Strategic Capital Facilities Plan

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Prepared by
Carpinteria Valley Water District
1301 Santa Ynez Avenue Carpinteria, CA 93013
(805) 684-2816 Fax: (805) 684-3170

Carpinteria Valley Water District Board of Directors

Fred Lemere, President
Glen Hickey, Vice President
Bob Lieberknecht
Matt Roberts
June Van Wingerden

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Additional copies of this document can be obtained from the Carpinteria Valley Water District Office at 1301 Santa Ynez Avenue, Carpinteria, CA 93013.

SUMMARY

The Carpinteria Valley Water District (District) encompasses about 8,912 acres with a mixture of agriculture (approximately 39 percent), residential (approximately 15 percent), industrial/commercial/institutional (approximately 16 percent), and open space land uses (approximately 30 percent). It has three sources of water: Cachuma Project water, State Water Project (SWP) water, and groundwater. The Cachuma Project water entitlement represents about 50 percent of the District's total supplies, at 2,813 acre feet per year. The District's SWP water entitlement is 2,200 acre feet per year (including drought buffer). Groundwater is extracted from the Carpinteria Valley Groundwater Basin, which has a total estimated safe yield of about 5,000 acre feet. The District pumps about 1,300 acre feet per year on average from this basin. An additional approximately 2,480 acre feet per year on average is pumped from private wells, primarily for agricultural use. Approximately 50 percent of the District's water deliveries are for agricultural customers.

The current planning issues facing the District revolve around three general categories: water supply and quality, capital facilities improvements, and operations improvements. Within this document, several issues are identified for each of these general categories. The District's options for addressing these issues are then discussed, together with an assessment of the financial impact of each option.

Water Supply and Quality

Two issues face the District with regards to its Cachuma Project water entitlement. Both the upcoming State Water Resources Control Board (SWRCB) water rights hearings and the steelhead trout's listing as an endangered species have the potential to adversely impact the District's Cachuma Project water entitlement. The District plans to join with the other Member Units to develop "consensus plans" which would minimize the impact of these two issues on the District's water supply.

The District's SWP entitlement is subject to two planning issues. The CALFED Bay-Delta Accord has the potential to improve the reliability and quality of this water supply, and should be supported by the District. State Water also provides a potential marketing opportunity for the District. The District can plan so as to identify areas where a marketing opportunity may develop in the future.

With increasing demand, the District's groundwater supply may need additional management and development. In the future, it may become necessary for the District to directly monitor and measure groundwater use by private well owners. The District also plans to take part in or administer a Carpinteria Valley Watershed Management Plan in order to protect its groundwater resources. To further develop these groundwater resources, the District plans on assessing the development of additional wells and, if feasible, a groundwater recharge system. The District also has the option to plan for the future development of a system which could be used to reclaim/recycle water for irrigation purposes.

Based upon historical data, and current City and County general plans and zoning, the District anticipates a steady increase in the demand for water at a rate of approximately 2.5% annually over the next 10 years. Annexation of additional lands by the District could potentially add to this rate. With its current supplies of Cachuma Project water, State Water Project water, and groundwater, the District has ample water supplies to meet this projected increased demand.

The quality of the District's surface water is potentially subject to two contaminants of particular concern. These are trihalomethanes (THMs) and coliform bacteria. The District currently meets all regulations for THMs, although stricter regulations are anticipated for the future. The District can address anticipated new regulations for THMs by the following:

1. Flushing the distribution system;
2. Covering or reconfiguring the Ortega and Carpinteria Reservoirs;
3. Blending low THM groundwater with higher THM surface water; and/or
4. Using chloramines for disinfection;

The District has not experienced any problems related to coliform bacteria, though it is present in the District's surface water in low levels on rare occasions. Introduction of coliform bacteria can also be addressed to some extent by covering or reconfiguring the Ortega and Carpinteria Reservoirs.

Groundwater quality concerns primarily revolve around the level of nitrates found in the shallow aquifers within the District. Nitrate levels appear to be increasing in shallow aquifers within the District. To begin to address this potential problem, the District plans to implement a data collection and monitoring program in order to increase its monitoring efforts of nitrate levels. An annual sampling program of privately owned wells within the District may be developed.

Capital Facilities

A primary capital facility improvement currently under consideration by the District is the covering or reconfiguring of the United States Bureau of Reclamation (USBR)-owned Ortega and Carpinteria Reservoirs. The California Department of Health Services has notified the District that open reservoirs such as the Ortega and Carpinteria Reservoirs are a potential public health threat and should be covered. As such, the District is planning for the covering of the reservoirs and the reconfiguration of the inlet/outlet piping of the Ortega Reservoir. Other options which have either been considered or are still under consideration include:

1. Leaving the reservoirs as raw storage and adding additional treatment facilities;
2. Replacing the existing reservoirs with tanks; and
3. Covering the reservoirs and increasing storage with tanks at other locations.

The District is also considering improving its chlorination facilities in order to respond to recent and pending regulations, and to reduce the potential risk of chlorine gas accidents. It is planning on installing shut-off valves at all of its chlorination and treatment facilities as a short-term solution. Other long-term considerations include:

1. Replacing the chlorine gas system with alternative disinfectants;
2. Continuing chlorine gas use with the addition of neutralizing scrubbers;
3. Replacing chlorine gas with liquid sodium hypochlorite solution; and
4. Replacing chlorine gas with hypochlorite generated onsite from softened water, salt, and electricity.

Additional distribution and storage facility capital improvements the District is considering include:

1. Placement of a flow meter and assessing peaking capacity on the South Coast Conduit;
2. Relocation of the mains in the Concha Loma area from backyards to the street;
3. Replacement of inefficient and/or old booster pumps;
4. Implementation of a valve evaluation and preventive maintenance program; and
5. Extending Lateral 15L to connect with Lateral 16L, as a means of improving water service in the area.

There are also several areas where the District can improve its well facilities and their management. The District plans to annually assess whether or not to place one or more of its wells on time-of-use rates, or whether to have them serviced by an alternative electricity provider. The wells' efficiency and operation have the potential to be improved through regular efficiency testing and the creation of an evaluation and preventive maintenance plan. A wellhead protection program could also be further developed and implemented. In addition, the District has the option of developing additional wells, particularly at the location of the currently abandoned Santa Ynez Well.

Increased automation of the District's facilities also needs to be considered. A Supervisory Control and Data Acquisition (SCADA) system could be developed, allowing for efficient data acquisition and facility operation.

Operations

There is the potential for the District to increase the automation and computerization of its office operations. The District has the option of allowing its customers to pay their bills with their credit cards or over the internet. The District's records could be converted to CD-Rom or microfiche in order to conserve space and increase efficiency of retrieval. Data management could become increasingly computerized within the District, including the development of a Geographic Information System (GIS). Data exchange could also be improved within the District and with other agencies. A network server could be developed to allow for data exchange within the District, while a data exchange system could be developed to allow for data exchange with other agencies. In addition, the

District has the option to improve its meter reading operations. This can be done by retrofitting the meters to allow for touch, radio, or phone reading of the meters. The District could also contract-out the reading of its meters with an outside company.

To encourage public involvement and feedback, the District is considering several options which can be included in a working public involvement plan. These options include:

1. Increased access to the District over the internet;
2. Increased information about the District provided through the media; and
3. Increased public education by the District.

Through intergovernmental coordination, the District can potentially increase the efficiency and reduce the costs of its operations. This may be done by sharing equipment or operational duties with other agencies. One option involving intergovernmental coordination which may be open to the District is promoting the merging of Joint Power Authorities (JPAs), such as the Cachuma Operation and Maintenance Board (COMB) and the Cachuma Conservation and Release Board (CCRB). The District also has the option to promote the redesign of possibly redundant JPAs, such as the Santa Barbara County Water Purveyors Agency (SBCWPA). The District may also pursue increasing its involvement in particular JPAs, such as with the City of Santa Barbara regarding the operation of the Cater Treatment Plant.

It is also desirable for the District to remain receptive to potential areas of growth. These areas may help the District increase revenues and/or decrease costs. Two potential areas for growth include (1) evolving into an electricity retailer and (2) creation of a new JPA with other Carpinteria Valley agencies.

To improve its emergency preparedness, the District plans on purchasing a portable emergency generator which is capable of operating the District's well pumps in the event of a blackout. The District also plans to assess its available emergency supplies, and purchase needed items such as a portable water tank.

Funding Options and Financial Impacts

The District has identified a preliminary capital project spending schedule, subject to Board approval, which includes the following projects:

1. Purchase of a portable generator for the wells;
2. Ortega Reservoir pipeline reconfiguration;
3. Connecting Lateral 15L to Lateral 16L;
4. Chlorination shut-off valves;
5. Concha Loma Mains replacement;
6. Covering of the Ortega and Carpinteria Reservoirs;
7. Construction of a 2.5 million gallon storage tank; and
8. Redevelopment of the Santa Ynez Well.

These projects are estimated to cost approximately $9.0 million. Funding options the District is considering for these projects include:

1. Rate increases;
2. General Obligation Bonds;
3. Revenue Bonds;
4. Revenue Certificates of Participation;
5. State Loans;
6. Pooled Financings;
7. A Water Availability Charge;
8. Variable Rate Demand Obligations;
9. Bank Loans; and
10. Lease Purchase Financing.

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1.0. INTRODUCTION

The Carpinteria Valley Water District (District) incorporated as a special district in 1941. The District supplies water to about 16,500 residents, or about 4,100 service connections, in a 13.9 square mile area, including all of the City of Carpinteria. See Figure 1.1 for the District boundary area. About half of the District's annual water sales of approximately 4,300 acre feet are to agricultural users, while the other half is to residential, commercial, industrial, and public authority customers. The District has three sources of water: Cachuma Project water, State Water Project (SWP) water, and groundwater. The Cachuma Project water entitlement represents about 50 percent of the District's current supplies, at 2,813 acre feet per year. The District's SWP water entitlement is 2,200 acre feet per year (including drought buffer). Groundwater is extracted from the Carpinteria Valley Groundwater Basin, which has a total estimated safe yield of about 5,000 acre feet. The District pumps about 1,300 acre feet per year on average from this basin, while private pumpage averages about 2,480 acre feet per year.

The current issues facing the District revolve around water supply and quality, capital facility deficiencies, and needed operations improvements. These subjects are very broad and stem from many other peripheral issues such as Federal and State water policies, increasingly stringent water quality standards, and increased environmental regulation, to mention just a few. In this document, each general category of issues is broken down into individual issues. Options available to the District in dealing with these individual issues are then outlined. Finally, financial information for each of the options is provided when available.

The purpose of this Carpinteria Valley Water District Strategic and Capital Facilities Plan is to describe the present status of the District, identify issues facing the District, and formulate the District's options for addressing these issues. The suggested options are put forth as a means of dealing with dynamic events which are anticipated to have an impact on the District. This document is meant to provide a basic explanatory framework on which future policy decisions and specific plans can be made.

Reliable projections are difficult to make in such a dynamic environment, but certain trends can be identified and acted upon. The extent of these developments is estimated in this document in regard to the impacts they may have on the District's future. Policy suggestions are at a preliminary level within the Plan, and must be addressed by the District in an in-depth manner as they are refined.

2.0. WATER SUPPLY AND QUALITY

2.1. WATER SUPPLY

The Carpinteria Valley Water District's (District) water supply consists of both surface water and groundwater. Surface water is further divided into local surface water and imported surface water. Local surface water is collected in Lake Cachuma from the Santa Ynez River watershed, and is delivered to the District through the Cachuma Project facilities. Imported surface water is transported to Lake Cachuma by way of the State Water Project, and is also delivered to the District through the Cachuma Project facilities. The District is annually entitled to 2,813 acre-feet of Cachuma Project water and 2,200 acre-feet of State Water (including drought buffer). The safe yield of the Carpinteria Valley Groundwater Basin is estimated at 5,000 acre-feet, though the District uses an average of approximately 1,300 acre-feet of groundwater annually.

2.1.1. Cachuma Project Water Supply

Water from Lake Cachuma is supplied to the District by the Cachuma Project. The Cachuma Project was constructed in the early 1950s by the United States Department of the Interior, Bureau of Reclamation (USBR) under contract with the Santa Barbara County Water Agency (Agency) on behalf of the Cachuma Project Member Units. The District, together with other local water districts, is one such Member Unit. The Member Units entered into water delivery contracts with the Agency upon initial deliveries of Project water in 1955.

The Cachuma Project facilities consist of the Bradbury Dam, Tecolote Tunnel, South Coast Conduit, and regulating reservoirs. Bradbury Dam is on the Santa Ynez River approximately 25 miles northwest of Santa Barbara. It forms Lake Cachuma, which has a surface area of approximately 3,043 acres. The original reservoir capacity was 205,000 acre-feet, but that capacity has been reduced by siltation to the current capacity of approximately 190,000 acre-feet. The current operational yield of the reservoir agreed upon by the U.S. Bureau of Reclamation and the Member Units is 25,714 acre-feet per year. Water from Lake Cachuma is conveyed to the District through the Tecolote Tunnel intake tower at the east end of the reservoir. Tecolote Tunnel extends 6.4 miles through the Santa Ynez Mountains from Lake Cachuma to the South Coast Conduit, which is a reinforced concrete pipeline that extends from the Tecolote Tunnel outlet to its terminus at the Carpinteria Reservoir.

The District's annual entitlement of Cachuma Project water is 2,813 acre-feet. This provides roughly half of the District's average annual water use. There is the potential that the District's Cachuma Project entitlement may be impacted in the future. The upcoming State Water Resources Control Board's (SWRCB) water rights hearings in the year 2000, the steelhead trout listing as an endangered species, as well as drought all have the potential to adversely impact the District's Cachuma Project entitlement.

2.1.1.1. State Water Resources Control Board Water Rights Hearings

The authority to issue water appropriation permits is established under State law. The USBR must comply with this authority unless it conflicts with federal law. As such, the State Water Resources Control Board (SWRCB) establishes the amount of water that can be diverted by the Cachuma Project. This appropriation can only be changed through a separate SWRCB permit process. A SWRCB hearing on Cachuma Project water rights permits is planned for no later than December 1, 2000. SWRCB will determine if permit modifications are necessary to provide for downstream water rights and public trust resources. Cachuma Project permit modifications may impact the District's Cachuma Project water entitlement.

Current Conditions

In December 1994, the SWRCB issued WR 94-5 amending USBR's water rights permits for the Cachuma Project. In essence, the order granted an extension of WR 89-18, while continuing to reserve jurisdiction over USBR's permits. The order established a deadline of December 1, 2000 for the SWRCB to commence hearings to determine if any modifications of USBR's permits are necessary to provide for downstream water rights and public trust resources affected by the Cachuma Project. Prior to these hearings, USBR must conduct various studies and collect certain data that will be used by the SWRCB in the hearings. The Member Units created the joint powers authority Cachuma Conservation Release Board (CCRB) to manage the studies and considerations required. WR 94-5 included the following five conditions:

1. The SWRCB reserves jurisdiction over the permits until long-term permit conditions are set to protect downstream water rights holders.

2. A hearing will be convened no later than December 1, 2000 to address the need to modify USBR's water rights permits.

3. Reclamation must provide the following studies, reports, and/or data compilation to the SWRCB no later than February 1, 2000:

a) Final EIS/EIR for the Cachuma Project Contract Renewal;

b) Reports and data from the studies conducted under the so-called "Fish MOU" that began in 1993 and continue today;

c) Report on the riparian vegetation study required under Order 73-17;

d) Information developed and conclusions reached, if any, during negotiations among the Cachuma Project Member Units and the City of Lompoc on groundwater impacts of the project;

e) A study report, or compilation of other existing information, which clearly describes the impacts, or lack thereof, of the project on downstream users as compared to the conditions that would have occurred in the absence of the project;

f) Any other reports or studies required by the SWRCB.

4. By March 1, 2000, the SWRCB staff will determine what, if any, additional CEQA environmental documentation is required for the SWRCB's determination of any modifications to USBR's permits. Any such documentation would be completed by July 31, 2000. The Board would be the lead CEQA agency, but the document would be prepared by the Permittee.

5. USBR must continue to make releases to maintain and study fish below the dam in accordance with the "Fish MOU."

Based on the above considerations, it is possible that the SWRCB may find that modifications of USBR's permits are necessary to provide for downstream water rights and public trust resources affected by the Cachuma Project. These potential modifications may impact the District's Cachuma Project entitlement. This could in turn result in the District having to utilize the more expensive water from its State Water entitlement. Treated State Water costs the District approximately $275 per acre-foot while treated Cachuma Project water costs the District approximately $240 per acre-foot.

District Options

The District plans to organize with the Member Units and USBR to prepare a plan that describes how the parties will develop a "consensus project" for the SWRCB water rights hearing. This could be organized through the CCRB, as it is most familiar with the studies required for the hearings. The plan could explain how the parties would integrate the Fish MOU recommendations with the Lompoc Basin water quality studies into an integrated set of permit modifications, if any. To the extent possible, the "consensus project" could be designed to protect public trust resources that have received less attention in the past, such as other native fish and aquatic species and coastal resources.

Based on the above considerations, there is a wide range of possible modifications to the project water rights permits that could be proposed for the hearing in the year 2000. Examples of these proposals are shown below in Table 2.1.

Financial Assessment

If the District's Cachuma Project water entitlement is reduced, the per acre-foot cost of Cachuma Project water for the District would increase. Total annual costs incurred by the Member Units for the Cachuma Project are fixed, and are reflected in the costs of Cachuma Project water. If less water is delivered, charges for the delivered water must be increased to cover Cachuma Project costs. Cachuma Project water currently costs the

District approximately $240 per acre-foot for delivery and treatment. A reduction in the District's Cachuma Project entitlement may also cause the District to increase its use of its State Water entitlement. State Water is currently more expensive for the District than Cachuma Project water, costing approximately $275 per acre-foot for delivery and treatment. This cost is in addition to the amortized costs of the State Water Project pipeline.

Table 2.1
Possible Water Rights Permits Modifications

Alternative Modifications to the Water Rights Permits for the Cachuma Project	Modifications to Protect Groundwater/Water Quality/Water Rights			Modifications to Protect Steelhead		Modifications to Protect Other Public Trust Resources	
	Minor Change in 89-18	Major Change in 89-18	Physical Solution to Lompoc Basin Problem	Minor Change in 89-18	Major Change in 89-18	Minor Change in 89-18	Major Change in 89-18
Minor Modifications	X			X		X	
Major change to address downstream issues, but only minor changes for ESA compliance		X		X		X	
Minor change to address downstream issues, but major changes due to ESA	X				X	X	
Minor change to address downstream issues, but major changes for other issues	X				X		X
Major changes for downstream and ESA issues		X			X	X	
New facilities for downstream issues, but only minor changes for ESA compliance			X	X		X	
New facilities for downstream issues, and major changes for ESA compliance			X		X	X	

2.1.1.2. Steelhead Listing as Endangered Species

In August of 1997 the National Marine Fisheries Service (NMFS) listed anadromous rainbow trout/steelhead inhabiting the southern California Evolutionarily Significant Unit (ESU) including the Santa Ynez River, as an endangered species under the Federal

Endangered Species Act. Fisheries investigations and water quality monitoring conducted on the Santa Ynez River over the past several years have identified a variety of factors which may have adversely impacted rainbow trout/steelhead on the Santa Ynez River mainstem below Bradbury Dam and its tributaries. These factors include, but are not limited to, elevated water temperatures, depressed dissolved oxygen concentrations, seasonal flows, passage barriers, angler harvest, and general instream habitat conditions. While a program has been in place since 1993 to collect scientific information regarding habitat conditions and fisheries resources on the lower Santa Ynez River in support of developing a fisheries management plan by the year 2000, the recent listing of rainbow trout/steelhead has prompted the need to develop a plan of management actions that will protect rainbow trout/steelhead inhabiting the river while scientific investigations and development of a long term management plan are underway. In response to this need a proposed draft fisheries management plan has been created. As a Member Unit of the Cachuma Project, the District is one of the stakeholders responsible for the implementation of a fisheries management plan for the Santa Ynez River.

Current Conditions

The proposed fisheries management plan has been developed as a cooperative effort by the USBR and the Cachuma Member Units in consultation with the Santa Barbara County Water Agency and the Santa Ynez River Water Conservation District. The management plan is intended to be used as part of the proposed operations of Lake Cachuma, Bradbury Dam, and operations to meet downstream water user demands.

This multifaceted rainbow trout/steelhead fisheries management plan has been designed to (1) protect and improve instream habitat within the mainstem Santa Ynez River and selected tributaries, (2) create opportunities for successful reproduction and survival of anadromous rainbow trout/steelhead, and (3) not adversely impact other important aquatic resources or riparian habitat. The ultimate objective of the fisheries management plan is to implement reasonable and prudent measures that will avoid jeopardy and promote recovery of the Santa Ynez River steelhead population that are consistent with water supply availability, project facilities, access to private lands, and competing demands for resources.

The fisheries management plan consists of six main actions to be used in the implementation of the plan:

- Identification and Management of Priority Geographic Areas – Priority geographic areas along both the lower Santa Ynez River mainstem and selected tributaries will be protected and improved as part of the fisheries management plan. Currently, high value riparian areas would, to the extent practicable, be preserved and complemented by additional riparian vegetation planting. Instream habitat improvements including placement of boulders, use of large woody debris, and gravel enhancement would also be included as part of the overall habitat improvement effort. Priority habitats include: Hilton Creek, the mainstem Santa Ynez River downstream of Bradbury Dam, and Salsipuedes Creek upstream of the confluence with El Jaro Creek.

- Conjunctive Operation of Water Right Releases – The objective of conjunctive operation of water right releases in combination with releases from the fish reserve account (an account of 2000 acre-feet of Cachuma Project water to be used for fish studies) would be to extend the period of time each year when instream flows improve fisheries habitat for spawning and juvenile rearing within the mainstem river. The releases will be managed, to the extent possible, to improve instream flow, habitat, and fisheries benefits associated with these releases.

- Tributary Passage Barrier Removal – Passage barriers exist in the primary tributaries of the lower Santa Ynez river. These tributaries may otherwise provide suitable habitat for rainbow trout/steelhead spawning and/or oversummering.

- Supplementation Hatchery – In an effort to increase the numbers of rainbow trout/steelhead inhabiting the lower Santa Ynez River and its tributaries, the fisheries management plan includes the use of a supplementation hatchery to increase successful spawning and egg incubation with the out-planting of juvenile rainbow trout/steelhead as fry.

- Fishing Regulations – A complete moratorium on recreational angling and harvest of all fish species should be imposed from Bradbury Dam downstream to the lagoon, including all tributaries.

- Fish Rescue Plan – A fish rescue plan would be included as part of the fisheries management plan to reduce mortality associated with stranding and/or relocation of rainbow trout/steelhead from areas having adverse conditions to more suitable habitat.

District Options

As a Member Unit of the Cachuma Project, the District is one of the stakeholders responsible for the implementation of a fisheries management plan for the Santa Ynez River. The District plans to review the mitigation measures proposed in the draft fisheries management plan. By working with the Santa Ynez River Technical Advisory Committee during this review, the District may be able to identify the mitigation measures which provide the most protection for the steelhead, while also remaining cost effective.

Financial Assessment

Based on its annual entitlement of 11% of Cachuma Project water, the District is responsible for approximately 11% of the cost of implementing whichever measures are chosen for the final fisheries management plan.

2.1.1.3. Drought

A large portion of the District's water supply is reliant upon limited local sources. As such, the District has been susceptible to periodic droughts, most recently from 1985 to 1991. While the District's contracting for SWP water has reduced this susceptibility, the unpredictable nature of the state's and District's water supply leaves the District subject to potential water shortages due to drought conditions.

Current Conditions

The series of relatively wet years following the 1985-1991 drought (particularly the El Nino winter of 1997-8), has left the state's and District's water supplies in good condition. Reservoirs are full and water shortages do not appear to be a factor in the near future. Regardless of water supplies, however, the District has continued to implement "water waste restrictions" since the drought. These restrictions are used to inform the District's customers that there is a continuing need to conserve water. The restrictions also discourage wasteful uses of water. In the past, when water conservation was a necessity due to drought conditions, the District also implemented water allocations and a moratorium on new development with the District. A more detailed discussion of the District's water conservation efforts can be found in section 2.1.4.1.

District Options

In the event of a drought, the District has the option to again implement water allocations and development moratoriums. Other measures which can also be implemented include: steeply tiered water rates or penalties for excessive use, restrictions on lawn irrigation, financial incentives for customers to convert to more efficient toilets, free showerheads, and intensive public information campaigns. The District plans to assess the implementation of these measures as considered necessary.

Financial Assessment

The implementation of relatively extreme water conservation measures, such as water allocations and development moratoriums, would decrease the demand for water within the District. This decreased demand would result in decreased revenues for the District.

2.1.2. State Water Supply

Voters in Santa Barbara County approved the acquisition of State Water Project (SWP) water in 1991. SWP water originates in the headwaters of the rivers emptying into the Sacramento-San Joaquin Delta. It is delivered to Lake Cachuma through a series of aqueducts and pipelines. From Lake Cachuma, the SWP water reaches the District through Cachuma Project distribution facilities. SWP water was first available to the District in 1997-1998. The District has not yet been required to request the delivery of SWP water, due to several recent wet years which have made additional water supplies unnecessary.

The District's full entitlement of water from the State Water Project is 2000 acre-feet per year, with an additional 200 acre-feet per year to be used as "drought buffer." The delivery of SWP water will vary from year to year depending upon the requested deliveries, runoff into the San Francisco Bay (Bay) and Sacramento River and San Joaquin River Delta (Delta), and restrictions on pumping that may occur due to regulatory actions protecting fish, wildlife, and water quality in the Bay-Delta. This potential variability in State Water deliveries illustrates the State Water issues facing the District. The impending CALFED Bay-Delta Accord decision (or lack of one) may have an impact on the District's State Water entitlement. In addition, if the full entitlement of State Water is not needed by the District in a given year, the District may explore the possibility of marketing the excess supply.

2.1.2.1. CALFED Bay-Delta Accord

The Bay-Delta is the largest estuary on the West Coast. It is critical to California's economy, supplying drinking water for two-thirds of all Californians and irrigation water for 250 crops and livestock commodities. The CALFED Bay-Delta Program was developed to provide a long-term comprehensive plan that will restore ecological health and improve water management for beneficial uses of the Bay-Delta system. The four main issues it will attempt to address are ecosystem quality, water quality, water supply reliability, and levee system reliability.

The CALFED Bay-Delta Program originally identified three potential alternatives for the program to follow. Rather than choose one alternative for the program, it has since created a Policy Framework for developing the Preferred Alternative for the program. The Policy Framework identifies early implementation actions that can proceed under existing authorities. The CALFED Policy Group believes the Policy Framework lays the foundation to proceed with the Preferred Alternative for the program. Important aspects of the Policy Framework are listed below:

1. *Staged Implementation and Staged Decision Making* - The complexity of the Bay-Delta system and the inability to predict future events and how the system will respond to proposed actions requires that an adaptive management philosophy and process be employed. Central features of adaptive management are staged implementation and staged decision making.

2. *Continuous Improvement in all Resource Areas* - ecosystem, water quality, levee system integrity, and water supply reliability.

3. *Stage 1 Implementation* - The first stage of implementation will be a seven-year period commencing with the certification of the Programmatic EIS/EIR. Stage 1 must:
    - Result in overall improvement for all resource areas
    - Provide stability in the water resource management framework
    - Improve conditions in the Bay-Delta system for listed and proposed species.
    - Have a mix of public and private funding

- Build the information needed to make decisions for the transition to Stage 2
- Address the conditions and linkages for storage and conveyance

4. *Assurances Package* - The assurances package will replace and expand upon the Bay-Delta Accord and include a set of actions and mechanisms to assure that the Program will be implemented and operated as agreed.

5. *Finance Package* - Total "life cycle" cost estimates for the Program are being developed. The finance package will include a final cost estimate, including operation and maintenance and mitigation costs, and agreement on the financial principles and cost allocation strategy.

6. *Delta conveyance*
   Primary strategy is to develop a through-Delta conveyance alternative based on the existing Delta configuration and modifications. Everything practical will be done to make this conveyance strategy achieve CALFED goals and solution principles.
   Contingent strategy is to include a dual Delta conveyance with an isolated facility if the primary strategy does not meet CALFED goals and solution principles.

7. *Water Supply Reliability*
   - Aggressive implementation of water transfers and water use efficiency measures
   - Option for new or expanded groundwater and surface storage

8. *Actions and Assurances for 1998-99 Under Existing Authorities* – During the period before the final EIS/EIR and ROD are issued in the fall of 1999, the CALFED agencies will continue to make progress in implementing, coordinating, and expanding ongoing project specific actions to provide additional benefits for environmental, urban, and agricultural users, where consistent with the CALFED Bay-Delta Programmatic framework. Project specific actions to pursue include:
   - Develop and implement the annual CVP/SWP Operations Plan
   - Expand south of Delta groundwater storage
   - Facilitate additional short-term water transfers
   - Improve coordination of Category III, Bay-Delta Act, CVPIA and other funds for ecosystem restoration projects
   - Initiate environmental documentation and feasibility analysis
   - Target and increase funding for water conservation, reclamation, water quality, and flood plain and watershed management programs
   - Seek continued funding for Delta levees program
   - Issue final State Water Resources Control Board water rights decision to allocate responsibility for meeting the 1995 Water Quality Control Plan
   - Extend the Bay-Delta Accord to provide operational and environmental stability through December 1999, at which time CALFED anticipates the ROD will be issued
   - Resolve permitting issues and, as appropriate, initiate south Delta improvement actions

- Incorporate ongoing and planned monitoring and studies into the CALFED Comprehensive Monitoring Assessment and Research Program

Depending on which actions are eventually chosen for implementation, the CALFED Bay-Delta Program may have an impact on the SWP. Impacts on the SWP will be reflected in the District's SWP water entitlement. At present, the District's SWP entitlement can be reduced in a given year due to water shortages. With the success of the CALFED Bay-Delta Program, this situation is likely to improve. The SWP water entitlement would become more reliable, thereby enhancing the reliability of the District's SWP entitlement in the future. Increased reliability may also lead to the possibility of the District increasing its SWP entitlement in the future, if necessary.

The water quality of the District's SWP deliveries will also most likely be impacted by the CALFED Bay-Delta Program. Though SWP water is generally considered to be of superior quality to that of Cachuma Project water because of its low levels of Total Dissolved Solids, SWP water is occasionally high in bromide and organics. These two constituents are present in SWP water due to saltwater intrusion and the organic content of levees in contact with the water. Bromide and organics can react with chlorine in treated water to form trihalomethanes, a potentially carcinogenic contaminant. If a decision is reached in regards to the Bay-Delta, this aspect of SWP water quality will most likely improve, since one of the primary goals of the program is improved water quality. One method through which water quality may be improved is through the construction of an isolated conveyance facility, which would route water away from areas of saltwater intrusion and help prevent its contact with organics in earthen levees.

CALFED has suggested a variety of public and private funds to finance the Delta solution including taxes, general obligation bonds, user fees, and federal and state appropriations. The chosen method of financing has the potential to impact SWP contractors, such as the Central Coast Water Authority (of which the District is a member). Depending upon which actions are implemented and which method of financing is chosen, the District's SWP water costs may change.

Current Conditions

The District's full entitlement of water from the State Water Project is 2000 acre-feet per year, with additional 200 acre-feet per year to be used as "drought buffer." At present, the District's SWP entitlement can be reduced in a given year due to water shortages.

SWP water exported from the Bay-Delta contains high levels of organic matter and bromides (ocean salt from San Francisco Bay) which, when treated, can create disinfection byproducts. The most common of these byproducts are trihalomethanes (THMs), suspected carcinogens. See section 2.2.1.1. for a discussion on THM levels in the District's water supply.

The District currently pays approximately $275 per acre-foot for delivery and treatment of SWP water.

District Options

The District has the option to endorse the CALFED Bay-Delta Program. The program, if successful, should increase the District's SWP water supply reliability and water quality. After a thorough review of the actions under consideration by the CALFED Bay-Delta Program, the District and Member Units should endorse the programs which would do the most to ensure its SWP water entitlement and improve water quality. The District should also endorse the funding mechanism which would minimize potential increases in SWP water costs for the District.

Financial Assessment

The projected cost for the Delta solution is between $4 billion and $10 billion, to be apportioned among the many beneficiaries of such a solution. The key issues are who will pay, how much, and how the fees will be assessed. A funding program will be chosen when a preferred alternative is selected. The chosen method of financing has the potential to change the cost the District pays for SWP water.

2.1.2.2. Marketing Opportunity

The addition of the State Water entitlement to the District's water supply has resulted in a surplus of water supply for the District during normal or wet conditions. This surplus of water supply has created a marketing opportunity for the District. Since State Water is the most expensive water the District pays for, it is the first water the District would opt to market.

Current Conditions

There is currently no market for the District's State Water entitlement. The price of State Water is high relative to other water supplies in the area.

District Options

If a favorable market for the District's State Water entitlement were to evolve, the District plans to assess the marketing of its State Water supply. Marketing of the water would have to be fiscally advantageous to the District in terms of the amount of water supply reliability the District would be sacrificing in order to market the water.

Financial Assessment

The cost of State Water is relatively high when compared to other water sources in the area. As such, the minimization of State Water use by the District would increase revenues for the District. The marketing of State Water would further increase the revenues of the District.

2.1.3. Groundwater Supply

The District places its highest priority on its groundwater supply. Groundwater is the District's principal water supply because it is (1) the water source with the highest water quality, (2) the water source with the lowest cost, and (3) the water source over which the District has the greatest control.

The Carpinteria Valley Groundwater Basin is an elongate northwest-southeast trending basin that occupies approximately 7620 acres between the Santa Ynez Mountains to the north and the Pacific Ocean to the south. See Figure 2.1 for the basin boundary. The basin is about seven miles long and widens towards the southeast, with an areal extent of approximately 12 square miles. At the extreme western boundary is the Toro Canyon sub-basin, which encompasses an area of 700 acres along Toro Creek. The Rincon Thrust Fault, a northwest-southeast trending fault, divides the basin into two storage units. Storage Unit No. 1 lies to the north of the fault, and Storage Unit No. 2 is located south of the fault. The fault is reported to be a hydrologic barrier between the two storage units. The Carpinteria Valley groundwater basin is a complex aquifer system consisting of four main water bearing layers that are moderately continuous throughout the basin. It is likely that there is vertical communication between the layers based on tracer and water quality data.

Geotechnical Consultants, Inc. (GCI) estimated in 1986 that the total basin storage was 700,000 acre-feet. Approximately 27%, or 170,000 acre-feet, is located in Storage Unit No. 1. The Santa Barbara County Water Agency currently considers the Carpinteria basin to have 50,000 acre-feet of available storage. Annual safe yield of the basin is estimated to be 5,000 acre-feet.

Groundwater pumpage varies greatly from year to year depending upon the availability of surface water, precipitation, and land use. From 1993 to 1997, the District pumped an average of approximately 1,300 acre-feet of groundwater per year. From 1992 to 1996, private well owners pumped an average of approximately 2,480 acre-feet of groundwater per year. Maximum capacity of the four wells operated by the District is 4,670 acre-feet per year. There is a growing use of the basin by private landowners as a source of irrigation water and the continuing need to maintain the basin as a major sustainable drinking water resource for the District. As a result, the District has identified several issues which relate to groundwater supply.

2.1.3.1. Conjunctive Use of Groundwater with Surface Water

The conjunctive use of groundwater and surface water is the planned balanced use of both types of water, so that the supplies and use of both these types of water can be maximized. During wet years, conjunctive use implies that the plentiful surface water supply is used to its maximum, while groundwater use is minimized. This allows for groundwater supplies to be saved and recharged. During dry years, this plentiful groundwater supply can then be used to help ensure that important surface water supplies

are not depleted rapidly. Conjunctive use also encompasses the use of surface waters to artificially recharge the groundwater basin during wet years.

Current Conditions

The District currently practices conjunctive use of its groundwater and surface water. During the wet winter of 1997-1998, the District maximized its use of plentiful surface water, while groundwater use by the District was halted. As a result, the Carpinteria Valley groundwater basin is currently gaining recharge, and this source of supply can be saved for the future. Conjunctive use allows for the creation of a recharged groundwater basin, which can be used as insurance against potential drought or other impacts on the District's water supply.

District Options

The District plans to continue to evaluate the feasibility of artificial recharge of the groundwater basin through projects such as the Santa Monica Creek Diversion Project or other conjunctive use projects. Artificial recharge of the groundwater basin is discussed in Section 2.1.3.4.

2.1.3.2. Use of Groundwater by Private Well Owners

There are approximately 85 privately owned wells currently in operation within the District and an additional 20 to 30 wells which are not routinely pumped. See Figure 2.2 for the locations of active wells within the District. These wells are primarily used for agricultural purposes. From 1992-1996, an average of 2,480 acre-feet of groundwater was pumped by private well owners from the Carpinteria Valley Groundwater Basin. Combined with District groundwater use, increased pumping of groundwater by private well owners within the District may lead to the safe yield of the Carpinteria Valley Groundwater Basin being exceeded.

Under Assembly Bill 3030 (AB3030), the District has adopted a groundwater management plan for the Carpinteria Valley Groundwater Basin. As the designated manager of the groundwater basin, it may become necessary for the District to increase its direct management of the basin's groundwater resources. In order to curtail groundwater use, this may include offering private well owners water at prices cheaper than what they pay for groundwater. It may also become necessary for the District to regulate the use of groundwater by private well owners. The District may also be able to impose a charge on private well owners for costs incurred by the District for replenishing groundwater.

Current Conditions

The District currently monitors the use of groundwater by private well owners. This is done through the District's estimation of water use based on acreage and crop types. No regulations are currently in place to limit the use of groundwater by private well owners.

However, the mechanism to create and implement such limitations is in place under AB3030.

District Options

1. In order to curtail groundwater use by private well owners, it may be necessary for the District to offer the well owners water at prices lower than what they spend to obtain their groundwater.

2. If there is an increased demand for groundwater within the District, as the manager of the groundwater basin it may become necessary for the District to regulate the use of groundwater by private well owners. In this case, the District may pursue an agreement on groundwater use between the private well owners and the District. Voluntary levels of groundwater use by private well owners could be agreed upon. This could include placement of meters on all private wells so that direct monitoring of groundwater use can be implemented. The setting of limits on groundwater use by private well owners may also be necessary. It should be noted that the regulation of private groundwater pumpage would most likely be met with strong opposition from the private well owners.

3. The District may pursue the implementation of a groundwater recharge system. A system of this type could reduce the impact of private well pumping on the groundwater basin. This subject is discussed more fully in Section 2.1.3.4. If such a system is found to be necessary, the District may impose a charge on private well owners for "replenishment waters."

Financial Assessment

1. The District currently pays $240 per acre-foot for Cachuma Project water and $275 per acre-foot for SWP water. Costs to the District for pumping and treating groundwater is approximately $150 per acre-foot. The cost of groundwater for private well owners is lower than the District's costs for groundwater. This is because private well owners generally use groundwater for irrigation, which does not require water quality concerns to be addressed. The cost a private well owner pays for an acre-foot of groundwater varies with the location of the well within the basin.

2. Costs for reaching an agreement on groundwater use by private well owners should be low, but resistance would be anticipated. Purchase and installation of meters on all private wells would cost approximately $2000 per unit, or $200,000 for one hundred wells.

3. See Section 2.1.3.4. for a discussion of the costs for a groundwater recharge system. Possible charges imposed on private well owners for "replenishment waters" has yet to be determined.

2.1.3.3. Carpinteria Valley Watershed Management Plan

A Carpinteria Valley Watershed Management Plan (Plan) may be developed to manage the creeks and groundwater of the Carpinteria Valley watershed. The primary objective of the plan would be to protect the water resources of the watershed. The Plan would most likely include restrictions on the use of water from the creeks within the watershed. Restrictions on land use adjacent to creeks would also be included to control sedimentation. Such a Plan, if implemented, would also provide other benefits, including safer water for swimmers in the ocean. This would be provided by decreasing the loading of pollutants to the ocean from the creeks. While working in conjunction with the City of Carpinteria and other agencies, it may be desirable for the District to play a key role in the creation of this document, as the document could be used to help ensure the protection of groundwater resources within the District.

Current Conditions

During the El Nino winter of 1997-98, both the Carpinteria and Rincon Creeks, which are located within the District, frequently carried elevated levels of nitrates and coliform bacteria into the ocean. These elevated levels of nitrates and coliform bacteria appear to be the result of high runoff rates due to strong rains and the gradual change in land use patterns along the creeks and their tributaries. High levels of nitrates within these creeks is a concern for the District because the creeks and their tributaries (particularly Carpinteria Creek) may account for as much as 20% of the groundwater basin recharge within the District. The District, working in partnership with landowners and owners of private wells, adopted an AB 3030 Groundwater Management Plan in August of 1996, and has become the protector of groundwater resources for the whole Valley. In addition, the District relies upon the groundwater resources within the Valley for up to 50% of its water supply. To address these concerns, the District is prepared to participate in a South Coast Watershed Characterization Study under the direction of the County of Santa Barbara. Though there is currently no Carpinteria Watershed Management Plan, this study will most likely evolve into the preliminary phase of such a Plan.

District Options

The District supports the creation of a Carpinteria Valley Watershed Management Plan. This would help ensure the water quality of the creeks within the watershed, which would in turn improve the water quality of the Valley's groundwater resources. The District, with its working relationship with many of the landowners along Carpinteria and Rincon Creeks, may be an ideal partnering agency for the City and/or County, if not an appropriate lead agency, in the creation and management of such a Plan. Watershed management would possibly involve restrictions on land use and irrigation practices. The District, with an elected Board representing the whole valley, would be able to commit resources not subject to County Board of Supervisors politics, and would maximize local control and local resident participation.

Financial Assessment

Expenditures for the creation and implementation of a Carpinteria Valley Watershed Management Plan should be low. Funds may eventually become available through the Governor's Watershed Protection and Restoration Council. Costs incurred would most likely be in the form of time commitments by the District's staff.

2.1.3.4. Groundwater Basin Recharge

The Carpinteria Valley groundwater basin is recharged by seepage from streams, percolation of precipitation, subsurface inflow from materials underlying the Santa Ynez Mountains, and return flow of imported water, such as surface water from Lake Cachuma. Natural recharge of the Carpinteria Valley groundwater basin occurs primarily through seepage from Carpinteria Creek and its tributaries, along with other creeks found within the basin. Much of this recharge occurs along the northern boundary of the basin, where water transmissive units that extend deep into the basin are exposed at or near the surface ("windows" to the aquifers). The most significant recharge capacity of the basins is limited by the occurrence of streams flowing across the "windows" to the aquifers and the areal extent of the recharge area. Therefore most recharge occurs in periods of extended rainfall and runoff and less recharge occurs in dry periods or when rainfall and runoff occurs over short periods.

With intermittent natural recharge, it may be beneficial to the District to consider artificial recharge of the Carpinteria Valley groundwater basin. Runoff from a creek within the District could be diverted during large rain events. This diverted water could then be used to recharge the basin through the use of an injection well. Excess runoff would be used to maximize the District's groundwater supply, allowing for this water to saved within the groundwater basin until needed.

Current Conditions

The District does not currently artificially recharge the groundwater basin. The District also does not own the facilities necessary to recharge the groundwater basin. Diversion facilities and an injection may be required.

District Options

1. The District plans to continue to assess the need for the implementation of a groundwater recharge system. This system could be placed on the property owned by the District located behind the District's maintenance yard. This is the site of the abandoned Santa Ynez Well, and the property is currently unused. Santa Monica Creek also runs adjacent to this property. Water could be diverted from Santa Monica Creek during large rain events and injected into the groundwater basin via the abandoned Santa Ynez Well or a new injection well.

2. The District plans to continue to assess the practicality of utilizing tertiary-level treated water from the Carpinteria Sanitary District, as a source of recharge for the Carpinteria Valley Groundwater Basin. Release of tertiary-level treated water into the creek in the Foothill Road area would potentially increase the creek's recharge capability. The releases would also serve the dual purpose of increasing flows within the creek. These increased flows could enhance fish migration and serve to flush the creek of potential pollutants. Frequent flushing due to these releases could serve to dilute the loading of potential pollutants to the ocean from the creek. Any potential pollutants would be flushed from the creek frequently, preventing their buildup and reducing the potential for high pollutant levels in the ocean from single storm events.

The Carpinteria Sanitary District has the capability to treat its effluent to a tertiary level, though this treatment is not currently practiced. Some retrofitting of the treatment plant would be required to perform tertiary treatment. Delivery of tertiary-level treated water to Carpinteria Creek would also require construction of new distribution lines. Furthermore, operating costs of the Carpinteria Sanitary District would increase in order to treat its effluent to tertiary levels.

See Section 2.1.6.2. for further discussion of tertiary treatment and reclaimed/recycled water use.

Financial Assessment

1. A feasibility study would be required to determine the costs associated with the implementation of a groundwater recharge system. A study of this type is estimated to cost $10,000.

2. A feasibility study would be required to determine the costs associated with the implementation of a system capable of treating water to a tertiary level and releasing it to the Carpinteria Creek. A study of this type is estimated to cost $10,000. Operating costs for the Carpinteria Sanitary District could increase from approximately $1,300 per acre-foot for secondary treatment to as much as $1,960 per acre-foot for tertiary treatment.

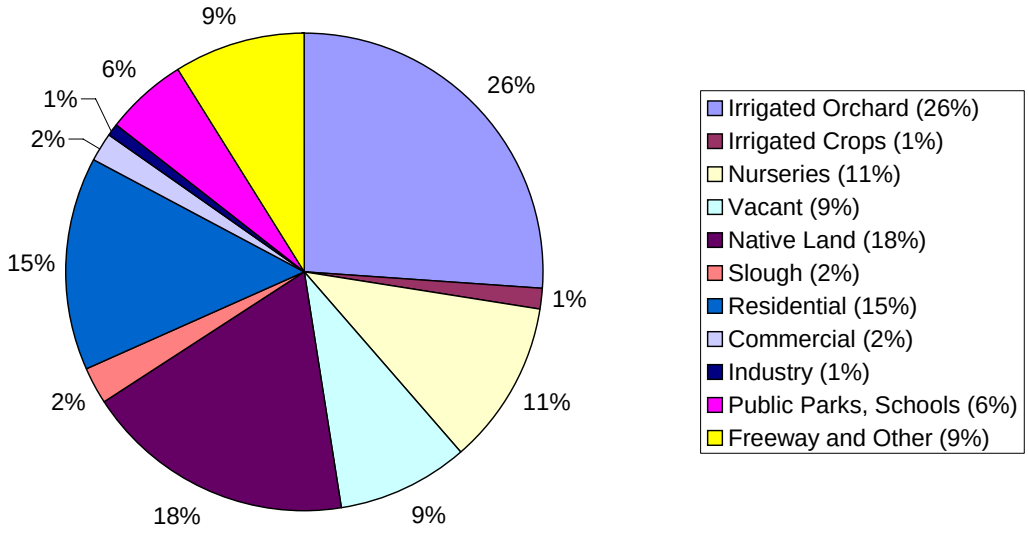
2.1.3.5. Santa Ynez Well Development

Should the District experience an increase in growth and demand, it may be desirable or necessary to develop additional wells. Additional wells are also desirable for the District in that it would increase the reliability of the District's groundwater capability. A favorable site for well development would be at the property located behind the District's maintenance yard at 1301 Santa Ynez Avenue. This location was previously the site of the District's Santa Ynez well, now abandoned. The District may desire to preserve this land as a potential future well site. A full discussion of this subject can be found in Section 3.2.5.

2.1.3. Past, Current, and Projected Water Use

The District's water service is provided to a population of about 16,500 (1995 District estimate) and approximately 3,486 acres of irrigated crops. Water is also provided for commercial, recreational, light industrial, and municipal purposes. Figure 2.3 shows the proportion of various land uses within the District. There are approximately 4,036 service connections within District boundaries. The District anticipates steady growth in demand for water from its residential, commercial, light-industrial, municipal, and agricultural sectors.

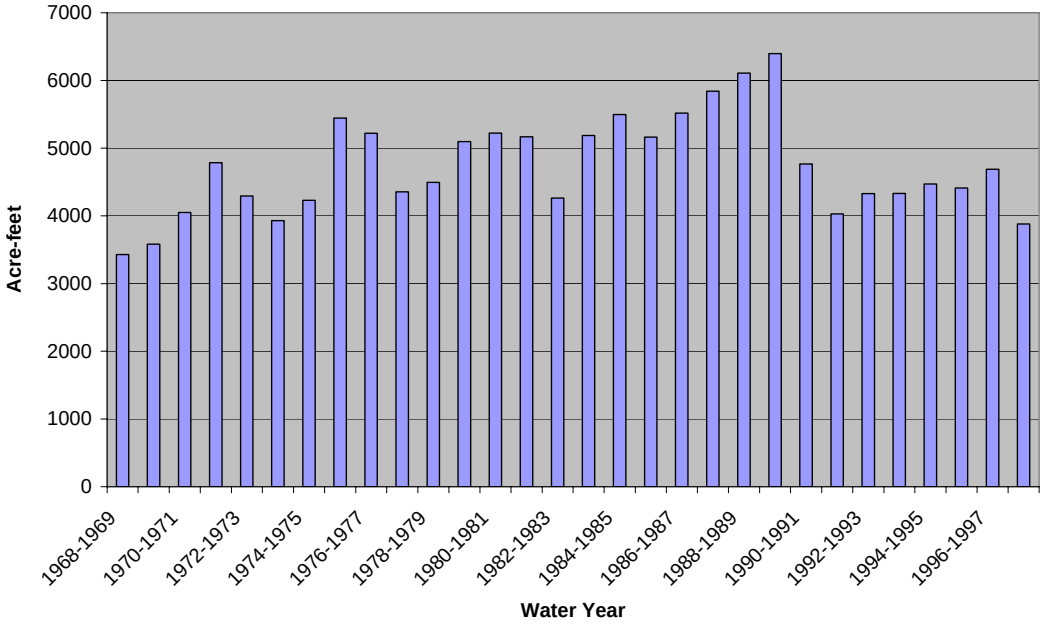
Figure 2.3
District Land Use 1997



Past, Current, and Projected Conditions

The 1986-1990 five year average water use was 5,806 acre-feet per year. On January 31, 1990 the District Board of Directors declared a water shortage emergency in response to significant drought-related cutbacks in supply from Lake Cachuma, and soon thereafter instituted a moratorium on new water connections. A water allocation ordinance limiting water use by existing District customers was also established. The subsequent 1991-1995 average use was 4,385 acre-feet per year, an average decrease of 1,420 acre-feet per year from the 1986-1990 five year average. The decrease in District use can be attributed to the number of additional and rehabilitated private wells in use during and since the drought. Historical water use by the District is shown in Figure 2.4.

Figure 2.4.
Historical District Water Use



Since the moratorium has been lifted, new connections have increased at a rate of approximately 1% per year. During this same period, water demand has risen at a rate of approximately 2.5% a year, or 110 acre-feet per year.

Residential connections are projected to increase at 1% per year, but could average 2-3% a year. This additional increased growth would be within the City of Carpinteria, which is mandated to provide for 644 new housing units over the next four years under its Regional Housing Needs Plan. Existing single-family accounts use 127 gallons per capita per day. However, efficiency requirements in new construction should reduce single-family use in new homes to 110 gallons per capita per day.

Commercial, light-industrial, and municipal demand is projected to increase between 1-3% per year. Demand for public parks and schools is expected to remain constant. Increased efficiency and landscape conservation at existing parks will provide sufficient water savings to supply new recreational projects contained in the general plan. No golf courses or other high water use recreational facilities are currently planned within the District.

Normal agricultural demand is expected to increase at a rate of approximately 2% per year, since most available agricultural land is already planted in high-value crops. Peak agricultural demand is expected to remain constant. Total acreage in agricultural production actually decreased in the 25 year period between 1970-1995, with a 24% decrease in irrigated orchards during that time. During the same period, however, nurseries have increased by 360% and irrigated crops have increased slightly. Water use projections have been made based on continuation of this trend of conversion either to nurseries or other high value crops.

The District is unique on the South Coast because while only 11% of District accounts are agricultural, they account for 48% of District normal demand. All other classes combined make up the remaining 89% of District accounts, yet represent only 52% of District normal demand. The District's agricultural accounts irrigate more than 3,486 acres (2,368 acres of permanent crops, 668 acres of annual crops, and 450 acres of greenhouses). During the period from 1991 to 1995, these 3,486 acres were irrigated with an average of 2,109 acre-feet per year from the District and an average of 2,431 acre-feet per year from privately pumped groundwater. Since 1990, private pumpage has increased at an average of between 3-5% per year. The District estimates that this increase is due in part to current District agricultural rates. Due to the value of the permanent crops and expensive water, most District agricultural customers irrigate with sprinkler or drip irrigation systems.

Based upon historical data and current City and County general plans and zoning, which predict total population of the District at buildout to be approximately 24,000 people, the District has prepared a preliminary projection of long-term District water demand as follows:

Year	Projected Water Use (acre-feet)
1999	4,500
2004	5,000
2009	5,500

The District also projects that private pumpage increase will level off in 1999, with only slight increases in subsequent years.

District Options

The District is annually entitled to 2,813 acre-feet of Cachuma Project water and 2,200 acre-feet of State Water (including drought buffer), while the safe yield of the Carpinteria Valley Groundwater Basin is estimated at 5,000 acre-feet. As such, it appears that the District can readily meet projected demands for water. Therefore, no action by the District is believed to be necessary at this time. However, the District plans to periodically assess its ability to meet future projected water demands.

2.1.5. Annexation of Additional Land by the District

Land adjacent to the District would require annexation by the District to receive water service. Water service to the newly annexed land would result in an increase in demand on the District's water supply.

Current Conditions

The representatives of the owners of an area known as Rancho Monte Allegre have inquired about annexation to the District. In addition, similar tracts of land may be developed in the future, also requiring annexation by the District. Annexation of Rancho

Monte Allegre and other potential developments may increase the demand on the District's water supply. With the addition of State Water to the District's water supply, it is expected that the District can adequately meet these increased demands.

It should be noted that if annexation does not occur, properties may develop water supplies which could adversely impact the District. For example, without annexation a proposed development may wish to divert water from a creek within the District, reducing groundwater recharge from the creek.

District Options

The District plans to continue to assess annexations on an individual basis. With access to State Water, the District can meet the demands of reasonably foreseeable new annexations.

Financial Assessment

The District passes on all of its costs associated with an annexation to the annexing party. Annexation increases the District's revenues from the purchase of water for the annexed land, thereby reducing the pressure of State Water costs for pre-annexation customers.

2.1.6. Conservation/Recycling of Water

A large portion of the District's water supply is reliant upon limited local sources. As such, the District has been susceptible to periodic droughts, most recently from 1985 to 1991. While the District's contracting for SWP water has reduced this susceptibility, the unpredictable nature of the state's and District's water supply leaves the District subject to potential water shortages due to drought conditions. This susceptibility to drought has led the District to adopt an extensive water conservation program. As a long-term project, the District is also considering recycled/reclaimed water as a method to increase the District's water supply reliability.

2.1.6.1. Water Conservation

Efficient water use has long been a priority within the District. The District has been dependent on limited local water supplies and has experienced periodic droughts, most recently from 1985-1991. State and federal agencies now require water purveyors to demonstrate that existing water supplies are being used as efficiently as possible/feasible. Water conservation standards have been developed by these agencies, often called "best management practices (BMPs)," and are being encouraged and required of the District.

Current Conditions

The District has developed a Water Conservation Plan. It has also created a Best Management Practices Committee to implement the plan. The enactment of this plan has put the District in compliance with state and federal regulations. Federal regulations fall

under the Reclamation Reform Act of 1982 and the Central Valley Improvement Act of 1992. State regulations fall under the California Urban Water Conservation Memorandum of Understanding of 1991.

The federal Reclamation standards for water use efficiency programs are listed below. The District is in compliance with these standards.

A. *Key Best Management Practices for all Districts*

1. Measure, with a minimum accuracy of ± two percent, the volume of water delivered by the District to customers.
2. Implement pricing and billing procedures that provide incentives for more efficient use and management of water and reduced drainage.
3. Designate a water conservation coordinator responsible for development and implementation of the water conservation plan.
4. Provide, or support, the availability of educational programs, materials, etc. for water users and staff.
5. For agricultural water suppliers, provide, or support, the availability of conservation services to the District's customers.
6. If the District is in California and overlies any portion of a usable groundwater aquifer, the District shall begin working with overlying and affected parties to develop a groundwater management plan.
7. If the District delivers 2000 or more acre-feet of water for M&I uses, the District shall implement the Best Management Practices detailed in Memorandum of Understanding Regarding Urban Water Conservation in California, September 1991.

B. *Other Best Management Practices*

1. Line ditches or canals with impermeable membranes, or use pipes;
2. Construct or line regulatory reservoirs;
3. Implement an increasing tiered block water pricing structure, or other water pricing structure, that promotes the most effective management of water;
4. Modify distribution facilities and District policies to increase the flexibility of water deliveries;
5. Construct District operational spill reuse systems;
6. Facilitate, and/or provide, financial incentives and assistance for on-farm water management improvements;
7. Increase conjunctive use of surface and groundwater within the District;
8. Facilitate alternative uses for lands whose irrigation would lead to unmanageable problems;
9. Measure water use by crop and field, and provide information to customers;
10. Facilitate voluntary water transfers that do not unreasonably affect the District, the environment, or third parties;
11. Coordinate the evaluation of District and private pump efficiencies with local utilities;

12. Evaluate potential USBR and District institutional changes which could allow more flexible water delivery and carry-over storage.

The California Urban Water Conservation Best Management Practices are listed below. The District has implemented these practices, with the exception of numbers 11, 15, 16. Conservation pricing (#11) is not believed to be necessary for the District because the District's water prices are high enough to facilitate conservation without a tiered-pricing system. Financial incentives for conservation (#15) are not offered by the District directly, though the District does offer guidance to customers seeking funds or low interest loans for water conservation projects. Ultra low flush toilet replacement (#16) is not offered by the District because of the prohibitive cost to the District to keep an overhead supply of toilets available. BMP #s 11, 15, and 16 may be offered by the District in the future, however, if found to be necessary for water conservation.

1. Interior and exterior water audits and incentives;
2. Plumbing – new and retrofit (a. enforce state law for water efficient plumbing devices in new construction, b. support state/federal law prohibiting sale of toilets using over 1.6 gallons per flush, c. retrofit kits for pre-1980 homes);
3. System water audits and leak detection and repair;
4. Meter new connections, retrofit existing connections;
5. Water audits for large landscapes;
6. Landscape conservation requirements for new developments;
7. Public information;
8. School information;
9. Commercial and industrial water conservation;
10. New commercial and industrial water use/review;
11. Conservation pricing;
12. Landscape water conservation for new/existing single family homes;
13. Water waste prohibition;
14. Water conservation coordinator;
15. Financial incentives;
16. Ultra low flush toilet replacement.

<u>District Options</u>

No additional actions by the District regarding water conservation are believed to be necessary at this time.

2.1.6.2. Recycled/Reclaimed Water

Reclaimed water is wastewater which has undergone treatment, allowing it to be reused, either for irrigation or recharging of groundwater supplies. Through an agreement with the Carpinteria Sanitary District, a reclaimed water treatment and distribution system could be developed by the District. Reclaimed water would have to undergo tertiary treatment to reduce the risk of health hazards from its use. The Carpinteria Sanitary District has the potential to upgrade its current secondary treatment facilities to tertiary

levels, though it would require fairly extensive retrofitting of existing systems. Operating costs for treatment would also increase. Furthermore, a distribution system for the reclaimed water would need to be created. Within the District, a reclaimed water system would allow for treated wastewater to be used for irrigation, thereby reducing demand for the District's principal water supply. This would help decrease the District's susceptibility to water shortages, in turn increasing the District's water supply reliability. A reclaimed water system may be necessary for the District in the future in order to meet increasing demands on the District's water supply.

Current Conditions

The District does not currently have a reclaimed water system available to it. The Carpinteria Sanitary District has the potential for the tertiary treatment required of reclaimed water, but retrofitting at the Sanitary District would be necessary. A distribution system for the reclaimed water would also be necessary. There is currently no such system in place.

District Options

The District has the option to create a long-term plan for implementing a reclaimed water system. Discussion with the Carpinteria Sanitary District would be necessary for the planning process. Potential uses and demand for reclaimed water within the District could also be studied. It should be noted that major legal issues are associated with reclaimed water use.

Financial Assessment

Development of a reclaimed water system would require a large capital investment. Tertiary treatment and distribution systems would need to be constructed. A feasibility study would most likely be required to determine costs and benefits of such a reclaimed water system for the District. A study of this type is estimated to cost $10,000. In addition, operating costs for the Carpinteria Sanitary District could increase from approximately $1,300 per acre-foot for secondary treatment to as much as $1,960 per acre-foot for tertiary treatment.

2.2. WATER QUALITY

Overall, the District's water is of high quality. It is continually monitored and is in compliance with current regulations. There are several issues regarding water quality which the District may have to address in the near future, however. The uncovered status of both the Carpinteria and Ortega Reservoirs is a water quality concern. The potential for vertical communication within the Carpinteria Valley groundwater basin has also led to water quality concerns regarding the District's groundwater supply.

2.2.1. Surface Water Quality

Approximately half of the District's water supply is surface water from Lake Cachuma. The water of Lake Cachuma is either local surface water or imported surface water from the State Water Project. To protect the quality of the lake's water, only light recreation is allowed on the lake. The surrounding watershed is also strictly protected. Lake Cachuma surface water is treated at the City of Santa Barbara's Cater Treatment Plant, through a joint powers agreement between the City of Santa Barbara and the District which allows for the sharing of treatment costs. After treatment it flows through the South Coast Conduit to the District's distribution and storage system, including the Ortega and Carpinteria Reservoirs.

As part of the Cachuma Project, the Ortega and Carpinteria Reservoirs were designed and constructed for irrigation purposes. As an irrigation project, the reservoirs of the Cachuma Project were not required to be covered. For their current use as domestic potable water reservoirs, however, current water works standards would require the reservoirs to be covered to prevent contamination from birds, windblown material, and vandalism. In order to minimize this problem, COMB has surrounded the reservoir with a six foot chain link fence, while the District inspects the reservoir twice a day. The water entering the reservoir contains chlorine residual, and to ensure disinfection a small amount of chlorine is added when the water leaves the reservoir. Every year the reservoir is emptied and cleaned.

Surface water delivered to the District from Lake Cachuma and stored in the Ortega and Carpinteria Reservoirs has several potential water quality concerns. Due to the open condition of Lake Cachuma and the other reservoirs of the Cachuma Project (including the Ortega and Carpinteria Reservoirs), there is potential for water stored in these reservoirs to contain coliform bacteria and other pathogens. In addition, the open reservoirs require additional chlorination, providing the potential for high levels of trihalomethanes (THMs) to form. Higher levels than desired of dissolved solids are also found in the water. The potential for increasingly stringent regulations have made these constituents a concern for the District. The District's ability to address these concerns is complicated by the fact that the reservoirs were constructed and are owned by USBR, which has indicated that it does not believe it has any obligation to address water quality issues.

2.2.1.1. Trihalomethanes (THMs)

THMs are a disinfection byproduct resulting from the chlorination of surface water supplied to the District from Lake Cachuma. THMs are a byproduct of the combination of organics present in the water and chlorine residuals from the chlorination process. THMs ingested through drinking water have recently been linked to "spontaneous abortion." They are also suspected carcinogens. As a result, new federal EPA regulations will lower acceptable THM levels from 80 parts per billion (ppb) to 40 ppb by 2002. In addition, the method of assessing THM levels may change. THMs levels are currently averaged on an annual basis. This allows for THM levels to occasionally

exceed regulation levels as long as the average level meets standards. The California Department of Health Services (DHS) may prohibit this averaging of THM levels in the future. This could result in increased difficulty for the District in meeting regulatory requirements.

Current Conditions

In 1997, the District's THM levels ranged from 17-97 ppb, while averaging approximately 67 ppb. Though the District is below the current requirement of a rolling annual average of 80 ppb based on quaterly sampling, quarterly levels occasionally exceed 80 ppb. The District is currently sampling monthly for THMs at the input and output of the Carpinteria Reservoir in order to determine THM loading at the reservoir. The City of Santa Barbara is expected to address THM levels at the Cater Treatment Plant, possibly by changing from the use of chlorine in its disinfection process to the use of chloramines (a combination of chlorine and ammonia). If this occurs, THM levels within the District may be substantially reduced. The effect of the actions at the Cater Treatment Plant on the District's THM conditions is unclear, however. The District may be required to take some action to address this issue in the future.

District Options

1. The District plans to begin a program of periodic flushing of its distribution system to clear it of any organic debris which may be caught in the pipes. This debris may be reacting with chlorine residual in the pipes, raising THM levels within the system. The District plans to sample for THMs before and after the flushing, in order to help determine if debris in the pipes was contributing to elevated THM levels. If flushing is shown to significantly reduce THM levels, a more accelerated program may be implemented.

2. The District plans to pursue the covering the Ortega and Carpinteria Reservoirs. With the reservoirs covered, the secondary chlorination of the water in the reservoirs would no longer be necessary. This decrease in the amount of chlorine added to the water supply would reduce the potential for the formation of THMs within the District's distribution system. The combination of new treatment involving chloramines to reduce THMs at the Cater Treatment Plant and the covering of the Carpinteria Reservoir may reduce THMs to adequate levels within the District. It is possible, however, that additional treatment within the District would still be required. A feasibility study may be necessary to determine the suitability and cost effectiveness of this option in reducing THM levels. Approval of USBR would also be required. For a more detailed discussion of the covering of the Carpinteria Reservoir, see section 3.1.1.

3. The District has the option to blend low THM level groundwater with higher THM level surface water from Lake Cachuma. This will allow overall THM levels to be reduced. This method can be practiced during the particular months when THM levels within the District are expected to be high.

4. In the future, the Cater Treatment Plant may begin to utilize chloramines for disinfection in order to reduce THM levels in Cachuma Project water along the South Coast. If this does not adequately reduce the level of THMs within the District, the District has the option to also use chloramines for the reduction of THM levels in its surface water. Chloramines are formed through the addition of ammonia to the chlorination process. The use of chloramines produces lower THM levels than the use of chlorine. If the Cater Treatment Plant chooses to decrease THM levels by this method, it will likely require the District to also use this option, as water chemistry conflicts may then be avoided. Potential concerns with this method include increases in the pH levels of the water. Though chloramines are longer lasting than free chlorine, chloramines may also not be effective over long periods of time. If treated water stays in the distribution system for too long, THM levels may increase to previous levels. A feasibility study may be necessary to determine the suitability and cost effectiveness of this option in reducing THM levels.

5. Though not feasible with existing District practices, in the future the District may have the option to utilize ozone for the reduction of THM levels in its water. Water treated with ozone results in very low levels of THMs. Water chemistry conflicts may arise, however, with the use of this method if it does not match with the method chosen at the Cater Treatment Plant. A feasibility study may be necessary to determine the suitability and cost effectiveness of this option in reducing THM levels.

Financial Assessment

1. Flushing of the distribution system requires approximately 1-2 acre-feet of water. The District charges agriculture $583 per acre-foot for this water, making the total cost for flushing of the distribution system approximately $1000, not including any labor overtime.

2. See section 3.1.1. for financial assessment of the covering of the Carpinteria Reservoir.

3. Costs incurred due to the implementation of this method would most likely be limited to increased well pumping costs. In dry years the District may be required to pump more groundwater than usual in order to implement this plan. See section 3.2.1. for a discussion of well pumping costs.

4. A feasibility study would be required to determine the costs associated with the implementation of this method. A study of this type is estimated to cost $10,000.

5. A feasibility study would be required to determine the costs associated with the implementation of this method.

2.2.1.2. Total Dissolved Solids

Surface water from Lake Cachuma is generally higher in Total Dissolved Solids (TDS) content than the District's groundwater. At times, the level of total dissolved solids of

the surface water may approach the maximum contaminant level (MCL) of 1,000 mg/L allowed by the California Domestic Water Quality and Monitoring Regulations. TDS levels in SWP water are generally lower than those of Cachuma Project water. However, SWP water has little impact on the quality of the District's surface water, since it is mixed with Cachuma Project water and is a small proportion of the resulting delivered surface water.

Current Conditions

In 1997, total dissolved solids levels for surface water ranged from 662-804 mg/L, while the average was 698 mg/L. Total dissolved solids levels for groundwater ranged from 580-600 mg/L, while the average was 590 mg/L.

District Options

No additional action by the District is believed to be necessary at this time.

2.2.1.3. Coliform Bacteria and Other Pathogens

Coliform bacteria and other pathogens (such as cryptosporidium) can cause illness to humans when ingested. They can originate from a number of animal hosts, including cattle, horses, deer, ducks, seagulls, dogs, and humans. They are conveyed through fecal matter. Coliform bacteria and other pathogens can enter the District's water supply at Lake Cachuma and other uncovered reservoirs, including the Ortega and Carpinteria Reservoirs.

Current Conditions

In 1997, total coliform bacteria was present in 0-1.6% of the surface water samples collected, while the average was 0.33%. Total coliform bacteria was not present in groundwater samples collected in 1997.

The City of Santa Barbara currently monitors cryptosporidium as an indicator organism at the Cater Treatment Plant. The District does not currently monitor for pathogens such as cryptosporidium. With the Carpinteria Reservoir and other reservoirs which hold the District's water being uncovered, the District is vulnerable to cryptosporidium contamination.

District Options

The District plans to pursue the covering of the Carpinteria Reservoir in order to decrease the potential for coliform bacteria and other pathogen contamination in its water supply. Covering of the reservoir would prevent birds and animals from being potential sources of contamination at the reservoir. By eradicating the nearest potential source to the District, the District decreases the chances that viable coliform bacteria and other pathogens will be present in its water supply. For a more detailed discussion of the

covering of the Carpinteria Reservoir, see section 3.1.1. It should be noted that while covering the reservoir may decrease the presence of coliform bacteria and other pathogens, these contaminants may still be found in the District's water supply due to entry into the system at Lake Cachuma or other uncovered reservoirs located along the South Coast Conduit.

Financial Assessment

See section 3.1.1. for the financial assessment of the covering of the Carpinteria Reservoir.

2.2.2. Groundwater Quality

The Carpinteria Valley groundwater basin is a complex aquifer system consisting of four main water bearing aquifers that are moderately continuous throughout the basin. It is possible, based on recent analysis by Assistant Professor of Geology Dr. Jordan Clark of UC Santa Barbara, that there could be vertical communication between the layers based on tracer and water quality data. The vertical movement of groundwater could be the result of either (1) the layers are not completely continuous throughout the basin or (2) the aquifers are only partially confined. The importance of the vertical movement of groundwater is that relatively young water can be found hundreds of feet below the land surface, thus providing the mechanism to transport potential contaminants to moderately deep wells. The vertical movement may be enhanced by intense pumping in wells which are screened in the different layers.

The District's groundwater is pumped from four wells (El Carro, Foothill, Lyon, and Smillie, though the Smile Well is not currently in use pending repair). The groundwater has consistently been found to be free of industrial byproducts. Nitrate levels in the shallow groundwater within the District appear to be rising, as indicated in the rising levels of nitrate found in wells pumping from the area's shallow aquifers. Nitrate is a salt or ester of nitric acid. Sources of nitrate found in groundwater include fertilizers and septic tanks. Nitrate present in drinking water can have negative human health effects. These higher nitrate levels have not yet been found in the groundwater pumped from the deeper aquifers by the District's wells, however. The District is also concerned with the mineral content of its groundwater, which sometimes contains high levels of iron and manganese. Seawater intrusion does not appear to be a problem because the Rincon Thrust Fault, clay layers, and impermeable bedrock of the basin serve to limit migration of seawater. It should be noted, however, that seismic activity along the Rincon Thrust Fault may alter this condition.

2.2.2.1. Nitrate

The level of nitrates in the groundwater of the Carpinteria Valley Basin was recently measured by Assistant Professor of Geology Dr. Jordan Clark of the University of California at Santa Barbara. Twenty-eight private wells within the District were sampled for the study (District-owned wells are also sampled regularly). Preliminary findings

indicate that groundwater nitrate levels may be increasing for the shallow aquifers (<200 feet below sea level) within the District. Potential sources of nitrates include septic tanks and fertilizer use.

Current Conditions

Nitrate levels for the groundwater pumped from the District-owned wells currently average 6.5 parts per million (ppm). This groundwater is pumped from deep aquifers, and its average nitrate level is well below the maximum contaminant level (MCL) of 45 ppm allowed by the California Domestic Water Quality and Monitoring Regulations. Of the 28 privately-owned wells sampled for nitrates, preliminary findings indicate that 16 wells have nitrate levels of 0-15 ppm, one well has nitrate levels of 15-30 ppm, three wells have nitrate levels of 30-45 ppm, three wells have nitrate levels of 45-60 ppm, and three wells have nitrate levels above 60 ppm.

A general pattern has been observed in relation to nitrate levels and well depth. Six wells sampled during the current study overlap with wells sampled in 1985. Of these six overlap wells, two draw groundwater from deep aquifers and the other four from shallow aquifers. The two wells which draw groundwater from deep aquifers showed no increase from the low nitrate levels found in 1985. The other four shallow wells show increases in nitrate levels.

The groundwater found in these shallow wells is approximately 10-20 years old. It has taken this water approximately 10-20 years to reach these shallow aquifers from the surface. The increase in nitrate levels in these wells mirrors the increased use of fertilizers in the area during this time. Further increases in the use of fertilizer could result in additional increases in nitrate levels in the future. For example, present fertilizer use and septic tank problems may be reflected in shallow aquifer nitrate levels 10-20 years from now. As such, the District may experience continued increases in nitrate levels in its shallow aquifers.

District Options

To protect the Carpinteria Valley Groundwater Basin's groundwater resources, a data collection and monitoring program would be useful. The District plans to develop a program which would routinely collect water level and water quality data (such as nitrate levels) from key wells in the basin consistent with the hydrogeologic structure of the basin and groundwater usage. Such data would be integrated into an annual report to be prepared by District staff documenting groundwater usage, well drilling activities, water level/water quality trends, issues of concern, etc. The report would supplement the District's efforts in the implementation of the basin Groundwater Management Plan adopted under AB 3030.

Development of such a program would require a data review and qualification of potential wells for monitoring. Well qualification would need to consider well location within the basin, well depth, perforated interval, ownership, well condition, access for

sampling, historical database, etc. A field survey of the wells to be monitored would then need to be conducted to ensure their status. Program development would then be required, including determination of sampling protocols, sampling frequency, reporting and tabulation of data, and program implementation costs.

Financial Assessment

Development of a Groundwater Basin Data Collection and Monitoring Program is anticipated to cost approximately $6,000. Additional annual costs would include costs for materials, labor, and laboratory analysis.

2.2.2.2. Iron and Manganese Content

Iron and manganese levels are frequently found to be high in groundwater pumped from the El Carro and Foothill Wells. To address this problem, the District has installed a filtration plant at each of these sites. Groundwater from the other wells is also usually higher in manganese than the District's surface water. When this occurs, it is possible for the District to blend this groundwater with the District's surface water. This blending lowers the overall manganese content of the District's delivered water.

Current Conditions

In 1997, manganese levels for Lake Cachuma water ranged from ND(non-detect)-0.04 mg/L, while the average was 0.016 mg/L. Manganese levels for groundwater ranged from 0.02-0.05 mg/L, while the average was 0.03 mg/L. In 1997, iron levels for Lake Cachuma water ranged from ND-0.05 mg/L, while the average was 0.004 mg/L. Iron levels for groundwater were not detected. The groundwater iron and manganese levels are averaged from water samples taken after iron and manganese treatment has occurred. When the iron and manganese levels of groundwater from the Lyons and Smillie Wells is found to be high, it can be blended with Lake Cachuma surface water.

District Options

No action by the District is believed to be necessary at this time.

3.0. CAPITAL FACILITIES

3.1. DISTRIBUTION AND STORAGE FACILITIES

The District's distribution and storage facilities are comprised of three groups of facilities. The first group of facilities are Cachuma Project facilities, constructed in the 1950s by the U.S. Bureau of Reclamation (USBR). Within the District, these facilities are the Carpinteria Reservoir, South Coast Conduit, and turnouts from the South Coast Conduit. Ortega Reservoir, located within the Montecito Water District, is also a Cachuma Project facility. USBR owns these facilities, while the Cachuma Operation and Maintenance Board (COMB) is responsible for the operation and maintenance of the facilities. District staff assists in this operation and maintenance. COMB is a joint powers agency created by the Member Units of the Cachuma Project.

The second group of distribution and storage facilities within the District was constructed as part of a second contract with USBR. It consists of thirty main laterals branching from the South Coast Conduit, a mainline and sub-lateral distribution system branching from the thirty main laterals, the Gobernador Reservoir, the Shepard Mesa Tank, and associated valves and end drains. These facilities are currently owned by USBR, although the District is responsible for the operation and maintenance of the facilities.

The third group of distribution and storage facilities within the District is the District-owned system of mainlines and laterals installed primarily in the urban area of the District.

See Figure 3.1 for the locations of the main facilities within the District.

3.1.1. Carpinteria and Ortega Reservoirs

The Carpinteria Reservoir (Figure 3.2) is a concrete-lined open reservoir of 14 million gallons (44 acre feet) nominal capacity. Table 3.1 lists the significant design and construction details of the reservoir.

The Ortega Reservoir is a concrete-lined open reservoir of 21 million gallons (65 acre feet) nominal capacity. Table 3.1 lists the significant design and construction details of the reservoir.

The California Department of Health Services (DHS) has notified the District that open reservoirs such as the Carpinteria and Ortega Reservoirs are a potential public health threat and should be covered to assure a "safe, wholesome, and potable water supply." Although there is no specific State or Federal ruling in effect mandating the covering of existing facilities, new facilities must be fully covered. DHS does, however, have the authority to force "Boil Water Orders" if any water quality samples show positive coliform results. Recent findings by the United States Environmental Protection Agency (USEPA) and DHS consider uncovered potable water storage reservoirs as a potential

public health threat due to their increased susceptibility to contamination via airborne matter and animals.

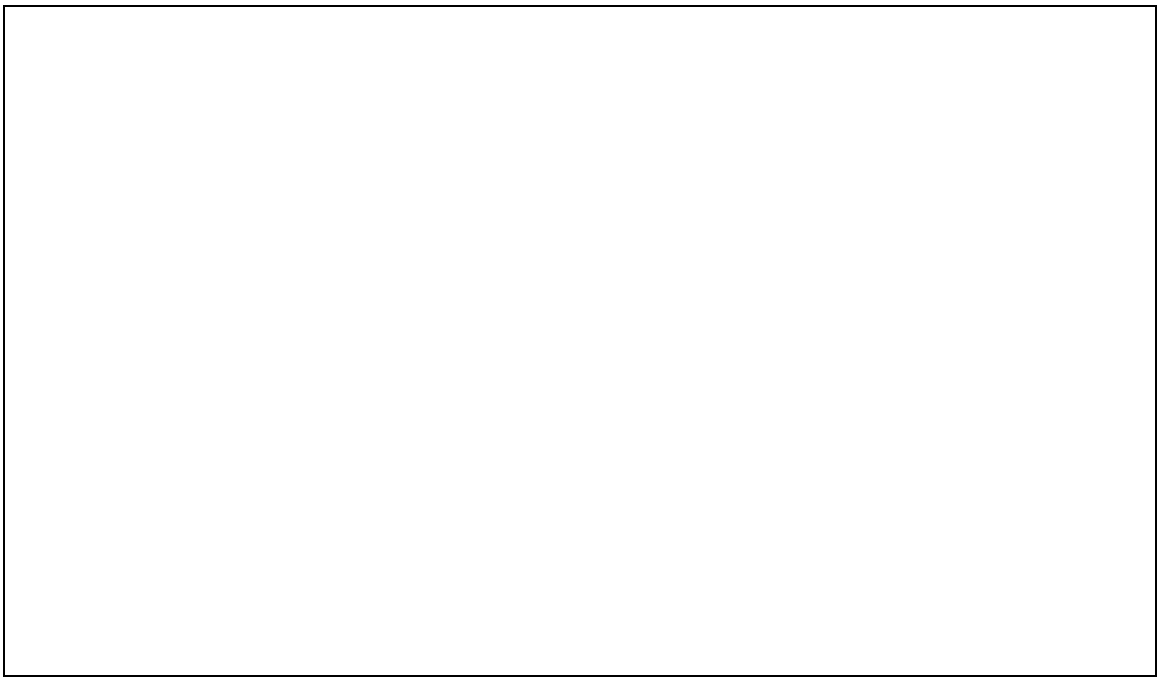


Figure 3.2. Carpinteria Reservoir

The following discussion of the reservoirs' conditions and needs is based on Fugro West's draft report "Reservoir Alternatives Feasibility Study for the Carpinteria and Ortega Reservoirs" dated April 1998.

Table 3.1
Reservoir Design Summary

Item	Carpinteria	Ortega
Date Constructed	1957	1956
Capacity (af)	44	65
Maximum Water Elevation (ft. MSL)	382	458
Normal Water Elevation (ft. MSL)	378	455
Floor Elevation (ft. MSL)	362	440
Surface Area at Parapet (Ac.)	2.5	4.0
Floor Slab Thickness (in.)	4	4
Floor Joint Spacing (ft.)	40	20
Slab Thickness at Joints (in.)	6	6
Sidewall Slab Thickness (in.)	4	4
Sidewall Slope	2:1	2:1
Parapet Construction TxH (in.)	8" X 30"	8" X 24"
Inlet Piping Size (in.)	24	30
Underlain Piping Size (in.)	4 and 6	4
Hydrostatic Load at Maximum w.l. (psf)	1250	1120

Current Conditions

Carpinteria Reservoir – The Carpinteria Reservoir was constructed as a regulating reservoir in the 1950s by the USBR as part of the Cachuma Project. The reservoir is currently owned by the USBR, while its operation and maintenance is overseen by COMB, a joint powers agency of the Member Units of the Cachuma Project. The Carpinteria Reservoir is also monitored daily by District staff. Chlorine levels going into and out of the reservoir are checked, and water level is observed. In addition, the area surrounding the reservoir is checked for dead animals or birds and vandalism. The reservoir is drained, cleaned, and disinfected as part of its annual maintenance schedule by COMB and District staff. This monitoring and maintenance of the reservoir is considered sufficient by District staff to keep the reservoir in efficient operating condition.

In general, the Carpinteria Reservoir structure is in good condition. The condition of the concrete surfaces in contact with water show only mild scaling, and exposed surfaces are generally smooth. The majority of the structure is free of hairline and major slab cracking. Two areas of the structure show evidence of differential settlement. Near the north end of the reservoir in the floor, there is an approximately 1½ inch offset between 40 foot sections at the NE-SW section joint. The second area of differential settlement is proximate to the south end of the structure in the lower one-third of the side walls at the inlet/outlet control structure.

Ortega Reservoir – The Ortega Reservoir was constructed as a regulating reservoir in the 1950s by the USBR as part of the Cachuma Project. The reservoir is currently owned by the USBR, and its operation and maintenance is overseen by COMB, a joint powers agency of the Member Units of the Cachuma Project. Monitoring of the Ortega Reservoir is overseen by the Montecito Water District. The reservoir is drained, cleaned, and disinfected as part of its annual maintenance schedule by COMB and the involved water districts' staffs. This monitoring and maintenance of the reservoir is considered sufficient to keep the reservoir in good operating condition.

In general, the Ortega Reservoir structure is in excellent condition. The condition of the concrete surfaces in contact with water show only mild scaling, and exposed surfaces are generally smooth. The entire structure appears to be free of major slab cracking and differential settlement, and only minor hairline cracking is visible.

An assessment of the Carpinteria and Ortega Reservoirs' design has raised two issues. At the time of design (and since USBR excluded water quality considerations from project design because the reservoir was for irrigation purposes), there was little knowledge or concern of reservoir circulation patterns or "dead zones" in storage. These adversely affect water quality. The design of single inlet/outlets in the corner of the reservoirs reflects this and are now considered undesirable characteristics of the facilities. Poor circulation in the reservoirs and extensive sunlight during the summer months has led to documented bacterial contamination.

In addition, seismic stability was not considered in the reservoirs' design as extensively as it would be today. USBR is currently studying the issue of strong ground motion for the Cachuma Project facilities. After this general study is completed, site specific analysis with recommendations for retrofit improvements (if any) is scheduled for completion in 2000-2001. USBR would then fund and implement potential recommendations 2 to 3 years thereafter. Major retrofitting or a reduction in operating water levels is not anticipated; however, measures to prevent foundation offset may emerge. Any plans or schedules regarding modifications to the reservoirs by the District will need to include USBR. This will help ensure compatibility between potential USBR and District modifications and schedules.

District Options

1. *Conventional Metal Roof Option* – The District plans to pursue the covering of the Carpinteria and Ortega Reservoirs with a conventional metal roof in order to meet DHS requirements. Because the reservoirs appear to be adequately sized, in good condition, and have a reasonable remaining useful life, this alternative is desirable for the District. In addition, the structural design of the reservoirs would be adequate for the retrofit installation of a fixed aluminum or steel roof structure. Due to the reservoirs' size, intermediate columns would need to be installed in the reservoir at 40 foot spacings. A conventional framing system of structural steel (or aluminum) beams and purlins would support the metal roof, which could be coated or uncoated.

Implementation of this plan should include repair of any existing reservoir damage and repiping of the inlet/outlet structures to eliminate "dead zones." In addition, any seismic work needed should be included in the implementation of this option.

Advantages of this alternative include the following:

- Reliable, full sanitary protection of the reservoirs.
- DHS requirements are met.
- Relatively short construction duration.

The major disadvantage is that the reservoirs would need to be out of service for an extended period. It would be infeasible to retrofit both the Carpinteria and Ortega Reservoirs simultaneously.

In conjunction with the covering of the reservoirs, the District is considering construction of a 2.5 MG storage tank. The storage tank could be constructed prior to the covering of the Carpinteria Reservoir, thereby minimizing the impact of the reservoir being out of service. The site of the storage tank could be chosen based on the District's hydraulic needs and other distribution system factors.

Approximately half of the District's water use is consumed in regulated (i.e., reduced pressure) lines. Based on the topography within the District and the geographic proximity of reduce pressure laterals, a desirable storage area would be in the foothills

above Highway 150 at an elevation of approximately 200 feet. Interconnection of laterals and pipelines to the storage tank would require approximately 12,000 feet of 18 to 24 inch pipe. Based on current District water use, a storage facility of 2.5 MG initially should be satisfactory to meet diurnal and fire requirements. The storage would be interconnected to the South Coast Conduit as well as the District's well field, providing redundant sourcing for this service subarea. A 5-acre parcel at the desired 200-foot elevation would adequately hold the necessary storage and piping. The remaining regulated and unregulated laterals would be serviced by water stored in the Carpinteria Reservoir.

The advantages of a 2.5 MG storage tank in this location include the following:

- The 220-foot elevation storage could be constructed without interruption of District facilities. When the Carpinteria Reservoir is retrofitted or replaced, this storage will greatly reduce the impacts of the Carpinteria Reservoir being out of service.
- Additional storage facilities will increase the redundancy and reliability of the system.
- Cost savings from reduced well pumping costs to the 200-foot elevation storage will be between $50,000 and $100,000 per year (depending upon groundwater use).

The disadvantage of the storage tank is the higher cost of implementation. Figure 3.3 shows a schematic representation of the 2.5 MG storage tank option.

2. Inlet/Outlet Reconfiguration Option - To correct the circulation problem of the Ortega Reservoir, it has been proposed by the Montecito Water District that a new inflow line be constructed to extend to the reservoir's northwest corner. The existing inflow/outflow line would then be used only as an outflow line. Under the new layout, the inlet and outlet to the reservoir would be located in opposite ends of the reservoir, thereby facilitating improved circulation within the reservoir. This improved circulation is expected to lead to water quality improvements. The District is planning on supporting this proposal. This method could also be considered by the District for use in improving circulation in the Carpinteria Reservoir.

(Other reservoir improvement options the District has considered are listed below. Though these options are not currently planned for implementation, they will continue to be considered by the District.)

3. *Raw Storage with Treatment Option* – To meet DHS requirements, the District considered the option of leaving the reservoirs in place as raw storage, while adding treatment to the reservoirs' outlets in order to purify water. For this option, the existing reservoirs would be kept as raw water storage to be fed into new treatment plants and clearwells before returning to the distribution system.

The main advantage of this option is that the majority of the work can be done without removing the existing reservoir from service. In addition, an emergency bypass line could be maintained to allow direct reservoir use if the need arose. Disadvantages to this system include the potential problem with treating water that is nearly pure already; many

treatment plants have operating problems with very low turbidity water. Other problems include the need for waste (filter backwash water) disposal, limited site area for the additional treatment plant and clearwell (which would likely be 2.5 to 5.0 million gallons), and the additional ongoing costs of operating and maintaining the plant. If implementation of this option were to take place at both Ortega and Carpinteria Reservoirs, there would be the additional problem at Carpinteria of receiving "double treated" water, which would then be treated a third time.

4. *Replace Existing Reservoirs with Tanks Option* - To meet DHS requirements, the District considered the option of demolishing the existing reservoirs and replacing them with covered storage tanks on the same sites. The volume of replacement storage could be identical to the existing reservoir, or be initially developed with a minimally sized storage tank that would be incrementally expanded (a "tank farm") as the District's needs for storage increased.

This alternative is desirable for a variety of reasons, including the following:

- Initial storage may be able to be constructed while the existing reservoir is still in service.
- Capital costs for storage can be deferred until the demonstrated need arises.
- New tanks can be configured to maximize water quality during storage.
- Operating and maintenance costs are minimal.
- System would have full DHS support and approval.

The primary disadvantage would be if the initial storage could not be constructed without demolition of the existing reservoir. In this case, the reservoir would be out of service for approximately 8 to 9 months.

Financial Assessment

1. Covering of the Carpinteria Reservoir with a conventional metal roof is estimated to cost approximately $1.6 - 2.1 million. Covering of the Ortega Reservoir is estimated to cost approximately $2.4 – 3.4 million. The District is responsible for half of the costs for the Ortega Reservoir. These costs do not include any fees for repair of existing reservoir damage or seismic upgrading, which are assumed to be funded by USBR. The estimates do include the costs of repiping the inlet/outlet to eliminate "dead zones". Reduced pressure storage of 2.5 MG at a 220-foot elevation is estimated to cost $3.5 million. Covering of the reservoirs is therefore estimated to cost the District approximately $2.8-3.8 million. With the addition of a 2.5 MG storage tank, the total cost to the District is estimated to cost $6.3 – 7.3 million.

2. Purchase and installation of the circulation system for the Ortega Reservoir is estimated by the Montecito Water District to cost approximately $250,000. The District would be responsible for half of these costs, or $125,000. Costs for rehabilitation of the Carpinteria Reservoir should be similar, though the District would be responsible for the full amount.

3. Addition of a 7 MGD capacity treatment plant and a 3 MGD capacity clearwell to the Carpinteria Reservoir is estimated to cost approximately $7.6 million. Addition of a 12 MGD capacity treatment facility and a 6 MGD capacity clearwell to Ortega Reservoir is estimated to cost approximately $11.0 million. The District is responsible for half of the costs for the Ortega Reservoir. Estimates do not include additional costs for any additional land (easements) needed.

4. Cost for replacement tanks with minimal initial storage capacity (31 af) at Carpinteria Reservoir is estimated at $3.9 million. Cost for replacement tanks with minimal initial storage capacity (55 af) at Ortega Reservoir is estimated at $8.2 million. The District is responsible for half of the costs for the Ortega Reservoir.

Table 3.2
Reservoir Options Capital Cost Summary

Alternative	Preliminary Cost Estimate ($M)	
	Carpinteria	Ortega
Fixed Metallic Roof	1.6 – 2.1	1.2 – 1.7*
Add Storage at 220-Foot Elevation	3.5	NA
Inlet/Outlet Reconfiguration	125,000	62,500*
Raw Water Storage Plus Treatment	7.6	5.5*
Replace Reservoirs with Tanks	3.9	4.1*

*Cost estimate is District's portion of estimated total capital costs

3.1.2. Gobernador Reservoir

Gobernador Reservoir, constructed in the early 1950s, is a covered, concrete-lined reservoir with a capacity of 500,000 gallons. Water is pumped to this reservoir by the booster pump station located at the Carpinteria Reservoir. The Gobernador Reservoir supplies water to the upper elevations at the east end of the District.

Current Conditions

The Gobernador Reservoir is part of the USBR owned distribution system located within the District. It is inspected by the Bureau of Reclamation every two years. This inspection includes assessment of the reservoir's lining, structural stability, and overall condition. Operation, maintenance, and repair of the reservoir is the responsibility of the District. These actions are overseen by the District, while the USBR is notified of the work needed. The District also inspects the reservoir daily to insure it remains well maintained and free of vandalism. In addition, the District oversees the cleaning of the reservoir every two years. The Gobernador Reservoir is believed by District staff to be in good operating condition.

District Options

Periodic assessment of the reservoir roof's structural integrity is needed. The District plans to determine the appropriate time period for the scheduling of such inspections.

This will help ensure to roof's viability and aid in the identification of when the roof may need repair or replacement.

Financial Assessment

Determination of a schedule for the inspection of the reservoir roof's structural condition can be done by District staff. Costs for such a determination would most likely be in the form of time commitments from the District staff.

3.1.3. Shepard Mesa Tank

The Shepard Mesa Tank (Figure 3.4) is an elevated storage tank with a capacity of 50,000 gallons. Thirty-five thousand gallons are for emergency purposes, while the remainder is for pump cycling. The Shepard Mesa Tank supplies water to the hilltop plateau area of Shepard Mesa.

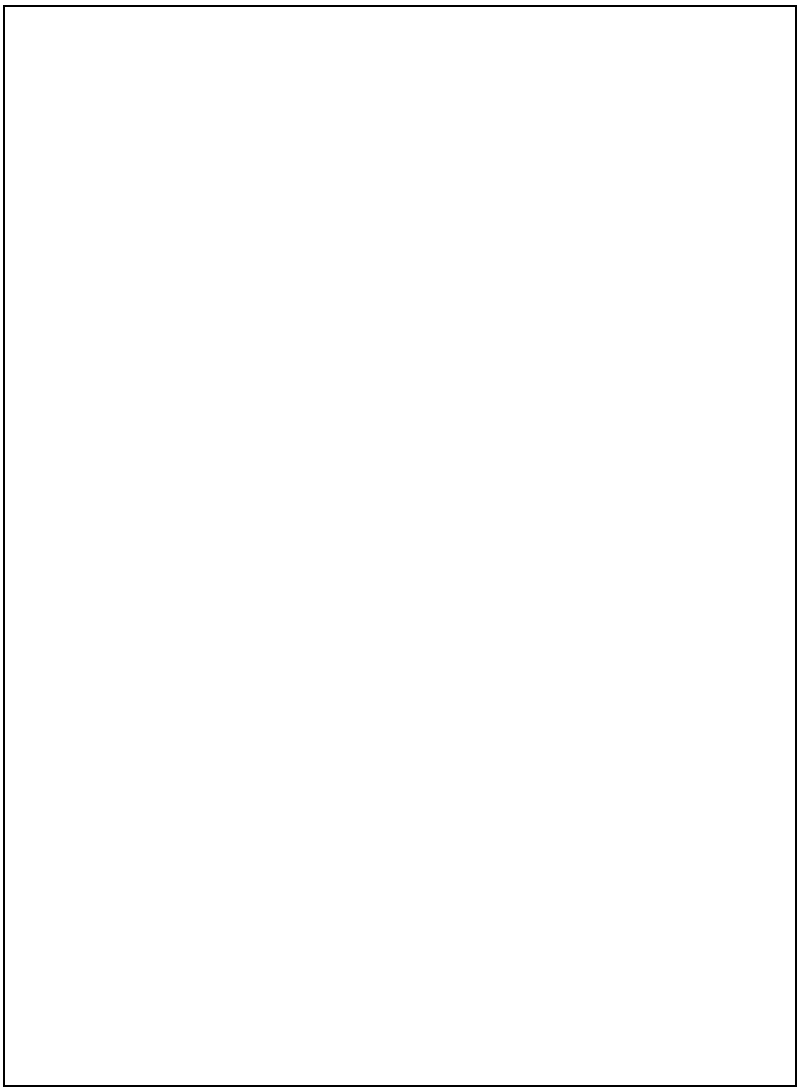


Figure 3.4. Shepard Mesa Tank

Current Conditions

The Shepard Mesa Tank, constructed in the early 1950s, is part of the USBR owned distribution system located within the District. Operation, maintenance, and repair of the reservoir is the responsibility of the District. These actions are overseen by the District, while the USBR is notified of work needed. The tank is inspected annually by Harco Waterworks. Harco checks the tank's cathodic protection system by taking anode readings and checking the system rectifier. The District checks the tank annually for any movement of its foundation. The tank foundation was previously reinforced due to a slope failure in the tank's vicinity. The District also inspects the tank daily to insure it remains well maintained and free of vandalism. The Shepard Mesa Tank is believed by District staff to be in good operating condition.

District Options

No action by the District regarding the Shepard Mesa Tank is believed to be necessary at this time. The tank is found to be in good operating condition and current tank evaluation and preventive maintenance is believed to be adequate.

3.1.4. Chlorination Facilities

The District currently disinfects its produced and imported waters with chlorine gas. There are currently four sites (Carpinteria Reservoir, Foothill Well, El Carro Well, and Lyon Well) within the District where chlorine gas is either stored or dispensed.

In order to respond to recent or pending regulations, and to reduce the risk of potential chlorine gas accidents, the District is considering chlorine gas alternatives or safety enhancements to the current chlorine gas system. Chlorine gas is extremely toxic and considered fatal to humans at a dilution of 1000:1. Regulations regarding chlorine gas use, transport, and storage have become increasingly stringent. Probably the most stringent regulations are promulgated by the Santa Barbara County Fire Department (SBCFD). These regulations require that hazardous gas storage or dispensing system must include a double containment, negative vent pressure, and/or neutralizing system, such that if a catastrophic failure of the container occurred, that any release of gas to the atmosphere would be at a concentration of less than 50 percent of the Immediately Dangerous to Life and Health (IDLH) level established by the United States Environmental Protection Agency (USEPA).

The following discussion of the District's chlorination facilities' conditions and needs is based on Fugro West's draft report "Chlorine Use Alternatives Study" dated December 1997.

Current Conditions

The District uses chlorine gas for many different purposes in improving its water quality. It is used for disinfection, residual disinfection, odor control, oxidation (for iron and

manganese), and as a bactericide or germicide. Within the District, there are chlorination facilities located at the Carpinteria Reservoir and the El Carro, Foothill, Lyon, and Smillie Wells. Chlorine gas leak detectors are utilized by the District wherever chlorine gas is used or stored.

District Options

1. *Shut-Off Valve Option* – In order to increase safety, the District plans to install emergency valve shut-off systems on all of its chlorination installations. Through the use of locally mounted panic buttons and leak detectors, these systems automatically close the valve of leaking cylinders within approximately 1.5 seconds. This prevents chlorine gas leaks from reaching dangerous levels.

The Shut-Off Valve Option is an option the District is planning to implement over the short-term. Other options to be considered for longer-term implementation are included below. The District plans to continue to consider these options in the future.

2. *Mixed Oxidants (MIOX) System Option* – In order to meet regulations and increase safety, the District has the option to replace chlorine gas as a disinfectant with a MIOX system. The MIOX system is an onsite generating unit that uses NaCl (salt) brine and electricity to produce a mixture of oxidant compounds (predominantly hypochlorite ion), which is then metered into the water piping. The mixture of oxidants (hypochlorite, chlorine dioxide, and ozone) creates a disinfectant/oxidant stream that is considerably more powerful than free chlorine alone; thus, it has superior germicidal effectiveness when compared to the District's existing practices.

The potential drawback to such a powerful mixture is that it may be too powerful an oxidant for the Fe/Mn treatment systems in use at the El Carro and Foothill Wells, according to the filter manufacturer. Onsite pilot testing of the MIOX system would therefore be required to determine its utility for these sites. Similar pilot testing would also be required at the Carpinteria Reservoir to determine if undesirable organic byproducts were formed when MIOX is utilized for surface water treatment.

The MIOX system uses only softened water, salt, and electricity to function, thus the handling of hazardous chemicals is avoided. The process does generate a hydrogen gas as a byproduct that will require special design and installation to avoid the accumulation of an explosive gas mixture. The MIOX system, as well as the bulk salt reagent would require indoor storage; a sufficiently sized building would therefore be needed at each site. Although common salt is not hazardous, the bulk solids handling required by District staff would be substantial. For the equivalent of one 150-pound Cl cylinder, operators would have to load 450 pounds of salt into the MIOX brine chamber.

The District's water quality would likely benefit from the increased germicidal effectiveness of MIOX. However, since both the brine and oxidants are injected into the water source, an increase in total dissolved solids (TDS) of between 7 mg/l and 22 mg/l with up to 50 percent of the increase as Na (sodium) from the salt brine.

3. *Chlorine Gas with Neutralizing Scrubber Option* – In order to meet regulations and increase safety, the District has the option to continue chlorine gas use, but also install an emergency neutralizing fume scrubber at each chlorine site to mitigate the accidental release of gas to the atmosphere. This system works by recirculating a caustic soda solution through a venturi scrubber system, which draws in the chlorine-laden atmosphere from the chlorine storage/dispensing building. The scrubber is activated via a chlorine leak sensor located in the dispensing room. The chlorine is completely neutralized in the caustic solution into a diluted caustic bleach.

The advantage to this system is the avoidance of changing to other disinfectant and oxidizing chemicals at the District. A scrubber system would be installed at each site and would not be utilized unless an accident occurred. There would be no changes in District chemical use or water quality. The only major requirement for the scrubber system is that to be fully effective, the system should have an emergency power source (backup generator) to allow operation during a power outage. This power source would need to be tested frequently, and the scrubber would require periodic on-going scheduled maintenance.

4. *Sodium Hypochlorite Dispensing Option* – In order to meet regulations and increase safety, the District has the option to replace chlorine gas and gas feeding equipment with the delivery and dispensing of liquid sodium hypochlorite (bleach) solution. The solution would be pumped into the existing District injection points via adjustable metering pumps.

Advantages of this system include the avoidance of chlorine gas handling and the straightforward method of dispensing, adjustment, and equipment maintenance. Disadvantages include more frequent operator attention in order to change barrels (approximately three times more frequently than 150-pound cylinders) and a much more intensive equipment maintenance requirement for the liquid metering pumps.

Water quality is moderately affected by the change to hypochlorite. Total dissolved solids (TDS) would increase by 4 to 16 mg/l, and interference reactions with organic compounds in raw waters may reduce hypochlorite effectiveness as an oxidizer at the District's Fe/Mn treatment systems. The system manufacturer strongly recommends pilot testing at the Foothill and El Carro sites to determine if this change will adversely affect the Fe/Mn treatment systems. Pilot testing is also recommended at the Carpinteria Reservoir site to confirm equipment sizing based on actual hypochlorite demand measurements.

5. *Onsite Hypochlorite Generation Option* – The fourth option available to the District to meet regulations and increase safety is the use of hypochlorite, as generated onsite from softened water, salt, and electricity. The method of generation is similar to the MIOX process (Option 1), but with a slightly higher efficiency. As with the MIOX system, hypochlorite generation would require a new building and significant handling of salt, as well as similar increases in TDS and sodium. The oxidizing and germicidal properties

would be essentially equal to that of sodium hypochlorite (Option 3) and would thereby require pilot testing at most District sites.

Financial Assessment

1. The purchase and installation of shut-off valve systems for all of the District's chlorination installations is estimated to cost $75,000.

2. Implementation of the MIOX system is estimated to cost $313,800 at the Carpinteria Reservoir. Operations costs at the reservoir are estimated to be $34,200 annually. Implementation of the MIOX system at the Lyon, Foothill, El Carro, and Smillie Well sites is estimated to cost $117,600, $129,600, $129,600, and $59,900, respectively. Operation costs at the Lyon, Foothill, El Carro, and Smillie Well sites are estimated to be $10,400, $10,300, $13,900, and $4,500 annually, respectively.

3. Implementation of the chlorine gas with scrubber system is estimated to cost $168,500 at the Carpinteria Reservoir. Operations costs at the reservoir are estimated to be $17,700 annually. Implementation of the chlorine gas with scrubber system at the Lyon, Foothill, El Carro, and Smillie Well sites is estimated to cost $97,500 per site. Operation costs at the Lyon, Foothill, El Carro, and Smillie Well sites are estimated to be $5,800, $6,300, $7,800, and $3,000 annually, respectively.

4. Implementation of the sodium hypochlorite system is estimated to cost $117,600 at the Carpinteria Reservoir. Operations costs at the reservoir are estimated to be $52,200 annually. Implementation of the sodium hypochlorite system at the Lyon, Foothill, El Carro, and Smillie Well sites is estimated to cost $63,300, $73,300, $73,300, and $47,500, respectively. Operation costs at the Lyon, Foothill, El Carro, and Smillie Well sites are estimated to be $13,300, $14,600, $18,900, and $5,800 annually, respectively.

5. Implementation of the onsite hypochlorite system is estimated to cost $255,500 at the Carpinteria Reservoir. Operations costs at the reservoir are estimated to be $32,900 annually. Implementation of the onsite hypochlorite system at the Lyon, Foothill, El Carro, and Smillie Well sites is estimated to cost $114,700, $124,700, $124,700, and $72,600, respectively. Operation costs at the Lyon, Foothill, El Carro, and Smillie Well sites are estimated to be $10,100, $9,900, $12,200, and $4,300 annually, respectively.

Table 3.3
Capital and Operating Costs of Chlorination Options

	Site	Shut-Off Valve Systems	MIOX	Chlorine Gas with Scrubber	Sodium Hypochlorite	Onsite Hypochlorite
Capital Cost Estimates ($)	Carpinteria Res.	100,000	313,800	168,500	117,600	255,500
	Lyon Well		117,600	97,500	63,300	114,700
	Foothill Well		129,600	97,500	73,300	124,700
	El Carro Well		129,600	97,500	73,300	124,700
	Smillie Well		59,900	97,500	47,500	72,600
Operations Cost Estimates ($ per week)	Carpinteria Res.	NA	658	341	1005	632
	Lyon Well		201	112	256	194
	Foothill Well		198	121	280	190
	El Carro Well		267	150	363	234
	Smillie Well		86	56	111	83

3.1.5. South Coast Conduit

The main conveyance feature of the Cachuma Project is the South Coast Conduit. It is a high pressure concrete pipeline which begins at the outlet portal of the Tecolote Tunnel and transports Project water 26 miles to its terminus at the Carpinteria Reservoir. Within the District the conduit diameter is 27 inches with a design capacity for forward flow of 22 cfs. Capacity is currently estimated to be approximately 16 cfs, due most likely to the build-up of sediment.

Current Conditions

The South Coast Conduit was constructed in the 1950s by the USBR as part of the Cachuma Project. The conduit is currently owned by the USBR, and its operation and maintenance is overseen by the Cachuma Operation and Maintenance Board (COMB), a joint powers agency of the Member Units of the Cachuma Project. Though the District does not monitor the South Coast Conduit, it does protect its length within the District and notifies COMB if any construction work is being done in its area.

With continually increasing water demands along the South Coast since the time of the design and construction of the South Coast Conduit, together with anticipated increases in demand for water in the future, there is the potential that peaking demand for water may occasionally surpass the South Coast Conduit's capacity to deliver water. In addition, the City of Santa Barbara is considering several water quality improvements at the Sheffield Reservoir, which would reduce the amount of water storage at the Sheffield Reservoir site. Reduced Sheffield Reservoir storage capacity may result in greater demands on the Carpinteria Reach of the South Coast Conduit, affecting water deliveries to the District. The peaking capacities of the different segments of the conduit are unknown. Maximum demands by the Member Units are also not known precisely. Furthermore, the location of the limiting segments of the conduit are not known. A study of the flow capacities of the South Coast Conduit is needed.

In addition, there are currently no operable flow meters along the length of the South Coast Conduit found within the District. This makes quantity of flows into the District difficult to assess.

District Options

1. A study of the hydraulic capacity, operating modes, and other related issues of the South Coast Conduit is currently being managed by COMB. The study is anticipated to include the following:

- Review of original design and operating criteria, operation and maintenance records, periodic facility examination reports, and other historical documents and information
- Examination of the changes in South Coast Conduit System (System) operations and/or hydraulic capacity which have occurred over time due to design irregularities, physical alterations, agreements allowing introduction of non-Cachuma Project water into the System, or other causes
- Review of current System operating modes, flow control, and metering capabilities, and maintenance practices
- Evaluation of present hydraulic capacities of the Goleta and Carpinteria Reaches of the System through actual flow testing and computer modeling
- Investigation of possible impacts on System operations and/or hydraulic capacity due to proposed modifications to the System or to facilities served by the System
- Summary of findings, conclusions, and recommendations

The District plans on participating in this study by serving on the technical committee which will work with the consultant conducting the study. This will help ensure that issues pertinent to the District are addressed within the study.

2. The District is promoting the placement of a flow meter on the South Coast Conduit where the conduit enters the District. The meter should be able to measure forward and reverse flows, with no restrictions on the flows within the conduit. This would allow for the District to monitor the exact flows it is receiving from the Cater Treatment Plant. Placement of a flow meter on the South Coast Conduit would require coordination between the District, COMB, and the USBR.

Financial Assessment

1. COMB is coordinating the South Coast Conduit Peaking Capacity Study. The COMB budget does not contain funding for this project. Once the cost of services is known, however, COMB's Board of Directors may elect to use contingency funds for this purpose, or approve a special assessment of the concerned Member Units to provide the needed funding.

2. An electronic magnetic meter manufactured by a reputable company may meet the District's requirements for a meter to be placed on the South Coast Conduit. A meter of this type which would fit the 27 inch diameter pipeline would cost approximately $9,000.

Installation of this meter is estimated to cost another $8,000-10,000. COMB has indicated that funding for this project is available through COMB's normal operating budget.

3.1.6. Booster Pumps

The District operates four booster pump stations: Shepard Mesa, Carpinteria Reservoir, Lateral 10-L, and Smillie Well. These stations supply water to those areas lying above the hydraulic gradient of the South Coast Conduit. Pertinent information for each of the booster pump stations is listed in Table 3.4.

Table 3.4
Booster Pump Information

Pump Station Location	Number of Pumps	Year Installed	Horsepower	Capacity Per Unit (gpm)	Total Head (ft.)
Shepard Mesa	2	1955	40	300	193
Carpinteria Reservoir	3	1978	60	450	310
Lateral 10-L	1	1955	50	300	310
Smillie Well	1	1976	40	410	300

Current Conditions

The booster pumps at Shepard Mesa and Lateral 10-L are over 40 years old, while the booster pumps at the Carpinteria Reservoir and Smillie well are over 20 years old. These older booster pumps may be inefficient in their use of electricity.

Though the booster pumps may be inefficient, District staff does not currently find any problems with their operation. When in operation, the booster pumps' bearing packing is checked, presence of rust is checked, and the pumps are lubricated. This regular maintenance is considered sufficient to keep the pumps in good operating condition.

District Options

The District plans to replace the two booster pumps at the Shepard Mesa pump station as part of its preventive maintenance program. These pumps are used frequently and need to be reliable. Operation inefficiencies and unexpected failures resulting from age can be prevented by their replacement.

The District plans to continue to assess the performance and efficiency of its other booster pumps. The performance and efficiency of the booster pumps could be assessed through comparison with the performance and efficiency of potential new replacement booster pumps. Newer, more efficient booster pumps could potentially save the District in energy costs for booster pump operation. The District may also want to assess the potential need in the future for booster pumps with larger capacities. If water demands within the District increase, larger capacity booster pumps may be desirable.

Financial Assessment

Replacement of the two booster pumps at the Shepard Mesa pump station is estimated to cost approximately $5,500. Installation, engineering, permitting, and inspection of the replacement would be conducted by District staff. Replacement of the three booster pumps at the Carpinteria Reservoir pump station is estimated to cost $5,195 per pump. Replacement of the booster pump at Lateral 10-L is estimated to cost $4,488. Replacement of the booster pump at the Smillie Well is estimated to cost $2,802.

3.1.7. Distribution System

The distribution system within the District is comprised of the USBR owned distribution system and the District owned distribution system. The USBR owned distribution system consists of a series of 30 laterals branching from the South Coast Conduit. These laterals range from 4 to 14 inches in diameter. Water is then conveyed from the USBR owned distribution system to the District's various service areas by the District owned distribution system. A series of mainlines and sub-laterals comprise this distribution system. The system is made of steel, asbestos-cement pipe or PVC piping and ranges from 4 to 16 inches in diameter.

Mainlines located in the Concha Loma service area of the District may require relocation. These mainlines are currently located in the backyards of this residential area. At these locations, the mainlines are susceptible to damage and are difficult to access. Relocation to the streets of this area would help prevent accidental rupture and improve access.

In addition, customers located along Lateral 15L do not have a back-up water supply should a problem develop with the lateral. No other segments of the distribution system are able to service customers in this area. Distribution system redundancy is needed in this area.

Current Conditions

Operation and maintenance of the distribution system is overseen by the District. The USBR is notified of work to be performed on the USBR owned segment of the distribution system. If movement of lines within the USBR owned system is necessary, USBR involvement may be needed due to easement issues.

The distribution system is currently believed by District staff to be in good operating condition. The only regular monitoring or maintenance done to the system is the monitoring of the cathodic protection of the steel mainlines. Magnesium sacrificial anodes are placed with the steel mainlines for their protection, and are monitored once a year at test stations in the field. Mainlines are repaired or replaced when water conveyance problems arise.

District Options

1. The District plans to relocate the mainlines in the Concha Loma area from the backyards of the area to the streets. These mainlines are located on private property in the back yards of the area's residences. Without relocation, there is a risk of these mainlines being damaged by residents who are not aware of their locations. Construction or other activities could lead to the accidental rupturing of a District mainline, resulting in water supply problems for the area. The mainlines could be relocated to the streets of the Concha Loma area in order to avoid this potential problem. An additional benefit of relocation would be improved access to the mainlines and water meters for District maintenance and monitoring. Little public opposition is expected if the mainlines are to be relocated. Residents would receive new main and service lines, and meters would no longer be located in their back yards.

2. To better service the customers located along Lateral 15L, the District plans to connect this lateral to Lateral 16L. This will create a loop connected to the South Coast Conduit. Distribution system redundancy will be provided, as water will be available to customers in this area from either lateral. The chance that customers will be left without water service due to pipe failure will be greatly decreased.

Financial Assessment

1. The estimated cost for the relocation of mainlines from backyards to the streets of the Concha Loma area is approximately $100,000.

2. Connection of Lateral 15L to Lateral 16L is estimated to cost approximately $50,000.

3.1.8. Valves

Valve settings are used to control flow rates within the District's distribution system. Valves can be used to slow flows or stop flows in order to isolate a section of pipe where a problem with a mainline has occurred. An annual evaluation and preventive maintenance program may help identify and reduce potential valve failures.

Current Conditions

The District's valves are primarily of two types. Prior to 1969, all of the valves installed within the District were gates valves. From 1969 to 1977 butterfly valves were installed. The District then switched back to installing gates valves from 1977 to present.

The District's valves are believed by District staff to be in good operating condition. Valve condition and operation are checked on a less than annual basis. This consists of the valves being exercised, where they are closed and reopened. Effectiveness and condition of valve seals is also checked. Valves are currently repaired or replaced when a problem with their operation arises.

District Options

The District plans to implement a regular valve evaluation and preventive maintenance program. A schedule for annual exercising and evaluation of valves can be created. A process for the replacement of valves of a certain age can also be formed. A regular valve evaluation and preventive maintenance program of this type may help identify and reduce potential valve failures.

Financial Assessment

Costs for the formation and implementation of a regular valve evaluation and preventive maintenance program should be low. Exercising and evaluation of valves can be performed by District staff.

3.1.9. Bradbury Dam

Bradbury Dam is located on the Santa Ynez River approximately 25 miles Northwest of Santa Barbara. It is an earth-filled structure with a structural height of 279 feet and a hydraulic height of 190 feet. The spillway crest is at elevation 720 feet and the top of the gates is at elevation 750 feet. There is an outlet at the base of the dam with a maximum capacity of 300 cubic feet per second (cfs); however, it is rarely used above 100 cfs. The reservoir, Lake Cachuma, has a surface area of 3043 acres. Lake Cachuma is the primary source of water for the Cachuma Project. Water from Lake Cachuma is delivered to the District through the Cachuma Project facilities. The original reservoir capacity was 205,000 acre feet, but the capacity has been reduced by siltation to approximately 190,409 acre feet.

Bradbury Dam is owned, operated, and maintained by USBR. COMB is the District's interface with USBR regarding Bradbury Dam issues.

Current Conditions

Bradbury Dam is the principal feature of the Cachuma Project. Investigations conducted under the USBR Safety of Dams program identified the potential for life threatening dam failure or sudden uncontrolled spillway releases from any of the following deficiencies:

1. Liquefaction of the dam foundation caused by a large earthquake resulting in instability and overtopping of the embankment.
2. Piping of the embankment core material due to coseismic deformation of the foundation or severe deformation of the dam embankment.
3. Separation of the spillway wall from the embankment or abutment allowing erosion and subsequent breaching of the embankment or abutment.
4. Failure of the spillway radial gates due to yielding and collapse of the gate arms or due to failure of the spillway piers during earthquake loading.
5. Overtopping of the dam from floods exceeding 52 percent of the probable maximum flood.

The failure of Bradbury Dam would threaten the lives of approximately 37,000 residents in the downstream communities of Solvang, Buellton, and Lompoc and other unincorporated areas which would be inundated by dam failure flows. Estimated economic damages caused by dam failure during an earthquake would be about $1.6 billion.

In order to rectify the potential for dam failure or uncontrolled spillway releases, the USBR has taken corrective actions. The implementation of these corrective actions was begun in 1996. They consist of strengthening the foundation of the dam, constructing a berm on top of the treated foundation, constructing filters and drains through the foundation soil, and strengthening the spillway walls, piers, and gates.

District Options

No action by the District is believed to be necessary at this time.

Financial Assessment

As a Member Unit of the Cachuma Project, the District is one of the beneficiaries of the Bradbury Dam corrective actions. Pursuant to the Federal Safety of Dams Act, USBR is seeking Member Unit repayment or 15 percent of the total modification costs. These total modifications costs are expected to range from $32,200,000 to $41,500,000. Fifteen percent of these figures is $4,830,000 to $6,225,000, of which approximately $1,3000,000 has been prepaid. Of the amount of which the Member Units are responsible, the District is expected to repay approximately 11 percent. The total amount the District is expected to repay is therefore approximately $531,300 to $684,750.

3.1.10. Obtaining Ownership of USBR Owned Facilities

The District may be interested in obtaining ownership of the facilities owned by USBR which were constructed under the second contract with the USBR. These facilities include the 30 main laterals which branch from the South Coast Conduit, the Gobernador Reservoir, and the Shepard Mesa Tank. To receive a title change from USBR to the District would require an act of Congress. Changing of USBR/private-owned easements to District/private-owned easements would also be required.

Current Conditions

USBR currently owns the 30 main laterals, Gobernador Reservoir, and Shepard Mesa Tank. The District, however, is responsible for the operation and maintenance of the facilities. At present, when the District needs to relocate these facilities, it must first contact USBR to receive permission. Direct ownership of these facilities would give the District complete control over the operation and maintenance of the facilities, and improve the efficiency of the facilities' management.

District Options

The District has the option to pursue ownership of the USBR owned facilities. To receive a title change from USBR to the District would require an act of Congress. Changing of USBR/private-owned easements to District/private-owned easements would also be required.

Financial Assessment

A feasibility study would be required to determine the costs and methods of financing for the District to obtain ownership of the USBR-owned facilities. A study of this type is estimated to cost approximately $5,000.

3.2. WELL FACILITIES

The District currently has four wells: El Carro, Foothill, Lyon, and Smillie. Information for each well is summarized in Table 3.5.

Table 3.5
Well Information

Well Name	Year Drilled	Date of Original Service	Depth Drilled (ft.)	Water Level (ft.) and Date Measured	Design Capacity (gpm)	Actual Capacity (gpm) and Year
Lyon Well	1976	Nov. 1976	1240	42.71 - 3/19/96	1000	1000-850/1994 900-850/1995 850/1996
Foothill Well	1989	May 1992	903	27.82 - 3/19/96	700	530-450/1990-1 350-330/1992 330-250/1993 250-250/1994 300-250/1995 300-220/1996
El Carro Well	1990	Feb. 1991	1215	*53.39 – 7/25/96	9000-1000	975-950/1990-2
Smillie Well	1975	Feb. 1975	1120	81.47 – 3/19/96	275-300	240/1993 280-250/1994 260-220/1995 220-210/1995-6

* Nearby well being pumped.

There are several areas where the District has the option of changing or improving the management and operation of its well facilities. These areas include decreasing the District's electricity charges through the utilization of time-of-use rates, increasing well motor efficiency, implementing an evaluation and preventive maintenance plan for well facilities, insuring wellhead protection, implementing well automation, and potentially redeveloping the Santa Ynez well. Figure 3.5 shows the El Carro well facility.

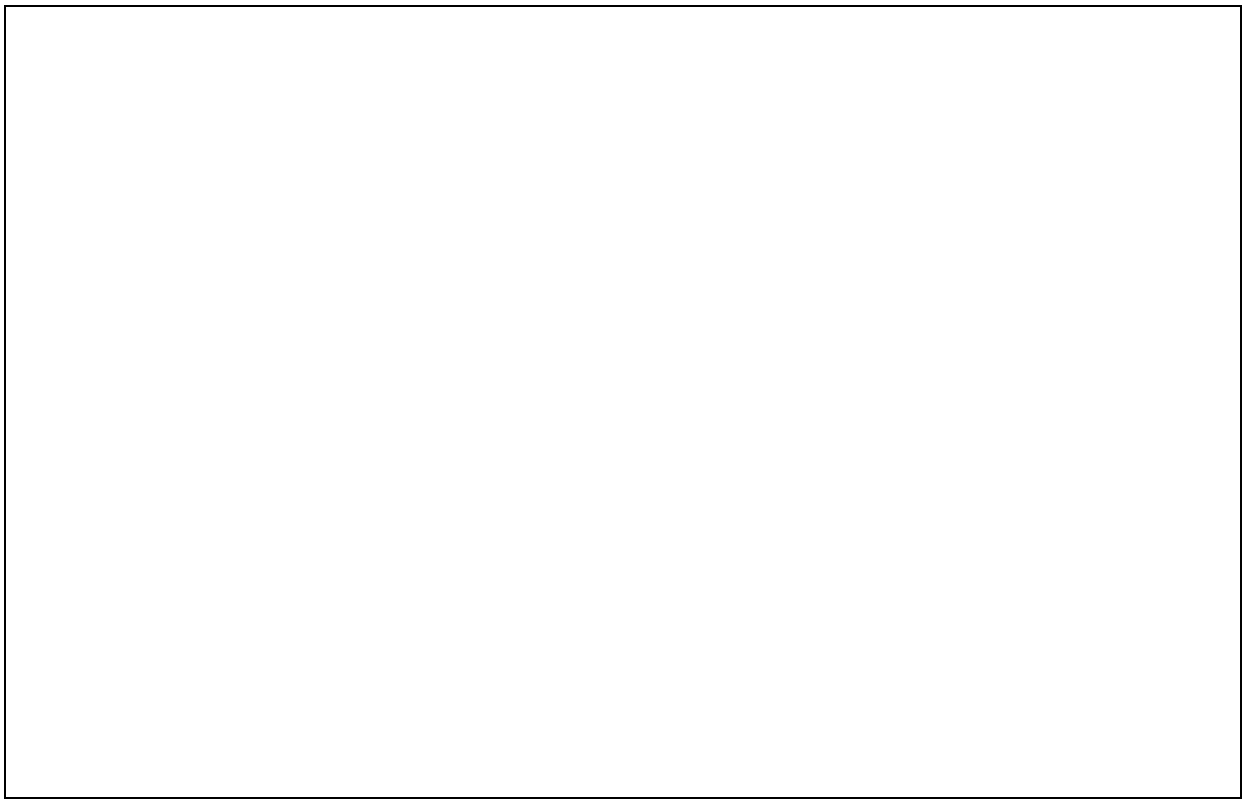


Figure 3.5. El Carro Well Facilities

3.2.1. Time-of-Use Rates

Southern California Edison (SCE) offers time-of-use rate schedules for electricity charges generated by the District's pumping of wells. On a time-of-use rate schedule, the District would receive discounted electricity charge rates by pumping a particular well (or wells) during designated off-peak time periods. The District has the option of utilizing these time-of-use rate schedules by placing one or more of its wells on a time-of-use rate pumping schedule.

The District is also a member of the Association of California Water Agencies – Utility Service Agency (ACWA-USA), a joint powers authority created with the purpose of pooling water agencies' electricity purchasing power to create savings on electricity use. ACWA-USA has contracted with New Energy Ventures to provide electricity services for its members. New Energy Ventures offers savings on electricity costs to the members of ACWA-USA. The District has the option of switching electricity providers by contracting with New Energy Ventures for its electricity services.

Current Conditions

The District's well pumping charges are currently defined by Southern California Edison's PA-2 pumping rate schedule. Charges incurred under this rate schedule are shown in Table 3.6, while Figure 3.6 shows the electrical cost of each well to pump an

acre-foot of groundwater. This pumping rate schedule does not include time-of-use rates otherwise offered by SCE, under which customers of SCE can receive discounted rates by operating well pumps during off-peak periods. As of July 1, 1998, the District will be placing its El Carro well on SCE's TOU-PA-SOP time-of-use pumping rate schedule, while its Lyon and Foothill wells will continue on the SCE PA-2 schedule. The Foothill well was originally planned for the time-of-use rate option, but it has been determined that the Foothill well does not lend itself to time-of-use rates because of the difficulties associated with the operation of its backwash system. Table 3.6 shows SCE's charges for operation of wells under the TOU-PA-SOP rate schedule. This rate schedule includes low charges for pumping during off-peak and super off-peak hours. Charges are higher during summer on-peak hours of 1-5 p.m., and well operation should be avoided during these time periods.

The District underwent careful consideration to ensure its customer's water demands could be met with the El Carro well operating on time-of-use rate pumping schedules. Due to spill conditions at the Bradbury Dam resulting from the wet winter of 1997/1998, the District has not had to use its usual full entitlement of Lake Cachuma water. This unused entitlement will therefore carry-over until needed next year. This carry-over of Lake Cachuma water will allow the District to meet its 4400 acre-feet yearly demand with approximately 2800 acre-feet of Lake Cachuma entitlement water, 1000 acre-feet of Lake Cachuma carry-over water, and 600 acre-feet of groundwater. If necessary, the District plans to pump an additional 1000 acre-feet of groundwater each year to create a 1000 acre-feet carry-over each year as insurance against drought or well problems. The District may also utilize its State Water entitlement to help create this 1000 acre-feet of carryover water. As such, the District will require up to 1600 acre-feet of groundwater each year to meet its customers' water demands. The District believes that these groundwater demands can be easily met with the El Carro well operating on time-of-use rates, and the Lyon and Foothill wells operating on the PA-2 rate schedule as back-up if pumping is needed during summer on-peak hours. When operating at a rate of 70% of capacity, the El Carro, Lyon, and Foothill wells can provide 2377 acre-feet per year.

The District is not currently contracted with New Energy Ventures for its electricity services. The electricity requirements of all of the District's wells are currently serviced by SCE.

District Options

1. The District has the option to place one or more of its wells on a time-of-use rate pumping schedule. The decision to place wells on a time-of-use rate schedule should be determined on a yearly basis. Careful consideration of several factors is needed by the District before wells are placed on a time-of-use rate pumping schedule.

The District must decide which time-of-use rate schedule to operate under. District usage, demand, and potential savings indicate that the TOU-PA-SOP plan would be the most appropriate schedule for the District at this time. If the District's needs change in a given year, the District may need to decide if another time-of-use rate schedule would be

more appropriate for its operations. Water supply and customer demand must also be considered on a yearly basis. If large quantities of groundwater are needed to meet projected customer demands, the District may need pumping capability 24 hours a day during the summer. In this case, time-of-use rate pumping schedules may not be appropriate for the District. In addition, the District should consider use of a "load controller" in conjunction with well operation on a time-of-use rate schedule. A "load controller" can be rented from SCE, and will ensure that well pumps on a time-of-use rate plan will be shut off during expensive on-peak summer hours.

2. In order to save on groundwater pumping costs, the District also has the option to switch to a new electricity provider, such as New Energy Ventures. The District is a member of the Association of California Water Agencies - Utility Service Agency (ACWA-USA), a joint powers authority created under ACWA in order to enable its members to work collectively together to provide for the development or purchase of utility services. By pooling their purchasing power, members can save on electricity costs. New Energy Ventures is the electricity marketer that ACWA-USA has contracted with for full electricity service for its members. New Energy Ventures offers reductions in electricity costs for its contractors.

Careful consideration of the advantages and disadvantages of this option is needed by the District before switching electricity providers. Advantages include reduced electricity costs. Disadvantages include potential unreliability of service and potential problems associated with the implementation of a new system.

Financial Assessment

1. Table 3.6 shows SCE's charges for well operation under the PA-2 and TOU-PA-SOP pumping rate schedules. "Load controller" devices provided by SCE cost approximately $1400 installed.

2. New Energy Ventures offers three electricity savings options for its customers: (1) a guaranteed 5% discount of the distribution utility tariffs, (2) a share-the-savings option that provides the supplier incentive to get maximum savings for its customers, and (3) a hybrid of the first two options.

Table 3.6
SCE Charge Rates for Wells

Rate Schedule	Rate Structure	Customer Charge	Demand or Connected Load Charge	Energy Charge (per kWh)	Other Conditions
PA-2	• Two-tiered energy rate • Time and Facilities related demand charges • Seasonal demand charge structure	$30.35/mo.	Facilities related demand charge: $2.25 per monthly maximum kW, all year	8.124¢ for the first 300 kWh per kW of maximum demand 5.091¢ for all additional kWh	Summer is the first Sunday in June to the first Sunday in October; remaining months comprise the winter season
TOU-PA-SOP	• Time-of-use rate • Time and facilities related demand charges • Seasonal structure • Benefits customers who can shift load to the super-off-peak time period	$42.80/mo.	Facilities related demand charge: $2.85 per monthly maximum kW, all year Time related demand charge: $44.35 per maximum on-peak kW in summer months; $0.00 in all other time periods	<u>Summer</u> 8.490¢/on-peak 4.917¢/off-peak 2.574¢/super-off-peak <u>Winter</u> 5.381¢/off-peak 2.574¢/super-off-peak	<u>Two summer season options:</u> 1. Summer is the first Sunday in July to the first Sunday in October. 2. Summer is the first Sunday in June to the first Sunday in September

3.2.2. Well Motor Efficiency

Over time the efficiency of electric turbine well motors may decrease. SCE offers several tests in order to help assess this potential decrease in efficiency. In addition to standard overall efficiency tests, SCE offers several other tests which can help in the assessment of well motor efficiency. The Infrared Panel Inspection test is used to identify locations of high temperature, which are indicative of poor electrical connections. The Megohm test measures the electrical resistance of the motor. A Vibration Inspection test will analyze vibrations produced by the motor. The efficiency tests offered by SCE could help the District identify inefficient motors which need repair or replacement. This can in turn help lower energy costs incurred by the District.

<u>Current Conditions</u>

The District has utilized SCE's standard overall efficiency test for its well motors. Table 3.7 indicates the age of the motors and the year of their last efficiency tests. Other more specific efficiency tests offered by SCE have not been utilized by the District.

Table 3.7
Well Efficiency Test Status

	Smillie Well	Lyon Well	Foothill Well	El Carro Well
Year Motor was Purchased	1975	1999	1989	1990
Year of Last Efficiency Test	1985	1999	1997	NA
Current Status	Needs test	OK, new motor	OK, recently reworked	New, never used

District Options

The District plans to create a schedule for the periodic testing of well motor efficiency. This schedule may be implemented over a designated time frame or based on the overall use a particular well has received.

Financial Assessment

Standard overall efficiency tests are provided free of charge by SCE. When performed together, Infrared Panel Inspection, Megohm, and Vibration Detection tests cost $325 total for one well.

3.2.3. Evaluation and Preventive Maintenance

An evaluation and preventive maintenance plan can help ensure efficiency and increase the life span of the District's well facilities. Evaluation of periodic monitoring data can help the District assess if maintenance is needed by a particular well. Well evaluation can further aid the District in determining when a new well may need to be developed. Wells which are reaching the end of their life span can be identified, and development of additional wells planned.

Current Conditions

The District's well facilities are currently visited every day. When the wells are in operation, the District monitors the chlorine feeds for all wells and the sulfur dioxide feeds for wells with iron and manganese treatment facilities. If the wells are not in operation, the well facilities are visually inspected to ensure no vandalism has taken place. In addition, the wells' water levels are checked monthly, unless the well pumps have just been started or stopped, when pumping and recovery rates are also checked. A schedule for the testing of well water quality as required by the State of California is also followed. Maintenance is performed on a well facility if and when a problem with its operation arises. The Smillie well will soon receive a new submersible pump and the Lyons well recently received a new motor. With the installation of the new pump at the Smillie well, all wells will be in good operating condition.

Wells with iron and manganese treatment facilities (Foothill and El Carro) receive additional care. The filter media of the treatment facilities are backflushed once a week in order to preserve the filter's integrity. Treatment facilities are also frequently cleaned, checked for rust, and painted, if needed. The iron and manganese treatment facilities are believed to be in good operating condition.

The District's wells and their associated treatment facilities have also been assessed to determine if they are susceptible to problems associated with Year 2000 computer malfunctions. The wells' treatment facilities are the only facilities within the District to currently function based on computer microchip technology. These microchips function on an hourly and daily basis, rather than annually, however. As such, it has been determined that they are not susceptible to problems associated with the Year 2000.

District Options

The District plans to formulate an evaluation and preventive maintenance plan for the care of its well facilities. Table 3.8 shows a schedule of various analyses which can be included in such an evaluation and preventive maintenance plan. Most of the analyses can be performed by District staff. Data from these analyses can be assessed in order to determine maintenance needed, if any. For the monitoring listed below, if well specific capacity declines by more than 20 percent, or ATP bacteria counts increase to more than 500,000 Colony Forming Units (CFU)/ml, well maintenance of some form is likely to be required.

Particular wells also have additional individual evaluation requirements. Due to presence of high levels of iron and manganese in the water of the Foothill and El Carro wells, these two wells should be evaluated for rehabilitation approximately every five years. The Smillie well also needs evaluation for possible reconstruction.

Table 3.8
Well Monitoring and Maintenance Schedule

Analysis	Weekly	Monthly	Annually	Biannually
1. Flow rate, pumping water level, pump pressure	X			
2. Backflush of filter media of Fe and Mn treatment systems	X			
3. Static water level		X		
4. Water Quality Analysis -General Mineral -ATP/BARTS Bacteria testing			X	
5. Edison efficiency test				X

In addition to the monitoring schedule outlined above, the District has the option to develop a plan to assess the life expectancy of its wells. It is estimated that wells within the District have a life span of approximately 25 – 40 years. When a well is approaching the end of its expected life span, the District can begin to assess its life expectancy and plan for the reconstruction of the well or the development of another well.

Financial Assessment

Cost of implementation of an evaluation and preventive maintenance plan should be low. Flow rate, pumping water level, pump pressure, and static water level can all be checked by District staff. SCE provides standard efficiency tests free of charge. General mineral tests cost approximately $140 per sample while ATP/BARTS Bacteria tests cost approximately $80 per sample.

3.2.4. Wellhead Protection

Improperly sealed and protected wells have the potential of becoming preferential pathways for the movement of poor-quality water, pollutants, and contaminants. This can lead to the degradation of groundwater resources.

Current Conditions

The District-owned wells are believed to be adequately sealed and protected. The wells are located in enclosed areas and were constructed with sanitary seals. Privately-owned wells located within the District, however, have the potential of being inadequately sealed and protected.

The County of Santa Barbara currently oversees wellhead protection of privately-owned wells within the District. The District has also made efforts to increase its involvement in the protection of the privately-owned wells. As noted in Sections 5 and 6 of its Groundwater Management Plan, the District has implemented both a Sanitary Seal Retrofit Program and a Well Abandonment and Destruction Program. The Sanitary Seal Retrofit Program requires "wells identified as being contaminated or polluted, or subject to a material or substantial contamination or pollution risk and identified as not having a sanitary seal, shall be fitted with sanitary seals or remedied by other actions as determined by the District." The Well Abandonment and Destruction Program indicates "all abandoned and/or improperly secured wells shall be identified and at the owner's expense, abandoned and secured in accordance with current State and County requirements."

District Options

To help insure adequate wellhead protection, the District has the option to increase its involvement in the monitoring of privately-owned wells. One method of doing this is to plan annual voluntary inspections of privately-owned wells within the District. These inspections could be performed by District staff or an intern. This can aid in the identification of wells requiring sanitary seals or proper abandonment and destruction. In addition, the District may periodically send out to well owners letters containing recommendations for proper wellhead protection and well abandonment.

Financial Assessment

If two wells could be inspected per hour, it would take approximately 50 hours to inspect the privately-owned wells located within the District. Another 50 hours could be required for creation of a database and writing of a well inspection report. If an intern were to perform this work at $8 per hour, costs would run approximately $1600 to $2000. Additional costs may be incurred if District staff is required to be present for any or all of the inspections. This could require up to 50 hours of District staff time. An additional $1000 could be expected to be needed for the mailing of informative letters to the well owners and other miscellaneous program expenses.

3.2.5. Santa Ynez Well Development

Should the District experience an increase in growth and demand, it may be desirable or necessary to develop another well. An additional well is also desirable for the District in that it would increase the reliability of the District's groundwater capability. A favorable site for well development would be at the property located behind the District's maintenance yard at 1301 Santa Ynez Avenue. This location was previously the site of the District's Santa Ynez well, now abandoned. The District may desire to preserve this land as a potential future well site.

Current Conditions

Maximum capacity of the El Carro, Lyon, Smillie, and Foothill Wells is 4,670 acre feet per year. At an operation rate of 70%, the El Carro, Lyon, Smillie, and Foothill Wells can provide the District with 2,634 acre-feet per year, while Lake Cachuma and State Water entitlements (including drought buffer) allow the District an additional 5,012 acre-feet per year. District customer demand from 1998 to 2002 is estimated to average 4,550 acre-feet per year. As such, the District appears to have secured an adequate water supply for the foreseeable future. Development of an additional well is therefore not considered necessary at this time. If the District would find it beneficial to have increased reliability for its groundwater supply, however, another well may be desirable. Increased future demands may also make another well necessary.

District Options

1. Should the development of an additional well be necessary, the site at 1301 Santa Ynez Avenue is considered favorable. This site is already owned by the District and was previously the site of the now-abandoned Santa Ynez well. Records for the previous Santa Ynez well provide information on aquifer systems and historic well production data for the area. The previous Santa Ynez well was an effective producer, generating approximately 1000 gpm. Pumping of the well was terminated in 1992 after twenty years of operation due to excessive sand production in the well. This sanding was believed to be the result of well casing erosion. The water produced by the previous Santa Ynez well had occasional excessive levels of iron and manganese ions, but these levels were not problematic after the well water was blended with other source water in the District's

distribution system. In addition, a Staal, Gardiner and Dunne, Inc. report dated November 15, 1993, found high concentrations of iron and manganese ions in samples collected during packer testing. These samples may not have been representative, however, due to high levels of settleable solids present in all of the samples. Additional testing of water quality would be needed prior to development of a new well. Due to the many favorable conditions for well development at 1301 Santa Ynez Avenue, the District may desire to reserve any unused space at this property for the development of an additional well in the future.

2. Development of a new well at another site would require the locating and purchasing of additional property by the District. Furthermore, information regarding aquifer systems, well production, and water quality would need to be obtained. Electrical services and piping in excess of that required at the 1301 Santa Ynez Avenue site would also most likely be needed.

Financial Assessment

1. A Fugro West, Inc. report dated June 6, 1996, estimates the cost of a replacement well at the 1301 Santa Ynez Avenue site. Based on the known data of the aquifer systems at the site and historic Santa Ynez well production data, the report estimates a replacement well of 14 to 16 inch diameter, 1,000 feet deep, and of stainless steel production, to cost approximately $325,000 including design and construction inspection. An additional budget contingency of $50,000 to $75,000 is recommended to reflect the cost of relocating electrical services and to intertie piping to the new well site. Since water quality at the Santa Ynez well site cannot be assured, costs could be higher in order to construct a filtration plant which would mitigate poor water quality. A maximum cost estimate for well development is approximately $1 million including filtration plant costs.

2. Development of a well at another site would likely be similar in cost, with the exception of increased costs for electrical service relocation and piping. Potential cost of additional property purchases would also need to be added to cost estimations.

3.3. AUTOMATION OF CAPITAL FACILITIES

The District is considering increasing the automation of its capital facilities. This would allow for the facilities' operation status to be known instantaneously and increase the efficiency of their operation. Two types of automation the District is considering is a Supervisory Control and Data Acquisition (SCADA) system and chlorine low level residual alarm at the Carpinteria Reservoir.

3.3.1. Supervisory Control and Data Acquisition (SCADA) System

Operation and monitoring of many of the District's capital facilities may be automated through the implementation of a SCADA system. A wide range of SCADA systems exist and the systems are very site specific. Stations within a SCADA system can simply be used for status indication and data acquisition, whereby information such as flow rates,

chlorine levels, and operation status can be obtained. SCADA systems also can serve in the control of the operations of capital facilities.

A SCADA system could aid District staff in the operation and monitoring of District capital facilities. While observation of the capital facilities on a daily basis is necessary, the rapid periodic monitoring a SCADA system provides could help improve the District's efficiency in the operation and monitoring of its capital facilities. The capital facilities could be monitored quicker and trips to field could be reduced.

Current Conditions

The District currently does not use a SCADA system in the operation and monitoring of its capital facilities. The reservoirs' water levels and the distribution system's flow rates are read manually in the field. Flows between reservoirs are controlled by signals sent and received through dedicated telephone wires. In addition, chlorine and sulfur dioxide levels used in water treatment and disinfection are also controlled and monitored in the field. Determination of well operation schedules is made through communication with the City of Santa Barbara's Cater Treatment Plant and observation of water levels in the Carpinteria Reservoir. When deliveries from the Cater Treatment Plant and storage in the Carpinteria Reservoir are not considered adequate to meet customer demands, wells are activated manually in the field.

District Options

The District has the option to implement a SCADA system in order to automate the operation and monitoring of its capital facilities. District staff has identified the following SCADA services at the following locations as being beneficial in the operation and monitoring of the capital facilities:

- Carpinteria Reservoir – reservoir water elevation; inflow and outflow of reservoir; and chlorine concentration
- Gobernador Reservoir – reservoir water elevation; inflow and outflow of reservoir
- Shepard Mesa Tank – tank water elevation; inflow and outflow of tank
- Wells – flow rate; chlorine concentration; signal notifying that a chlorine cylinder is empty and needs to be changed

Each of the above listed locations would require installation of a remote terminal unit (RTU). Transducers, signal conditioners, and power supplies would also need to be installed at sites, as required. The RTUs would monitor analog and digital signals representing pressure, flow rate, ON or OFF status of pumps, etc. These signals would be averaged over 15 minute intervals and transmitted when polled by a laptop or desktop computer with the appropriate protocol. Real-time values of all analog and digital inputs and outputs would also be transmitted. Transmitted data would then be displayed on a laptop or desktop computer through the system's software graphical interface.

The software's graphical interface could include the following windows:

- A summary window showing all reservoir levels, flow rates, alarm setpoints, alarm statuses and pumping station operation. The data on this window could be printable.
- A water balance window modeled after the District's current water usage spreadsheet. A report can be printed from this window.
- Graphs showing at least one week's history of each measured analog value. These graphs could be printable.
- A pager window, to alert personnel arriving at the station to call headquarters. This page could be canceled from headquarters and acknowledged from the station.

Financial Assessment

The District has received a proposal for a SCADA system as described above from John Howard of Kw Aware LLC. Scope of work includes graphical interface creation, selection and procurement of miscellaneous hardware, procurement and programming of RTUs, system integration, software installation, and system setup. Kw Aware LLC proposes to provide the hardware, software, and services described in the proposal for a lump-sum price of $31,700. If COMB installs hardware at the Carpinteria Reservoir for its own SCADA system, the lump-sum price would then be $29,100. These prices do not include hardware installation, mounting of hardware, running of wire to transducers, or running of wire to external signal and power sources. A high-end rough cost estimate for these services is approximately $7,000. Total costs are therefore estimated at $36,100-38,700. In-house costs incurred by the District, such as time commitments by staff for permitting requirements and obtaining easements, are not considered in this Plan. If additional hardware is required, the lump-sum amount would be adjusted by Kw Aware's net cost, plus 15 percent. If additional Kw Aware services are required, the applicable hourly billing rates are $95.00 per hour for the Senior Engineer classification, and $80.00 per hour for the Senior Programmer classification.

4.0. OPERATIONS

4.1. AUTOMATION/COMPUTERIZATION OF OFFICE OPERATIONS

There is potential for the District to increase the automation and computerization of its office operations. Operations areas with this potential include billing and receipt of payments, records storage, data management, data exchange, office networking, and meter reading.

4.1.1. Billing and Receipt of Payments

New technologies in the billing and payment of customer's accounts are available to the District. In addition to traditional billing and payment of accounts by mail, it is possible for customer's bank accounts or credit card accounts to be directly billed for their water use charges. In the near future it may also be possible for customers to pay their accounts over the internet.

Current Conditions

The District currently bills most customers by mail. Customers billed by mail can make payments by mail or in person at the District's main office at 1301 Santa Ynez Avenue. The District has also recently implemented the option of utilizing its bank (Santa Barbara Bank and Trust) to automatically charge its customer's bank accounts for their water bills. This required software provided by the bank to be installed at the District's main office. The District uses this software to bill customers who have agreed to the service. The customer's water use charges are withdrawn from their individual bank accounts and deposited in the District's bank account by Santa Barbara Bank and Trust. This occurs on a monthly basis.

In the past, the District has considered using a bank lock box service to handle payments. With such an arrangement, customer payments are mailed directly to the bank, which in turn, deposits the payments to the District's account and generates a list of customer payments which is then used by the District to post such payments on customer accounts. A mailing service was also considered as an option for the mailing of bills. Both of these methods of billing and receipt of payments were considered unnecessary by District staff due to the District's small size.

District Options

1. The District has the option to utilize its bank (Santa Barbara Bank and Trust) to automatically charge its customer's credit card accounts for their water bills. This would require a credit card terminal to be purchased or rented from Santa Barbara Bank and Trust and installed at the District's main office. The District would then bill the credit card accounts of customers who have agreed to the service on a monthly basis.

2. The District may have the option to bill and receive payments over the internet in the future. This would require the District to create a Web page, where customers could supply billing information such as credit card or bank account numbers, with which the District could charge the Customer's accounts. This method of billing and payment is not known to be practiced by other water districts at this time. This technology may be available to the District in the near future, however.

Financial Assessment

1. Set-up of a credit card billing and payment system costs approximately $500. Rental of a credit card terminal is then approximately $150 per month. Santa Barbara Bank and Trust would also charge an approximate 5% draft amount on all transactions.

2. As this method of billing and payment is not currently practiced, costs are not known at this time.

4.1.2. Records Storage

Old files and records stored as hard copies can be converted to CD-Rom or microfilm/microfiche. This can conserve space and increase efficiency through the avoidance of printing and binding of all records and files. Subsequent access to old files would also be improved.

Current Conditions

The District currently stores most of its files and records as hard copies at the District's main office. This requires a large amount of space and makes records retrieval difficult. With the addition of more files and records in the future, retrieval will become more difficult and additional storage space will need to be found. Records which are saved and stored by the District include ten year histories of customer water usage (compiled annually and dating back to 1970), annual general ledgers, and engineering department files and records. While some records, such as property deeds and title certificates, must remain in permanent storage as hard copies, other records may lend themselves to conversion to a more efficient form of storage.

District Options

1. The District has the option to convert files and records to CD-Rom. Old files and records stored as hard copies can be scanned into CD-Rom form, while recent files and records still in the District's computer system can be converted to CD-Rom as data. Converting files and records to CD-Rom as data is preferable to scanning, as it uses less disc space, is quicker, and less labor intensive. Scanning of documents requires labor to scan the documents and insure the accuracy of the scans. Text is generally scanned accurately, while graphics scans may have an accuracy rate of approximately 80-90%. District files and records which may be appropriate for conversion to CD-Rom include

the annual ten year histories of customer water usage, annual general ledgers, old reports, and water quality data.

2. The District has the option to convert files and records to microfilm/microfiche. With this method, files or records are printed out and then converted to microfilm/microfiche, usually by an outside company. The microfilm/microfiche is then returned to the District, where the microfilm/microfiche can be read or printed-out through the use of a microfilm/microfiche reader and printer. This can help conserve space at the District's main office and improve access to old files and records. District files and records which may be appropriate for conversion to microfilm/microfiche include the annual ten year histories of customer water usage, annual general ledgers, old reports, and water quality data. It should be noted that as conversion to CD-Rom has become more common, microfilm/microfiche usage has decreased.

Financial Assessment

1. Purchase and installation of a system capable of converting and storing computerized data files to CD-Rom is estimated to cost approximately $10,000 at the low end, and up to $100,000 at the high end. Cost of purchase and installation of a CD-Rom scanning system is estimated to be approximately $20,000. Total costs for a operable CD-Rom system can therefore range from $30,000-120,000. Additional costs of labor required to scan the documents and check accuracy of scans would also be incurred by the District. Scanning of documents to CD-Rom can also be contracted-out, with scanning charges of approximately 12¢ per page. Accuracy of scans can be a problem with this method, however. Total scanning costs are dependent upon the amount of documents which are to be scanned, which is unknown at this time.

2. The conversion of files and records from hard copies to microfilm/microfiche is usually contracted with an outside company. Conversion charges are approximately 3.5¢ per page, with a $10 per hour fee for document handling and preparation. Back-up copies of the microfilm/microfiche must also be purchased for approximately $8 per roll of film. A machine for reading and printing of microfiche/microfilm records costs approximately $5,000.

4.1.3. Data Management

The District generates and uses large amounts of data, both in the administrative and engineering departments. Increased computerization of the District's data management system is planned.

Current Conditions

Administration data is currently managed under the following computer menus: water billing, meters, general ledger, accounts payable, inventory, fixed assets, and payroll. Each of the menus is then subsequently categorized for data management (see Table 4.1).

Data which is used by administration, but is not currently computerized, includes customer orders/complaints.

The engineering data currently stored and managed by computer is generally private-well information, including state well number, parcels serviced, acres in production, and backflow information. Engineering data which is not currently managed by computer includes land use records, rainfall and evapotranspiration information, cross connection information, well information (water levels and water quality), and updates to regularly distributed plans and reports. The District also does not utilize a Geographic Information System (GIS) in the management and use of its engineering data.

Table 4.1
Computerized Administration Data

	Administration Data Menus						
	Water Billing	Meters	**General Ledger**	**Accounts Payable**	**Inventory**	**Fixed Assets**	**Payroll**
Data Categories Included In Menus	• Maint. • Cash Receipts • Billing • Month End/Year End • Reports	• Meter Maint	• Maint. & Inquiry • Transactions • Reports • Year End	• Maint. & Inquiry • Invoice process. • Misc. Reports • Calendar Year End	• Maint. & Inquiry • Transaction Processing • Reports	• Maint. & Inquiry • Trans. Process. • Reports	• Maint. • Current Payroll Process. • Reports

District Options

1. The District has the option to create a computerized management system for administrative data which is currently not managed on computer. Computerized management systems for the data generated by service orders and cash receipts are currently planned. Other administrative data which could be included in computerized systems includes customer order/complaint information. Due to the small number of customer orders/complaints received monthly, a computerized data management system is not considered necessary for this information at this time. In addition, if maintenance is performed in relation to a customer order/complaint, this information is tracked in other databases.

2. The District has the option to utilize a GIS for planning and engineering purposes. A GIS allows for layers of geographic and other data to be mapped and stored in an integrated format. These mapped layers of data can then be recalled and related to one another. Data which could be useful mapped in a GIS includes facility locations, distribution corridors and adjacent land owners, land use information, and private well information. A GIS could be used to estimate private well owners' groundwater pumpage, map potentiometric surfaces, identify land owners for easement considerations, and update regularly distributed plans and reports. A GIS could increase the organization of the District's engineering data and increase the efficiency of its use.

3. The District has the option to create a computerized index and data management system for engineering data. Types of data which could be included in such a system include land use information, rainfall and evapotranspiration information, cross connection information, well information (water levels and water quality), and updates to regularly distributed plans and reports. A computerized data management system of this type could increase efficiency and organization in the use of engineering data.

Financial Assessment

1. Cost of data management systems for service orders and cash receipt information is included in the cost of the District's upcoming computer system upgrade. Application software for a data management system for customer order/complaint information is estimated to cost approximately $1,500 to $3,500.

2. Costs for the creation of a GIS vary widely. The first step for the District would be to identify what functions the District would require of a GIS. This would help dictate the level of accuracy needed in the GIS. A GIS used for planning purposes would require less detail than a GIS to be used for engineering. Costs of a GIS also depend upon the amount of digital data available for the creation of a GIS. For example, plans or maps which only exist in hard copy form need to be scanned or otherwise entered into the GIS. Other plans or maps, however, may already exist in digital form. The District could possibly obtain digital information from such sources as UC Santa Barbara, Fire Districts, the City of Carpinteria, and publicly available road maps.

Consultants which develop GIS technologies often provide "needs assessments" for their clients. This involves working with the client to identify what uses for a GIS are available and desirable for the client. This process usually costs approximately $3000-6000. Creation of a base map GIS for planning purposes costs approximately $10,000. This could include such data as street and building information, District boundaries, and land use information. Other information, such as distribution line and facility locations could be added to the GIS as budgeting allows. The GIS software package Arcview costs approximately $2000. A personal computer with a 5 gigabyte hard drive, which costs approximately $3000, would also be necessary.

3. Application software for the management of each subdivision of engineering data is estimated to cost approximately $1,500 to $3,500.

4.1.4. Data Exchange with Other Agencies

The District provides data on flows and customer usage to the Carpinteria Sanitary District. Through the development of a computerized data exchange system, this data could be transferred from the District to the Carpinteria Sanitary District via computer.

Current Conditions

Flow and customer usage data is collected on back up tape in the District's main office computer system. Once a year, the back up tape containing the data the Sanitary District needs is sent to the Sanitary District. The Sanitary District then uses the data for billing purposes.

District Options

The District has the option to develop a computerized data exchange system with the Carpinteria Sanitary District. This would allow for data to be exchanged between the two districts via computer. With the recent computer system upgrade, the District's computer system has data exchange capability. Some programming would probably be required to set up the data exchange system, however. If considered necessary, the District can provide the Carpinteria Sanitary District with a password which will allow the Sanitary District to log on to the District's computer system, where it can retrieve the desired data. Since data is currently only exchanged once a year between the districts, set-up of a computerized data exchange system is not considered necessary at this time.

Financial Assessment

The District currently provides data to the Carpinteria Sanitary District free of charge. The Sanitary District then converts the data to a form which can be used. Since the new District computer system will be capable of computerized data exchange, set up costs of a computerized data exchange system between the District and the Carpinteria Sanitary District should be limited to costs for the necessary programming. These costs should be low.

4.1.5. Network Server for Office Computer System

The District's office computer system has recently undergone an upgrade. The computer system was replaced, along with additional hardware including an upgraded printer, replacement software, and some new software. These upgrades are expected to meet the District's long-term office computing needs. One additional computing capability not included in the computer system is a network server. A network server would allow office staff to easily access or transfer District computer files and documents from any main office PC terminal. E-mail could also be sent between staff using an office network.

Current Conditions

The District does not currently use an office network. Computer files are accessed or transferred by changing work stations or by using diskettes. Messages are given personally or in writing, as opposed to using e-mail.

District Options

If considered necessary, the District has the option to install a network server in its main office computer system. The District's main office PC terminals would also need to be upgraded to operate with the network server. This would allow office staff to access or transfer computer files and documents from any main office PC terminal. E-mail could also be sent among District main office staff. Due to the District's modest computing needs and small number of office personnel, an office network is not considered necessary at present.

Financial Assessment

Purchase and installation of an NT server network for the District's main office is estimated to cost up to approximately $50,000. Depending upon existing hardware and software presently installed at the District's main office, the cost may be less.

4.1.6. Meter Reading

Several new technologies exist in regards to methods of water meter reading. Options available to the District include touch reading, radio reading, and phone reading of meters. The District also has the option of contracting its meter reading requirements with an outside meter reading service. These options have the potential to increase efficiency and reduce costs of the District's meter reading operations.

Current Conditions

Water meters are currently read once a month within the District. Employees of the District visit each meter and record customer usage by manually typing meter readings into a hand held computer. Reading of all of the District's meters takes five staff members approximately one week to complete. Data from the hand held computers is then transferred at the District's main office for billing purposes.

District Options

1. The District has the option to implement a touch-read system for the reading of its water meters. This method allows for meters to be read through the use of a probe, which takes meter readings instantaneously when touching a pad connected to the meter. The touch pad can be placed on a meter box cover or mounted on a wall. This allows for the meter to be read without lifting the meter box cover or cleaning out of the meter box. It is estimated that meter reading times can be reduced by half through the utilization of this method. Implementation of a Sensus touch-read system would require retrofitting of the District's Sensus meters and replacement of the District's Neptune and Badger meters. Sensus hand held interrogators and probes would also be required.

2. The District has the option to implement a radio-read system for the reading of its water meters. This method is particularly effective when meter access is difficult. A

radio-read system allows for meters to be read by simply walking past the meters with a hand held interrogator. The meters are then activated and automatically send the meter reading to the hand held interrogator. Meters can be read from a distance of 200 feet to a 1/2 mile. Radio-reading of meters can greatly reduce the time required to read meters with difficult access. Implementation of a Sensus radio-read system would require retrofitting of the District's Sensus meters and replacement of the District's Neptune and Badger meters, in addition to the installation of meter transceiver units. Sensus hand held interrogators with radio-read capability would also be required.

3. The District has the option to implement a phone-read system for the reading of its water meters. This system would allow for water meters to be read through phone lines. Phone-read systems are most effective when meter access is difficult or when new developments are built with phone lines connected to water meters during construction. Implementation of phone-read systems otherwise requires extensive retrofitting in order to connect customer phone lines to water meters. Due to the extensive retrofitting required, a phone read system is not considered feasible for the District at this time.

4. The District has the option to implement a meter reading system which is a combination of manual-reading, touch-reading, radio-reading, and phone-reading methods. Sensus offers systems which are capable of all methods concurrently. For example, difficult access meters can be fitted for radio-reading, while more accessible meters can be fitted for touch-reading. Meters which are capable of being read by touch-read or radio-read methods can also be read manually, if necessary. Furthermore, meters which are capable of touch-reads can be upgraded for radio-read capability relatively easily. Utilization of several meter reading methods at once allows for efficiency to be improved, while retrofitting of meters can be kept at a minimum.

5. The District has the option to contract-out its water meter reading to an outside firm. The firm would read all of the District's meters and provide the customer usage information to the District.

Financial Assessment

1-4. For touch-read or radio-read capability, the District's Sensus meters would require the addition of a Sensus SR-2 register. These registers cost approximately $50 each for regular meters and approximately $128 each for compound or turbo meters. The District's Neptune and Badger meters can be replaced with Sensus SR-2 register meters for approximately $90 per meter. Meter transceiver units, required for radio-read capability, cost approximately $135 per unit. These units can service up to 16 meters within 200 feet of the unit. Labor for retrofitting or replacement of meters for touch-read or radio-read capability is estimated to cost approximately $30-40 per meter. In addition, hand held interrogators cost approximately $4,300 for touch-read capability, and approximately $7,700 for radio-read capability. Sensus offers half price reductions for hand held interrogators if purchase is accompanied by the trade-in of an old hand held interrogator. Touch-read probes to be used with the hand held interrogators cost

approximately $300-700 per probe. Software for the touch-read system is approximately $4,000, while software for the radio-read system is approximately $5,000-6,000.

Conversion to a touch-read system is estimated to cost the District $359,800-403,100. Conversion to a radio-read system is estimated to cost the District $400,400-442,400. A mixed meter reading system is expected to cost the District approximately $400,000. Costs for conversion to a phone-read system has yet to be determined.

Sensus offers financial analyses of water districts' current meter reading systems in comparison with an upgraded system with Sensus. The financial analysis includes an assessment of the accuracy of a district's current meters, along with estimates of potential cost reductions from upgrading of the system. In addition, length of time for payback on investment is addressed.

5. The Alexander Meter Co. would charge approximately 69¢ per meter for the service of reading the District's water meters on a monthly basis. They would then supply the District with the meter data.

4.1.7. Year 2000

The Year 2000 poses potential problems for computer systems not capable of acknowledging years with four digits. The District has undergone an assessment of its computer system to assure that it is capable of handling the Year 2000. Since the District's computer system underwent an upgrade in 1998, any possible complications regarding the Year 2000 were addressed at that time. No additional action by the District regarding its computer system is believed to be necessary at this time.

4.2. PUBLIC INVOLVEMENT

To encourage public involvement and feedback, the District is considering several options which can be included in a working public involvement plan. These options include: increased access to the District over the internet, increased information about the District provided through the media, and increased public education by the District.

4.2.1. Internet

Public involvement with the District can be increased through greater access to the District over the internet. A web site for the District could be a useful tool in increasing public involvement. The District could also set up an e-mail account to solicit feedback from the public. These two uses of the internet could be used to create an informal forum for communication with the public.

Current Conditions

The District currently has access to the internet and the General Manager has an e-mail address. A web site has not yet been created and the District does not solicit e-mail from

the public. Communication with the public is generally done by mail. Customers can also come into the District's main office to discuss concerns.

District Options

1. The District has the option to create a web site. The web site could include information relevant to the District such as: water quality information, methods of water conservation, announcements, explanations about the District's water supply and its sources, and the history of the District. The web site could increase customers' knowledge about the District and possibly lead to increased public involvement. In the future it may also be possible for customers to pay their water bills by using the web site.

2. The District has the option to promote its e-mail account as a means for communication with the public. The address of the account could be advertised and also accessible from a web site. This could create an informal forum between the District and its customers, allowing for the customers to provide feedback on services and concerns. As e-mail communication is less formal and quicker than typical mail communication, an e-mail address accessible to the public should increase public involvement and feedback. Response to different e-mail messages from the public could be conducted by the District staff member with the most expertise in the subject of the e-mail message. This would allow for the duty of e-mail response to be shared by the whole staff.

Financial Assessment

1. A typical web site costs approximately $1000-5000 to design, depending upon the size of the site and its complexity. Web sites generally have to be housed with an internet service provider. This service costs approximately $15-25 per month.

2. E-mail accounts can be operated for approximately $10 per month.

4.2.2. Media

Public involvement can be increased through the use of media. Types of media which could used by the District include newsletters, video, broadcasts on the local TV channel, and local newspapers. By supplying information about the District to its customers, the District helps increase public involvement.

Current Conditions

The District currently issues an annual newsletter to its customers. The newsletters provide general information regarding the District, such as capital facilities improvements and rate structures. Information is more regularly provided to the local newspaper about Board meetings. The District is also currently working on creating an informational video.

District Options

No additional action by the District is believed to be necessary at this time.

4.2.3. Education

Public involvement with the District can be increased through the education of the District's customers about water related issues. This can be done through school programs, formation of a public water issues focus group, and creation of a demonstrative drought tolerant garden at the District's main office. If people are more educated about the District and its functions, they may increase their involvement with the District.

Current Conditions

The District currently does not conduct school programs which provide information about the District and water conservation. Plans are underway to develop such programs. The programs will utilize a variety of educational materials and hands-on experiments to instruct school children on where their water supply comes from and how it reaches them. The programs will also educate the children on the importance of conserving water, and ways they can assist in conserving it. These programs are planned for children in grades Kindergarten through Junior High.

There is currently no public water issues focus group in place, and the District's main office is only minimally landscaped with some drought resistant plants.

District Options

1. The District has the option to organize a public water issues focus group. The focus group could represent the public in voicing concerns related to water issues. The District could educate the focus group regarding these issues; the focus group could then be in charge of relaying the information back to the public. Meetings between the District and the focus group could be used as forums to increase public education and involvement.

2. The District has the option to create a program where drought resistant landscaping at the District's main office could be used to educate the public about water conservation. Large portions of the landscape at the office would need to be re-landscaped to increase the number of drought resistant plants. The re-landscaping program could include: selective removal of existing plant material, composting, cultivation of organic and inorganic soil amendments, installation of a broad palette of plant materials for visual impact, a two-year detailed maintenance program, and upgrading of the existing irrigation system. The District could then advertise and give educational tours of the landscaping. A walk-through descriptive map could also be made available to educate homeowners. This would increase the public's involvement with the District and help improve water conservation efforts.

Financial Assessment

1. Costs for the organization of a public water issues focus group should be low. Costs incurred would primarily be associated with the time commitments required of District staff.

2. The creation of an exemplary drought-tolerant landscape is anticipated to cost approximately $40,000-$60,000, to be implemented over a one or two year period. Subsequent costs incurred by the program would primarily be associated with the time commitments required of District staff for maintenance. Funds may be available from the USBR in the form of a grant program.

4.3. INTERGOVERNMENTAL COORDINATION

Through intergovernmental coordination, the District can potentially increase the efficiency and reduce the costs of its operations. Intergovernmental coordination allows for agencies with similar interests to work together to meet their goals. The District would like to keep its options open for increased intergovernmental efficiency through the formation of new joint powers authorities (JPAs) or other intergovernmental coordination.

4.3.1. Partnerships

The District is a member of several JPAs. The different JPAs serve many different functions, allowing their member agencies to work together toward common goals. JPAs of which the District is a member include Cachuma Operations and Maintenance Board (COMB), Cachuma Conservation and Release Board (CCRB), Central Coast Water Authority (CCWA), Association of California Water Agencies-Utility Service Agency (ACWA-USA), the Joint Exercise of Powers Agreement Providing for Water Treatment (with the City of Santa Barbara for the Cater Treatment Plant), and Santa Barbara County Water Purveyors Agency. The District would like to identify areas where the efficiency and cost effectiveness of these JPAs can improve.

Current Conditions

The JPAs the District is a member of and the functions the JPAs serve are listed below.

- *COMB* – The Member Units of COMB are the Carpinteria Valley Water District (District), Montecito Water District (MWD), City of Santa Barbara, Goleta Water District (GWD), and Santa Ynez River Water Conservation District-Improvement District#1 (SYRWCD-ID#1). COMB is the Member Units' interface with the USBR with regards to the Cachuma Project. It is currently responsible for the operation and maintenance of the Tecolote Tunnel, South Coast Conduit, and related reservoirs and distribution facilities. In addition, it is responsible for the administration of Cachuma contracts and the maintaining of trust funds under the Cachuma Water Service

Contract and the Warren Act Contract. It is also the lead local agency in the Safety of Dams work on Bradbury Dam.

- *CCRB* – CCRB was created by the South Coast Member Units minus SYRWCD-ID#1 in 1973. Its purpose is to maximize the amount of water which can be obtained from the Cachuma Project for the benefit of its members. This agency deals mainly with water rights related issues. CCRB was formed because there are Cachuma Project related water rights issues on which the South Coast Member Units may have a different position than SYRWCD-ID#1 because of SYRWCD-ID#1's dual position as a diverter from the Project and a beneficiary of downstream water rights releases from the Project.

  In recent years the work of CCRB has gone beyond supporting a different position on certain water rights issues. CCRB, with pro rata support by SYRWCD-ID#1, has been the funding mechanism for the Memorandum of Understanding on fishery protection and enhancement for the Santa Ynez River and a vegetation monitoring study ordered by the SWRCB. CCRB also solely funds a consultant to participate in Below Narrows groundwater studies. These studies are being done in anticipation of the SWRCB hearings on the Cachuma Project water rights permits. CCRB and STRWCD-ID#1 also jointly fund the studies and reports necessary for the Endangered Species Act (ESA) consultations with the National Marine Fisheries Service (NMFS).

- *CCWA* – CCWA consists of the District, MWD, City of Santa Barbara, GWD, La Cumbre Mutual, Morehart Land Co., Santa Barbara Research, SYRWCD-ID#1, City of Buellton, SoCal Water, City of Santa Maria, City of Guadalupe, and Vandenberg Air Force Base (VAFB). CCWA is responsible for the construction and operation and maintenance of the State Water Project within the County of Santa Barbara. The principal task of CCWA is operation of a water treatment plant in San Luis Obispo County and a pipeline that runs from the treatment plant to Lake Cachuma. It also administers the State Water contract with the State Department of Water Resources and pays into the Warren Act Fund under contract with USBR.

- *ACWA-USA* – ACWA-USA is a JPA formed by ACWA to enable its members to work collectively together to provide for the development and purchase of utility services for their mutual benefit. ACWA-USA formed a Project Service Agreement (PSA), a subgroup of the ACWA-USA membership, to provide for a pooling of purchasing power or the collective working together of the participants for specific utility service interests. The District became a member of the Electricity PSA on April 16, 1997.

- *Joint Exercise of Powers Agreement for Water Treatment (with the City of Santa Barbara for the Cater Treatment Plant)* – This JPA is comprised of the District, the Montecito Water District, and the City of Santa Barbara. Through this agreement the City of Santa Barbara is contracted to treat the District's and Montecito Water District's water coming from Lake Cachuma. The City of Santa Barbara is required

to confer with the District regarding the Cater Treatment Plant's operations, but is not bound to act upon the District's recommendations.

- *SBWPA* – SBWPA consists of the District, MWD, City of Santa Barbara, GWD, SYRWCD-ID#1, City of Solvang, City of Buellton, City of Lompoc, VVCSD, MHCSD, VAFB, SYWCD, SoCal, City of Santa Maria, City of Guadalupe, and the CWA. The SBWPA is an agency that was formed to do regional water planning efforts cooperatively by the Santa Barbara County Water Purveyors. This included joint projects such as the Lake Cachuma enlargement study and the State Water Project studies. Since the formation of CCWA, it now primarily serves as an informational forum. It is also involved in cloud seeding. Its value is that it includes all water purveyors in Santa Barbara County and does not have a single issue focus.

- *Joint Exercise of Powers Agreement for Installation, Construction, Operation, and Maintenance of Chlorination Facilities at Ortega and Carpinteria Reservoirs and Sheffield Pump Station* – This JPA is comprised of the District and the Montecito Water District. This agreement dictates which District will be responsible for the chlorination facilities at the Ortega and Carpinteria Reservoirs and the Sheffield Pump Station. It also provides the formula for the sharing of costs between the Districts for any major replacement or reconstruction at the Ortega Reservoir.

In addition, the District has the following contractual agreements:

- *Cross-Connection Program Service Agreement* – This agreement is comprised of the District, the Montecito Water District, and the La Cumbre Mutual Water Company. It allows for the members to jointly provide the required procedures to prevent water, or any other substance, from an unapproved source from entering into the public water, as required under the Safe Drinking Water Act.

- *SBCWA* – SBCWA is a county-wide dependent district which is operationally merged with flood control. It holds the Cachuma Project Master Contract and the State Water Contract but has assigned most of the rights and responsibilities to the Member Units. It also contracts for cloud seeding, a water conservation fair, and provides information to its members. SBWCA also makes $100,000 per year available for projects or purposes related to the Cachuma Project.

The District faces several issues with regards to its participation in the above JPAs. The first issue revolves around water rights. There have been historic water rights disagreements between the South Coast Member Units and SYRWCD-ID#1, which are members of COMB. CCRB was formed to by the South Coast Member Units' because of the potential for continued water rights disagreements. There is no outstanding water rights conflict presently, however. In addition, SYRWCD-ID#1 and the South Coast Member Units are unified in their approach to steelhead related issues. Though the parties need to maintain a mechanism for expressing different points of view at least through the scheduled SWRCB water rights hearings in the year 2000, agreement on water rights issues may eventually allow for the merger of COMB and CCRB. In

addition, COMB and CCRB often share or transfer projects or activities. This often leads to staffing discontinuity. Merging of the organizations would help in avoiding this problem.

Another JPA issue facing the Member Units is the upcoming SWRCB water rights hearings in the year 2000. It is expected that an Environmental Impact Report (EIR) will be required as part of the California Environmental Quality Agency (CEQA) review process. Which local agency will have responsibility for this effort needs to be determined. Staffing requirements of the chosen agency then need assessment.

In addition, all or parts of the Cachuma Project may be available for acquisition by the Member Units jointly or individually. If title transfer of facilities is to be pursued, current JPAs or the creation of new JPAs should be assessed for their effectiveness in aiding such a transfer.

District Options

1. Due to recent agreements on water rights issues between the South Coast Member Units and SYRWCD-ID#1, the District has the option to promote the combining of COMB and CCRB into a single JPA. Merger could most likely only happen after the SWRCB water rights hearings in the year 2000. In this scenario COMB would take over all responsibilities of CCRB. SYRWCD-ID#1 would be protected in water rights issues because the COMB JPA agreement requires unanimity on water rights issues (and all capital costs greater than $1 million). The COMB general manager would be responsible for executing all joint responsibilities including the SWRCB water rights hearings and ESA consultation, subject to direction and approval by the COMB Board. CCRB could be merged with COMB to increase the efficiency and effectiveness of the two JPAs. For example, the shifting of projects between the agencies, together with the associated staffing continuity problems, could be avoided.

2. The District plans to take part in the decision of determining which JPA is to be responsible for the management of the EIR which will most likely be required for the SWRCB water rights hearings. Representation for the hearings could then be coordinated. Staffing requirements could also be determined.

3. The District plans to assess which current JPA, if any, might be useful in the transfer of Cachuma Project facilities to the District. Facilities may be transferable to the Member Units through an existing JPA, such as COMB. On the other hand, creation of a new JPA may be necessary.

4. The District has the option to take part in the assessment of whether the existing JPAs are still viable and necessary. Many of the existing JPAs no longer serve their original purpose; oftentimes their functions have been drastically reduced. As such, it may be desirable for the District and other members to consider disbanding particular JPAs or merging them with other JPAs. This has the potential to increase the efficiency and cost-effectiveness of the JPAs.

5. The District has the option to try to increase its influence in its agreement with the City of Santa Barbara regarding the operation of the Cater Treatment Plant. Though the City is required to confer with the District regarding the plant's operation, the City is not required to follow the District's recommendations. Increased influence could be desirable for the District because of the upcoming improvements the plant may undergo in order to address the THM issue. If the District had greater influence, it could help ensure that whichever improvements were chosen for the Cater Treatment Plant would be compatible with the District's disinfection methods.

Financial Assessment

1. The merging of COMB and CCRB could increase their efficiencies, potentially reducing the payments the District makes to the JPAs for their operation.

2. Once a JPA is chosen for management of the pending EIR, staff levels of the JPA will need to be increased. Costs for the EIR and new staff members salaries will be divided amongst the member agencies of the JPA.

3. Assessment of JPAs required for title transfer of Cachuma Project facilities could be included in a feasibility study, which would be required to determine the costs and methods of financing of a title transfer. Such a feasibility study is expected to cost approximately $5,000.

4. The merging or disbanding of JPAs could potentially reduce the payments the District must make to JPAs.

5. Increased input with the Cater Treatment Plant could save the District through more efficient communication and potential reduced costs in addressing the THM issue.

4.4. GROWTH OF DISTRICT

It is desirable for the District to remain receptive to potential areas of growth. These areas may help the District increase revenues and decrease costs. Two possible areas are (1) evolving into an electricity retailer and (2) creation of a new JPA with other Carpinteria Valley agencies.

4.4.1. Evolve into an Electricity Retailer

The District has the potential to increase its revenues by evolving into an electricity retailer. Meters are now available which can measure and read both water and electricity use. By the year 2002, homeowners may be required to install new meters as part of new deregulation requirements. The District could encourage the installation of meters with both water and electricity capability. Through the installation and implementation of these meters, the District could begin reading meters and billing customers for their electricity use.

Current Conditions

The District currently does not have the capability to become an electricity retailer. The meters installed within the District cannot be read for electricity use. This would require the purchase and installation of new or retrofitted meters.

District Options

The District plans to assess its option to evolve into an electricity retailer. A management plan could be created which would identify the steps necessary for the District to evolve into an electricity retailer. Once the necessary steps were identified, the District could undertake a feasibility study to determine if evolving into an electricity retailer is possible.

Financial Assessment

A feasibility study would be required to study the costs and benefits of the District's evolving into an electricity retailer.

4.4.2. Creation of a Joint Powers Authority with Carpinteria Valley Agencies

By coordinating efforts with other Carpinteria Valley Agencies through the formation of a new JPA, equipment and other needs can be pooled and purchasing power increased. By increasing purchasing power, the JPA members may save on costs by purchasing items such as maintenance equipment in bulk quantities. Overall efficiency of both agencies may also be increased. In the future the two agencies may coordinate on the development of a recycled/reclaimed water system or a Carpinteria Valley Watershed Management Plan. If this occurs, creation of a JPA between the two agencies may be advantageous.

Current Conditions

Agencies in Carpinteria Valley currently do not have any formal agreements such as in a JPA.

District Options

The District has the option to encourage the formation of a JPA with the Carpinteria Sanitary District. Both agencies often use similar equipment; by pooling demand for this equipment, purchasing power for both agencies can be increased and costs reduced. It should be noted, however, that pooling of equipment may result in occasional unavailability of the equipment for District use. The District needs to consider this if entering any equipment pooling agreements. Other goods and services for which demand can be pooled include electricity, telecommunications, and energy efficiency services. The JPA between the District and the Carpinteria Sanitary District could also be used in

the development of a system for reclaimed/recycled water use. Furthermore, a JPA between the two agencies might be appropriate for the management and implementation of a Carpinteria Valley Watershed Management Plan.

Financial Assessment

The formation of a JPA with the Carpinteria Sanitary District could potentially decrease the District's costs for particular goods and services. The costs of a formation of a JPA with the Carpinteria Sanitary District would primarily be associated with time commitments of the District's staff.

4.5. DISASTER PREPAREDNESS

A disaster is defined by the District as an interruption in water service where the health and welfare of the community is threatened. A disaster is considered major when (1) substantial mutual assistance is required (to be received or to be given) or (2) restoration of service to a majority of users is not expected for at least a week.

In the event of a disaster, the District will implement its Disaster Response Plan. The Plan addresses the role each District employee is expected to play in the event of a major disaster within the District's service area. The primary objectives of the Plan are to maintain existing water storage and to ensure the integrity of the distribution system in order to provide District customers and Fire District personnel with an adequate quantity of water.

An issue facing the District regarding disaster preparedness is the District's potential need for emergency supplies to support staff in the event of a disaster.

Current Conditions

The District has formulated a Disaster Response Plan which is divided into three phases. The immediate emergency phase consists of procedures which include check lists that outline activities for the assessment and reporting of facility conditions. This phase also includes the set up of a message center, maintaining water service to emergency services, and keeping of a map of distribution system conditions.

In the sustained emergency phase, activities which set the stage for policy actions are undertaken. These are under the overall direction of the General Manager. Determining assistance requirements, establishing liaison with other agencies, preparing suitable restoration measures, and preparing suitable water allocation measures are included in this phase. Operations under a sustained emergency start after the immediate emergency phase and could continue for several weeks.

The recovery phase consists of previously approved agreements and regulations that may be invoked by the District's Board of Directors. Decisions and implementation of plans for emergency water allocations, restoration priorities, draft ordinances, and draft

emergency announcements may need consideration in this phase. The recovery phase could continue for several months. It continues until a full recovery to normal operations is achieved.

A list of supplies available to the District in the event of a disaster is included in the Disaster Response Plan. If the District could not receive critical supplies (such as chemicals for filtration and chlorination), the District would be able to operate for a period of approximately 30-60 days, based on current stocking procedures. As a member of CCWA, the District also has access to the Water Agency Response Network. This is a network of agencies which agree to provide each other with mutual aid in the event of a disaster. Aid can be in the form of equipment or staff assistance.

In the event of a blackout or other disaster, which rendered the District's main office inoperable, it is possible for the District to move its office operations to the Montecito Water District. District staff could possibly work at the Montecito Water District office in the evening, when the office would be empty. The District and Montecito Water District computer hardware systems are compatible. District staff could use the District's most recent computer back up tape together with the back up tape with the District's software programs, and operate on the Montecito Water District computer system.

District Options

The District is currently assessing the list of supplies available and needed in the event of a disaster. Additional supplies which are needed should be identified. This would include the need for a portable emergency generator large enough to run the District's well pumps and treatment facilities in the event of a blackout. One or two small portable water tanks are also needed. The District has converted a small storage tank into a potable water tank, but may find purchase of another one or two tanks necessary.

Financial Assessment

A portable emergency generator large enough to operate the District's wells and the on site improvements at the well facilities needed to accept the generator are estimated to cost approximately $125,000. A small portable water tank, which can be mounted on the back of a pickup, with a capacity of 425 gallons costs approximately $394. Costs incurred by the District for mounting of the tank on a pickup would primarily be associated with time commitments by District staff. Costs of other supplies needed could be assessed when the supplies are identified.

5.0. FUNDING OPTIONS AND FINANCIAL IMPACT SUMMARY

5.1. BACKGROUND

The District was incorporated on February 13, 1941, and operates under the County Water District Law, Division 12 of the State of California Water Code (the "Act"), for the purposes of furnishing water within the District. The District has operated continuously since February 13, 1941.

The District has broad general powers over the use of water within its boundaries, including the right of eminent domain and the authority to acquire, control, distribute, store, spread, sink, treat, purify, reclaim, process and salvage any water for beneficial use, to provide sewer service, to sell treated or untreated water, to contract with the United States, other political subdivisions, public utilities, and other persons, and, subject to certain constitutional limits, to levy taxes on lands.

Outstanding Indebtedness

The District has incurred an obligation pursuant to a Water Supply Agreement by and between the District and the CCWA to provide for the development, financing, construction, operation and maintenance of certain extensions to the Coastal Aqueduct of the State Water Project. Additional entities have entered into similar Water Supply Agreements with the CCWA. In turn, the CCWA issued Refunding Revenue Bonds in 1996, in the amount of $198,015,000 secured in part by payments required to be made by the District from the District's Water System Revenues pursuant to its Water Supply Agreement (the "State Water Project Bonds"). With scheduled redemptions of the State Water Project Bonds through October 1, 1998, approximately $168,055,000 will remain outstanding. The principal amount of the District's share of outstanding CCWA revenue bond obligations under the Water Supply Agreement is anticipated to be approximately $17,534,048, although such amount could increase in the event that certain CCWA Participants default on payments under their respective Water Supply Agreements. The District's obligation to make payments under the Water Supply Agreement is payable as an operation and maintenance expense prior to District payments under the Joint Participation Agreement described below.

In 1993, the Cachuma Project Authority (CPA) issued Revenue Bonds in the amount of $9,950,000 to refund all of the outstanding principal balance of Montecito Water District's, Summerland Water District's and Carpinteria Valley Water District's 1978 Water Revenue Bonds (Cater Treatment Plant), to refinance each Member Unit's Contract with the State of California Department of Water Resources (DWR), and to advance refund all of the outstanding principal balance of SYWCD-ID#1's 1988 General Obligation Refunding Bonds. The CPA is currently composed of five Members (Summerland was annexed to Montecito in 1995), all of which are public agencies and all but two of which (Santa Barbara and Goleta) have entered into Joint Participation Agreements with the Authority. The purpose of the Joint Participation Agreements is to assist in carrying out the purposes of the Authority with respect to the Projects by

requiring that the Authority provide funds to the Project Members for the financing and/or refinancing, as the case may be, of their Projects, and by requiring that the Project Members pay certain amounts to the Authority. In the case of Carpinteria, all Water System Revenues (net of Operation and Maintenance Expenses) are irrevocably pledged to the payment of costs as provided in the Joint Participation Agreement. Following the July 1, 1998 payment, the principal amount of the CPA Bonds outstanding attributable to Carpinteria is $1,325,000. Under the terms of that agreement the District is required to pay the CPA approximately $210,000 per year through fiscal year 2004-05 and approximately $47,000 per year thereafter with the final payment due on July 1, 2012. Said amounts are payable from District revenues remaining after the payments pursuant to the Water Supply Agreement with CCWA.

Methods of Capital Financing

The District has two funding methods for its capital facilities: **pay-as-you-go** from current revenues or **debt issued in public debt markets**. Historically, the District has used both methods, financing its larger projects with debt and its smaller annual capital replacements on a pay-as-you-go basis. For smaller projects, net revenues were accumulated to required levels to fund projects, or water rates were raised to match project needs on a year-by-year basis.

The District is currently undergoing a major strategic planning effort that will define financial requirements, including reserve requirements and funding sources, in detail for the next ten years. Development of the Strategic Plan is a preliminary phase of this planning effort. As a result, the funding "mix" for capital project requirements is expected to change with the completion of the Strategic Plan. Given the size of the District's prospective project list, it is unlikely in the case of the larger capital program that ratepayers can afford, nor will they support, paying the rates and charges that would be necessary to make up-front cash payments for the total program. Another consideration is one of equity. By financing projects over their useful life, both current and future ratepayers who are receiving the benefits of the project have the opportunity to pay for the project over its useful life. Given the likelihood that at least a part of the capital program will be debt financed, the following section provides an overview of the types of financing options available to the District and related requirements for the issuance of long-term and short-term debt.

5.2. LONG-TERM DEBT FINANCING OPTIONS

General Obligation Bonds

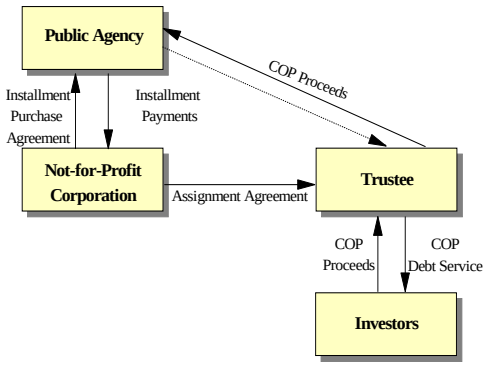
General obligation bonds are backed by the full faith and credit of an issuer and include a pledge to levy unlimited ad valorem property taxes as necessary to pay the principal of, and interest on, the general obligation bonds. Most statutes require voter authorization for a public agency to issue general obligation bonds. Since general obligation bonds are repaid from property taxes paid by property owners, projects which provide direct benefits to users of a utility which are unrelated to the value of property are generally not

financed with general obligation bonds. A further consideration in the case of the District is the type of facility and the essential nature of seeing the project completed. A request just short of an enforcement order from the Department of Health Services to construct water quality related infrastructure compels completion of the facilities. If a general obligation bond issue were not successful at election, the District's obligation to complete the facilities does not change. Consequently, if a general obligation bond election were to fail, the District would then be confronted with using its financing options which do not require an election, and to use such options in the face of a failed election.

Revenue Obligations

Revenue Bonds - Revenue bonds may generally be issued by water agencies to finance capital improvements if approved by voters. The procedures and security provisions vary from agency to agency and are set forth in applicable authorizing statutes. In the case of the District, issuing Revenue Bonds in its own name would require voter approval (see Section 24250 of the California Water Code and Section 8 of the County Water Authority Act which limit the incurring of debt by irrigation districts and county water agencies, respectively). However, Joint Action Agencies may issue Revenue Bonds on behalf of members with security provisions similar to Certificates of Participation.

Revenue Certificates of Participation - Certain forms of transactions fit within exceptions to the statutory debt limit of county water agencies. The most important debt limit exception is for debt secured by special fund revenues. Debt secured from a revenue source other than an agency's general fund, such as from revenues of an enterprise fund, is allowed. Hence, the District can issue debt secured by the revenues of its enterprise.



Since the 1980's, water agencies have turned increasingly to the use of revenue certificates of participation (COPs) to finance capital improvements. Agencies secure revenue certificates of participation with installment purchase agreements. In a typical transaction, the water agency would enter into an installment purchase contract with a not-for-profit corporation (generally governed by the board of the water agency), which in turn assigns the right to receive the installment payments to a trustee. The trustee then executes and delivers the revenue certificates of participation to investors and delivers the purchase price paid by the investors to the water agency for construction of the capital improvement. The chart at right illustrates the mechanics of a revenue COP financing.

Because an issuer's obligation to make payments under the installment purchase contract is irrevocable (i.e., there is a legal obligation to make payments under all circumstances) and since the installment purchase contract generally includes a pledge of revenues, a rate covenant and a limit on the issuance of additional debt, a revenue certificate of participation of a water agency in California is generally rated by the credit rating agencies the same as a revenue bond of such agency. Because of the similar security

provisions, there is little or no interest rate difference between an agency's revenue bonds and its revenue certificates of participation. Interestingly, the COP structure and the JPA structure are very similar, the principal difference being the use of the JPA, or the not-for-profit corporation, as the issuer of the debt.

State Loans - The State of California Department of Health Services operates the State's Drinking Water Revolving Fund Program wherein agencies who secure a high enough priority on the State's "priority list" are offered loans at below market interest rates. The District has submitted a pre-application for placement on the priority list and has been determined to meet the criteria for "Category H - Uncovered distribution reservoirs and low-head lines". See Sections 3.1.1. and 2.2.1. for discussions on the District's uncovered reservoirs and the potential water quality concerns they represent.

Pooled Financings - There are a variety of pooled funding structures which have been used in California. Experience suggests that pool structures have advantages and disadvantages depending on the specific circumstances of the projects to be financed, the credit quality of the project/agency/revenue stream, and the capability and financial sophistication of the staff at the borrowing agency. Further, because of tax law considerations and the greater flexibility that individual financings provide, pooled financings are generally more suited to smaller agencies with relatively small capital requirements.

However, there are instances where larger agencies with common programs (e.g., Southern California Public Power Agency, Central Coast Water Authority, Cachuma Project Authority and the West and Central Basin Finance Authority) have successfully joined together as joint action agencies to pool their borrowings to capture some economies of scale in the transaction costs of issuance for projects of common benefit. Generally speaking, economies of scale disappear quickly with multiple agencies unless the financing is for a shared project or very similar projects. Individual disclosure can be very difficult and cumbersome even for a shared project (for example, CCWA had 23 project participants, individual agency disclosure, multiple water supply agreements and required an Official Statement in excess of 900 pages). Blind pools have less disclosure but have traditionally been viewed as legally suspect and frequently attract Internal Revenue Service attention and other types of regulatory agency review.

Association pools, such as the California Special District Association (CSDA) or the one proposed but not yet executed by ACWA, do not yet have a history to enable a credible evaluation. Few participants who have market access on the basis of their own credit have been willing to serve as "guinea pigs" on the tax law questions or give up the flexibility associated with a stand alone financing. Anecdotal evidence on the ABAG Bond Pool executed in May, 1998 suggests substantially higher issuance costs were incurred for the pool than would have been expected with economies of scale. In addition, the interest rates appear to be higher than the District should expect in a similar market for a District only financing. However, over time such pools may overcome the high costs and legal infirmities associated with previous pools and may ultimately become a source of capital for larger agencies which is cost competitive with stand alone

financings. Until that history is clearly demonstrated, such pools are likely to continue to be tailored to smaller agencies or projects which otherwise may have limited market access.

Some of the key issues the District should consider regarding participating in a "blind pool" include an evaluation of a number of state and federal legal issues such as whether the costs of issuance and underwriting are properly accounted for and paid for directly by pool participants (versus such costs being folded into the cost of credit or liquidity support facilities which is in violation of Internal Revenue Service regulations) and whether a default by any other, unrelated participant can create cost and disclosure obligations, and potential market access problems, for the District on its other, stand alone financings. Certainly, pool financings are more likely to receive IRS and other regulatory agency review than stand alone financings with the consequent requirements of staff and legal time to prepare and respond to inquiries. Another issue is how the finance team for the pool is selected and compensated and what the pool's finance team is capable of in terms of structuring and executing the financing. In particular, can the pool financing be executed with the level of flexibility and all-in costs comparable to a financing executed by a team selected by the District and specifically tailored to the District's needs?

In our judgement, the District has clearly demonstrated that it has no market access problems, that it has staff with the requisite sophistication and expertise to tailor numerous elements of flexibility into its stand alone capital financing program, and that it is likely to benefit from lower credit support costs (e.g., bond insurance fees) and lower interest rates than any "blind pool" or "identifiable agency" pool can offer. Until larger, higher credit quality agency participation dominates the pools to "blend-up" the credit, it is highly unlikely that a pool financing for its contemplated capital program will offer any particular benefit for the District. An exception is noted should a shared or common facility require a neighboring agency to finance its participation (e.g., Montecito).

Water Availability Charge (Standby Charge)

Under the California Water Code, a Water Availability Charge can be levied by the District upon its customers to be collected as a property tax by the County. The charge is an annual fee based upon acreage or parcels of land. It pays the cost of making water available for fighting fires, and for other emergencies, as well as enhancing the value of all parcels by making municipal water service available to them. To determine the amount of the Water Availability Charge, the District would need to conduct a study determining the average benefit an acre receives from the District's water service. The Montecito Water District currently has a Water Availability Charge of $30 per acre per year. To levy a Water Availability Charge, the District would need to receive a positive vote from the majority of the voters.

5.3. SHORT-TERM DEBT FINANCING OPTIONS

Variable Rate Demand Obligations - While considered by the municipal market to be short-term debt, variable rate demand obligations (VRDO's) are long-term securities with maturities similar to those of long-term fixed rate securities. VRDO's bear interest at a variable rate that is adjusted at agreed upon intervals, typically daily or weekly. In order to satisfy certain regulatory requirements applicable to most investors in the VRDO market, VRDO's include a provision that permits an owner of the VRDO to "put" the VRDO back to the issuer on interest reset dates (e.g., daily or weekly). This "put" right is typically supported by a bank letter of credit, wherein the bank provides liquidity to purchase the VRDO's in the event where the securities cannot be remarketed. As a result of the combination of short-term interest rate period and the "put" right, the municipal market perceives these debt obligations to be short-term obligations.

Historically, VRDO interest costs have been significantly lower than fixed rate obligations of the same issuer, reflecting the short-term nature of the instrument from the investors' perspective. However, a VRDO issuer incurs interest rate risk in two forms. First, VRDO rates could increase above the level projected by the issuer for budgeting and planning purposes, resulting in cash flow and financial projection concerns. Second, in the event that the issuer desired to convert the VRDO's to a fixed rate, the fixed rate at the time of conversion could be higher than fixed rates at the time the VRDO's were initially issued.

Bank Loans – Banks can often offer loans at lower rates than bond rates over the short-term. However, banks typically loan money at variable loan interest rates, which could rise or fall. Interest rates have been dramatically higher within the last 20 years, and could rise again in future years. This represents an uncertainty the District would prefer to avoid in its fiscal planning. The advantage of a bank loan is that it may have a shorter term than a bond, which could lead to lower total interest payments if rates were to remain the same. It should be noted, however, that if a shorter payment period is desired with a bond, the bond can also be paid off early without penalty after 12 years.

Limitations on Amount of Variable Rate Debt - Because of the various risks involved with maintaining variable rate debt (see *"Risks Associated with Variable Rate Debt,"* herein), there exists a rule of thumb of the rating agencies that an issuer's program not have more than 15 to 25 percent of its total outstanding debt in the form of unhedged variable rate debt (which includes VRDO's). However, many issuers have unduly limited their variable rate debt exposure by application of this rule-of-thumb without regard to the natural hedge to interest rate volatility provided by short-term investments. To the extent that the amount of variable rate debt matches an issuer's short-term investments, changes in investment returns will be matched by changes in the short-term cost of debt. Actively managing variable rate debt to correspond to the amount of an agency's short-term investments will reduce net interest volatility, and the net interest earnings and costs become more predictable. This in turn reduces the perceived risk of an issuer to investors because the reliability of future cash flows available for debt service is improved.

Lease Purchase Financing – Lease Purchase Financing is typically used when other funding is not available. This mechanism is typically utilized for funds of less than $1 million. It is available through an ACWA sponsored program. Lease Purchase Financing is generally associated with higher interest rates, insurance costs, and incurred property taxes.

5.4. LONG-TERM VS. SHORT-TERM DEBT

Short-term financings (i.e., bond anticipation notes, revenue anticipation notes, commercial paper or other variable rate debt obligations) for the District's capital program could include interim financing which would ultimately be refinanced by long-term financings. The permanent source of funding could be grants or loans from the United States Bureau of Reclamation, the State of California Department of Health Services or Department of Water Resources or other sources.

The District may also determine to issue short-term debt and delay the issuance of long-term debt because the final amount necessary to borrow cannot be determined (because final construction costs or the availability of grant money is unknown) or because use of variable rate debt can reduce the overall cost of the capital program.

The principal advantage of variable rate debt is the opportunity for a lower interest cost. There are, however, other advantages as well. For example, issuance costs for variable rate debt frequently are significantly lower than for a long-term fixed rate financing as a result of lower underwriting costs and fewer securities laws and other regulatory requirements.

Risks Associated with Variable Rate Debt

The advantages of short-term debt carry with them certain risks. While these risks can be managed, such risks should be understood prior to selecting a final financing plan.

Interest Rate Risk - The principal disadvantage of variable rate debt is that interest rates may rise. Because future interest rates are unknown, the costs of capital improvements financed with variable rate debt are more difficult to estimate for revenue planning purposes. Significant interest rate increases could cause financial stress. Again, the rule-of-thumb is that an issuer not have more than 15-25% of its overall debt in an "unhedged" (i.e., the amount which is greater than District reserves) variable rate mode.

Market Risk - For a variety of reasons, including disruption of capital markets or legal or regulatory issues relating to the outstanding debt of the issuer, holders of short-term debt may exercise their option to tender their bonds, resulting in higher interest costs on remarketing, retirement of the debt or the payment of interest at a higher than projected rate. Any variable rate debt issued for the District's capital program should be structured to minimize such market risk.

Letter of Credit Renewal Risk - Variable rate debt normally requires a letter of credit or a third party guaranty to make it marketable. Under current market conditions, credit enhancement or liquidity facilities generally cannot be obtained for more than 5 to 7 years. As a result, an issuer runs the risk of not being able to obtain an extension or renewal of the expiring credit facility. In such an event, the issuer would be forced to retire the debt or convert it to fixed rate debt in a market environment which could be undesirable.

5.5. REVIEW OF HISTORIC AND PROJECTED OPERATING RESULTS

The following section describes the District's outstanding debt covenants, as well as certain revenue covenants and restrictions on the issuance of additional debt contained in the outstanding bond documents

Outstanding Debt Covenants

Rate Covenants and Additional Debt Tests - The District has entered into certain rate covenants and additional debt tests with respect to the CCWA Water Supply Agreement and the CPA Joint Participation Agreement. The **rate covenants** establish the CCWA Water Supply Agreement payments as senior to the District's other outstanding obligations and generally provide that the District will prescribe, assess and collect rates and charges which will be at least sufficient to yield net revenues (revenues after payment of the District's other operation and maintenance expenses) in each fiscal year equal to 125% of the Water Supply Agreement payments for such fiscal year. Additionally, the CPA Joint Participation Agreement generally provides that the District will collect net revenues (after payment of operation and maintenance expenses including CCWA payments) at least sufficient in each fiscal year equal to 125% of the CPA and any other parity obligation payment. The District historically has shown coverage significantly higher than required by these rate covenants and has prepaid expenses to CCWA from accumulated reserves to maintain its rates at more moderate levels.

The District has also entered into **additional debt tests** with respect to the Water Supply Agreement and the Joint Participation Agreement. The additional debt tests generally require a certification that the District is not in default under the terms of either agreement and that net revenues for the most recent audited Fiscal Year preceding the date of the execution of such additional obligation, including adjustments to give effect as of the first day of such Fiscal Year to increases or decreases in rates and charges for the water service approved and in effect as of the date of calculation, shall have produced a sum equal to at least one hundred percent (100%) of the sum of operation and maintenance costs and 125% of Debt Service for such fiscal year, (ii) one hundred twenty five percent (125%) of the Debt Service on Contracts executed or Bonds issued since the end of such Fiscal Year, (iii) maximum annual obligation service which would have accrued on any obligation executed since the end of such Fiscal Year, and (iv) maximum annual obligation service on such obligation. Simply stated, to issue debt on parity with its Joint Participation Agreement the District must show that it has rates and charges in place to meet its rate covenant of 125% on the existing as well as future obligations. This

limitation is not applicable if the District issues its new obligations on a subordinate basis. The following table provides an overview of the District's historic operating results for the past five fiscal years.

Table 5.1.
Historic Operating Results - Fiscal Years 1993-94 Through 1997-98

		1994	1995	1996	1997	1998
Revenue	Muni. & Ind. Water Sales	$1,423,410	$1,542,897	$1,912,628	$1,977,638	$1,908,457
	Agricultural Water Sales	1,159,694	1,101,000	1,183,633	1,268,370	1,077,984
	Water Service Charge	560,227	707,143	859,060	1,742,056	2,036,568
	Fire Protection & Serv. Revenue	56,836	60,546	72,294	141,474	168,268
	Capital Costs Rec. Fee	18,440	26,005	96,385	40,515	104,184
	Interest Revenue	97,028	196,058	230,968	277,003	250,693
	Other Income	8,186	32,211	83,936	50,247	145,533
	Overhead Charges	19,939	26,172	24,920	20,753	25,612
Total Revenue		**$3,343,760**	**$3,699,032**	**$4,464,274**	**$5,518,056**	**$5,717,569**
Expenses	Cost of Water	$80,941	$80,364	$194,759	$247,707	$334,779
	Pumping Expense	235,522	216,678	250,255	294,187	149,477
	Treatment Expense	496,818	425,013	416,165	456,188	443,110
	Trans. & Dist. Expense	339,778	380,426	409,808	402,988	461,048
	Customer Accounts	47,239	48,128	48,829	60,039	68,050
	General and Admin.	599,606	674,397	832,817	952,251	786,843
	Prior Debt Serv.	119,148	0	0	0	0
Total Expenses		**$1,919,052**	**$1,825,006**	**$2,152,633**	**$2,413,360**	**$2,243,307**
Net Revenues		**$1,424,708**	**$1,874,026**	**$2,311,641**	**$3,104,696**	**$3,474,262**
Rate Coverage Fund		**0**	**0**	**0**	**0**	**$750,000**
Total Available		**0**	**0**	**0**	**0**	**$4,224,262**
State Water Payments		**$191,233**	**$316,275**	**$683,621**	**$1,673,411**	**$2,321,529**
Coverage		**7.45**	**5.93**	**3.38**	**1.86**	**1.82**
Additional Debt Service		**$124,704**	**$105,782**	**$206,384**	**$206,659**	**$206,479**
Balance Available for Capital Projects or Other Purposes		**$1,108,771**	**$1,451,969**	**$1,421,636**	**$1,224,626**	**$946,254**

5.6. FINANCIAL IMPACT SUMMARY AND SCHEDULE

To assist in preparation of the capital facilities plan this section is prepared to create an envelope around a minimum and maximum sized program. Various assumptions are made for simplicity and may or may not reflect decisions which the District ultimately adopts. Readers are cautioned that this section is for planning purposes only and is not intended to present a particular forecast or summary of how the District may implement its capital improvement plan.

Estimated costs for the implementation of improvements and programs identified in the Water Supply and Quality Section (2.0) of the Strategic and Capital Facilities Plan are summarized in the table below.

Table 5.2.
Financial Impact Summary (Water Supply and Quality Section)

Category	Strategic Plan Section	Project	Financial Impact ($)	
			Capital Costs	O & M Costs
Cachuma Water Supply	2.1.1.1.	Impact of SWRCB Hearings	TBD	NA
	2.1.1.2.	Fisheries Management Plan Implementation	TBD	NA
	2.1.1.3.	Implementation of Extreme Conservation Measures in Event of Drought	TBD	NA
State Water Supply	2.1.2.1.	CALFED Bay-Delta Accord	TBD	NA
	2.1.2.2.	Marketing of State Water	TBD	NA
Ground Water Supply (see also Wells Category)	2.1.3.2.	Meters on 100 Private Wells	200,000	TBD
	2.1.3.3.	Carpinteria Valley Watershed Management Plan	TBD	NA
	2.1.3.4.	Groundwater Basin Recharge Feasibility Study	10,000	NA
Land Annexation	2.1.5.	Annexation of Additional Land	TBD	NA
Water Conservation	2.1.6.2.	Recycled/Reclaimed Water Feasibility Study	10,000	NA
Water Quality –Addressing THM Issue	2.2.1.1.	Flush Distribution System	1,000	NA
	2.2.1.1.	Reservoir Alternatives	*	*
	2.2.1.1.	Blending Cachuma Water with Groundwater	TBD	NA
	2.2.1.1.	Chloramines Feasibility Study	10,000	NA
	2.2.1.1.	Ozone Feasibility Study	10,000	NA
Water Quality	2.2.1.3.	Reservoir Alternatives for Coliform Bacteria and Other Pathogens	*	*
	2.2.2.1.	Development of Data Collection and Groundwater Monitoring Program	6,000	TBD
Estimated Total Costs			**247,000**	**TBD**

* see Table 5.3 Reservoir Alternatives Section
NA = Not Applicable
TBD = Financial Impact is To Be Determined

Estimated costs for the implementation of improvements and programs identified in the Capital Facilities Section (3.0) of the Strategic and Capital Facilities Plan are summarized in the table below.

Table 5.3.
Financial Impact Summary (Capital Facilities Section)

Category	Strategic Plan Section	Project	Financial Impact ($)	
			Capital Costs	O & M Costs
Reservoir Alternatives (Carpinteria and Ortega)	3.1.1.	Metal Roofs	2.8 – 3.8 Million	TBD
	3.1.1.	Additional Treatment Facilities	13.1 Million	TBD
	3.1.1.	Replacement Tanks	8 Million	TBD
	3.1.1.	Reduced Pressure Storage with Metal Roofs	6.3 – 7.3 Million	TBD
	3.1.1.	Ortega Res. Inlet/Outlet Reconfiguration	125,000	TBD
Chlorine Use Alternatives	3.1.4.	Shut-Off Valves	75,000	NA
	3.1.4.	MIOX	750,000	1,410/week
	3.1.4.	Gas with Scrubbers	558,500	780/week
	3.1.4.	Sodium Hypochlorite	375,000	2,015/week
	3.1.4.	Onsite Hypochlorite Generation	692,200	1,333/week
Misc.	3.1.5.	Meter on South Coast Conduit	17,000-19,000*	NA
	3.1.5.	South Coast Conduit Peaking Capacity Study	TBD	NA
	3.1.7.	Concha Loma Mains Relocation	100,000	NA
	3.1.7.	Lateral 15L Loop	100,000	NA
	3.1.8.	Valve Evaluation and Preventive Maintenance	TBD	TBD
	3.1.6.	Booster Pump Replacement	5,500 – 28,400	TBD
	3.1.9.	Bradbury Dam Retrofit	531,300– 684,750	NA
	3.1.10.	USBR Facilities Title Change Feasibility Study	5,000	NA
Wells	3.2.1.	Time of Use Rates for Wells	TBD	NA
	3.2.1.	Well Electricity Supplied by New Energy Ventures	TBD	NA
	3.2.2.	Efficiency Tests Schedule (4 Wells)	NA	1,300 Biannually
	3.2.3.	Well Monitoring Schedule (4 Wells)	NA	880/year
	3.2.4.	Wellhead Protection Program	NA	2600-3000
	3.2.5.	Santa Ynez Well Development	375,000-1,000,000	TBD
	3.3.1.	SCADA	36,100– 38,700	NA
Estimated Total Costs			**4.1 Million-15.8 Million**	**TBD**

NA = Not Applicable
TBD = Financial Impact is To Be Determined
* To be paid by COMB as part of its operating budget

Estimated costs for the implementation of improvements and programs identified in the Operations Section (4.0) of the Strategic and Capital Facilities Plan are summarized in the table below.

Table 5.4.
Financial Impact Summary (Operations Section)

Category	Strategic Plan Section	Project	Financial Impact ($)	
			Capital Costs	O & M Costs
Billing	4.1.1.	Credit Card Billing	500	150/month + 5% of all transactions
	4.1.1.	Internet Billing	TBD	TBD
Records Storage	4.1.2.	CD-Rom System	30,000-120,000	TBD
	4.1.2.	Microfilm/Microfiche System	5,000	TBD
Data Management	4.1.3.	Computerized Customer Orders	1,500-3,500	NA
	4.1.3.	Geographic Information System	18,000+	NA
	4.1.3.	Engineering Data Computerized	1,500-3,500/dataset	NA
	4.1.4.	Data Exchange with Sanitary District	TBD	NA
	4.1.5.	Network Server	50,000	NA
Meter Reading	4.1.6.	Touch Read	359,800-403,100	TBD
	4.1.6.	Radio Read	400,400-442,400	TBD
	4.1.6.	Phone Read	TBD	TBD
	4.1.6.	Contract Out Meter Reading	NA	2815/month
Public Involvement	4.2.1.	Web Site	1,000-5,000	15-25/month
	4.2.1.	E-mail	NA	10/month
	4.2.3.	Water Issues Focus Group	NA	TBD
	4.2.3.	Drought Tolerant Landscape	40,000-60,000	TBD
JPA Issues	4.3.1.	Merge COMB and CCRB	TBD	TBD
	4.3.1.	Determine JPA to Address SWRCB Hearings	TBD	TBD
	4.3.1.	Determine JPA for USBR Ownership Transfer	TBD	TBD
	4.3.1.	Disbanding or Merging of JPAs	TBD	TBD
	4.3.1.	Increase Input with Cater Treatment Plant	TBD	TBD
Growth of District	4.4.1.	Evolve into Electricity Retailer	TBD	TBD
	4.4.2.	JPA with Carpinteria Valley Agencies	TBD	TBD
Disaster Preparedness	4.5.	Emergency Generator for Wells	125,000	NA
	4.5.	Portable Water Tank	400	TBD
Estimated Total Costs			**602,700-828,300**	**TBD**

NA = Not Applicable
TBD = Financial Impact is To Be Determined

Total estimated costs for the implementation of improvements and programs identified in the Strategic and Capital Facilities Plan are summarized in the table below.

Table 5.5.
Financial Impact Summary (All Sections)

Section	Financial Impact ($)	
	Capital Costs	O & M Costs
2.0. Water Supply and Quality	247,000	TBD
3.0. Capital Facilities	4.1 Million – 15.8 Million	TBD
4.0. Operations	602,700-828,300	TBD
Estimated Total Costs	**4.9 Million – 16.9 Million**	**TBD**

At this early stage in the planning process, the following level of capital borrowing is assumed to present a gross approximation of potential debt service. This is based on a rough capital project spending schedule that has been identified by the District (see Table 5.6). The schedule identifies capital projects the District plans to implement over the next five years. This schedule is preliminary and subject to change.

Table 5.6.
Capital Project Spending Schedule

Fiscal Year	Project	Cost ($)	Estimated Rate Increase
1998-1999	Portable Generator for Wells Ortega Reservoir Pipeline Reconfiguration	125,000 62,500	No increase
1999-2000	Lateral 15L Loop Chlorination Shut-Off Valves Concha Loma Main Replacement	50,000 75,000 100,000	1-2%
2000-2001	A. Ortega Reservoir Cover Design and possible B. Storage Tank Land Purchase, CEQA, Design B. 2.5 MG Storage Tank Construction	100,000 555,000 1,400,000	2-3%
2001-2002	Ortega Reservoir Cover	1,700,000	3-4%
2002-2003	A. Carpinteria Reservoir Cover Design Or B. Storage Tank Land Purchase, CEQA, Design B. Santa Ynez Well Development	200,000 555,000 1,000,000	1-2% 3-4%
2003-2004	A. Carpinteria Reservoir Cover Or B. 2.5 MG Storage Tank Construction B. 24" Pipeline and Intertie for Storage Tank	2,000,000 1,400,000 1,400,000	3-4% 3-4%
2004-2005	A. Santa Ynez Well Development Or B. Carpinteria Reservoir Cover	1,000,000 2,000,000	3-4% 3-4%
Total		**8,767,500**	**13-21%**

The $9 million construction fund issues accounts for earnings on the construction fund during construction and is assumed as a 30 year financing at a fixed rate of approximately 5.0%.

The issue is assumed to be sized as follows:

Table 5.7.
$9.0 Million Program Construction Fund

$9.0 Million Program	
Sources of Funds:	
Par Amount of Issue	8,955,000
Uses of Funds:	
Construction Fund	8,082,296
Debt Service Reserve Fund	596,431
Bond Insurance	52,358
Costs of Issuance	115,000
Underwriter's Discount	107,460
Cash at Closing	1,456
Total Uses	8,955,000
Debt Service:	
Principal	8,955,000
Interest	8,497,524
Debt Service	17,452,524
Net Debt Service	15,978,615
PV of Net Debt Service	8,304,756
Arbitrage Yield	4.89592
Construction Earning Rate	4.89592
True Interest Cost	4.99803
Average Life	19.45

The following tables present projected operating results for the next five fiscal years for two operating scenarios for the District. The first table is for the scenario under which the District would not implement a major capital improvement program and would not increase rates. This has been called the "Do Nothing" scenario and is shown in Table 5.8. The second scenario is for the $9.0 million capital program, shown in Table 5.9. All numbers should be considered preliminary and subject to change.

Table 5.8.
Projected Operating Results – "Do Nothing" Capital Program

		1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005
Revenue	Muni. & Ind. Water Sales	1,953,676	1,995,276	2,036,876	2,078,476	2,120,076	2,161,676
	Agricultural Water Sales	1,167,400	1,167,400	1,167,400	1,167,400	1,167,400	1,167,400
	Water Service Charge	2,047,639	2,062,639	2,077,639	2,092,639	2,107,639	2,122,639
	Fire Protection & Serv. Revenue	171,000	173,000	175,000	177,000	177,000	177,000
	Capital Costs Rec. Fee	102,500	102,500	102,500	102,500	102,500	102,500
	Interest Revenue	268,000	253,000	238,000	223,000	208,000	200,000
	Other Income	50,000	50,000	50,000	50,000	50,000	50,000
	Overhead Charges	20,000	20,000	20,000	20,000	20,000	20,000
Total Revenue		**5,780,215**	**5,823,815**	**5,867,415**	**5,911,015**	**5,952,615**	**6,001,215**
Expenses	Cost of Water	341,850	341,850	341,850	341,850	341,850	341,850
	Pumping Expense	189,000	198,450	208,373	218,792	229,732	241,219
	Treatment Expense	562,708	590,843	620,385	651,404	683,974	718,173
	Trans. & Dist. Expense	575,400	604,170	634,379	666,098	699,403	734,373
	Customer Accounts	82,950	87,098	91,453	96,026	100,827	105,868
	General and Admin.	1,115,201	1,170,961	1,229,509	1,290,984	1,355,533	1,423,310
Total Expenses		**2,867,109**	**2,993,372**	**3,125,949**	**3,265,154**	**3,411,319**	**3,564,793**
Net Revenues		**2,913,106**	**2,830,443**	**2,741,466**	**2,645,861**	**2,541,296**	**2,436,422**
Rate Coverage Fund		**750,000**	**750,000**	**750,000**	**750,000**	**750,000**	**750,000**
Total Available for Debt Service		**3,663,106**	**3,580,443**	**3,491,466**	**3,395,861**	**3,291,296**	**3,186,422**
State Water Payments		**2,514,150**	**2,443,283**	**2,371,108**	**2,271,098**	**2,321,098**	**2,611,067**
Additional Debt Service		**201,674**	**207,794**	**205,534**	**207,659**	**207,659**	**207,659**
Coverage		**1.35**	**1.35**	**1.36**	**1.37**	**1.30**	**1.13**
Balance Available for Capital Projects or Other Purposes		**197,282**	**179,366**	**164,824**	**167,104**	**12,539**	**(382,304)**

Table 5.9.
Projected Operating Results - $9.0 Million Capital Program

		1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005
Revenue	Muni. & Ind. Water Sales	1,953,676	1,995,276	2,036,876	2,078,476	2,120,076	2,161,676
	Agricultural Water Sales	1,167,400	1,167,400	1,167,400	1,167,400	1,167,400	1,167,400
	Water Service Charge	2,047,639	2,062,639	2,077,639	2,092,639	2,107,639	2,122,639
	Fire Protection & Serv. Revenue	171,000	173,000	175,000	177,000	177,000	177,000
	Capital Costs Rec. Fee	102,500	102,500	102,500	102,500	102,500	102,500
	Interest Revenue	268,000	253,000	238,000	223,000	208,000	200,000
	Other Income	50,000	50,000	50,000	50,000	50,000	50,000
	Overhead Charges	20,000	20,000	20,000	20,000	20,000	20,000
Total Revenue		**5,780,215**	**5,823,815**	**5,867,415**	**5,911,015**	**5,952,615**	**6,001,215**
Additional Revenue Required – Rate Increase		**98,110**	**166,170**	**403,816**	**536,182**	**832,675**	**1,246,441**
TOTAL		**5,878,325**	**5,989,985**	**6,271,231**	**6,447,197**	**6,785,290**	**7,247,656**
Expenses	Cost of Water	341,850	341,850	341,850	341,850	341,850	341,850
	Pumping Expense	189,000	198,450	208,373	218,792	229,732	241,219
	Treatment Expense	562,708	590,843	620,385	651,404	683,974	718,173
	Trans. & Dist. Expense	575,400	604,170	634,379	666,098	699,403	734,373
	Customer Accounts	82,950	87,098	91,453	96,026	100,827	105,868
	General and Admin.	1,115,201	1,170,961	1,229,509	1,290,984	1,355,533	1,423,310
	State Water Payments	2,514,150	2,243,283	2,321,108	2,321,098	2,411,066	2,721,099
Total Expenses		**5,381,259**	**5,236,655**	**5,447,057**	**5,586,252**	**5,822,385**	**6,285,892**
Net Revenues		**497,066**	**753,330**	**824,174**	**860,945**	**962,905**	**961,764**
Total Debt Service		**397,653**	**602,664**	**659,339**	**688,756**	**770,324**	**769,411**
Coverage		**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Balance Available for Capital Projects or Other Purposes		**99,413**	**150,666**	**164,835**	**172,189**	**182,581**	**192,353**

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