

SANTA CLARA VALLEY WATER DISTRICT



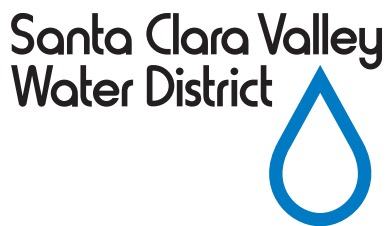
Water Use Efficiency Program
ANNUAL REPORT

FISCAL YEAR 2004-2005



Santa Clara Valley
Water District





Our Mission

The mission of the District is a healthy, safe, and enhanced quality of living in Santa Clara County through watershed stewardship and comprehensive management of water resources in a practical, cost-effective, and environmentally sensitive manner.

A scenic photograph of a river flowing through a lush, green landscape. The river is in the foreground, surrounded by tall grasses and reeds. In the middle ground, there are several large, mature trees with dense foliage. A person in a white shirt is standing on the bank near the water. The background shows a clear sky and more trees in the distance.

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www.valleywater.org

About the Santa Clara Valley Water District



The Santa Clara Valley Water District is the primary water resources agency for Santa Clara County, California. It acts not only as the county's water wholesaler, but also as its flood protection agency and is the steward for its streams and creeks, underground aquifers and District-built reservoirs.

As the county's water wholesaler, the Water District ensures there is enough clean, safe water for homes, businesses and agriculture. As the agency responsible for local flood protection, the Water District works diligently to protect Santa Clara Valley residents and businesses from the devastating effects of flooding.

Our stream stewardship responsibilities include creek restoration and wildlife habitat projects, pollution prevention efforts and a commitment to natural flood protection.

Santa Clara Valley Water District Board of Directors

Rosemary Kamei District 1

Joe Judge District 2

Richard P. Santos District 3

Larry Wilson District 4

Gregory A. Zlotnick District 5

Tony Estremera At Large

Sig Sanchez At Large



Front row, seated (from left to right): Sig Sanchez, Rosemary Kamei, Gregory Zlotnick

Back row, standing (from left to right): Joe Judge, Tony Estremera, Larry Wilson, Richard Santos

From the Office of the CEO



This year the District has been focusing on the “value of water” — looking at the true value of water and the far reaching impacts of water use. This is especially significant for the Water Use Efficiency Program, which strives to educate the public about using this most valuable of resources wisely and efficiently. This is not an easy task, particularly in years of above-average rainfall, as we’ve seen this year. However, when you examine the true value of water — and how it relates to energy — it quickly becomes clear that using water efficiently is essential year ‘round, regardless of reservoir and underground aquifer levels. Water Use Efficiency at the District refers to actions and activities that lead to sustainable or renewable uses of water, and includes water conservation, water recycling and desalination.

With this in mind, the Water Use Efficiency (WUE) Unit continued moving forward with its innovative water conservation program and helped to expand countywide recycled water use, reducing current water use by an estimated 46,000 acre-feet of water in FY 04-05. This is a notable achievement, not only because it eases the demand on water supply, but also because of a reduction in energy demand and benefits to air quality. In 2005, the WUE Unit analyzed the impacts of water conservation and recycling programs and estimated the energy savings from these programs to be more than 196 million kWh for FY 04-05 alone; cumulative energy savings are estimated to be more than 1.3 billion kWh from FY 92 - FY 05, the time span during which these programs have been operational. For FY 04-05, emissions of over 89 million kg of carbon dioxide were avoided due to the District’s water conservation and water recycling programs. For FY 91-92 through FY 04-05, the emissions of over 1.2 billion kg of carbon dioxide were avoided due to the District’s water conservation and water recycling programs.

The District’s long-term water supply planning combines integrated water resources planning with watershed stewardship. The District’s 2005 Urban Water Management Plan concludes that the District cannot meet demands through 2030 without maximizing opportunities for water conservation. Demand with conservation programs in place in 2030 is projected to be approximately 450,000 acre-feet. Using 1992 as a baseline, the county will be permanently conserving an estimated 100,000 acre-feet per year by the year 2030. In sum, water conservation will help to meet nearly 20% of the community’s water demand, making it a key part of the District’s water supply portfolio. The 2005 Urban Water Management Plan also states that recycled water has become an important additional source of supply and its role in offsetting demand for potable water will be more significant in the future. Recycled water projects provide a water supply source that is largely independent of weather patterns. Ensuring that the county’s water supply comes from a variety of sources enables the District to maintain maximum reliability and flexibility in providing for its residents’ water needs.

Understanding the true value of water and using it wisely to meet the needs of this growing community will continue to be a goal of the District in the years ahead.

A handwritten signature in black ink that reads "Stanley M. Williams". The signature is written in a cursive, flowing style.

Stanley M. Williams
Chief Executive Officer, Santa Clara Valley Water District

Contents



- ii About the Santa Clara Valley Water District
- iii From the CEO
- 1 Introduction
- 5 The Energy Savings-Water Savings Link
- 7 Calendar of Events

- 8 Water Conservation
 - 9 Water Conservation in the Home
 - 13 Water Conservation in Business
 - 18 Water Use Efficiency in Agriculture
 - 20 Education and Outreach
 - 23 Publications
 - 24 Grants and Cost-sharing Agreements
 - 26 Studies and Research
 - 27 Future Projects

- 29 Water Recycling and Desalination
 - 32 South Bay Water Recycling Program
 - 37 Palo Alto Recycled Water
 - 38 Sunnyvale Recycled Water
 - 39 South County Recycled Water
 - 41 Bay Area Regional Desalination Project
 - 43 Regional Brackish Water Desalination Project
 - 46 Education and Outreach
 - 46 Grants and Cost-sharing Agreements
 - 47 Studies and Research



The Water Use Efficiency Unit of the Santa Clara Valley Water District.

Water Utility Enterprise

Walt Wadlow Chief Operating Officer

Water Supply Management Division

Keith Whitman Deputy Operating Officer

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Karen Morvay Water Conservation Specialist II

Alice Ringer Program Administrator

Robert Siegfried Assistant Engineer II Agricultural

Toni Vye Senior Office Specialist

Ray Wong Associate Engineer (Civil)

Stanley Zhu Senior Civil Engineer

WATER USE EFFICIENCY: CONSERVATION, RECYCLING & DESALINATION



Summary

The water conservation, recycling and desalination programs in the Santa Clara Valley Water District's (District) Water Use Efficiency Unit (WUE) reduce demand placed on existing water supplies, helping to defer the cost and environmental impact of developing additional supplies. These programs also protect the South Bay salt march habitat by reducing freshwater effluent released from wastewater treatment facilities.

These programs also assist the District in meeting its Board Ends Policy on water reliability, water conservation and water recycling. The District's policies, in conjunction with the District's Integrated Water Resources Plan (IWRP) and 2005 Urban Water Management Plan (UWMP), emphasize the need for its water supply to be reliable to meet future demands, for water recycling to be expanded within Santa Clara County in partnership with the community, and that the District has a variety of water supply sources.

A number of the District's Water Use Efficiency Unit activities and programs have improved the reliability of District supplies and reduced the risk of shortages during drought periods. Important in this list of programs are the District's water conservation program and the recycled water program. Together, conservation and water recycling accounted for 46,000 acre-feet (AF) of water saving per year. With the projected growth in this area, their roles in offsetting demand for potable water will be even more significant in the future.

A new activity, desalination, was included as a program within the WUE Unit at the direction of the District's CEO two years ago. Staff is evaluating the feasibility of desalination (bay/ocean/brackish) as part of both regional and local efforts. The current desalination technology



is very similar to the technology used to lower salts in advanced treatment of recycled water. Recycled water has become an important additional source of supply and perhaps cost-effective desalinated water may be too. Both recycled water and desalinated water will be available supplies when all other conventional supplies are depleted.

Some of the District’s programs—such as storing water locally or outside the county (banking) and establishing agreements to buy or sell water to other agencies (transfers)— help increase District water supplies in years of shortage, as do District programs aimed at maintaining and maximizing local groundwater storage. Recycled water projects provide a water supply source that is largely independent of weather patterns and is considered an all-weather source. A renewed focus on advanced treated recycled water is under consideration for groundwater recharge and increasing stream flows, thereby enhancing the District’s conjunctive water management.

The District maintains that water use efficiency programs, such as water conservation and recycling, be maximized because they are key strategies to minimize overall demand.

This fourth annual report for the Santa Clara Valley Water District’s Water Use Efficiency Unit (WUE) provides an overview of achievements in Fiscal Year 04-05, and a look at current water use efficiency programs, including water conservation, water recycling and desalination. The report also looks at new and future projects and partnerships.

The District maintains that water use efficiency programs, such as water conservation and recycling, be maximized because they are key strategies to minimize overall demand.

The Santa Clara Valley Water District has been, and continues to be, a leader in water use efficiency, with programs that are innovative and comprehensive in scope. In FY 04-05, these water conservation and water recycling programs helped save the District 46,000 acre-feet of water.

This fiscal year was a successful one for developing partnerships. As an example, the Water Softener Replacement Rebate Program, a regional effort between the District, San Benito County Water District (SBCWD), and South County Regional Wastewater Authority (SCRWA), is under way. Furthermore, the District and San Benito County Water District are joint recipients of \$245,000 in Proposition 50 grants to conduct a \$490,000 brackish water feasibility study in the Pajaro River basin.

In addition to the many water conservation programs already in place, several new programs were launched this year, and numerous others were revised and improved. On the residential conservation side, the Residential Clothes Washer Rebate Program was redesigned and improved. This grant-funded regional effort provides residents with either a \$100 or \$150 rebate for a high-efficiency clothes washer (the higher the efficiency of the machine, the higher the rebate).

On the Commercial, Industrial and Institutional (CII) conservation side, the CII Water Use Survey Program, the Commercial High-Efficiency Toilet Installation Program, and the High-Efficiency Medical Equipment Rebate Program were launched this fiscal year.

The GardenSoft CD-ROM software is also a new addition to the water conservation program. This interactive CD-ROM showcases more than 1,000 native, drought-tolerant and water-efficient plants, and features the District's landscape design brochure "Rules of Thumb for Water-Wise Gardening." Through features such as "Garden Tours" and "Garden Gallery," users can view plants in beautiful, well-established gardens and click on them to learn about each plant's water, sun and soil requirements.

The District was honored to be the recipient of several awards this year:

- The District was given the Acterra Business Environmental Award's **Susanne Wilson Award** for pollution prevention and resource conservation in the special projects category for its Water Softener Rebate Program. This pilot program, which began in November 2003 and concluded in September 2004, provided 400 residents with a rebate of \$150 each for the replacement of their old water softener system with a newer, more efficient system.



Pam John, Shicha Chander, Director Larry Wilson and Ray Wong with the Acterra Business Environmental Award.

- The District was selected as one of the finalists for the prestigious 2005 **Clair A. Hill Water Agency Award for Excellence**, sponsored by the Association of California Water Agencies for the Water Softener Rebate Pilot Program. This award recognizes outstanding achievements by public water agencies.



- The District's Water-Efficient Demonstration Garden design received a **Merit Award** in the Analysis, Research Planning and Communication category of the annual awards competition organized by the Northern California Chapter of the American Society of Landscape Architects. This is quite an honor, and reflects recognition by a panel of professional landscape architects, urban designers, University of California professors and an environmental artist of the caliber of the work.

Fiscal Year 04-05 was another successful year for bringing in grant revenue to the District. Grants totaling \$3.48 million were awarded to the District from the State of California Department of Water Resources Proposition 50 grant funding. Grant funding recommendations for the District included:

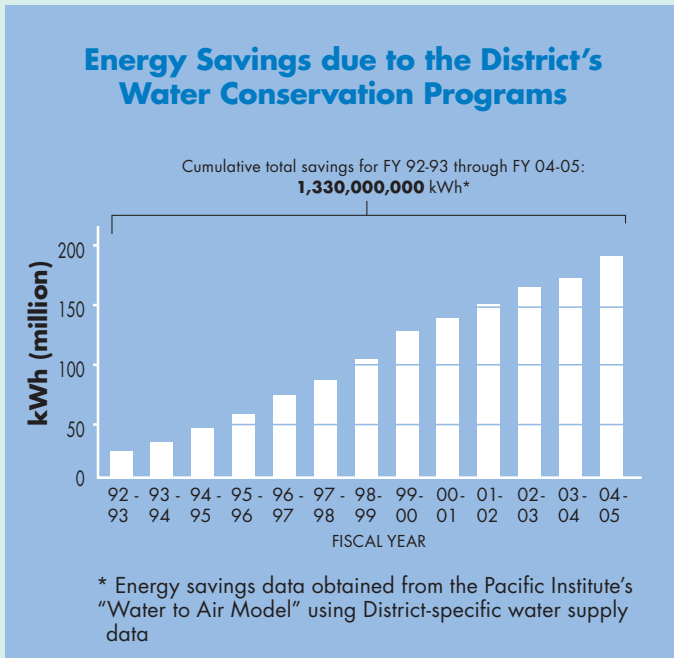
- Chapter 6 (desalination) funding recommendations (includes entire regional share): \$494,756
- Chapter 7 (recycling) funding recommendations (includes entire regional share): \$2.23 Million
- Chapter 7 (water use efficiency) funding recommendations (District funding amount only): \$757,250



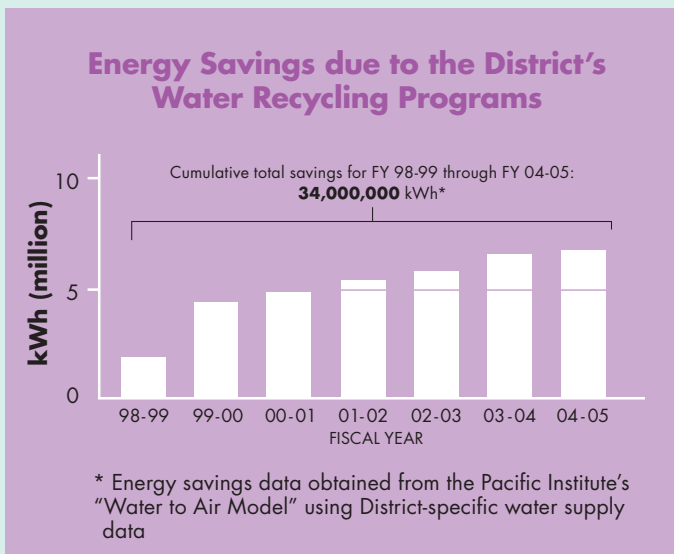
The District received a total of \$3,482,006 for these sections of the Proposition 50 grant (including regional portions). In addition, the WUE Unit entered into cost-sharing agreements with several regional and local agencies totaling nearly \$700,000 for a variety of water use efficiency programs.



A Closer Look: The Energy Savings – Water Savings Link



This year we conducted an in-depth analysis of the impact of our water use efficiency programs on water savings, energy savings and air quality. While the primary goal of water use efficiency programs is to use water more efficiently, thereby increasing water supply reliability, ancillary benefits include energy savings and reduced emissions of greenhouse gases, reactive organic gases, and particulates (energy production generates air emissions; a reduction in energy production leads to a reduction in air emissions).



Water conservation programs reduce energy consumption and air emissions through two routes:

- Decreasing end-use demand for hot water, and
- Reducing water flow upstream and downstream from the point of end-use.

Water recycling programs lead to energy savings and air emission reductions through decreasing water flow upstream and downstream from the point of end-use.

To determine the energy savings from reducing end-use demand for hot water,

Energy savings resulting from the District's water conservation and water recycling programs are estimated to be over 196 million kWh for FY 04-05 (only) and over 1.36 billion kWh for FY 91-92 through FY 04-05.

Cumulative total energy savings from District water conservation and recycling programs (FY 91-92 through FY 04-05) saved enough electricity to power more than 200,000 households for one year.

staff obtained energy savings numbers from the published literature and rebate data from the District's five water conservation programs that reduce end use demand for hot water. Energy savings from these five programs are estimated to be more than 20 million kWh for FY 04-05. Lifetime cumulative energy savings resulting from these five programs are estimated to be more than 700 million kWh.

To estimate the energy savings (and air emissions reductions) from reducing water flow upstream and downstream from the point of end-use, staff used the Water to Air model developed by the Pacific Institute (Oakland, CA). Energy savings resulting from the District's water conservation and water recycling programs are estimated to be more than 196 million kWh for FY 04-05 and more than 1.36 billion kWh for FY 91-92 through FY 04-05, the time span during which the programs have been operational. For FY 04-05, emissions of more than 92 million kg of carbon dioxide were avoided due to the District's water conservation and water recycling programs. For FY 91-92 through 04-05, emissions of more than 0.64 billion kg of carbon dioxide were avoided due to the District's water conservation and water recycling programs.



Water Use Efficiency Events for FY 04-05



2004

- July 15 **Fertigation Workshop** in Morgan Hill
- Aug. 5 **Irrigation Calculator Workshop** in Morgan Hill
- Aug. 24 **Fertigation Workshop** in Pajaro Valley
- Sept. 13-14 **Landscape Water Auditing Training Class** co-hosted by Cal Poly at Lick Mill Park in Santa Clara
- Sept. 23 **Bay Area Water Conservation Coordinators Meeting** hosted by the District
- Sept. 25-26 **A Taste of Morgan Hill** event in Morgan Hill
- Oct. 21 **Master Gardener workshop/meeting** hosted by the District
- Oct. 21 Staff gave a **vineyard tour and talk on vineyard irrigation** at the Stewardship for Small Acreages program Small Vineyard Workshop in Gilroy.
- Dec. 7 The District co-sponsored an **Annual Winter Growers Meeting** in South County.
- Dec. 17 **Bay Area Chrysanthemum Growers Association Workshop** in San Jose



2005

- Jan. 27 **Nor Cal Spring Trade Show** for Nurseries and Garden Centers, San Mateo Convention Center
- Feb. 16-17 **Northern California Turf and Landscape Council (NCLTC) 2005 Expo** at the Santa Clara Convention Center
- Water-Efficient Landscaping Workshop Series** hosted by the District
- Mar. 4 Selecting Plants for your water-wise garden
- Mar. 12 Water-Wise Garden Design
- Mar. 19 Water-Efficient Irrigation Design
- Mar. 26 Gardening With Natives
- April 2 **Eleventh Annual Spring Garden Market** at Emma Prusch Farm Park in San Jose
- April 7 **Pepper Crop Production in Sensitive Environments Workshop** with UC Cooperative Extension, Gilroy Grange Hall
- April 14 **Irrigation and Nutrient Management Seminar** at Cascade Ranch, Santa Cruz
- April 17 **Third Annual Going Native Garden Tour** at various home gardens in Santa Clara and San Mateo Counties
- April 20 **TCAA 2005 Rental Housing Conference and Expo** at Santa Clara Convention Center
- April 29-30 **Annual Spring Garden Tour** at the Elizabeth F. Gamble Garden, Palo Alto
- May 10 **Lockheed Environmental Fair** at Lockheed Martin, Sunnyvale Campus
- May 21- 22 **Home, Garden & Culinary Show** at Bonfante Gardens, Gilroy
- Landscape Irrigation Workshops for Professionals** at Lick Mill Park, Santa Clara
- June 9 Irrigation seminar in English
- June 10 Irrigation seminar in Spanish
- June 18 **Executive Council for Homeowners (ECHO) 33rd Annual Seminar and Exhibit** at Santa Clara Convention Center
- June 22 **UCCE/NRCS Farm Water Quality Planning Short Course** in Gilroy
- June 23 **Fertigation Workshop** in Morgan Hill
- June 25 **Free Water-Wise Gardening Workshop** for Mayfair Community Gardens, San Jose

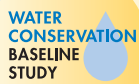


WATER CONSERVATION



Overview

The Water Conservation Program experienced another successful year, both in terms of water saved — reaching a total of 37,300 acre-feet in FY 04-05 — and in terms of programs, grants and partnerships.

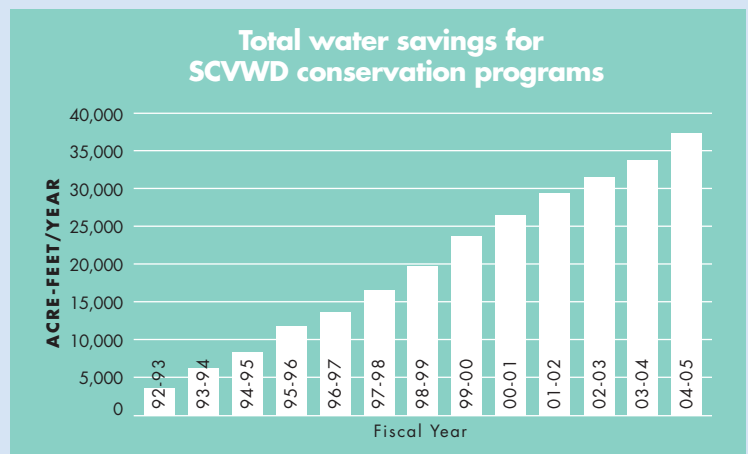


Look for boxes like this throughout the Water Conservation section; these boxes identify key findings from the District's WUE Baseline Studies.

Two of the most significant projects completed this fiscal year are the Residential and CII Baseline Water Conservation Studies. These two reports will help the District

estimate the types and quantities of water-using hardware in the residential and CII sectors, and establish a baseline from which future water savings can be measured.

Besides meeting long-term water reliability goals, water conservation programs help meet short-term demands placed on the water supply system during critical dry periods. They also help reduce the need to impose water-use reduction requirements upon water retailers. In addition, they reduce wastewater flows to Bay Area treatment plants, thus protecting the bay's salt marsh habitat.



Water Conservation

IN THE HOME

The District continues to expand residential programs as this sector remains one of the key areas for water conservation. In fact, according to the newly released “Santa Clara County Residential Water Use Baseline Survey,” the water savings potential for indoor water use in the county is 24,643 acre-feet per year for toilets, showerheads, clothes washers and household leaks. Current water conservation programs, identified in this section, will help the District achieve these savings. The total savings attributable to all residential conservation programs performed since 1992 reached 26,800 acre-feet.

WATER
CONSERVATION
BASELINE
STUDY

For residential landscape, overspray was the most common problem, with 49% of the single-family and 35% of the multi-family systems experiencing overspray.

The District’s Water-Wise House Call Program provides indoor and outdoor water use evaluations for residents.



1987

- District installs CIMIS weather station in Santa Clara.
- District distributes 50,000 water conservation kits.

1991

- District conducts conservation media campaign.
- District is one of the first signatories to the voluntary Memorandum of Understanding with the California Urban Water Conservation Council, which instituted conservation Best Management Practices.

1992

- District introduces Residential Ultra-Low-Flush Toilet and Low-Flow Showerhead Replacement programs.

1993

- District begins offering residential water-efficient landscaping workshops.

1994

- CALFED Bay-Delta Program established to address environmental and water management issues of Bay-Delta system.
- CIMIS Hotline established at District.

1995

- District introduces Irrigation Technical Assistance Program and Residential Clothes Washer Rebate Program.

1996

- Integrated Water Resources Plan (IWRP) adopted by the District Board with goals to increase county water conservation and recycling.



The District performed more than 3,500 residential home surveys during FY 04-05.

Water-Wise House Call Program

The District has been providing the Water-Wise House Call Program to county residents at no cost since 1998. This program is available to residents of single-family homes and owners/managers of apartments, condominiums and mobile home complexes. During the survey, technicians check for toilet flapper leaks, measure flow rates, offer conservation information, and install free showerheads and aerators. Surveyors also test the customer's irrigation system for uniformity, calculate and program a personalized irrigation schedule, and provide landscaping tips.

The District performed more than 3,500 residential home surveys during FY 04-05. Since the program began, over 20,000 home surveys have been completed. The District continues to routinely inspect and replace toilet flappers. These inspections are important since a California Urban Water Conservation Council study revealed that toilet leaks were the top reason for water waste in the home.

Low-flow Showerhead & Aerator Replacement Program

In FY 04-05, the District distributed 6,005 aerators and 4,495 low-flow showerheads. Because the installation of these devices has approached saturation (due to plumbing codes and the District's successful distribution program), the WUE Unit is not marketing low-flow showerheads and aerators at community outreach events quite so aggressively. However, they are still installed during Water-Wise House Calls, and are still available by mail, on-line through the District's website, and through water retailers at no cost to Santa Clara County residents. Despite the slowdown in low flow showerhead and aerator distribution, these devices accounted for approximately 8,800 acre-feet per year in water savings for FY 04-05.

WATER CONSERVATION BASELINE STUDY

For homes constructed before 1992, 59% of single-family homes, and 51% of multi-family homes had water-efficient showerheads.

These devices accounted for approximately 8,800 acre-feet per year in water savings for FY 04-05.

TIMELINE

1997	1998	2000	2001	2002	2003	2004
<ul style="list-style-type: none"> District installs its second CIMIS weather station in Morgan Hill. 	<ul style="list-style-type: none"> District introduces Water-Wise House Call Program and Mobile Lab Program. District begins offering annual irrigation efficiency workshops for growers. 	<ul style="list-style-type: none"> District introduces Commercial Clothes Washer Rebate Program. 	<ul style="list-style-type: none"> District water conservation and recycling units combine to form Water Use Efficiency Unit. District expands Water-Efficient Technologies Program to entire county. 	<ul style="list-style-type: none"> District introduces Pre-rinse Sprayer Program for Restaurants. District employs a third, portable CIMIS weather station. Water Efficiency Residential Baseline Study commences. 	<ul style="list-style-type: none"> District receives ACWA Theodore Roosevelt Environment Award. \$1.9 million in WUE grants received in FY 02-03. CII Baseline Study commences. 	<ul style="list-style-type: none"> Water savings from conservation reaches 37,300 acre-feet in FY 04-05 Baseline Studies (Residential and Commercial) conclude this year. CII High-Efficiency Toilet Program commences; 1,000 installed in FY 04-05

Residential Clothes Washer Rebate Program

The District continued to provide countywide rebates to residential customers who replaced their old clothes washers with new, water-efficient clothes washers, which use about half the water and energy of the older machines. The District has been offering the rebate program since 1995. During the summer of 2003 the District, along with seven other Bay Area water agencies, was awarded a Proposition 13 grant from the Department of Water Resources for the Bay Area Regional Residential High Efficiency Clothes Washer Rebate Program. This three-year program began during FY 04-05, and the District awarded 7,737 rebates in its first year.

The rebate amounts are based on the water efficiency rating of the clothes washer and range from \$100 to \$150, with clothes washers in Tiers 1, 2, and 3a receiving the lower amount and clothes washers in Tier 3b receiving the higher amount. (Higher tiers indicate more water-efficient clothes washers.) Tiers and the clothes washers belonging to each tier are determined by a national energy efficiency association, the Consortium for Energy Efficiency.

During FY 05-06 the Bay Area Regional Residential High Efficiency Clothes Washer Rebate Program will be taking the progressive step of rebating only the most water-efficient tiers (Tiers 2, 3a, and 3b) in an effort to drive a market transformation toward the purchase of more water-efficient clothes washers.

SANTA CLARA VALLEY WATER DISTRICT

Clean up on the savings!

Buy a high-efficiency clothes washer and get a \$100 - \$150 rebate.

PLUS, save money on your water and energy bills. Applications are available in stores where the machines are sold or by calling EGIA at 1.800.587.3442 or by visiting www.conservationrebates.com. Santa Clara County residents are eligible.*

This offer applies to qualifying clothes washers purchased new at a retail price. Resale or lease/ rental option units are ineligible. This offer is available for clothes washers purchased from January 1, 2005 through June 30, 2005, or until funds are depleted, whichever occurs first. All rebate applications must be postmarked no later than 60 days after installation or by August 31, 2005, whichever comes first. See application form for additional rules and regulations. Washer must be installed at a residential site in Santa Clara County.
*City of Palo Alto residents should call 650.329.2241.

Ad for Residential Clothes Washer Rebate Program that ran in the *San Jose Mercury News*.

This three-year grant-funded program awarded 7,737 rebates to county residents FY 04-05.

WATER CONSERVATION BASELINE STUDY

Most households rank the price and features of a water-using appliance above its efficiency as primary purchase considerations.

WATER CONSERVATION BASELINE STUDY

26% of single-family homes and 29% of multi-family homes had Energy Star™ or front-loading clothes washers.



Example of a high-efficiency toilet that's eligible for a \$125 rebate.

Residential High-Efficiency Toilet Program

The District's new innovative High-Efficiency Toilet (HET) program provides a \$125 rebate to residents when they replace their old water-guzzling toilet with new HETs. This new generation of toilets uses at least 20% less water than the federally regulated 1.6 gallon per flush (gpf) toilets. HETs include two types of technologies: one-gallon pressure assist, which utilizes a flush valve similar to commercial grade toilets, and dual-flush toilets which have full and half-flush options. The District issued 65 high-efficiency toilet rebates in FY 04-05.

**WATER CONSERVATION
BASELINE
STUDY**

For homes built before 1992, 42% of single-family homes and 31% of multi-family homes had ULFTs.

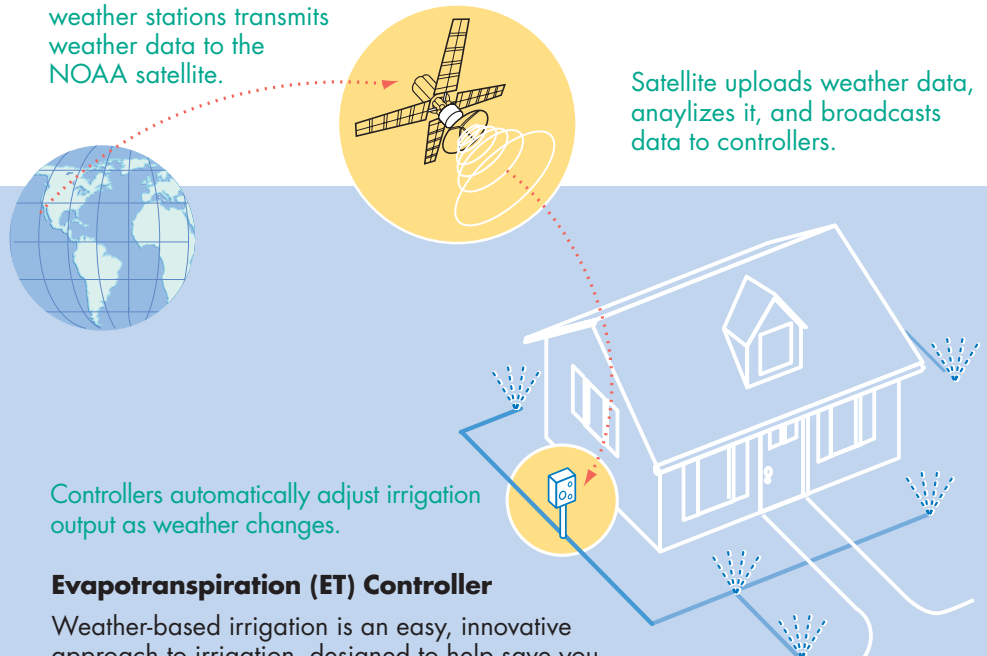
Evapotranspiration (ET) Controller Pilot Program

The District's new Evapotranspiration (ET) Controller Pilot Program employs weather-based irrigation scheduling in managing landscape water use. This new generation of irrigation controllers (also called "smart controllers") utilizes data on temperature, relative humidity, wind speed and solar radiation to calculate site specific irrigation schedules. These controllers modify their irrigation schedules on a daily basis to remain consistent with the landscape's irrigation requirements. The program installed an additional 51 controllers in its second year for a total of 176 residential and commercial controllers. More than ten of the ET Controllers were installed at Advanced Micro Devices (AMD) in Sunnyvale on 24 acres of turf.

WUE Unit staff programming a newly installed ET Controller



A vast network of weather stations transmits weather data to the NOAA satellite.



Satellite uploads weather data, analyzes it, and broadcasts data to controllers.

Controllers automatically adjust irrigation output as weather changes.

Evapotranspiration (ET) Controller

Weather-based irrigation is an easy, innovative approach to irrigation, designed to help save you time, water and money. This illustration shows one type; another type employs historic weather data and a temperature sensor.

Water Conservation

IN BUSINESS

The Water Use Efficiency Unit combines education, technical assistance and financial incentives to encourage commercial, industrial and institutional water users to reduce water consumption. Conservation programs help businesses save on water, energy and sewage costs. They also reduce wastewater flows to Bay Area treatment plants, thus protecting the bay's salt marsh habitats. Annual water savings attributable to business conservation programs reached 9,400 acre-feet last year. Whenever possible, the District partners with other agencies and local cities to reduce administrative overhead and enhance the efficiency of programs.

Landscape and Agricultural Area Measurement and Water Use Budgets Study (LAMS)

PHASE 1 In 2002, the District used multi-spectral images to identify landscape and agricultural areas by parcel for more than 900 square miles in Santa Clara County. These images were then used to categorize types of surfaces (such as areas of turf grass, trees, landscaping, water features, bare ground, hardscape, etc.) for each parcel. This information is now being used to calculate optimal water budgets for sites around the county.

WATER CONSERVATION BASELINE STUDY

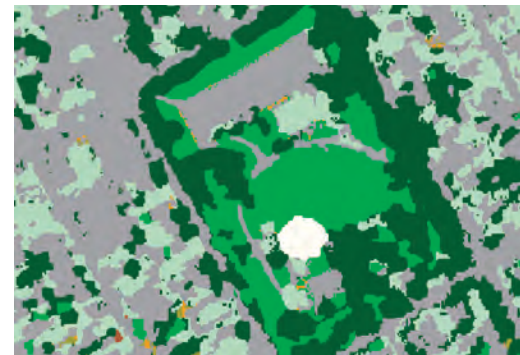
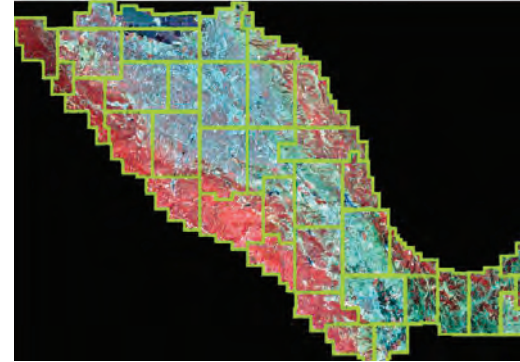
Average for all landscaped commercial settings:

- The percentage of irrigated landscaped area relative to total lot area was 10%
- The percent of turf area relative to irrigated landscaped area was 49%

The distribution uniformity (DU) average for measured commercial landscaped areas:

<u>Highest</u>	<u>Lowest</u>
• Hotels (.76)	• Grocery stores (.29)
• Office buildings (.65)	• Semiconductor manufacturing facilities (.31)
• Wholesale grocery stores (.62)	• Hospitals (.35)

Annual water savings attributable to business conservation programs reached 9,400 acre-feet last year.



Multi-spectral images were used to develop "classification layers" which identify different types of landcover.

**WATER
CONSERVATION
BASELINE
STUDY**

In landscaped commercial settings, on average, automatic irrigation systems had 2.2 controllers and these controllers were adjusted on average 3.7 times per year.

Since 1995, more than 650 parks, golf courses, large commercial sites, and large residential developments have received ITAP evaluations.

PHASE 2 Concurrently, the District developed web-based software that allows county water users to receive a site-specific water budget on-line by entering their contact information, meter readings, and other data.

This countywide water budget database allows on-line users to compare their actual water usage with recommended amounts for their specific areas. (The landscaped areas used to calculate the budget were provided by LAMS Phase I.)

To provide greater benefits from the study, the District recently decided to expand the project by creating a statewide, web-based resource. The District, in partnership with Cal-Poly's Irrigation Training and Research Center, is developing software to include water budgeting and irrigation scheduling throughout the state. On-line users will be given a schedule — the optimum days and minutes of watering time per week — for their specific landscape, as well as irrigation guidelines and other vital information. The project is scheduled for completion by December 2005.

Irrigation Technical Assistance Program

The District has been providing technical assistance to large landscape managers since 1995 through the Irrigation Technical Assistance Program (ITAP). A technician checks the irrigation system for deficiencies, determines an optimum water use budget, and develops an efficient watering schedule. ITAP participants can potentially save up to 1,500 gallons per day per acre, representing a potential \$1,000 per acre cost savings annually. The District provided 73 sites with ITAP services in FY 04-05. Since the program's inception, more than 650 parks, golf courses, large commercial sites, and large residential developments have received ITAP evaluations.

Water-Efficient Technologies Program

The Water-Efficient Technologies (WET) Program offers rebates between \$400 and \$50,000 to commercial, industrial, and institutional water customers for making process and equipment changes to reduce water use and wastewater flows. Beyond the initial rebate amount, participants continue to save year after year on water and sewer fees. Energy and chemical costs may also be reduced. The WUE Unit administers the WET program in the cities of Gilroy, Los Altos, Los Altos Hills, Morgan Hill, Mountain View, Palo Alto, Stanford, San Martin, Sunnyvale, and unincorporated



Testing irrigation system efficiency at a golf course in Morgan Hill.

parts of the county, and shares the cost of the program with the City of San José for the remaining Santa Clara County cities.

In FY 04-05, the District issued \$162,562 in WET rebates and saved more than 70 million gallons of water per year. One highlight of the program was a project at Intel for an electro dialysis reversal system to treat reverse osmosis (RO) reject water and use it for air scrubbers in four separate buildings and two cooling towers. Total savings for this project were more than 34 million gallons per year, and total rebates for five separate projects issued were \$85,296 (reflects 50% cost-sharing by the District). Another highlight was a project done at Maxim Integrated Products to retrofit their RO/de-ionized (DI) water purification system to make it more water-efficient, saving more than 13 million gallons per year and garnering \$48,491 in rebates (reflects 50% cost-sharing by the District).

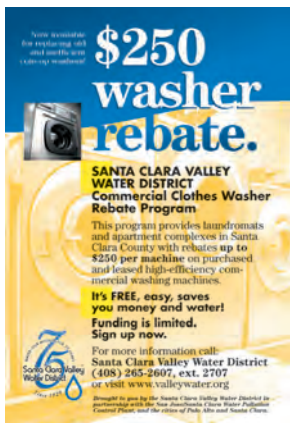


Pre-Rinse Spray Valve Program

“Rinse and Save,” a program designed to save restaurants water and money, began in FY 02-03, and continued into FY 04-05. The California Urban Water Conservation Council, with funding from the California Public Utilities Commission, the Santa Clara Valley Water District, and the City of San José, offered restaurants within the PG&E territory a free pre-rinse spray valve and installation. These high-efficiency spray valves save an average of 150 gallons of water per unit per day. Fifteen hundred valves were installed through the program this year. Each one is expected to save more than 284,000 gallons over the next five years.

Commercial Clothes Washer Rebate Program

The Commercial Clothes Washer Rebate Program provides laundromats and apartment complexes in Santa Clara County rebates between \$225 and \$350, depending on location, for each purchased or leased commercial high efficiency clothes washer. To help fund the program, the District established cost-sharing agreements with the cities of San Jose, Santa Clara and Palo Alto, the California Water Service Company, and Energy Solutions (through a grant from the California Public Utilities Commission). In FY 04-05, the Commercial Clothes Washer Rebate Program provided 424 rebates, bringing the total water savings for the program to 379 acre-feet per year.



Surveyor checks efficiency of a pre-rinse spray valve at a local high school cafeteria.

Each one of the 1,500 valves that was installed through the Rinse & Save program this year alone is expected to save more than 284,000 gallons over the next five years.



WATER CONSERVATION BASELINE STUDY

For coin-op laundry rooms in apartment buildings, 44%

were found to have front-loading, or Energy Star,[™] washers.

In FY 04-05, the Commercial Clothes Washer Rebate Program provided 424 rebates, bringing the total water savings for the program to 379 acre-feet per year.

WATER CONSERVATION BASELINE STUDY

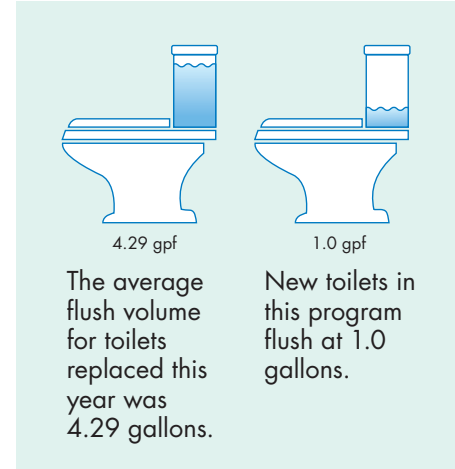
Of the gravity flush toilets tested, the highest flow rates were found in grocery stores (4.1 gpf), food product manufacturing (3.6 gpf), and wholesale grocery facilities (3.6 gpf).

Of all CII sectors measured, 20% had toilets that flushed at greater than 4 gpf.

Commercial High-Efficiency Toilet (HET) Installation Program

In 2003, the District received grant funding from the California Department of Water Resources to perform innovative high-efficiency commercial plumbing retrofits, including conducting a direct installation program for commercial high-efficiency toilets (HETs) within the District's service area.

The high-efficiency toilets installed through this program save much more than conventional ultra-low flush toilets (ULFTs), which are designed for 1.6 gallons per flush (gpf). The HETs have pressure-assisted flushing mechanisms and use 1.0 gallons per flush. Increasing the savings further, these HETs are mostly installed in commercial settings with high savings potential, such as restaurants, food stores, retail and wholesale stores, gas stations and hospitals.



A total of 990 HETs were installed in the commercial, industrial and institutional sectors in FY 04-05, with a total water savings for the CII toilet installation program of approximately 4,400 acre-feet per year.

Commercial high-efficiency toilet installer checks the flush volume on a newly installed toilet.



Each toilet that is replaced by one of these HETs is measured before it is removed (some flushing at more than 5 gallons per flush) so exact savings figures can be determined. The average flush volume of the toilets these HETs replaced is 4.29 gpf.

A total of 990 HETs were installed in the commercial, industrial and institutional sectors in FY 04-05, with a total water savings for the CII toilet installation program of approximately 4,400 acre-feet per year.

High-Efficiency Toilets installed in FY 04-05	
Sector	# of HETs Installed
Retail	286
Offices	173
Restaurants	154
Health	154
Autos	101
Other	59
Hotels	46
Churches	15
Schools	2
Total	990

Medical Equipment Rebate Program

In 2003, the District received Proposition 13 grant funding for innovative commercial, industrial and institutional water-efficient equipment retrofits, which included the Medical Equipment Rebate Program. The program was developed and launched in September 2004, rebating water-efficient x-ray film processors and non-water-using vacuum pumps. This program is targeted at hospitals, clinics and dental offices, and will continue through 2005.

Commercial, Industrial, Institutional Water Use Survey Program

A new Water Use Survey Program for Commercial, Industrial and Institutional (CII) businesses in Santa Clara County, which will provide CII establishments with a thorough survey of their indoor water use and suggestions for how to become more efficient (recommending District programs that can help them fund water efficiency improvements), began in FY 04-05 and will continue into FY 05-06. For FY 04-05, 18 reports have been completed, with commercial customers such as the Tied House, institutional customers such as San Tomas Convalescent Hospital, and industrial customers such as Abbott Laboratories, Agilent, Varian Associates and K&S Metal Finishing participating. Because most of the water savings potential seems to exist in the industrial and institutional sectors, these are the sectors that are emphasized. At the conclusion of this program, a final report will be released detailing the water savings potentials identified at these facilities. Additionally, the site reports match facilities to applicable programs in order to expedite equipment changes.



Example of a water conservation device designed to be used with medical x-ray film processors.



WATER CONSERVATION BASELINE STUDY

Average daily water use per:

- Office employee29 gallons
- Hospital employee42 gallons
- Semiconductor mfg. employee 163 gallons
- Wholesale grocery employee 198 gallons
- Physician/dental employee362 gallons

District staff examines a water meter at Cupertino Electric, a certified Green Business by the Santa Clara County Green Business Program.

Water Use Efficiency

IN AGRICULTURE

The Mobile Lab program has provided 256 on-site irrigation system evaluations to 71 growers since its inception. This represents a total of 6,066 acres.

The District's Water Use Efficiency Unit conducts growers' meetings and provides technical assistance to help growers with improving irrigation practices. This is done to facilitate their compliance with the non-point source discharge regulations of the State Water Quality Control Board. District agricultural programs also support the Central Valley Project Improvement Act, an historic compromise between agricultural, urban and environmental interests concerning the allocation of water resources.

Mobile Lab Program

The District's Mobile Lab program started in 1998 to assess the uniformity of growers' irrigation systems. The Mobile Lab program provides free on-site pump and irrigation system evaluations to farmers and greenhouse operators. The program has provided 256 on-site irrigation system evaluations to 71 growers since its inception. This represents a total of 6,066 acres. Potential annual water savings of 4,045 acre-feet have been identified. Financial incentives for program participation are provided by discounts of the groundwater withdrawal fees.

Growers may increase the efficiency of their water use through improvements in irrigation system uniformity, which enables them to increase the efficiency of fertilizer use.



The District and the UC Cooperative Extension Service jointly engage in educational programs for water use efficiency.

Irrigating squash with portable sprinklers.



These measures reduce the leaching of fertilizer-derived nitrogen to the groundwater. This program has helped both in irrigation efficiency and groundwater quality.

California Irrigation Management Information System (CIMIS)

This valuable free service provides daily reference evapotranspiration estimates to growers and landscape irrigators to use for scheduling irrigation. Reference evapotranspiration is the water use of standardized green grass. Crop evapotranspiration is mathematically related to reference evapotranspiration.

The District owns and maintains two CIMIS weather stations in Santa Clara County. One is active at Live Oak High School in Morgan Hill (since 1997), and one was temporarily decommissioned in November 2002 pending relocation. The latter station had been active since 1987 at the former University of California field station in Santa Clara. The weather stations measure sunlight intensity, humidity, wind speed and direction, and temperature every six seconds to estimate reference evapotranspiration.



Contractor and District staff discuss booster pump (in background).

Furrow irrigation in south Santa Clara County



The District's CIMIS weather stations are part of a statewide network of stations from which the California Department of Water Resources' (DWR) central computer downloads data nightly. Growers and landscape irrigators can access current irrigation scheduling information around the clock by visiting the District web site at www.valleywater.org.

The District also participates in gathering weather data from so-called "non-ideal" sites. These are sites throughout the county (and the state) which do not meet the specifications for a standard CIMIS station. Non-ideal sites are correlated mathematically to their nearest CIMIS site, and this relationship provides a means of making evapotranspiration data site-specific. This long-range project will give landscape managers in local microclimates more accurate data for their irrigation decisions.



CIMIS weather station at the former Bay Area Research and Extension Center.

WATER CONSERVATION EDUCATION AND OUTREACH



The keys to any program's success are good education and outreach components. To these ends, the District has developed effective and informative classes and materials.

Water Use Efficiency Nursery Program

For the past seven years, the District has distributed water conservation information at major county nursery and garden stores. The literature pertains to water-wise gardening, efficient lawn watering, low water use plants, drip irrigation and District programs. In FY 04-05, 20 nurseries participated in the program throughout the District's service area.

Water-Efficient Landscaping Workshops for Homeowners

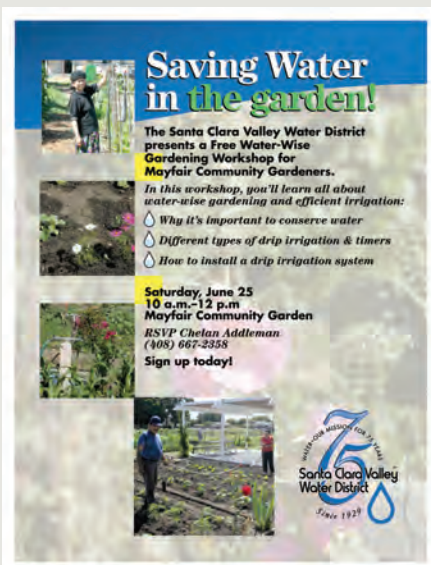
The District held its 13th annual Water-Efficient Landscaping Workshop series in March 2005 over four weekends. The topics were: Selecting Plants for Your Water-Wise Garden, Water-Efficient Irrigation Design, Water-Wise Garden Design, and Gardening with Natives. The spring workshops are presented by landscape and irrigation experts and provide practical advice on water-saving gardening. The workshops were very popular; a total of 200 people attended this series of workshops.

Community Events

The District promoted water-use efficiency at numerous community events in FY 04-05, including the Tri-County Apartment Association Expo, the Mayfair Community Garden Event, Water Conservation Day at the San Jose Giants, irrigation seminars for landscape professionals, landscaping workshops for homeowners, and many others. These events provide the WUE Unit an opportunity to talk to the public directly, and educate them about water-use efficiency with hands-on displays, educational handouts and free water-efficient device distribution.

May Water Awareness Campaign and Summer Water Conservation Campaigns

The WUE Unit assisted the District's Office of Communications in developing a May Water Awareness Campaign, consisting of television, transit, radio, movie theater screen and print advertising using material from California's Water Awareness campaign. The District's campaign goals were to increase community perception that it is important not to waste water—even when we're not in a drought—and to encourage community members to adopt water-efficient behaviors and implement water-saving technologies to help ensure future water supplies are adequate.



The WUE Unit also assisted the District's Office of Communications in developing a Summer Water Conservation Campaign. This year, the campaign focused on the "Value of Water." The "We See Water" campaign addressed misperceptions about water use as identified in a countywide survey, the Residential Water Conservation Baseline Study. The campaign also reminded residents that using water more wisely can reduce consumers' monthly water bills and, in the summer, can help prevent power blackouts through saving energy. The campaign featured radio, television, bus and print ads.



Going Native Garden Tour

The District-co-sponsored the third annual Going Native Garden Tour, which took place on Sunday, April 17th. The tour was a great success, showcasing 28 native plant gardens throughout Santa Clara and San Mateo counties, with more than 4,600 visitors. The goal of the tour was to provide examples of residential gardens that are water-wise, low maintenance, and bird- and butterfly-friendly for the public to view. The gardens—landscaped with native plants and ranging from newly planted gardens to well-established ones—were open to the public. Water-wise gardening literature, provided by the District, was available to all participants.



Seminars for Agriculture Professionals

Since 1998, the District has presented two meetings annually for growers—one in April and one in December—on topics relating to water and fertilizer use efficiency, District programs, farm safety and legal compliance. All workshops have been presented with real-time Spanish translation.

ANNUAL WINTER GROWERS MEETINGS

The District co-sponsored an Annual Winter Growers Meeting in December 2004 in South County, which covered topics such as irrigation scheduling with CIMIS and tensiometers, and preventing runoff and groundwater contamination.

ANNUAL FERTIGATION WORKSHOP FOR IRRIGATORS

The 2005 Annual Fertigation Workshop was held on June 23 in south Santa Clara County. The workshop provided a real-time Spanish translator.



Landscape Irrigation Workshops for Professionals

The District conducts a special one-day water conservation workshop each year for landscape contractors. Topics change annually as irrigation issues are identified in the field. In FY 04-05, the workshop covered basic hydraulics of an irrigation system, how to increase distribution uniformity, and common mechanical and electrical problems. The District offers the contractor workshops in both English and Spanish.

Master Gardener Workshop

The Water Use Efficiency Unit coordinated and arranged a one-day workshop, "Water: A Precious Resource" for Santa Clara County master gardeners on Oct. 21, 2004. Approximately 90 master gardeners participated in this workshop, which is part of the continuing education for their veteran members.

Judy Ingols from the District's Vegetation Management Unit discusses native and water-efficient vegetation around the District grounds with the Santa Clara County master gardeners.



PUBLICATIONS

GardenSoft CD-ROM Software

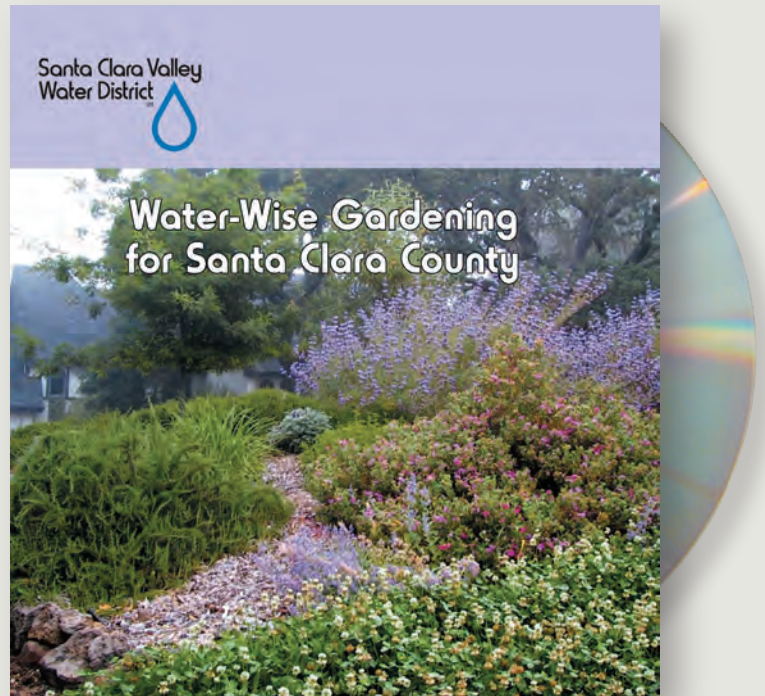
The Water Use Efficiency Unit is now promoting water-efficient gardening design with a new user-friendly CD, *Water-Wise Gardening for Santa Clara County*. This interactive CD showcases more than 1,000 native, drought-tolerant and water-efficient plants, and features the District's landscape design brochure "Rules of Thumb for Water-Wise Gardening."

Through features such as "Garden Tours" and "Garden Gallery," users can view plants in beautiful well-established gardens and click on them to learn about each plant's water, sun, and soil requirements. Users also have the option of searching the "Plant List" database by scientific and common name or by a plant's unique characteristics. Selected plants can be saved in a customized list and compiled into three styles of reports. These reports can be printed out with plant pictures for the user to bring to local nurseries and to assist in making water-efficient choices.

This software is used to promote water-efficient plant selection and garden design at District workshops and selected events. More than 500 *Water-Wise Gardening for Santa Clara County* CDs were distributed in FY 04-05.

Soil Matters

This new publication, produced by *Bay Nature* magazine with funding by various agencies including the District, describes the important role soil plays in our landscape: "Soil is an essential, living element of the landscape, and is the foundation for the health of entire ecosystems." The 32-page publication is being distributed by the District at outreach events and in water-wise landscaping classes, and through the Water-Wise House Call program.



WATER CONSERVATION GRANTS & COST-SHARING AGREEMENTS



Water-use efficiency is a community-wide effort, and it will take the cooperation of many agencies, water retailers and organizations to meet future water supply goals. The District maintains cost-sharing agreements with many area cities and utilities to provide water-use efficiency programs for residential and commercial water customers.

Grants

The District received several grants from state and federal agencies to help fund program expansion and vital research. Additionally, the WUE Unit participated in and finalized many different grant projects this year. Grant projects include:

- **PRE-RINSE SPRAYERS:** The CUWCC's statewide Rinse & Save Program continued into FY 04-05, ending in June 2005, after reaching the goal in the District's territory of 1,500 sprayers installed.
- **ET CONTROLLERS:** The regional DWR Prop.13 grant for funding weather-based irrigation controller retrofits will begin in FY 05-06.
- **RESIDENTIAL CLOTHES WASHER REBATE PROGRAM:** The regional DWR Prop.13 grant-funded program began in FY 04-05.
- **IRRIGATION SYSTEM HARDWARE UPGRADES:** The DWR Prop.13 grant funded program will begin in FY 05-06.
- **COMMERCIAL CLOTHES WASHERS REBATE PROGRAM:** The CPUC funded this regional grant program, administered by Energy Solutions, to help fund high-efficiency clothes washer rebates. The program will continue through December 2005.
- **INNOVATIVE HIGH-EFFICIENCY COMMERCIAL EQUIPMENT RETROFITS PROGRAM:** The program, funded by a DWR Prop.13 grant, is designated to help fund financial incentives to replace commercial equipment (plumbing and medical equipment) with water-efficient models. The program commenced in FY 04-05.
- **DEDICATED LANDSCAPE METER PROGRAM:** Grant from DWR Prop.13 funds allocated for the retrofit of mixed-use meters with dedicated landscape meters.



Consultant conducts water use evaluation for the CII Water Survey Program.

Future Grant Funded Programs

The WUE Unit received notice in FY 04-05 that the Department of Water Resources Proposition 50 Chapter 7 grant funding, in the amount of \$757,250, had been recommended for programs beginning in FY 05-06. The grant funding

is allocated for a WUE Demonstration Garden Project (\$146,000), a Regional Residential Clothes Washer Rebate Program (\$461,250 for the District portion), and a Regional Water Softener Rebate Program (\$150,000 for the District portion).

Cost-Sharing Agreements

The WUE Unit administered more than \$662,258 in Cost-Sharing Agreements in FY 04-05. Cost-Sharing Agreements that were active in FY 04-05 included:

- CITY OF PALO ALTO: cost-sharing agreement for a variety of water conservation programs: \$89,405
- CITY OF SANTA CLARA: cost-sharing agreement for commercial high-efficiency clothes washer rebates \$12,500
- CITY OF SAN JOSE: cost-sharing agreement for a variety of water conservation programs \$540,353
- CALIFORNIA WATER SERVICE CO.: cost-sharing agreement for a variety of water conservation programs \$20,000

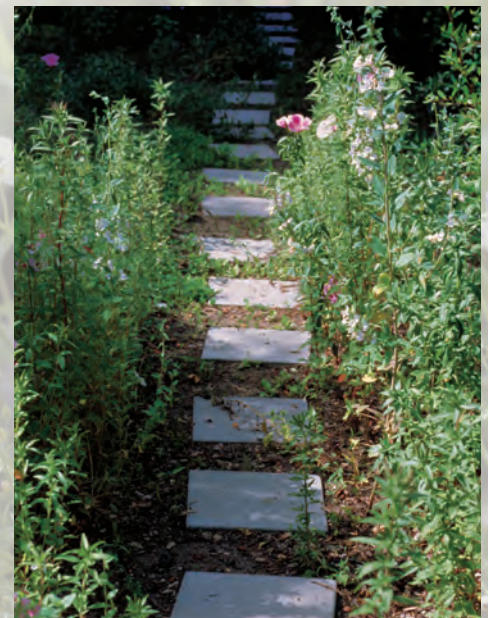


WATER CONSERVATION STUDIES, RESEARCH, PILOT PROGRAMS & FUTURE PROJECTS

The District continually conducts research, on its own and in collaboration with other agencies, to increase water savings and cost-effectiveness in its water conservation programs. Data from the studies and research listed below will be vital in creating an effective, long-range water management strategy for Santa Clara County.

The District is gathering reliable information on how and why conservation programs work most efficiently. Ongoing research and pilot programs help evaluate the cost-effectiveness of District programs, as well as test new programs and water-saving devices as they become available.

How do the attitudes and practices of residential, business and agricultural customers affect their water use? Which programs and users have the greatest water savings potential? How can we use the latest technology to give customers the water conservation tools they need? These are just a few of the important issues being explored in the following studies.



STUDIES & RESEARCH

Residential Water Conservation Baseline Study

The Residential Baseline Study was completed in 2003 and released in 2004. The study surveyed 600 single-family and multi-family dwellings in Santa Clara County to determine the distributions of water-using appliances, fixtures and landscapes in the residential sector. The study also assessed Santa Clara County residential customers' knowledge and attitudes about water use and conservation.

The information compiled by the study will enable the District to estimate the types and quantities of water-using hardware within the residential sector of Santa Clara County, and to establish a baseline from which future residential water savings potential can be measured. Study results will be useful for service area demand forecasting, conservation program marketing and design, BMP program evaluation, and BMP program implementation.

Final reports are now available.

Commercial, Industrial and Institutional Water Conservation Baseline Study

The Commercial, Industrial and Institutional (CII) Baseline Study was completed in FY 04-05.

In January 2004, the District embarked on a baseline study and survey program of selected CII customer sectors. The objective of the baseline study was to gain practical understanding of nonresidential water use for the purpose of improving water use efficiency programs. The survey program targeted 225 customers in 11 nonresidential customer groups. On-site surveys were used to collect information on facility characteristics, water conservation perceptions, water sources, and selected water uses and appliances.

A final report will be available at the end of 2005.

Irrigation Submeter Study

In FY 00-01, the District provided submeters to three large landscape property owners—two homeowners associations and a commercial business park—which allowed them to monitor water used for irrigation. The District will continue to collect data for five years, and then analyze them for water savings to determine whether the program merits expansion.

Artificial Turf Feasibility Study

Artificial turf has the potential to save substantial quantities of water and has received considerable attention in the water conservation community. Before the District decides whether to offer financial incentives for the installation of artificial turf in the business and residential communities, the District would



District staff checks a resident's irrigation efficiency.

like to determine whether there are any adverse water quality impacts (i.e., whether any contaminants are present in the leachate) due to artificial turf installation. A preliminary study done by the District suggests that heavy metal contamination (specifically zinc, copper, barium and chromium) may be a concern.

In FY 05-06 Phase II of the Artificial Turf Feasibility Study will investigate whether heavy metal contamination is a concern at field sites around the county where artificial turf has been installed.

FUTURE PROJECTS

Dedicated Landscape Meter Pilot Program

The District has been awarded \$100,000 for a Proposition 13 Urban Water Conservation Program grant from the California Department of Water Resources to be used for the installation of dedicated landscape meters throughout the county. The project, which began in FY 04-05, installs dedicated meters at sites with high landscape water savings potential that currently have mixed-use meters. Two retail agencies in the District's service area — Palo Alto and Mountain View — will pay for 10 sites within each agency's service area to install dedicated meters. The outreach program will target an additional 180 sites with promising water savings potential where the customer will pay for meter installation. Currently, one meter has been installed and staff are working with the cities of Palo Alto and Mountain View to identify other large landscape sites with water savings potential.

Irrigation Retrofit Program

The project, also funded by a \$100,000 Proposition 13 grant, is to install upgraded irrigation hardware for sites previously identified as having high, unrealized conservation potential by the District's Irrigation Technical Assistance Program (ITAP). By building on the customer information accrued through the ITAP program, this program aims at difficult-to-attain but cost-effective conservation on sites with greater than one acre of irrigated landscape. These hardware installations can be expected to produce water savings lasting longer than the savings that can be attained through behavior change alone. The project is expected to begin in FY 05-06.

Water-Efficient Landscape Rebate Pilot Program

While significant water conservation has been achieved in the indoor sector, there are many water conservation opportunities that remain in the outdoor sector. The goal of the Water-Efficient Landscape Rebate Program (WELRP) is to improve outdoor water use efficiency by offering rebates for the conversion of high water-consuming landscapes — primarily irrigated turf — to low or no water-consuming landscapes, (i.e. low-water using plants,



An irrigation efficiency test at a local golf course.



permeable hardscape). District staff recently completed an extensive review of other water agencies' landscape rebate programs to determine which features are most important for a cost-effective program that leads to the greatest water savings, and have included those features in the design of the Water-Efficient Landscape Rebate Pilot Program. The program will begin in FY 05-06.

Example of cooling tower system



Regional Cooling Tower Conductivity Controller Rebate Pilot Program

The District identified significant water use efficiency savings available by improving the water efficiency of cooling towers, which are used to regulate air temperature in a CII facility. While cooling towers use substantial quantities of water, approximately 75% of cooling towers do not use water efficiently. Cooling tower conductivity controllers and pH controllers both lead to more efficient water use.

The program will help increase water use efficiency by providing rebates to CII customers for the installation of cooling tower conductivity controllers and pH controllers. The amount of the rebate will be based on the size of the cooling tower. This program, which will be done in partnership with the SFPUC and BAWSCA, is expected to begin in FY 05-06.

Demonstration Garden

The overall goal of this project is to design and develop a unique demonstration garden that promotes water use efficiency in landscaping. The garden will be an educational resource, test facility and learning center providing environmentally sound and cost-effective landscaping alternatives. The primary purpose of the garden is to educate the general public on the use of water-wise plants while promoting efficient irrigation technologies and recycled water. A conceptual design for the garden has been completed. To offset some of the construction costs, the Water Use Efficiency Unit applied for and was awarded \$146,000 in grant funding through Proposition 50 (the District will be responsible for approximately \$48,000 of "in kind" costs which primarily consists of annual maintenance costs). The District is also working with the City of San José Parks and Recreation Department, the Guadalupe Gardens Technical Committee, and the Friends of Guadalupe Park and Gardens to assist in the implementation of the project.



Plan view of conceptual design of the demonstration garden.

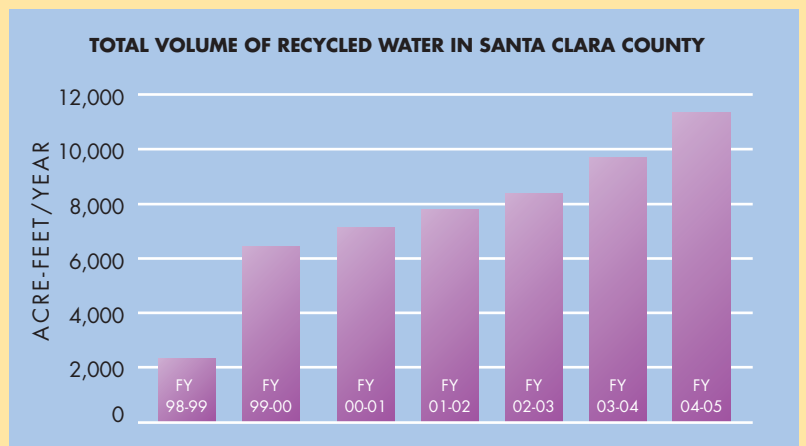
WATER RECYCLING and DESALINATION



Overview

Along with water conservation, water recycling and desalination are identified in the District's 2003 update to the Integrated Water Resources Planning document as key components in meeting future dry year shortfalls. Recycled water and desalination are all-weather resources. Increasing recycled water supplies in Santa Clara County would increase local water supply reliability, independent of the District's imported water supply.

The District Board's Ends Policies prescribe that recycled water use comprise 5 percent of total county water use by 2010, and 10 percent of total water use by 2020. These targets are reviewed annually by the Board. In FY 04-05, recycled water use in the county is on target to meet the 2010 board policy target. Recycled water use is being expanded in accordance with another Board Policy that calls for groundwater quality to be aggressively protected from contamination or threat of contamination.



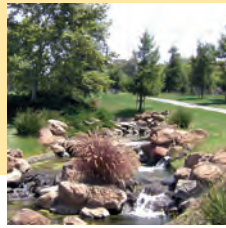
Note: FY 04-05 included treatment plant internal use

1975

- District conducts water recycling feasibility study with Palo Alto.
- The District constructs a reclamation facility, operates it for 10 years, then sells to Palo Alto Regional Water Quality Control Plant.

1977

- District and Gilroy build recycled water system.



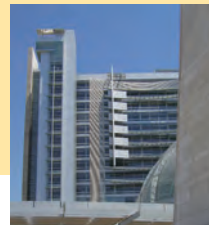
1994

- District partners with San Jose on the planning of South Bay Water Recycling Program (SBWR).



1995

- District agrees to reimburse Santa Clara for recycled water delivered.



1996

- Integrated Water Resources Plan adopted by Board with goals to increase county water recycling and conservation.

1997

- District increases recycled water reimbursement from \$93 to \$115 per acre-foot.
- District begins subsidizing Sunnyvale recycled water program.
- Phase 1 of South Bay Water Recycling Program completed.

1999

- District and Gilroy partner to upgrade South County Recycled Water system.
- Recycled water use in Santa Clara County totals 2,357 acre-feet for FY 98-99.

The 2003 IWRP has the following recommendations for water recycling and desalination:

- “Encourage investments in New Local Water Sources — the District should continue to explore local options, such as expanded conservation, groundwater recharge, water recycling, desalination, and local storage to promote a greater variety of water sources.”
- “Resolve water quality and market issues related to recycled water to evaluate potential use in the future.”
- “Conduct further study of advanced treatment of recycled water, engaging the public to avoid hurdles in recycled water perception and acceptance, seeking funding for advanced treatment projects and other recycled water projects. Taking these steps now will prove valuable if the District contemplates expanding recycled water over unconfined areas as well as indirect potable reuse in the future.”
- “Explore the feasibility of desalination through studies to confirm potential quantities, public acceptance and costs.” The 2003 IWRP recommends feasibility study work on both brackish desalination and seawater/bay desalination.

In FY 04-05, all projects and programs were conducted in accordance with District Board policies as well as with 2003 IWRP recommendations.

By laying the groundwork for new programs and studying recycled water uses and issues, the District will be ready to create more partnerships and systematically expand countywide water recycling. Use of recycled water is especially important in drought years. Using recycled water for irrigation and other uses makes potable, surface, and groundwater available for drinking purposes. Using more recycled water also protects the bay’s salt marsh habitat by reducing freshwater effluent released from wastewater treatment facilities into the San Francisco Bay.

The District’s approach to recycled water expansion is to develop partnerships with the cities and publicly owned agencies that produce and/or distribute recycled water.

A renewed focus on advanced treated recycled water is under consideration for groundwater recharge and increasing stream flows thereby enhancing the District’s conjunctive water management.

TIMELINE

2000	2001	2002	2003	2004	2005
<ul style="list-style-type: none"> Recycled water use in Santa Clara County totals 6,401 acre-feet for FY 99-00. 	<ul style="list-style-type: none"> District begins Advanced Recycled Water Treatment Feasibility Study. \$82.5 million SBWR Phase 2 expansion approved. Recycled water use in Santa Clara County totals 7,124 acre-feet in FY 00-01. 	<ul style="list-style-type: none"> District and San Jose enter agreement for long-term ownership of the SBWR collaborative effort. Construction of new booster pump station, reservoir, and pipeline extension completed for South County Recycled Water system. 	<ul style="list-style-type: none"> District and San Jose establish collaborative effort to expand recycled water use. Construction of the Silver Creek Pipeline extension begins. Recycled water in Santa Clara County totals 8,368 acre-feet in FY 02-03. 	<ul style="list-style-type: none"> Recycled water in Santa Clara County totals 9,881 acre-feet in FY 03-04 Construction of the Silver Creek Pipeline completed in summer of 2004. Completed Advanced Recycled Water Treatment Feasibility Study. 	<ul style="list-style-type: none"> Recycled water in Santa Clara County totals 11,315 acre-feet in FY 04-05.



The District has entered into recycling partnerships with all four recycled water producers in Santa Clara County: the South Bay Water Recycling Program (SBWR) operating out of the San Jose/Santa Clara Water Pollution Control Plant, the Sunnyvale Water Pollution Control Plant (Sunnyvale WPCP) and the South County Regional Wastewater Authority (SCRWA) in Gilroy. In FY 04-05, the District began studies of plant and soil limitations to recycled water quality and the site specific best management practices for use of recycled water for the City of Mountain View and the Palo Alto Regional Water Quality Control Plant (Palo Alto RWQCP).

COUNTYWIDE TOTAL RECYCLED WATER USE/TOTAL WATER USE (ACRE-FEET/YEAR)

FISCAL YEAR	SOUTH BAY WATER RECYCLING PROGRAM	SUNNYVALE WATER POLLUTION CONTROL PLANT	SOUTH COUNTY REGIONAL WASTEWATER AUTHORITY	PALO ALTO REGIONAL WATER QUALITY CONTROL PLANT	TOTAL RECYCLED WATER USED IN COUNTY
98-99	2,357	—	—	—	2,357
99-00	5,002	439	896	63	6,401
00-01	5,409	944	708	63	7,124
01-02	6,037	1,210	487	66	7,800
02-03	6,177	1,602	536	53	8,368
03-04	7,246	1,816	619	200	9,881
04-05	6,320	1,786	1,609*	1,600*	11,315

*Note: SCRWA and Palo Alto started to account treatment plant internal use in FY 04-05

The District sees desalination as a viable way to diversify its water supply portfolio. The 2003 Integrated Water Resources Plan identified two preliminary objects for desalination: help augment the District’s current water resources, and provide greater drought or emergency reliability by serving as a consistent, long-term water supply source.

SOUTH BAY

Water Recycling Program



Evergreen College has been a long-time recycled water customer.

The South Bay Water Recycling (SBWR) Program, administered by the City of San José, produces the majority of recycled water delivered within Santa Clara County. In FY 04-05, the program produced 6,320 of the total 11,315 acre-feet of recycled water used in the county.

The SBWR Program was created to reduce the environmental impact of freshwater effluent discharged into the salt marshes of the south end of San Francisco Bay to help protect two endangered species: the California clapper rail and the salt marsh harvest mouse. The state requires that the San Jose/Santa Clara Water Pollution Control Plant keep summer wastewater flows below 120 million gallons per day.

The District has been working with the City of San José on its recycled water program since 1994, providing financial and technical support for system expansion, and acting as a liaison with water retailers. In addition, the District has provided financial incentives since 1995 for recycled water used to displace potable water. The partnership between the District and the City of San José provides for distribution of recycled water within the cities of San José, Santa Clara and Milpitas.

In January 2002, the San José City Council and District Board of Directors agreed to develop an institutional framework for the long-term ownership, operation, maintenance and future expansion of South Bay Water Recycling that most effectively meets the needs of the community. The collaborative effort defines the relationship between the District and the SBWR Program, and helps balance the water supply and wastewater discharge needs of the South Bay community.

Facilities and Customers

The combined costs of Phases 1 and 2 of the SBWR Program is \$220 million. One hundred miles of pipeline were constructed. The system is capable of delivering 21 million gallons per day (mgd) and so far has had deliveries above 11 mgd on hot summer days. It serves more than 500 customers, mainly for landscape irrigation at parks, schools and golf courses. Industrial users were initially slow to accept recycled water, but their number has increased over the years. With the recent addition of Los Esteros Critical Energy Facility, the Donald Von Raesfeld Power Plant (also called Pico Power Plant), and Metcalf Energy Center (MEC), industrial use is soon expected to comprise a good deal of SBWR's demand. Industrial uses of recycled water include water processing for manufacturing and cooling towers. Dual plumbing for non-potable restroom uses is also increasing, especially in industrial high-rise developments. Several commercial complexes including Nortel, Yahoo! and Cisco are dual-plumbed for toilet flushing. Recently, the new San Jose City Hall and the Martin Luther King Jr. Library were also dual plumbed for use of recycled water.

Silver Creek Pipeline/Coyote Valley Specific Plan

The District entered into an agreement with the SBWR Program and invested approximately \$5.5 million, or 25% of total construction costs, in seven miles of the 30-inch Silver Creek Pipeline. The pipeline delivers approximately 3,000 acre-feet per year of recycled water to Metcalf Energy Center in the north end of Coyote Valley. This new Calpine power plant started operation in June 2005 using recycled water for its cooling towers. As part of the agreement with the SBWR Program, the District maintains the sole right to use capacity of 5 mgd and any unused capacity of the total 15 mgd, and becomes the recycled water wholesaler to the Santa Teresa area and Coyote Valley.

The Silver Creek Pipeline Agreement with the SBWR Program will become the foundation to supply recycled water to the Coyote Valley Specific Plan



The new Martin Luther King Jr. Library in San Jose is dual-plumbed to use recycled water for all toilet flushing.



Preliminary land-use map for the proposed Coyote Valley Specific Plan.



Development, a “new town” envisioned to create 50,000 jobs and 25,000 housing units in North and Mid-Coyote Valley while establishing a permanent greenbelt in South Coyote Valley.



Los Lagos Golf Course is one of the many golf courses receiving recycled water for its irrigation.

The District’s Water Supply Availability Analysis projects the water demand from this development to be 16,000 to 20,000 acre-feet per year. The analysis identifies recycled water as the key component for sustainable development due to its drought-proof nature. Finally, advanced treated recycled water could be used for non-potable uses to offset demand on the Coyote Subbasin, which has a limited storage capacity. The estimated recycled water demand for non-potable uses is 4,000 acre-feet per year.

The analysis also suggests that advanced treated recycled water could provide source water for supplementing the groundwater subbasin. It has been agreed between the City of San José, the District and other stakeholders in the South Bay Water Recycling Collaborative process that recycled water should be advanced treated in order to ensure that groundwater quality in the sensitive Coyote Subbasin is maintained.

Reimbursement Agreement/Distribution Cost

The District continues to provide financial assistance to recycled water purveyors of \$115 per acre-foot of recycled water, because this supplements the county water supply and strengthens the reliability and diversity of the District’s water portfolio. The original five-year agreement, from July 1, 1997 through June 30, 2002, was renewed for three more years through June 30, 2005. The agreement is renewable for additional terms by the mutual approval of the District and the city up to a maximum of 25 years. At the time of this writing, both the District and the city are planning to renew the reimbursement agreement for another term.

The District also has been exploring more active partnership roles in water recycling with SBWR. An alternative could be cost sharing on expansion projects. Similar to the Silver Creek Pipeline arrangement, the District could provide a financial contribution to a construction project in exchange for exclusive system capacity which would allow the District to be the wholesaler in new service areas. The District and city staff meet on a regular basis to explore and develop new partnership opportunities and joint projects that will expand the use of recycled water.

Why is it opportune to consider recycled water use in upcoming future developments, including Coyote Valley and North San Jose?

Early large-scale development in an area, including the planning of a new town, provides a unique opportunity to cost-effectively develop the infrastructure for recycled water delivery.

While recycled water is being deployed throughout the county, its pace of deployment can be economically accelerated in a new development. Long-term new water supply demands throughout the county may all require some recycled water component in order to meet these demands. North San Jose development and Coyote Valley should not be exempted.

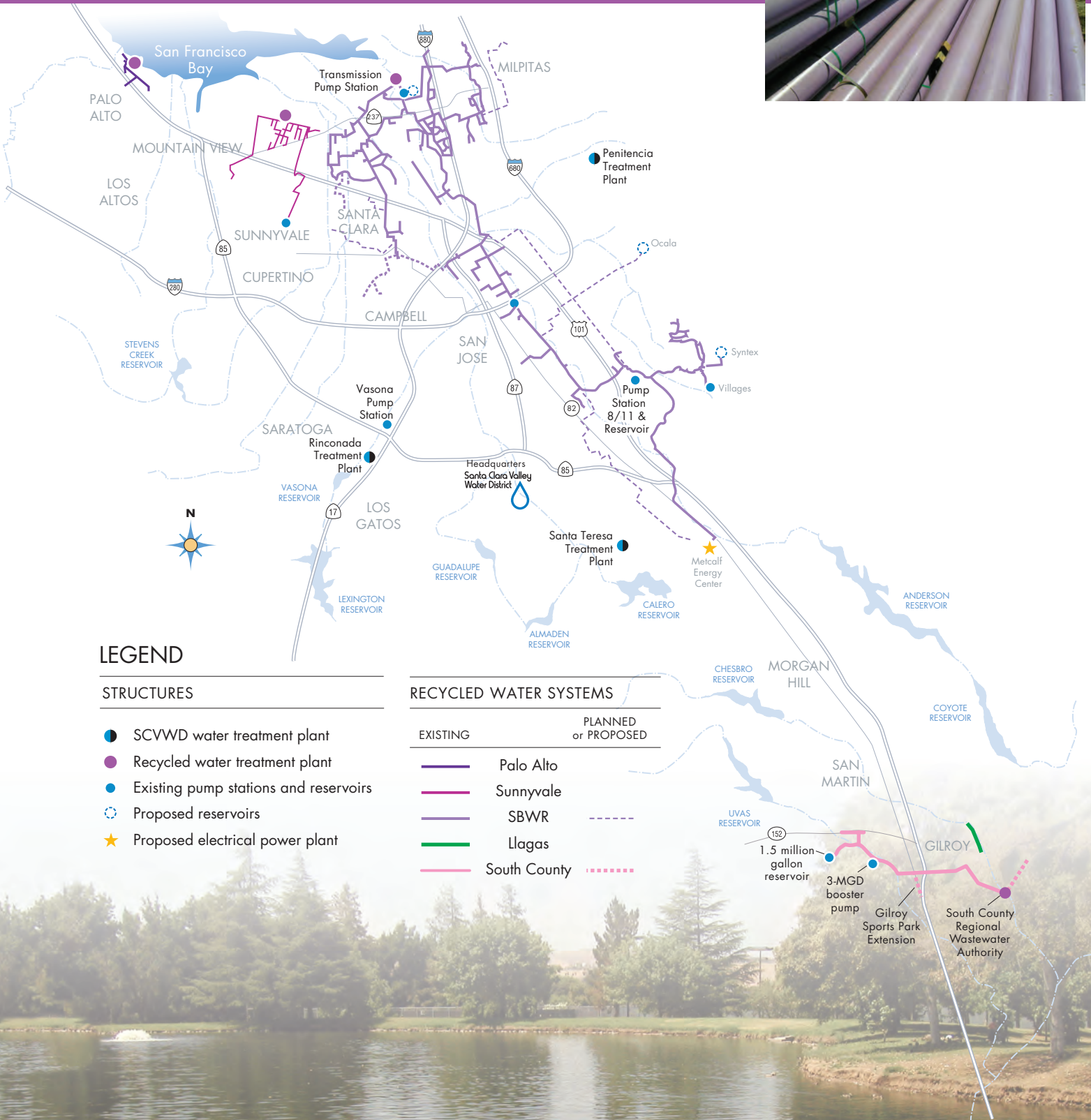
The City of San José's vision for the Coyote Valley development amounts to the creation of a minimum of 25,000 households, 50,000 jobs and 80,000 people. The City of San José also has new development plans for the area in North San Jose. The District's goal is to work collaboratively with the city and other stakeholders to ensure a shared vision for a sustainable and environmentally sensitive development that contributes to an enhanced quality of life for the existing and future residents of Coyote Valley, the City of San José and all of Santa Clara County.

Constructing recycled water infrastructure may cost the least in new developments — including North San Jose and Coyote Valley — where there are few existing structures that would need to be modified or built around. In the long term, current surface water supplies are only getting more expensive and are not drought tolerant. However, treating recycled water to higher qualities is getting cheaper and cheaper as the technology improves. In terms of treatment costs, the advances in this reverse osmosis water quality improvement technology and its decreases in costs over the last few years make recycled water increasingly attractive for the future. Advances in reverse osmosis technology are creating new sources of water for a growing number of communities, including a community in Southern California where reverse osmosis is used to produce high-quality recycled water that is then pumped into the ground for later reuse. Average costs have been estimated at about \$600 per acre-foot. These costs are generally comparable to other water supply options.



The Zone Three Reservoir is under construction and will have a storage capacity of 55 million gallons.

Recycled Water in Santa Clara County



LEGEND

STRUCTURES

- SCVWD water treatment plant
- Recycled water treatment plant
- Existing pump stations and reservoirs
- Proposed reservoirs
- ★ Proposed electrical power plant

RECYCLED WATER SYSTEMS

EXISTING	PLANNED or PROPOSED
	Palo Alto
	Sunnyvale
	SBWR
	Llagas
	South County

PALO ALTO

Recycled Water

Recycled Water Expansion Plan for Palo Alto

The Palo Alto Regional Water Quality Control Plant (RWQCP) serves Palo Alto, Mountain View, Los Altos, Los Altos Hills, Stanford University and the East Palo Alto Sanitary District. In 2004, RWQCP delivered 1,125 acre-feet of recycled water, which included 1,000 acre-feet of treatment plant processing use that was not recorded in the previous years.

In 2004, RWQCP completed the planning phase of its Palo Alto-Mountain View Pipeline Extension with the goal of replacing the existing pipeline to the Shoreline Golf Course and extending the pipeline to the Mountain View-Moffett area for landscape irrigation. The proposed pipeline will likely follow the levees near the Palo Alto Refuse Center along Matadero Creek, and will be located adjacent to East Bayshore towards Mountain View. The pipeline replacement helps fulfill RWQCP permit requirements. To mitigate the discharge of treated wastewater to San Francisco Bay, the RWQCP is required to operate and maintain the Water Reuse Program.

Engineering and design of this project started in summer 2005 and construction is expected to start in 2006. The project cost will be shared between the RWQCP and the cities of Palo Alto and Mountain View. The project is also scheduled to receive a state grant to help finance construction.

This \$16 million project was at risk at one point when the City of Mountain View became concerned about the sensitivity of redwood trees to the salinity in recycled water. The District stepped in, offering a “Solutions Project” to ensure recycled water, properly applied, would not contribute to any redwood tree or landscape decline. This “Solutions Project” also garnered the interests of the cities of Santa Clara and San José, which joined the effort.

This project evaluates soil and drainage issues site specifically, among other things, and will develop solutions or best management practices based on the specific landscape, soil and water quality.

The Solutions Project helped get the project back on track. The mayor of the City of Mountain View expressed his appreciation by sending a letter to then-District Board Chairman Joe Judge.

SUNNYVALE

Recycled Water



Support for Sunnyvale Water Pollution Control Plant

The City of Sunnyvale has experienced a slight decrease in recycled water consumption and a meaningful decrease in potable water consumption, primarily due to a combination of wet weather and economic downturn. The District has provided a financial incentive to the City of Sunnyvale's water recycling program since 1997 at the rate of \$115 per acre-foot of recycled water used to offset potable water use. The reimbursement agreement that covered the period from 1997-2002 came to a close and the District signed a continuation agreement for another three-year period through June 2005. The reimbursement by the District helped the city offset the deficit between revenues and expenses, and enabled the city to make additional capital improvements to increase system reliability and expand system capacity. At the time of this writing, both the city and the District are planning to renew this reimbursement agreement for another term.

The Sunnyvale WPCP plans to expand its water recycling systems in order to meet state and federal discharge requirements. Staff from the City and the District have had preliminary discussions on developing a long-term comprehensive operating strategy and on near-term recycled water expansion opportunities. Expansion could include improvements to the reliability of the system, and provide improved hydraulic stability and greater versatility by "looping" the system. Possible expansion could include serving recycled water to Moffett Field Golf Course and a proposed new development at NASA Ames. Serving these new customers may require a collaborative effort between the District, the City of Sunnyvale, the City of Mountain View, the City of Palo Alto and San Francisco Public Utilities Commission. This work will require significant improvements to the distribution system. The looping of the system, as well as additional storage and pumping capacity, would be required to provide water in sufficient quantity and pressure to meet the demands of customers within the city limits.

SOUTH COUNTY

Recycled Water

District Takes on Different Roles for Recycled Water

The District maintains different roles in the county in recycled water. For example, in south Santa Clara County, the District is a wholesaler of recycled water. South County Regional Wastewater Authority is the producer of recycled water and the City of Gilroy is the retailer. The District, Gilroy and SCRWA have producer-wholesaler-retailer agreements in place delineating their respective roles and responsibilities. This is different in the north part of the county where the District is not a producer/wholesaler/retailer of recycled water. The District takes on a partnership role and enters into different agreements for joint pipeline construction projects, recycled water reimbursement incentives, or joint water quality studies that all lead toward the goal of expanding recycled water used in the county.

Background

In 1977, the Santa Clara Valley Water District, the City of Gilroy and the Gavilan Water Conservation District (which was merged with the District in 1989) began a partnership to construct and operate a recycled water system extending from the SCRWA treatment plant southeast of Gilroy to several customers along Hecker Pass Road. The system operated sporadically for about 20 years.

In 1999, the District and the SCRWA entered into a Producer and Wholesaler Agreement to take tertiary treated water from the wastewater treatment plant and sell it to local users, including farmers, parks and golf courses. The agreement states that the District owns and operates the distribution facilities up to the point of connection with the SCRWA treatment plant. The agreement requires the District to execute the first phase of capital improvement projects to upgrade the existing old distribution facilities to a more reliable, modern recycled water system. In summer 2002, a new 3 mgd booster pump station in Christmas Hill Park and a 1.5 million gallon reservoir above Eagle Ridge Golf Course commenced operation. The District and SCRWA agreed to work together to create and approve a Master Plan for the design and construction of facilities for the distribution of recycled water in the SCRWA service area. The cost of outside consultants to prepare the master plan was shared by both agencies.



The Gilroy Sports Park, currently under construction, is slated to use recycled water. This 63-acre sports park will contain 12 lighted multi-purpose fields, informal recreation areas and a Uvas Creek trail extension.



The new 3 million gallons-per-day grant-funded water reservoir in the SCRWA treatment plant

South County Recycled Water Master Plan

Since July 2003, the District contracted with Carollo Engineers to develop the South County Recycled Water Master Plan. The master plan defines immediate-term, short-term and long-term capital improvement programs. The Immediate-Term CIP defines projects the District and SCRWA can implement within the next year or so to increase recycled water use and reliability. The Short-Term CIP includes projects that can be implemented in approximately the next five years to expand the customer base. The Long-Term CIP could change as the result of changes in project conditions, customer needs and the identification of other feasible projects.

Immediate-Term Project

In December 2004, the District and SCRWA Boards approved the implementation of the Immediate-Term Project of the master plan program.

The Immediate-Term project joins SCRWA's tertiary filter expansion project to eliminate the duplication of engineering and construction mobilization, since all construction activities will be within the perimeter of the treatment plant. CEQA compliance was completed and construction started in spring 2005. The project consists of the following components:

- 4,800 feet of 20-inch distribution pipelines
- 3 million gallon reservoir
- 3 mgd Pump Station
- 6 mgd Tertiary Filtration Expansion

The joint project is scheduled to receive a grant from the California State Water Resources Control Board to offset 25 percent of the total project cost.

The name "Immediate-Term" describes the urgency of expanding recycled water capacity. While a number of satisfied recycled water customers are demanding additional volume, the existing system simply cannot be stretched enough to meet the demand. Calpine requested an additional 1,200 gallons per minute of recycled water for its co-generation plant after its satisfactory experience cooling its Gilroy Energy Center cooling towers with recycled water. However, the existing recycled water system can supply only part of the demand. The District is negotiating with Calpine to jointly expand the distribution system by constructing the Short-Term phase pipeline of the master plan.

In June 2005, the District entered into a contract with RECON to develop an Environmental Impact Report for the master plan projects. The report is expected to be completed in summer 2006.

DESALINATION

Bay Area Regional Desalination Project

The Bay Area's four largest water agencies, East Bay Municipal Utility District, the San Francisco Public Utilities Commission, Contra Costa Water District and the Santa Clara Valley Water District, are jointly exploring development of regional desalination facilities that would benefit 5.4 million Bay Area residents and businesses. The Bay Area Regional Desalination Project may consist of one or more desalination facilities with an ultimate total capacity of up to 65 million gallons per day. The regional desalination project would:

- Provide replacement sources of water during emergencies such as earthquakes;
- Provide a supplemental supply source during extended drought periods;
- Allow other major facilities, such as treatment plants, transmission mains and pump stations, to be taken out of service for an extended period of time for maintenance or repairs; and
- Increase the diversity of the agencies' water supply portfolios by providing a full-time supplemental water supply, which would increase reliability.

In October 2003, the regional partner agencies completed a Phase 1 pre-feasibility study that evaluated the construction of regional desalination facilities. Site selection for a desalination plant is one of the most important decisions in the development process as it may have a substantial impact on cost, schedule and potential environmental effects.

Near Bay Bridge site, Oakland





Opportunities to locate near power plants and bay discharger sites were sought, since they offer potential power cost savings, brine dilution opportunities and other environmental benefits. The Phase 1 pre-feasibility study concluded that there are at least three locations in the Bay Area where a regional desalination facility could be located without any fatal flaws. A systematic preliminary screening of potential Bay Area sites was completed. A two-step screening process narrowed the list of potential sites from over 20 to 13 and then to 3. The three Santa Clara County brackish groundwater sites fell off the top rankings because their yields were very small from a regional supply perspective. The three sites that ranked highest were:

- Mirant Pittsburg power plant, Pittsburg (east Contra Costa site)
- Near Bay Bridge, Oakland
- Oceanside, San Francisco

Preliminary cost analysis indicated that siting a desalination plant at the Mirant Pittsburg Plant site would be the most cost-effective, followed by the Near Bay Bridge site and, finally, the Oceanside site.

The analysis is being refined as part of the feasibility study. Siting a regional desalination plant presents many regulatory and technical challenges. Cooperation of the four partner agencies in this effort will enhance the project's chances of success. Depending on the preferred facility locations and capacities, construction of additional pipelines and pump stations may be necessary. The Phase 2 pre-feasibility study will be conducted to further evaluate the three sites identified in the Phase 1 and Phase 2 pre-feasibility study to better define the desalination project facilities. The planned uses of the product water by each of the agencies, the institutional arrangements between the agencies, geotechnical and hazardous waste reconnaissance, preliminary environmental screening, and the conceptual engineering design of the treatment facilities will be conducted.

The preliminary project cost for facilities to deliver up to 65 million gallons per day is estimated at \$200 million to \$500 million, depending on the location and capacity of the facilities. Costs will be refined after completion of environmental review and selection of preferred project locations and capacities. The cost-share arrangements for the project will be based on the respective benefits received by the four agencies, and by any other parties that may be identified as potential partners and beneficiaries.

ACCOMPLISHMENT

In mid-2005, the partners were informed that the project will receive \$250,000 from state Proposition 50 funds to complete the feasibility study portion of the project.

A project description will be developed after comprehensive technical, environmental, regulatory and cost information is available. The elected boards of participating agencies will then decide how to proceed with desalination facilities. If a specific project is selected, necessary inter-agency agreements will be developed to finance, design, build and operate the facilities.

NEXT STEPS

A detailed feasibility study, piloting and environmental studies will be conducted as the next steps (estimated to cost approximately \$4 million). State and federal funding will be sought for the regional project. This level of study is needed to provide more information on potential benefits, location and type of facilities, appropriate technologies, environmental impacts, and to estimate costs of the various options. Public outreach will occur during the feasibility study phase of the project and will expand during the environmental portion of the study.

- Piloting at several sites (one year)
- Environmental study and public outreach
- Final design and construction



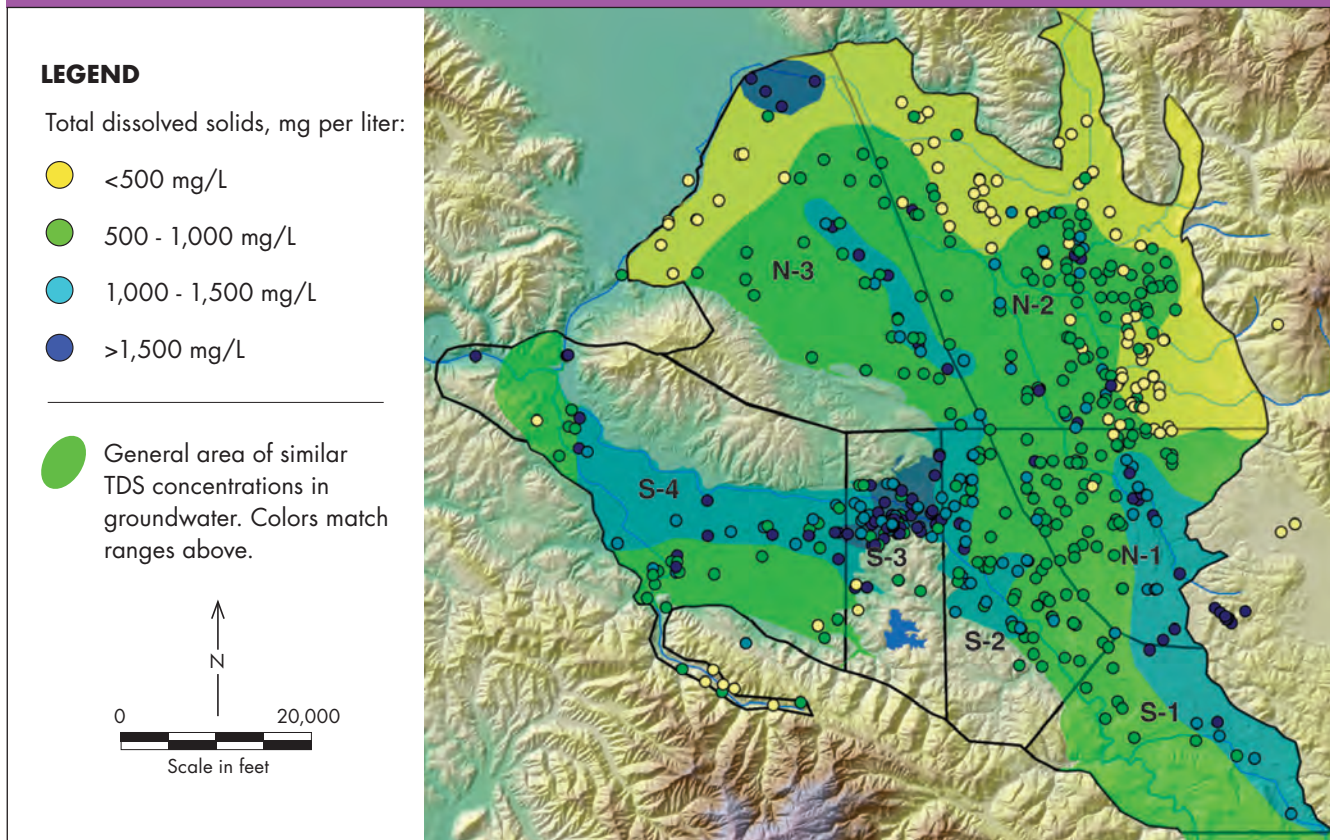
Regional Brackish Water Desalination Project

The San Benito County Water District and the Santa Clara Valley Water District have recently entered into a memorandum of understanding to study opportunities for improving water supply efficiencies and reliability within the Pajaro River watershed. Both agencies also executed a memorandum of understanding to conduct a joint brackish water desalination project. The Pajaro River joins the northern portion of San Benito County and the southern portion of Santa Clara County. In addition to this common watershed, the agencies share an imported water supply via the Central Valley Project's San Felipe



Example of a membrane treatment facility for desalination.

Levels of Total Dissolved Solids (TDS) in the San Juan Groundwater Basin



System. Although the upper Pajaro River Watershed already offers each of the agencies a local groundwater supply to complement their CVP imported supply, several pockets of historically poor quality groundwater lie within the watershed unusable to either of the agencies as a municipal and industrial (M&I) water supply. As one strategy to complement their CVP supply with a reliable local source, these agencies are interested in conducting a feasibility study to investigate a brackish groundwater desalination facility in the region. A groundwater desalination facility in this region may be feasible, considering the value of supply reliability that it brings to the area. Other benefits that it would provide are:

1. Managing groundwater level management
2. Reducing the need for water softeners in the service area
3. Enabling M&I effluent to be used as an alternative agricultural irrigation supply, thereby offsetting additional CVP demand, and, in turn
4. Providing an effluent management option for local agencies that relieves further salt loading of the basin.

PROJECT SETTING

The Regional Brackish Water Desalination Project is a feasibility study that will examine options for the desalination of brackish groundwater for municipal and industrial (M&I) use in the San Juan groundwater basin, an area within the upper Pajaro River watershed with well documented high groundwater salinity. Two municipalities, the City of Hollister and the City of San Juan Bautista, are near the San Juan groundwater basin, and could use demineralized groundwater from this basin to supplement their existing M&I supplies.

PROJECT GOALS AND OBJECTIVES

The feasibility study has four main goals:

- Evaluate the feasibility and cost-effectiveness of treating brackish groundwater for potable use
- Assess different treatment technologies and brine management methods to provide the highest level of benefits possible to the project partners
- Analyze the groundwater quality and depth in multiple locations to determine the optimum site for the groundwater extraction wells and corresponding desalination system
- Quantify the offset of CVP water due to the use of local groundwater as a new, alternative potable water source

In addition, the feasibility study will provide a basis to determine whether groundwater desalination is a viable method to provide alternative potable water supply to users in the San Juan basin. The results of this study will allow the work performed at this site to be used as a demonstration site for other inland, brackish groundwater treatment locations.

ACCOMPLISHMENT

In mid-2005, this project was identified by the California Department of Water Resources to receive \$245,000 from Proposition 50 grant funds for the \$490,000 feasibility study.

SCHEDULE

This project is scheduled for completion in early 2007.





WATER RECYCLING EDUCATION AND OUTREACH

Networking with cities and wastewater treatment plants

The District networks with area cities and wastewater treatment plants to ensure that the costs of future water supply and sewage treatment are balanced to provide the most efficient use of resources for the community. The District also provides staff support for its Water Retailers Recycling Subcommittee, Agricultural Water Advisory Committee and Landscape Advisory Committee. Staff members also track technical and regulatory developments that affect the production and use of recycled water, and participate in statewide recycling organizations and activities.

WATER RECYCLING & DESALINATION GRANTS AND COST-SHARING AGREEMENTS

FY 04-05 was a successful grant revenue year for the District. Funding from the California Department of Water Resources Proposition 50 grant totaled \$1,184,500 for water recycling and desalination projects and studies. The WUE Unit also finalized agreements and is conducting many different projects this year. These projects include:

- \$60,000 ■ Water Softener Program (full scale):
After the successful pilot program, the District and San Benito County Water District jointly applied and were recommended a grant of \$300,000 from DWR to further the replacing of old, inefficient water softeners
- \$257,000 ■ Feasibility of brackish groundwater reuse:
DWR grant through MWD
- \$300,000 ■ Impact Evaluation of Stream Flow Augmentation with Tertiary Recycled Water:
DWR Grant through MWD
- \$243,000 ■ EPA II Desalination Research Grant through MWD:
Low-Fouling Membrane Pilot Study
- \$122,000 ■ Brackish Groundwater Desalination Feasibility Study:
Proposition 50 grant
- \$62,500 ■ Bay Area Regional Desalination Project:
Proposition 50 grant
- \$1,000,000 ■ South County Immediate-Term Construction Project:
Proposition 50 grant

WATER RECYCLING & DESALINATION STUDIES AND RESEARCH

District governance policies call for the expansion of water recycling in Santa Clara County, while at the same time ensuring that groundwater basins are protected from threat of contamination. To fulfill these goals, the District is working to identify new markets and uses for recycled water, while also conducting research to evaluate the effects that existing and planned recycled water projects may have on groundwater quality. While recycled water is currently used for large landscape irrigation, agriculture, and some industrial processes, it may also have uses for environmental purposes, such as enhancing stream flows, reservoirs and wetlands. A renewed focus on advanced treated recycled water is under consideration for groundwater recharge. Expanding recycled water applications will require increased monitoring of soil and groundwater quality, as well as advanced levels of treatment depending on where and how recycled water is used.

Research will also investigate treatment methods to expand water recycling options and protect groundwater. Current research studies are described below.

Characterization of Salinity Contributions in Sewer Collection and Reclaimed Water Systems

The District is participating in this nationwide study to determine the amounts of salt contributed to reclaimed water systems by different sectors, specifically residential users, restaurants and industrial/commercial operations. The study will result in best management practices to control salinity coming into a wastewater treatment plant. (Timeline: May 2002 to December 2005)

Advanced Treatment Project: Electrodialysis Reversal/ Reverse Osmosis (EDR/RO) Comparison Pilot Study

The District developed agreements with the City of San José and Metropolitan Water District of Southern California to support (via a California Energy Commission grant) and participate in the study to investigate desalination capabilities of reverse osmosis and electrodialysis equipment, focusing on the removal of dissolved solids from recycled water. The study demonstrated the technical feasibility of advanced water treatment and provided detailed cost data useful in planning for larger treatment works. The project was completed in early 2005, and a final report was accepted by the California Energy Commission. The completed final report was also distributed to recycled water purveyors for information sharing.



New San Jose City Hall with dual plumbing and ornamental fountain designed to utilize recycled water, starting in early 2006.

TO CONSERVE WATER, THIS BUILDING
USES RECLAIMED WATER TO FLUSH
TOILETS.



Potential San Francisco Bay Area Desalination site in east Contra Costa County

Low-Fouling Membrane Pilot Study

The District is the recipient of an EPA grant to perform a pilot study to evaluate the performance of low fouling RO membranes with varied pretreatment of tertiary treated recycled water. The effectiveness of RO is dependent in large part on the type of pretreatment applied to the source water. The use of microfiltration (MF) as a pretreatment for RO has proven effective but expensive. It is feasible that low-fouling RO membranes could operate successfully when integrated into the existing local treatment facilities by using tertiary treated water as the sole pretreatment for RO. The cost savings by eliminating MF will significantly improve the likelihood of future full-scale advanced treated recycled water projects in Santa Clara County. The District will partner with the City of San José and conduct the pilot work at the Transmission Pump Station. (Timeline: May 2005 to December 2006)

Bay Area Regional Desalination Pre-Feasibility Study – Phase 1 and Phase 2

The four largest San Francisco Bay Area water suppliers (SCVWD, EBMUD, SFPUC, CCWD) have established a partnership to evaluate the feasibility of a regional desalination plant to provide water for 5.4 million residents to meet water supply reliability and emergency needs. The joint venture began in 2003, and the partnership completed the pre-feasibility work. The study participants were recent joint recipients of \$249,950 Proposition 50 funds to conduct an approximately \$500,000 feasibility study.

Pajaro Watershed Brackish Groundwater Desalination Feasibility Study

The District and San Benito County Water District are the joint recipients of \$245,000 in Proposition 50 grants to conduct a \$490,000 brackish water feasibility study in the Pajaro River basin.

Memorandum of understanding (MOU) negotiations are currently under way with SBCWD.

Palo Alto/Mountain View Solutions Project

This project is evaluating the limits to the sustainable use of recycled water for landscape irrigation. Soil from Mountain View and from throughout the county is being tested at UC Davis against water samples varying in sodium and total salt concentration to determine the effects of the water on soil structure.

The project has also engaged researchers in the horticulture department at UC Davis to determine the sodium and chloride tolerances of Coast redwoods, the city tree of Mountain View and a highly sensitive species. When the investigatory part of the project is complete, the District will formulate site-specific best management practices for recycled water use in Santa Clara Valley.

Research Studies with Stanford University

In FY 03-04, the District and its research partner, Stanford University, embarked on two grant-financed research studies entitled “The Feasibility of Brackish Groundwater Reuse” and “Impact Evaluation of Streamflow Augmentation with Tertiary Recycled Water.” The two grant projects have secured state grants from the California Department of Water Resources through the Desalination Research and Innovation Partnership (DRIP) administered by the Metropolitan Water District of Southern California.

(A) THE FEASIBILITY OF BRACKISH GROUNDWATER REUSE

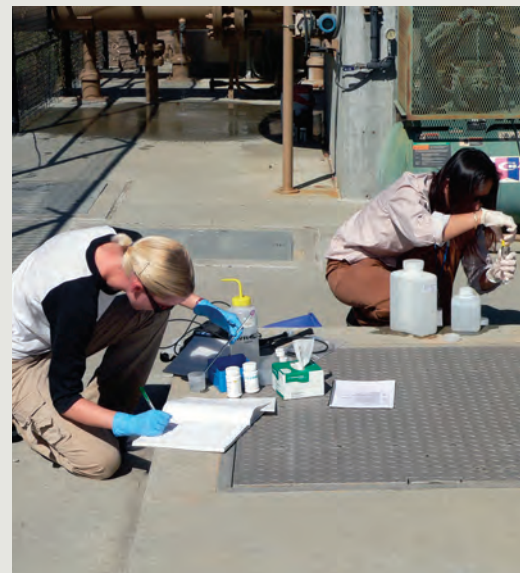
The research project “The Feasibility of Brackish Groundwater Reuse” will investigate the feasibility of implementing brackish groundwater reuse in Santa Clara County to supplement expected shortages in future supplies of potable water. The project will have the potential to identify a new source of supply. The project will demonstrate the technical and economic feasibility of treating brackish groundwater with state-of-the-art-technology to a suitable quality for beneficial uses. (Timeline: December 2003 to December 2006)

(B) IMPACT EVALUATION OF STREAM FLOW AUGMENTATION WITH TERTIARY RECYCLED WATER

This project will investigate whether dechlorinated recycled water can be used to augment stream flows. The study will assess the potential of fate mechanisms (including photochemical degradation, adsorption, and biotransformation), and assess the fate of contaminants during percolation to groundwater. In addition, if results indicate adverse effects on groundwater or stream ecology, appropriate treatment methods for the augmentation water will be evaluated. The partnership with Stanford University enables the District to use the latest methodology available to detect trace levels of pharmaceuticals and endocrine-disrupting compounds. In spring 2005, the District began baseline monitoring. Preliminary monitoring of the recycled water supply detected no pharmaceuticals, and revealed trace levels of hormone compounds that are just above the “no detect” level. Water quality monitoring will continue in 2005 to collect data on existing conditions in surface and ground water. The District will apply for a NPDES permit to discharge recycled water into Upper Silver Creek, the selected discharge point. (Timeline: December 2003 to June 2007)

n-Nitrosodimethylamine (NDMA) Fate and Transport

NDMA is a carcinogen sometimes found in recycled water. The District participated in a statewide study conducted by a leading research team led by Dr. David Sedlack of University of California, Berkeley. The primary objectives of the project were to understand the fate and transport of NDMA in soil and groundwater when recycled water is used for spray irrigation and indirect and/or direct groundwater recharge. These have been accomplished



District and Stanford staff sample recycled water at the Yerba Buena pump station.



by documenting and assessing any current fate and transport data, and through field and laboratory experiments. One local site in Santa Clara County was part of the study. (Timeline: February 2003 to May 2005)

The proposed research project employed a combination of laboratory and field studies to address the attenuation of NDMA, and to identify the mechanisms responsible for that attenuation. Laboratory experiments will be conducted to quantify physical removal (e.g., volatilization from soil after landscape irrigation), chemical transformation (e.g., transformation in survey water conveyance systems, in ponds used for irrigation storage, and spreading basins used for groundwater recharge) and biotransformation (e.g., metabolism by soil bacteria). Predictions from laboratory experiments will be tested by comparison with soil column studies and data collected at field sites where water reuse is practiced. Results from the laboratory experiments, column studies, test plot studies and field measurements will be integrated into a final report to present the study results. One desired outcome of the study is to provide practitioners of water reuse with recommendations to minimize the potential for contamination of groundwater with NDMA. This work will likely be funded in subsequent phases of the project. (Timeline: April 2003 to November 2005).



District staff monitoring the ground water

Groundwater Monitoring

The District continually monitors groundwater quality and is expanding its monitoring network to target areas where recycled water is used for irrigation. The monitoring data will be used to detect and correct problems early on, before they have a chance to develop. (Timeline: ongoing)

Pilot Water Softener Rebate Program Study

The District implemented a Pilot Water Softener Replacement Rebate Program in 2003-2004. The Program, funded in part by a Proposition 13 grant from California Department of Water Resources, was designed to test the effectiveness of providing financial rebates to existing water softener owners to promote the replacement of old, timer-based water softeners with more efficient Demand Initiated Regeneration (DIR) water softeners. Water softeners installed in the county were predominantly timer-based devices. These water softeners were found to be significantly less efficient and to use large amounts of salt for regeneration when compared to newer DIR models. The DIR models implement ion exchange only when a hardness limit is exceeded, thereby limiting discharge of salt-laden water to wastewater treatment plants. The program provided a rebate incentive of \$150 for residents in the county who replaced their timer-based water softener with (1) a DIR water softener,

or a non-regenerating water filter; or (2) one using centralized off-site regeneration. The program concluded in September 2004 with 400 rebates given to participating residents in the county.

The success and innovative approach of this program received great interest from local and regional parties. On July 8, 2005, the District and DWR jointly sponsored a workshop, "A Salinity Management Strategy –Water Softener Replacement Rebate Program." More than 60 interested participants representing 28 entities throughout California learned about salinity management issues related to water softeners on the state and local levels.

Development of a full-scale Water Softener Replacement Rebate Program is under way. The program will be a regional effort among the District, San Benito County Water District, and South County Regional Wastewater Authority. The District and the SBCWD jointly applied for—and were informed that they will receive—a \$300,000 grant from the Department of Water Resources under Proposition 50. The District will receive \$150,000 from the grant, which will go toward 1,000 Santa Clara County rebates of \$150 each for the replacement of older water softeners with newer and more efficient water softeners.

SCRWA service area is characterized as having hard water, and the area already has a prevalence of water softening devices. A water softener replacement rebate program is one solution to managing salt entering the flow to the SCRWA facility. As an incentive program for managing salinity issues, SCRWA will contribute an additional \$30,000 towards an additional 200 rebates earmarked specifically within SCRWA's jurisdiction area. (Approximate timeline: October 2005)




Water Utility Deputy Operating Officer Keith Whitman addresses water softener workshop participants.





**Santa Clara Valley
Water District**



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