1. Number of surveys offered:   | 0                             | 0                         |
| 2. Number of surveys completed: | 0                             | 0                         |

### Indoor Survey:

- 3. Check for leaks, including toilets, faucets and meter checks yes      no
- 4. Check showerhead flow rates, aerator flow rates, and offer to replace or recommend replacement, if necessary yes      no
- 5. Check toilet flow rates and offer to install or recommend installation of displacement device or direct customer to ULFT replacement program, as necessary; replace leaking toilet flapper, as necessary yes      no

### Outdoor Survey:

- 6. Check irrigation system and timers yes      no
- 7. Review or develop customer irrigation schedule no      no
- 8. Measure landscaped area (Recommended but not required for surveys) yes      no
- 9. Measure total irrigable area (Recommended but not required for surveys) no      no
- 10. Which measurement method is typically used (Recommended but not required for surveys) Odometer Wheel
- 11. Were customers provided with information packets that included evaluation results and water savings recommendations? yes      no
- 12. Have the number of surveys offered and completed, survey results, and survey costs been tracked? yes      no
  - a. If yes, in what form are surveys tracked? spreadsheet
  - b. Describe how your agency tracks this information.

Customer service work orders

### C. Water Survey Program Expenditures

**This Year      Next Year**

|                          |      |      |
|--------------------------|------|------|
| 1. Budgeted Expenditures | 1000 | 1000 |
| 2. Actual Expenditures   | 0    |      |

**D. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**E. Comments**

Looking to contract out in 2004/2005

## BMP 02: Residential Plumbing Retrofit

Reporting Unit: **Camrosa Water District**      BMP Form Status: **100% Complete**      Year: **2004**

### A. Implementation

- 1. Is there an enforceable ordinance in effect in your service area requiring replacement of high-flow showerheads and other water use fixtures with their low-flow counterparts? no
  - a. If YES, list local jurisdictions in your service area and code or ordinance in each:
  
- 2. Has your agency satisfied the 75% saturation requirement for single-family housing units? no
- 3. Estimated percent of single-family households with low-flow showerheads: 60%
- 4. Has your agency satisfied the 75% saturation requirement for multi-family housing units? no
- 5. Estimated percent of multi-family households with low-flow showerheads: 56%
- 6. If YES to 2 OR 4 above, please describe how saturation was determined, including the dates and results of any survey research.

### B. Low-Flow Device Distribution Information

- 1. Has your agency developed a targeting/ marketing strategy for distributing low-flow devices? yes
  - a. If YES, when did your agency begin implementing this strategy? 2/7/1997
  - b. Describe your targeting/ marketing strategy.

Distribute with ULFT's and as requested by customer's. Also hand out to the general public when we attend special functions.

| Low-Flow Devices Distributed/ Installed                                  | SF Accounts | MF Units    |
|--|-------------|-------------|
| 2. Number of low-flow showerheads distributed:                           | 0           | 10          |
| 3. Number of toilet-displacement devices distributed:                    | 0           | 0           |
| 4. Number of toilet flappers distributed:                                | 1           | 28          |
| 5. Number of faucet aerators distributed:                                | 0           | 0           |
| 6. Does your agency track the distribution and cost of low-flow devices? |             | yes         |
| a. If YES, in what format are low-flow devices tracked?                  |             | Spreadsheet |
| b. If yes, describe your tracking and distribution system :              |             |             |

Excel spreadsheet, technical services staff.

### C. Low-Flow Device Distribution Expenditures

|                          | This Year | Next Year |
|--------------------------|-----------|-----------|
| 1. Budgeted Expenditures | 0         | 0         |
| 2. Actual Expenditures   | 0         |           |

### D. "At Least As Effective As"

- 1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**E. Comments**

No expensses, product in stock.

**BMP 03: System Water Audits, Leak Detection and Repair**

Reporting Unit: **Camrosa Water District**      BMP Form Status: **100% Complete**      Year: **2004**

**A. Implementation**

- 1. Has your agency completed a pre-screening system audit for this reporting year? yes
- 2. If YES, enter the values (AF/Year) used to calculate verifiable use as a percent of total production:
  - a. Determine metered sales (AF) 12915
  - b. Determine other system verifiable uses (AF) 0
  - c. Determine total supply into the system (AF) 12511.55
  - d. Using the numbers above, if (Metered Sales + Other Verifiable Uses) / Total Supply is < 0.9 then a full-scale system audit is required. 1.03
- 3. Does your agency keep necessary data on file to verify the values used to calculate verifiable uses as a percent of total production? yes
- 4. Did your agency complete a full-scale audit during this report year? yes
- 5. Does your agency maintain in-house records of audit results or the completed AWWA audit worksheets for the completed audit? yes
- 6. Does your agency operate a system leak detection program? yes
  - a. If yes, describe the leak detection program:

System is checked on an on going basis by all field staff.

**B. Survey Data**

- 1. Total number of miles of distribution system line. 130
- 2. Number of miles of distribution system line surveyed. 130

**C. System Audit / Leak Detection Program Expenditures**

|                          | This Year | Next Year |
|--------------------------|-----------|-----------|
| 1. Budgeted Expenditures | 0         | 0         |
| 2. Actual Expenditures   | 0         |           |

**D. "At Least As Effective As"**

- 1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No
  - a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**E. Comments**

**BMP 04: Metering with Commodity Rates for all New Connections and Retrofit of Existing**

Reporting Unit: **Camrosa Water District**      BMP Form Status: **100% Complete**      Year: **2004**

**A. Implementation**

- 1. Does your agency require meters for all new connections and bill by volume-of-use? yes
- 2. Does your agency have a program for retrofitting existing unmetered connections and bill by volume-of-use? no
  - a. If YES, when was the plan to retrofit and bill by volume-of-use existing unmetered connections completed?
  - b. Describe the program:
- 3. Number of previously unmetered accounts fitted with meters during report year. 0

**B. Feasibility Study**

- 1. Has your agency conducted a feasibility study to assess the merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters? no
  - a. If YES, when was the feasibility study conducted? (mm/dd/yy)
  - b. Describe the feasibility study:
- 2. Number of CII accounts with mixed-use meters. 15
- 3. Number of CII accounts with mixed-use meters retrofitted with dedicated irrigation meters during reporting period. 0

**C. Meter Retrofit Program Expenditures**

|                          | This Year | Next Year |
|--------------------------|-----------|-----------|
| 1. Budgeted Expenditures | 0         | 0         |
| 2. Actual Expenditures   | 0         |           |

**D. "At Least As Effective As"**

- 1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No
  - a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**E. Comments**

Reported as of 1/26/06

## BMP 05: Large Landscape Conservation Programs and Incentives

Reporting Unit: **Camrosa Water District**      BMP Form Status: **100% Complete**      Year: **2004**

### A. Water Use Budgets

- |  |     |
|--|-----|
| 1. Number of Dedicated Irrigation Meter Accounts:  | 298 |
| 2. Number of Dedicated Irrigation Meter Accounts with Water Budgets:                       | 0   |
| 3. Budgeted Use for Irrigation Meter Accounts with Water Budgets (AF):                     | 0   |
| 4. Actual Use for Irrigation Meter Accounts with Water Budgets (AF):                       | 0   |
| 5. Does your agency provide water use notices to accounts with budgets each billing cycle? | no  |

### B. Landscape Surveys

- |  |    |
|--|----|
| 1. Has your agency developed a marketing / targeting strategy for landscape surveys? | no |
| a. If YES, when did your agency begin implementing this strategy?                    |    |
| b. Description of marketing / targeting strategy:                                    |    |
| 2. Number of Surveys Offered.  | 0  |
| 3. Number of Surveys Completed.  | 0  |
| 4. Indicate which of the following Landscape Elements are part of your survey:       |    |
| a. Irrigation System Check   | no |
| b. Distribution Uniformity Analysis  | no |
| c. Review / Develop Irrigation Schedules   | no |
| d. Measure Landscape Area  | no |
| e. Measure Total Irrigable Area  | no |
| f. Provide Customer Report / Information   | no |
| 5. Do you track survey offers and results?   | no |
| 6. Does your agency provide follow-up surveys for previously completed surveys?      | no |
| a. If YES, describe below:   |    |

### C. Other BMP 5 Actions

- |   |     |
|---|-----|
| 1. An agency can provide mixed-use accounts with ETo-based landscape budgets in lieu of a large landscape survey program. Does your agency provide mixed-use accounts with landscape budgets? | no  |
| 2. Number of CII mixed-use accounts with landscape budgets.   | 0   |
| 3. Do you offer landscape irrigation training?  | yes |
| 4. Does your agency offer financial incentives to improve landscape water use efficiency?   | no  |

| Type of Financial Incentive: | Budget<br>(Dollars/<br>Year) | Number Awarded<br>to Customers | Total<br>Amount<br>Awarded |
|------------------------------|------------------------------|--------------------------------|----------------------------|
| a. Rebates                   | 0                            | 0                              | 0                          |
| b. Loans                     | 0                            | 0                              | 0                          |

|  |   |   |     |
|--|---|---|-----|
| c. Grants  | 0 | 0 | 0   |
| 5. Do you provide landscape water use efficiency information to new customers and customers changing services? |   |   | yes |
| a. If YES, describe below:   |   |   |     |
| Brochures and Protector del Agua training.   |   |   |     |
| 6. Do you have irrigated landscaping at your facilities?   |   |   | yes |
| a. If yes, is it water-efficient?  |   |   | no  |
| b. If yes, does it have dedicated irrigation metering?   |   |   | yes |
| 7. Do you provide customer notices at the start of the irrigation season?                                      |   |   | no  |
| 8. Do you provide customer notices at the end of the irrigation season?  |   |   | no  |

**D. Landscape Conservation Program Expenditures**

|                          | This Year | Next Year |
|--------------------------|-----------|-----------|
| 1. Budgeted Expenditures | 10000     | 10000     |
| 2. Actual Expenditures   | 0         |           |

**E. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No
  - a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**F. Comments**

Our first large landscape audit is scheduled for December 8, 2004. We will be contracting this service with an outside agency.

## BMP 06: High-Efficiency Washing Machine Rebate Programs

Reporting Unit: **Camrosa Water District**      BMP Form Status: **100% Complete**      Year: **2004**

### A. Implementation

1. Do any energy service providers or waste water utilities in your service area offer rebates for high-efficiency washers? yes

a. If YES, describe the offerings and incentives as well as who the energy/waste water utility provider is.

Limited funds, all allocated.

2. Does your agency offer rebates for high-efficiency washers? yes

3. What is the level of the rebate? 300

4. Number of rebates awarded. 0

### B. Rebate Program Expenditures

|                          | This Year | Next Year |
|--------------------------|-----------|-----------|
| 1. Budgeted Expenditures | 5000      | 10000     |
| 2. Actual Expenditures   | 0         |           |

### C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

### D. Comments

Due to time constraints unable to conduct rebate this year. Will resume with 2004/2005.

### BMP 07: Public Information Programs

Reporting Unit: **Camrosa Water District**      BMP Form Status: **100% Complete**      Year: **2004**

#### A. Implementation

1. Does your agency maintain an active public information program to promote and educate customers about water conservation? yes

a. If YES, describe the program and how it's organized.

Advertising in publications Protector del Agua residential landscape classes as well as PDA for the professional landscaper. Camrosa web site and link to CUWCC.

2. Indicate which and how many of the following activities are included in your public information program.

| Public Information Program Activity  | Yes/No | Number of Events |
|--|--------|------------------|
| a. Paid Advertising  | no     | 0                |
| b. Public Service Announcement   | no     | 0                |
| c. Bill Inserts / Newsletters / Brochures  | yes    | 2                |
| d. Bill showing water usage in comparison to previous year's usage                                     | yes    |                  |
| e. Demonstration Gardens   | yes    | 0                |
| f. Special Events, Media Events  | yes    | 2                |
| g. Speaker's Bureau  | no     | 0                |
| h. Program to coordinate with other government agencies, industry and public interest groups and media | yes    |                  |

#### B. Conservation Information Program Expenditures

|                          | This Year | Next Year |
|--------------------------|-----------|-----------|
| 1. Budgeted Expenditures | 59000     | 48000     |
| 2. Actual Expenditures   | 20000     |           |

#### C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

#### D. Comments

Received a \$20,000 grant to help replace our landscape with Native California/drought tolerant plants. Garden was completed August, 2004. Tours will be given and a brochure is in design. This will also be used in our PDA classes. Total cost of project was \$85,000.

**BMP 08: School Education Programs**

Reporting Unit: **Camrosa Water District**      BMP Form Status: **100% Complete**      Year: **2004**

**A. Implementation**

1. Has your agency implemented a school information program to promote water conservation? yes

2. Please provide information on your school programs (by grade level):

| Grade          | Are grade-appropriate materials distributed? | No. of class presentations | No. of students reached | No. of teachers' workshops |
|----------------|--|----------------------------|-------------------------|----------------------------|
| Grades K-3rd   | yes  | 0                          | 0                       | 0                          |
| Grades 4th-6th | yes  | 0                          | 0                       | 0                          |
| Grades 7th-8th | yes  | 0                          | 0                       | 0                          |
| High School    | yes  | 0                          | 0                       | 0                          |

3. Did your Agency's materials meet state education framework requirements? yes

4. When did your Agency begin implementing this program? 06/01/1995

**B. School Education Program Expenditures**

|                          | This Year | Next Year |
|--------------------------|-----------|-----------|
| 1. Budgeted Expenditures | 0         | 0         |
| 2. Actual Expenditures   | 0         |           |

**C. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**D. Comments**

Have brochures on hand and web site. Give tours of the district to students.

Reported as of 1/26/06

**BMP 09: Conservation Programs for CII Accounts**

Reporting Unit: **Camrosa Water District**      BMP Form Status: **100% Complete**      Year: **2004**

**A. Implementation**

1. Has your agency identified and ranked COMMERCIAL customers according to use? yes
2. Has your agency identified and ranked INDUSTRIAL customers according to use? yes
3. Has your agency identified and ranked INSTITUTIONAL customers according to use? yes

**Option A: CII Water Use Survey and Customer Incentives Program**

4. Is your agency operating a CII water use survey and customer incentives program for the purpose of complying with BMP 9 under this option? no

| <b>CII Surveys</b>   | <b>Commercial<br/>Accounts</b> | <b>Industrial<br/>Accounts</b>      | <b>Institutional<br/>Accounts</b>      |
|--|--------------------------------|-------------------------------------|--|
| a. Number of New Surveys Offered   | 0                              | 0                                   | 0                                      |
| b. Number of New Surveys Completed   | 0                              | 0                                   | 0                                      |
| c. Number of Site Follow-ups of Previous Surveys (within 1 yr)                                 | 0                              | 0                                   | 0                                      |
| d. Number of Phone Follow-ups of Previous Surveys (within 1 yr)                                | 0                              | 0                                   | 0                                      |
| <b>CII Survey Components</b>   | <b>Commercial<br/>Accounts</b> | <b>Industrial<br/>Accounts</b>      | <b>Institutional<br/>Accounts</b>      |
| e. Site Visit  | no                             | no                                  | no                                     |
| f. Evaluation of all water-using apparatus and processes                                       | no                             | no                                  | no                                     |
| g. Customer report identifying recommended efficiency measures, paybacks and agency incentives | no                             | no                                  | no                                     |
| <b>Agency CII Customer Incentives</b>  | <b>Budget<br/>(\$/Year)</b>    | <b>No. Awarded to<br/>Customers</b> | <b>Total \$<br/>Amount<br/>Awarded</b> |
| h. Rebates   | 0                              | 0                                   | 0                                      |
| i. Loans   | 0                              | 0                                   | 0                                      |
| j. Grants  | 0                              | 0                                   | 0                                      |
| k. Others  | 0                              | 0                                   | 0                                      |

**Option B: CII Conservation Program Targets**

5. Does your agency track CII program interventions and water savings for the purpose of complying with BMP 9 under this option? no

- |   |    |
|---|----|
| 6. Does your agency document and maintain records on how savings were realized and the method of calculation for estimated savings? | no |
| 7. Estimated annual savings (AF/yr) from site-verified actions taken by agency since 1991.  | 0  |
| 8. Estimated annual savings (AF/yr) from non-site-verified actions taken by agency since 1991.                                      | 0  |

### **B. Conservation Program Expenditures for CII Accounts**

|                          | <b>This Year</b> | <b>Next Year</b> |
|--------------------------|------------------|------------------|
| 1. Budgeted Expenditures | 0                | 0                |
| 2. Actual Expenditures   | 0                |                  |

### **C. "At Least As Effective As"**

- |   |    |
|---|----|
| 1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?   | No |
| <p>a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."</p> |    |

### **D. Comments**

Audits & rebates to start in 2004/2005

**BMP 09a: CII ULFT Water Savings**

Reporting Unit: **Camrosa Water District**      BMP Form Status: **100% Complete**      Year: **2004**

1. Did your agency implement a CII ULFT replacement program in the reporting year? No  
 If No, please explain why on Line B.  
 10.

**A. Targeting and Marketing**

1. What basis does your agency use to target customers for participation in this program? Check all that apply.
  - a. Describe which method you found to be the most effective overall, and which was the most effective per dollar expended.
  
2. How does your agency advertise this program? Check all that apply.
  - a. Describe which method you found to be the most effective overall, and which was the most effective per dollar expended.

**B. Implementation**

1. Does your agency keep and maintain customer participant information? (Read the Help information for a complete list of all the information for this BMP.)
2. Would your agency be willing to share this information if the CUWCC did a study to evaluate the program on behalf of your agency?
3. What is the total number of customer accounts participating in the program during the last year ?

| CII Subsector         | Number of Toilets Replaced |              |                   |                  |  | Type Not Specified |
|-----------------------|----------------------------|--------------|-------------------|------------------|--|--------------------|
|                       | Standard Gravity Tank      | Air Assisted | Valve Floor Mount | Valve Wall Mount |  |                    |
| 4.                    |                            |              |                   |                  |  |                    |
| a. Offices            |                            |              |                   |                  |  | 0                  |
| b. Retail / Wholesale |                            |              |                   |                  |  | 0                  |
| c. Hotels             |                            |              |                   |                  |  | 0                  |
| d. Health             |                            |              |                   |                  |  | 0                  |
| e. Industrial         |                            |              |                   |                  |  | 0                  |
| f. Schools: K to 12   |                            |              |                   |                  |  | 0                  |
| g. Eating             |                            |              |                   |                  |  | 0                  |
| h. Government         |                            |              |                   |                  |  | 0                  |

- i. Churches 0
- j. Other 0

5. Program design.

6. Does your agency use outside services to implement this program?

a. If yes, check all that apply.

7. Participant tracking and follow-up.

8. Based on your program experience, please rank on a scale of 1 to 5, with 1 being the least frequent cause and 5 being the most frequent cause, the following reasons why customers refused to participate in the program.

- a. Disruption to business
- b. Inadequate payback
- c. Inadequate ULFT performance
- d. Lack of funding
- e. American's with Disabilities Act
- f. Permitting
- g. Other. Please describe in B. 9.

9. Please describe general program acceptance/resistance by customers, obstacles to implementation, and other issues affecting program implementation or effectiveness.

10. Please provide a general assessment of the program for this reporting year. Did your program achieve its objectives? Were your targeting and marketing approaches effective? Were program costs in line with expectations and budgeting?

No activity 2004

**C. Conservation Program Expenditures for CII ULFT**

1. CII ULFT Program: Annual Budget & Expenditure Data

|                              | <b>Budgeted</b> | <b>Actual<br/>Expenditure</b> |
|------------------------------|-----------------|-------------------------------|
| a. Labor                     |                 |                               |
| b. Materials                 |                 |                               |
| c. Marketing & Advertising   |                 |                               |
| d. Administration & Overhead |                 |                               |
| e. Outside Services          |                 |                               |
| f. Total                     | 0               | 0                             |

2. CII ULFT Program: Annual Cost Sharing

- a. Wholesale agency contribution
- b. State agency contribution
- c. Federal agency contribution
- d. Other contribution

e. Total

0

**D. Comments**

Reported as of 1/26/06

**BMP 11: Conservation Pricing**

|                               |                      |             |
|-------------------------------|----------------------|-------------|
| Reporting Unit:               | BMP Form             | Year:       |
| <b>Camrosa Water District</b> | Status:              | <b>2004</b> |
|                               | <b>100% Complete</b> |             |

**A. Implementation****Rate Structure Data Volumetric Rates for Water Service by Customer Class****1. Residential**

|  |                          |
|--|--------------------------|
| a. Water Rate Structure  | Increasing Block         |
| b. Sewer Rate Structure  | Non-volumetric Flat Rate |
| c. Total Revenue from Volumetric Rates                                       | \$3987701                |
| d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources | \$1423546                |

**2. Commercial**

|  |                          |
|--|--------------------------|
| a. Water Rate Structure  | Increasing Block         |
| b. Sewer Rate Structure  | Non-volumetric Flat Rate |
| c. Total Revenue from Volumetric Rates                                       | \$663682                 |
| d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources | \$54360                  |

**3. Industrial**

|  |                          |
|--|--------------------------|
| a. Water Rate Structure  | Increasing Block         |
| b. Sewer Rate Structure  | Non-volumetric Flat Rate |
| c. Total Revenue from Volumetric Rates                                       | \$0                      |
| d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources | \$0                      |

**4. Institutional / Government**

|  |                          |
|--|--------------------------|
| a. Water Rate Structure  | Increasing Block         |
| b. Sewer Rate Structure  | Non-volumetric Flat Rate |
| c. Total Revenue from Volumetric Rates                                       | \$343348                 |
| d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources | \$220836                 |

**5. Irrigation**

|  |                          |
|--|--------------------------|
| a. Water Rate Structure  | Decreasing Block         |
| b. Sewer Rate Structure  | Non-volumetric Flat Rate |
| c. Total Revenue from Volumetric Rates                                       | \$530324                 |
| d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources | \$0                      |

**6. Other**

|  |                           |
|--|---------------------------|
| a. Water Rate Structure  | Increasing Block          |
| b. Sewer Rate Structure  | Increasing Block Seasonal |
| c. Total Revenue from Volumetric Rates                                       | \$1588746                 |
| d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources | \$0                       |

**B. Conservation Pricing Program Expenditures**

|                          | <b>This Year</b> | <b>Next Year</b> |
|--------------------------|------------------|------------------|
| 1. Budgeted Expenditures | 0                | 0                |
| 2. Actual Expenditures   | 0                |                  |

**C. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**D. Comments**

**BMP 12: Conservation Coordinator**

Reporting Unit: **Camrosa Water District**      BMP Form Status: **100% Complete**      Year: **2004**

**A. Implementation**

- 1. Does your Agency have a conservation coordinator? yes
- 2. Is this a full-time position? yes
- 3. If no, is the coordinator supplied by another agency with which you cooperate in a regional conservation program ?
- 4. Partner agency's name:
- 5. If your agency supplies the conservation coordinator:
  - a. What percent is this conservation coordinator's position? 100%
  - b. Coordinator's Name Mary Jo Mitchell
  - c. Coordinator's Title Water Conservation/Public Information Coordinator
  - d. Coordinator's Experience and Number of Years On the job training, attend seminars, work shops, PDA class - 6 years experience
  - e. Date Coordinator's position was created (mm/dd/yyyy) 7/1/1997
- 6. Number of conservation staff, including Conservation Coordinator. 1

**B. Conservation Staff Program Expenditures**

|                          | This Year | Next Year |
|--------------------------|-----------|-----------|
| 1. Budgeted Expenditures | 38500     | 44500     |
| 2. Actual Expenditures   | 15000     |           |

**C. "At Least As Effective As"**

- 1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no
  - a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**D. Comments**

**BMP 13: Water Waste Prohibition**

Reporting Unit: **Camrosa Water District**      BMP Form Status: **100% Complete**      Year: **2004**

**A. Requirements for Documenting BMP Implementation**

- 1. Is a water waste prohibition ordinance in effect in your service area? yes
  - a. If YES, describe the ordinance:
 

Rules & Regulations adopted February 22, 2001
- 2. Is a copy of the most current ordinance(s) on file with CUWCC? yes
  - a. List local jurisdictions in your service area in the first text box and water waste ordinance citations in each jurisdiction in the second text box:
 

None None

**B. Implementation**

- 1. Indicate which of the water uses listed below are prohibited by your agency or service area.
  - a. Gutter flooding yes
  - b. Single-pass cooling systems for new connections no
  - c. Non-recirculating systems in all new conveyor or car wash systems no
  - d. Non-recirculating systems in all new commercial laundry systems no
  - e. Non-recirculating systems in all new decorative fountains no
  - f. Other, please name no
- 2. Describe measures that prohibit water uses listed above:

Visual checks by Service personnel during their daily work routine.

**Water Softeners:**

- 3. Indicate which of the following measures your agency has supported in developing state law:
  - a. Allow the sale of more efficient, demand-initiated regenerating DIR models. yes
  - b. Develop minimum appliance efficiency standards that:
    - i.) Increase the regeneration efficiency standard to at least 3,350 grains of hardness removed per pound of common salt used. yes
    - ii.) Implement an identified maximum number of gallons discharged per gallon of soft water produced. yes
  - c. Allow local agencies, including municipalities and special districts, to set more stringent standards and/or to ban on-site regeneration of water softeners if it is demonstrated and found by the agency governing board that there is an adverse effect on the reclaimed water or groundwater supply. yes
- 4. Does your agency include water softener checks in home water audit programs? no
- 5. Does your agency include information about DIR and exchange-type water softeners in educational efforts to encourage replacement of less efficient timer models? no

**C. Water Waste Prohibition Program Expenditures**

**This Year**      **Next Year**

|                          |   |   |
|--------------------------|---|---|
| 1. Budgeted Expenditures | 0 | 0 |
| 2. Actual Expenditures   | 0 |   |

**D. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**E. Comments**

### BMP 14: Residential ULFT Replacement Programs

Reporting Unit: **Camrosa Water District**      BMP Form Status: **100% Complete**      Year: **2004**

#### A. Implementation

|  | Single-Family<br>Accounts | Multi-Family<br>Units |
|--|---------------------------|-----------------------|
| 1. Does your Agency have program(s) for replacing high-water-using toilets with ultra-low flush toilets? | yes                       | yes                   |
| <b>Number of Toilets Replaced by Agency Program During Report Year</b>                                   |                           |                       |
| Replacement Method   | SF<br>Accounts            | MF Units              |
| 2. Rebate  | 29                        | 4                     |
| 3. Direct Install  | 0                         | 11                    |
| 4. CBO Distribution  | 0                         | 0                     |
| 5. Other   | 0                         | 0                     |
| <b>Total</b>   | <b>29</b>                 | <b>15</b>             |

6. Describe your agency's ULFT program for single-family residences.

Advertised on our web site and as customers call in to inquire if we have a program. Future distributions are planned.

7. Describe your agency's ULFT program for multi-family residences.

Same as residential

8. Is a toilet retrofit on resale ordinance in effect for your service area? no

9. List local jurisdictions in your service area in the left box and ordinance citations in each jurisdiction in the right box:

#### B. Residential ULFT Program Expenditures

|                          | This Year | Next Year |
|--------------------------|-----------|-----------|
| 1. Budgeted Expenditures | 2000      | 5000      |
| 2. Actual Expenditures   | 1980      |           |

#### C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

#### D. Comments

## BMP 01 Coverage: Water Survey Programs for Single-Family and Multi-Family Residential Customers

Reporting Unit:  
Camrosa Water District

Reporting Period:  
03-04

### MOU Exhibit 1 Coverage Requirement

No exemption request filed

Agency indicated "at least as effective as" implementation during report period? No

A Reporting Unit (RU) must meet three conditions to satisfy strict compliance for BMP 1.

Condition 1: Adopt survey targeting and marketing strategy on time

Condition 2: Offer surveys to 20% of SF accounts and 20% of MF units during report period

Condition 3: Be on track to survey 15% of SF accounts and 15% of MF units within 10 years of implementation start date.

### Test for Condition 1

|  |      |                      |                     |
|--|------|----------------------|---------------------|
| Camrosa Water District to Implement Targeting/Marketing Program by:            | 1999 |                      |                     |
|  |      | <b>Single-Family</b> | <b>Multi-Family</b> |
| Year Camrosa Water District Reported Implementing Targeting/Marketing Program: | 1995 |                      |                     |
| Camrosa Water District Met Targeting/Marketing Coverage Requirement:           | YES  |                      | NO                  |

### Test for Condition 2

|                             |       |                               | <b>Single-Family</b> | <b>Multi-Family</b> |
|-----------------------------|-------|-------------------------------|----------------------|---------------------|
| Survey Program to Start by: | 1998  | Residential Survey Offers (%) |                      |                     |
| Reporting Period:           | 03-04 | Survey Offers $\geq$ 20%      | NO                   | NO                  |

### Test for Condition 3

|   | Completed Residential Surveys |              |
|---|-------------------------------|--------------|
|   | Single Family                 | Multi-Family |
| Total Completed Surveys 1999 - 2004:  | 201                           |              |
| Past Credit for Surveys Completed Prior to 1999 (Implementation of Reporting Database): | 70                            |              |
| Total + Credit  | 271                           |              |
| Residential Accounts in Base Year   | 8,650                         | 514          |
| Camrosa Water District Survey Coverage as % of Base Year Residential Accounts           | 3.13%                         |              |
| Coverage Requirement by Year 7 of Implementation per Exhibit 1                          | 7.90%                         | 7.90%        |

|   |    |    |
|---|----|----|
| Camrosa Water District on Schedule to Meet 10-Year Coverage Requirement | NO | NO |
|---|----|----|

---

**BMP 1 COVERAGE STATUS SUMMARY:**

**Water supplier has not met one or more coverage requirements for this BMP.**

## BMP 02 Coverage: Residential Plumbing Retrofit

Reporting Unit:

Reporting Period:

**Camrosa Water District**

**03-04**

### MOU Exhibit 1 Coverage Requirement

No exemption request filed

Agency indicated "at least as effective as" implementation during report period?

No

An agency must meet one of three conditions to satisfy strict compliance for BMP 2.

Condition 1: The agency has demonstrated that 75% of SF accounts and 75% of MF units constructed prior to 1992 are fitted with low-flow showerheads.

Condition 2: An enforceable ordinance requiring the replacement of high-flow showerheads and other water use fixtures with their low-flow counterparts is in place for the agency's service area.

Condition 3: The agency has distributed or directly installed low-flow showerheads and other low-flow plumbing devices to not less than 10% of single-family accounts and 10% of multi-family units constructed prior to 1992 during the reporting period.

### Test for Condition 1

| Report Year | Report Period | Single-Family       |                   | Multi-Family        |                   |
|-------------|---------------|---------------------|-------------------|---------------------|-------------------|
|             |               | Reported Saturation | Saturation > 75%? | Reported Saturation | Saturation > 75%? |
| 1999        | 99-00         | 50.00%              | NO                | 40.00%              | NO                |
| 2000        | 99-00         | 55.00%              | NO                | 50.00%              | NO                |
| 2001        | 01-02         | 60.00%              | NO                | 55.00%              | NO                |
| 2002        | 01-02         | 60.00%              | NO                | 55.00%              | NO                |
| 2003        | 03-04         | 60.00%              | NO                | 56.00%              | NO                |
| 2004        | 03-04         | 60.00%              | NO                | 56.00%              | NO                |

### Test for Condition 2

| Report Year | Report Period | Camrosa Water District has ordinance requiring showerhead retrofit? |
|-------------|---------------|---|
| 1999        | 99-00         | NO  |
| 2000        | 99-00         | NO  |
| 2001        | 01-02         | NO  |
| 2002        | 01-02         | NO  |
| 2003        | 03-04         | NO  |
| 2004        | 03-04         | NO  |

### Test for Condition 3

Reporting Period: 03-04

|                  |   |                              |                         |
|------------------|---|------------------------------|-------------------------|
| 1992 SF Accounts | Num. Showerheads Distributed to SF Accounts | Single-Family Coverage Ratio | SF Coverage Ratio > 10% |
| 5,242            | 17  | 0.3%                         | NO                      |
| 1992 MF Accounts | Num. Showerheads Distributed to MF Accounts | Multi-Family Coverage Ratio  | MF Coverage Ratio > 10% |
| 514              | 42  | 8.2%                         | NO                      |

### BMP 2 COVERAGE STATUS SUMMARY:

**Water supplier has not met one or more coverage requirements for this BMP.**



Reported as of 1/26/06

## BMP 03 Coverage: System Water Audits, Leak Detection and Repair

Reporting Unit:  
Camrosa Water District

Reporting Period:  
03-04

### MOU Exhibit 1 Coverage Requirement

No exemption request filed

Agency indicated "at least as effective as" implementation during report period?

Yes

An agency must meet one of two conditions to be in compliance with BMP 3:

Condition 1: Perform a prescreening audit. If the result is equal to or greater than 0.9 nothing more needs be done.

Condition 2: Perform a prescreening audit. If the result is less than 0.9, perform a full audit in accordance with AWWA's Manual of Water Supply Practices, Water Audits, and Leak Detection.

### Test for Conditions 1 and 2

| Report Year | Report Period | Pre-Screen Completed | Pre-Screen Result | Full Audit Indicated | Full Audit Completed |
|-------------|---------------|----------------------|-------------------|----------------------|----------------------|
| 1999        | 99-00         | YES                  | 90.2%             | No                   | NO                   |
| 2000        | 99-00         | YES                  | 90.6%             | No                   | NO                   |
| 2001        | 01-02         | YES                  | 99.8%             | No                   | YES                  |
| 2002        | 01-02         | YES                  | 104.3%            | No                   | YES                  |
| 2003        | 03-04         | YES                  | 97.5%             | No                   | YES                  |
| 2004        | 03-04         | YES                  | 103.2%            | No                   | YES                  |

### BMP 3 COVERAGE STATUS SUMMARY:

Water supplier is meeting coverage requirements for this BMP.

Reported as of 1/26/06

## **BMP 04 Coverage: Metering with Commodity Rates for all New Connections and Retrofit of Existing**

Reporting Unit:

**Camrosa Water District**

Reporting Period:

**03-04**

### **MOU Exhibit 1 Coverage Requirement**

No exemption request filed

Agency indicated "at least as effective as" implementation during report period?

No

---

An agency must be on track to retrofit 100% of its unmetered accounts within 10 years to be in compliance with BMP 4.

---

### **Test for Compliance**

---

Total Meter Retrofits

Reported through 2004

No. of Unmetered Accounts  
in Base YearMeter Retrofit Coverage as  
% of Base Year Unmetered  
AccountsCoverage Requirement by  
Year 6 of Implementation per  
Exhibit 1

42.0%

RU on Schedule to meet 10  
Year Coverage Requirement

YES

### **BMP 4 COVERAGE STATUS SUMMARY:**

**Water supplier is meeting coverage requirements for this BMP.**

## BMP 05 Coverage: Large Landscape Conservation Programs and Incentives

Reporting Unit:  
**Camrosa Water District**

Reporting Period:  
**03-04**

### MOU Exhibit 1 Coverage Requirement

No exemption request filed

Agency indicated "at least as effective as" implementation during report period? No

An agency must meet three conditions to comply with BMP 5.

Condition 1: Develop water budgets for 90% of its dedicated landscape meter accounts within four years of the date implementation is to start.

Condition 2: (a) Offer landscape surveys to at least 20% of its CII accounts with mixed use meters each report cycle and be on track to survey at least 15% of its CII accounts with mixed use meters within 10 years of the date implementation is to start OR (b) Implement a dedicated landscape meter retrofit program for CII accounts with mixed use meters or assign landscape budgets to mixed use meters.

Condition 3: Implement and maintain customer incentive program(s) for irrigation equipment retrofits.

#### Test for Condition 1

| Year | Report Period | BMP 5 Implementation Year | No. of Irrigation Meter Accounts | No. of Irrigation Accounts with Budgets | Budget Coverage Ratio | 90% Coverage Met by Year 4 |
|------|---------------|---------------------------|----------------------------------|---|-----------------------|----------------------------|
| 1999 | 99-00         | 1                         | 163                              |   |                       | NA                         |
| 2000 | 99-00         | 2                         | 190                              |   |                       | NA                         |
| 2001 | 01-02         | 3                         | 190                              |   |                       | NA                         |
| 2002 | 01-02         | 4                         | 194                              |   |                       | No                         |
| 2003 | 03-04         | 5                         | 422                              |   |                       | No                         |
| 2004 | 03-04         | 6                         | 298                              |   |                       | No                         |

#### Test for Condition 2a (survey offers)

Select Reporting Period: 03-04  
 Large Landscape Survey Offers as % of Mixed Use Meter CII Accounts  
 Survey Offers Equal or Exceed 20% Coverage Requirement NO

#### Test for Condition 2a (surveys completed)

Total Completed Landscape Surveys Reported through Credit for Surveys Completed Prior to Implementation of Reporting Database  
 Total + Credit 143  
 CII Accounts in Base Year  
 RU Survey Coverage as a % of Base Year CII Accounts  
 Coverage Requirement by Year of Implementation per Exhibit 1 6.3%  
 RU on Schedule to Meet 10 Year Coverage Requirement NO

#### Test for Condition 2b (mixed use budget or meter retrofit program)

Agency has mix-use No. of mixed-use

| Report Year | Report Period | BMP 5 Implementation Year | budget program | budgets |
|-------------|---------------|---------------------------|----------------|---------|
| 1999        | 99-00         | 1                         | NO             |         |
| 2000        | 99-00         | 2                         | NO             |         |
| 2001        | 01-02         | 3                         | NO             |         |
| 2002        | 01-02         | 4                         | NO             |         |
| 2003        | 03-04         | 5                         | NO             |         |
| 2004        | 03-04         | 6                         | NO             |         |

| Report Year | Report Period | BMP 4 Implementation Year | No. of mixed use CII accounts | No. of mixed use CII accounts fitted with irrig. meters |
|-------------|---------------|---------------------------|-------------------------------|---|
| 1999        | 99-00         | 1                         | 15                            |   |
| 2000        | 99-00         | 2                         | 15                            |   |
| 2001        | 01-02         | 3                         | 15                            |   |
| 2002        | 01-02         | 4                         | 15                            |   |
| 2003        | 03-04         | 5                         | 15                            |   |
| 2004        | 03-04         | 6                         | 15                            |   |

**Test for Condition 3**

| Report Year | Report Period | BMP 5 Implementation Year | RU offers financial incentives? | No. of Loans | Total Amt. Loans |
|-------------|---------------|---------------------------|---------------------------------|--------------|------------------|
| 1999        | 99-00         | 1                         | NO                              |              |                  |
| 2000        | 99-00         | 2                         | NO                              |              |                  |
| 2001        | 01-02         | 3                         | NO                              |              |                  |
| 2002        | 01-02         | 4                         | NO                              |              |                  |
| 2003        | 03-04         | 5                         | NO                              |              |                  |
| 2004        | 03-04         | 6                         | NO                              |              |                  |

| Report Year | Report Period | No. of Grants | Total Amt. Grants | No. of rebates | Total Amt. Rebates |
|-------------|---------------|---------------|-------------------|----------------|--------------------|
| 1999        | 99-00         |               |                   |                |                    |
| 2000        | 99-00         |               |                   |                |                    |
| 2001        | 01-02         |               |                   |                |                    |
| 2002        | 01-02         |               |                   |                |                    |
| 2003        | 03-04         |               |                   |                |                    |
| 2004        | 03-04         |               |                   |                |                    |

**BMP 5 COVERAGE STATUS SUMMARY:**

**Water supplier has not met one or more coverage requirements for this BMP.**

Reported as of 1/26/06

## BMP 06 Coverage: High-Efficiency Washing Machine Rebate Programs

Reporting Unit:  
Camrosa Water District

Reporting Period:  
03-04

### MOU Exhibit 1 Coverage Requirement

No exemption request filed

Agency indicated "at least as effective as" implementation during report period? No

An agency must meet one condition to comply with BMP 6.

Condition 1: Offer a cost-effective financial incentive for high-efficiency washers if one or more energy service providers in service area offer financial incentives for high-efficiency washers.

#### Test for Condition 1

| Year | Report Period | BMP 6 Implementation Year | Rebate Offered by ESP? | Rebate Offered by RU? | Rebate Amount |
|------|---------------|---------------------------|------------------------|-----------------------|---------------|
| 1999 | 99-00         | 1                         | YES                    | NO                    |               |
| 2000 | 99-00         | 2                         | YES                    | NO                    |               |
| 2001 | 01-02         | 3                         | NO                     | NO                    |               |
| 2002 | 01-02         | 4                         | YES                    | NO                    | 100.00        |
| 2003 | 03-04         | 5                         | YES                    | YES                   | 300.00        |
| 2004 | 03-04         | 6                         | YES                    | YES                   | 300.00        |

| Year | Report Period | BMP 6 Implementation Year | No. Rebates Awarded | Coverage Met? |
|------|---------------|---------------------------|---------------------|---------------|
| 1999 | 99-00         | 1                         |                     | NO            |
| 2000 | 99-00         | 2                         |                     | NO            |
| 2001 | 01-02         | 3                         |                     | YES           |
| 2002 | 01-02         | 4                         |                     | NO            |
| 2003 | 03-04         | 5                         | 95                  | YES           |
| 2004 | 03-04         | 6                         |                     | YES           |

#### BMP 6 COVERAGE STATUS SUMMARY:

Water supplier is meeting coverage requirements for this BMP.

**BMP 07 Coverage: Public Information Programs**

Reporting Unit:  
**Camrosa Water District**

Reporting Period:  
**03-04**

**MOU Exhibit 1 Coverage Requirement**

No exemption request filed

Agency indicated "at least as effective as" implementation during report period? No

An agency must meet one condition to comply with BMP 7.

Condition 1: Implement and maintain a public information program consistent with BMP 7's definition.

**Test for Condition 1**

| Year | Report Period | BMP 7 Implementation Year | RU Has Public Information Program? |
|------|---------------|---------------------------|------------------------------------|
| 1999 | 99-00         | 2                         | YES                                |
| 2000 | 99-00         | 3                         | YES                                |
| 2001 | 01-02         | 4                         | YES                                |
| 2002 | 01-02         | 5                         | YES                                |
| 2003 | 03-04         | 6                         | YES                                |
| 2004 | 03-04         | 7                         | YES                                |

**BMP 7 COVERAGE STATUS SUMMARY:**

**Water supplier is meeting coverage requirements for this BMP.**

Reported as of 1/26/06

**BMP 08 Coverage: School Education Programs**Reporting Unit:  
**Camrosa Water District**Reporting Period:  
**03-04****MOU Exhibit 1 Coverage Requirement**

No exemption request filed

Agency indicated "at least as effective as" implementation during report period?

No

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An agency must meet one condition to comply with BMP 8.

Condition 1: Implement and maintain a school education program consistent with BMP 8's definition.

**Test for Condition 1**

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| Year | Report Period | BMP 8 Implementation Year | RU Has School Education Program? |
|------|---------------|---------------------------|----------------------------------|
| 1999 | 99-00         | 2                         | YES                              |
| 2000 | 99-00         | 3                         | YES                              |
| 2001 | 01-02         | 4                         | YES                              |
| 2002 | 01-02         | 5                         | YES                              |
| 2003 | 03-04         | 6                         | YES                              |
| 2004 | 03-04         | 7                         | YES                              |

---

**BMP 8 COVERAGE STATUS SUMMARY:****Water supplier is meeting coverage requirements for this BMP.**

## BMP 09 Coverage: Conservation Programs for CII Accounts

Reporting Unit:  
**Camrosa Water District**

Reporting Period:  
**03-04**

### MOU Exhibit 1 Coverage Requirement

No exemption request filed

Agency indicated "at least as effective as" implementation during report period? No

An agency must meet three conditions to comply with BMP 9.

Condition 1: Agency has identified and ranked by use commercial, industrial, and institutional accounts.

Condition 2(a): Agency is on track to survey 10% of commercial accounts, 10% of industrial accounts, and 10% of institutional accounts within 10 years of date implementation to commence.

OR

Condition 2(b): Agency is on track to reduce CII water use by an amount equal to 10% of baseline use within 10 years of date implementation to commence.

OR

Condition 2(c): Agency is on track to meet the combined target as described in Exhibit 1 BMP 9 documentation.

#### Test for Condition 1

| Year | Report Period | BMP 9 Implementation Year | Ranked Com. Use | Ranked Ind. Use | Ranked Inst. Use |
|------|---------------|---------------------------|-----------------|-----------------|------------------|
| 1999 | 99-00         | 1                         | YES             | YES             | YES              |
| 2000 | 99-00         | 2                         | YES             | YES             | YES              |
| 2001 | 01-02         | 3                         | YES             | YES             | YES              |
| 2002 | 01-02         | 4                         | YES             | YES             | YES              |
| 2003 | 03-04         | 5                         | YES             | YES             | YES              |
| 2004 | 03-04         | 6                         | YES             | YES             | YES              |

#### Test for Condition 2a

|   | Commercial | Industrial | Institutional |
|---|------------|------------|---------------|
| Total Completed Surveys Reported through 2004                               |            |            |               |
| Credit for Surveys Completed Prior to Implementation of Reporting Databases |            |            |               |
| Total + Credit  |            |            |               |
| CII Accounts in Base Year   | 124        | 15         | 4             |
| RU Survey Coverage as % of Base Year CII Accounts                           |            |            |               |
| Coverage Requirement by Year 6 of Implementation per Exhibit 1              | 4.2%       | 4.2%       | 4.2%          |
| RU on Schedule to Meet 10 Year Coverage Requirement                         | NO         | NO         | NO            |

#### Test for Condition 2b

| Year | Report Period | BMP 9 Implementation Year | Performance Target Savings (AF/yr) | Performance Target Savings Coverage | Performance Target Savings Coverage Requirement | Coverage Requirement Met |
|------|---------------|---------------------------|------------------------------------|-------------------------------------|---|--------------------------|
| 1999 | 99-00         | 1                         |                                    |                                     | 0.5%  | NO                       |
| 2000 | 99-00         | 2                         |                                    |                                     | 1.0%  | NO                       |
| 2001 | 01-02         | 3                         |                                    |                                     | 1.7%  | NO                       |

|            |   |      |    |
|------------|---|------|----|
| 2002 01-02 | 4 | 2.4% | NO |
| 2003 03-04 | 5 | 3.3% | NO |
| 2004 03-04 | 6 | 4.2% | NO |

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**Test for Condition 2c**

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Total BMP 9 Surveys + Credit

BMP 9 Survey Coverage

BMP 9 Performance Target Coverage

BMP 9 Survey + Performance Target Coverage

Combined Coverage Equals or Exceeds Coverage Requirement?

NO

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**BMP 9 COVERAGE STATUS SUMMARY:****Water supplier has not met one or more coverage requirements for this BMP.**

Reported as of 1/26/06

**BMP 11 Coverage: Conservation Pricing**Reporting Unit:  
**Camrosa Water District**Reporting  
Period:  
**03-04****MOU Exhibit 1 Coverage Requirement**

No exemption request filed

Agency indicated "at least as effective as" implementation during report period? **No**

An agency must meet one condition to comply with BMP 11.

Agency shall maintain rate structure consistent with BMP 11's definition of conservation pricing. Implementation methods shall be at least as effective as eliminating non-conserving pricing and adopting conserving pricing. For signatories supplying both water and sewer service, this BMP applies to pricing of both water and sewer service. Signatories that supply water but not sewer service shall make good faith efforts to work with sewer agencies so that those sewer agencies adopt conservation pricing for sewer service.

a) Non-conserving pricing provides no incentives to customers to reduce use. Such pricing is characterized by one or more of the following components: rates in which the unit price decreases as the quantity used increases (declining block rates); rates that involve charging customers a fixed amount per billing cycle regardless of the quantity used; pricing in which the typical bill is determined by high fixed charges and low commodity charges.

b) Conservation pricing provides incentives to customers to reduce average or peak use, or both. Such pricing includes: rates designed to recover the cost of providing service; and billing for water and sewer service based on metered water use. Conservation pricing is also characterized by one or more of the following components: rates in which the unit rate is constant regardless of the quantity used (uniform rates) or increases as the quantity used increases (increasing block rates); seasonal rates or excess-use surcharges to reduce peak demands during summer months; rates based upon the longrun marginal cost or the cost of adding the next unit of capacity to the system.

**Test for Condition 1**

| Year | Report Period | RU Employed Conserving WATER Rate Structure | RU Employed Conserving SEWER Rate Structure | RU Meets BMP 11 Coverage Requirement |
|------|---------------|---|---|--------------------------------------|
| 1999 | 99-00         | YES   | NO  | NO                                   |
| 2000 | 99-00         | YES   | NO  | NO                                   |
| 2001 | 01-02         | YES   | NO  | NO                                   |
| 2002 | 01-02         | YES   | NO  | NO                                   |
| 2003 | 03-04         | YES   | NO  | NO                                   |
| 2004 | 03-04         | NO  | NO  | NO                                   |

**BMP 11 COVERAGE STATUS SUMMARY:****Water supplier has not met one or more coverage requirements for this BMP.**

Reported as of 1/26/06

**BMP 12 Coverage: Conservation Coordinator**Reporting Unit:  
**Camrosa Water District**Reporting Period:  
**03-04****MOU Exhibit 1 Coverage Requirement**

No exemption request filed

Agency indicated "at least as effective as" implementation during report period? **No**


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Agency shall staff and maintain the position of conservation coordinator and provide support staff as necessary.

---

**Test for Compliance**

| Report Year | Report Period | Conservation Coordinator<br>Position Staffed? | Total Staff on Team (incl.<br>CC) |
|-------------|---------------|---|-----------------------------------|
| 1999        | 99-00         | YES   | 1                                 |
| 2000        | 99-00         | YES   | 1                                 |
| 2001        | 01-02         | YES   | 1                                 |
| 2002        | 01-02         | YES   | 1                                 |
| 2003        | 03-04         | YES   | 1                                 |
| 2004        | 03-04         | YES   | 1                                 |

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**BMP 12 COVERAGE STATUS SUMMARY:****Water supplier is meeting coverage requirements for this BMP.**

**BMP 13 Coverage: Water Waste Prohibition**

Reporting Unit:

Reporting Period:

**Camrosa Water District**

**03-04**

**MOU Exhibit 1 Coverage Requirement**

No exemption request filed

Agency indicated "at least as effective as" implementation during report period?

No

An agency must meet one condition to comply with BMP 13.

Implementation methods shall be enacting and enforcing measures prohibiting gutter flooding, single pass cooling systems in new connections, non-recirculating systems in all new conveyer car wash and commercial laundry systems, and non-recycling decorative water fountains.

**Test for Condition 1**

**Agency or service area prohibits:**

| Year | Gutter Flooding | Single-Pass Cooling Systems | Single-Pass Car Wash | Single-Pass Laundry | Single-Pass Fountains | Other | RU has ordinance that meets coverage requirement |
|------|-----------------|-----------------------------|----------------------|---------------------|-----------------------|-------|--|
| 1999 | YES             | NO                          | NO                   | NO                  | NO                    | NO    | NO   |
| 2000 | YES             | NO                          | NO                   | NO                  | NO                    | NO    | NO   |
| 2001 | YES             | NO                          | NO                   | NO                  | NO                    | NO    | NO   |
| 2002 | YES             | NO                          | NO                   | NO                  | NO                    | NO    | NO   |
| 2003 | YES             | NO                          | NO                   | NO                  | NO                    | NO    | NO   |
| 2004 | YES             | NO                          | NO                   | NO                  | NO                    | NO    | NO   |

**BMP 13 COVERAGE STATUS SUMMARY:**

**Water supplier has not met one or more coverage requirements for this BMP.**

Reported as of 1/26/06

## BMP 14 Coverage: Residential ULFT Replacement Programs

Reporting Unit: **Camrosa Water District**

### MOU Exhibit 1 Coverage Requirement

A Reporting Unit (RU) must meet one of the following conditions to be in compliance with BMP 14.

Condition 1: Retrofit-on-resale (ROR) ordinance in effect in service area.

Condition 2: Water savings from toilet replacement programs equal to 90% of Exhibit 6 coverage requirement.

An agency with an exemption for BMP 14 is not required to meet one of the above conditions. This report treats an agency with missing base year data required to compute the Exhibit 6 coverage requirement as out of compliance with BMP 14.

**Status: Water supplier is meeting coverage requirements for this BMP. as of 2004**

| Coverage Year | BMP 14 Data Submitted to CUWCC | Exemption Filed with CUWCC | ROR Ordinance in Effect | Exhibit 6 Coverage Req'mt (AF) | Toilet Replacement Program Water Savings* (AF) |
|---------------|--------------------------------|----------------------------|-------------------------|--------------------------------|--|
| 1998          | YES                            |                            |                         | 28.47                          | 87.26  |
| 1999          | YES                            | NO                         | NO                      | 67.28                          | 158.27   |
| 2000          | YES                            | NO                         | NO                      | 113.28                         | 228.93   |
| 2001          | YES                            | NO                         | NO                      | 165.19                         | 298.77   |
| 2002          | YES                            | NO                         | NO                      | 222.07                         | 367.99   |
| 2003          | YES                            | NO                         | NO                      | 283.11                         | 436.92   |
| 2004          | YES                            | NO                         | NO                      | 347.56                         | 504.59   |
| 2005          | NO                             | NO                         | NO                      | 414.78                         |  |
| 2006          | NO                             | NO                         | NO                      | 484.18                         |  |
| 2007          | NO                             | NO                         | NO                      | 555.26                         |  |

\*NOTE: Program water savings listed are net of the plumbing code. Savings are cumulative (not annual) between 1991 and the given year. Residential ULFT count data from unsubmitted forms are NOT included in the calculation.

---

#### BMP 14 COVERAGE STATUS SUMMARY:

**Water supplier is meeting coverage requirements for this BMP.**

## BMP 14 Coverage: Residential ULFT Replacement Programs

Reporting Unit: **Camrosa Water District**

### BMP 14 Coverage Calculation Detail: Retrofit on Resale (ROR) Ordinance Water Savings

|  | Single Family | Multi-Family |
|--|---------------|--------------|
| <b>1992 Housing Stock</b>                                  |               |              |
| Average rate of natural replacement (% of remaining stock) | .04           | .04          |
| Average rate of housing demolition (% of remaining stock)  | .005          | .005         |
| Estimated Housing Units with 3.5+ gpf Toilets in 1997      | 4278.64       | 419.54       |
| Average resale rate  | .0508         | .88          |
| Average persons per unit                                   |               |              |
| Average toilets per unit                                   |               |              |
| Average savings per home (gpd; from Exhibit 6)             | 43.8          | 46.3         |

### Single Family Housing Units

| Coverage Year | Unretrofitted Houses | Houses Sold | Houses Unsold | Sold and Retrofitted | Sold and Already Retrofitted | Unsold and Retrofitted | Gross ROR Savings (AFY) | Nat'l Replacement Only Savings (AFY) | Net ROR Savings (AFY) |
|---------------|----------------------|-------------|---------------|----------------------|------------------------------|------------------------|-------------------------|--------------------------------------|-----------------------|
| 1998          | 3900.73              | 216.27      | 4040.98       | 216.27               |                              | 161.64                 | 65.80                   | 55.61                                | 10.18                 |
| 1999          | 3556.20              | 215.19      | 4020.77       | 197.17               | 18.02                        | 147.36                 | 82.70                   | 63.63                                | 19.06                 |
| 2000          | 3242.10              | 214.11      | 4000.67       | 179.75               | 34.36                        | 134.35                 | 98.10                   | 71.33                                | 26.77                 |
| 2001          | 2955.75              | 213.04      | 3980.66       | 163.88               | 49.16                        | 122.48                 | 112.15                  | 78.73                                | 33.42                 |
| 2002          | 2694.68              | 211.97      | 3960.76       | 149.40               | 62.57                        | 111.66                 | 124.96                  | 85.83                                | 39.13                 |
| 2003          | 2456.68              | 210.92      | 3940.96       | 136.21               | 74.71                        | 101.80                 | 136.63                  | 92.65                                | 43.98                 |
| 2004          | 2239.69              | 209.86      | 3921.25       | 124.18               | 85.69                        | 92.81                  | 147.28                  | 99.20                                | 48.08                 |
| 2005          | 2041.87              | 208.81      | 3901.65       | 113.21               | 95.60                        | 84.61                  | 156.98                  | 105.48                               | 51.50                 |
| 2006          | 1861.53              | 207.77      | 3882.14       | 103.21               | 104.56                       | 77.14                  | 165.83                  | 111.52                               | 54.31                 |
| 2007          | 1697.11              | 206.73      | 3862.73       | 94.09                | 112.64                       | 70.33                  | 173.89                  | 117.31                               | 56.58                 |

### Multi Family Housing Units

| Coverage Year | Unretrofitted Houses | Houses Sold | Houses Unsold | Sold and Retrofitted | Sold and Already Retrofitted | Unsold and Retrofitted | Gross ROR Savings (AFY) | Nat'l Replacement Only Savings (AFY) | Net ROR Savings (AFY) |
|---------------|----------------------|-------------|---------------|----------------------|------------------------------|------------------------|-------------------------|--------------------------------------|-----------------------|
| 1998          | 50.19                | 367.35      | 50.09         | 367.35               |                              | 2.00                   | 24.05                   | 5.76                                 | 18.29                 |
| 1999          | 6.00                 | 365.51      | 49.84         | 43.94                | 321.57                       | 0.24                   | 26.34                   | 6.60                                 | 19.75                 |
| 2000          | 0.72                 | 363.68      | 49.59         | 5.26                 | 358.43                       | 0.03                   | 26.62                   | 7.39                                 | 19.22                 |
| 2001          | 0.09                 | 361.87      | 49.35         | 0.63                 | 361.24                       | 0.00                   | 26.65                   | 8.16                                 | 18.49                 |
| 2002          | 0.01                 | 360.06      | 49.10         | 0.08                 | 359.98                       | 0.00                   | 26.65                   | 8.90                                 | 17.76                 |
| 2003          | 0.00                 | 358.26      | 48.85         | 0.01                 | 358.25                       | 0.00                   | 26.65                   | 9.60                                 | 17.05                 |
| 2004          | 0.00                 | 356.46      | 48.61         | 0.00                 | 356.46                       | 0.00                   | 26.65                   | 10.28                                | 16.37                 |
| 2005          | 0.00                 | 354.68      | 48.37         | 0.00                 | 354.68                       | 0.00                   | 26.65                   | 10.93                                | 15.72                 |
| 2006          | 0.00                 | 352.91      | 48.12         | 0.00                 | 352.91                       | 0.00                   | 26.65                   | 11.56                                | 15.09                 |
| 2007          | 0.00                 | 351.14      | 47.88         | 0.00                 | 351.14                       | 0.00                   | 26.65                   | 12.16                                | 14.49                 |

## **Appendix C - Ordinance 40-05**

- CWD Ordinance 40-05 – Rules and Regulations Governing the Provision of Water and Sanitary Services (Adopted January 13, 2005)



**Ordinance 40-05**

**Rules and Regulations**

**Governing  
The Provision of**

**Water and Sanitary Services**

**Adopted:**

**January 13, 2005**

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## Camrosa Water District Rules and Regulations Governing Water and Sanitary Services

### 1.0 Purpose

The purpose of this ordinance is to establish the terms and conditions of Camrosa's Water and Sanitary Services. These terms and conditions are intended to both assure the individual "Customer" of fair and equitable service and protect the community Camrosa serves from the undue exposure to liability. Water, Sewer, Reclaimed Water and Recycled Water service shall be available only in accordance with the Rules and Regulations contained herein and in conformance with applicable federal, state and local statutes, ordinances, regulations and contracts.

### 2.0 General

Water and sanitary service by Camrosa Water District is subject to the availability of facilities, adequate capacity of facilities, and compliance with the terms and conditions herein set forth or as may be augmented and set forth in any agreement or permit issued by the District.

### 3.0 Definitions

"Acre Foot of Water" shall mean for the purposes of this Ordinance 43,560 cubic feet of water, which is equal to 435.6 Units or 325,851 gallons of water.

"Customer" shall mean the applicant of record for water service.

"Certified Backflow Device" shall mean for the purposes of this Ordinance equipment, with proper and current certification, designed to prevent the reverse flow of customer's system into district system.

"Cross connection" shall mean any unprotected connection between any part of a water system used or intended to supply water for drinking purposes and any source or system containing water or substance that is not or cannot be approved as safe, wholesome, and potable for human consumption.

"Non-potable Water" shall mean for the purposes of this Ordinance ground water or surface water which is intended for use as irrigation water and other accepted uses for which "Potable Water" is not required.

"Non-Potable Irrigation System" shall mean for the purposes of this Ordinance the transmission and distribution piping and appurtenances, which transport Non-Potable Irrigation Water.

"Potable Water" shall mean for the purposes of this Ordinance water, which is intended for all general uses including human consumption, and therefore, water that meets all primary drinking water standards set forth by the California Department of Health Services.

"Potable Water System" shall mean for the purposes of this Ordinance the transmission and distribution piping and appurtenances, which transport "Potable Water" from the various "Potable Water" sources to the "Customer".

"Pressure Zones" shall mean for the purposes of this Ordinance subdivisions within the "Potable Water" System, the "Non-Potable Irrigation System", and the "Recycled Irrigation Water System", which are hydraulically isolated from the main distribution

system and have their own unique hydraulic characteristics and associated energy requirements for delivery.

"Property" shall mean a parcel of land assigned a separate assessors parcel number by the County of Ventura.

"Recycled Water" shall mean for the purposes of this Ordinance, water that is a direct product of a wastewater treatment plant and, therefore, water which is regulated by the State of California as recycled water.

"Recycled Secondary Treated Water" shall mean recycled water that has been oxidized and disinfected so that the median concentration of total coliform bacteria in the disinfected effluent does not exceed a most probable number (MPN) 23 per 100 milliliters utilizing the bacteriological results of the last seven days for which analyses have been completed, and the number of total coliform bacteria does not exceed an MPN of 240 per 100 milliliters in more than one sample in any 30 day period.

"Recycled Tertiary Treated Water" shall mean filtered and subsequently disinfected wastewater using a chlorine disinfection process following filtration that provides a CT value of not less than 450 milligram-minutes per liter at all times with modal contact time of at least 90 minutes, based on peak dry weather design flow and a median concentration of total coliform bacteria measured in the disinfected effluent that does not exceed an MPN of 2.2. per 100 milliliters utilizing the bacteriological results of the last seven days for which analyses have been completed and the number of total coliform bacterial does not exceed an MPN of 23 per 100 milliliters in more than one sample in any 30 day period. No sample shall exceed and MPN of 240 total coliform bacterial per 100 milliliters.

"Recycled Irrigation Water System" shall mean for the purposes of this Ordinance the transmission and distribution piping and appurtenances, which transport effluent water from the Camrosa Water Reclamation Facility.

"Surplus Water" shall mean for the purposes of this Ordinance water in excess of the current water demands within the boundaries of the district as determined by Camrosa Water District.

"Unit of Water" shall mean for the purposes of this Ordinance one hundred cubic feet of water, which is equal to 748 gallons.

## **SECTION 1 - WATER SERVICE**

### **4.0 Eligibility for Water Service**

Camrosa provides both Potable and Non-potable Water Service for all indoor and outdoor uses to "Properties" within the District. To be eligible for Water Service the "Customer" shall satisfy both the General Requirements of Water Service and the requirements of the Type and Classification of Water Service listed below.

#### **4.1 General Requirements of Water Service**

The "Property" to be served shall be within the Camrosa Water District boundaries. The "Property" shall have an established water connection with a Camrosa water meter of adequate size and capacity, as determined by Camrosa, to serve the "Property's" water needs without causing undue wear to the Camrosa metering facilities or interfere with Camrosa's ability to provide reliable service to other "Properties". The "Customer" shall have completed and submitted an application for water service, paid any deposit that may be required as defined in the "Schedule of

Rates, Fees and Charges for Water and Sanitary Services". The "Property" shall be free of any delinquent fees and charges from prior accounts established to serve the "Property" and the current "Customer" must establish and maintain an active water service account with Camrosa that is current, free of any delinquent fees and charges.

#### **4.2 Types and Classifications of Water Service**

Camrosa provides three types of water service: "Potable" water service, "Non-Potable" water service, and "Recycled" water service. For each type of water service Camrosa provides water based upon service classification. Specific terms and requirements for water service are based upon the type and classification of the "Customer's" intended water use. Failure to continuously comply with any requirement for water service may result in re-classification of the service and/or termination of service.

##### **4.2.1 "Potable" Water Service**

Camrosa provides "Potable Water" Service for all indoor and outdoor uses. To be eligible for "Potable Water" Service the "Customer" shall satisfy both the *General Requirements of Water Service* contained in Section 4.1 and the requirements of the classification of water use.

###### **4.2.1.1 Municipal Water Service Classifications**

Municipal Water Service is water service, which is intended to meet long-term "potable" water needs. It is considered uninterrupted service and, accordingly, must meet "Camrosa Water District Will Serve Policy" requirements.

###### **4.2.1.1.1 *Residential Water Service Class I***

Residential Water Service - Class I is intended for all general uses both indoor and outdoor. To be eligible for Residential Water Service - Class I the "Property" served must include a dwelling or other structure suitable for occupancy, meet all the general requirements of "Potable Water" service, and have an approved application for "Potable Water" service on record.

###### **4.2.1.1.2 *Master Metered Residential Service Class II***

Master Metered Residential Service is intended for all general uses both indoor and outdoor. To be eligible for Master Metered Residential Service the "Property" served must include multiple dwelling units, have common plumbing system, managed by a formal homeowners association and have water service provided through one or more meters serving the common water system. The "Property" served must meet all the general requirements of "Potable Water" service, and have an approved application for "Potable Water" service on record. In addition, because it is the policy of the Camrosa Water District to encourage wherever practicable the metering of individual residential units, the property must secure the approval of the General Manager in the "Will Serve" process to qualify for Master Metered Service. Camrosa may require a backflow device be installed in order to qualify for this classification.

**4.2.1.1.3 Commercial and Industrial Water Service Class III**

Commercial and Industrial Water Service is intended for all general uses both indoor and outdoor for the purpose of providing service to privately operated services, manufacturing, or other business activities. To be eligible for Commercial and Industrial Water Service the "Property" served must possess an active conditional use permit, business license, or other evidence that the local land use jurisdiction recognizes the operation as a commercial or industrial enterprise. The primary water use must be a use other than irrigation. The "Property" must also meet all the general requirements of "Potable Water" service, have a certified backflow prevention device at the meter service, and have an approved application for Commercial and Industrial Water Service on record.

**4.2.1.1.4 Public Water Service Class IV**

Public Water Service is intended for all general uses both indoor and outdoor for public services, such as public schools, recreation facilities, hospitals, government administrative services, and public safety services. To be eligible for Public Water Service the "Property" served must be publicly operated, exempt from property tax, and the primary water use must be a use other than landscape irrigation. The "Property" must also meet all the general requirements of "Potable Water" service, have a certified backflow prevention device at the meter service, have an approved application for "Potable Water" service on record.

**4.2.1.1.5 Municipal Irrigation Water Service Class V**

Municipal Irrigation Water Service is intended for all general landscape irrigation needs where the primary use of water is to maintain large turf areas and other landscape for parks, golf courses, common areas, medians, open spaces and similar uses. To be eligible for Municipal Irrigation Water Service the "Property" served must meet all the general requirements of "Potable Water" service, have a certified backflow prevention device at the meter service, and have an approved application for "Potable Water" service on record.

**4.2.1.1.6 Fire Service Class VI**

Fire Service is intended to provide water for private fire flow needs either within a private complex to which Camrosa does not provide public fire hydrants or for supplementary indoor fire flows. To be eligible for Fire Service the "Property" serviced must maintain a separate and isolated fire service water system and, rather than a conventional water meter, the service must include a fire flow detector meter that will detect the use of water on the fire flow system. Use of water through the fire flow system for other than fire protection shall disqualify the service from fire service classification and require compliance with a conventionally metered municipal service classification. The "Property" must also meet the general requirements of "Potable Water" service, have a certified backflow prevention device at the meter service, and have an approved application for "Potable Water" service on record.

**4.2.1.2 Agricultural Water Service Classifications**

Agricultural Water Service is a class of service intended to serve commercial agriculture. To qualify for this class of service, the "Property" must qualify for the Agricultural Water Program available from Metropolitan Water District of Southern California and Calleguas Municipal Water District. This service, unlike Municipal Water Service is interruptible. Agricultural services may be interrupted for extended periods as a result of general water shortages, drought, maintenance requirements, and operational requirements. Agricultural Water Service may not be promptly restored following emergencies. Therefore, Agricultural service shall not be eligible for conversion to the Municipal Service without satisfying all "Will Serve" requirements as set forth in the "Camrosa Water District Will Serve Water Policy".

**4.2.1.2.1 Agricultural Irrigation Water Service**

Agricultural Irrigation Water Service is intended for commercial agricultural properties, which raise food crops, floral crops, nursery crops, or commercial livestock. It is not the intent of this ordinance to classify home gardens, home orchards, or pets as agricultural operations. To be eligible for Agricultural Irrigation Water Service the "Property" must include a minimum of one full contiguous, irrigated acre dedicated to commercial agriculture. The "Property" must meet the requirements set forth in the most current "Camrosa Water District Commercial Agricultural Policy". The "Property" must also meet all the general requirements of "Potable Water" service, have a certified backflow prevention device at the meter service, and have an approved application for Agricultural Irrigation Water Service on record.

**4.2.1.2.2 Domestic Agricultural Water Service**

Domestic Agricultural Water Service is intended for commercial agricultural properties, which raise food crops, floral crops, nursery crops, and commercial livestock where the "Property" includes a dwelling or dwellings in which the residential water requirements are incidental to the agricultural operation. It is not the intent of this ordinance to classify home gardens, home orchards, or pets as agricultural operations. To be eligible for Domestic Agricultural Water Service the "Property" must include a minimum of one full, contiguous, irrigated acre dedicated to commercial agriculture. The "Property" must meet the requirements set forth in the most current Camrosa Water District Commercial Agricultural Policy. The "Property" must also meet all the general requirements of "Potable Water" service, have a certified backflow prevention device at the meter service, have an approved application for Domestic Agricultural Water Service on record, and comply with all "Will Serve" requirements as set forth in the "Camrosa Water District Will Serve Water Policy".

**4.2.1.3 Temporary Service**

Temporary Water Service is service intended for "Customers" having short-term water use needs.

**4.2.1.3.1 Temporary Construction Water**

Construction water is intended for "Customers" that may need water for dust abatement, general construction site use, and other construction related needs. The "Property" shall meet all the general requirements of

“Potable Water” service; a site, approved by Camrosa, shall be specified for installation of a Temporary Meter Service; the temporary meter installed; suitable backflow prevention techniques, approved by Camrosa, are employed and the “Customer” shall have completed and submitted an application for Construction Water Service. Construction Water Service shall be for a term no longer than six (6) consecutive months. The General Manager may authorize longer terms on a case-by-case basis.

#### **4.2.1.3.2 Temporary Municipal Water**

Temporary Municipal Water is intended for “Customer’s” having a short term need for “Potable Water” service. Examples of such short-term needs are special events, community sponsored functions, which may require water service for a period not to exceed 30 days. The General Manager, on a case-by-case basis, shall determine the requirements and conditions of such service and may authorize longer terms on a case-by-case basis.

#### **4.2.1.3.3 Temporary Agricultural Water**

Temporary Agricultural Water Service is intended to provide short-term water service to agriculture operations, which do not have service to the “Property” and require water to supplement the primary water source for a term not to exceed one (1) year.

#### **4.2.1.3.4 Temporary Contractual Water**

The Board of Directors may, from time to time, authorize water service on a temporary basis for a term and under conditions set forth by special contract.

#### **4.2.1.4 Emergency Water Service**

Emergency Water Service is intend to provide water for the protection of the health, safety and/or property for a “Property” or “Customer” unable to satisfy the requirements and conditions of “Potable Water” service. Emergency service may be provided only after Camrosa has received a complete application for Emergency Water Service from a “Customer” for a specific “Property”, has determined that the situation warrants an emergency determination and all fees and charges have been paid. Camrosa shall determine any additional terms and conditions as established in the Camrosa “Schedule of Rates, Fees and Charges for Water and Sanitary Services”.

#### **4.2.1.5 Surplus Water - Out of boundary service**

Surplus water may be served for any useful purpose outside the boundaries of the District by special agreement as authorized by the Board of Directors.

### **4.2.2 “Non-Potable Water” Service**

Camrosa provides “Non-potable Water” for a variety of irrigation, industrial, and commercial purposes. All non-potable service is interruptible due to non-availability of water, system maintenance requirements or operational requirements. To be eligible for “Non-potable Water” Service the “Customer” shall satisfy the *General Requirements of Water Service* contained in Section 4.1, the “Property” to be served must either have no potable service or have a certified backflow prevention device on the potable service and a separate non-potable plumbing system with no existing or potential cross connection.

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“Customers” must have a beneficial use for “Non-potable Water” approved by Camrosa and meet the requirements of the specific “Non-potable Water” classification of water use.

#### **4.2.2.1 “Non-potable Water” Classifications**

The following outlines the classifications of non-potable service available from Camrosa Water District. Qualifications and requirements for use of “Non-potable Water” by individual residents may require State or County Department of Health Services prior approval before Camrosa may provide service. In addition, State or County Departments of Health Services may require periodic inspections of privately operated Non-Potable Irrigation Systems to assure that no cross connections exist.

##### **4.2.2.1.1 *Commercial Agricultural Class I***

Class I is intended for general irrigation purposes on lands requiring water to irrigate commercial crops. To receive water under this classification, the lands must be primarily used for production of commercial crops and must meet the requirements set forth in the most current “Camrosa Water District Commercial Agricultural Policy”.

##### **4.2.2.1.2 *Landscape Irrigation Class II***

Landscape Irrigation Class II is intended for commercial operations, public landscaping such as public parks, medians playing fields and schools, and common-area landscaping needs of homeowners associations where large amounts of irrigation water are needed to maintain turf areas or other landscaping. To qualify for this class, the property must have access to the non-potable water system, have an approved backflow prevention device, must be free of any cross-connections between the potable and non-potable systems and must be primarily in turf or other high-water-demand landscaping.

##### **4.2.2.1.3 *Residential Landscaping Class III***

Residential Non-Potable Water service is intended for irrigation of landscape, gardens, orchards and other appropriate outdoor water uses. To be eligible for Non-potable Residential Water service the property served must have access to the non-potable water system, have an approved backflow prevention device owned and maintained by the district on the potable water service to the property, the property must be free of any cross-connections between the potable and non-potable systems, meet all the general requirements of non-potable water service, have an approved application for non-potable water service on record and have paid all applicable fees and charges for non-potable water service.

##### **4.2.2.1.4 *Class IV- Temporary Construction Water***

Class IV is intended for uses related to general construction such as dust abatement, compaction, and roadway cleaning. To be eligible for Class IV Non-potable service a construction site must (1) have access to a non-potable water supply, (2) be permitted by Camrosa for use of “Non-potable Water” use; (3) the “Customer” shall make deposits and pay any special fees and charges as established by the Board of Directors; and (4) “Customer” shall agree to comply with all State and County Department of Health Services requirements for uses of “Non-potable Water”.

**4.2.2.1.5 Class VI Commercial Agricultural**

The district has entered into separate agreements for delivery of non-potable water and may again enter into such agreements. This class is intended for lands requiring large amounts of water to irrigate commercial crops and have contractual commitments with Camrosa for long-term Non-Potable Irrigation Water Service. Minimum requirements for Class I service are: (1) (a) the parcel served is a minimum of 20 acres; or (b) the parcel is joined with a larger parcel totaling 20 acres and is considered part of the larger parcel's operation as determined by Camrosa; (2) the lands are primarily used for production of commercial crops; (3) the owner of the land has endorsed, submitted, and secured approval of a Non-Potable Irrigation Service Agreement with Camrosa Water District on or before December 31, 1994

**4.2.3 Recycled Water**

Camrosa provides "Recycled Water" for a variety of irrigation, industrial, and commercial purposes. To be eligible for "Recycled Water" Service the "Customer" shall satisfy the *General Requirements of Water Service* contained in Section 4.1, the "Property" to be served must either have no potable service or have a certified backflow prevention device on the potable service and a separate Recycled water plumbing system with no existing or potential cross connection. The "Customer" must have a beneficial use for "Recycled Water" approved by Camrosa and the meet the requirements of the specific "Recycled Water" classification of water use. All classes must be approved through a permit application process which includes inspection of facilities.

**4.2.3.1 "Recycled Water" Service Classifications**

The following outlines the classifications of non-potable water available from Camrosa Water District. Qualifications and requirements for use of "Non-potable Water" by individual residents may require State or County Department of Health Services prior approval before Camrosa may provide service. In addition, State or County Departments of Health Services may require periodic inspections of privately operated Non-Potable Irrigation Systems to assure that no cross connections exist.

**4.2.3.1.1 Class I - Commercial Agricultural**

This Class of Recycled Water is intended for lands requiring large amounts of water for irrigation of commercial crops. The water served under this class is "Recycled Tertiary Treated Water", therefore, qualifying for use under minimum restrictions. To receive water under this classification, the lands must be primarily used for production of commercial crops and must meet the requirements set forth in the most current "Camrosa Water District Commercial Agricultural Policy".

**4.2.3.1.2 Class II - Landscape Irrigation Water**

Class II is intended for parks, golf courses, and other large irrigated turf areas. The water provided under this class is "Recycled Tertiary Treated Water", therefore, qualifying for use under minimum restrictions. Minimum requirements are: (1) the land to be served is primarily used for recreational, decorative, or other purposes where large amounts of irrigated turf are required; (2) the land to be served is posted in

accordance with Department of Health Services regulations for use of "Recycled Water" in areas open to the general public.

**4.2.3.1.3 Class III Limited-use Commercial Agricultural Water**

Class III is intended for the irrigation of commercial crops with restrictions on the method of irrigation or crop type as imposed by the Department of Health Services. The water provided is "Recycled Secondary Treated Water" therefore, its uses are restricted. To receive water under this classification, the lands must be primarily used for production of commercial crops and must meet the requirements set forth in the most current "Camrosa Water District Commercial Agricultural Policy".

**4.2.3.1.4 Class IV Commercial Agriculture**

Class IV is intended for lands requiring large amounts of water for commercial crops and contractual commitments with Camrosa for long-term "Recycled Water" Service. The water provided under this class is "Recycled Tertiary Treated Water", therefore, qualifying for use under minimum restrictions. To be eligible for Class IV service, the land to be served must be used primarily for the production of commercial crops and the owner of the land has endorsed, submitted, and secured approval of a "Recycled Water" Service Agreement with Camrosa Water District on or before December 31, 1994.

**5.0 Conditions of Water Service**

In addition to the general requirements for water service contained in this ordinance, properties with water service agree, upon receiving service, to the conditions contained in this ordinance as it may be amended from time to time by the Camrosa Water District Board of Directors. Failure to meet the conditions contained here in may result in termination of service.

**5.1 Cross Connection Control**

The "Customer" shall be responsible for the prevention of cross connections of the "Customer's" system with sources of potential contamination. Any "Customer" that has an alternate source of water to the "Property" served by Camrosa regardless of classification shall maintain the water systems separately and shall maintain a certified backflow prevention device at the "Property's" potable water service meter. At the discretion of the District, Camrosa may require the installation of a backflow device on any service provided by the District. "Customer's" required to maintain backflow prevention equipment shall certify the equipment annually except in those instances where the backflow prevention devices are maintained by Camrosa as part of the monthly service fee. In those instances, Camrosa shall test and certify the equipment annually.

**5.2 Water Pressure and Surges**

Camrosa is not responsible for damages resulting from pressure variations or surges. It is the responsibility of the "Customer" to protect the "Property" from variations in water system pressure and water system surges. The "Customer" shall not operate the "Property's" system in a manner, which may cause surges to the Camrosa water system.

### **5.3 Water Leaks**

Camrosa is not responsible for water losses due to leaks in the "Property's" water system. The "Customer" shall maintain the "Property's" water system to avoid leaks and shall repair leaks promptly.

### **5.4 Meters, Metering Facilities and Hydrants**

The meter and the metering facility are the property of the Camrosa Water District. The outlet, outlet valve and any piping and equipment on the outlet side of the meter are the full responsibility of the "Customer". All water that passes through the meter is the responsibility of the "Customer".

#### **5.4.1 Meter Testing**

Any customer may demand that the meter through which potable, reclaimed or recycled water is being furnished be examined and tested by the District for the purpose of ascertaining whether or not it is correctly registering the amount of water being delivered through it. Such demand shall be in writing and shall be accompanied by a deposit equal to the charge for testing as determined by the District.

Upon receipt of such demand and deposit, the District will have the meter examined and tested and, if upon such test the meter shall be found to register over two percent (2%) more water than actually passes through it, the meter shall be properly adjusted or another meter substituted therefore, the deposit shall be returned, and the water bill for the current month will be adjusted proportionately. If the meter should be found to register more than two percent (2%) more water than actually passes through it, the deposit shall be retained by the District as the expense of making the test.

#### **5.4.2 Obstruction of or deposit of material in and around Meter Boxes or Hydrants**

No person shall place, dispose or deposit or permit the placement, disposal or deposit of oil, toxic hazardous or contaminated liquid or waste, trash, dirt building materials or other substances, objects or obstructions in on or around meter boxes or hydrants. It shall be the responsibility of each customer to prevent meter boxes, District hydrants or other District facilities from becoming obstructed or obscured by the customer's trees, shrubs plants or in any other manner so as to impede their use or access to them or make their location difficult to determine.

If such substances, objects or obstructions are not cleaned or removed, or are permitted to obscure or impede such facilities, the District may, after providing reasonable notice to the customer, accomplish the cleaning and removal and charge the customer for the cost of doing so.

#### **5.4.3 Change of Meter Location**

When the location of a meter and service is changed at the "Customer's" request, the cost of making such change will be paid for by the "Customer" in accordance with charges established in the "Schedule of Rates, Fees and Charges for Water and Sanitary Service".

### **5.5 Exporting Water**

The "Customer" shall not export water from the "Property" assigned service by Camrosa to any other "Property" without the written permission of Camrosa. This prohibition includes other "Property" under the same ownership.

**5.6 Water Quality**

"Potable Water" provided by Camrosa meets or exceeds all primary drinking water requirements set forth by the California Department of Health Services. Camrosa water does contain minerals that contribute to "hardness". Hardness may result in the accumulation of mineral deposits of water appliances. Camrosa is not liable for any discoloration, spotting or any other damages resulting from the mineral content of the water.

Non-potable and Recycled waters are not intended for human consumption. These waters may contain high levels of minerals and salts to which some plants are not tolerant. Camrosa is not responsible for any damages to crops or plants resulting from the use of water delivered by Camrosa.

**5.7 Interruptions in Service for System Maintenance**

Camrosa may interrupt service from time to time for routine maintenance, repairs, and meter testing. Camrosa is not responsible for any damages to the "Customer's" property or other losses as a result of such interruptions.

**5.8 Automatic Fire Sprinkler Service Connections**

When an automatic fire sprinkler service connection is installed, the control valve for the sprinkler system will be left closed and sealed until a written order to turn on the water is received from the "Customer". After the water is turned on, the District shall not be liable for damages of any kind that may occur on or to the premises or "Property" therein served due to the installation, maintenance or use of such service connection, or because of fluctuation of pressure or interruption of water supply.

Water shall not be used through an automatic fire sprinkler service connection for any purpose other than the extinguishing of fires, or a purpose related thereto.

**5.9 Access to District-owned Facilities**

Camrosa shall have access to all District-owned meters, pipelines and appurtenant facilities at all times. No person shall willingly obstruct or prevent access to District-owned facilities.

**5.10 Right of Inspection of and Access to Customers Premises**

By accepting service from the District, the "Customer" agrees that authorized representatives of the District may, at reasonable times, enter upon the "Customer's" premises for the purpose of determining the existence, operation, maintenance, and/or use of:

1. Any plumbing or water piping which may cause, create or permit backflow, back-siphonage or any other condition affecting or likely to affect the purity and/or potability of the water supply furnished by the District;
2. Any private source of water supply which may be connected with the water supply system of the District; or,
3. Any source of pressure, vacuum, contamination, or pollution affecting or likely to affect the purity and /or potability of the water supply furnished by the District.

**5.11 Tampering with Metering Facilities**

Tampering with any Camrosa facility, which results in damages to the facilities or the loss of water by leakage or meter malfunction may result in immediate termination of service and both civil and criminal prosecution.

**5.12 Beneficial Use of Water**

The "Customer" shall use water provided by Camrosa in any manner, which results in reasonable benefit to the "Property" or the "Customer".

**5.13 Prohibition of Water Waste**

The following prohibitions are in effect at all times, regardless of whether any declared shortage condition is in effect:

1. Gutter Flooding - No person shall cause or permit any water furnished to any property within the District to run or to escape from any hose, pipe, valve, faucet, sprinkler or irrigation device into any gutter or to otherwise escape from the property, if such running or escaping can reasonably be prevented.
2. Leaks - No person shall permit leaks of water that he/she has the authority to eliminate.
3. Waste - No person shall cause or permit water under his/her control to be wasted.

Willful waste of water may result in additional fees, charges and/or termination of service.

**5.14 Reasonable Attorney Fees Paid by Customer**

In the event an action is commenced in a court of law by the District to collect any obligations incurred by the use of water or sewer service, the "Customer" shall be required to pay reasonable attorney's fees if said action is successful.

**5.15 Mandatory use of Reclaimed or Recycled Water where Available**

Where non-potable or recycled water is available to a property served by Camrosa, the property shall utilize such water in lieu of potable water wherever practicable.

**5.16 Water Shortage Emergencies**

"Water Shortage Emergency" is a condition resulting from some catastrophic event or events, which cause or threaten to cause an impairment, reduction, or severance of the district's water supply or access to its water supplies in a manner that may result in district's inability to meet ordinary water demands for potable water service.

In the event of a imminent inability of the district to meet ordinary water demands for a period beyond what can reasonably be considered routine system repairs the General Manager shall report to the Board of Directors on the extent, estimated duration, cause, and estimated severity of the event or events leading to the emergency and by resolution the Board of Directors may declare a Water Shortage Emergency and activate one or more of the following emergency provisions of this ordinance:

**Stage One Emergency**

The goal of a stage one emergency is a 10% potable water demand reduction to preserve water supplies for district and or the region until the emergency has ended.

The district shall notify its customers via newspaper, radio, television and direct mail or by any other means determined by the district to be prudent that a Water Shortage Emergency has been declared and that the District is requesting all customers to voluntarily reduce water use by 10%.

#### Stage Two Emergency

The goal of a stage two emergency is a 20-30% reduction in potable water demands to prevent the loss of property and to protect the health and safety of the community and region. The district shall notice all of its customers via newspaper, radio, television and direct mail or by any other means determined by the district to be prudent that a Water Shortage Emergency has been declared and that the District is prohibiting the use outdoor use of potable water where non-potable or recycled water is available, all dust abatement, car washing, washing of sidewalks and driveways. The district shall request that all landscape and agricultural irrigation with potable water be monitored and carried out prudently to preserve water supplies. Failure to comply with the emergency requirements may result in fees and charges prescribed in the districts schedule of rates fees and charges of stage emergency conditions and/or termination of service.

#### Stage Three Emergency

The goal of a Stage three emergency is to reduce potable water demands by 50% to protect the health and safety of the community and the region. In addition to the actions and requirements of a stage two emergency the district shall prohibit all outdoor potable water use with the exception that perennial plants may be irrigated only to prevent the loss of the plant or tree not to enhance crop yield or appearance until the emergency has ended. Violation of any provision of a stage three emergency may result in fees and charges prescribed in the districts schedule of rates, fees and charges. Repeated violations shall result in water capacity restrictions to the property or termination of service.

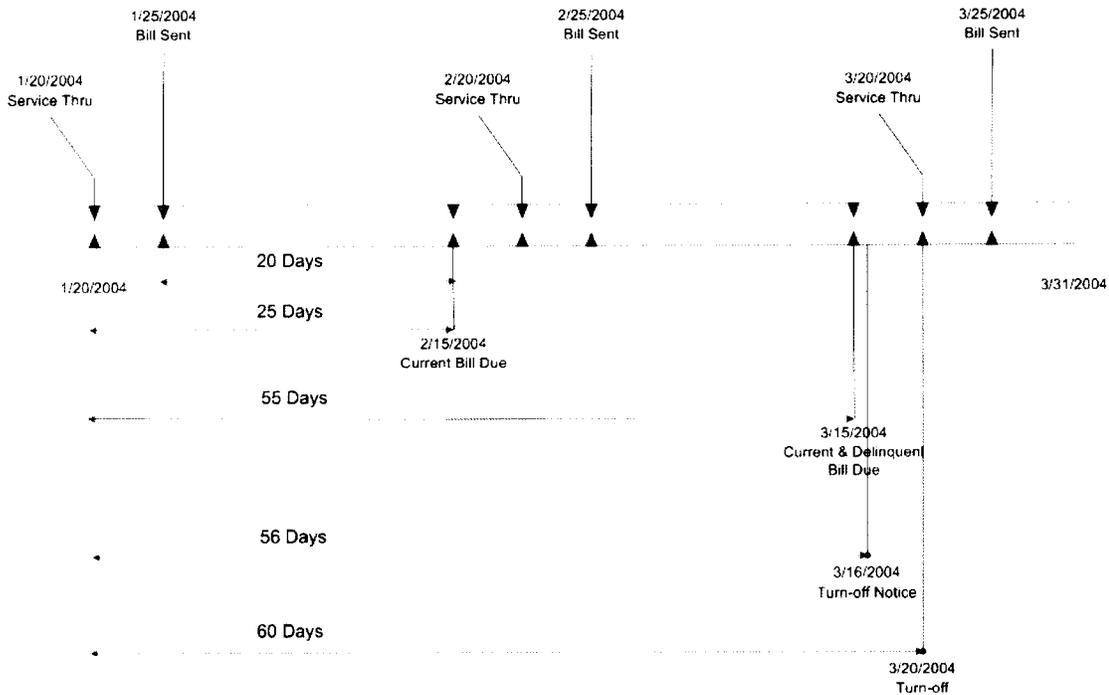
The Board of Directors may move from stage to stage as necessary to best manage the emergency. Once the emergency conditions have subsided and water supplies returned to normal the Board shall by resolution declare an end to the emergency and restore service to pre-emergency conditions.

## **6.0 Water Services Rates, Fees, and Charges**

The "Customer" shall pay all assigned rates, fees, and charges for the type and class of service provided in the manner and within the times set forth in this Ordinance and the Camrosa Water District "Schedule of Rates, Fees and Charges for Water and Sanitary Services" as established and amended from time to time by the Camrosa Board of Directors. Failure to make timely payment may result in termination of service upon notice as may be required by law.

### **6.1 Time and Manner of Payment**

All bills and charges for water, sewer, reclaimed water and recycled water service shall be due and payable upon presentation and shall become delinquent if not paid by the date specified on the face thereof. Such bills and charges shall be deemed to be presented upon having been deposited in the United States Mail, postage paid, and addressed to the customer or owner reflected in the records of the District. Payments may be made in person, by mail or by electronic transfer of funds to the District.



The timeline presented above is the normal billing cycle for the District. If an amount billed is not paid within 25 days of date it is presented for payment, the amount shall be considered delinquent. If a delinquent amount is not paid within 55 days from its original date of presentment, the account shall become a candidate for termination. and, following such notice and proceedings as may be required by law, the water, reclaimed water and/or recycled water service to the property may be discontinued.

**6.2 Delinquent Fees and Charges**

Fees may be applied to accounts deemed delinquent. Charges may be applied for noticing the customer with a door hanger and for reconnection of service terminated as a result of delinquency, as provided for in the "Schedule of Rates, Fees and Charges for Water and Sanitary Services." The General Manager is authorized to waive the door hanger fee if, in the judgment of the General Manager, such waiver is in the best interests of the District.

**6.3 Property Liens**

If, in the judgment of the General Manager, a delinquent account has proven to be uncollectible, a lien against the property served may be established in the amount owing to the District. Reestablishment of service to the property may be withheld until the General Requirements of Water Service are met.

**6.4 Pressure Zone Surcharges**

Water Services may be subject to surcharges if the areas to be served are above the first hydraulic lift. Zone Surcharges are intended to reflect the actual cost of any additional pumping and shall be reviewed annually to assure that they reflect current costs.

**SECTION 2 - SEWER SERVICE****7.0 Sewer Service General**

The District protects the health, welfare and safety of the local residents by constructing, operating and maintaining a system of local sewers and laterals, trunk sewers and interceptors, and liquid waste treatment and disposal facilities to serve the homes, industries and commercial establishments throughout the District and surrounding environs as required by State and Federal law.

**7.1 Sewer Service Area**

Camrosa Water District has facilities capable of providing Sanitary Service to approximately 50% of its customers. The boundaries of the existing service area are:

1. North of the 101 Freeway to Worth Way and;
2. Calleguas Creek on the West to Morongo Drive on the East.
3. California State University, Channel Islands
4. Casa Pacifica, Las Posadas, Villa Calleguas

Sanitary Service south of the 101 Freeway, and within the Camrosa Water District boundary, is provided by the City of Camarillo while Camrosa provides the Water Service. The only exceptions are listed as #3 and #4 above.

**7.2 Demarcation of Sewer Service Responsibilities**

For the purpose of defining the location at which District facilities end and private facilities begin, the cleanout on sewer lateral connections to private property, located either just behind the curb and gutter, or just behind the sidewalk, shall serve as the point of demarcation.

The cleanout shall not, however, serve as the point where obstructions, causing a backup of wastewater within the lateral, cease to be the responsibility of the sewer customer. It is the responsibility of the Customer to maintain clear and free flow in the lateral from their property all the way to the District sewer main. This includes clearing obstructions caused by something flushed or dropped into the lateral or caused by root intrusion from nearby landscaping. Simply causing the obstruction to pass the demarcation point does not then place the responsibility for correction of the problem onto the District. Root intrusion caused by City or County placed trees or shrubs is, likewise, the customers responsibility to correct and then, if so inclined, to file a claim with the appropriate agency.

The District shall not be liable for damage to private property caused by blockage in a sewer lateral. The District may assume liability only in instances when a backup in the District sewer main causes damage to private property.

**7.3 Water Reclamation Policy**

The District is committed to a policy of wastewater reclamation and reuse in order to provide an alternate source of water supply and to reduce overall costs of wastewater treatment and disposal. The reclamation of wastewater through wastewater treatment processes may necessitate more stringent quality requirements on industrial waste discharges as the demand for reclaimed water increases. Accordingly, industry is urged to seek recovery and reuse procedures to meet the limitations set in industrial waste discharges rather than those procedures designed solely to meet discharge limitations.

#### **7.4 Eligibility for Sewer Service**

The highest and best use of the sewerage system is the collection, treatment and reclamation or disposal of domestic sewage. Connection to the District's facilities by customers within the sewer service area is unrestricted provided the prospective customer has completed the application process, all fees have been paid, the connection meets district construction specifications and the type of discharge is not detrimental to either the collection system or the treatment process.

The use of the sewerage system for industrial waste discharges is subject to regulation by the District. The District shall retain responsibility for final regulation and control of industrial waste discharges into District facilities.

Sewage, liquid waste and industrial waste will be accepted into the sewerage system provided such wastes will not: 1) menace public health, 2) detrimentally affect the local environments, 3) create nuisances such as odors, insects, etc., 4) damage structures, 5) impose excessive collection, treatment or disposal costs on the District, 6) significantly interfere with wastewater treatment processes, 7) interfere with wastewater reclamation processes, 8) exceed quality limits and quantity requirements established by the District.

#### **7.5 Regulation of Sewer Service**

The District has adopted *Camrosa Water District Industrial Waste and Sanitary Service Ordinance Regulating and Controlling Sewage Liquid Waste and Industrial Waste Discharges* (as amended from time to time) for the purpose of controlling and regulating sewage, liquid waste and industrial waste discharges directly or indirectly into the sewerage system and disposal works of the Camrosa Water District,

The Ordinance establishes the quality and quantity of discharged wastes; the degree of waste pretreatment required; the issuance of industrial wastewater discharge permits; the establishment of fees and charges; and the establishment of fees, charges, and penalties for violation.

Provisions are made within the Ordinance to regulate industrial waste discharges, to comply with State and Federal government requirements and policies, and to meet increasingly higher standards of treatment plant effluent quality and environmental considerations. The ordinance establishes quantity and quality limitations on sewage, liquid waste and industrial waste discharges where such discharges may adversely affect the sewerage system or the effluent quality. Methods of cost recovery are also established where the industrial waste discharge would impose unreasonable collection, treatment or disposal costs on the District.

*The provisions of "Camrosa Water District Industrial Waste and Sanitary Service Ordinance Regulating and Controlling Sewage Liquid Waste and Industrial Waste Discharges", as amended from time to time, are fully incorporated by reference into these rules and regulations and shall apply to the discharge of all wastes, directly or indirectly, to a public sewer of the District.*

### **SECTION 3 - CONSTRUCTION SPECIFICATIONS**

#### **8.0 Inclusion by Reference**

The design and construction of water, reclaimed water, recycled water and sewer lines and other appurtenances within the District's service area shall comply with the published "*Requirements and Specifications for Making Application - Developing Designs and Constructing Water Facilities by Public and Private*

*Contract for Camrosa County Water District" and "Rules and Regulations of Camrosa County Water District Establishing General Provisions and Specifications for Design and Construction of Sanitary Sewers and Appurtenances".*

**SECTION 4 - IMPLEMENTATION**

**9.0 Implementation and Prior Rules and Regulations**

This Ordinance supersedes all prior Ordinances and Resolutions relating to rules and regulations for Potable, Non-Potable and/or "Recycled Water" Services.

**10.0 Discretionary Authority Provided to the General Manager**

The General Manager is provided, herein, discretionary authority to interpret this ordinance and implement its provisions. This authority includes establishment of eligibility for service, determination of the availability of facilities and capacity, determination of compliance with this ordinance, application of fees, resolution of billing disputes, and negotiation of agreements. The Camrosa Board of Directors may address unresolved disputes. The decision of the Board of Directors regarding such disputes is final.

**Appendix D – Draft Resolution Declaring a Water Shortage Emergency**

- A Resolution of the Board of Directors of Camrosa Water District Declaring a Water Shortage Emergency & Implementing a Water Shortage Contingency Plan (DRAFT)



Resolution No: DRAFT

*A Resolution of the Board of Directors  
of Camrosa Water District*

*Declaring a Water Shortage Emergency &  
Implementing a Water Shortage Contingency Plan*

**Board of Directors**

Al E. Fox  
Division 1  
Jeffrey C. Brown  
Division 2  
Timothy H. Hoag  
Division 3  
Ronald J. Vogel  
Division 4  
Terry L. Foreman  
Division 5

**General Manager**

Richard H. Hajas

*Whereas, due to [describe circumstances that have limited water supply, e.g. earthquake damage to critical water supply and transmission facilities], the water supply available to Camrosa Water District is reduced ; and,*

*Whereas, Camrosa Water District's Ordinance 40-05, "Rules and Regulations Governing the Provision of Water and Sanitary Services," has provided procedures for the declaration and response to water shortage emergencies ; and,*

*Whereas, the Board of Directors has received, and duly considered, a report on the extent, estimated duration, cause, and estimated severity of the events or events leading to the emergency; and,*

*Whereas, the ordinary demands and requirements of water consumers cannot be satisfied without depleting the water supply of the District's water system to the extent there would be insufficient water for human consumption, sanitation, and fire protection;*

*Now, Therefore, Be It Resolved, that the Camrosa Water District Board of Directors declares a water shortage emergency condition currently prevails within the area served by the Camrosa Water District; and,*

*Be It Further Resolved that pursuant to Ordinance 40-05, Section 5.16, the Board of Directors directs the General Manager to implement Stage \_\_\_\_ emergency response ; and,*

*Be It Further Resolved that the Board of Directors adopts the emergency rates, fees, charges, and penalties, as shown in Attachment A [such rates, fees, etc. to be determined by the Board of Directors at the time of the declaration of emergency].*

*Adopted Signed and Approved this X<sup>th</sup> day of Month, 20XX.*

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*Al E. Fox, President  
Board of Directors  
Camrosa Water District*

*ATTEST:*

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*Richard H. Hajas, Secretary  
Board of Directors  
Camrosa Water District*

Camassa Water District  
Groundwater Modeling Study  
Well Extraction Summary (Acrefeet)

| Year      | SRINVD<br>9<br>021919P2<br>(21,29) | Saw<br>(21,37) | Vickers<br>Farm<br>(22,36) | Penny<br>(22,36) | Lamb 1<br>(5,9) | Lamb<br>(5,9)<br>(5,9) | Gerry 1<br>(4,9) | Kerry<br>(4,9) | Gerry 3A<br>(4,9) | Gerry 4<br>(11,15) | McCluskey<br>(11,14) | 022023K1<br>(4,11) | 022023L3<br>(4,11) | Barker<br>(14,19) | SRINVD<br>10<br>(17,20) | Cande 1<br>(14,19) | Cande 1<br>(14,19) | Cande 3<br>(14,19) | SRINVD<br>8<br>(17,20) | SRINVD<br>3<br>(16,16) | Annual<br>Percentage |                   |
|-----------|------------------------------------|----------------|----------------------------|------------------|-----------------|------------------------|------------------|----------------|-------------------|--------------------|----------------------|--------------------|--------------------|-------------------|-------------------------|--------------------|--------------------|--------------------|------------------------|------------------------|----------------------|-------------------|
|           |                                    |                |                            |                  |                 |                        |                  |                |                   |                    |                      |                    |                    |                   |                         |                    |                    |                    |                        |                        |                      | 022023G2<br>(4,9) |
| Jan-89    |                                    | 0.1            | 29.4                       | 0.1              |                 | 4.1                    | 10.0             |                |                   |                    |                      |                    |                    |                   |                         |                    |                    |                    |                        |                        |                      |                   |
| Feb-89    |                                    | 0.0            | 17.6                       | 0.0              |                 | 2.7                    | 6.7              |                |                   |                    |                      |                    |                    |                   |                         |                    |                    |                    |                        |                        |                      |                   |
| Mar-89    |                                    | 2.3            | 10.9                       | 16.5             |                 | 5.8                    | 14.1             |                |                   |                    |                      |                    |                    |                   |                         |                    |                    |                    |                        |                        |                      |                   |
| Apr-89    |                                    | 26.2           | 38.9                       | 17.8             |                 | 6.7                    | 16.5             |                |                   |                    |                      |                    |                    |                   |                         |                    |                    |                    |                        |                        |                      |                   |
| May-89    |                                    | 8.4            | 36.3                       | 22.4             |                 | 5.6                    | 13.8             |                |                   |                    |                      |                    |                    |                   |                         |                    |                    |                    |                        |                        |                      |                   |
| Jun-89    |                                    | 38.0           | 35.0                       | 24.1             |                 | 7.1                    | 17.4             |                |                   |                    |                      |                    |                    |                   |                         |                    |                    |                    |                        |                        |                      |                   |
| Jul-89    |                                    | 49.4           | 29.8                       | 25.0             |                 | 7.6                    | 18.6             |                |                   |                    |                      |                    |                    |                   |                         |                    |                    |                    |                        |                        |                      |                   |
| Aug-89    |                                    | 34.8           | 34.8                       | 20.1             |                 | 7.0                    | 17.2             |                |                   |                    |                      |                    |                    |                   |                         |                    |                    |                    |                        |                        |                      |                   |
| Sep-89    |                                    | 0.0            | 33.4                       | 0.0              |                 | 4.3                    | 10.5             |                |                   |                    |                      |                    |                    |                   |                         |                    |                    |                    |                        |                        |                      |                   |
| Oct-89    |                                    | 0.0            | 41.3                       | 0.0              |                 | 5.2                    | 12.8             |                |                   |                    |                      |                    |                    |                   |                         |                    |                    |                    |                        |                        |                      |                   |
| Nov-89    |                                    | 0.0            | 31.1                       | 0.0              |                 | 3.8                    | 9.4              |                |                   |                    |                      |                    |                    |                   |                         |                    |                    |                    |                        |                        |                      |                   |
| Dec-89    |                                    | 0.0            | 47.6                       | 0.0              |                 | 6.1                    | 15.0             |                |                   |                    |                      |                    |                    |                   |                         |                    |                    |                    |                        |                        |                      |                   |
| Subtotal: |                                    | 187.2          | 384.7                      | 134.0            |                 | 64.0                   | 162.0            |                |                   |                    |                      |                    |                    |                   |                         |                    |                    |                    |                        |                        |                      |                   |
| Jan-90    |                                    |                | 37.0                       |                  |                 | 5.7                    | 12.6             |                |                   |                    |                      |                    |                    |                   |                         |                    |                    |                    |                        |                        |                      |                   |
| Feb-90    |                                    |                | 33.7                       |                  |                 | 6.0                    | 13.4             |                |                   |                    |                      |                    |                    |                   |                         |                    |                    |                    |                        |                        |                      |                   |
| Mar-90    |                                    |                | 72.7                       |                  |                 | 13.1                   | 28.9             |                |                   |                    |                      |                    |                    |                   |                         |                    |                    |                    |                        |                        |                      |                   |
| Apr-90    |                                    |                | 42.3                       |                  |                 | 5.7                    | 13.7             |                |                   |                    |                      |                    |                    |                   |                         |                    |                    |                    |                        |                        |                      |                   |
| May-90    |                                    |                | 33.5                       |                  |                 | 6.3                    | 13.9             |                |                   |                    |                      |                    |                    |                   |                         |                    |                    |                    |                        |                        |                      |                   |
| Jun-90    |                                    |                | 33.0                       |                  |                 | 5.7                    | 12.5             |                |                   |                    |                      |                    |                    |                   |                         |                    |                    |                    |                        |                        |                      |                   |
| Jul-90    |                                    |                | 37.1                       |                  |                 | 5.9                    | 13.0             |                |                   |                    |                      |                    |                    |                   |                         |                    |                    |                    |                        |                        |                      |                   |
| Aug-90    |                                    |                | 38.9                       |                  |                 | 4.7                    | 10.4             |                |                   |                    |                      |                    |                    |                   |                         |                    |                    |                    |                        |                        |                      |                   |
| Sep-90    |                                    |                | 77.1                       |                  |                 | 7.2                    | 15.9             |                |                   |                    |                      |                    |                    |                   |                         |                    |                    |                    |                        |                        |                      |                   |
| Oct-90    |                                    |                | 38.5                       |                  |                 | 3.8                    | 8.5              |                |                   |                    |                      |                    |                    |                   |                         |                    |                    |                    |                        |                        |                      |                   |
| Nov-90    |                                    |                | 38.5                       |                  |                 | 4.9                    | 10.9             |                |                   |                    |                      |                    |                    |                   |                         |                    |                    |                    |                        |                        |                      |                   |
| Dec-90    |                                    |                | 38.0                       |                  |                 | 4.7                    | 10.3             |                |                   |                    |                      |                    |                    |                   |                         |                    |                    |                    |                        |                        |                      |                   |
| Subtotal: |                                    |                | 373.3                      |                  |                 | 74.0                   | 162.2            |                |                   |                    |                      |                    |                    |                   |                         |                    |                    |                    |                        |                        |                      |                   |
| Jan-91    |                                    |                | 37.3                       |                  |                 | 3.9                    | 7.9              |                |                   |                    |                      |                    |                    |                   |                         |                    |                    |                    |                        |                        |                      |                   |
| Feb-91    |                                    |                | 31.8                       |                  |                 | 3.5                    | 7.0              |                |                   |                    |                      |                    |                    |                   |                         |                    |                    |                    |                        |                        |                      |                   |
| Mar-91    |                                    |                | 24.6                       |                  |                 | 3.7                    | 7.5              |                |                   |                    |                      |                    |                    |                   |                         |                    |                    |                    |                        |                        |                      |                   |
| Apr-91    |                                    |                | 36.7                       |                  |                 | 4.0                    | 8.0              |                |                   |                    |                      |                    |                    |                   |                         |                    |                    |                    |                        |                        |                      |                   |
| May-91    |                                    |                | 36.7                       |                  |                 | 3.8                    | 7.8              |                |                   |                    |                      |                    |                    |                   |                         |                    |                    |                    |                        |                        |                      |                   |
| Jun-91    |                                    |                | 36.3                       |                  |                 | 4.9                    | 9.9              |                |                   |                    |                      |                    |                    |                   |                         |                    |                    |                    |                        |                        |                      |                   |
| Jul-91    |                                    |                | 31.1                       |                  |                 | 3.1                    | 6.3              |                |                   |                    |                      |                    |                    |                   |                         |                    |                    |                    |                        |                        |                      |                   |
| Aug-91    |                                    |                | 33.0                       |                  |                 | 3.2                    | 6.3              |                |                   |                    |                      |                    |                    |                   |                         |                    |                    |                    |                        |                        |                      |                   |
| Sep-91    |                                    |                | 30.6                       |                  |                 | 3.0                    | 6.3              |                |                   |                    |                      |                    |                    |                   |                         |                    |                    |                    |                        |                        |                      |                   |
| Oct-91    |                                    |                | 48.7                       |                  |                 | 4.8                    | 10.0             |                |                   |                    |                      |                    |                    |                   |                         |                    |                    |                    |                        |                        |                      |                   |
| Nov-91    |                                    |                | 42.7                       |                  |                 | 4.2                    | 8.5              |                |                   |                    |                      |                    |                    |                   |                         |                    |                    |                    |                        |                        |                      |                   |
| Dec-91    |                                    |                | 57.2                       |                  |                 | 5.1                    | 10.3             |                |                   |                    |                      |                    |                    |                   |                         |                    |                    |                    |                        |                        |                      |                   |
| Subtotal: |                                    |                | 431.7                      |                  |                 | 49.3                   | 94.0             |                |                   |                    |                      |                    |                    |                   |                         |                    |                    |                    |                        |                        |                      |                   |

Camrose Water District  
Groundwater Modeling Study  
Well Extraction Summary (Acrefeet)

| Year      | SRINWD<br>9<br>(21,37) | Seew<br>(21,37) | Ventura<br>Farms<br>(22,39) | Fenny<br>(23,39) | Land 1<br>(5,9) | Land 2<br>(Summit)<br>(4,9) | Carry 1<br>(4,13) | R Carry<br>(4,13) | Carry 3A<br>(4,13) | Carry 4<br>(11,19) | McCluskey<br>(11,19) | Carry 1<br>(11,19) | Carry 2<br>(11,19) | Carry 3<br>(11,19) | SRINWD<br>10<br>(14,19) | SRINWD<br>8<br>(17,20) | SRINWD<br>3<br>(16,19) | Annual<br>Percentage |
|-----------|------------------------|-----------------|-----------------------------|------------------|-----------------|-----------------------------|-------------------|-------------------|--------------------|--------------------|----------------------|--------------------|--------------------|--------------------|-------------------------|------------------------|------------------------|----------------------|
| Jan-86    | 8.3                    | 9.0             | 3.2                         | 4.4              |                 |                             |                   |                   |                    |                    |                      |                    |                    |                    |                         |                        |                        | 6.92%                |
| Feb-86    | 6.5                    | 4.9             | 0.3                         | 1.2              |                 |                             |                   |                   |                    |                    |                      |                    |                    |                    |                         |                        |                        | 5.41%                |
| Mar-86    | 8.1                    | 3.9             | 0.1                         | 1.0              |                 |                             |                   |                   |                    |                    |                      |                    |                    |                    |                         |                        |                        | 6.79%                |
| Apr-86    | 9.2                    | 28.3            | 1.4                         | 14.4             |                 |                             |                   |                   |                    |                    |                      |                    |                    |                    |                         |                        |                        | 7.65%                |
| May-86    | 10.9                   | 42.6            | 8.0                         | 22.8             |                 |                             |                   |                   |                    |                    |                      |                    |                    |                    |                         |                        |                        | 9.11%                |
| Jun-86    | 11.5                   | 41.4            | 6.9                         | 22.2             |                 |                             |                   |                   |                    |                    |                      |                    |                    |                    |                         |                        |                        | 9.55%                |
| Jul-86    | 5.7                    | 44.8            | 17.9                        | 21.6             |                 |                             |                   |                   |                    |                    |                      |                    |                    |                    |                         |                        |                        | 9.91%                |
| Aug-86    | 5.6                    | 40.6            | 31.9                        | 17.3             |                 |                             |                   |                   |                    |                    |                      |                    |                    |                    |                         |                        |                        | 9.76%                |
| Sep-86    | 5.7                    | 44.2            | 18.5                        | 19.1             |                 |                             |                   |                   |                    |                    |                      |                    |                    |                    |                         |                        |                        | 10.03%               |
| Oct-86    | 5.7                    | 43.4            | 33.8                        | 0.8              |                 |                             |                   |                   |                    |                    |                      |                    |                    |                    |                         |                        |                        | 9.97%                |
| Nov-86    | 4.8                    | 35.8            | 22.1                        | 0.0              |                 |                             |                   |                   |                    |                    |                      |                    |                    |                    |                         |                        |                        | 8.33%                |
| Dec-86    | 3.8                    | 10.4            | 5.0                         | 0.0              |                 |                             |                   |                   |                    |                    |                      |                    |                    |                    |                         |                        |                        | 6.59%                |
| Subtotal: | 43.8                   | 309.3           | 134.7                       | 124.8            |                 |                             |                   |                   |                    |                    |                      |                    |                    |                    |                         |                        |                        | 100.00%              |
| Jan-87    | 4.1                    | 27.8            | 6.0                         | 0.0              |                 |                             |                   |                   |                    |                    |                      |                    |                    |                    |                         |                        |                        | 7.18%                |
| Feb-87    | 3.9                    | 18.5            | 17.8                        | 0.0              |                 |                             |                   |                   |                    |                    |                      |                    |                    |                    |                         |                        |                        | 6.79%                |
| Mar-87    | 4.5                    | 15.1            | 9.2                         | 6.6              |                 |                             |                   |                   |                    |                    |                      |                    |                    |                    |                         |                        |                        | 7.06%                |
| Apr-87    | 5.4                    | 38.2            | 20.0                        | 24.2             |                 |                             |                   |                   |                    |                    |                      |                    |                    |                    |                         |                        |                        | 9.33%                |
| May-87    | 6.0                    | 44.9            | 24.1                        | 28.3             |                 |                             |                   |                   |                    |                    |                      |                    |                    |                    |                         |                        |                        | 10.59%               |
| Jun-87    | 5.0                    | 44.8            | 24.0                        | 15.2             |                 |                             |                   |                   |                    |                    |                      |                    |                    |                    |                         |                        |                        | 8.76%                |
| Jul-87    | 6.0                    | 39.9            | 22.7                        | 26.0             |                 |                             |                   |                   |                    |                    |                      |                    |                    |                    |                         |                        |                        | 9.59%                |
| Aug-87    | 6.1                    | 38.0            | 27.7                        | 23.9             |                 |                             |                   |                   |                    |                    |                      |                    |                    |                    |                         |                        |                        | 9.61%                |
| Sep-87    | 5.6                    | 39.4            | 24.7                        | 23.6             |                 |                             |                   |                   |                    |                    |                      |                    |                    |                    |                         |                        |                        | 8.84%                |
| Oct-87    | 5.3                    | 33.5            | 12.5                        | 22.2             |                 |                             |                   |                   |                    |                    |                      |                    |                    |                    |                         |                        |                        | 8.34%                |
| Nov-87    | 4.7                    | 24.5            | 14.0                        | 11.1             |                 |                             |                   |                   |                    |                    |                      |                    |                    |                    |                         |                        |                        | 7.36%                |
| Dec-87    | 3.8                    | 0.0             | 13.5                        | 0.0              |                 |                             |                   |                   |                    |                    |                      |                    |                    |                    |                         |                        |                        | 6.00%                |
| Subtotal: | 64.3                   | 382.3           | 216.7                       | 182.7            |                 |                             |                   |                   |                    |                    |                      |                    |                    |                    |                         |                        |                        | 100.00%              |
| Jan-88    | 5.8                    | 0.0             | 17.9                        | 0.0              |                 |                             |                   |                   |                    |                    |                      |                    |                    |                    |                         |                        |                        | 9.15%                |
| Feb-88    | 7.1                    | 0.0             | 27.6                        | 0.0              |                 |                             |                   |                   |                    |                    |                      |                    |                    |                    |                         |                        |                        | 11.23%               |
| Mar-88    | 6.7                    | 0.0             | 29.4                        | 0.0              |                 |                             |                   |                   |                    |                    |                      |                    |                    |                    |                         |                        |                        | 10.56%               |
| Apr-88    | 5.0                    | 0.0             | 31.4                        | 0.0              |                 |                             |                   |                   |                    |                    |                      |                    |                    |                    |                         |                        |                        | 7.95%                |
| May-88    | 8.2                    | 37.6            | 27.6                        | 24.5             |                 |                             |                   |                   |                    |                    |                      |                    |                    |                    |                         |                        |                        | 12.99%               |
| Jun-88    | 4.6                    | 4.0             | 24.1                        | 9.2              |                 |                             |                   |                   |                    |                    |                      |                    |                    |                    |                         |                        |                        | 7.27%                |
| Jul-88    | 4.9                    | 2.7             | 19.5                        | 0.6              |                 |                             |                   |                   |                    |                    |                      |                    |                    |                    |                         |                        |                        | 7.13%                |
| Aug-88    | 5.4                    | 5.9             | 25.9                        | 0.1              |                 |                             |                   |                   |                    |                    |                      |                    |                    |                    |                         |                        |                        | 7.55%                |
| Sep-88    | 4.6                    | 0.0             | 23.5                        | 0.0              |                 |                             |                   |                   |                    |                    |                      |                    |                    |                    |                         |                        |                        | 6.62%                |
| Oct-88    | 4.1                    | 0.0             | 17.8                        | 0.0              |                 |                             |                   |                   |                    |                    |                      |                    |                    |                    |                         |                        |                        | 5.89%                |
| Nov-88    | 4.7                    | 0.0             | 23.3                        | 0.0              |                 |                             |                   |                   |                    |                    |                      |                    |                    |                    |                         |                        |                        | 6.78%                |
| Dec-88    | 4.6                    | 0.0             | 26.2                        | 0.0              |                 |                             |                   |                   |                    |                    |                      |                    |                    |                    |                         |                        |                        | 6.61%                |
| Subtotal: | 63.8                   | 34.2            | 296.3                       | 34.2             |                 |                             |                   |                   |                    |                    |                      |                    |                    |                    |                         |                        |                        | 100.00%              |

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| Sub-Basin   | CWD  | SRMWC | Other | Total |
|-------------|------|-------|-------|-------|
| Lower       | 0    | 0     | 1205  | 1205  |
| Middle      | 1718 | 468   | 0     | 2186  |
| Upper       | 470  | 42    | 0     | 512   |
| Total Basin | 2188 | 510   | 1205  | 3903  |

**Santa Rosa Groundwater Basin  
1989-95 Average Pumping Within Sub-Basins (afy)**

The following table presents the discretization of average model period (1989-95) pumping among lower, middle, and upper sub-basins. The lowest pumping for the total basin occurred in 1991 and was 2,594 afy.

**Santa Rosa Basin Groundwater Model  
Pumping Discretization**

**SUBJECT:** Santa Rosa Basin Groundwater Model Pumping Discretization

**PAGES:** 1

**TOTAL:** 1

**FROM:** Jay Spurgin/Boyle Engineering Corporation

**TO:** John Murray/Camrosa Water District  
Fax no. 987-4797

February 18, 1997



FAX MEMORANDUM

## Appendix 2

Well Extraction Data

**Camrosa Water District  
Groundwater Modeling Study  
General Well Information**

| State         | Well No. | Well Name     | Drill Date | Diameter | Depth | Township | Range | Section | Parcel | Well Elev. | Lithology (Y/N) | Water Level Period | Extraction Period |
|---------------|----------|---------------|------------|----------|-------|----------|-------|---------|--------|------------|-----------------|--------------------|-------------------|
| 02N/20W-25C06 |          | SRL/WC 8      | 09/30/92   | 14       | 240   |          |       |         |        | 260        | Y               | None               | 1989-93           |
| 02N/20W-25D01 |          | SRL/WC 3      | 07/01/28   | 16       | 460   |          |       |         |        | 235        | Y               | 1986-93            | 1989-93           |
| 02N/20W-25D02 |          |               |            |          | 510   |          |       |         |        |            | Y               | None               | None              |
| 02N/20W-25D03 |          |               | 08/01/29   | 18       | 219   | 02N      | 20W   | 25      | Q      | 222.87     | Y               | None               | None              |
| 02N/20W-25D04 |          | Fitzgerald    | 01/01/28   |          | 190   |          |       |         |        | 219.1      | Y               | 1986-93            | None              |
| 02N/20W-25D05 |          |               | 02/29/84   | 14       | 729   | 02N      | 20W   | 26      | B      | 234        | Y               | None               | None              |
| 02N/20W-25D06 |          | Goldberg      | 12/09/91   | 14       | 400   |          |       |         |        | 230        | Y               | None               | None              |
| 02N/20W-25L01 |          |               | 01/01/25   | 16       | 173   |          |       |         |        | 235.2      | Y               | None               | None              |
| 02N/20W-25L02 |          |               | 06/01/29   | 16       | 190   |          |       |         |        | 234.91     | Y               | None               | None              |
| 02N/20W-25F01 |          | Chamberlain 4 | 11/06/62   | 12       | 133   |          |       |         |        | 280        | Y               | None               | None              |
| 02N/20W-25Q01 |          | Chamberlain 5 | 11/12/62   | 11       | 265   |          |       |         |        | 260        | Y               | 1986-93            | None              |
| 02N/20W-26B01 |          |               | 01/01/30   | 16       |       |          |       |         |        | 204.7      | Y               | None               | None              |
| 02N/20W-26B02 |          | Hernandez     | 01/24/48   | 12       | 392   |          |       |         |        | 200        | Y               | 1986-93            | 1993              |
| 02N/20W-26B03 |          |               | 10/01/39   | 6        | 300   |          |       |         |        | 218        | Y               | None               | None              |
| 02N/20W-26C02 |          |               | 07/10/48   | 12       | 392   |          |       |         |        | 201.63     | Y               | None               | None              |
| 02N/20W-26D01 |          |               | 09/15/49   |          | 745   |          |       |         |        |            | Y               | None               | None              |
| 02N/20W-27A01 |          |               | 01/01/24   | 18       | 236   |          |       |         |        |            | Y               | None               | None              |
| 02N/20W-27D01 |          |               |            |          |       |          |       |         |        | 154        | Y               | None               | None              |
| 02N/20W-27D02 |          |               |            |          | 333   |          |       |         |        |            | Y               | None               | None              |
| 02N/20W-27D03 |          |               |            |          | 736   |          |       |         |        |            | Y               | None               | None              |
| 02N/20W-27D04 |          |               | 01/21/59   | 12       | 500   |          |       |         |        |            | Y               | None               | None              |

**Total Wells w/ Records: 72 27 29**

**Camrosa Water District  
Groundwater Modeling Study  
General Well Information**

| State Well No. | Well Name              | Drill Date | Diameter | Depth | Township | Range | Section | Parcel | Well Elev. | Lithology (Y/N) | Water Level Period | Extraction Period |
|----------------|------------------------|------------|----------|-------|----------|-------|---------|--------|------------|-----------------|--------------------|-------------------|
| 02N/20W-23K02  | Lamb (Sneak)           | 07/01/53   | 12       | 514   | 02N      | 20W   | 23      | G      | 282        | Y               | 1986-93            | 1989-93           |
| 02N/20W-23G01  | Gerry *                | 05/01/48   | 14       | 496   | 02N      | 20W   | 23      | H      | 378        | Y               | 1986-93            | None              |
| 02N/20W-23G02  | Gerry 2*               | 10/01/50   | 12       | 560   | 02N      | 20W   | 23      | K      | 310        | Y               | 1987-93            | 1989-93           |
| 02N/20W-23G03  | R Gerry                | 09/01/90   | 14       | 900   |          |       |         |        |            | Y               | None               | 1989-93           |
| 02N/20W-23H02  | Gerry 3A               | 03/01/62   | 14       | 910   | 02N      | 20W   | 23      | Q      | 320        | Y               | 1986-93            | 1989-93           |
| 02N/20W-23J01  | Gerry 4                | 12/01/91   | 14       | 895   |          |       |         |        |            | Y               | None               | 1990-93           |
| 02N/20W-23K01  | MacCloukey *           | 11/01/50   | 12       | 800   |          |       |         |        | 274        | Y               | 1986-93            | 1989-93           |
| 02N/20W-23L03  |                        | 12/01/51   | 12       | 770   | 2N       | 19W   | 19      |        |            | Y               | None               | 1989-93           |
| 02N/20W-23M01  | Berkshille Investments | 12/09/91   | 12       | 563   |          |       |         |        |            | Y               | None               | 1989-93           |
| 02N/20W-23Q01  |                        | 12/01/43   | 13       |       | 02N      | 20W   | 24      | E      | 230        | Y               | None               | None              |
| 02N/20W-23Q02  | MacCloukey 2*          |            |          | 163   |          |       |         |        | 235        | Y               | 1986-93            | 1993              |
| 02N/20W-23Q03  |                        | 07/01/46   |          | 178   |          |       |         |        | 226.3      | Y               | None               | None              |
| 02N/20W-23Q04  |                        | 04/10/46   |          |       |          |       |         |        |            | Y               | None               | None              |
| 02N/20W-23Q05  |                        | 08/07/51   |          | 813   | 02N      | 20W   | 24      | Q      |            | Y               | None               | None              |
| 02N/20W-23R01  |                        | 06/01/61   | 15       | 353   | 02N      | 20W   | 24      | R      | 234.6      | Y               | None               | 1993              |
| 02N/20W-24E01  | Burbett                | 10/01/50   | 12       | 852   | 02N      | 20W   | 24      | R      | 330        | Y               | None               | 1989-93           |
| 02N/20W-24K01  |                        | 07/01/50   |          |       |          |       |         |        | 300        | Y               | None               | None              |
| 02N/20W-24F03  |                        |            |          |       |          |       |         |        |            | Y               | None               | None              |
| 02N/20W-24Q01  |                        | 10/01/28   | 16       | 357   | 02N      | 20W   | 25      | C      | 223.97     | Y               | None               | None              |
| 02N/20W-24Q02  |                        | 05/01/28   | 14       | 346   |          |       |         |        | 225.5      | Y               | None               | None              |
| 02N/20W-24Q03  | SRM/WC 10              | 05/01/54   | 14       | 360   | 02N      | 20W   | 25      | C      | 235        | Y               | 1986-93            | 1989-93           |
| 02N/20W-24R02  | Archdiocese            |            |          |       | 02N      | 20W   | 25      | C      | 240        | Y               | 1986-93            | None              |
| 02N/20W-24R03  | SRM/WC 5               | 10/01/28   | 16       | 287   |          |       |         |        | 245        | Y               | 1986-93            | None              |
| 02N/20W-25B01  | C. O'Connor            | 03/09/92   | 88       | 300   | 02N      | 20W   | 25      | D      | 800        | Y               | None               | 1993              |
| 02N/20W-25C01  | Coalgio 1              |            | 12       | 335   |          |       |         |        | 235        | Y               | None               | 1982-94           |
| 02N/20W-25C02  | Coalgio 2              | 03/17/50   | 16       | 399   |          |       |         |        | 226        | Y               | 1986-93            | 1982-94           |
| 02N/20W-25C03  |                        | 10/01/23   | 14       | 200   | 02N      | 20W   | 25      | D      | 227.16     | Y               | None               | None              |
| 02N/20W-25C04  |                        |            |          |       |          |       |         |        | 228        | Y               | 1986-93            | None              |
| 02N/20W-25C05  | Coalgio 3              | 05/01/91   | 16       | 260   |          |       |         |        | 220        | Y               | 1993               | 1989-94           |

Camross Water District  
Groundwater Modeling Study  
Well Extraction Summary (Acrefeet)

| Year     | SRINWD 9         |                  | Snow             |                  | Ventura Farms    |                | Feeny          |                | Lamb 2 (Sokal) |                | Lamb (Sokal)   |                | Gerry 2        |                | Gerry 3A       |                | Gerry 4        |                | McChesley      |                | Burrket        |                | SRINWD 10      |                | Conc 1         |                | Conc 3         |                | SRINWD 3       |                | Annual Percentage |
|----------|------------------|------------------|------------------|------------------|------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-------------------|
|          | 021919F2 (21,29) | 021920M1 (21,27) | 021920M1 (21,26) | 021920M3 (21,26) | 021920M4 (21,26) | 022022J1 (5,6) | 022022K2 (4,5) |                   |
| Jan-92   |                  |                  | 34.7             |                  |                  | 15.1           | 2.3            | 10.7           | 11.3           | 19.3           | 5.1            | 7.5            | 15.4           | 66.3           | 35.7           | 0.0            | 9.4            |                |                |                |                |                |                |                | 9.4            |                |                | 8.6            | 6.9%           |                |                   |
| Feb-92   |                  |                  | 35.6             |                  |                  | 15.5           | 2.3            | 11.0           | 11.6           | 19.8           | 5.2            | 7.7            | 15.8           | 56.7           | 30.5           | 0.0            | 5.7            |                |                |                |                |                |                |                | 5.7            |                |                | 3.7            | 7.1%           |                |                   |
| Mar-92   |                  |                  | 39.0             |                  |                  | 17.0           | 2.5            | 12.1           | 12.7           | 21.7           | 5.7            | 8.4            | 17.3           | 60.6           | 32.6           | 0.0            | 2.9            |                |                |                |                |                |                |                | 2.9            |                |                | 7.8            | 7.8%           |                |                   |
| Apr-92   |                  |                  | 35.5             |                  |                  | 15.4           | 2.3            | 11.0           | 11.5           | 19.8           | 5.2            | 7.7            | 15.3           | 63.9           | 34.4           | 0.0            | 8.7            |                |                |                |                |                |                |                | 8.7            |                |                | 14.4           | 7.1%           |                |                   |
| May-92   |                  |                  | 37.7             |                  |                  | 16.4           | 2.4            | 11.6           | 12.2           | 21.6           | 5.5            | 8.2            | 16.7           | 61.8           | 33.3           | 0.0            | 14.2           |                |                |                |                |                |                |                | 14.2           |                |                | 24.6           | 7.5%           |                |                   |
| Jun-92   |                  |                  | 31.7             |                  |                  | 13.8           | 2.1            | 9.8            | 10.3           | 17.7           | 4.6            | 6.9            | 14.1           | 51.9           | 27.9           | 0.0            | 16.5           |                |                |                |                |                |                |                | 16.5           |                |                | 31.3           | 6.3%           |                |                   |
| Jul-92   |                  |                  | 16.9             |                  |                  | 11.0           | 2.3            | 11.0           | 11.6           | 19.8           | 5.2            | 7.7            | 15.8           | 51.9           | 29.0           | 0.0            | 20.6           |                |                |                |                |                |                |                | 20.6           |                |                | 41.4           | 7.1%           |                |                   |
| Aug-92   | 5.8              |                  | 26.2             |                  |                  | 24.0           | 3.6            | 17.1           | 17.9           | 30.7           | 8.1            | 12.0           | 24.6           | 74.8           | 39.3           | 35.3           | 24.2           | 39.7           |                |                |                |                |                |                | 39.7           |                |                | 48.0           | 11.0%          |                |                   |
| Sep-92   | 3.3              |                  | 26.2             |                  |                  | 24.0           | 3.6            | 17.1           | 17.9           | 30.7           | 8.1            | 12.0           | 24.6           | 74.8           | 39.3           | 35.3           | 24.2           | 39.7           |                |                |                |                |                |                | 39.7           |                |                | 48.0           | 11.0%          |                |                   |
| Oct-92   | 6.0              |                  | 26.2             |                  |                  | 24.0           | 3.6            | 17.1           | 17.9           | 30.7           | 8.1            | 12.0           | 24.6           | 74.8           | 39.3           | 35.3           | 24.2           | 39.7           |                |                |                |                |                |                | 39.7           |                |                | 48.0           | 11.0%          |                |                   |
| Nov-92   | 6.4              |                  | 26.2             |                  |                  | 24.0           | 3.6            | 17.1           | 17.9           | 30.7           | 8.1            | 12.0           | 24.6           | 74.8           | 39.3           | 35.3           | 24.2           | 39.7           |                |                |                |                |                |                | 39.7           |                |                | 48.0           | 11.0%          |                |                   |
| Dec-92   | 1.1              |                  | 13.6             |                  |                  | 12.5           | 1.9            | 8.9            | 9.3            | 15.9           | 4.2            | 6.2            | 12.7           | 40.6           | 15.7           | 3.8            | 1.1            | 21.3           |                |                |                |                |                |                | 1.1            |                |                | 7.5            | 5.7%           |                |                   |
| Subtotal | 22.7             |                  | 208.7            |                  |                  | 217.3          | 32.4           | 154.0          | 162.3          | 278.0          | 72.3           | 102.2          | 222.1          | 882.9          | 396.3          | 725.0          | 171.1          | 278.1          |                |                |                |                |                |                | 171.1          |                |                | 278.1          | 100.0%         |                |                   |
| Jan-93   | 0.8              |                  | 6.7              |                  |                  | 6.3            | 1.3            | 5.3            | 4.5            | 9.0            | 1.9            | 3.3            | 7.2            | 71.0           | 1.3            | 0.8            | 8.3            |                |                |                |                |                |                |                | 8.3            |                |                | 1.5            | 2.8%           |                |                   |
| Feb-93   | 0.0              |                  | 6.6              |                  |                  | 6.3            | 1.3            | 5.3            | 4.5            | 9.0            | 1.9            | 3.3            | 7.2            | 71.0           | 1.3            | 0.8            | 8.3            |                |                |                |                |                |                |                | 8.3            |                |                | 1.5            | 2.8%           |                |                   |
| Mar-93   | 2.2              |                  | 10.8             |                  |                  | 10.2           | 2.2            | 8.6            | 7.3            | 14.6           | 3.2            | 5.4            | 11.7           | 73.0           | 10.0           | 1.0            | 6.4            |                |                |                |                |                |                |                | 6.4            |                |                | 7.8            | 4.5%           |                |                   |
| Apr-93   | 5.7              |                  | 15.9             |                  |                  | 15.0           | 3.2            | 12.6           | 10.8           | 21.5           | 4.6            | 7.9            | 17.2           | 83.4           | 35.0           | 23.2           | 29.6           |                |                |                |                |                |                |                | 29.6           |                |                | 4.0            | 6.7%           |                |                   |
| May-93   | 4.3              |                  | 26.9             |                  |                  | 25.4           | 5.4            | 21.2           | 18.2           | 36.3           | 7.8            | 13.3           | 29.1           | 97.8           | 52.0           | 138.4          | 36.5           | 12.2           |                |                |                |                |                |                | 36.5           |                |                | 12.2           | 11.3%          |                |                   |
| Jun-93   | 4.5              |                  | 23.3             |                  |                  | 22.0           | 4.7            | 18.4           | 15.8           | 31.5           | 6.8            | 11.3           | 25.3           | 74.4           | 40.1           | 102.7          | 43.3           | 11.4           |                |                |                |                |                |                | 43.3           |                |                | 11.4           | 9.8%           |                |                   |
| Jul-93   | 8.1              |                  | 34.2             |                  |                  | 31.2           | 5.3            | 21.1           | 18.1           | 34.1           | 7.8            | 13.2           | 29.0           | 80.3           | 43.3           | 107.7          | 49.8           | 13.1           |                |                |                |                |                |                | 49.8           |                |                | 13.1           | 11.2%          |                |                   |
| Aug-93   | 5.6              |                  | 35.1             |                  |                  | 31.5           | 5.5            | 21.7           | 18.6           | 37.1           | 8.0            | 13.6           | 29.7           | 85.3           | 43.3           | 102.1          | 51.7           | 18.1           |                |                |                |                |                |                | 51.7           |                |                | 18.1           | 11.5%          |                |                   |
| Sep-93   | 10.9             |                  | 32.0             |                  |                  | 23.6           | 5.0            | 19.8           | 16.9           | 33.8           | 7.3            | 12.4           | 27.1           | 67.3           | 43.3           | 133.0          | 46.4           | 16.0           |                |                |                |                |                |                | 46.4           |                |                | 16.0           | 10.5%          |                |                   |
| Oct-93   | 9.0              |                  | 32.1             |                  |                  | 23.7           | 5.0            | 19.8           | 17.0           | 33.9           | 7.3            | 12.4           | 27.2           | 67.3           | 43.3           | 133.0          | 46.4           | 16.0           |                |                |                |                |                |                | 46.4           |                |                | 16.0           | 10.5%          |                |                   |
| Nov-93   | 6.2              |                  | 25.9             |                  |                  | 19.1           | 4.0            | 16.0           | 13.7           | 27.3           | 5.9            | 10.0           | 21.9           | 50.1           | 33.1           | 118.4          | 25.6           | 11.0           |                |                |                |                |                |                | 25.6           |                |                | 11.0           | 8.5%           |                |                   |
| Dec-93   | 4.0              |                  | 28.8             |                  |                  | 21.3           | 4.5            | 17.8           | 15.2           | 30.4           | 6.6            | 11.1           | 24.4           | 56.2           | 37.5           | 122.9          | 25.9           | 9.6            |                |                |                |                |                |                | 25.9           |                |                | 9.6            | 9.4%           |                |                   |
| Subtotal | 61.6             |                  | 292.2            |                  |                  | 228.9          | 47.4           | 187.8          | 162.3          | 326.6          | 89.2           | 127.4          | 257.0          | 1023.7         | 398.2          | 1002.3         | 257.0          | 171.8          |                |                |                |                |                |                | 257.0          |                |                | 171.8          | 100.0%         |                |                   |
| Jan-94   | 4.0              |                  | 30.6             |                  |                  | 18.2           | 2.7            | 12.9           | 13.6           | 23.3           | 6.1            | 9.1            | 18.6           | 84.4           | 38.9           | 116.2          | 24.5           | 0.0            |                |                |                |                |                |                | 24.5           |                |                | 0.0            | 8.3%           |                |                   |
| Feb-94   | 1.4              |                  | 42.7             |                  |                  | 13.9           | 2.1            | 9.9            | 10.4           | 17.8           | 4.7            | 6.9            | 14.2           | 83.4           | 11.9           | 83.4           | 8.0            | 0.0            |                |                |                |                |                |                | 8.0            |                |                | 0.0            | 8.3%           |                |                   |
| Mar-94   | 2.7              |                  | 40.5             |                  |                  | 11.9           | 1.8            | 8.5            | 8.9            | 15.2           | 4.0            | 5.9            | 12.2           | 42.8           | 7.6            | 68.7           | 9.4            | 8.8            |                |                |                |                |                |                | 9.4            |                |                | 8.8            | 5.4%           |                |                   |
| Apr-94   | 5.2              |                  | 40.0             |                  |                  | 18.1           | 2.7            | 12.8           | 13.5           | 23.1           | 6.1            | 9.0            | 18.5           | 42.8           | 7.6            | 68.7           | 9.4            | 8.8            |                |                |                |                |                |                | 9.4            |                |                | 8.8            | 5.4%           |                |                   |
| May-94   | 6.6              |                  | 32.9             |                  |                  | 18.7           | 2.8            | 13.3           | 14.0           | 24.0           | 6.3            | 9.3            | 19.1           | 42.8           | 7.6            | 68.7           | 9.4            | 8.8            |                |                |                |                |                |                | 9.4            |                |                | 8.8            | 5.4%           |                |                   |
| Jun-94   | 10.0             |                  | 32.9             |                  |                  | 18.7           | 2.8            | 13.3           | 14.0           | 24.0           | 6.3            | 9.3            | 19.1           | 42.8           | 7.6            | 68.7           | 9.4            | 8.8            |                |                |                |                |                |                | 9.4            |                |                | 8.8            | 5.4%           |                |                   |
| Jul-94   | 10.5             |                  | 43.7             |                  |                  | 21.5           | 3.2            | 15.3           | 16.1           | 27.6           | 7.2            | 10.7           | 22.0           | 42.8           | 7.6            | 68.7           | 9.4            | 8.8            |                |                |                |                |                |                | 9.4            |                |                | 8.8            | 5.4%           |                |                   |
| Aug-94   | 14.6             |                  | 38.2             |                  |                  | 20.8           | 3.1            | 14.8           | 15.5           | 26.6           | 7.0            | 10.4           | 21.3           | 42.8           | 7.6            | 68.7           | 9.4            | 8.8            |                |                |                |                |                |                | 9.4            |                |                | 8.8            | 5.4%           |                |                   |
| Sep-94   | 11.4             |                  | 42.1             |                  |                  | 19.7           | 2.9            | 14.0           | 16.1           | 27.7           | 7.2            | 10.8           | 22.1           | 42.8           | 7.6            | 68.7           | 9.4            | 8.8            |                |                |                |                |                |                | 9.4            |                |                | 8.8            | 5.4%           |                |                   |
| Oct-94   | 10.1             |                  | 39.6             |                  |                  | 15.9           | 2.4            | 11.3           | 11.9           | 20.3           | 5.3            | 7.9            | 16.2           | 42.8           | 7.6            | 68.7           | 9.4            | 8.8            |                |                |                |                |                |                | 9.4            |                |                | 8.8            | 5.4%           |                |                   |
| Nov-94   | 5.5              |                  | 44.6             |                  |                  | 18.2           | 2.7            | 12.9           | 13.6           | 23.3           | 6.1            | 9.1            | 18.6           | 42.8           | 7.6            | 68.7           | 9.4            | 8.8            |                |                |                |                |                |                | 9.4            |                |                | 8.8            | 5.4%           |                |                   |
| Dec-94   | 4.7              |                  | 46.6             |                  |                  | 21.3           | 3.4            | 15.4           | 16.3           | 27.0           | 7.9            | 10.2           | 22.1           | 42.8           | 7.6            | 68.7           | 9.4            | 8.8            |                |                |                |                |                |                | 9.4            |                |                | 8.8            | 5.4%           |                |                   |
| Subtotal | 86.8             |                  | 466.6            |                  |                  | 272.3          | 52.4           | 154.4          | 162.3          | 326.6          | 92.9           | 127.4          | 257.0          | 1023.7         | 398.2          | 1002.3         | 257.0          | 171.8          |                |                |                |                |                |                | 257.0          |                |                | 171.8          | 100.0%         |                |                   |

Camrosa Water District  
Groundwater Modeling Study  
Well Extraction Summary (Acreefeet)

| Year      | SR1W/D 9         |                  | Ventura Farms    |                  | Penny          |                 | Lamb 2          |                 | Lamb (Seabird)  |                  | Gerry 2          |                 | R Gerry          |                  | Gerry 3A         |                  | Gerry 4          |                  | McCluskey        |                  | Berkett          |                  | SR1W/D 10        |                  | Conejo 1         |                  | Conejo 3         |                  | SR1W/D 8          |                   | SR1W/D 3          |                   | Annual Percentage |                   |
|-----------|------------------|------------------|------------------|------------------|----------------|-----------------|-----------------|-----------------|-----------------|------------------|------------------|-----------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
|           | 011919P2 (21,29) | 021920M1 (21,27) | 021920M3 (22,26) | 021920M4 (22,26) | 022022J1 (5,6) | 022022K2 (8,12) | 022022G2 (8,12) | 022022G3 (9,13) | 022022H2 (9,15) | 022022J3 (11,15) | 022022K1 (11,14) | 022022L3 (8,11) | 022024Q3 (17,20) | 022025C1 (18,19) | 022025C2 (18,19) | 022025C3 (18,19) | 022025C4 (17,20) | 022025C5 (18,19) | 022025C6 (17,20) | 022025D1 (16,16) | 022025D2 (16,16) | 022025D3 (16,16) | 022025D4 (16,16) | 022025D5 (16,16) | 022025D6 (16,16) | 022025D7 (16,16) | 022025D8 (16,16) | 022025D9 (16,16) | 022025D10 (16,16) | 022025D11 (16,16) | 022025D12 (16,16) | 022025D13 (16,16) |                   | 022025D14 (16,16) |
| Jan-95    | 0.1              |                  | 35.8             |                  | 10.2           | 2.1             |                 | 8.5             | 7.3             | 14.5             | 3.1              | 5.3             | 11.7             | 1.3              | 28.9             | 10.2             | 44.4             | 3.5              | 3.0              |                  |                  |                  |                  |                  |                  |                  |                  |                  |                   |                   |                   |                   |                   | 4.53%             |
| Feb-95    | 2.5              |                  | 34.6             |                  | 13.4           | 2.8             |                 | 11.2            | 9.6             | 19.2             | 4.1              | 7.0             | 15.4             | 1.9              | 45.2             | 12.1             | 65.8             | 7.4              | 1.9              |                  |                  |                  |                  |                  |                  |                  |                  |                  |                   |                   |                   |                   |                   | 5.99%             |
| Mar-95    | 1.4              |                  | 38.3             |                  | 12.7           | 2.7             |                 | 10.6            | 9.1             | 18.1             | 3.9              | 6.6             | 14.6             | 0.0              | 45.2             | 0.0              | 65.5             | 6.4              | 1.4              |                  |                  |                  |                  |                  |                  |                  |                  |                  |                   |                   |                   |                   |                   | 5.66%             |
| Apr-95    | 8.0              |                  | 37.9             |                  | 23.5           | 5.0             |                 | 19.7            | 16.8            | 33.7             | 7.3              | 12.3            | 27.0             | 3.2              | 101.1            | 0.0              | 137.3            | 18.6             | 4.9              |                  |                  |                  |                  |                  |                  |                  |                  |                  |                   |                   |                   |                   | 10.50%            |                   |
| May-95    | 10.0             |                  | 35.8             |                  | 19.4           | 4.1             |                 | 16.3            | 13.9            | 27.8             | 6.0              | 10.2            | 22.3             | 11.6             | 59.7             | 0.0              | 132.6            | 26.6             | 6.7              |                  |                  |                  |                  |                  |                  |                  |                  |                  |                   |                   |                   |                   | 8.67%             |                   |
| Jun-95    | 13.0             |                  | 34.9             |                  | 19.9           | 4.2             |                 | 16.7            | 14.3            | 28.5             | 6.2              | 10.4            | 22.9             | 26.6             | 64.7             | 0.0              | 134.7            | 29.8             | 7.1              |                  |                  |                  |                  |                  |                  |                  |                  |                  |                   |                   |                   |                   | 8.90%             |                   |
| Jul-95    | 23.2             |                  | 33.1             |                  | 22.6           | 4.8             |                 | 18.9            | 16.2            | 32.4             | 7.0              | 11.8            | 25.9             | 32.9             | 97.2             | 0.0              | 135.4            | 41.4             | 13.6             |                  |                  |                  |                  |                  |                  |                  |                  |                  |                   |                   |                   |                   | 10.09%            |                   |
| Aug-95    | 19.3             |                  | 31.0             |                  | 22.9           | 4.8             |                 | 19.1            | 16.4            | 32.7             | 7.1              | 12.0            | 26.2             | 8.7              | 96.8             | 0.0              | 140.8            | 45.2             | 15.2             |                  |                  |                  |                  |                  |                  |                  |                  |                  |                   |                   |                   |                   | 10.20%            |                   |
| Sep-95    | 17.7             |                  | 28.1             |                  | 21.6           | 4.6             |                 | 18.1            | 15.5            | 30.9             | 6.7              | 11.3            | 24.8             | 17.9             | 91.9             | 0.0              | 134.0            | 43.2             | 12.9             |                  |                  |                  |                  |                  |                  |                  |                  |                  |                   |                   |                   |                   | 9.65%             |                   |
| Oct-95    | 16.3             |                  | 19.1             |                  | 20.7           | 4.4             |                 | 17.3            | 14.8            | 29.6             | 6.4              | 10.8            | 23.7             | 15.5             | 88.8             | 0.0              | 135.2            | 30.9             | 6.5              |                  |                  |                  |                  |                  |                  |                  |                  |                  |                   |                   |                   |                   | 9.24%             |                   |
| Nov-95    | 8.9              |                  | 22.8             |                  | 19.7           | 4.2             |                 | 16.5            | 14.1            | 28.2             | 6.1              | 10.3            | 22.6             | 0.0              | 78.8             | 0.0              | 139.8            | 19.0             | 0.2              |                  |                  |                  |                  |                  |                  |                  |                  |                  |                   |                   |                   |                   | 8.79%             |                   |
| Dec-95    | 4.5              |                  | 29.2             |                  | 17.4           | 3.7             |                 | 14.6            | 12.5            | 24.9             | 5.4              | 9.1             | 20.0             | 0.0              | 69.4             | 0.0              | 106.0            | 14.3             | 0.3              |                  |                  |                  |                  |                  |                  |                  |                  |                  |                   |                   |                   |                   | 7.77%             |                   |
| Subtotal: | 174.9            |                  | 308.6            |                  | 231.9          | 47.4            |                 | 187.6           | 168.5           | 328.6            | 69.2             | 117.4           | 257.0            | 139.5            | 847.7            | 22.3             | 1371.5           | 284.3            | 73.5             |                  |                  |                  |                  |                  |                  |                  |                  |                  |                   |                   |                   |                   |                   | 100.00%           |
| Jan-96    | 3.8              |                  | 28.7             |                  | 10.2           | 2.1             |                 | 8.5             | 7.3             | 14.5             | 3.1              | 5.3             | 11.7             | 11.8             | 38.2             | 0.0              | 104.5            | 15.2             | 2.4              |                  |                  |                  |                  |                  |                  |                  |                  |                  |                   |                   |                   |                   |                   | 4.53%             |
| Feb-96    | 1.6              |                  | 28.6             |                  | 13.4           | 2.8             |                 | 11.2            | 9.6             | 19.2             | 4.1              | 7.0             | 15.4             | 17.4             | 0.0              | 0.0              | 121.8            | 6.4              | 1.1              |                  |                  |                  |                  |                  |                  |                  |                  |                  |                   |                   |                   |                   | 5.99%             |                   |
| Mar-96    | 2.5              |                  | 28.6             |                  | 12.7           | 2.7             |                 | 10.6            | 9.1             | 18.1             | 3.9              | 6.6             | 14.6             | 5.5              | 0.0              | 0.0              | 143.1            | 10.3             | 1.6              |                  |                  |                  |                  |                  |                  |                  |                  |                  |                   |                   |                   |                   | 5.66%             |                   |
| Apr-96    | 12.7             |                  | 24.5             |                  | 23.5           | 5.0             |                 | 19.7            | 16.8            | 33.7             | 7.3              | 12.3            | 27.0             | 9.1              | 0.0              | 0.0              | 140.6            | 35.8             | 8.2              |                  |                  |                  |                  |                  |                  |                  |                  |                  |                   |                   |                   |                   | 10.50%            |                   |
| May-96    | 13.9             |                  | 27.7             |                  | 19.4           | 4.1             |                 | 16.3            | 13.9            | 27.8             | 6.0              | 10.2            | 22.3             | 15.0             | 0.0              | 0.0              | 130.4            | 39.9             | 9.5              |                  |                  |                  |                  |                  |                  |                  |                  |                  |                   |                   |                   |                   | 8.67%             |                   |
| Jun-96    | 17.4             |                  | 25.0             |                  | 19.9           | 4.2             |                 | 16.7            | 14.3            | 28.5             | 6.2              | 10.4            | 22.9             | 40.9             | 0.0              | 0.0              | 131.7            | 53.1             | 15.3             |                  |                  |                  |                  |                  |                  |                  |                  |                  |                   |                   |                   |                   | 8.90%             |                   |
| Jul-96    | 20.4             |                  | 25.3             |                  | 22.6           | 4.8             |                 | 18.9            | 16.2            | 32.4             | 7.0              | 11.8            | 25.9             | 29.3             | 0.0              | 0.0              | 131.3            | 49.7             | 17.7             |                  |                  |                  |                  |                  |                  |                  |                  |                  |                   |                   |                   |                   | 10.09%            |                   |
| Subtotal: | 72.2             |                  | 184.4            |                  | 231.9          | 47.4            |                 | 187.6           | 168.5           | 328.6            | 69.2             | 117.4           | 257.0            | 129.1            | 38.2             | 0.0              | 981.4            | 210.3            | 51.8             |                  |                  |                  |                  |                  |                  |                  |                  |                  |                   |                   |                   |                   |                   | 54.34%            |

Note: Annual Percentage is based on the Conejo, Ventura Farms, Snow, and Penny Well Extraction Totals.

For January 1994 through July 1996, extractions from wells other than Camrosa and Santa Rosa were assumed to be equal to the previous years (1992 and 1993).

# Appendix 3

## Streamflow, HCWWTP Discharge, & Precipitation Data

**Camrosa Water District  
Groundwater Modeling Study**

| Year             | Streamflow Hill Canyon (cfs) | Precipitation WWTP (in) | Precipitation (in) |
|------------------|------------------------------|-------------------------|--------------------|
| Jan-86           | 1,523                        | 14.5                    | 4.13               |
| Feb-86           | 3,039                        | 14.1                    | 5.62               |
| Mar-86           | 2,715                        | 16.3                    | 6.08               |
| Apr-86           | 861                          | 15.6                    | 0.90               |
| May-86           | 660                          | 14.5                    | 0.00               |
| Jun-86           | 564                          | 14.6                    | 0.00               |
| Jul-86           | 520                          | 14.5                    | 0.00               |
| Aug-86           | 497                          | 14.5                    | 0.00               |
| Sep-86           | 602                          | 15.2                    | 0.80               |
| Oct-86           | 514                          | 15.0                    | 0.00               |
| Nov-86           | 973                          | 14.3                    | 1.90               |
| Dec-86           | 449                          | 16.4                    | 0.26               |
| <b>Subtotal:</b> | <b>12,917</b>                | <b>179.5</b>            | <b>19.69</b>       |
| Jan-87           | 795                          | 15.4                    | 1.60               |
| Feb-87           | 631                          | 14.0                    | 1.17               |
| Mar-87           | 637                          | 15.3                    | 1.74               |
| Apr-87           | 481                          | 14.4                    | 0.00               |
| May-87           | 464                          | 15.1                    | 0.00               |
| Jun-87           | 422                          | 15.0                    | 0.00               |
| Jul-87           | 439                          | 15.3                    | 0.00               |
| Aug-87           | 465                          | 15.2                    | 0.00               |
| Sep-87           | 403                          | 14.4                    | 0.00               |
| Oct-87           | 1,190                        | 15.1                    | 1.39               |
| Nov-87           | 793                          | 14.8                    | 2.28               |
| Dec-87           | 1,756                        | 15.7                    | 1.39               |
| <b>Subtotal:</b> | <b>8,496</b>                 | <b>179.6</b>            | <b>9.37</b>        |
| Jan-88           | 1,371                        | 15.3                    | 2.36               |
| Feb-88           | 965                          | 14.9                    | 1.76               |
| Mar-88           | 643                          | 15.6                    | 0.29               |
| Apr-88           | 854                          | 15.2                    | 1.63               |
| May-88           | 461                          | 15.3                    | 0.00               |
| Jun-88           | 470                          | 14.9                    | 0.00               |
| Jul-88           | 442                          | 14.9                    | 0.00               |
| Aug-88           | 418                          | 15.5                    | 0.00               |
| Sep-88           | 490                          | 15.1                    | 0.02               |
| Oct-88           | 516                          | 15.4                    | 0.00               |
| Nov-88           | 494                          | 14.9                    | 1.33               |
| Dec-88           | 1,453                        | 15.8                    | 4.15               |
| <b>Subtotal:</b> | <b>8,577</b>                 | <b>182.9</b>            | <b>11.54</b>       |
| Jan-89           | 673                          | 15.8                    | 0.42               |
| Feb-89           | 1,278                        | 14.2                    | 4.96               |
| Mar-89           | 747                          | 15.7                    | 0.97               |
| Apr-89           | 521                          | 15.1                    | 0.34               |
| May-89           | 504                          | 16.0                    | 0.17               |
| Jun-89           | 486                          | 14.4                    | 0.00               |
| Jul-89           | 464                          | 15.0                    | 0.00               |
| Aug-89           | 502                          | 15.2                    | 0.00               |
| Sep-89           | 557                          | 15.4                    | 0.09               |
| Oct-89           | 639                          | 16.1                    | 0.43               |
| Nov-89           | 541                          | 15.3                    | 0.47               |
| Dec-89           | 542                          | 15.2                    | 0.00               |
| <b>Subtotal:</b> | <b>7,454</b>                 | <b>183.5</b>            | <b>7.85</b>        |

**Camrosa Water District  
Groundwater Modeling Study  
Water Balance Analysis 1992 (AF)**

|  | West of<br>Fault | East of<br>Fault | Total<br>Basin |
|--|------------------|------------------|----------------|
| <i>Extractions-Groundwater</i>                 |                  |                  |                |
| Camrosa WD <sup>(1)</sup>                      | 0                | 1746             | 1746           |
| SRMWD <sup>(1)</sup>                           | 0                | 442              | 442            |
| Other users <sup>(2)</sup>                     | 1248             | 0                | 1248           |
| Subtotal Groundwater                           | 1248             | 2188             | 3436           |
| <i>Extractions-Conejo Creek</i> <sup>(3)</sup> | 1196             | 1348             | 2544           |
| <b>Total Extractions</b>                       | <b>2444</b>      | <b>3536</b>      | <b>5980</b>    |
| <i>Consumption</i>                             |                  |                  |                |
| Camrosa WD customers                           | 169              | 1970             | 2139           |
| SRMWD <sup>(4)</sup>                           | 0                | 442              | 442            |
| Other users <sup>(5)</sup>                     | 2444             | 1348             | 3792           |
| <b>Total Consumption</b>                       | <b>2613</b>      | <b>3760</b>      | <b>6373</b>    |
| <i>Imported water</i> <sup>(6)</sup>           | 169              | 1526             | 1695           |
| <i>Groundwater export</i> <sup>(7)</sup>       | 0                | 1302             | 1302           |

|                              |      |     |
|------------------------------|------|-----|
| Camrosa WD Total Consumption | 8413 |     |
| Camrosa WD Total Import      | 6667 | 79% |
| Camrosa WD Total Groundwater | 1746 | 21% |

**Notes:**

- (1) From groundwater extraction data - all east of Bailey fault.
- (2) From groundwater extraction data - all west of Bailey fault.
- (3) From Camrosa Water District (CWD) estimate for 1993 - split east/west based on land acreage.
- (4) Equal to SRMWD groundwater extraction.
- (5) Equal to other users groundwater extractions and Conejo Creek extractions.
- (6) Based on same ratio as CWD total import/total consumption.
- (7) CWD groundwater extractions + imported water - CWD consumption.

**Camrosa Water District  
Groundwater Modeling Study  
Water Balance Analysis 1993 (AF)**

|  | West of<br>Fault | East of<br>Fault | Total<br>Basin |
|--|------------------|------------------|----------------|
| <i>Extractions-Groundwater</i>                 |                  |                  |                |
| Camrosa WD <sup>(1)</sup>                      | 0                | 2606             | 2606           |
| SRMWD <sup>(1)</sup>                           | 0                | 615              | 615            |
| Other users <sup>(2)</sup>                     | 1384             | 0                | 1384           |
| Subtotal Groundwater                           | 1384             | 3221             | 4605           |
| <i>Extractions-Conejo Creek</i> <sup>(3)</sup> | 1271             | 1445             | 2716           |
| <b>Total Extractions</b>                       | <b>2655</b>      | <b>4666</b>      | <b>7321</b>    |
| <i>Consumption</i>                             |                  |                  |                |
| Camrosa WD customers                           | 134              | 1954             | 2088           |
| SRMWD <sup>(4)</sup>                           | 0                | 615              | 615            |
| Other users <sup>(5)</sup>                     | 2655             | 1445             | 4100           |
| <b>Total Consumption</b>                       | <b>2789</b>      | <b>4014</b>      | <b>6803</b>    |
| <i>Imported water</i> <sup>(6)</sup>           | 134              | 1348             | 1483           |
| <i>Groundwater export</i> <sup>(7)</sup>       | 0                | 2000             | 2000           |

|                              |      |     |
|------------------------------|------|-----|
| Camrosa WD Total Consumption | 8981 |     |
| Camrosa WD Total Import      | 6375 | 71% |
| Camrosa WD Total Groundwater | 2606 | 29% |

**Notes:**

- (1) From groundwater extraction data - all east of Bailey fault.
- (2) From groundwater extraction data - all west of Bailey fault.
- (3) From Camrosa Water District (CWD) estimate for 1993 - split east/west based on land acreage.
- (4) Equal to SRMWD groundwater extraction.
- (5) Equal to other users groundwater extractions and Conejo Creek extractions.
- (6) Based on same ratio as CWD total import/total consumption.
- (7) CWD groundwater extractions + imported water - CWD consumption.

**Camrosa Water District  
Groundwater Modeling Study**

| <b>Year</b>      | <b>Streamflow<br/>(cfs)</b> | <b>Hill Canyon<br/>WWTP (cfs)</b> | <b>Precipitation<br/>(in)</b> |
|------------------|-----------------------------|-----------------------------------|-------------------------------|
| Jan-90           | 1,337                       | 14.9                              | 4.29                          |
| Feb-90           | 803                         | 13.3                              | 3.10                          |
| Mar-90           | 448                         | 14.7                              | 0.03                          |
| Apr-90           | 460                         | 13.6                              | 0.18                          |
| May-90           | 426                         | 13.8                              | 1.03                          |
| Jun-90           | 374                         | 13.3                              | 0.03                          |
| Jul-90           | 358                         | 13.5                              | 0.00                          |
| Aug-90           | 379                         | 13.3                              | 0.00                          |
| Sep-90           | 352                         | 13.2                              | 0.02                          |
| Oct-90           | 408                         | 13.6                              | 0.00                          |
| Nov-90           | 535                         | 13.3                              | 0.40                          |
| Dec-90           | 478                         | 13.7                              | 0.04                          |
| <b>Subtotal:</b> | <b>6,337</b>                | <b>164.2</b>                      | <b>9.72</b>                   |
| Jan-91           | 563                         | 13.7                              | 2.11                          |
| Feb-91           | 1,017                       | 11.7                              | 4.20                          |
| Mar-91           | 3,564                       | 13.5                              | 18.24                         |
| Apr-91           | 538                         | 12.2                              | 0.01                          |
| May-91           | 381                         | 12.2                              | 0.00                          |
| Jun-91           | 365                         | 11.7                              | 0.14                          |
| Jul-91           | 329                         | 11.8                              | 0.00                          |
| Aug-91           | 319                         | 11.7                              | 0.00                          |
| Sep-91           | 358                         | 11.5                              | 0.00                          |
| Oct-91           | 430                         | 11.6                              | 0.67                          |
| Nov-91           | 307                         | 11.4                              | 0.23                          |
| Dec-91           | 2,028                       | 12.3                              | 5.09                          |
| <b>Subtotal:</b> | <b>16,198</b>               | <b>145.2</b>                      | <b>38.69</b>                  |
| Jan-92           | 1,310                       | 12.9                              | 3.42                          |
| Feb-92           | 9,662                       | 15.3                              | 13.77                         |
| Mar-92           | 4,560                       | 15.8                              | 5.26                          |
| Apr-92           | 958                         | 13.9                              | 0.04                          |
| May-92           | 727                         | 13.6                              | 0.49                          |
| Jun-92           | 650                         | 13.1                              | 0.00                          |
| Jul-92           | 486                         | 13.3                              | 0.57                          |
| Aug-92           | 489                         | 13.1                              | 0.00                          |
| Sep-92           | 472                         | 12.7                              | 0.00                          |
| Oct-92           | 662                         | 13.2                              | 1.67                          |
| Nov-92           | 496                         | 12.8                              | 0.00                          |
| Dec-92           | 1,887                       | 13.6                              | 7.46                          |
| <b>Subtotal:</b> | <b>22,359</b>               | <b>163.3</b>                      | <b>32.68</b>                  |
| Jan-93           | 9,412                       | 17.3                              | 16.23                         |
| Feb-93           | 7,881                       | 16.7                              | 13.85                         |
| Mar-93           | 2,495                       | 16.6                              | 6.18                          |
| Apr-93           | 1,022                       | 15.2                              | 0.00                          |
| May-93           | 773                         | 15.3                              | 0.22                          |
| Jun-93           | 631                         | 14.7                              | 0.98                          |
| Jul-93           | 601                         | 14.6                              | 0.00                          |
| Aug-93           | 573                         | 14.2                              | 0.00                          |
| Sep-93           | 513                         | 13.9                              | 0.00                          |
| Oct-93           | 718                         | 14.3                              | 0.23                          |
| Nov-93           | 728                         | 13.1                              | 0.84                          |
| Dec-93           | 1,024                       | 13.9                              | 1.21                          |
| <b>Subtotal:</b> | <b>26,371</b>               | <b>179.8</b>                      | <b>39.74</b>                  |

**Camrosa Water District  
Groundwater Modeling Study**

| <b>Year</b>      | <b>Streamflow<br/>(cfs)</b> | <b>Hill Canyon<br/>WWTP (cfs)</b> | <b>Precipitation<br/>(in)</b> |
|------------------|-----------------------------|-----------------------------------|-------------------------------|
| Jan-94           | 638                         | 13.7                              | 0.44                          |
| Feb-94           | 1,673                       | 13.2                              | 3.21                          |
| Mar-94           | 1,151                       | 14.3                              | 1.95                          |
| Apr-94           | 568                         | 13.5                              | 0.43                          |
| May-94           | 508                         | 13.5                              | 0.53                          |
| Jun-94           | 452                         | 12.9                              | 0.00                          |
| Jul-94           | 449                         | 13.1                              | 0.00                          |
| Aug-94           | 435                         | 12.8                              | 0.00                          |
| Sep-94           | 572                         | 12.5                              | 0.06                          |
| Oct-94           | 529                         | 13.0                              | 0.50                          |
| Nov-94           | 560                         | 12.7                              | 0.99                          |
| Dec-94           | 630                         | 13.2                              | 0.85                          |
| <b>Subtotal:</b> | <b>8,165</b>                | <b>158.3</b>                      | <b>8.96</b>                   |
| Jan-95           | 10,124                      | 17.4                              | 10.18                         |
| Feb-95           | 1,121                       | 13.3                              | 1.27                          |
| Mar-95           | 4,585                       | 16.4                              | 7.47                          |
| Apr-95           | 1,303                       | 14.5                              | 0.55                          |
| May-95           | 1,006                       | 14.4                              | 0.23                          |
| Jun-95           | 835                         | 13.9                              | 0.79                          |
| Jul-95           | 624                         | 13.8                              | 0.00                          |
| Aug-95           | 535                         | 13.6                              | 0.00                          |
| Sep-95           | 574                         | 13.2                              | 0.00                          |
| Oct-95           | 596                         | 13.5                              | 0.00                          |
| Nov-95           | 563                         | 13.1                              | 0.15                          |
| Dec-95           | 1,260                       | 13.5                              | 0.56                          |
| <b>Subtotal:</b> | <b>23,146</b>               | <b>178.3</b>                      | <b>27.38</b>                  |
| Jan-96           | 1,039                       | 13.8                              | 0.91                          |
| Feb-96           | 1,931                       | 13.7                              | 5.69                          |
| Mar-96           | 964                         | 14.5                              | 1.39                          |
| Apr-96           | 652                         | 14.1                              | 0.42                          |
| May-96           | 532                         | 14.3                              | 0.12                          |
| Jun-96           | 499                         | 13.8                              | 0.00                          |
| Jul-96           |                             | 13.9                              | 0.00                          |
| <b>Subtotal:</b> | <b>5,617</b>                | <b>98.6</b>                       | <b>8.53</b>                   |

# Appendix 4

## Water Balance Estimates

**Camrosa Water District  
Groundwater Modeling Study  
Water Balance Analysis 1989 (AF)**

|  | West of<br>Fault | East of<br>Fault | Total<br>Basin |
|--|------------------|------------------|----------------|
| <i>Extractions-Groundwater</i>                 |                  |                  |                |
| Camrosa WD <sup>(1)</sup>                      | 0                | 1912             | 1912           |
| SRMWD <sup>(1)</sup>                           | 0                | 437              | 437            |
| Other users <sup>(2)</sup>                     | 1304             | 0                | 1304           |
| Subtotal Groundwater                           | 1304             | 2349             | 3653           |
| <i>Extractions-Conejo Creek</i> <sup>(3)</sup> | 1946             | 2194             | 4140           |
| <b>Total Extractions</b>                       | <b>3250</b>      | <b>4543</b>      | <b>7793</b>    |
| <i>Consumption</i>                             |                  |                  |                |
| Camrosa WD customers                           | 1002             | 3488             | 4490           |
| SRMWD <sup>(4)</sup>                           | 0                | 437              | 437            |
| Other users <sup>(5)</sup>                     | 3250             | 2194             | 5444           |
| <b>Total Consumption</b>                       | <b>4252</b>      | <b>6119</b>      | <b>10371</b>   |
| <i>Imported water</i> <sup>(6)</sup>           | 1002             | 2861             | 3863           |
| <i>Groundwater export</i> <sup>(7)</sup>       | 0                | 1285             | 1285           |

|                              |       |     |
|------------------------------|-------|-----|
| Camrosa WD Total Consumption | 13691 |     |
| Camrosa WD Total Import      | 11779 | 86% |
| Camrosa WD Total Groundwater | 1912  | 14% |

**Notes:**

- (1) From groundwater extraction data - all east of Bailey fault.
- (2) From groundwater extraction data - all west of Bailey fault.
- (3) From Camrosa Water District (CWD) estimate for 1993 - split east/west based on land acreage.
- (4) Equal to SRMWD groundwater extraction.
- (5) Equal to other users groundwater extractions and Conejo Creek extractions.
- (6) Based on same ratio as CWD total import/total consumption.
- (7) CWD groundwater extractions + imported water - CWD consumption.

**Camrosa Water District  
Groundwater Modeling Study  
Water Balance Analysis 1994 (AF)**

|  | West of<br>Fault | East of<br>Fault | Total<br>Basin |
|--|------------------|------------------|----------------|
| <i>Extractions-Groundwater</i>                 |                  |                  |                |
| Camrosa WD <sup>(1)</sup>                      | 0                | 2916             | 2916           |
| SRMWD <sup>(1)</sup>                           | 0                | 600              | 600            |
| Other users <sup>(2)</sup>                     | 1248             | 0                | 1248           |
| Subtotal Groundwater                           | 1248             | 3516             | 4764           |
| <i>Extractions-Conejo Creek</i> <sup>(3)</sup> | 1352             | 1525             | 2877           |
| <b>Total Extractions</b>                       | <b>2600</b>      | <b>5041</b>      | <b>7641</b>    |
| <i>Consumption</i>                             |                  |                  |                |
| Camrosa WD customers                           | 355              | 2127             | 2482           |
| SRMWD <sup>(4)</sup>                           | 0                | 600              | 600            |
| Other users <sup>(5)</sup>                     | 2600             | 1525             | 4125           |
| <b>Total Consumption</b>                       | <b>2955</b>      | <b>4252</b>      | <b>7207</b>    |
| <i>Imported water</i> <sup>(6)</sup>           | 355              | 1367             | 1721           |
| <i>Groundwater export</i> <sup>(7)</sup>       | 0                | 2155             | 2155           |

|                              |      |     |
|------------------------------|------|-----|
| Camrosa WD Total Consumption | 9514 |     |
| Camrosa WD Total Import      | 6598 | 69% |
| Camrosa WD Total Groundwater | 2916 | 31% |

**Notes:**

- (1) From groundwater extraction data - all east of Bailey fault.
- (2) From groundwater extraction data - all west of Bailey fault.
- (3) From Camrosa Water District (CWD) estimate for 1993 - split east/west based on land acreage.
- (4) Equal to SRMWD groundwater extraction.
- (5) Equal to other users groundwater extractions and Conejo Creek extractions.
- (6) Based on same ratio as CWD total import/total consumption.
- (7) CWD groundwater extractions + imported water - CWD consumption.

**Camrosa Water District  
Groundwater Modeling Study  
Water Balance Analysis 1995 (AF)**

|  | West of<br>Fault | East of<br>Fault | Total<br>Basin |
|--|------------------|------------------|----------------|
| <i>Extractions-Groundwater</i>                 |                  |                  |                |
| Camrosa WD <sup>(1)</sup>                      | 0                | 2632             | 2632           |
| SRMWD <sup>(1)</sup>                           | 0                | 624              | 624            |
| Other users <sup>(2)</sup>                     | 1384             | 0                | 1384           |
| Subtotal Groundwater                           | 1384             | 3256             | 4640           |
| <i>Extractions-Conejo Creek</i> <sup>(3)</sup> | 1332             | 1502             | 2834           |
| <b>Total Extractions</b>                       | <b>2716</b>      | <b>4758</b>      | <b>7474</b>    |
| <i>Consumption</i>                             |                  |                  |                |
| Camrosa WD customers                           | 195              | 2063             | 2258           |
| SRMWD <sup>(4)</sup>                           | 0                | 624              | 624            |
| Other users <sup>(5)</sup>                     | 2716             | 1502             | 4218           |
| <b>Total Consumption</b>                       | <b>2911</b>      | <b>4189</b>      | <b>7100</b>    |
| <i>Imported water</i> <sup>(6)</sup>           | 195              | 1429             | 1624           |
| <i>Groundwater export</i> <sup>(7)</sup>       | 0                | 1998             | 1998           |

|                              |      |     |
|------------------------------|------|-----|
| Camrosa WD Total Consumption | 9373 |     |
| Camrosa WD Total Import      | 6741 | 72% |
| Camrosa WD Total Groundwater | 2632 | 28% |

**Notes:**

- (1) From groundwater extraction data - all east of Bailey fault.
- (2) From groundwater extraction data - all west of Bailey fault.
- (3) From Camrosa Water District (CWD) estimate for 1993 - split east/west based on land acreage.
- (4) Equal to SRMWD groundwater extraction.
- (5) Equal to other users groundwater extractions and Conejo Creek extractions.
- (6) Based on same ratio as CWD total import/total consumption.
- (7) CWD groundwater extractions + imported water - CWD consumption.

**Camrosa Water District  
Groundwater Modeling Study  
Water Balance Analysis 1990 (AF)**

|  | West of<br>Fault | East of<br>Fault | Total<br>Basin |
|--|------------------|------------------|----------------|
| <i>Extractions-Groundwater</i>                 |                  |                  |                |
| Camrosa WD <sup>(1)</sup>                      | 0                | 1627             | 1627           |
| SRMWD <sup>(1)</sup>                           | 0                | 409              | 409            |
| Other users <sup>(2)</sup>                     | 1210             | 0                | 1210           |
| Subtotal Groundwater                           | 1210             | 2036             | 3246           |
| <i>Extractions-Conejo Creek</i> <sup>(3)</sup> | 2068             | 2332             | 4400           |
| <b>Total Extractions</b>                       | <b>3278</b>      | <b>4368</b>      | <b>7646</b>    |
| <i>Consumption</i>                             |                  |                  |                |
| Camrosa WD customers                           | 1241             | 3762             | 5002           |
| SRMWD <sup>(4)</sup>                           | 0                | 409              | 409            |
| Other users <sup>(5)</sup>                     | 3278             | 2332             | 5610           |
| <b>Total Consumption</b>                       | <b>4519</b>      | <b>6502</b>      | <b>11021</b>   |
| <i>Imported water</i> <sup>(6)</sup>           | 1241             | 3202             | 4443           |
| <i>Groundwater export</i> <sup>(7)</sup>       | 0                | 1068             | 1068           |

|                              |       |     |
|------------------------------|-------|-----|
| Camrosa WD Total Consumption | 14549 |     |
| Camrosa WD Total Import      | 12922 | 89% |
| Camrosa WD Total Groundwater | 1627  | 11% |

**Notes:**

- (1) From groundwater extraction data - all east of Bailey fault.
- (2) From groundwater extraction data - all west of Bailey fault.
- (3) From Camrosa Water District (CWD) estimate for 1993 - split east/west based on land acreage.
- (4) Equal to SRMWD groundwater extraction.
- (5) Equal to other users groundwater extractions and Conejo Creek extractions.
- (6) Based on same ratio as CWD total import/total consumption.
- (7) CWD groundwater extractions + imported water - CWD consumption.

**Camrosa Water District  
Groundwater Modeling Study  
Water Balance Analysis 1991 (AF)**

|  | West of<br>Fault | East of<br>Fault | Total<br>Basin |
|--|------------------|------------------|----------------|
| <i>Extractions-Groundwater</i>                 |                  |                  |                |
| Camrosa WD <sup>(1)</sup>                      | 0                | 1346             | 1346           |
| SRMWD <sup>(1)</sup>                           | 0                | 425              | 425            |
| Other users <sup>(2)</sup>                     | 823              | 0                | 823            |
| Subtotal Groundwater                           | 823              | 1771             | 2594           |
| <i>Extractions-Conejo Creek</i> <sup>(3)</sup> | 1201             | 1354             | 2555           |
| Total Extractions                              | 2024             | 3125             | 5149           |
| <i>Consumption</i>                             |                  |                  |                |
| Camrosa WD customers                           | 600              | 1997             | 2598           |
| SRMWD <sup>(4)</sup>                           | 0                | 425              | 425            |
| Other users <sup>(5)</sup>                     | 2024             | 1354             | 3378           |
| Total Consumption                              | 2624             | 3777             | 6401           |
| <i>Imported water</i> <sup>(6)</sup>           | 600              | 1583             | 2184           |
| <i>Groundwater export</i> <sup>(7)</sup>       | 0                | 932              | 932            |

|                              |      |     |
|------------------------------|------|-----|
| Camrosa WD Total Consumption | 8450 |     |
| Camrosa WD Total Import      | 7104 | 84% |
| Camrosa WD Total Groundwater | 1346 | 16% |

Notes:

- (1) From groundwater extraction data - all east of Bailey fault.
- (2) From groundwater extraction data - all west of Bailey fault.
- (3) From Camrosa Water District (CWD) estimate for 1993 - split east/west based on land acreage.
- (4) Equal to SRMWD groundwater extraction.
- (5) Equal to other users groundwater extractions and Conejo Creek extractions.
- (6) Based on same ratio as CWD total import/total consumption.
- (7) CWD groundwater extractions + imported water - CWD consumption.

## **Appendix 5 (diskette)**

**Well Lithology, Water Level, & Extraction Data  
(self-extracting compressed MS Excel 5.0 files)**

**Model Input Files for 1989-95 Calibration & Future  
Baseline Runs (self-extracting compressed text  
files)**



Figure 8. Estimated Water Table for 1989

Figure 9. Principal Components of Water Budget (1989-1995)

Figure 10. Future Baseline

Figure 11. Scenario 1 - Pumping Shift to Upper Basin

Figure 12. Scenario 2 - Pumping Shift to Upper Basin Without Inflow

Figure 13. Scenario 3 - Future Baseline With Inflow

Figure 14. Scenario 4 - Weather Variation

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**APPENDICES (following figures)**

Appendix 1. General Well Information

Appendix 2. Well Extraction Data

Appendix 3. Streamflow, Hill Canyon WWTP Discharge, and  
Precipitation Data

Appendix 4. Water Budget Estimates

Appendix 5. (diskette) Well Lithology, Water Level, and Extraction  
Data; Model Input Files for Calibration 1989-95 and  
Future Baseline Runs

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**PLATES (in pocket)**

Plate 1. Santa Rosa Groundwater Basin Base Map

# 1.0 INTRODUCTION

Final Report 4/24/97

*A groundwater flow model was developed as a tool for managing water resources of the Santa Rosa Basin. It replaces a model originally developed in 1987.*

This report summarizes work performed as part of the Santa Rosa Groundwater Basin Management Plan Update. The work involved the development of a groundwater flow model of the Santa Rosa Groundwater Basin for use as a tool in managing water resources of the basin, evaluating conjunctive use alternatives, and evaluating alternatives for reducing the District's reliance on imported water.

The model developed as part of the current study is designed to replace an earlier groundwater flow model developed for the District in 1987 (Finite Element Ground Water Model Version 14, FEGW14, Johnson and Yoon, 1987). Accordingly, the present model relies extensively on the findings of the earlier work, including hydrologic relationships, aquifer characteristics, and general relationships between major inflow and outflow components of the basin's water budget.

## 2.1 MODFLOW Model

The groundwater model employed is based on the U.S. Geological Survey's finite difference code known as MODFLOW (McDonald and Harbaugh, 1988).

*The model is based on the USGS finite-difference code known as MODFLOW.*

MODFLOW accomplishes its solutions for groundwater conditions using several core "packages" to solve the basic groundwater flow equations, combined with a number of optional "packages" to address model boundary conditions (inflows/outflows/water levels), recharge by deep percolation, recharge through streams, pumping, etc. The Santa Rosa Basin Model was constructed using the following packages:

| Table 1<br>Santa Rosa Basin Model Packages |  |
|--|--|
| Package                                    | Purpose  |
| Basic Package (BAS)                        | Administrative functions, model definition, time discretization              |
| Block-Centered Flow (BCF)                  | Grid dimensions, aquifer properties (aquifer bottom, hydraulic conductivity) |
| Output Control (CTL)                       | Instructions for model output  |
| Well Package (WEL)                         | Basin pumping/discrete recharge events                                       |
| River Package (RIV)                        | Recharge from Arroyo Conejo and Conejo Creek                                 |
| Recharge Package (RCH)                     | Rainfall recharge/recharge from applied water                                |
| General Head Boundary (GHB)                | Water-level dependent basin inflow (eastern boundary)                        |

In addition, several pre- and post-processing routines are employed to assist in the development of input data files, and to assist in the extraction of key model output information. Following is a summary of the pre- and post-processors:

| <b>Table 2</b><br><b>Santa Rosa Basin Model Pre- and Post-Processors</b> |   |
|--|---|
| <b>Name</b>  | <b>Purpose</b>  |
| Pre-Mod  | Commercial product to generate and modify model packages  |
| Well   | Generate pumping input files (developed for this project)   |
| Recharge   | Generate recharge files for rain recharge and recharge of applied water, based on user specified distribution of irrigated lands (developed for this project) |
| River  | Generate river package input files, based on discharges at HCWWTP (developed for this project)  |
| Output   | Read and tabulate key water budget components from MODFLOW output file (developed for this project)   |
| Hydrograph   | Read and tabulate hydrograph data for up to 9 wells from MODFLOW output (code modification)   |
| Post-Mod   | Commercial product to convert MODFLOW binary water level output file for use by water level contour mapping software  |
| ZONEBUDGET   | Commercial product to provide separate accounting of groundwater conditions for each of the three sub-basins within the model                                 |

---

## 2.2 Model Grid

The model grid consists of 48 columns (C) and 26 rows (R) defining uniformly sized cells measuring 500 feet by 500 feet. There are a total of 620 active cells (the model therefore covers a total area of approximately 3,600 acres). The grid was oriented such that one set of grid lines was generally parallel to the principal direction of ground water flow. The boundaries of the model grid were set to coincide as much as possible with the known geologic boundaries of the basin as defined in the earlier model (Johnson and Yoon, 1987). Plate 1 (in pocket) illustrates the model grid superimposed on a map of the basin.

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## 2.3 Time Discretization

The model operates on a monthly time step (stress period). It simulates a seven year period from 1989 through 1995. Forecasting of alternative basin pumping and inflow conditions is for a seven year period, using a monthly time-step.

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## 2.4 Aquifer Properties

The basin has been represented as a single-layer system. This represents a departure from the previous model, which treated the basin as a two-layered system. Although stratigraphic information from wells in the basin suggested that several zones could be discriminated in portions of the basin, no separate water level data existed which would allow separate calibration of these zones. Further, wells are typically screened through multiple layers, making it difficult to allocate their pumping to individual zones. It was concluded that a single-layer model provided an appropriate representation of the hydrologic system.

*The basin has been represented as a single layer.*

Estimates of aquifer properties (hydraulic conductivity, elevation of aquifer base, and storage coefficient) must be assigned to each cell within the model's domain. Initial estimates of aquifer properties were obtained from the earlier model (Johnson and Yoon, 1987). These properties were subsequently adjusted to account for representation of the basin as a single layer, and again during calibration as dictated by differences between observed and predicted water level conditions.

The distribution of aquifer parameters (hydraulic conductivity and elevation of the aquifer's base) assigned in the model are contained in the model input files in the Appendix to this report. Figure 1 shows the approximate elevation of the base of the aquifer as represented in the model. A uniform value of 0.02 was used for the storage coefficient.

## 2.5 Pumping

The locations of wells for which pumping records are available are shown on Plate 1 (see Appendix 1). While some wells report values of monthly pumping, complete data on pumping of individual wells within the basin is available for annual pumping only. The distribution of pumping on a monthly basis was estimated using a combination of data for wells reporting monthly values and the monthly distribution of imported supplies, since this is taken to reflect monthly demands for irrigation water. See Appendix 2 for a summary of well extraction data. Complete extraction data is included on diskette in Appendix 5. The monthly distribution was taken to be constant from year to year, and is shown in Table 3:

| Jan  | Feb  | Mar  | Apr  | May  | Jun  | Jul  | Aug  | Sep  | Oct  | Nov  | Dec  |
|------|------|------|------|------|------|------|------|------|------|------|------|
| 0.06 | 0.05 | 0.06 | 0.08 | 0.09 | 0.10 | 0.12 | 0.11 | 0.09 | 0.09 | 0.08 | 0.07 |

Toward the end of this study, it was noted by District staff that one well in the Upper Sub-Basin (Caston well 2N/19W-20N1), for which pumping data was not available, had, in fact, been extracting water from the basin for at least the past 10 years (estimated average pumping rate 170 af/yr). This additional pumping, along with any other new or revised information which becomes available, can be incorporated into future updates to model baseline data.

## 2.6 Recharge

*Groundwater recharge is estimated based on measured rainfall and estimates of water applied for irrigation.*

The earlier model (FEGW14) included a detailed soil-moisture accounting routine as part of the estimation of recharge. The current model predicts recharge as a function of rainfall and applied water using relationships extracted from the prior modeling results. Also, the previous model included a detailed rainfall/runoff routine for estimation of streamflows. No such capability exists in MODFLOW.

A review of the prior model's water budget (Table 3-1, Estimated Historical Water Balance, Johnson and Yoon, 1987) reveals groundwater recharge to be relatively constant, and largely independent of runoff. Accordingly, no separate prediction is made of surface runoff leaving the basin.

Annual values of recharge of rainfall and deep percolation of applied water are estimated using a highly correlated relationship obtained during previous modeling ( $R^2=0.9$ ) relating annual values of ground water recharge and annual values of combined rainfall and applied water. For purposes of modeling, lands within the basin were classified as follows:

- Irrigated Lands** - Those areas receiving recharge from a combination of deep percolation of applied irrigation water and deep percolation of rainfall.
- Other Lands** - Those lands on which the principal source of recharge is deep percolation of rainfall.

The distribution of land types was obtained from aerial photographs of the basin taken in 1993. The classification of lands as represented in the model is shown in Figure 2.

*The distribution of land types receiving recharge was estimated from aerial photographs of the basin taken in 1993.*

The monthly distribution of recharge is estimated based on measured values of monthly rainfall (see Appendix 3) coupled with a typical monthly distribution of water supplied for irrigation, as shown in Table 4. The monthly distribution used to estimate recharge was lagged by several months relative to the time at which water is applied, to account for the delay between application and the time at which the water actually reaches the water table.

| <b>Table 4</b><br><b>Monthly Distribution of Recharge</b><br>(values shown are fraction of annual value) |      |      |      |      |      |      |      |      |      |      |      |
|--|------|------|------|------|------|------|------|------|------|------|------|
| Jan  | Feb  | Mar  | Apr  | May  | Jun  | Jul  | Aug  | Sep  | Oct  | Nov  | Dec  |
| 0.08   | 0.08 | 0.08 | 0.07 | 0.07 | 0.08 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 |

---

## 2.7 Boundary Conditions

**Bailey Fault** - The feature locally referred to as the Bailey Fault (Plate 1) is represented by a set of model cells which have been assigned a hydraulic conductivity value which contrasts with values in adjacent cells to simulate the resistance to flow offered by this feature.

**Sub-Surface Inflow** - Groundwater inflow at the easternmost end of the basin is estimated using a general-head boundary condition. In this formulation, sub-surface inflows vary in proportion to water levels predicted within the basin. Water levels outside the basin are specified according to water levels observed in a well (Maulhardt Well 2N/19W-21H1) located outside of the basin. Boundary conditions employed in the model are shown in Figure 3.

---

## 2.8 Stream Recharge

Parameters defining the monthly and annual recharge of Hill Canyon WWTP flows were calibrated to earlier modeling results, and results of gain/loss studies reported in previous work. Cells in which stream recharge is simulated are shown in Figure 3. Monthly streamflow and Hill Canyon WWTP discharge data are included in Appendix 3.

---

## 2.9 Import/Export Water

Estimates of the amounts of water imported to the basin are available on a monthly basis. An estimate of the amount of water exported from the basin was available for one year only. Remaining years were estimated based on the proportion calculated for the single year in which data were available for both imported and exported quantities. The net of these quantities is assumed to be distributed within the basin for use. See Appendix 4 for estimates of basin water balance for the study period 1989-95.

---

## 3.1 Initial Calibration (1987 - 1993)

The model was initially calibrated against transient hydrologic conditions within the basin for the period 1987 through 1993. Calibration results were considered good for the early years of this calibration period (1987 through about 1991). However, beginning in about 1993, water levels in several wells in the easternmost portion of the basin rose significantly, a behavior which could not be duplicated by the model as formulated at that time. It was also unclear from the water level records whether this response would continue beyond 1993, the end of the simulation period. Given the relatively poor calibration results for the final years of the simulation, and the uncertainty about future water level conditions, a decision was made to shift the modeling period from 1987 to 1993 to the period 1989 to 1995.

---

## 3.2 Revised Calibration (1989 - 1995)

In light of the rising water levels observed in several wells in the eastern portion of the basin, the modeling period was shifted to the 7-year period 1989 to 1995, and the model was re-calibrated. Two significant changes in the model's formulation were made during this calibration process. First, an additional source of inflow to the model was incorporated to account for flow conditions observed in the Arroyo Santa Rosa. During a field reconnaissance of the stream during October, 1996 it was observed to carry a surface discharge estimated at about 2 cfs. This flow disappeared abruptly near the intersection of the creek with Santa Rosa Road, indicating significant losses of water from the channel to the ground water system. Second, in attempting to duplicate the water level rise observed in several wells in the eastern portion of the basin, while at the same time maintaining relatively stable water level conditions elsewhere in the basin, a zone of low permeability was introduced. This zone of low permeability is inferred to be either fault-related, similar to conditions associated with the Bailey Fault, or stratigraphic in origin (low permeability sediments).

*A zone of low permeability is inferred east of the Bailey Fault. Combined with the Bailey Fault, this feature divides the basin into three sub-units.*

With these two significant changes, the calibration of the model was considered good. Comparisons of predicted versus observed water

levels at several locations in the basin are shown in **Figures 4, 5, 6 and 7**. The locations of the wells from which these hydrographs are taken are shown in **Figure 8**. **Figure 8** also shows the water table estimated by the model for the end of 1989.

Introduction of a zone of low permeability in the basin model effectively divides the basin into three sub-basins, herein referred to as the Upper Sub-Basin (easternmost area, comprising about 1,250 acres), the Middle Sub-Basin (middle portions of the basin including Arroyo Conejo, comprising about 1,030 acres) and the Lower Sub-Basin (comprising about 1,340 acres). The boundary between the Middle and Lower Sub-Basins is formed by the so-called Bailey Fault. These divisions are shown in **Plate 1**.

Comparison of basin outflows to the Pleasant Valley Basin as predicted by the previous model (Johnson and Yoon, 1987) and the current model reveals a notable difference. The average subsurface outflow from the previous model for the period 1972-83 was predicted to be about 725 af/yr. The current model's prediction for average subsurface outflow for the period 1989-95 is approximately 480 af/yr. The primary reason for this difference is that the previous model did not simulate a pumping depression in the Lower Sub-Basin (in the vicinity of Gerry wells, 2N/20W-23G1, G2, G3, and H2, see **Plate 1**), as newer data would indicate. See for example **Figure 3.6** from the previous model report (Johnson and Yoon, 1987), in which a uniform gradient to the west is evident. The previous model gradient resulted in a boundary water level elevation of about 80 feet at the lower basin limits, which appears to be too low. New data suggests a depression in the Lower Sub-Basin water table level (elevation at the Gerry wells of approximately 120 feet and elevation at Lamb well 2N/20W-22K2 of about 160 feet, see **Plate 1** and **Figure 8**) resulting in a local gradient to the east, away from the basin boundary. To achieve this shape in calibration it was necessary to restrict permeability at the boundary. Checks on geometry used in the previous model and the current model provide good agreement. Checks using continuity (Darcy's Law) indicate a subsurface outflow range of about 180 af/yr to over 1,100 af/yr, depending on the boundary condition assigned. The conclusion is that current conceptualization of the basin is more refined based on recent data, and the lower basin boundary representation is reasonable.

It is important to note that the model is presently calibrated for the set of observed water level conditions coupled with the various estimates of basin inflows and outflows (such as pumping, net imported water, etc.) as described above. In the event that it becomes possible to refine these estimates, it is likely that some additional calibration of the model will be necessary. In such a case, the magnitude of each of the predicted water budget components is also likely to change.

An example of data refinement which might suggest that the model be re-calibrated is the new pumping information for the Caston well in the Upper Sub-Basin (see Section 2.5 Pumping). To accommodate the additional well pumping of about 170 af/yr, re-calibration of the model would likely result in slightly higher Upper Sub-Basin inflow and/or slightly lower outflow to the Middle Sub-Basin (the level of additional pumping is only about 10 percent of the total Upper Sub-Basin inflow component).

Principal components of the basin's water budget as predicted in the groundwater model are shown in Figure 9. Table 5 summarizes these components for the model calibration period.

| Water Budget Component    | Sub-Basin    |              |              |
|---------------------------|--------------|--------------|--------------|
|                           | Lower        | Middle       | Upper        |
| Subsurface Inflow         | 0            | 180          | 301          |
| Recharge (Rain + Applied) | 1,109        | 700          | 546          |
| River Leakage             | 23           | 1,113        | 700          |
| Inflow Fr. Adj. Sub-Basin | 495M; 67U    | 725U         | 7M           |
| <i>Total Inflow</i>       | <i>1,694</i> | <i>2,718</i> | <i>1,554</i> |
| Subsurface Outflow        | 477          | 32           | 6            |
| Well Pumping              | 1,205        | 2,186        | 512          |
| Outflow to Adj. Sub-Basin | 0            | 495M; 7U     | 67L; 725M    |
| <i>Total Outflow</i>      | <i>1,682</i> | <i>2,720</i> | <i>1,310</i> |

Note: L = Lower Sub-Basin, M = Middle Sub-Basin, U = Upper Sub-Basin

An estimate was made of the volume of water in storage at the beginning and end of the calibration period. The estimate was based on a specific yield of 10%. This value is within the range of values

reported by Johnson and Yoon (1987). Following is a tabulation of water in storage as of 1989 and 1995:

| <b>Table 6</b>                    |                |                |               |
|-----------------------------------|----------------|----------------|---------------|
| <b>Estimated Water in Storage</b> |                |                |               |
| <b>Values in Acre-Feet</b>        |                |                |               |
| <b>Basin</b>                      | <b>Year</b>    |                |               |
|                                   | <b>1989</b>    | <b>1995</b>    | <b>Change</b> |
| <b>Lower Sub-Basin</b>            | <b>60,400</b>  | <b>60,480</b>  | <b>80</b>     |
| <b>Middle Sub-Basin</b>           | <b>26,890</b>  | <b>26,870</b>  | <b>-20</b>    |
| <b>Upper Sub-Basin</b>            | <b>25,790</b>  | <b>27,490</b>  | <b>1700</b>   |
| <b>Total</b>                      | <b>113,080</b> | <b>114,840</b> | <b>1,760</b>  |

Complete MODFLOW model input files for the 1989-95 calibration run are included on diskette in **Appendix 5**.

# 4.0 FORECASTING RESULTS

## 4.1 Future Baseline

The Future Baseline condition was constructed in order to provide a "baseline" against which "future" scenarios might be compared. For this purpose, the Future Baseline was assembled using near-average hydrologic conditions in the basin, repeated over the 7-year period. A synthetic record of average rainfall was constructed by distributing average annual rainfall for the basin (approximately 15 inches) according to an average monthly distribution of rainfall recorded at Oxnard, California, the nearest station with long-term records. Following is the monthly distribution of rainfall used to develop the Future Baseline condition:

| Jan  | Feb  | Mar  | Apr  | May  | Jun  | Jul  | Aug  | Sep  | Oct  | Nov  | Dec  |
|------|------|------|------|------|------|------|------|------|------|------|------|
| 0.22 | 0.21 | 0.17 | 0.07 | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.02 | 0.10 | 0.17 |

The Future Baseline is considered to represent a starting point for the basin and as such approximates recent average hydrologic conditions. Pumping rates for wells within the basin were set equal to the average of pumping reported for 1994 and 1995. Hill Canyon WWTP discharge to Arroyo Conejo were set equal to the rates reported for 1995. The net of water imported to and exported from the basin varied widely over the period 1989 to 1995. For purposes of the Future Baseline condition, the net water supply added to the basin was set equal to the average difference of imports and exports during the period 1989 - 1995 (net of 896 af/yr added to the basin). Starting water levels for the Future Baseline condition were set equal to water levels predicted by the model for the end of 1995.

The model's eastern boundaries with the Tierra Rejada Basin, and a small drainage area to the south of Terra Rejada, were both set equal to a condition prevailing until just prior to the recent period of heavy rain. This condition (general head boundary water level set equal to

elevation 504 feet) is believed to be representative of average recent hydrologic conditions, but unaffected by the heavy rainfall events recorded beginning about 1991. As such, recharge from live stream flow conditions observed along the Arroyo Santa Rosa in the east end of the basin was excluded from the Future Baseline.

Principal components of the basin's water budget and representative water level hydrographs for this condition are shown in **Figure 10**. Water levels are predicted to decline significantly in all three sub-basins, with the greatest declines in the upper and middle sub-basins. Natural (subsurface) outflows from the basin as a whole are lowest of all the scenarios considered, while subsurface inflow to the basin as a whole is highest of all the scenarios. Complete MODFLOW model input files for the future baseline simulation are included on diskette in **Appendix 5**.

---

## **4.2 Scenario 1 - Pumping Shift to Upper Basin**

This scenario simulates a redistribution of pumping between the middle and upper sub-basins, such that approximately 1/3 of the total of the middle and upper sub-basin pumping occurs in the upper sub-basin, and 2/3 of the pumping occurs in the middle sub-basin. In effect, this represents an increase of about 590 acre-feet/year pumping in the upper sub-basin, with a corresponding decrease in pumping in the middle sub-basin.

Principal components of the basin's water budget and representative water level hydrographs for this condition are shown in **Figure 11**. The shift in pumping to the upper sub-basin causes a noticeable change in water levels in the upper sub-basin (as reflected by the forecasted water levels at a location near the Stuart well, **Figure 11**). Water levels in the middle sub-basin rise slightly, consistent with the reduced pumping from this basin.

---

## **4.3 Scenario 2 - Pumping Shift to Upper Basin Without Tierra Rejada Inflow**

This scenario involves the same redistribution of pumping as in Scenario 1. However in this scenario, surface inflows from the Tierra

Rejada basin have been discontinued. Subsurface inflows continue to recharge the upper sub-basin as in prior scenarios.

Principal components of the basin's water budget and representative water level hydrographs for this condition are shown in **Figure 12**. Water levels decline significantly in all three sub-basins. The most significant declines are in the upper sub-basin where some locations within the model dewater. This has the effect of eliminating pumping in the affected cells. The water budget forecast for this scenario reflects this reduction in pumping, and slight recovery in water levels are shown in model hydrographs (for example the Stuart Well, beginning in about 2005, **Figure 12**). It may be concluded that the shift in pumping from the middle to the upper sub-basin cannot be sustained in the absence of the significant recharge from the Tierra Rejada basin. It is possible that a redistribution of pumping to other locations in the basin could be sustained, although such other pumping distributions were not tested.

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#### **4.4 Scenario 3 - Future Baseline Conditions With Tierra Rejada Inflow**

This scenario involves conditions identical to those used to construct the Future Baseline condition, with the inclusion of recharge to the upper sub-basin by surface inflows from the Tierra Rejada basin.

Principal components of the basin's water budget and representative water level hydrographs for this condition are shown in **Figure 13**. Water levels are stable over the 7-year forecasting period. This behavior is consistent with the balance in inflow and outflow components of the water budget, also shown in **Figure 13**.

---

#### **4.5 Scenario 4 - Weather Variation**

This scenario was constructed in order to test basin response to a relative drought condition followed by a return to the hydrologic conditions prevailing at the conclusion of 1995. The first three years of the simulation used average rainfall conditions for the basin in 1989 and 1990 (average rainfall 8.5 inches), followed by four years in which rainfall was assumed to be equal to the long-term basin average of

about 15 inches. It was assumed that there would be no recharge of the upper basin by Tierra Rejada inflows during the first three years of the simulation, while recharge would occur during the final four years. All other conditions were as modeled in the Future Baseline condition.

Principal components of the basin's water budget and representative water level hydrographs for this condition are shown in Figure 14. Water levels are predicted to decline significantly from the during the first three years of the simulation (Figure 14), then recover in about the same amount of time beginning in the fourth year of the simulation. There were no areas of the model which dewatered in this scenario.

# 5.0 CONCLUSIONS AND RECOMMENDATIONS

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## 5.1 Conclusions

Following are the principal conclusions of this work:

- A three-dimensional, finite-difference groundwater flow model was constructed of the Santa Rosa Groundwater Basin for use as a water resources management tool.
- The model was successfully calibrated against basin groundwater conditions for the period 1989 through 1995.
- The model relies on estimates of natural and artificial hydrologic conditions, including rainfall, natural inflows and outflows, stream leakage, pumping, water applied for irrigation, Hill Canyon WWTP effluent discharge, water which is imported for use within the basin, and water which is exported from the basin. The model depends on reliable estimates of these water budget components.
- There is evidence of a subsurface condition which impedes groundwater movement from the eastern end of the basin to the central portion of the basin. This condition may be related to stratigraphic changes or faulting in the subsurface. This, along with the previously identified Bailey Fault, has the effect of dividing the basin into three sub-basins, herein named the lower sub-basin, the middle sub-basin, and the upper sub-basin.
- Extraordinarily wet conditions prevailing since about 1991 have caused a dramatic rise in water levels in the easternmost portion of the basin (the upper sub-basin). This rise may be the result of the combined effects of heavy rainfall, net surplus of imports/exports, reduced pumping in the upper sub-basin, and significant increases in inflows (both surface and subsurface) from the adjoining Tierra Rejada Basin.
- The basin currently receives a significant amount of recharge by infiltration of surface inflows from the adjoining Tierra Rejada Basin. This recharge may be critical to basin management alternatives which involve additional groundwater pumping from the upper sub-basin.
- The basin appears to respond relatively quickly to changes in weather/recharge conditions.

- Total basin storage as of 1989 is estimated to have been about 113,00 acre-feet. Total basin storage as of 1995 is estimated to have been about 115,000 acre-feet, representing a gain of about 2,000 acre-feet over the seven year period. These estimates are based on a specific yield of 0.10. Recoverable storage, defined to be that water which can be pumped from the basin by reasonable means, is expected to be about 60 percent of the water in storage.
- There are combinations of high pumping rates and low recharge conditions which have the potential to adversely effect hydrologic conditions in the basin. The most evident effect would be the drying up of wells, as has been reported during past drought conditions. In an effort to effectively manage the basin's resources, it may be appropriate to define water level elevations which would signal that such adverse conditions are imminent, and also serve as a limit for basin drawdown. Based upon review of long-term water level records of wells in the basin, and modeling of combinations of pumping and recharge which have led to unstable water levels, the following drawdown elevation limits are suggested:
  - Lower Sub-Basin—100 feet;
  - Middle Sub-Basin—125 feet;
  - Upper Sub-Basin—125 feet.

Depths of wells vary greatly, as do water levels, pump settings, and interference between wells. As these elevations represent average conditions within the sub-basins, they cannot be relied upon to guarantee against dewatering of specific wells. Because of this, it is recommended that these values be re-evaluated frequently, and adjusted according to observed conditions in individual wells within the basin.

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## 5.2 Recommendations

The following activities are recommended as ways for improving the reliability of the model, and enhancing its utility to CWD for future water resource management activities:

**Additional Data Collection:**

- Import/Export Data** - The quantities of water imported to and exported from the basin represent a very significant fraction of the basin's water budget. Small errors in estimates of these quantities will translate into large errors in model predictions. Improved accounting of water entering and leaving the basin would improve the model's reliability.
- Pumping Data** - Pumping has a significant effect on local water levels. More complete data on the timing and location of pumping would improve the model's reliability.
- Gaging of Streamflow of Arroyo Santa Rosa** - Historically, this tributary stream carried water only intermittently, in response to major rainfall events. The discharge of this stream has reportedly increased in recent years, with flows of several cubic feet per second lasting over much of the year.

**Other Activities:**

The Tierra Rejada Basin represents an upstream source of surface and subsurface inflows to the Santa Rosa Basin. As such, changes in hydrologic conditions in the Tierra Rejada Basin will be felt to some degree in the Santa Rosa Basin. A basin-wide water budget is recommended as an initial step in quantifying hydrologic conditions in the Tierra Rejada Basin, and possibly refining estimates of inflows from the Tierra Rejada Basin to the Santa Rosa Basin.

## 6.0 REFERENCES

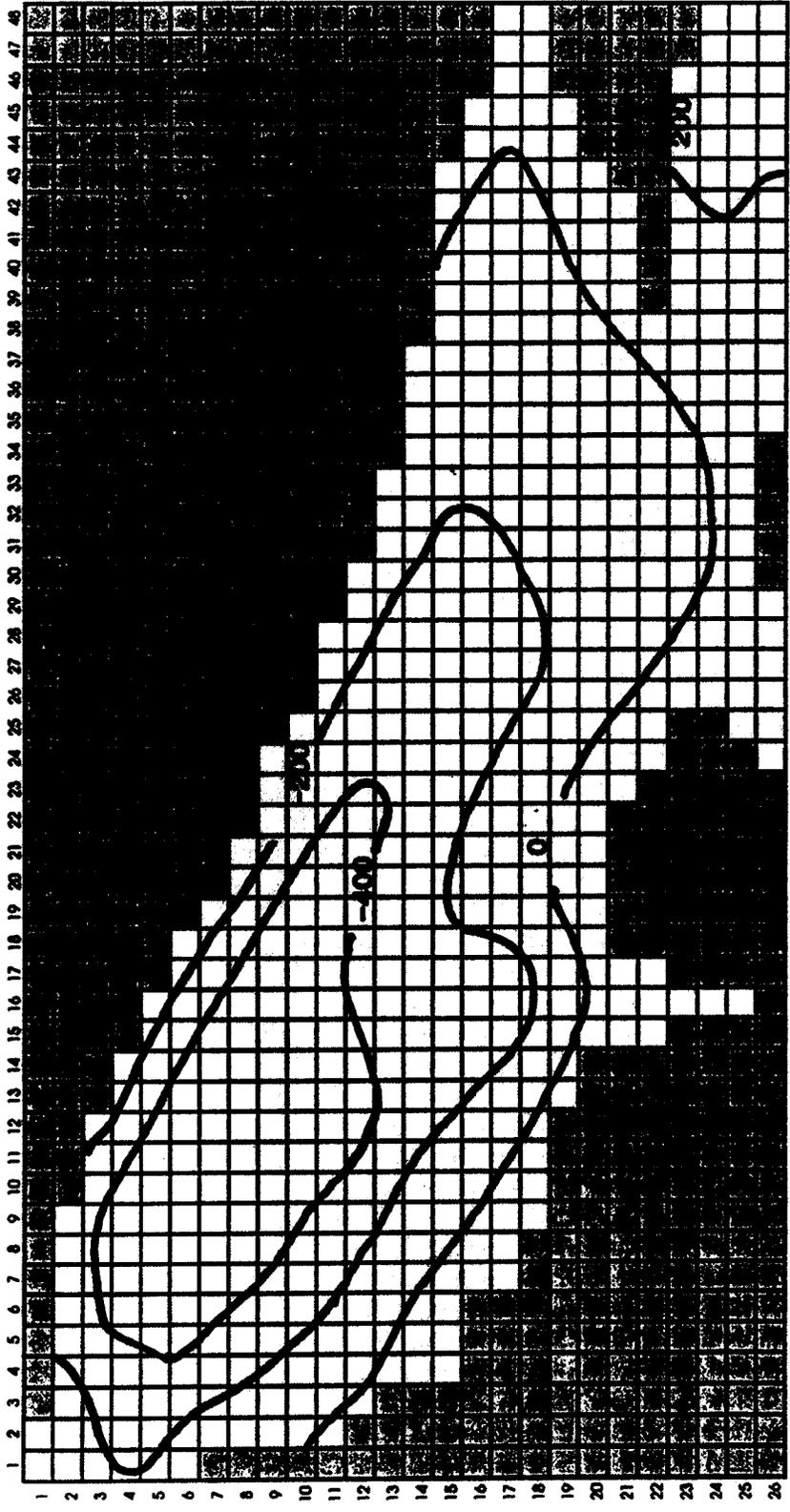
Final Report 4/24/97

Johnson, Ronald L. and Young Yoon, 1987. Report on Santa Rosa Groundwater Basin Management Plan. Report prepared for City of Thousand Oaks.

Feeney, Martin B., 1987. Development of a Two-Dimensional Digital Ground Water Flow Model for the Santa Rosa Valley Ground Water Basin. Master of Arts Thesis, California State University.

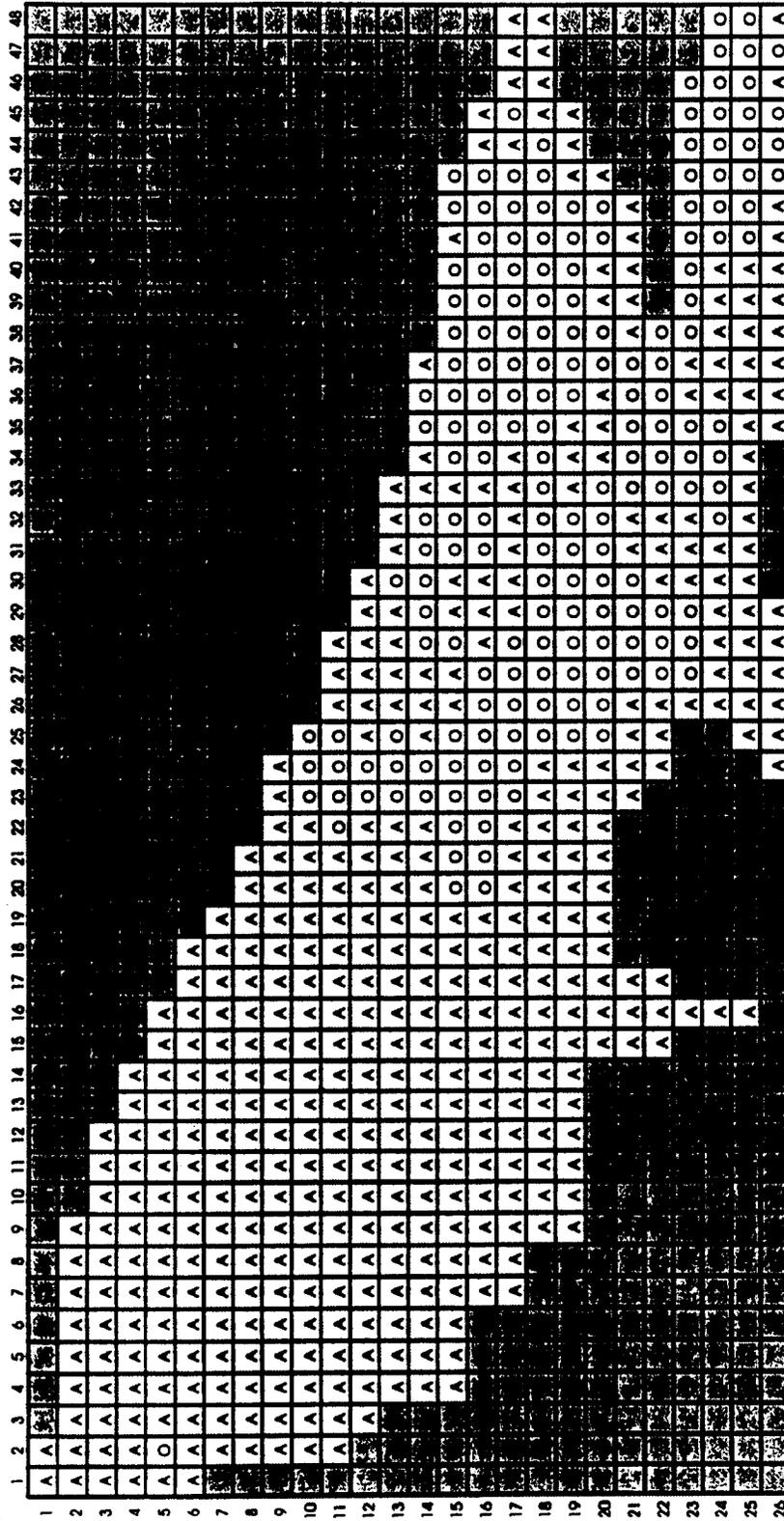
Bailey, Thomas L., 1969. Geology and Ground Water Supply of Camrosa County Water District. Report prepared for Camrosa County Water District.

McDonald, Michael G. and Arlen W. Harbaugh, 1988. A Modular Three-Dimensional Finite-Difference Ground-Water Flow Model. U.S. Geological Survey Techniques of Water-Resources Investigations, Book 6.



LEGEND:  
 □ ACTIVE CELL  
 ■ INACTIVE CELL

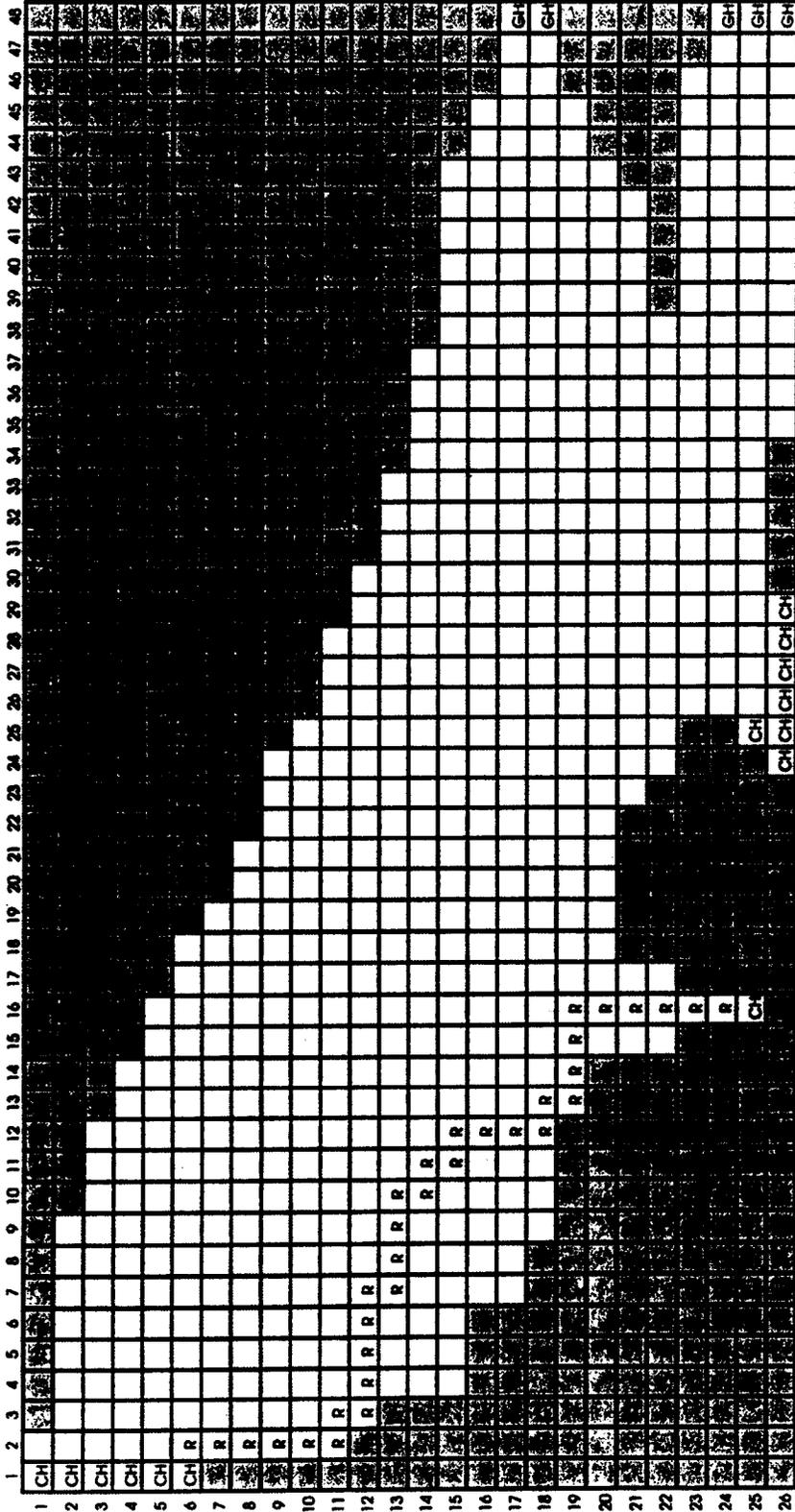
FIGURE 1. APPROXIMATE ELEVATION OF AQUIFER BASE, IN FEET



LEGEND:

-  AGRICULTURAL LAND USE
-  OTHER LAND USES (INCLUDES COMMERCIAL, RESIDENTIAL)
-  INACTIVE CELL

FIGURE 2. DISTRIBUTION OF LAND USES IN MODEL



LEGEND:

- R RIVER CELL
- CH CONSTANT HEAD CELL
- GH GENERAL HEAD BOUNDARY CELL
- INACTIVE CELL

FIGURE 3. MODEL BOUNDARY CONDITIONS

**CAMROSA WATER DISTRICT  
Water Level Hydrograph Well 2N/20W-23K1  
McCloskey/Lower Sub-Basin**

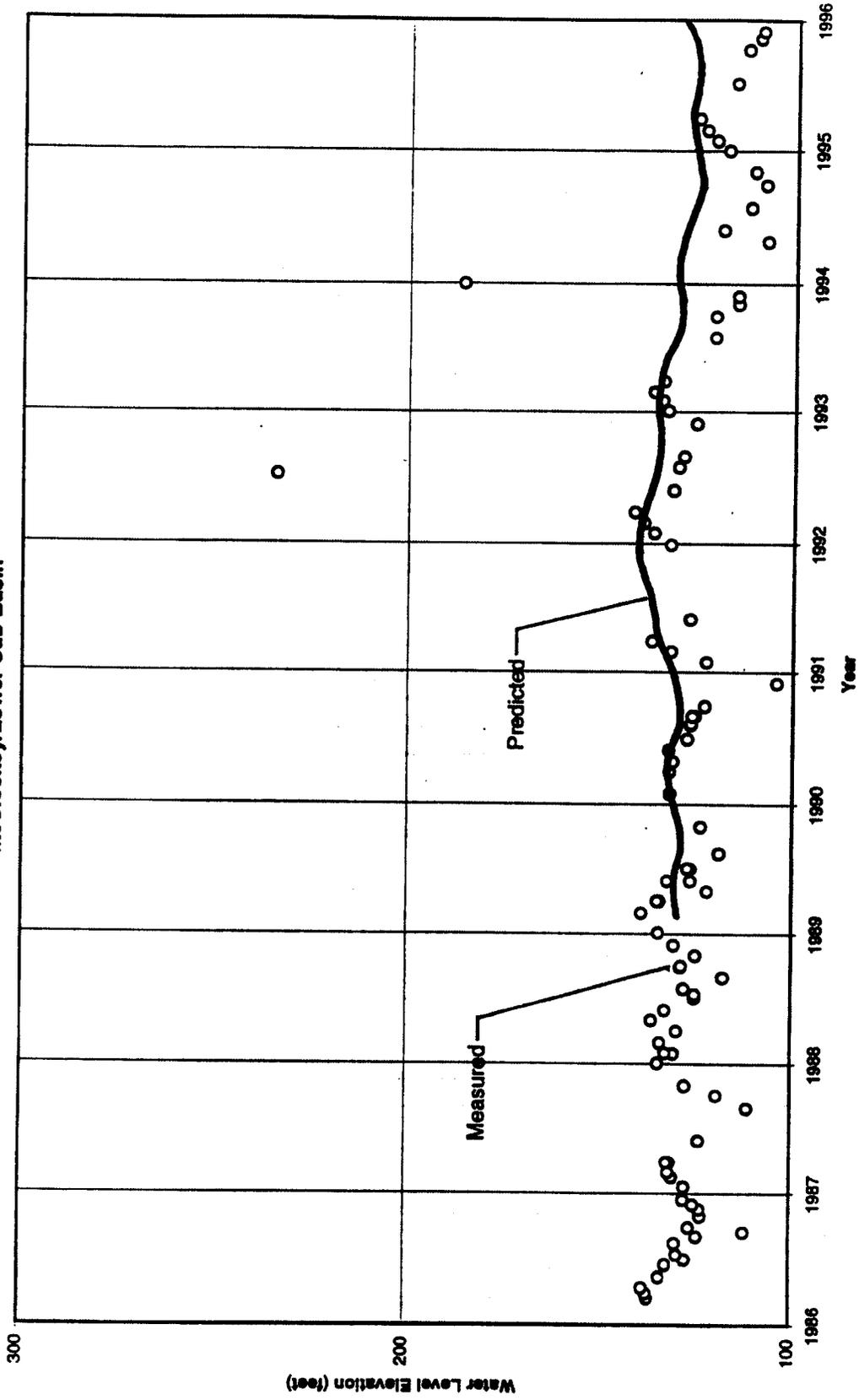
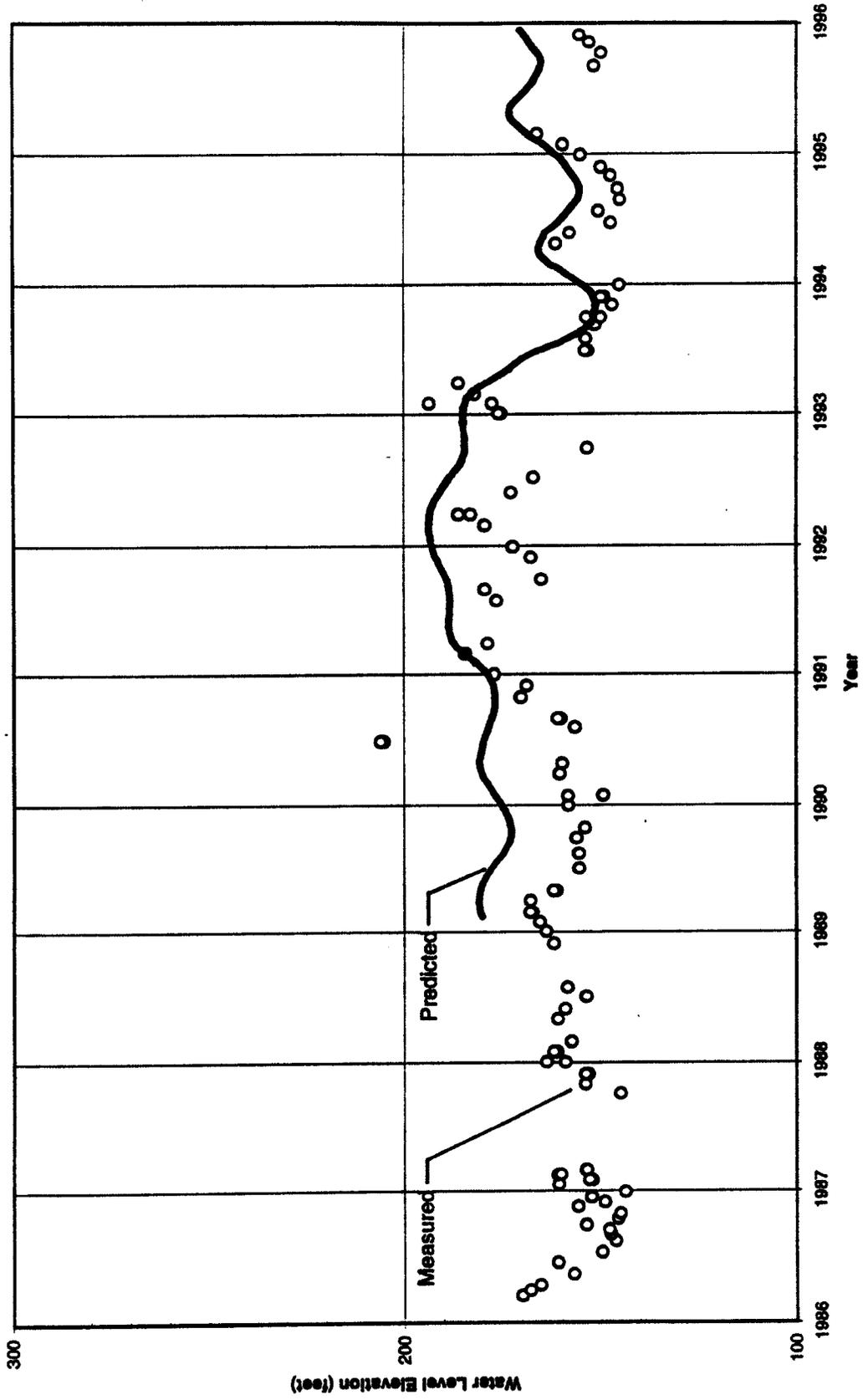


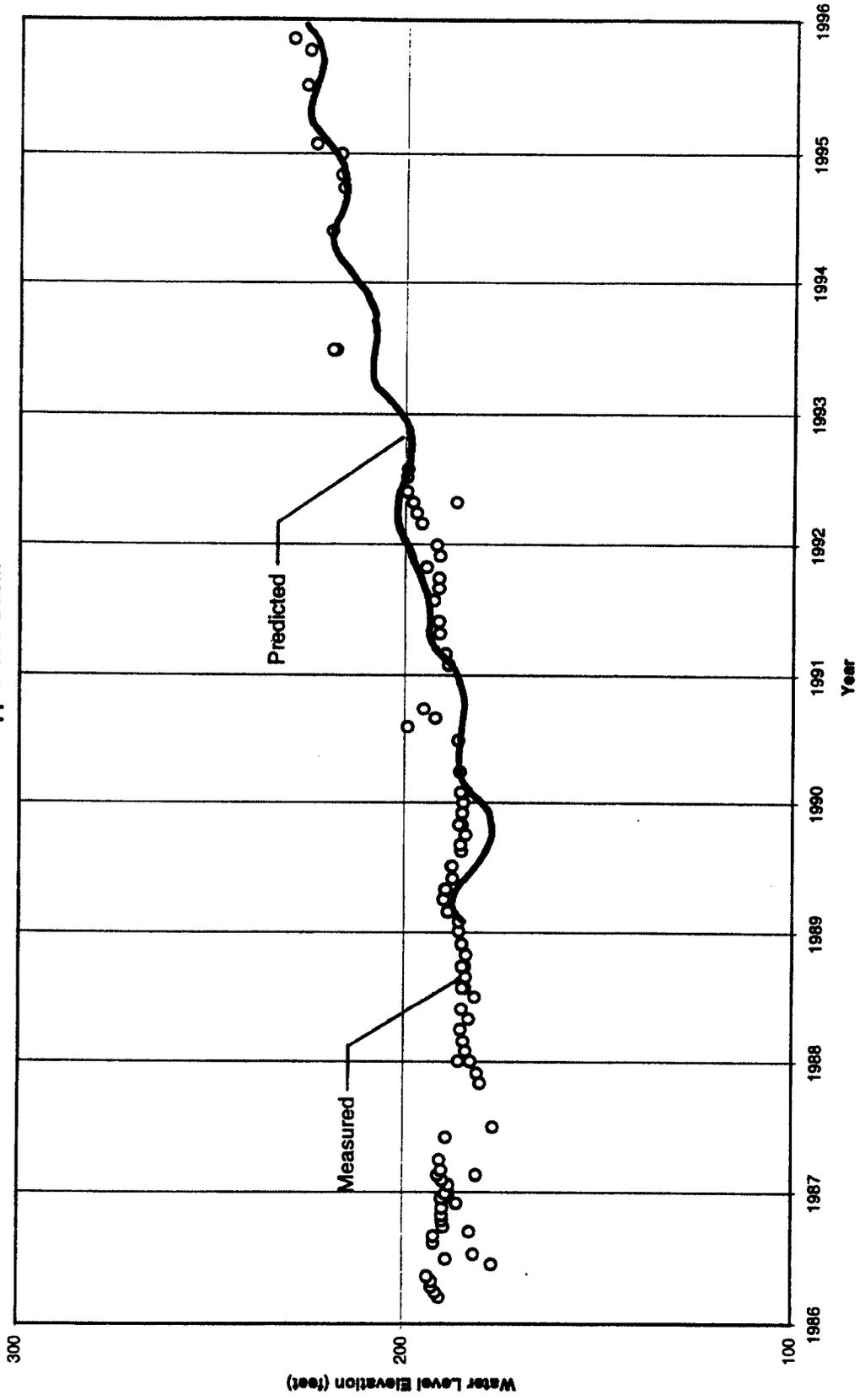
FIGURE 4. CALIBRATION WELL 23K1

**CAMROSA WATER DISTRICT  
Water Level Hydrograph Well 2N/20W-25D1  
SRMWC #3/Middle Sub-Basin**



**FIGURE 5. CALIBRATION WELL 25D1**

**CAMROSA WATER DISTRICT**  
**Water Level Hydrograph Well 2N/19W-19P2**  
**SRMWC#9/Upper Sub-Basin**



**FIGURE 6. CALIBRATION WELL 19P2**

CAMROSA WATER DISTRICT  
Water Level Hydrograph Well 2N/19W-19J3  
Stuart/Upper Sub-Basin

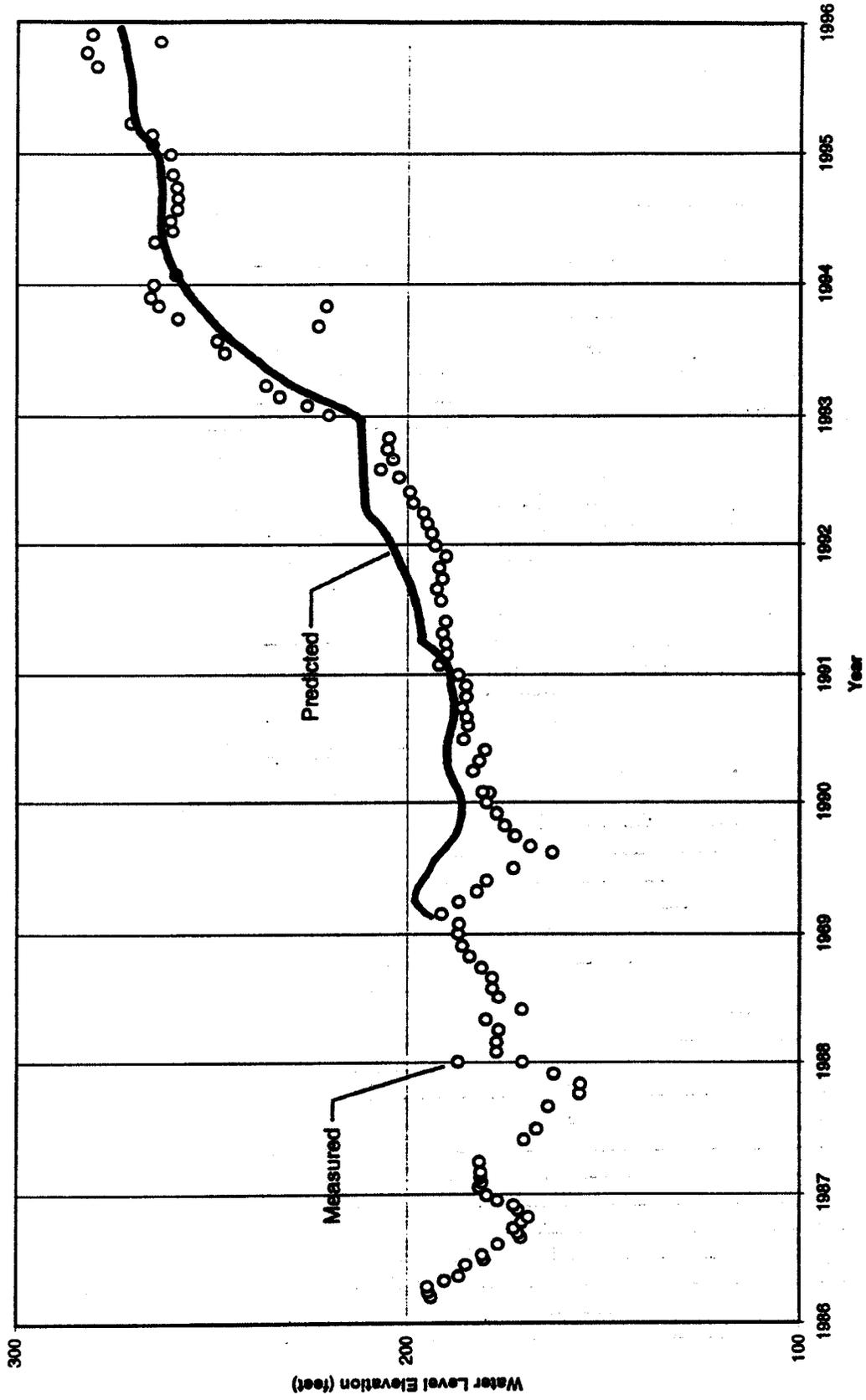


FIGURE 7. CALIBRATION WELL 19J3

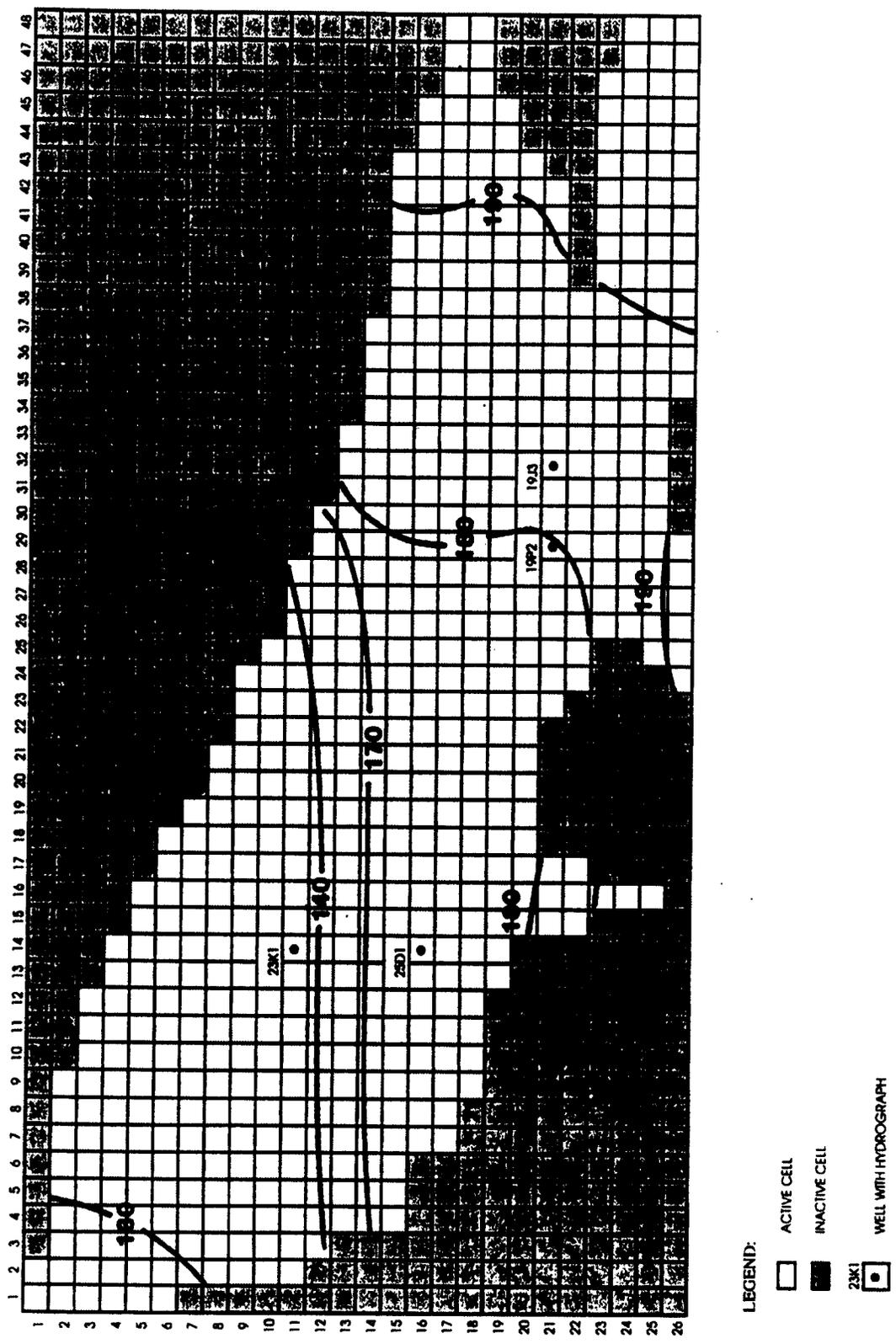


FIGURE 8. PREDICTED ELEVATION OF WATER TABLE, END OF 1989, IN FEET

# Santa Rosa Groundwater Basin

## Principal Components of Water Budget

(Average Values 1989-1995, Acre-feet/Year)

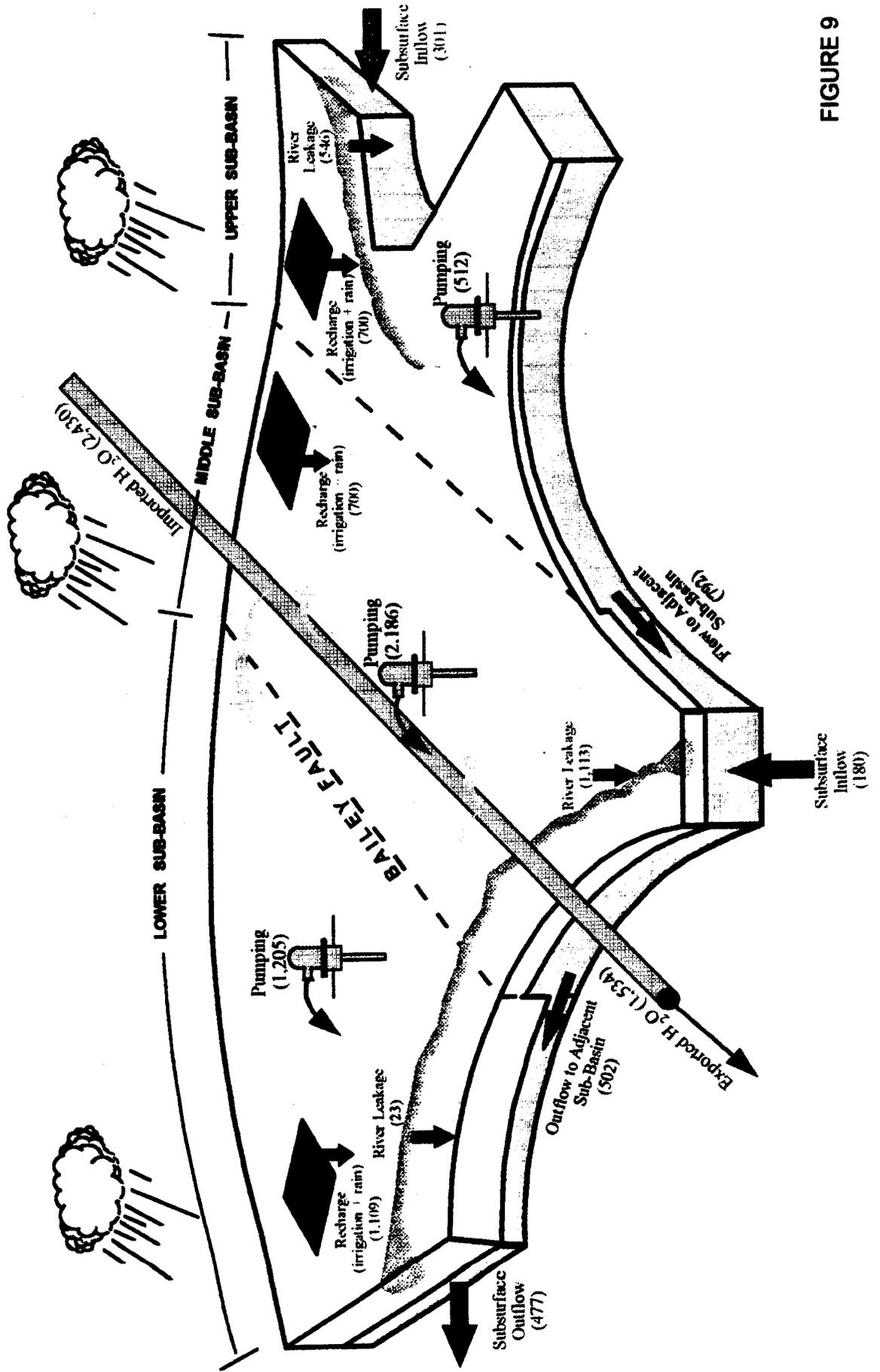


FIGURE 9

| Principal Components of Water Budget - Future Baseline W/out Inflow<br>Average Values, Acre-Feet/Year |             |             |             |             |
|---|-------------|-------------|-------------|-------------|
| Water Budget Component  | Sub-Basin   |             |             | Total       |
|   | Lower       | Middle      | Upper       |             |
| Subsurface Inflow   | 89          | 594         | 326         | 1009        |
| Recharge (Rain+ Applied)  | 966         | 612         | 485         | 2063        |
| River Leakage   | 23          | 1118        | 0           | 1141        |
| Inflow From Adjacent Sub-Basins   | 213M; 55U   | 3L; 603U    | 5M          | 879         |
| <b>Total Inflow</b>   | <b>1346</b> | <b>2930</b> | <b>816</b>  | <b>5092</b> |
| Subsurface Outflow  | 72          | 5           | 2           | 79          |
| Well Pumping  | 1315        | 2829        | 529         | 4673        |
| Outflow to Adj. Sub-Basins  | 3M          | 213L; 5U    | 55L; 603M   | 879         |
| <b>Total Outflow</b>  | <b>1390</b> | <b>3052</b> | <b>1189</b> | <b>5631</b> |

L = Lower Sub-Basin  
M = Middle Sub-Basin  
U = Upper Sub-Basin

Scenario Components:

1. Average rainfall, recent pumping/water levels
2. Without Arroyo Santa Rosa surface recharge

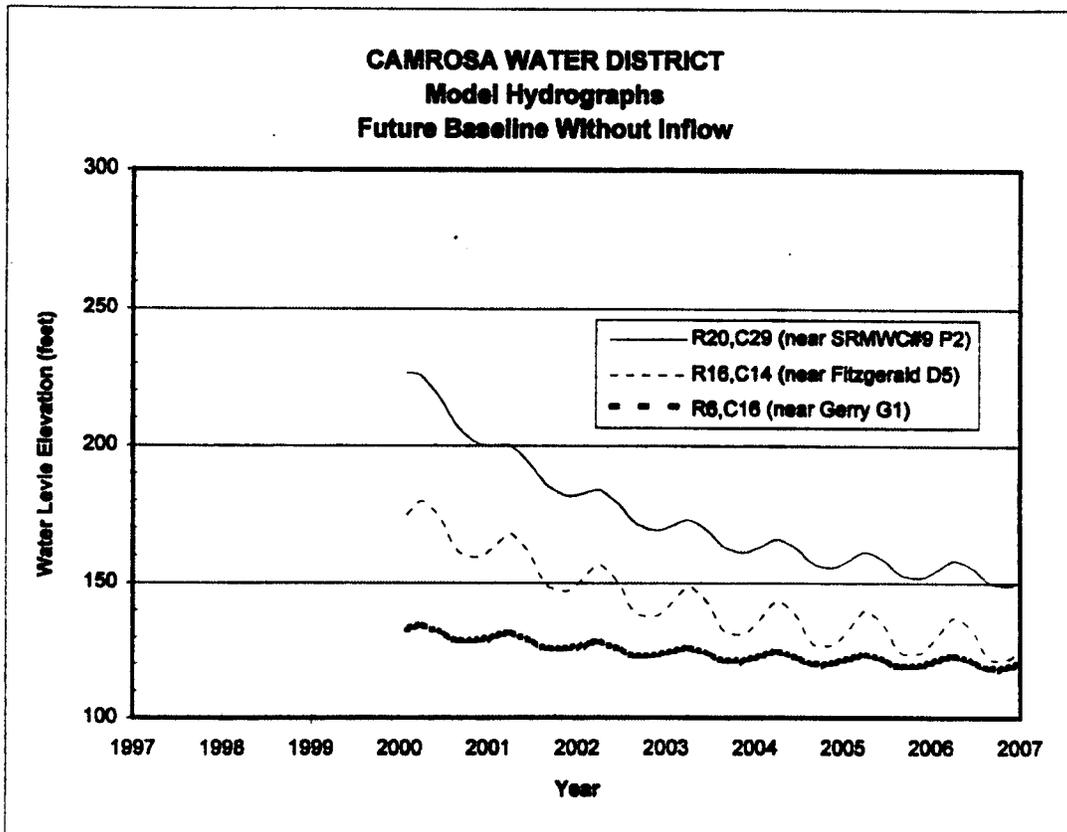


FIGURE 10. FUTURE BASELINE

| <b>Principal Components of Water Budget - Pumping Shift to Upper Basin</b> |                  |               |              |              |
|--|------------------|---------------|--------------|--------------|
| <b>Average Values, Acre-Foot/Year</b>                                      |                  |               |              |              |
| <b>Water Budget Component</b>  | <b>Sub-Basin</b> |               |              | <b>Total</b> |
|  | <b>Lower</b>     | <b>Middle</b> | <b>Upper</b> |              |
| Subsurface Inflow  | 0                | 18            | 261          | 279          |
| Recharge (Rain+ Applied)   | 966              | 612           | 485          | 2063         |
| River Leakage  | 23               | 1118          | 1634         | 2775         |
| Inflow From Adjacent Sub-Basins  | 619M; 93U        | 1218U         | 0            | 1930         |
| <b>Total Inflow</b>  | <b>1701</b>      | <b>2966</b>   | <b>2380</b>  | <b>7047</b>  |
| Subsurface Outflow   | 380              | 88            | 13           | 481          |
| Well Pumping   | 1315             | 2240          | 1118         | 4673         |
| Outflow to Adj. Sub-Basins   | 0                | 619L          | 93L; 1218M   | 1930         |
| <b>Total Outflow</b>   | <b>1695</b>      | <b>2947</b>   | <b>2442</b>  | <b>7084</b>  |

L = Lower Sub-Basin  
M = Middle Sub-Basin  
U = Upper Sub-Basin

Scenario Components:  
1. Average rainfall, recent pumping/water levels  
2. With Arroyo Santa Rosa surface recharge  
3. Shift 590 afy Middle to Upper Sub-Basin

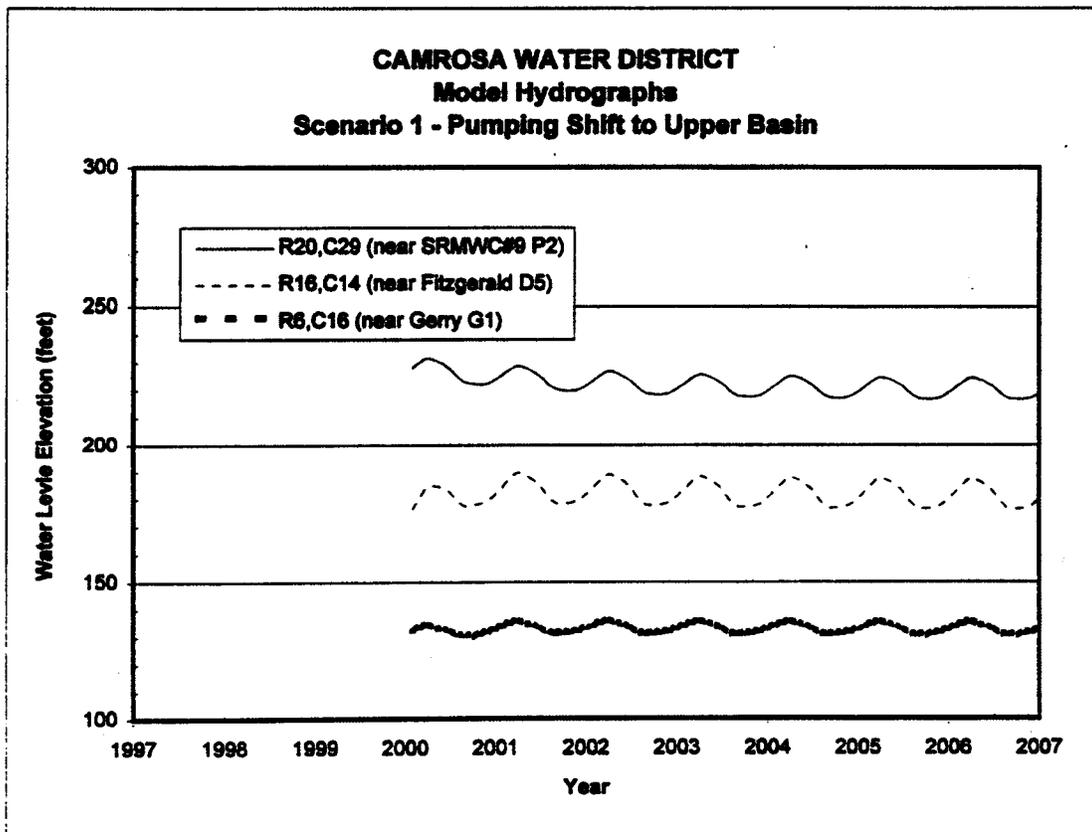


FIGURE 11. SCENARIO 1 - PUMPING SHIFT TO UPPER BASIN

| Principal Components of Water Budget - Pumping Shift W/out Inflow |             |             |             |             |
|---|-------------|-------------|-------------|-------------|
| Average Values, Acre-Foot/Year                                    |             |             |             |             |
| Water Budget Component  | Sub-Basin   |             |             | Total       |
|   | Lower       | Middle      | Upper       |             |
| Subsurface Inflow   | 44          | 560         | 338         | 942         |
| Recharge (Rain+ Applied)  | 966         | 612         | 473         | 2051        |
| River Leakage   | 23          | 1118        | 0           | 1141        |
| Inflow From Adjacent Sub-Basins                                   | 309M; 42U   | 237U        | 58M         | 646         |
| <b>Total Inflow</b>   | <b>1384</b> | <b>2527</b> | <b>869</b>  | <b>4780</b> |
| Subsurface Outflow  | 103         | 7           | 1           | 111         |
| Well Pumping  | 1315        | 2240        | 963         | 4518        |
| Outflow to Adj. Sub-Basins  | 0           | 481L        | 42L; 237M   | 760         |
| <b>Total Outflow</b>  | <b>1418</b> | <b>2728</b> | <b>1243</b> | <b>5389</b> |

L = Lower Sub-Basin  
M = Middle Sub-Basin  
U = Upper Sub-Basin

Scenario Components:

1. Average rainfall, recent pumping/water levels
2. Without Arroyo Santa Rosa surface recharge
3. Shift 590 afy Middle to Upper Sub-Basin

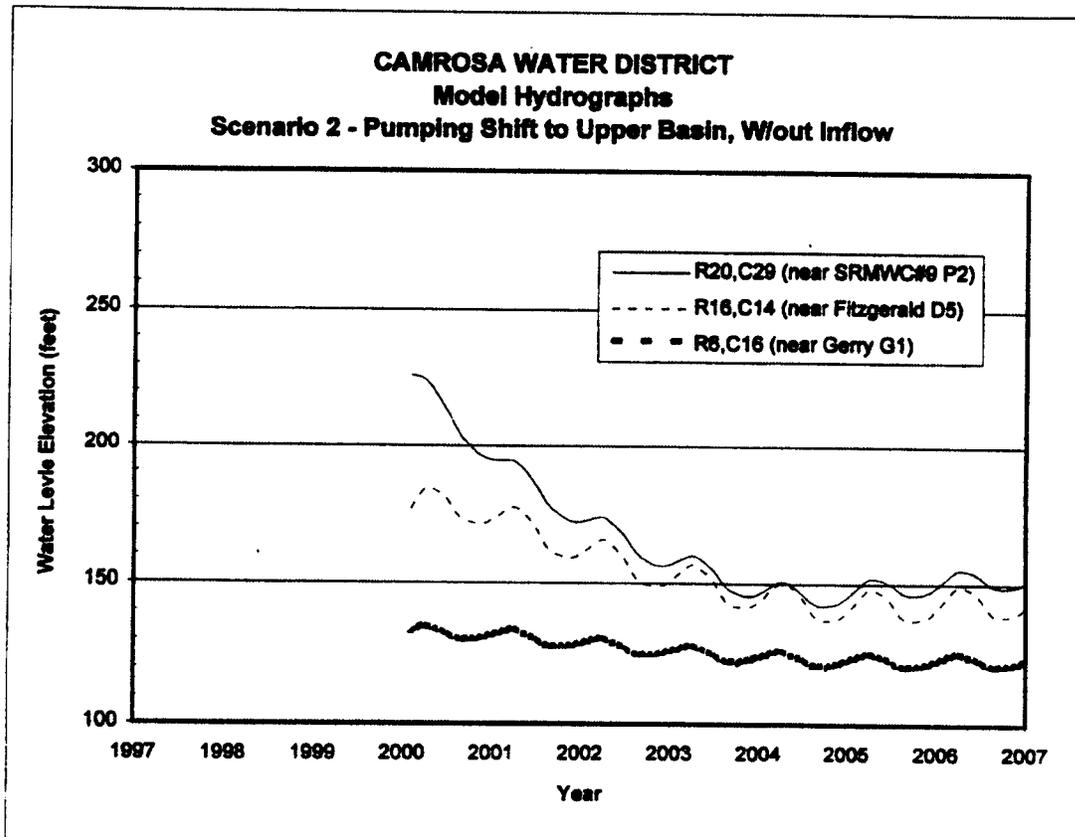


FIGURE 12. SCENARIO 2 - PUMPING SHIFT TO UPPER BASIN W/OUT INFLOW

| Principal Components of Water Budget - Future Baseline<br>Average Values, Acre-Foot/Year |             |             |             |             |
|--|-------------|-------------|-------------|-------------|
| Water Budget Component   | Sub-Basin   |             |             | Total       |
|  | Lower       | Middle      | Upper       |             |
| Subsurface Inflow  | 0           | 31          | 243         | 274         |
| Recharge (Rain+ Applied)   | 966         | 612         | 485         | 2063        |
| River Leakage  | 23          | 1118        | 1634        | 2775        |
| Inflow From Adjacent Sub-Basins  | 539M; 108U  | 1687U       | 0           | 2334        |
| <b>Total Inflow</b>  | <b>1636</b> | <b>3448</b> | <b>2362</b> | <b>7446</b> |
| Subsurface Outflow   | 320         | 76          | 17          | 413         |
| Well Pumping   | 1315        | 2829        | 529         | 4673        |
| Outflow to Adj. Sub-Basins   | 0           | 539L        | 108L; 1687  | 2334        |
| <b>Total Outflow</b>   | <b>1635</b> | <b>3444</b> | <b>2341</b> | <b>7420</b> |

L = Lower Sub-Basin  
M = Middle Sub-Basin  
U = Upper Sub-Basin

Scenario Components:  
1. Average rainfall, recent pumping/w+N19water leve  
2. With Arroyo Santa Rosa surface recharge

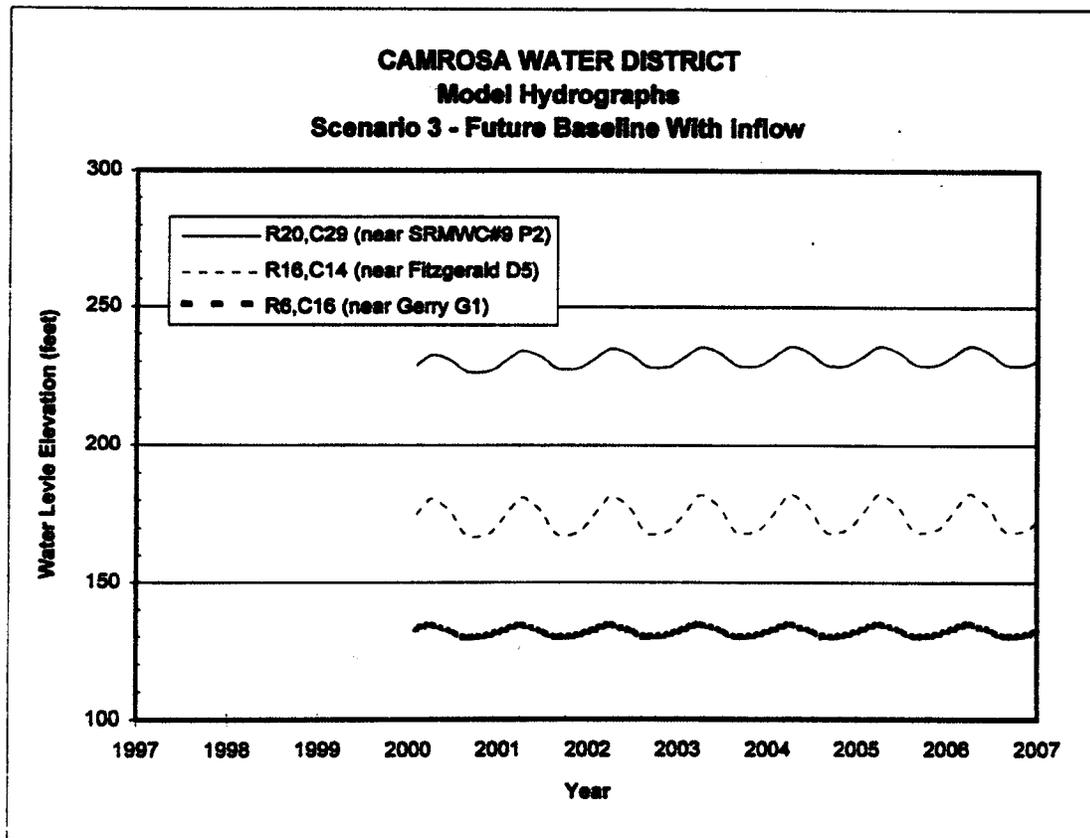


FIGURE 13. SCENARIO 3 - FUTURE BASELINE WITH INFLOW

| Principal Components of Water Budget - Weather Variation |             |             |             |             |
|--|-------------|-------------|-------------|-------------|
| Average Values, Acre-Foot/Year                           |             |             |             |             |
| Water Budget Component                                   | Sub-Basin   |             |             | Total       |
|  | Lower       | Middle      | Upper       |             |
| Subsurface Inflow  | 49          | 339         | 290         | 678         |
| Recharge (Rain+ Applied)                                 | 910         | 573         | 445         | 1928        |
| River Leakage  | 23          | 1118        | 934         | 2075        |
| Inflow From Adjacent Sub-Basins                          | 335M;75U    | 1070U       | 0           | 1480        |
| <b>Total Inflow</b>                                      | <b>1392</b> | <b>3100</b> | <b>1669</b> | <b>6161</b> |
| Subsurface Outflow                                       | 86          | 10          | 6           | 102         |
| Well Pumping   | 1315        | 2829        | 529         | 4673        |
| Outflow to Adj. Sub-Basins                               | 0           | 335L        | 75L;1070M   | 1480        |
| <b>Total Outflow</b>                                     | <b>1401</b> | <b>3174</b> | <b>1680</b> | <b>6255</b> |

L = Lower Sub-Basin  
M = Middle Sub-Basin  
U = Upper Sub-Basin

Scenario Components:  
1. Recent pumping/water levels  
2. Years 1-3, 1989 rain; years 4-7, avg. rain  
3. Years 1-3, no Arroyo Santa Rosa recharge

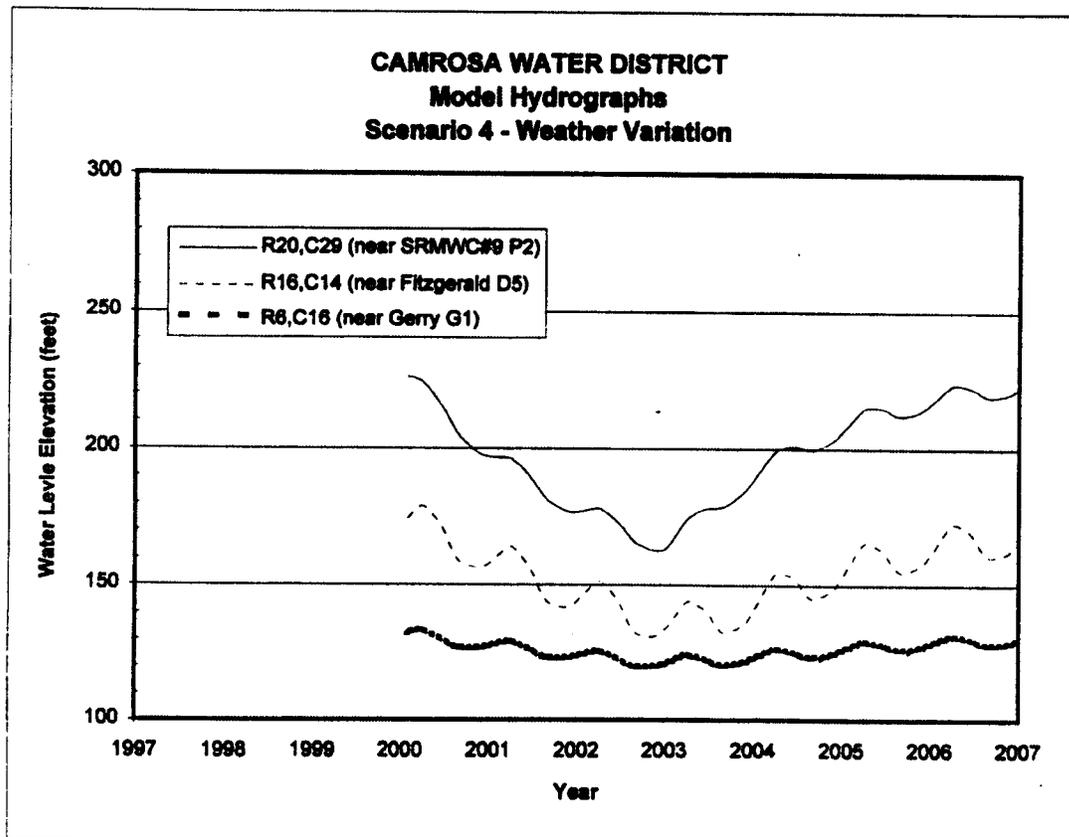


FIGURE 14. SCENARIO 4 - WEATHER VARIATION

# Appendix 1

## General Well Information

**Camrosa Water District  
Groundwater Modeling Study  
General Well Information**

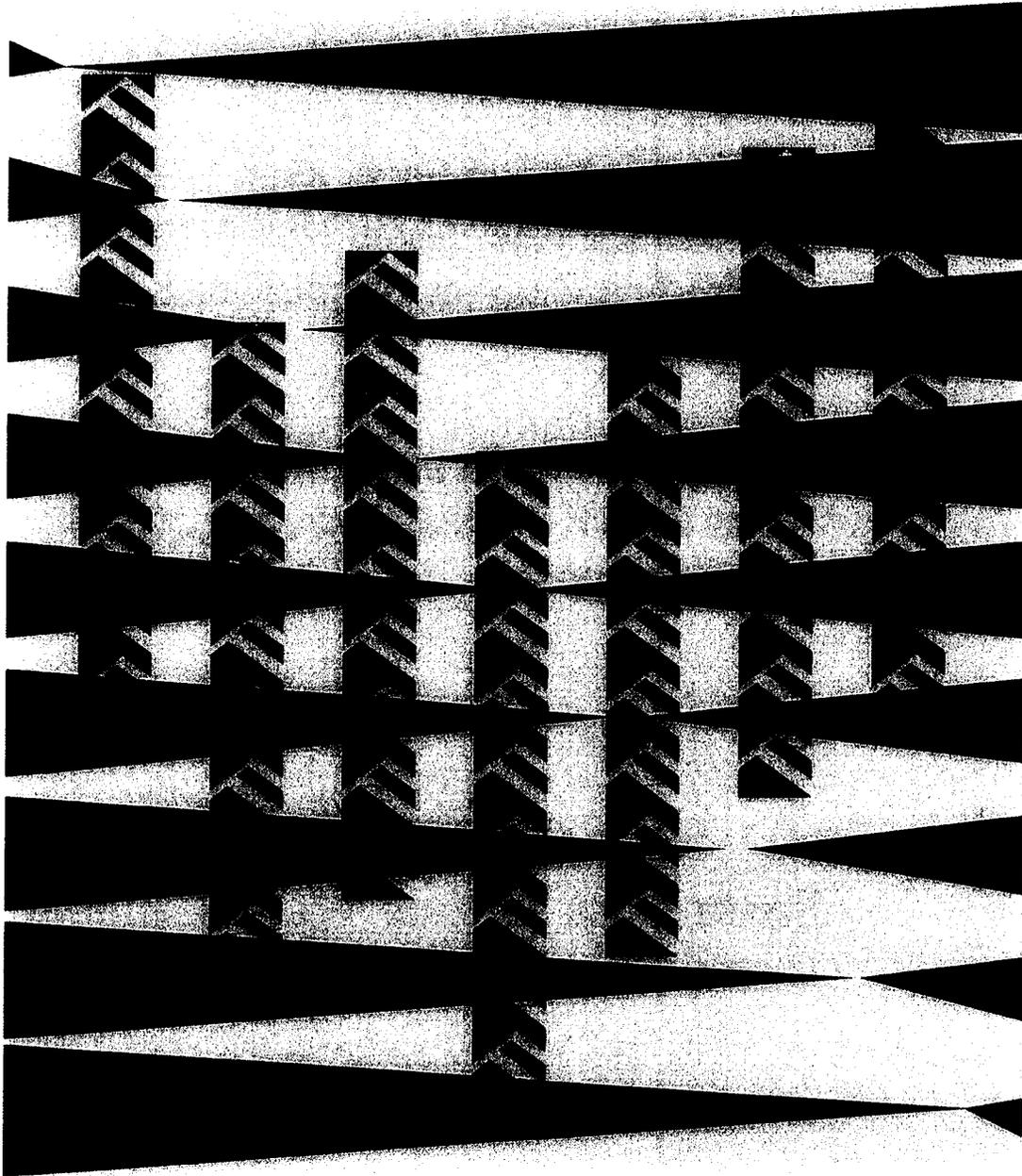
| State Well No. | Well Name     | Drill Date | Diameter | Depth | Township | Range | Section | Parcel | Well Elev. | Lithology (Y/N) | Water Level Period | Extraction Period |
|----------------|---------------|------------|----------|-------|----------|-------|---------|--------|------------|-----------------|--------------------|-------------------|
| 02N/19W-19J01  |               |            | 12       | 354   |          |       |         |        | 301        | Y               | 1989               | None              |
| 02N/19W-19J03  | Stuart        |            |          |       | 02N      | 19W   | 19      | J      | 315        | N               | 1986-93            | None              |
| 02N/19W-19J04  |               | 07/17/51   | 14       | 520   | 2N       | 19W   | 19      |        |            | Y               | 1951               | None              |
| 02N/19W-19L01  | Jones         |            | 14       | 515   | 02N      | 19W   | 19      | L      | 347        | N               | 1986-88            | None              |
| 02N/19W-19N01  |               |            | 12       | 180   | 02N      | 19W   | 19      | N      | 237.9      | N               | None               | None              |
| 02N/19W-19N02  |               | 11/01/49   | 12       | 400   |          |       |         |        | 240        | Y               | None               | 1993              |
| 02N/19W-19P01  | SRMWC 7       | 01/01/28   |          |       | 02N      | 19W   | 19      | P      | 276.6      | N               | 1986-89            | None              |
| 02N/19W-19P02  | SRMWC 9       | 03/29/40   | 16       | 393   | 02N      | 19W   | 19      | P      | 280        | Y               | 1986-93            | 1989-93           |
| 02N/19W-19Q01  |               | 02/25/29   |          | 438   | 2N       | 19W   | 19      | Q      | 265        | Y               | None               | None              |
| 02N/19W-19Q02  | Nicholson     |            |          |       | 02N      | 19W   | 19      | Q      | 290        | N               | 1986-93            | 1993              |
| 02N/19W-19R01  |               |            |          | 300   | 02N      | 19W   | 19      | R      | 295.26     | N               | None               | None              |
| 02N/19W-19R02  |               | 06/01/26   | 16       | 380   | 2N       | 19W   | 19      | R      | 291.4      | Y               | None               | None              |
| 02N/19W-20K01  |               | 08/08/30   | 16       | 237   | 02N      | 19W   | 20      | K      | 318.3      | Y               | None               | None              |
| 02N/19W-20K02  | bogus         |            |          |       | 02N      | 19W   | 20      | L      |            | N               | None               | None              |
| 02N/19W-20L01  |               | 01/01/28   | 16       | 275   | 02N      | 19W   | 20      | M      | 302.5      | Y               | None               | 1993              |
| 02N/19W-20M01  | Snow          | 01/01/15   | 16       | 500   | 02N      | 19W   | 20      | M      | 320.6      | Y               | 1986-93            | 1982-92           |
| 02N/19W-20M03  | Ventura Farms | 08/01/59   | 10       | 300   | 02N      | 19W   | 20      | M      | 322        | Y               | 1986-93            | 1982-94           |
| 02N/19W-20M04  | Penny         | 03/01/62   | 10       | 464   | 02N      | 19W   | 20      | N      | 325        | Y               | 1986-93            | 1982-92           |
| 02N/19W-20N01  |               |            |          |       | 02N      | 19W   | 20      | N      | 305.55     | N               | None               | None              |
| 02N/19W-20N02  |               | 11/01/51   | 16       | 575   | 02N      | 19W   | 21      | C      | 316.22     | Y               | None               | 1993              |
| 02N/19W-21C01  |               | 12/01/29   | 18       | 157   | 02N      | 19W   | 21      | C      | 490.8      | Y               | None               | None              |
| 02N/19W-21C02  |               | 01/01/26   | 18       | 411   | 02N      | 19W   | 21      | E      | 489.6      | Y               | None               | None              |
| 02N/19W-21E01  |               | 11/01/29   | 18       | 78    | 02N      | 19W   | 21      | E      | 420        | Y               | None               | None              |
| 02N/19W-21E02  |               |            | 12       | 60    | 02N      | 19W   | 21      | F      | 438        | Y               | None               | None              |
| 02N/19W-21F01  |               | 08/19/47   | 12       | 168   |          |       |         |        |            | Y               | None               | None              |
| 02N/19W-21F02  |               | 04/02/38   | 10       | 500   | 02N      | 19W   | 21      | H      |            | Y               | None               | None              |
| 02N/19W-21H01  | Maulhardt     | 10/01/50   | 14       | 888   | 02N      | 19W   | 21      | K      | 535        | Y               | 1986-93            | None              |
| 02N/19W-21K01  | D. Conner     | 06/09/87   | 6        | 200   |          |       |         |        | 600        | Y               | None               | 1993              |
| 02N/19W-22A01  |               | 01/26/39   | 16       | 575   | 02N      | 20W   | 22      | K      |            | Y               | None               | None              |
| 02N/20W-22J01  | Lamb 2        | 04/01/91   | 16       | 915   | 02N      | 20W   | 23      | G      |            | Y               | None               | 1989-93           |

## **Appendix E – Santa Rosa Basin Groundwater Management Plan**

- Santa Rosa Basin Groundwater Management Plan



# Santa Rosa Basin Groundwater Management Plan



Camrosa Water District ♦ Santa Rosa Mutual  
Water Company ♦ Property Owners  
April 24, 1997

**Santa Rosa Basin  
Groundwater Management Plan**

**For Areas Within the Arroyo Santa Rosa Portion of  
the Santa Rosa Groundwater Basin Not Within the  
Boundaries of the Fox Canyon Groundwater  
Management Agency**

**Including, as an appendix, *Santa Rosa Groundwater Basin  
Management Plan Update, Final Report, April 24, 1997,*  
Boyle Engineering Corporation**

**Camrosa Water District  
Santa Rosa Mutual Water Company  
Property Owners**

**April 24, 1997  
Second Edition**

**7385 Santa Rosa Road ♦ Camarillo, California 93012**

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**I. GENERAL BACKGROUND**

## **INTRODUCTION**

The Santa Rosa Basin Groundwater Management Plan (Plan) is a cooperative effort among the Camrosa Water District, the Santa Rosa Mutual Water Company, and property owners with groundwater rights overlying the basin. The Plan Council was formally formed in August of 1996 by the signatories to the Memorandum of Understanding Regarding Groundwater Basin Management in the Arroyo Santa Rosa Groundwater Basin (MOU) for the purpose of developing this Plan. The Council has met regularly throughout the development of the Plan and the efforts of many of the signatories to the MOU are reflected in the contents.

The Plan uses the authority of the Groundwater Management Act of the California Water Code (Section 10750, et seq.), enacted in 1992 as Assembly Bill 3030. The Camrosa Water District has the authority to adopt and implement this Plan under the guidelines specified in the California Water Code. Camrosa, however, desires the cooperation of all of the parties to the MOU in the implementation and administration of the Plan.

## **INTENT**

It is the intent of all of the parties to the Santa Rosa Groundwater Management Plan to optimize the beneficial uses of the groundwater basin, preserve and enhance water quality, and assure preservation of the resource for future generations. All efforts towards our goal shall be incremental. Each incremental action shall be measured and the results evaluated prior to further action. No action shall be taken which is detrimental to neighboring water bodies, the environment, or individual pumpers without agreed mitigating measures.

It is not the intent of the Plan to form a Groundwater Management Agency or to infringe on the property rights of individual landowners overlying the Santa Rosa Basin. Implementation of the Plan or any aspects of the Plan, which impact private property, shall be accomplished through a combination of education and cooperation rather than regulation and coercion. It is not the intention of the Plan to direct land use policy, although the information generated by the Plan is available to those public agencies charged with land use planning. Camrosa and Santa Rosa Mutual shall share the financial responsibilities of Plan implementation based upon separate agreements.

## **THE BASIN**

The Santa Rosa hydrologic sub-unit (State designation 4-7) covers an area of 12.5 square miles of which the overall groundwater basin occupies approximately 5.9 square miles. The surface drainage area is bounded on the north by the Las Posas Hills, on the south by the Conejo Hills, on the east by the Moncliff Ridge, and the west by the Pleasant Valley Summit. The basin within the Santa Rosa Valley is generally defined by structural and geologic conditions. The basin is bounded on the north by the Simi Fault, and on the south by the outcrop of the Conejo Volcanics. The western boundary is formed by

narrowing caused by a low, north trending ridge of volcanic rocks. The eastern boundary is located at the narrow valley of the Arroyo Santa Rosa; the Tierra Rejada hydrologic sub-unit lies to the east of the divide. Two distinct regions of the basin exist on either side of the Bailey Fault, which hydrogeologically divides the western third of the basin from the eastern two-thirds.

Though the Santa Rosa Groundwater Basin encompasses almost the entire underlying substructures of the Santa Rosa Valley, the areas west of the Bailey Fault can be considered to be hydrogeologically separate from the area east of the fault. The formations to the west of the Bailey Fault have much more in common geologically with the formations lying to the west than they do with the formations to the east.<sup>1</sup> The western third of the basin consists of a combination of formations found in the Fox Canyon/San Pedro geologic regions of the County. Thus, the Fox Canyon Groundwater Management Agency (GMA) has assumed management of the operation of the part of the Santa Rosa Basin lying west of the Bailey Fault. This document is the Plan for management of the operation of the remainder of the basin, identified throughout the Plan as the Arroyo Santa Rosa Groundwater Basin.

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<sup>1</sup> "Geology and Groundwater Supply of Camrosa County Water District"; Thomas L. Bailey, March, 1969

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**II. THE SANTA ROSA GROUNDWATER BASIN**

## **DESCRIPTION**

The Santa Rosa Groundwater Basin is a broad, elliptical, and flat-bottomed valley. The dominant structural element of the basin is the Santa Rosa Syncline, a downward trending fold lying east to west and extending from the east end of Tierra Rejada Valley westward into Pleasant Valley. Several major faults occur in the Santa Rosa Basin, the largest of which is the Simi Fault Zone. This zone of faulting has resulted in displacement of the geologic strata of 500 to 5,000 feet along the northern edge of the basin. The other major fault, the Bailey Fault, runs northeast to southwest near the western end of the basin, and separates the northwestern third of the basin from the rest of the basin. The Bailey Fault is a geologic and political boundary within the basin.

Groundwater in the Santa Rosa Basin is extracted from sediments of Holocene, Pleistocene, Upper Pleistocene, and Miocene age. There are four major water-bearing zones within the basin; conglomerate beds within the Conejo Volcanics, conglomerate and sandstone within the Santa Margarita Formation, sand and gravel in the Saugus Formation, and alluvium. Structurally, the Conejo Volcanics underlie the basin and form the base on which the other formations lie. The Santa Margarita Formation is peculiar to the area of the basin lying east of the Bailey Fault and lies atop the Conejo Volcanics. Over the Santa Margarita Formation lies a confining layer and over that, the alluvium. The area west of the Bailey Fault consists primarily of the Saugus Formation, a combination of Fox Canyon and San Pedro Formations. The Saugus Formation evident within the Santa Rosa Basin is the result of an outcropping of the larger Fox Canyon and San Pedro Formations west of the valley. This outcropping pinches off at the western end of the valley and then fans out into the valley, stopping at the Bailey Fault barrier. Due to the pinching off of the Saugus Formation, the Santa Rosa Groundwater Basin is considered to be a confined basin, separate from the larger western water bearing zones.<sup>2</sup>

Although there are few wells which penetrate into the Conejo Volcanics, of special interest to this Plan are the alluvium, Santa Margarita and Saugus Formations from which the majority of groundwater pumping occurs. It is also important to recognize the effects of the Bailey Fault, both hydrogeologically and politically, on groundwater production within the Basin.

### **Saugus Formation**

The thickness of the Saugus Formation ranges from approximately 300 to 900 feet. Wells perforated into the Saugus Formation have specific capacities (well yield per foot of drawdown) ranging from 2.3 gallons per minute per foot (gpm/ft) to 100 gpm/ft. Water in the Saugus Formation occurs under leaky artesian conditions.

---

<sup>2</sup> "Santa Rosa Groundwater Basin Management Plan, Final Draft"; Boyle Engineering, June 1987. Also, "Geology and Groundwater Supply of Camrosa County Water District"; Thomas L. Bailey, March, 1969

### **Santa Margarita Formation**

East of the Bailey Fault and underlying the older alluvium aquifer is the Santa Margarita Aquifer. The thickness of this aquifer is 700 feet in the center of the Basin and pinches out against the Conejo Volcanics to the south. Specific capacities of wells perforated into this formation range from 3 gpm/ft. to 75 gpm/ft.

### **Alluvium**

The alluvium layer on the east side of the Bailey Fault is old alluvium of Pleistocene age. This unit ranges in thickness from 300 to 600 feet. A pump efficiency test performed in the mid-1980's on Santa Rosa Mutual Well #10 (2N/20Q3) indicates a specific capacity of 19 gpm/ft.

### **Bailey Fault Zone**

The Bailey Fault runs northeast and southwest through the Santa Rosa Valley, separating the primary Saugus Formation from the Santa Margarita Formation. A thinner layer of Saugus Formation exists east of the Bailey Fault, above the Santa Margarita Formation. However, the Saugus Formations on either side of the Bailey Fault are hydrogeologically separated. There is a particularly noticeable difference in water levels across the Bailey Fault. Water levels east of the fault are 60 to 80 feet higher than the western portion, indicating a poor transmittability of water across the fault.<sup>3</sup>

### **Inferred Semi-Permeable Boundary**

In February 1997, Boyle Engineering issued a report which describes modeling efforts to determine yield of the overall Basin. The report identifies a zone of low permeability which is inferred to be either fault-related, similar to conditions associated with the Bailey Fault, or stratigraphic in origin (low permeability sediments). The zone was identified when rising water levels observed in several wells in the eastern most areas of the Basin did not correspond with stable water levels observed in the western area.

## **YIELD**

The yield, or safe yield, of the Santa Rosa Groundwater Basin, including areas east and west of the Bailey Fault, is approximately 4,200 AFY. Prior to 1964, water levels in the Santa Rosa Basin had been rapidly declining under an average annual extraction of approximately 3,500 AF. This extraction rate was believed to be overdrafting the basin by about 600 AFY. With the initiation of discharge of treated wastewater to Arroyo Conejo in 1964, water levels within the basin began to recover. Recovery to pre-overdraft conditions was established by 1970 and water levels have remained relatively stable since that time. Storage capacity of the entire basin, both east and west of the Bailey Fault, is estimated to be 170,000 AF.<sup>4</sup>

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<sup>3</sup> "Santa Rosa Groundwater Basin Management Plan, Final Draft"; Boyle Engineering, June, 1987

<sup>4</sup> "Santa Rosa Groundwater Basin Management Plan Update"; Boyle Engineering, January, 1997

## **QUALITY**

Water quality degradation in the Santa Rosa Groundwater Basin continues to be a significant concern. Since 1987, general mineral concentrations have increased slightly at some wells, while nitrate-nitrogen ion concentrations continue to be reported at levels exceeding State standards for potable water quality.

Historically, nitrate concentrations (NO<sub>3</sub>-N) occasionally exceed State standards for certain wells within the basin. Speculation attributes these localized occurrences of elevated concentrations of nitrate to percolation of residues of nitrogen-based fertilizers, wells with inadequate sanitary seals, excessive application of fertilizers, effluent from septic tanks, and effluent from the Thousand Oaks Hill Canyon Treatment Plant.

Total dissolved solids (TDS) concentrations have remained fairly consistent since the mid-1980's. In general, TDS concentrations have ranged between 600 and 1,000 PPM.

Recently, chloride sampling has become part of an annual water quality review by Camrosa. Chloride concentrations in the samples collected in July 1992 were found to range from 128 PPM to 184 PPM. Based on available data, chloride concentration levels range from 117 PPM to 140 PPM in the geographical center of the basin.

## **HISTORICAL USE**

The groundwater levels of the Santa Rosa Groundwater Basin experienced a steady decline averaging five feet per year from the early 1950's to the early 1960's. The decline was due to heavy pumping by agricultural concerns and low rainfall during the period. When discharges from Hill Canyon Treatment Plant into the Conejo Creek began in the early 1960's, water levels in the basin began rising rapidly. The average water level rise in the Saugus Formation has been 2 to 3 feet per year, primarily attributed to the percolation and recharge of treatment plant effluent. The water level rise in the Santa Margarita Formation has been more dramatic with a range of rise between 5 and 10 feet per year. The central portion of the basin, east of the Bailey Fault has received the greatest benefit of effluent percolation and recharge. Increased rainfall between 1964 and 1980 also contributed to water level rise.

The Santa Rosa Basin has historically been devoted to agricultural pumping. Principal crops in the area are citrus and avocados. Residential land use has increased since the 1960's, however, density is low. No sewage collection system has been planned or designed for the area east of the City of Camarillo boundaries. Septic systems are used throughout the Santa Rosa Valley.

Development of groundwater resources in the Santa Rosa Basin began in the early 1900's. Over 100 test holes and wells have been drilled throughout the basin and approximately 60 were completed as water wells. As many as 30 wells are still active. There are three

major producers of groundwater in the Santa Rosa Basin: individual well operators, Camrosa Water District, and Santa Rosa Mutual Water Company. Santa Rosa Mutual supplies potable domestic and agricultural water from 4 wells. The Santa Rosa Mutual wells are located in the central portion of the basin, perforated into the alluvium or Santa Margarita aquifer layers. Camrosa presently operates 4 wells in the central portion of the basin, perforated into both the alluvium and Santa Margarita layers. Private pumping is located throughout the basin.

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### **III. ORGANIZATIONAL STRUCTURE**

## **THE COUNCIL**

The Santa Rosa Groundwater Management Council (Council) is comprised of three primary groups with interest in the Santa Rosa Basin and are signatories to the MOU. These groups are: the Santa Rosa Mutual Water Company; the Camrosa Water District; and the owners of private and public properties with the associated water rights, directly overlying the groundwater basin subject to the Plan or their assignees.

### **Santa Rosa Mutual Water Company (SRMWC)**

The Santa Rosa Mutual Water Company (SRMWC) is an investor-owned mutual water company. SRMWC sole source of water is the Santa Rosa Basin. The SRMWC provides both domestic and agricultural water service to its shareholders. SRMWC is managed by a board of directors elected by the shareholders. Two SRMWC Board Members sit on the "Council."

### **Camrosa Water District (Camrosa)**

Camrosa Water District (Camrosa) is a publicly-owned water utility formed under the authority of the County Water District Section of the California Water Code. Camrosa produces water from the Santa Rosa Basin; as well as, the Tierra Rejada and Pleasant Valley Basins; and purchases imported water from Calleguas Municipal Water District. Camrosa provides domestic and agricultural water service throughout the Santa Rosa - Valley, the Tierra Rejada Valley, and the eastern portion of the City of Camarillo. Camrosa is managed by a five member Board of Directors elected at large by the District's residents. Two Camrosa Board Members sit on the "Council".

### **Property Owners**

The owners of private or public property with the associated water rights directly overlying the groundwater basin subject to the Plan or their assignees operate individually owned wells throughout the basin. The Property Owners include large agricultural operations, small farms, and idle lands. Some Property Owners have wells which are inactive, some produce only a portion of the water they require and receive the balance from Camrosa or from the Conejo Creek. There are others who depend completely on Santa Rosa Basin water. Each Property Owner who has signed the MOU sits on the Council. Any property owner with associated water rights overlying the Basin may, at any time, join the council by signing the MOU.

## **MEETING SCHEDULE AND DETERMINATION OF QUORUM**

Regular Council meetings shall be scheduled a minimum of once each year. A quorum of the Council shall be one member from SRMWC, one member from Camrosa, and Property Owners representing greater than 50% of the combined irrigatable acreage of the Council Member Property Owners.

### **Brown Act**

The Council shall conduct meetings and take all actions in compliance with the Brown Act (California Government Code 54953) of the State of California.

## **VOTING PROCEDURES**

### **Qualifying Property**

Qualifying Property shall mean the portions of parcels of land, which physically overlie the Santa Rosa Groundwater Basin and retain the associated overlying groundwater rights. An initial determination of the parcels or portions of parcels included within the basin shall be made by reviewing existing parcel maps and basin descriptions. Voting of the Property Owners shall be apportioned based upon the number of irrigatable acres within the Qualifying Property.

The official apportionment shall be approved by the full Council and remain in force until amended by the Council. The apportionment shall be reviewed no less than every two years by the Executive Committee. Upon the recommendation of the Executive Committee a re-apportionment shall be reviewed and approved by the full Council. The current apportionment shall be approved at the first Council Meeting.

### **Vote of the Council**

Each of the three interest groups on the Council shall have one vote on issues before the body. SRMWC shall have one vote, Camrosa shall have one vote, and the Property Owners shall collectively have one vote.

Immediately following the opening of each Council meeting SRMWC and Camrosa Council members will declare the Council member authorized to cast the organizations' vote. That member and only that member will be recognized to vote for the organization throughout the meeting.

The Property Owners shall also declare one member of the Property Owner's Executive Committee representatives to be recognized to vote for the group. However, prior to each vote any Property Owner sitting on the Council may request a roll call of the Property Owners. Following the roll call, the vote of the Property Owners shall be cast to reflect the choice of more than 50% of the combined irrigatable acreage of the Property Owners on the Council.

All actions of the Council shall require three affirmative votes.

### **Absentee Voting Procedures**

Prior to each Annual Council Meeting an agenda and an agenda packet shall be distributed to each Council Member. The Property Owners Packets shall also include a

ballot listing each action item. The Property Owner may submit the ballot to the Chairman prior to the meeting. If a role call is ordered on any item, the Property Owners' absentee Ballots for that item will be counted. If no ballot is submitted and the Property Owner is not present, the vote shall be counted as an affirmative for that item.

#### **Assignments**

Property Owners may assign their apportioned vote to any person authorized to act in their behalf. This person may be an agent of the Property Owner or another member of the Council who is also a property Owner. Assignments must be made in writing on a form provided by the Council and submitted to the Council Chairperson prior to Council meetings. The Chair shall announce prior to consideration of action items any assignment of voting authority.

## **OFFICERS OF THE COUNCIL**

#### **Chair and Vice Chair**

The Executive Committee shall select a Chairperson and a Vice-Chairperson for terms of two years each. The Chairperson shall preside over both the Executive Committee meetings and the Council meetings. The Vice-Chairperson shall act as Chairperson in his/her absence.

#### **Executive Committee**

The Executive Committee of the Council shall be two representatives of SRMWC, two representatives of Camrosa, and two representatives of the Property Owners. The representatives of the Property Owners shall be selected by the Property Owners at each annual Council meeting.

The Executive Committee shall meet regularly four times per year, and Special Meetings may be scheduled as necessary.

#### **IV. GOALS AND CONSTRAINTS OF THE PLAN**

## **GENERAL CONSTRAINTS**

The Santa Rosa Basin Groundwater Management Plan shall have some generally accepted (and Council approved) limitations and constraints. In general, elements of the plan which call for any change in the status quo shall not be implemented except in an incremental fashion, accompanied by regular monitoring and reporting of potential impacts. Current evidence does not show a state of the basin, such as overdraft, which would necessitate immediate action to rectify.

The elements of the Plan shall not adversely impact the environment and shall not violate Federal or State regulations. An Environmental Impact Report or Impact Statement, where required, shall be completed for each element of the plan as it is implemented.

Elements of the Plan shall not result in overdrafting of the basin. Elements of the Plan shall not adversely impact neighboring water bodies or individual pumpers.

## **MAXIMIZATION OF BENEFICIAL USE**

The Santa Rosa Basin, including both portions lying east and west of the Bailey Fault, has an estimated storage capacity of 170,000<sup>5</sup> acre feet of water. The usable storage is some fraction of this amount. If overdrafted the storage capacity may be permanently lost to ground subsidence, high concentrations of salts or other dissolved solids. The total usable storage is a function of the limitations on total drawdown of the basin and the rate of recovery.

We do know that in the late 1950's and early 1960's that the basin was drawn down to historical lows. We also know that the basin recovered very rapidly resulting from a combination of rainfall, start-up of the Hill Canyon Wastewater Treatment Plant, and importation of State Project Water to both the Conejo and the Santa Rosa Valleys.

When groundwater was the only source of water to the area it was critical that adequate usable storage was maintained to meet the water demands of all users throughout the most critical dry periods. With the importation of State Project Water and reclamation of wastewater the opportunity to conjunctively use these various water resources to the optimization of each could result in additional yield from the Santa Rosa Basin. Systematic draw down of the basin to take full advantage of above average rainfall years and recharge from Hill Canyon may result in additional water yield with minimal impacts to those depending on the water resource. A variety of options such as off-season storage, in-lieu of use, and water exchanges could facilitate better management of the basin's storage.

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<sup>5</sup> "Santa Rosa Groundwater Basin Management Plan Update"; Boyle Engineering, January, 1997

**Goal: Maximize Beneficial Water Use**

Increasing demands are being made on the basin for local urban use. Both Camrosa Water District and Santa Rosa Mutual depend on basin supplies for delivery of domestic water. The basin is also a valuable source of irrigation water for overlying pumpers. In addition, some overlying individual pumpers use basin water for domestic use on their parcels.

There is a need for conjunctive management of groundwater, imported water, and local surface flows in the basin to maximize the use of available sources of supply. In 1992, Camrosa issued a Staff Report on the Demands and Supplies of the District. The Supply and Demand Study indicated that a potential demand of approximately 7,500 acre feet per year existed over the total basin, including that area within the GMA and the predominately domestic use in the eastern end of the basin. Local sources of supply may exist to meet this demand, however water quality issues impact use of some local supplies for domestic purposes.

**Goal: Maximize Beneficial Storage Capabilities**

Conjunctive use of the various water supplies may enable basin users to increase the total yield by better management of the Basin's storage and recharge capabilities.

**Goal: Maximize Replenishment Opportunities**

Enhanced recharge may also produce additional yield from the basin. Areas in Hill Canyon and in the eastern portion of the Valley could be developed to increase the amount of the recharge to the basin.

**MANAGE WATER QUALITY**

Degradation of the basin's water quality has been on going since the development of agriculture in the early 1900's. Although relatively high chlorides and other typical dissolved solids occur naturally in the area, chlorides, and particularly nitrates have grown in concentration through large scale irrigation of farmland, use of fertilizers, livestock operations, discharges from Hill Canyon Wastewater Treatment Plant, and more recently septic systems from urbanization of the eastern valley. Some pesticide contamination has also been found in wells near the Arroyo Santa Rosa.

The most notable contaminate is nitrate. Concentrations exceed the safe Drinking Water Levels in a majority of the large production wells in the Valley. The levels have been increasing since the early 1980's and threaten to make the water unusable for domestic purposes.

Currently adequate imported water is available with very low nitrates to blend with groundwater both reducing the nitrates to an acceptable level and also reducing TDS and general hardness.

Modern agricultural practices do not present the same threat to water quality, as did the past. The key to improving quality will be to identify the mineral load (chlorides, nitrates, etc.) to the basin take action in the form of education to reduce the loading and extract at least as much or more than is being applied each year.

**Goal: Prevent Future Degradation**

Prevention of future degradation will require determining the present sources of potential degradation. Annual loading of minerals into basin soils will be quantified. Sources of basin recharge and the quality of the recharge water will be analyzed. Conjunctive use of all sources of supply, addressed within the Plan's goal of maximization of beneficial use, may provide the ability to control degradation of the basin by supplementing higher quality recharge water. Alternatives will be developed to maximize recharge from the highest quality sources.

Annual loading of non-point source pollution, such as pesticides, oils, street runoff, and livestock by-products impact the basin to an unknown degree. The Plan will address quantification of these impacts and development of educational programs or community out-reach programs to involve the community in environmentally sound disposal of potential pollutants.

**Goal: Improve Water Quality**

Improvement of overall quality will require the same approach as prevention of further contamination except on a much more intense scale. Reducing annual loading and increasing extraction of minerals and nutrients beyond annual loading levels may over time improve water quality. However, this process will not be accomplished quickly but would over decades provide future generation with a better quality local supply.

## **MAINTAIN LOCAL OVERSIGHT OF BASIN MANAGEMENT**

Various local, state, and federal regulatory agencies exist which have mandates to insure the health and safety of local groundwater users. Implementation of these mandates takes the form of state or local laws, or formation of agencies which review and approve projects or land use.

**Goal: Cooperate with Other Agencies to Insure Protection of the Basin**

The Plan will provide an opportunity for Plan participants to inform themselves of the positions and requirements of regulatory agencies regarding use and protection of local groundwater. The Plan will provide participants interface to regulatory agencies through the review and comment process of those agencies. Agencies will be provided with a single contact point for communication with local groundwater users.

**Goal: Provide a Source Document of Groundwater Quantity and Quality**

The Plan will provide a single, verifiable data source for review by those individuals and agencies requiring data for formulation of regulatory policies or land use planning. It is the intent of the Plan to provide an on-going data collection program that can be used to define the Basin.

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**V. ELEMENTS OF THE PLAN**

**A. BASIN YIELD**

**B. BASIN QUALITY**

## **A. BASIN YIELD**

### **BACKGROUND**

In 1969, Camrosa Water District retained Thomas L. Bailey, Geologist, to produce a report entitled Geology and Groundwater Supply of Camrosa County Water District. The Bailey report included a statement of safe yield for the entire Basin as envisioned by Bailey. Bailey discussed the historical safe yield, drought conditions, and the impacts of the Hill Canyon Wastewater Plant discharge into Conejo Creek. Bailey indicated that effluent discharge increases the safe yield of the Basin by approximately 500 acre feet, but decreases the expected long-term water quality. After Bailey's report and until 1986, little analytical work was performed regarding Basin yield or quality.

Since 1986, two documents have been produced which describe the basin and implementation of a groundwater management plan. In 1988, Boyle Engineering Corp. prepared for the City of Thousand Oaks and Camrosa Water District the Report on Santa Rosa Groundwater Basin Management Plan. In 1997, Boyle Engineering Corp. will finalize a report on a computer generated model (ModFlow) describing the basin from the period 1989 to 1995. The intent of the first document was to develop a plan to manage the resources of the total Basin. The intent of the second document is to better describe the unmanaged portion of the total Basin and determine an operational plan for that area.

The 1988 document included a groundwater flow model developed for the report (Finite Element Groundwater Model Version 14, Johnson and Yoon, 1987). The model developed for the 1997 study is designed to replace the previous model, and employs the U.S. Geological Survey's finite difference code known as ModFlow (McDonald and Harbaugh, 1988). ModFlow has become a generally accepted modeling tool which can be modified using several non-proprietary core "packages" to solve the basic groundwater flow equations.

### **FINDINGS**

The various studies conducted over the years have resulted in some generally accepted findings regarding the storage characteristics of the Santa Rosa Basin. The total volume of the basin, subdivisions of the Basin, sources of recharge, the relationship of other basins and average annual extraction from the basin have been developed, analyzed and refined to the point that a working module is able to project the result of various management strategies with reasonable accuracy.

#### **Subdivisions of the Basin**

The 1997 Boyle study reconfirms the presents of some geologic barrier, generally understood to be the Bailey Fault, which separates the western portion or lower Basin from the eastern portion Upper Basin. This barrier creates a hydraulic differential of approximately 60 feet and, although it allows some degree of leakage, is relatively

impervious. This physical boundary is paralleled closely by the political boundary of the Fox Canyon GMA.

The 1997 study also indicates the existence of a second geological barrier running north and south across the basin (see Exhibit A). This semi-permeable barrier creates a third cell in the basin by dividing the eastern basin into the middle and upper Santa Rosa sub-basins.

**Storage Capacity**

The total basin storage capacity is estimated to be 115,000 acre feet of water. The storage capacity of each of the sub-basins are estimated as follows:

| Lower (AFY) | Middle (AFY) | Upper (AFY) |
|-------------|--------------|-------------|
| 60,500      | 26,900       | 27,500      |

It is understood these storage amounts are estimates and are intended to be representative of the proportional distribution of storage capacity. The volume of stored water available for use from each sub-unit is estimated at less than half the actual storage capacity.

**Basin Recharge**

The basin has several sources of water, which provide recharge. These sources have been evaluated by each study. The findings of the most recent 1997 Boyle Report and corresponding boundary conditions used in the ModFlow model are deliberately conservative. A conscious effort was taken to avoid over estimation of the amount of water available for recharge.

|                            | <u>Base Case<sup>6</sup></u> |             |            |
|----------------------------|------------------------------|-------------|------------|
|                            | Lower (AF)                   | Middle (AF) | Upper (AF) |
| Sub-surface Inflow         | 13                           | 511         | 326        |
| Recharge (Rain + Applied)  | 1,019                        | 644         | 507        |
| River Leakage              | 23                           | 1,118       | 0          |
| Inflow from Adj. Sub-Basin | <u>387</u>                   | <u>405</u>  | <u>6</u>   |
| Total                      | 1,442                        | 2,678       | 839        |

In addition to the above sources of recharge to the basin the most recent study has identified additional inflows from the Tierra Rejada Valley. These flows are surface flows which have been observed for the past 4 years in amounts estimated to contribute 1500 acre feet per year to the recharge of the Upper Basin. These flows are most likely

<sup>6</sup> "Santa Rosa Groundwater Basin Management Plan Update Preliminary Draft Report", Boyle Engineering, Jan. 1997

the result of the overflow of the Tierra Rejada basin during the most recent period of above average rainfall, 1993-1997.

Although this inflow can not be considered a firm and continuous supply to the basin there may be operating alternatives, which may take better advantage of this supply when it is available. The Base Case 1997 ModFlow model run does not include this inflow. However, inclusion of the inflow is required to simulate the observed rise in water levels in the Upper sub-basin during the model calibration period.

During wet cycles and the calibration period the total basin inflows have been observed to be as follows:

Future Baseline (Current Conditions, 1997)<sup>7</sup>

|                            | Lower (AF) | Middle (AF)  | Upper (AF) |
|----------------------------|------------|--------------|------------|
| Sub-surface Inflow         | 0          | 135          | 263        |
| Recharge (Rain + Applied)  | 966        | 612          | 485        |
| River Leakage              | 23         | 1,336        | 1,416      |
| Inflow from Adj. Sub-Basin | 604        | <u>1,296</u> | <u>0</u>   |
| Total                      | 1,593      | 3,379        | 2,164      |

**Basin Extractions and Losses**

**Losses:** Basin losses or outflow to down gradient basins has been estimated for each sub-basin unit based upon basin conditions over the period 1989-1996. These outflows are as follows:

| Lower (AF) | Middle (AF) | Upper (AF) |
|------------|-------------|------------|
| 72         | 343         | 455        |

Outflow from the Middle sub-basin to the Lower sub-basin represents flow across the GMA Boundary. Outflow from the Lower sub-basin represents flow to the Pleasant Valley Basin. It must be noted that the 1987 Boyle Report did not specifically address flow across the GMA Boundary. The Report did, however, estimate a much greater amount of outflow to the Pleasant Valley Basin averaging 730 AF/yr.<sup>8</sup> This Plan does not dispute the earlier Report nor claim to quantify the exact flow across either boundary. The Plan's intent is only to recognize that some flow does occur.

**Extractions:** Annual basin extractions from all pumpers have varied throughout the past seven years from as low as 2,595 AFY to 3,550 AFY. The average extraction rate per sub-basin has varied when Camrosa and Santa Rosa Mutual have changed operations and

<sup>7</sup> "Santa Rosa Groundwater Basin Management Plan Update Draft Report", Boyle Engineering, Jan. 1997

<sup>8</sup> "Santa Rosa Groundwater Basin Management Plan Update Draft Report"



concentrated pumping in different areas of the Basin. The average extraction rate was as follows from each portion of the basin:

| Lower AFY | Middle AFY | Upper AFY |
|-----------|------------|-----------|
| 1,200     | 2,190      | 520       |

The most recent extraction rates and distribution of pumping by water user:

|            | Lower AFY    | Middle AFY | Upper AFY  |
|------------|--------------|------------|------------|
| Camrosa    | 0            | 2,415      | 380        |
| SRM        | 0            | 535        | 75         |
| All Others | <u>1,315</u> | <u>150</u> | <u>175</u> |
| Total      | 1,315        | 3,100      | 630        |

Recent increased private pumping activity in the lower and upper sub-basins has been observed, but is not reflected in the seven year average.

#### **Average Annual Yield of Sub-basins**

The 1987 Boyle Study found the annual yield of the Basin to be approximately 4200 AF. The 1997 Modflow model (Base Case) confirms this result and further provides estimated yields for each of the three sub-basins. The following annual yields are based upon the base case model:

| Lower AFY | Middle AFY | Upper AFY |
|-----------|------------|-----------|
| 1,380     | 2,335      | 385       |

## **BASIN OPERATIONAL POLICIES**

### **Operational Philosophy**

The Santa Rosa Groundwater basin water users prior to 1964 had no alternate sources of water. An overdraft of the basin similar to that which accrued in the 1950's threatened the livelihood of local farming operations, overall property values, and potentially the health and safety of the residents. Fortunately, today alternate water resources are available to the Santa Rosa Valley. Camrosa Water District provides imported water for all beneficial uses. Reclaimed water is available from the Hill Canyon Wastewater treatment plant for irrigation.

Imported State Project water from Callegues Municipal Water District is available to Camrosa for a variety of uses that can benefit the operation of the Basin. In addition to providing an uninterrupted supplemental domestic water supply, interruptible supplies

are available during years when surplus waters are available to the State Project. Water is available at a discounted rate for agricultural irrigation and water is also available at a reduced rate for seasonal storage. Seasonal storage water has been purchased by Camrosa and successfully injected into and recovered from the Santa Rosa Basin and the Pleasant Valley Basin.

Camrosa also has a purchase agreement with the City of Thousand Oaks and Calleguas for the water discharged from the Hill Canyon Treatment Plant over the next 25 years. These agreements will result in the eventual construction of the Conejo Creek Project and delivery of reclaim water throughout Camrosa service area, including the Santa Rosa Valley. The agreements also provide assurance that any recharge benefits the basin has received from the Conejo Creek will continue throughout the term of the contract.

**Santa Rosa Mutual and Property Owners:** Although alternate water supplies are ultimately available to everyone in the Santa Rosa Valley many residents and property owners are still solely reliant on groundwater. An overdraft of the ground water supplies would cause these water users economic hardships in both capital for new facilities and increased water costs.

**Camrosa Water District:** The Santa Rosa Basin is extremely important to the Camrosa Water district. Camrosa's ability to utilize this water resource in conjunction with imported water, and reclaimed water improves the overall reliability of the water supply to the Camrosa service area. The Santa Rosa Basin can provide reserve water supplies for emergencies, storage capacity in years when surplus imported waters are available, and an economical supplementary water source.

**Regional Benefits:** Beyond the needs of the Santa Rosa Valley and Camrosa, this water supply reduces the average annual demand on the Calleguas, Metropolitan Water District and the State Water Project, making more water available to Southern California. The surrounding communities served by Calleguas may benefit particularly in times of emergency when Camrosa can reduce its purchases of imported water so others relying solely on imported water have additional supplies.

**Fox Canyon Groundwater Management Agency:** The Santa Rosa Basin also plays a role in the overall water balance within Ventura County. The down gradient basins of the Fox Canyon GMA (including the Lower Santa Rosa sub-basin) receive some recharge benefits from the Santa Rosa Basin through sub-surface flow to the down gradient Pleasant Valley Basin. Routine overdrafting of the Santa Rosa basin could result in the loss of a water source to the Fox Canyon GMA basins already suffering from overdraft. The Lower (GMA) Santa Rosa sub-basin also benefits from the applied irrigation water to the extensive agricultural zone overlying the Lower sub-basin. The total demand for water in this area is estimated to be 3,000 AF annually, based on year-round crop production. Approximately 1,400 AFY are pumped from the Lower GMA sub-basin; the remainder of the demand is met by a combination of State Project Water, basin water pumped from the Middle and Upper sub-basins, and water pumped from the Conejo

Creek. A total of 1,900 AF per year of applied water imported to the Lower GMA sub-basin benefits recharge.

The net result of Camrosa's operation is a benefit to the GMA's primary goal of protecting the various basins under their management from overdraft. The availability of Camrosa water for irrigation at a reasonable price deters additional well drilling or extensive pumping of existing wells in the Lower Sub-basin.

**Summary of Philosophy:** The operation of the Basin must assure all of the beneficiaries of this water supply that a reliable water source will be available and that no individual or entity will suffer damages from the operational alternatives selected. Because Camrosa is the largest user of basin water and has established access to alternate water sources, Camrosa can act as the basin management control point by varying its pumping operation to both prevent water shortages and optimize the storage potential of the Basin.

Both the Boyle Reports and observed conditions in the Basin demonstrate that the basin although very limited in capacity, recharges very rapidly during wet cycles or through applied recharge. The limited size, area served, and few number of basin users provide a manageable environment which can be use to optimize the benefits of the unique features of the Basin to the benefit of all concerned interests.

#### **Minimum Storage Requirements**

The ModFlow model of the Basin developed by Boyle projects basin water levels at three key points located in the various zones of the Basin. These locations are highlighted in Exhibit A and identified as the locations of the Stuart Well, the Fitzgerald Well, and the Gerry No. 1 Well. Hydrographs for the Base Case conditions illustrate where water levels would be with average rainfall and average pumping observed over the past 7 years.

Historically water levels have been much lower than in the recent past. As illustrated by hydrographs for the period of 1955 through 1964 (See Exhibit B) water levels dropped dramatically in each sub-basin. Also illustrated is the dramatic rise in water levels following a wet weather pattern and the start-up of the Calleguas imported water system.<sup>9</sup>

#### **Historical Water Elevations (1955 to 1983)**

|                      | <b>Lower AF</b> | <b>Middle AF</b> | <b>Upper AF</b> |
|----------------------|-----------------|------------------|-----------------|
| <b>Average Elev.</b> | 135             | 210              | 205             |
| <b>Low Elev.</b>     | 70              | 80               | 110             |
| <b>Difference</b>    | 65              | 130              | 95              |

<sup>9</sup> "Development of a Two-Dimensional Digital Groundwater Flow Model for the Santa Rosa Valley Groundwater Basin"; Martin Feeney, The Consortium of the California State University, 1987

These historical records can be used to establish a minimum water level for each sub-basin that will assure water supplies to all well operators. As with other guidelines of the Plan, the minimum levels selected are conservative.

**Upper Sub-Basin Minimum Storage Levels:** The Upper sub-basin contains the least storage capacity; 35,000 AF of which 10,000 to 15,000 is recoverable. However, the Upper sub-basin also receives the most immediate benefits from rainfall. Routine exercise of this portion of the basin between wet cycles may be very beneficial. Operations should not however cause projected or observed water levels to fall below 125 ft above sea level at the Stuart Well.

**Middle Sub-Basin Minimum Storage Levels:** The Middle sub-basin storage capacity of 41,000 AF contains approximately 12,000 to 18,000 AF of recoverable storage. This sub-basin also recharges very rapidly and benefits from both rainfall and stream recharge from the Conejo Creek. Operations should not, however, cause projected or observed water levels to fall below 125 ft above sea level at the Fitzgerald Well.

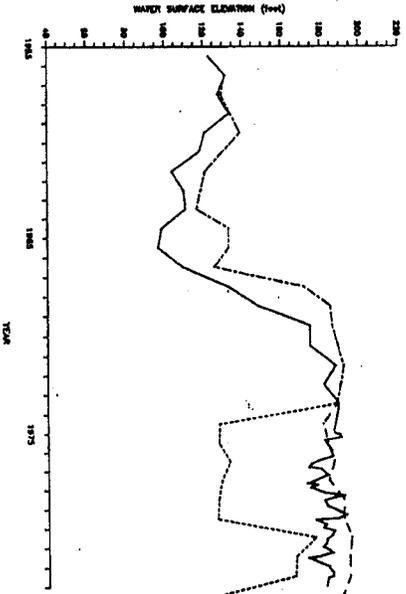
**Lower Sub-Basin Minimum Storage Levels:** The Lower sub-basin storage capacity is the largest of the three; approximately 94,000 AF. This portion of the basin historically recharges very slowly compared to the other sub-basins. This sub-basin is also linked to the Pleasant Valley Groundwater Basin and supplies some recharge to the Pleasant Valley Basin via subsurface flows. Reduced water levels in the lower sub-basin will reduce the hydraulic gradient between the Pleasant Valley and the Santa Rosa basins and consequently reduce subsurface inflows.

The Lower sub-basin is outside the jurisdiction of this Plan and within the Fox Canyon GMA boundaries. The Lower sub-basin is, however, within the service area of Camrosa Water District. Camrosa imports approximately 1,900 AFY to the Lower sub-basin. The net result of Camrosa's operation is a benefit to the GMA's primary goal of protecting various basins under their management from overdraft. The availability of Camrosa's irrigation water at a price below imported water costs has prevented additional well drilling over the Lower sub-basin and held overall pumping to a minimum.

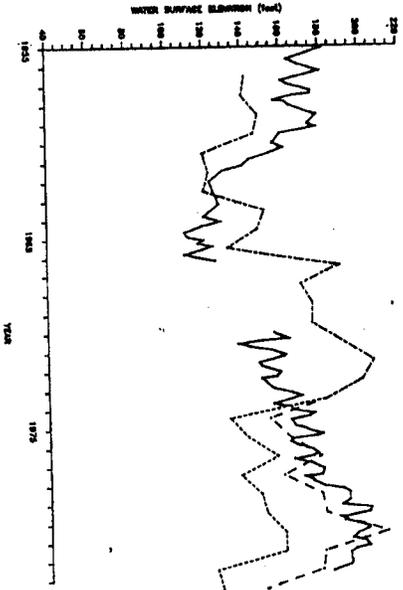
Extraction rates from the Lower basin are managed by the GMA. However, the GMA's management plan is based upon a very large set of groundwater basins and sub-basins. The finite nature of the Santa Rosa sub-basins is not well represented in the overall GMA management plan. To aid the GMA in its management efforts, care will be taken to prevent water levels in the lower sub-basin from dropping below 100 ft. above sea level. This will be accomplished through Camrosa's continued supply of competitively priced irrigation water to the properties overlying this portion of the basin. By utilizing economic incentives Camrosa can discourage expanded well production in the area and, with the planned delivery of Conejo Creek Project water to this area, effect even further reductions in basin water use, if necessary.

# Exhibit B

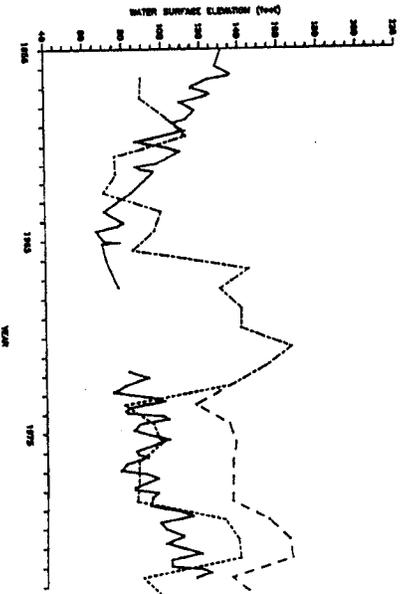
STATE WELL NO. 2N/20W-28B3  
NODE 13.8



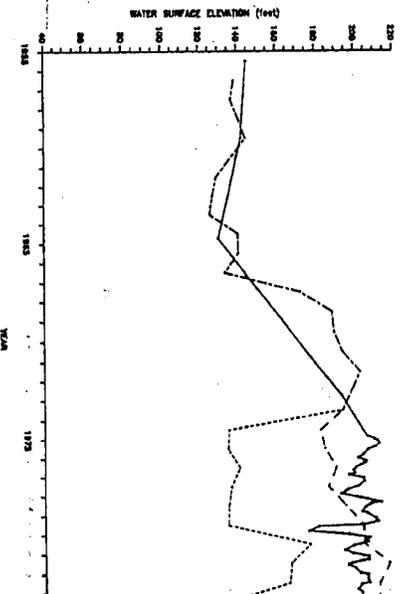
STATE WELL NO. 2N/19W-19B2  
NODE 21.19



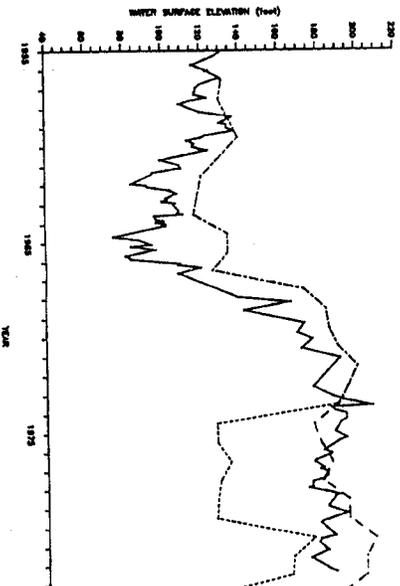
STATE WELL NO. 2N/20W-23K1  
NODE 10.9



STATE WELL NO. 2N/20W-23L1  
NODE 20.10



STATE WELL NO. 2N/20W-23R1  
NODE 14.10



## LEGEND

- ~ HISTORIC MEASURED WATER LEVELS
- VERIFICATION RUN SIMULATED WATER LEVELS
- SIMULATED WATER LEVELS - CESSATION OF HCTP EFFLUENT

## WATER WELL HYDROGRAPHS Santa Rosa Valley Ground Water Basin

The net result of the Plan's maintenance of a minimum storage level in the Lower sub-basin will be a fixed sub-surface water supply to the Pleasant Valley Groundwater Basin. By maintaining a constant hydraulic gradient up-stream of Pleasant Valley Basin, the Lower sub-basin will act as a buffer to any actions taken up gradient of the Lower sub-basin. Historical flows to the Pleasant Valley Basin will continue undisturbed and the actual volume need not be exactly quantified.

## **YIELD OBJECTIVES AND ACTION PLAN**

### **Annual Water Budget**

The Council will produce an annual water budget based upon the proposed pumping projections of each well pumped in the basin. The council will review the pumping projections, evaluate projected storage levels in relation to the Plan's minimum storage levels, review prior year production reports and, based upon the guidelines of this Plan, adopt an annual budget.

The annual budget will include a state of the basin report, updates on the progress of any projects related to basin operation, and describe any new projects to be implemented during the upcoming year.

### **Evaluate Pumping Capacities**

The vast majority of the total pumping capacity within the Basin is concentrated in the Middle sub-basin. Camrosa and SRM will develop a plan to utilize existing pumping facilities and investigate sites for additional pumping facilities to achieve a better balance and more flexible pumping scheme.

## **B. BASIN QUALITY**

Management of the quality of water in the Arroyo Santa Rosa Basin requires a more complex approach than management of basin yield. Far more variables are involved and much more new information is required. Quality parameters vary based upon the type of use. Some pollutants occur naturally, other have resulted from historical land use practices no longer employed. Some pollutants continue to enter the water supply on a regular basis and there are other potential sources. Management of the basin quality will require the efforts of all the residents of the Santa Rosa Valley, not only the Basin pumpers.

## **QUALITY OBJECTIVES AND ACTION PLAN**

The California Regional Water Quality Control Board (RWQCB), Los Angeles Region, adopted the Water Quality Control Plan, Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties in 1994 (Basin Plan). This plan specifies the types of beneficial uses for each watershed or sub-section of the watershed in Ventura County and has established water quality objects for each groundwater basin based upon designated

beneficial uses for surface waters impacting the basins. The beneficial uses of the water bodies impacting the Santa Rosa Basin (Basin No. 4-7) are:

- Arroyo Conejo - Municipal water supply, groundwater recharge, freshwater replenishment, water contact recreation, non-contact water recreation, warm freshwater habitat, wildlife habitat, habitat for rare/threatened species.
  
- Conejo Creek - Municipal/industrial/agricultural supply, groundwater recharge, freshwater replenishment, water contact recreation, non-contact water recreation, warm freshwater habitat, wildlife habitat, spawning/reproduction habitat.
  
- Arroyo Santa Rosa - Municipal supply, groundwater recharge, freshwater replenishment, water contact recreation, non-contact water recreation, warm freshwater habitat, wildlife habitat.

The established water quality objectives for the Santa Rosa Basin are:

|                          |          |
|--------------------------|----------|
| Total Dissolved Solids - | 900 mg/L |
| Sulfate -                | 300 mg/L |
| Chloride -               | 150 mg/L |
| Boron -                  | 1.0 mg/L |

In addition to these water quality objectives those using Santa Rosa Basin water have established water quality requirements and water quality desires. Domestic users are required to meet all California Department of Health Services Primary Drinking water Standards. These standards contain limits for a large number of mineral, organic and biological contaminants.

Agricultural users have a variety of quality requirements based upon the crop irrigated. Chloride, however, is of the most universal concern. Chloride levels in excess of 100 mg/L may impact crop yields.

Water quality desires among the various users is much higher than the RWQCB basin objectives, DOHS primary standards or the maximum chloride tolerance for various crops. Domestic users would benefit from reductions in TDS and hardness. Agriculture users would benefit from reductions in chlorides, boron and other salts.

To achieve the quality objectives of those utilizing Basin water, a long-term plan must be developed and implemented. The following key elements of the Water Quality Management Plan will provide a vehicle to achieve the long-term objectives of those utilizing the Basin.

### **Water Quality Model**

In 1987 a water quality model was developed for the Santa Rosa Basin. This model can provide the foundation for an updated and more detailed model, which will enable basin users to determine the best means of managing water quality. The key components of the model are the quantification of annual mineral and contaminate loading on the basin, quantification of annual mineral exports, sources of mineral loading and contamination and forecasting quality conditions based upon various actions or inaction. Work on the Quality model is scheduled to begin in July 1997.

### **Routine Water Quality Monitoring Program of the Basin**

Once a model of the basin quality is in place a routine sampling program including surface waters, storm waters and groundwater will be established to monitor basin quality. The routine program will measure success in attempts to improve quality, alert basin users of changes in quality and provide basin users with an early warning of any new threats to quality that may arise. A routine water quality-monitoring program is partially in place and is scheduled for complete implementation in fiscal year 1997-98.

### **Water Quality Public Information Program**

It is reasonable to assume that a good portion of the mineral loading and other contamination or potential contamination is the result of land use directly over the basin. Land use over the basin is limited to low density residential, agriculture, open space and recreation. No industrial or commercial uses currently exist.

A public information program which targets homeowners, custom farming operations, large farming operations, and well operators could reduce current mineral loading and prevent future contamination.

Homeowners and custom farming operations will be provided with information regarding maintenance of private septic systems; proper use and disposal of household, garden and farming chemicals and fertilizers; and proper disposal of livestock waste.

Large farming operations, particularly tenant farmers new to the area, will be apprised of the ground water quality concerns over the basin and provided with guidelines for best management practices in farming over the basin.

Well operators will be provided with information to assess the security of their wellhead, guidelines for maintenance, restoration, abandonment, destruction of wells. Guidelines will also be provided for construction of new wells that may be unique to the Santa Rosa Basin.

The public information program for homeowners and custom farming operations will be developed beginning in July 1997 and implemented as various components are completed throughout 1998. The assistance of the local farm bureau and the UC extension will be sought to develop a program for large farming operations. The County of Ventura's Water Resource Department and state agencies provide a great deal of information on

well head protection, well construction and well abandonment that may be made available to all well operators throughout the basin. This information can be a part of the Santa Rosa Basin Council regular meeting agenda's.

**Abandoned Well Identification and Destruction Program**

Over three hundred recorded wells have been constructed in the basin. Some wells have been destroyed, a few are actively pumped, some are used only to gather data and many are simply abandoned. Identification of all of these wells has already begun. An annual budget will be established by Camrosa to properly destroy wells which are no longer useful. A five-year program to properly destroy these wells will begin in July 1997.

**Annual Reporting**

Annual State of the Basin to EPA, RWQCB, Ventura County, homeowners, landowners and Basin users. The first state of the Basin will be published in October 1997. Annual reports will follow each October.

**Treatment of Basin Water**

Camrosa is conducting a pilot program to treat basin water for general minerals, specifically nitrates. The results of the pilot work will be complete in spring of 1997. Based upon the results of the pilot study Camrosa will pursue development and selection of the various alternatives to construct and operate a full-scale mineral removal and disposal system. Development of alternatives and selection of the final process is scheduled for completion in fiscal year 1997-98.

Santa Rosa Mutual is also interested in the outcome of the pilot project and will have an opportunity to participate with Camrosa in alternative development and final process selection, if they determine mineral removal to be a feasible direction for their operation.

**Interim Emergency Plan**

Camrosa and Santa Rosa Mutual will develop interim procedures for supplying drinking water to SRM customers in the event drinking water standards cannot be met by SRM wells. These interim procedures will be intended to meet SRM domestic customers' needs until permanent solutions can be developed and implemented.

**VI. APPENDIX**

**Memorandum of Understanding  
Regarding Groundwater Basin Management  
in the Arroyo Santa Rosa Groundwater Basin**

1. This Memorandum of Understanding regarding Arroyo Santa Rosa Groundwater Basin Management Plan ("MOU") is entered into as of the 24th day of April, 1997, at Camarillo, California, by and among the Camrosa Water District ("Camrosa"), a county water district; Santa Rosa Mutual Water Company ("Santa Rosa"), a mutual water company; and the undersigned (a) private individuals, (b) private entities, (collectively "Property Owners"), all of whom may from time to time pump groundwater from wells in the Arroyo Santa Rosa Groundwater Basin ("Basin").

**Factual Recitals**

2. The parties to this MOU hereby acknowledge the following facts, conditions, and intentions of the various parties related to the implementation and administration of the Arroyo Santa Rosa Groundwater Basin Management Plan (Plan):

A. The Plan was developed through the joint efforts of all the Parties to this MOU pursuant to the Groundwater Management Act of 1993 (AB3030; Water Code, Section 10750 et seq.)

B. Camrosa was organized in 1962 under the County Water District Law, Division 12, of the Water Code of the State of California. The Basin lies wholly within the Camrosa Water District which encompasses approximately 18,000 acres, entirely within Ventura County. Camrosa's boundaries include the Santa Rosa Valley and the Tierra Rejada Valley.

C. Santa Rosa, an investor-owned water company, lies wholly within the boundaries of the Camrosa Water District and delivers water pumped from the Arroyo Santa Rosa Groundwater Basin. Santa Rosa currently serves an area of about 1,600 acres and provides water to approximately 180 water users. Santa Rosa currently produces approximately 550 acre feet per year (AFY) of water from the Basin.

D. Property Owners are among the approximately 20 separate (a) private individuals, (b) private entities, and (c) public entities that own wells within the Basin. Such groundwater users in the Basin produce approximately 1,000 AFY of water which is used predominantly for agricultural purposes.

E. The Arroyo Santa Rosa Groundwater Advisory Council (Council) was formed as part of the Plan to oversee the basin management. Each entity or individual signatory to this MOU is thereby a member of the Council.

## Agreement

3. The parties to this MOU hereby agree as follows:
4. **Implementation of the Adopted Plan:** The Council shall implement the Plan upon final adoption by the Camrosa and Santa Rosa Mutual Boards of Directors. The parties to this MOU agree to cooperate in sharing data required by the Plan and supporting the various elements of the Plan that may require the participants or cooperation among the parties of this MOU.
5. **Plan Administration:** Camrosa shall, within reasonable financial limitations, assist the Council in administering the adopted Plan. Such administration shall include assisting with the planning of meetings, preparing meeting documents, mailing notices and newsletters, gathering and compiling data, analyzing trends in water quantity and quality, and preparing a draft annual report of groundwater conditions in the Basin.
6. **Financial Obligations:** All parties agree that this MOU and its association to the Council implies or imposes no financial commitments or liability to the Plan, the Council or individual Party to this MOU. The financial obligations of the Plan are the responsibility of Camrosa and Santa Rosa and only then by separate agreement between the parties.
7. This MOU may be executed by any party in one or more counterparts, all of which, taken collectively, shall be considered one and the same document.

**IN WITNESS WHEREOF**, I hereby become a party to this MOU as of the day and year first written above.

Ronald J. Vogel, President  
(Print Name)

  
(Sign)

CAMROSA WATER DISTRICT  
(Representing)

**Memorandum of Understanding  
Regarding Groundwater Basin Management  
in the Arroyo Santa Rosa Groundwater Basin**

1. This Memorandum of Understanding regarding Arroyo Santa Rosa Groundwater Basin Management Plan ("MOU") is entered into as of the 12th day of September, 1997, at Camarillo, California, by and among the Camrosa Water District ("Camrosa"), a county water district; Santa Rosa Mutual Water Company ("Santa Rosa"), a mutual water company; and the undersigned (a) private individuals, (b) private entities, (collectively "Property Owners"), (c) public entities that own wells within the Basin, all of whom may from time to time pump groundwater from wells in the Arroyo Santa Rosa Groundwater Basin ("Basin").

**Factual Recitals**

2. The parties to this MOU hereby acknowledge the following facts, conditions, and intentions of the various parties related to the implementation and administration of the Arroyo Santa Rosa Groundwater Basin Management Plan (Plan):

A. The Plan was developed through the joint efforts of all the Parties to this MOU pursuant to the Groundwater Management Act of 1993 (AB3030; Water Code, Section 10750 et seq.)

B. Camrosa was organized in 1962 under the County Water District Law, Division 12, of the Water Code of the State of California. The Basin lies wholly within the Camrosa Water District which encompasses approximately 18,000 acres, entirely within Ventura County. Camrosa's boundaries include the Santa Rosa Valley and the Tierra Rejada Valley.

C. Santa Rosa, an investor-owned water company, lies wholly within the boundaries of the Camrosa Water District and delivers water pumped from the Arroyo Santa Rosa Groundwater Basin. Santa Rosa currently serves an area of about 1,600 acres and provides water to approximately 180 water users. Santa Rosa currently produces approximately 550 acre feet per year (AFY) of water from the Basin.

D. Property Owners are among the approximately 20 separate (a) private individuals, (b) private entities, and (c) public entities that own wells within the Basin. Such groundwater users in the Basin produce approximately 1,000 AFY of water which is used predominantly for agricultural purposes.

E. The Arroyo Santa Rosa Groundwater Advisory Council (Council) was formed as part of the Plan to oversee the basin management. Each entity or individual signatory to this MOU is thereby a member of the Council.

**Agreement**

3. The parties to this MOU hereby agree as follows:

4. **Implementation of the Adopted Plan:** The Council shall implement the Plan upon final adoption by the Camrosa and Santa Rosa Mutual Boards of Directors. The parties to this MOU agree to cooperate in sharing data required by the Plan and supporting the various elements of the Plan that may require the participants or cooperation among the parties of this MOU.

5. **Plan Administration:** Camrosa shall, within reasonable financial limitations, assist the Council in administering the adopted Plan. Such administration shall include assisting with the planning of meetings, preparing meeting documents, mailing notices and newsletters, gathering and compiling data, analyzing trends in water quantity and quality, and preparing a draft annual report of groundwater conditions in the Basin.

6. **Financial Obligations:** All parties agree that this MOU and its association to the Council implies or imposes no financial commitments or liability to the Plan, the Council or individual Party to this MOU. The financial obligations of the Plan are the responsibility of Camrosa and Santa Rosa and only then by separate agreement between the parties.

7. This MOU may be executed by any party in one or more counterparts, all of which, taken collectively, shall be considered one and the same document.

IN WITNESS WHEREOF, I hereby become a party to this MOU as of the day and year first written above.

FRANK P. STABEN  
(Print Name)

  
(Sign)

Santa Rosa Mutual  
(Representing)  
Water Co.

Prepared for  
**Camrosa Water District**

**Santa Rosa Groundwater Basin  
Management Plan Update  
Final Report**

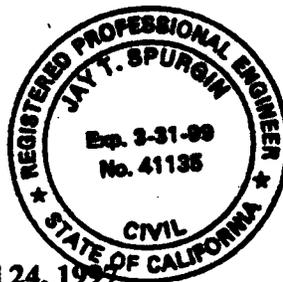
Prepared by  
**BOYLE ENGINEERING CORPORATION**

*Project Manager*

**Jay T. Spurgin, PE**

*Project Geologist*

**William F. Hahn**



April 24, 1997

A handwritten signature in black ink that reads "Jay T. Spurgin". The signature is written over a horizontal line.

VT-C13-200-02

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**BOYLE**

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