



Annual Review 2002

Coachella Valley Water District

Includes:

—Water quality report

—Water management issues

—Colorado River update



LEGEND

SOUTHERN PACIFIC AIRLINE
CITY BOUNDARY	-----
COUNTY BOUNDARY	-----
STATE BOUNDARY	-----
STATE HIGHWAY	-----
INTERSTATE	-----
ROADWAY	-----

District service...by the numbers *(As of Dec. 31, 2002)*

General information

Local government agency formed — 1918, stormwater unit, 1915.

Governing board — 5 directors elected to 4-year terms.

Fields of service — Importation and distribution of domestic water; wastewater collection, reclamation and redistribution; regional flood protection; importation and distribution of irrigation water; irrigation drainage collection, groundwater management and water conservation.

Service area — 639,857 acres, 377,776 acres in stormwater unit, lying mainly in Riverside County with territory in Imperial County and a small portion of San Diego County.

Property valuation — Properties within CVWD had a total combined full value in 2002 of \$27,867,344,456 as fixed by Riverside and Imperial County assessors and state officials in charge of utility properties.

Irrigation water service

Colorado River water use in acre-feet

Total irrigable area, acres	78,553
Active accounts	1,393
Total sales	278,521
Average daily consumption	763
Maximum daily demand	1,220
Avg. use/crop-acre (multiple crops)	3.96

System

Reservoirs	2
Storage capacity, acre-feet	1,301
Distribution system, miles	485
Pumping plants	19
Canal, miles	122

Domestic water service

Water use in gallons

Population served	219,793
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Water jargon

Acre-Foot: 325,851 gallons, enough water to cover one acre of land (about the size of a football field) one foot deep. In the Coachella Valley an acre of developed land (houses, agriculture, golf courses, lakes, etc.) typically uses an estimated six acre-feet per year.

Parts Per Billion (ppb): A measurement used by water quality professionals to determine the level of a constituent in drinking water. A reading of 1 ppb is equivalent to one teaspoon of sugar dissolved in 1,297,000 gallons—enough water for a typical Coachella Valley family for six years.

Active meter services	87,917
Average <i>home</i> use, per person/day	253
Summer, per person/day	338
Sales, billion gallons	39
Sales, acre-feet	120,719

System

Active wells	87
Reservoirs	59
Storage, million gallons	105.8
Distribution lines, miles	1,730
Fire hydrants	12,165

Urban conservation in acre-feet

Reclaimed from sewage	13,659
Imported supply since 1973	1,755,740

Water reclamation (sanitation)

Wastewater reclamation plants	6
Daily capacity, million gallons	31.8
Collector system, miles	1,040
Active services	78,483
Average population served	196,208
Average daily flow, million gallons	15.8
Annual flow, billion gallons	5.78
Annual flow, acre-feet	17,729

Regional stormwater protection, miles

Whitewater River Channel	24
Coachella Valley Channel	24.5
Eastside Dike	25.5
Detention Channel 1	3.25
Detention Channel 2	2.25
Detention Channel 3	1.75
Westside Dike	4.5
Avenue 64 Evacuation Channel	6.75
La Quinta Evacuation Channel	4.5
Bear Creek Channel	3.5
La Quinta Channel	1.75
Deep Canyon facilities	6
Dead Indian Canyon facilities	2.75
Palm Valley Channel	6
East Magnesia Canyon Channel	1.75
West Magnesia Canyon Channel	1.25
Thunderbird Channel	1
Villas Stormwater Channel	.75
Peterson Stormwater Channel	.5
Sky Mountain Channels	1.75
Rancho Mirage Drain system	3
Portola Avenue Drain system	5
North Portola Avenue Storm Drain	1.3

Agricultural drainage

On-farm lines added, miles	0
Total on-farm drains, miles	2,298
District open drains, miles	21
District pipe drains, miles	166
Acreage with farm drains	37,425

This *Annual Review* of recent activities that could affect Coachella Valley water users is sent to households and property owners within the boundaries of Coachella Valley Water District to help them make informed decisions about their water supply.

It has been a year of peaks and valleys concerning Coachella Valley's water future. District staff and

Message from the general manager

directors, led by former general manager-chief engineer Tom Levy negotiated almost daily throughout the year to attempt to settle Colorado River issues by the end of the year. This was necessary to allow California time to develop new water supplies and conservation techniques before the state would be cut to its basic entitlement of Colorado River water—a loss of more than 15 percent.

Unfortunately the four negotiating water agencies failed to approve an agreement and the federal government immediately reduced California's Colorado River use at the beginning of 2003.

Negotiations and legal battles continued at press time in April but it looked then like a major portion of that cut would be borne by Coachella Valley Water District until the issue is settled, forcing farmers to rely more heavily on their wells for irrigation and threatening the stability of the valley's groundwater basin.

During the last year the CVWD board of directors approved a valley-wide water management plan which had been several years in development. To meet the valley's future water needs, the multi-pronged plan stresses conservation but not deprivation. Besides decreased water use, the plan calls for increased importation of supplemental supplies and increased reclamation and reuse of wastewater.

Unfortunately, much of the plan counts on a stable Colorado River supply which hadn't yet materialized.

As part of the management plan, the district board recently adopted a new landscape ordinance which reduces the amount of water available to new landscaping by 25 percent. The current state-wide landscaping law doesn't take into consideration the water efficiency needs of desert areas. Other valley water agencies and cities agreed to adopt similar ordinances.



Negotiating settlement—Tom Levy, right, meets with reporters following marathon negotiations concerning Colorado River water.

3 general managers—Facing page, Tom Levy, right, swaps stories at his retirement party with his predecessor Lowell O. Weeks, left, and his successor Steve Robbins. Weeks led the Coachella Valley Water District from the mid-'50s to the mid-'80s when he retired and Levy assumed control.

Coachella Valley Water District hired only its third general manager-chief engineer in nearly half a century—and eighth since it was founded in 1918—when the CVWD board of directors on April 14 this year appointed Steve Robbins, 50, to fill the water district’s top administrative position.

Steve Robbins appointed GM

The UCLA graduate, who had been the assistant general manager for slightly more than a year, had been serving as interim general man-

ager-chief engineer since Dec. 31, following the announcement by Tom Levy that he was retiring after 30 years with CVWD, 16 as general manager-chief engineer.

Levy had been appointed as general manager-chief engineer in 1986, replacing Lowell Weeks, who served with CVWD for 36 years, 30 as general manager-chief engineer.

“I am honored that board members have confidence in my ability to manage the water district’s daily operations, especially during what promises to be very challenging times,” Robbins said. “I am humbled by the tremendous responsibilities of this position because the way Coachella Valley manages its water supply will have a greater impact on this region’s future than any other issue.”

Robbins, a California-certified engineer, has 16 years of experience with CVWD. He first came to work for the water district in 1978 as an assistant civil engineer. He had risen to become senior civil engineer with CVWD before resigning in 1984 to enter private business. Robbins would return as assistant director of engineering, a position he held from 1994 until his promotion in February 2000 to assistant to the general manager.

Robbins and his wife Karen and their three daughters live in La Quinta, where he serves on the La Quinta Planning Commission.



Security and water quality has been on everyone's mind during the last year. While we can't talk about implemented security measures, we did score well when we brought in a highly rated team of experts to evaluate your system and to prepare a plan for improvements.

We are fortunate in the Coachella Valley to have very little industry to pose significant threats to groundwater supplies. We continue to meet all governmental standards for drinking water quality. The included annual water quality report shows exactly what is in your drinking water and how much of it is there.

A significant change in the district occurred at the end of the calendar year with the retirement of former general manager-chief engineer Tom Levy.

Tom had been with the district more than 30 years, working his way up through the engineering department and serving as assistant general manager before his appointment as general manager-chief engineer in 1986.

He spent much of the last seven years in Sacramento, Washington or Los Angeles or on the telephone negotiating a Colorado River settlement. He continues to work on that project as a consultant for the district.

He sharpened his negotiating skills earlier when he and several other water leaders from throughout the state sequestered themselves in a Monterey hotel room until they negotiated what came to be known as the "Monterey Agreement" in water circles. This document changed the way State Water Project water was distributed among contractors for the water.

Under his leadership the valley water management plan and landscape ordinances were developed.

He also held leadership roles in state, regional and federal water associations.

Tom and his wife Diane have retired to San Clemente where he continues to be involved in water issues as a consultant.

While we are legally required to provide you with some of this information annually, it has always been our contention that an informed water user and voter is better equipped to make the decisions necessary to keep your water future secure.

You can read about some of these issues in more detail in this publication. Even more details about a wider variety of issues can be found on our website, www.cvwd.org.

Remember, CVWD is a local government agency. You elect your board of directors and, except under specific circumstances, the board meetings are open to the public. Meetings are held on the second and fourth Tuesdays of each month at 9 a.m. in the district's board room, Forbes Auditorium, at CVWD headquarters at Avenue 52 and Highway 111 in Coachella.

Yours very truly,



Steve Robbins
general manager-chief engineer

Published by the communications office of the Coachella Valley Water District.

John W. McFadden, president, Division I

Peter Nelson, vice president, Division IV

Russell Kitahara, director, Division V

Patricia Larson, director, Division II

Tellis Codekas, director, Division III

Steve Robbins, general manager-chief engineer

Dennis C. Mahr, editor

Robert Keeran, photo editor

Jack Porrelli, writer

For additional copies, contact:

Coachella Valley Water District

P.O. Box 1058, Coachella, CA 92236

(760) 398-2651

Cover photos: Front, lush and efficient landscaping reduces water use at Desert Willow, City of Palm Desert's municipal golf course.

Back, an artichoke goes to seed, providing a striking contrast to those unharvested in the surrounding field. **Inside back**, Rod Nason, canal and distribution system crew chief, prepares to stock sterilized grass carp in the Coachella Canal. The voracious weed eaters can eat up to six times their weight each day and have been used by the district for about 20 years as a biological control to reduce water losses and to prevent weeds from reducing the flow of Colorado River water to Coachella Valley farms.

By 2035 Coachella Valley's population is expected to increase more than 85 percent, from about 285,000 people three years ago to an estimated 529,000 residents in the next three decades.

In the lower valley—where farming has thrived for three-quarters of a century—the number of people calling the area home will nearly double, faster than in the

Coachella Valley Water Management Plan adopted

already populous upper valley; and not at the expense of agriculture, which is expected to continue to have phenomenal success for generations.

Given this growth it is impossible to reduce total water demand in the Coachella Valley. Yet, the area's aquifer already is in a state of overdraft. More water is pumped out each year than returned through natural and imported supplies. And there will continue to be uncertainty about the availability of imported water supplies until the status of the Quantification Settlement Agreement (QSA) is resolved.

Successfully managing current and future water supplies, ensuring there are sufficient quantities to meet everyone's needs, is a crucial component of Coachella Valley Water District operations. The demand for water cannot increase at the same rate as the population if there is to be enough water to go around.

CVWD thus has developed an ambitious blueprint—the *Water Management Plan*—that targets specific constituents for reductions in their water use. These reductions will keep future water demand increases at half that of residential growth increases.

To meet these demands the plan also focuses extensively on source substitutions—replacing one type of water supply with another—and projects to increase groundwater recharge.

CVWD adopted the management plan last year with very little fanfare. Two special hearings were hosted for public comment before the water district's board of directors approved the plan. These followed several public workshops throughout the valley during the last three years to give water users an opportunity for input and to seek answers to questions.

The visionaries who founded the water district in 1918 recognized the importance of water conservation and comprehensive planning for the future, but the *Water Management Plan* is the most ambitious strategy by CVWD yet.

The plan calls for a 7 percent reduction in crop irrigation demand by 2015, an ambitious goal given the

existing efficiency already demonstrated by Coachella Valley farmers. An agricultural water conservation plan will outline additional ways to reduce water demand, focusing on even greater use of drip irrigation and refinement of existing drip irrigation management and design to improve distribution uniformity.

Individual grower's water-use practices also will be evaluated through on-farm water audits on a field-by-field basis. Each will take into account any unique characteristics of the acreage and the crops grown and result in a confidential report to the farmer and spell out the land's general irrigation efficiency and recommendations for improvement, if any.

Water use by fish farms, duck clubs and greenhouses will be evaluated case-by-case.

Golf course water use also is being singled out for greater efficiency, with a 5 percent reduction in demand—for existing facilities—called for by 2010. New courses will be addressed case-by-case.

As with agriculture, golf course irrigation practices will receive significant attention. Improved sprinkler layout, increased use of computer-based systems and irrigation scheduling based on evapotranspiration information are among the techniques called for to improve efficiency.

Turf restrictions also are anticipated for new golf facilities, with regulations likely that will specify the maximum amount of area on a course that can be irrigated. Areas considered "in play"—tees, greens and small portions of each fairway—will continue to use turf while other portions of the course will not, relying instead on lush and efficient landscaping techniques.

Golf course managers also can anticipate working within what are known as maximum allowable annual water allowances for newly installed or refurbished landscaping.

Municipal water demand is targeted for the greatest reduction—10 percent by 2010. More water-efficient plumbing—ultra low-flush toilet and low-flow showerhead requirements in new and remodeled buildings, for example—will help, but since most domestic water use occurs outside the home, greater attention is being paid to landscape irrigation.

The water district in early 2003 adopted a model landscaping ordinance (see separate article) that serves as the foundation for establishing more water-efficient irrigation techniques.

In the future CVWD may establish tiered pricing for domestic water to assist in water conservation efforts, taking into account what is appropriate use during dif-

ferent seasons, and rewarding with lower rates constituents who demonstrate less water demand.

As with golf courses, maximum allowable water allowances—involving new policies and the enforcement of existing ones—are possible for parks, playgrounds, sports fields, school yards and other recreation areas.

In developing its landscape ordinance, the water district worked closely with local governments throughout Coachella Valley. This cooperative approach will continue in the development of additional policies meant to foster water conservation.

These policies likely will include requirements that alternative sources of water, such as recycled water for non-potable purposes—be used whenever practical.

The district will continue with its aggressive, innovative public information and public education efforts, and add additional staff for water conservation plans.

Reducing demand addresses only part of the challenge facing Coachella Valley with respect to water. To significantly reduce demand on groundwater, alternative sources are necessary.

For agriculture this means greater use of canal water in lieu of well water. Emerging technologies make this more viable, but conflict associated with the availability of Colorado River water will have to be resolved, or the district will have to locate and obtain—at substantially high cost—other sources of imported water.

As the lower valley's population base increases, it is expected the area will continue to garner a greater

share of recreation facilities such as golf courses. The management plan also calls for converting existing golf courses in the lower valley from groundwater to canal water, with new courses also using imported water.

The switch from the use of well water to canal water for agricultural and golf course irrigation in the lower valley will reduce significantly the amount of aquifer overdraft that portion of the Coachella Valley is experiencing.

In the upper valley, greater use of recycled water for golf course irrigation and other large volume water uses is expected. One positive from increased residential development will be greater availability of recycled water. State Water Project water exchanged for Colorado River water also will be used to irrigate upper valley golf courses.

At present this water is used to recharge the aquifer in percolation ponds west of Palm Springs.

Aquifer recharge in the lower valley has been more difficult because of a thick layer of clay that prevents water from reaching the lower, high-quality aquifer. Pilot programs are underway, however, to address this problem and be implemented in the very near future.

The aquifer beneath Coachella Valley is not in any immediate danger of going “dry,” but continued overdraft permanently diminishes groundwater storage capacity and threatens overall water quality. Water located closest to the surface has the poorest quality, making it necessary to drill deeper and deeper wells as the groundwater tables drop.

Key Elements of the CVWD Water Management Plan:

Conservation

A 10-percent reduction in urban (domestic) use by 2010

A 5-percent reduction in golf course use by 2010

A 7-percent reduction in agricultural water use by 2015

Lower Valley Groundwater Recharge

Dike #4 Recharge Facilities

Martinez Canyon (Pilot) Recharge Program

Source Substitution

Conversion of lower valley agricultural use from groundwater to canal water

Conversion of Oasis area agricultural use from groundwater to canal water

Conversion of Lower Valley golf courses from groundwater to canal water

Conversion of Upper Valley irrigation systems to recycled water

Municipal (urban) use of canal water

Even more efficient—*The attractive landscaping at Desert Willow, (facing page and front cover) Palm Desert's municipal golf course, thrives on less water than the district's new landscaping ordinance mandates. The City of Palm Desert has even stricter irrigation water use requirements.*



In keeping with the Coachella Valley Water Management Plan to assure that water is available to meet future needs, the district has adopted a landscaping ordinance designed to reduce outside water use for new developments by 25 percent. Other valley water agencies and cities have agreed to adopt similar ordinances.

Landscaping water reduced

Several years ago, Coachella Valley Water District water conservation staff, working with their counterparts from other water agencies throughout the state, helped the legislature develop a state law limiting landscape design to use no more than 80 percent of the water the entire property would require if planted in grass.

The new ordinance ratchets that down by 25 percent.

The valley-wide Landscape Water Conservation Ordinance Committee that reviewed and drafted the new model ordinance included representatives from every community in Coachella Valley, and Riverside County and the building and landscape industry representatives. Every city in Coachella Valley except

Palm Desert will be asked to adopt the same model ordinance. Palm Desert's current landscape ordinance is even more stringent in its water conservation requirements.

A representative from the Building Industry Association endorsed the ordinance at the CVWD board meeting. Builders, landscape architects and contractors have expressed frustration at the lack of a uniform ordinance throughout Coachella Valley.

Reducing domestic water demand by at least 10 percent is among crucial long-term goals established by CVWD's 35-year *Water Management Plan*, which the board approved last year. Because 70-80 percent of all domestic water use occurs outside of the home, landscape irrigation is considered a logical starting point for water conservation efforts.

"We think (this ordinance) is a reasonable step," CVWD's general manager-chief engineer Steve Robbins told the board prior to its unanimous approval of the new regulations. "It's an attempt to recognize that we do live in the desert, and that water is something we cannot take for granted."

Existing landscaping will not be affected by the ordinance unless it undergoes refurbishing.

Ensuring that every drop of the more than 39 billion gallons it provides annually meets all federal and state health standards for drinking water is a top priority at Coachella Valley Water District.

State and federal health agencies establish what are known as maximum contamination levels (MCLs)

Chemicals in water make news

for chemicals that are known or suspected carcinogens, or that pose other serious health risks.

MCLs are stringent guidelines addressing what are considered to be acceptable levels of contaminants in drinking water. Typically, an MCL involves a level that—realistically, based on cost-effectiveness and technology—is both detectable and treatable.

Most contaminants are measured in parts per billion (ppb). One ppb is the equivalent of 25 drops in enough water to fill an Olympic-sized swimming pool. But technology is advancing to the point that parts per trillion (ppt) now are being considered as the standard measurement for some chemicals.

The federal Environmental Protection Agency (EPA) also establishes an MCL goal (MCLG) for contaminants, below which there is no known or expected health risk. For known carcinogens the federal MCLG always is set at “zero,” even if the technology is not yet available to detect and remove the identified chemical entirely.

The state equivalent, set by the California EPA, is a Public Health Goal (PHG). While the federal EPA normally sets a contaminant’s MCL and MCLG at the same time, California’s EPA often establishes a PHG first, followed by an MCL. There are some chemicals, however, that have an MCL, but no PHG.

MCLGs and PHGs in of themselves are not regulatory, whereas state and federal MCLs are enforceable.

CVWD remains committed to the principle that all water-related health and safety standards should be based solely on good, solid scientific practices and procedures, not politics or media attention. Naturally, the costs associated with detecting and removing chemical constituents from drinking water are passed on to consumers, who should not be asked to fund such expenses when they are not justified.

This past year the one chemical attracting the most attention was perchlorate.

Perchlorate—best known for its use as a solid rocket propellant but also popular in the manufacture of fireworks, explosives and some fertilizers—has been linked in some studies to thyroid-related illnesses—but only recently has it attracted significant media attention and public scrutiny.

In scores of locations in California the groundwater has been contaminated by plumes of perchlorate that almost always are traced to current or former military bases or defense contractors. Because such industrial complexes are not present in Coachella Valley, the potential for direct groundwater contamination in this fashion is virtually nonexistent.

Perchlorate has been discovered, however, in Colorado River water, which provides more than two-thirds of the agricultural irrigation in Coachella Valley. Contamination has been traced to a Henderson, Nev., plant, where perchlorate seeped into local tributaries and found its way into Lake Mead, the primary Lower Basin storage reservoir for the Colorado River, which is Southern California’s primary water supply.

That factory, like many others manufacturing or using perchlorate, was built in the 1940s and the chemical was made there until 1998. The ability to identify the presence of perchlorate with any level of sophistication was not possible until 1997, however, when new technology made possible detection levels of four parts per billion (ppb). Previously, no detection was available below 400 ppb.

No federal or state MCL is in effect for perchlorate. Legislation was introduced calling for federal standards by July 1, 2004, but according to the EPA, enforceable regulations for drinking water will not be available until 2007 at the earliest.

State health officials, meanwhile, have released a draft PHG for public comment, one that sets the “no risk” level for perchlorate at either 2 ppb or 6 ppb, depending upon which criteria are used. California hopes to have a standard for perchlorate by next year.

In January 2002 the California Department of Health Services (DHS) lowered the action advisory level for perchlorate from 18 ppb to 4 ppb. When the state lowered this guideline, CVWD took a La Quinta-area well out of service when perchlorate was detected there at levels between 5 ppb and 6 ppb, even though it was not required to do so. DHS’s well closure recommendation doesn’t go into effect until perchlorate levels reach or exceed 40 ppb.

No additional action has been necessary at CVWD wells since this closure in 2002.

Colorado River water has been used to irrigate crops since completion of the Coachella Canal in the late 1940s. Scientists believe perchlorate began contaminating Lake Mead as early as the 1970s, so it is possible that the chemical has been in imported water delivered to this area for many years.

Aggressive efforts are underway in Nevada to clean up perchlorate at the source of the contamina-

"Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. USEPA/Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline 1-800-426-4791."
—California Department of Health Services

tion. This is considered the more efficient and cost-effective way to address the problem, although to date more than \$75 million has been spent. Perchlorate recently was measured at 12 ppb in Lake Mead. Levels in the river have been dropping, however. It was 9 ppb in 1997 when measured at Metropolitan Water District's Colorado River Aqueduct intake and only 5 ppb when measured there in 2003.

At present arsenic represents one of the few instances where federal standards are tougher than those adopted by the state. But this situation is only temporary. The federal MCL for arsenic is 10 ppb, but this does not go into effect until January 23, 2006.

The state's current MCL for arsenic is 50 ppb, but California's Office of Environmental Health Hazard Assessment (OEHHA) has released a draft PHG of 4 parts per trillion. This goal was due by Dec. 31, 2002, but has been delayed. State health codes require California to have a new MCL for arsenic published by June 30, 2004. State and federal standards are

This annual water quality report is published to document that extremely high quality and healthful water that meets all government standards is served to all constituents of the Coachella Valley Water District.

Coachella Valley residents tap high quality, healthful water

Data summarized here come from CVWD's most recent monitoring, completed between 2000-2002. The state allows the monitoring for some contaminants less than once a year because their concentrations do not change frequently.

All domestic water served by the Coachella Valley

"Este informe contiene información muy importante sobre su agua potable. Tradúzcalo ó hable con alguien que lo entienda bien." —CDHS

expected to go into effect simultaneously, however.

At present there are four CVWD wells—all in the lower, southernmost portion of the district—with arsenic levels that would not meet the 10 ppb federal MCL if it was in effect.

The water district is reviewing several ways to address the problem. Unlike perchlorate, arsenic is a naturally occurring and common constituent of groundwater supplies throughout the world.

Like perchlorate, 1,2,3-Trichloropropane (TCP), an industrial solvent, has many applications, including its use as a paint remover, degreaser and in the manufacture of other chemicals.

There is no MCL or PHG for TCP, but in 2001 the state adopted special monitoring requirements for unregulated chemicals, so its detection above five ppt requires that local governing agencies be notified.

CVWD has been monitoring its wells for TCP since 1988. Using a detection level of 500 parts per trillion, the best available technology could offer, no traces of TCP were found. Last year a new method became available, however, to test for TCP at five ppt.

In late 2002, CVWD tested all of its wells for TCP using this new method. A well on the grounds of the Monterey Country Club, at the corner of Monterey Avenue and Magnesia Falls Drive in Palm Desert, showed TCP levels of 5 ppt and 6 ppt in separate tests.

Although not required to do so, the well was taken out of service Jan. 13. It is being kept as a standby source while CVWD investigates the effectiveness of pumping modifications that may reduce TCP to levels below detection. The source of TCP in this well is not known at this time.

Water District is obtained locally, from wells drilled into the Coachella Valley's vast groundwater basin.

The Coachella Valley Water District is governed by a locally-elected board of directors, who normally meet in public session at 9 a.m. on the second and fourth Tuesdays of each month at district headquarters, Avenue 52 & Highway 111, Coachella.

Most water quality testing is done in the district's state-certified laboratory. A few highly specialized tests must be sent to other laboratories, which have the very expensive equipment necessary to find minuscule amounts of some constituents.

In addition to the detected constituents listed in the table on the following pages, CVWD's water quality staff of biologists, chemists, engineers and techni-

cians monitor for more than 100 other regulated and unregulated chemicals. All of these are below detection levels in CVWD's domestic water.

While all of CVWD's domestic water supply meets the current standard for arsenic, drinking water supplied to some service areas does contain low levels of this constituent. The standard for arsenic balances the current understanding of the chemical's possible health effects against the costs of removing the constituent from drinking water. The California Department of Health Services continues to research the health effects of low levels of arsenic, which is a mineral known to cause cancer in humans at high concentrations, and is linked to other health effects such as skin damage and circulatory problems.

With respect to the presence of arsenic in drinking water in excess of 10 ppb but less than 50 ppb—which is the case for wells supplying the communities of Mecca, Bombay Beach, North Shore, Hot Mineral Spa and Valerie Jean—the state Department of Health Services warns that some people who drink water containing arsenic in excess of the maximum contaminant level (MCL) during many years could experience skin damage or problems with their circulatory system, and may have an increased risk of getting cancer.

Radon is a naturally occurring, radioactive gas—a byproduct of uranium—that originates underground but is found in the air. Radon moves from the ground into homes primarily through cracks and holes in their foundations. While most radon enters the home through soil, radon from tap water typically is less than two percent of the radon in indoor air.

The federal Environmental Protection Agency (EPA) has determined that breathing radon gas increases an individual's chances of developing lung cancer, and has proposed a maximum contaminant level of 300 picoCuries per liter (pCi/L) for radon in drinking water. This proposed standard is far less than the 4,000 pCi/L in water that is equivalent to the radon level found in outdoor air. CVWD tests show the radon level in district wells ranges from 80 to 360 pCi/L which is far less radon than that in outdoor air.

Nitrate in drinking water at levels above 45 milligrams per liter (mg/L) is a health risk for infants who are younger than six months old. High nitrate levels in drinking water can interfere with the capacity of the infant's blood to carry oxygen, resulting in serious illness; symptoms include shortness of breath and blueness of skin. If you are caring for an infant you can be assured that your drinking water meets the standards for nitrate. Groundwater nitrate is the most closely monitored chemical in drinking water and nitrate levels do not change quickly in the district's

deep wells, used to supply drinking water. If the nitrate level in a well begins to climb, the district increases its monitoring frequency and, if necessary, wells are taken out of service before they become unsafe.

As noted, all drinking water served by CVWD comes from wells. The California Department of Health Services requires water agencies to state, however, *"the sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs and wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.*

"Contaminants that may be present in source water include:

—"Microbial contaminants, such as viruses and bacteria, that may come from sewage treatment plants, septic systems, agricultural livestock operations and wildlife.

—"Inorganic contaminants, such as salts and metals, that can be naturally occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining or farming.

—"Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban stormwater runoff and residential uses.

—"Organic chemical contaminants, including synthetic and volatile organic chemicals, that are byproducts of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff and septic systems.

—"Radioactive contaminants, which can be naturally-occurring or be the result of oil and gas production and mining activities.

"In order to ensure that tap water is safe to drink, USEPA and the State Department of Health Services (Department) prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. Department regulations also establish limits for contaminants in bottled water that must provide the same protection for public health.

"Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the USEPA's Safe Drinking Water Hotline (800-426-4791)."

The district currently is conducting source water assessments to provide information about their vulnerability to contamination. Those assessments have been completed for the district's 14 wells serving its

five small water systems. Those results are included here.

Indio Hills, Sky Valley & areas adjacent to Desert Hot Springs

This assessment was completed in December 2002. Water from wells serving this area is considered most vulnerable to activities not associated with any detected contaminants. These are automobile repair shops, illegal activities such as unauthorized dumping and septic systems but development in the area is low density.

All four wells in the system are located in a rural area with a small amount of residential development. Although the possible contaminating activities listed exist, they occur in small numbers. No contaminants associated with any of the listed activities have been detected in these wells.

Mecca, Bombay Beach, North Shore & Hot Mineral Spa

This assessment was completed in December 2002. Water from wells serving this area is considered most vulnerable to activities not associated with any detected contaminants. These are agricultural drainage and sewer collection systems.

These wells are located within agricultural and residential areas and draw from a confined aquifer where the thickness of the confining area ranges from more than 100 feet to more than 400 feet. No contaminants associated with the listed activities have been detected and, due to this protecting clay layer, no contamination from these activities is anticipated.

Desert Shores, Salton Sea Beach & Salton City

This assessment was completed in September 2002. The only source of vulnerability to these three wells are the running of the wells themselves.

All are located in a remote area surrounded by desert with some agriculture in the outer zones. CVWD owns and maintains all of the wells. No contaminants associated with the operation of these wells have been detected in them.

Valerie Jean

This assessment was completed in October 2002. High density septic systems are considered to be the most significant activity to which these two wells are vulnerable.

The wells are located in an agricultural area with some small residential areas. The number of septic systems is small. Future development in the area is expected to include centralized sewer collection which will replace existing on-site sewage

disposal facilities. No contaminants associated with septic systems have been detected in the wells.

Thermal

This assessment was completed in December 2002. Water from wells serving this area is considered most vulnerable to activities not associated with any detected contaminants. These are airport maintenance and fueling areas, agricultural drainage, illegal dumping, low density septic systems and irrigation wells.

The wells draw from a confined aquifer where the thickness of the confining layer is more than 170 feet. Due to the confining layer and depth of the sanitary seals in the wells, no contaminants associated with the activities have been detected nor are they anticipated.

Complete copies of these assessments may be viewed at Coachella Valley Water District, Highway 111 & Avenue 52, Coachella, CA 92236.

To receive a summary of the assessments or for additional water quality data or clarification, readers are encouraged to call the district's water quality specialist, Steve Bigley, at (760) 398-2651, extension 2286.



Definitions, abbreviations & footnotes

AI—Agressive Index —

This is a measurement of corrosivity. Sources with AI values of 12 or greater are non-corrosive. AI values between 10 and 12 are moderately corrosive and AI values less than 10 are corrosive.

AL—Regulatory Action Level — The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

MCL—Maximum Contaminant Level — The highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to public health goals or maximum contaminant level goals as economically and technologically feasible. Secondary MCLs are set to protect the odor, taste and appearance of drinking water.

MCLG—Maximum Contaminant Level Goal — Level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the federal EPA.

mg/L — Milligrams per liter (parts per million).

MRDL—Maximum Residual Disinfectant Level — The level of a disinfectant added for water treatment that may not be exceeded at the consumer's tap.

MRDLG—Maximum Residual Disinfectant Level Goal — The level of a disinfectant added for water treatment below which there is no known or expected risk to health. MRDLs are set by the U.S. Environmental Protection Agency.

NA — Not analyzed.

ND — None detected.

ng/L — Nanograms per liter (parts per trillion).

NTU — Nephelometric turbidity units (measurement of suspended material).

pCi/L — picoCuries per liter.

PHG—Public Health Goal — Level of a contaminant in drinking water below which there is no known or expected risk to health. PHGs are set by the California EPA.

Primary Drinking Water Standard — Primary maximum contaminant levels and maximum residual disinfectant levels for

Detected parameter, units	PHG or (MCLG)	Primary or (secondary) MCL	Cove Communities ⁽¹⁾ Range (Average)	Indio Hills, Sky Valley & areas adjacent to Desert Hot Springs Range (Average)
Aluminum, mg/L	0.6	1.0, (0.2)	ND-0.1 (ND)	ND
Arsenic, ug/L	None	50	ND-2.9 (ND)	ND
Boron, mg/L ⁽²⁾	None	None	ND-0.1 (ND)	ND
Chlorate, ug/L ⁽²⁾	None	None	ND-44 (ND)	NA
Chloride, mg/L	None	(500)	5.8-110 (14)	14-21 (17)
Chlorine (as CL ₂), mg/L	MRDLG 4.0	MRDL 4.0	ND-1.0 (0.3)	0.1-0.4 (0.3)
Chromium, ug/L	(100)	50	ND-20 (ND)	12-18 (15)
Chromium IV, ug/L ⁽²⁾	None	None	1.5-17 (7.3)	9.1-19 (15)
Color, units	None	(15)	ND-5 (ND)	ND-3 (1.5)
Copper, mg/L ⁽³⁾ (homes tested/ sites exceeding AL)	0.17	AL=1.3	0.13 (54/ 0)	0.12 (11/ 0)
Corrosivity, AI	None	(Non-corrosive)	11-13 (12)	12
DCPA mono & diacid degrade, ug/L ⁽²⁾	None	None	ND-0.9 (ND)	NA
Electrical conductance, umhos/cm	None	(1,600)	240-1,110 (366)	570-730 (640)
Fluoride, mg/L	1	2	0.2-0.9 (0.6)	0.5-0.7 (0.6)
Foaming agents (MBAS), ug/L	None	(500)	ND-100 (ND)	ND
Gross alpha particle activity, pCi/L	None	15	1.0-9.2 (3.7)	2.3-7.0 (5.4)
Hardness (as CaCO ₃), mg/L	None	None	29-290 (119)	120-188 (160)
Iron, ug/L	None	(300)	ND-300 (ND)	ND
Nitrate (as NO ₃), mg/L	45	45	ND-44 (6.5)	ND-6.7 (3.5)
Odor threshold, units	None	(3)	ND-3.0 (ND)	ND-1 (ND)
Perchlorate, ug/L ⁽²⁾	None	None	ND-5.5 (ND)	ND
Selenium, ug/L	(50)	50	ND-6 (ND)	ND
Sodium, mg/L	None	None	16-100 (26)	56-77 (67)
Sulfate, mg/L	None	(500)	15-270 (37)	143-200 (164)
Tetrachloroethylene (PCE), ug/L	0.06	5	ND-0.6 (ND)	ND
Total dissolved solids, mg/L	None	(1,000)	140-730 (223)	354-496 (417)
Total trihalomethanes, ug/L	None	80	ND-3.2 (0.6)	NA
Trichloropropane (1,2,3-TCP), ng/L ⁽²⁾	None	None	ND-5.5 (ND)	ND
Turbidity, NTU	None	(5)	ND-2.2 (0.2)	ND-1.3 (0.4)
Uranium, pCi/L	0.5	20	ND-15 (3.6)	ND-8.8 (5.0)
Vanadium, ug/L ⁽²⁾	None	None	4.8-32 (11)	6.6-20 (12)

contaminants that affect health, along with monitoring and reporting requirements.

Secondary Drinking Water Standard — Based on aesthetics, these secondary maximum contaminant levels have monitoring and reporting requirements specified in regulations.

ug/L—Micrograms per liter (parts per billion).

umhos/cm — Micromhos per centimeter.

Domestic water quality report

Mecca, Bombay Beach, North Shore & Hot Mineral Spa Range (Average)	Desert Shores, Salton Sea Beach & Salton City Range (Average)	Valerie Jean Range (Average)	Thermal Range (Average)	Major Source(s)
ND	ND	ND	ND	Erosion of natural deposits
14-27 (18)	ND	12	2.8-3.8 (3.3)	Erosion of natural deposits
ND	0.4	ND	ND	Erosion of natural deposits
NA	NA	NA	NA	By-product of drinking water chlorination
8.7-9.4 (9.0)	195-220 (204)	10	8.8-14 (11)	Leaching from natural deposits
ND-0.3 (0.2)	0.2-0.8 (0.3)	0.2-0.5 (0.3)	0.1-0.4 (0.3)	By-product of drinking water chlorination
ND	ND	17	22-23 (22)	Erosion of natural deposits
ND-6.7 (2.2)	ND	18	21-22 (22)	Erosion of natural deposits
ND	1	ND	ND-1 (ND)	Naturally occurring organic materials
ND (20/ 0)	0.23 (11/ 0)	ND (5/ 0)	ND (10/ 0)	Internal corrosion of household plumbing
11	12	12	11-12 (12)	Natural balance of hydrogen, carbon and oxygen
NA	NA	NA	NA	Leaching of herbicide used on grasses and weeds
219-254 (240)	1,300-1,510 (1,380)	240	251-282 (267)	Substances that form ions when in water
0.9-1.1 (1.0)	0.4-1.8 (1.2)	0.8	0.6-0.7 (0.7)	Erosion of natural deposits
ND	ND-100 (ND)	ND	ND	Municipal and industrial waste discharges
1.5-3.6 (2.2)	2.2-6.3 (4.0)	1.7	2.4-2.8 (2.6)	Erosion of natural deposits
14-22 (18)	165-221 (187)	8.9	34-47 (41)	Erosion of natural deposits
ND	ND-118 (ND)	ND	ND	Leaching from natural deposits
ND	3.6-7.3 (6.0)	2.3	2.5-2.8 (2.7)	Leaching of fertilizer, animal wastes or natural deposits
ND	ND-1.4 (ND)	ND	ND	Naturally occurring organic materials
ND	ND	ND	ND	Discharge of rocket fuel; leaching of fertilizer
ND	ND-9.9 (ND)	ND	ND	Erosion of natural deposits
38-46 (43)	196-237 (211)	46	35-40 (38)	Erosion of natural deposits
29-35 (32)	184-295 (227)	22	23-30 (27)	Leaching from natural deposits
ND	ND	ND	ND	Discharge from dry cleaners and auto shops
124-139 (134)	766-911 (820)	128	145-166 (156)	Leaching from natural deposits
NA	NA	NA	NA	By-product of drinking water chlorination
ND	ND	ND	ND	Leaching of solvents used for cleaning
0.1	0.1-1.4 (0.7)	0.1	0.1	Leaching from natural deposits
ND-2.6 (ND)	ND-5.2 (2.9)	ND	3.0-3.1 (3.0)	Erosion of natural deposits
3.4-29 (12)	22-28 (24)	46	26-31 (29)	Erosion of natural deposits

⁽¹⁾ Includes the communities of Rancho Mirage, Thousand Palms, Palm Desert, Indian Wells, La Quinta and portions of Bermuda Dunes, Cathedral City and Riverside County.

⁽²⁾ Unregulated contaminants are those for which EPA and the California Department of Health Services have not established drinking water standards. The purpose of unregulated contaminant monitoring is to assist both regulatory agencies in determining the

occurrence of unregulated contaminants in drinking water and whether future regulation is warranted.

⁽³⁾ Reported values are 90th percentile levels for samples collected from faucets in water user homes. No sample exceeded the regulatory action level.

Throughout the year, Coachella Valley Water District fields scores of questions about the water it supplies. Some deal with aesthetics, others with health-related concerns. Here are some of the most frequent questions and answers.

Why is it that when I first turn on one of my faucets, the water appears cloudy, but then clears up?

Tiny air bubbles—similar to those found in soft drinks and other carbonated beverages—are responsible for the cloudy water. After a while these bubbles rise to the top of the water and dissipate.

Water users seek answers

My water tastes or smells funny. Why?

In all likelihood the taste or smell comes from chlorine, which is added to protect against microbial (germ) contamination. It is not harmful in the amounts added to drinking water. CVWD has determined that adding chlorine, which it has done since 1990, is required to ensure compliance with new drinking water standards, although it is not required by the state Department of Health Services. The presence of a rotten-egg smell reflects another problem, and may be present if the temperature of a home's water heater has been turned down, which is common while residents are away for any length of time. At 98 degrees, for example, microbes can "stew" in the water heater, producing the sulfur-like smell that can be quite powerful when the faucet is turned on for the first time. At 104 degrees or hotter, however, the microbes are prevented from reproducing in high enough densities to cause the unpleasant odor. Residents are cautioned to use care when turning up the temperature of a water heater since doing so can produce water too hot for safe use in bathing/showering.

Is tap water safe for kidney dialysis machines, fish aquariums or fish ponds.

Generally speaking, no. Persons using kidney dialysis machines should contact their health-care providers to ensure that their tap water is properly treated before it is used in dialysis equipment. Chlorine has been found to be harmful to tropical fish, but chemicals to remove it readily are available from aquarium and pet stores. The chlorine will dissipate if the water sits in an aquarium (or any open container) for 24 hours before fish are introduced. Heating the water and letting it cool will speed up the process. Water in aquariums and ponds should be treated to remove chlorine before fish are introduced into either.

There is what appears to be sand in my water. How did that get in there?

All of CVWD's domestic water comes from wells drilled deep into the ground to access the local aquifer. To remove sand and other solids from water being pumped out of the ground, specially-designed screens are used. Still, some sand gets through these screens and usually settles to the bottom of the pipes used to bring water into your home. But when a large amount of water is pumped through these pipes—to fight a fire, fill water trucks or flush the delivery system, for example—this sand can get stirred up and find its way into your tap.

A salesman contacted me the other day, claiming he represented a company that manufactured devices that

used an electromagnet to treat water, making it not only softer—and thus better tasting—but "wetter," thus reducing overall water consumption. I'd like to do my part to conserve water, but was this salesman telling the truth?

Water softeners have been around for a long time, but the Water Quality Association, a non-profit group representing the water-treatment industry, has a cautious view of magnetic, electromagnetic and catalytic devices, concluding there cannot be a scientific finding about the effectiveness of these appliances without specific, scientific standards, which to date do not exist. The old axiom, "If it seems too good to be true, it probably is," generally applies to many sales pitches.

What are those holding ponds northwest of Desert Hot Springs?

Those ponds trap imported water to allow it to percolate into the soil to replenish the groundwater basin. A larger groundwater recharge area has been in operation near Windy Point northwest of Palm Springs for 30 years. While CVWD and Desert Water Agency have contracts for water from the State Water Project, the plumbing isn't in place to deliver that water to the valley so the two agencies trade their State Project water for a like amount of Colorado River water taken from Metropolitan Water District's aqueduct which passes through Coachella Valley. This imported water helps keep the western valley's groundwater table stable.

How deep and how large, in miles, is the aquifer under the Coachella Valley?

The aquifer, generally is the length and width of the Coachella Valley—about 45 miles long. This water-bearing strata begins about 150 feet below the soil surface in the center of the valley—deeper on the slopes—and extends more than 1,000 feet deep. It is replenished with natural runoff from snow melt supplemented with imported supplies.

Comparative condensed balance sheet

Assets	June 30, 2001	June 30, 2002
Current assets		
Cash in bank	\$4,334,352	\$3,316,251
Accounts receivable, inventory & prepaid expenses	15,497,036	13,929,574
	19,831,388	17,245,825
Deposits & other assets	3,802,694	3,198,345
Property, plant & equipment		
All American Canal & distribution system (participating equity)	\$ 34,874,502	\$34,874,502
State Water Plan (participating equity)	84,167,388	85,444,896
Land, facilities and equipment	624,527,376	668,345,308
	743,569,266	788,664,706
Less accumulated amortization & depreciation	(174,452,148)	(225,851,939)
	569,117,118	562,812,767
Construction work in progress	53,171,480	55,964,402
	622,288,598	618,777,169
Investments & other long-term assets		
Assets restricted for development & other purposes	246,746,489	266,179,548
Notes & contracts receivable unrestricted	26,148	4,006
	246,772,637	266,183,554
Total assets	892,695,317	905,404,893
Liabilities & equities		
Current liabilities		
Accounts payable	\$ 5,989,001	\$4,778,645
Customers' advances & deposits	13,062,483	14,540,926
Accrued salaries, interest, other expenses, & deferrals	16,716,194	4,707,762
	35,767,678	24,027,333
Long-term liabilities		
Notes payable	\$ 0	\$ 0
Water & sanitation systems acquired	2,048,459	1,867,816
Refunding agreements (construction costs advanced)	104,820	96,610
State Water Plan	14,738,884	8,408,356
	16,892,163	10,372,781
Bonds payable and certificates of participation	39,735,000	36,365,000
	56,627,163	46,737,781
Total liabilities	92,394,841	70,765,115
Taxpayers' equity in assets*	800,300,476	834,639,778
Total liabilities and taxpayer equity	\$892,695,317	905,404,893

*Includes the taxpayers' equity in canal and irrigation distribution facilities, pipelines, wells and reservoirs, treatment plants and stormwater facilities. This value includes facilities paid for by others and donated to the district. The value has been reduced by any outstanding debt (liabilities).

Condensed statement of revenues & expenditures

Fiscal year ended June 30, 2002

	Irrigation	Domestic	Sanitation	Stormwater	General	Total
Revenues						
Water sales	\$4,221,365	\$41,199,713	\$ 0	\$ 0	\$ 0	\$45,421,078
Service charges	1,044,089	1,930,930	15,292,135	0	0	18,267,154
Availability charges	1,030,534	785,817	101,083	0	0	1,917,434
Taxes	575,941	101,432	4,119,306	6,701,137	11,444,291	22,942,107
Interest	370,141	2,960,015	2,114,479	1,003,892	733,909	7,182,436
Other revenues	59,610	120,722	615,696	999,104	11,405,904 ⁽¹⁾	13,201,036
Total revenues	\$7,301,680	\$47,098,629	\$22,242,699	\$8,704,133	\$23,584,104	\$108,931,245
Expenditures						
Operation & maintenance	\$3,816,251	\$23,660,586	\$ 9,306,066	\$ 614,394	\$ 0	\$37,397,297
Engineering, administration & general	2,914,836	11,649,852	5,068,990	2,910,036	11,440,575	33,984,289
Contract & bond payments	0	157,321	3,628,176	1,418,537	10,125,927 ⁽²⁾	15,329,961
New construction	639,863	6,721,976	5,362,235	28,426	2,028,693	14,781,193
Reserves	(69,270)	4,908,894	(1,122,768)	3,732,740	(11,091) ⁽²⁾	7,438,505
Total expenditures	\$7,301,680	\$47,098,629	\$22,242,699	\$8,704,133	\$23,584,104	\$108,931,245

⁽¹⁾Most is groundwater replenishment assessment fees—well owners' proportionate shares of the cost of importing water to replenish the groundwater basin. ⁽²⁾Purchase of 242 acre feet of additional State Water Project water received in fiscal year 2001-02 funded from reserves.

Coachella Valley has been forced into a “wait and see” position with respect to imported water supplies following the collapse in late 2002 of efforts to resolve Colorado River water-related disputes, and an unfavorable federal court ruling earlier this year.

Events during the remainder of this and next year likely will have tremendous and far-reaching ramifications

Colorado River issues still unsettled

with respect to the future of the valley’s thriving agricultural and booming recreation-tourism industries.

In jeopardy is nearly a third of the water Coachella Valley gets from the Colorado River by canal for agriculture use, which in turn places tremendous demand on the already overdrawn aquifer that supplies a portion of crop irrigation water and virtually all of the drinking water in Coachella Valley.

An agreement that would guarantee that Coachella Valley gets the Colorado River water it needs for at least 45 years has been approved in principle by the affected water agencies. The accord—the Quantification Settlement Agreement (QSA)—must be approved by the federal Department of the Interior, however, and

is dependant upon significant financial assistance from Sacramento lawmakers—the allocation of \$200 million from a water bond passed by voters last November (Proposition 50) and \$150 million in loan guarantees.

Meanwhile, the federal Bureau of Reclamation notified Coachella Valley Water District (CVWD) that its Colorado River water order for 2003 was being cut from 347,000 acre-feet to 245,800 acre-feet following a federal judge’s order that Imperial Irrigation District (IID) have fully restored its 3.1 million acre-feet order for the year.

CVWD has met with and is working with area growers to alleviate the crisis and find the best short-term solutions to this dilemma. In some cases farmers are switching from canal water to well water and, where feasible, the district is working with private well owners to have them pump water into the district’s irrigation distribution system on a short-term basis.

With the groundwater table already declining in the agricultural area, heavy reliance on wells cannot be sustained for a long period. The declining water table also affects domestic water wells, especially those serving the west shore of the Salton Sea. Implementation

Flowing to Coachella Valley—Colorado River water flows through the Coachella Branch of the All-American Canal toward Coachella Valley farms. Plans are in design to finish lining this canal with concrete to eliminate seepage losses. Only the portion along the Salton Sea remains unlined.





Top crop—Table grapes continue to be Coachella Valley's top crop, both in terms of total acreage and gross value. Last year 12,224 acres added \$118.1 million to the valley's economy. As most Coachella Valley crops, these are irrigated by drip to conserve water and produce improved yields.

of the QSA would give the valley more water to help groundwater basin recover in this area.

The district has also stopped all non-agricultural Colorado River water deliveries, including deliveries to the few golf courses within the Colorado River service area, and was negotiating with alfalfa growers and others with relatively low dollar value crops to fallow for the remainder of 2003.

Meanwhile, a significant court battle that could shape water usage throughout the state—but take years to resolve—is expected unless the QSA can be implemented.

In non-surplus years, California legally is entitled to no more than 4.4 million acre-feet (an acre-foot is 325,900 gallons—enough to cover an area roughly the size of a football field in 12 inches of water) of Colorado River water. Of this, 3.85 million acre-feet are designated for agricultural use. Rights to the remaining 550,000 acre-feet belong to the Metropolitan Water District (MWD).

Other lower Colorado River basin states that use Colorado River water—Arizona and Nevada—historically had not used their full entitlements, creating a “surplus” that California had access to for some time. California annually was using as much as 800,000 acre-feet in excess of its 4.4 million acre-feet allotment. Those states are now using their full entitlements so surpluses will only be available during unusually high flows on the river.

Concern that this surplus use would become a permanent part of California's annual entitlement led the six other basin states to pressure the federal government to limit the Golden State to its legal allotment. Provided it reach certain milestones in reducing its dependency on

the Colorado River, however, the other states agreed to give California 15 years to ratchet-down to 4.4 million acre-feet, the so-called “soft landing.”

The single-most important component of California's efforts to reduce its Colorado River water dependency was the QSA, which features more than 40 agreements but built primarily upon the transfer of water from agricultural to urban use. About 17 million Southern Californians in suburban, coastal communities get 35 percent of their imported water from the Colorado River.

Such a transfer, between IID and MWD, was agreed upon in 1988 for about 100,000 acre-feet, but only after significant concerns by CVWD were addressed. Mitigation includes a provision that if it needs it, CVWD can obtain 50,000 acre-feet of the transferred water.

When fully in force the QSA provides for the transfer annually of 200,000 acre-feet of water from IID, currently used in Imperial County to irrigate crops, to the San Diego County Water Authority (SDCWA), primarily for domestic use. SDCWA is one of the 26 water agencies and cities that constitute the MWD consortium, but in the event of a water shortage, likely to be among the first to see its allocation reduced.

The QSA also provides for the eventual transfer of slightly more than 100,000 acre-feet of water each year from IID to CVWD.

A significant portion of this additional Colorado River water is earmarked by CVWD for use by farmers in lieu of private wells, thus reducing overall demand on the aquifer. Most of the canal water not used for crop irrigation would go toward recharging the aquifer. Through this transfer and other agreements, the QSA

enables CVWD to increase its importation of Colorado River water to 456,000 acre-feet annually.

This amount of imported water enables CVWD to more effectively implement long-term conservation efforts, including source substitution programs and aquifer recharging projects.

As important to Coachella Valley as the water transfer and conservation measures, however, is the “quantification” of CVWD’s entitlement to Colorado River water at 330,000 acre-feet. This would protect the area from cuts such as the one it was dealt by the Bureau of Reclamation this year, unless there is a declared shortage of water.

In order to transfer water to SDCWA, IID must implement conservation methods that result in water being available that otherwise would not. One agency cannot simply sell Colorado River water to another because, according to what is known as the Law of the River, it is entitled only to what it can use reasonably and beneficially. What it cannot use in this fashion must stay in or be returned to the river so that it is available to the agency with the next priority.

The first 3.85 million acre-feet of Colorado River water designated for agriculture is not quantified by volume. Instead, the eligible irrigation districts are allocated water based on specific acreage. Palo Verde Irrigation District (PVID), which has the first priority for Colorado River water in California, is entitled to sufficient water to irrigate 104,500 acres; followed by the Bureau of Reclamation’s Yuma Project with water for up to 25,000 acres.

CVWD and IID share the third (3a) priority (with PVID (3b) also getting additional water to irrigate 16,000 acres). But because of rulings and agreements dating back to the 1930s, Coachella Valley was coerced

into the position of a “junior” water rights holder—on paper, at least, CVWD doesn’t get a drop until IID’s thirst is quenched.

As a result, Coachella Valley farmers for decades have faced ever-present uncertainty regarding how much Colorado River water would be available because of IID’s established irrigation techniques. Self-preservation and smart business practices led many farmers in Coachella Valley, at their own expense, to adopt and implement some of the most water-efficient irrigation techniques available. Ironically, it is these same farmers who may not have enough water to irrigate their crops because surplus Colorado River water—at least for now—is not available.

The QSA would go a long way toward eliminating this concern by capping IID’s entitlement to Colorado River water at 3.1 million acre-feet. Subtracted from this amount would be water transferred to MWD, SDCWA and CVWD.

Efforts to reach an accord were hampered significantly, however, by environmental concerns, specifically the impact of reduced irrigation drainage inflows into the Salton Sea.

Because of IID’s irrigation practices, more than a third of its water (35 percent) ends up in the Salton Sea—in excess of one million acre-feet per year. Ironically, there were concerns about the QSA by some environmentalists, who worried that reduced inflows created by water conservation would adversely impact the sea’s elevation and salinity.

Environmental issues began to take center stage in 2002 as participating water agencies and government representatives worked to shape a QSA that everyone

CV without water?—Lake Cahuilla, terminal reservoir on the Coachella Canal, sits dry—not because of the threatened loss of Colorado River water but to remove a 15-year buildup of silt. The project was completed before the end of the year.



Strawberries on drip—Facing page, conserving water and improving yield, this strawberry field is on micro-irrigation. Less than 40 percent of Coachella Valley agriculture still uses the less efficient row or flood irrigation methods.



could live with. To some extent these issues remain a significant stumbling block, since existing state environmental law must be modified to permit the transfers to move forward and untold millions of dollars may be needed to mitigate Salton Sea-related issues.

Intervention by state and federal lawmakers led in October to a version of the QSA that seemed acceptable to all of the participating agencies. CVWD's board of directors approved this accord, as did the governing panels for SDCWA and MWD. IID directors, however, balked at approving the agreement, voting against it in early December, then approving their own version of the QSA on Dec. 31, mere hours before the midnight deadline. CVWD and MWD announced even before IID's board voted, however, that the QSA they were considering was one that the other agencies had not had time to review or vote on. When a mutually-acceptable version of the QSA was not approved by the end of the year, the Department of the Interior suspended the federal regulations—the *Interim Surplus Guidelines*—that legally entitled California to use surplus Colorado River water. This limited California to no more than 4.4 million acre-feet, effective immediately on January 1 this year.

As a result, the Bureau of Reclamation cut IID's 2003 water order at the beginning of 2003 from 3 million acre-feet to 2.8 million acre-feet, citing that district's over-use of water. The cut, 233,600 acre-feet, represented a reduction of less than 8 percent.

MWD, which is first in line to receive surplus water,

also had its water order cut, from 1.25 million acre-feet to 713,500 acre-feet (43 percent), but CVWD's request was unaffected by the bureau's initial water order approvals.

IID sued, claiming its farmers would suffer irreparable harm, and in March this year convinced a federal judge to issue a preliminary injunction restoring the full 2003 water order. The judge ruled that in cutting IID's order the Bureau of Reclamation had failed to follow its own guidelines and federal law.

Unresolved, however, is the issue of IID's water use, which has been cited as wasteful by both the Bureau of Reclamation and the California State Water Resources Control Board. IID contended that determining what constitutes "reasonable and beneficial" use of Colorado River water falls under state, not a federal, law.

CVWD and MWD joined the litigation on the side of the Department of the Interior and Bureau of Reclamation, opposing the preliminary injunction and continuing to advocate that responsibility for managing Colorado River water rests solely with the federal government.

The judge did agree that it was the federal government's responsibility to determine reasonable and beneficial use. He directed the Bureau of Reclamation to reconsider the issue, this time following proper procedure.

That process was expected to take several months, leaving CVWD's water supplies in limbo until completed.



Channel protection continues—
Earth movers prepare a portion of the stormwater channel in Coachella for concrete slope protection. The concrete guards against potential breaks caused by erosion.

An absence of flooding in the past 12 months did little to diminish Coachella Valley Water District's workload with respect to providing regional stormwater protection across more than 590 square miles.

Residents in the Coachella area may have noticed work late in 2002 and early this year on the Coachella Valley Stormwater Channel, where concrete lining was

Thousand Palms, Oasis flood projects in planning stages

installed along about two miles of the southwest bank between Avenue 50 and Industrial Way.

This concrete, later buried beneath the same earth that was excavated to permit its installation, provides additional protection for homes, businesses and other property, which includes the site of a planned industrial park in Coachella, even during severe flooding.

Cost of the project was slightly more than \$4.6 million, with the City of Coachella's Redevelopment Agency chipping in with an estimated \$650,000 because of the direct benefits to its plans for industrial expansion in the area.

CVWD is seeking federal financing to improve stormwater facilities for 4,400 acres in the Oasis area, where flooding in August 2000 and July 2001 caused hundreds of thousands of dollars in damage.

No homes were lost in the two floods, but agricultural losses were significant and a local public school was damaged.

An estimated \$11 million to \$26 million is needed in the Oasis area to provide adequate flood control. The district pre-qualified to participate in the grant, but

an application for any actual money is pending.

Work continues in the Oasis area on the development of maps that will designate where flooding risks are greatest and where they are minimal. Once the Federal Emergency Management Agency (FEMA) approves these maps, landowners with property in low-risk areas will be able to seek lower flood insurance premiums.

Much attention with respect to flood control last year continued to be focused on the Thousand Palms area, location of a 19,000-acre preserve for the endangered fringe-toed lizard. Stormwater protection has been an issue in the area for nearly four decades, but any projects must mitigate potential impacts on the lizard's environment.

The area is subject to alluvial fan flooding from rainfall in and around nearby hills and mountains. FEMA mapped portions of Thousand Palms with potential flood depths ranging from one to three feet. In 1964 a CVWD-funded study estimated flood control would cost \$8.5 million; that since has ballooned to as much as \$170 million for the entire area.

Instead, a \$30-million United States Army Corps of Engineers project meant to protect 2,800 acres, within which virtually all of the residential development is located, is underway, but remains in the design phase.

Staff continues to work with property owners, including interested homeowner groups and developers, to ensure their concerns are addressed.

The project will provide regional flood control for about 5,000 Thousand Palms residents, without adversely impacting the supply of sand that the dunes within the lizard preserve are dependent upon.

Clay, not sand is the concern in the Mecca area, where a layer of the former keeps surface water caused by heavy rain from soaking into the ground. This is the same clay that makes aquifer recharge more challenging in the lower valley.

A master plan to address the problem is being developed. Once it is completed, the feasibility of implementing such a plan will be considered.

In an effort to keep up with growth and to increase water reuse, the district doubled the capacity of its wastewater reclamation plant serving the Sun City area during the last year.

Reclamation plant doubled

The district's wastewater collection system was expanded with the installation of additional pipeline and a mile of force main was added to the redistribution system carrying the reclaimed water back to

golf courses and greenbelts for reuse as an irrigation supply.

Plans are underway to expand the chlorination contact chamber at the reclamation plant serving the area from La Quinta to Mecca. The upgrade of the chlorination chamber is the first phase of expansion that will ultimately increase capacity of the Thermal-area plant from 5.7 million gallons per day to 9.9 million.

The district operates six wastewater reclamation plants to serve people throughout its 1,000-square-mile area.

Currently in various stages of planning and construction are the moving of a pump station serving the district's Bombay Beach plant, upgrading a pump station at the district's North Shore plant and improving sludge dewatering facilities at the district's Palm Desert regional plant.



Doubling reclamation capacity—The water reclamation plant serving the Sun City area was expanded to double its capacity during the last year. The plant receives sewage and reclaims the water from it for reuse in golf course and greenbelt irrigation. This plant is the primary source of water for the Sun City golf course.

The district's domestic water systems continued to be expanded during the year to accommodate growth.

Two reservoirs were completed, adding 5 million gallons of storage to the systems, and another four

serve a new school at Avenue 66 and Tyler Street and future development in the Oasis area and a 2.5 million gallon reservoir north of Vista Chino.

Five new wells were added to district systems with 14 more in various stages of planning and construction. More than 12 miles of pipelines were installed by the district and more than 10 more were acquired by the district from developers that had completed housing and commercial developments.

Buried reservoir added to domestic system

were in various stages of planning and construction that would add another 25 million gallons of storage.

One of the completed reservoirs, a 4 million gallon buried concrete facility in Canyons of the Big Horn, was unique to the system. While most district domestic water reservoirs are steel tanks hidden in the hills above the valley, this was the district's first concrete buried reservoir.

The other completed reservoir serves the Rancho Mirage Cove area. Reservoirs in various stages of design and construction include a 10 million gallon tank north of Interstate 10 to serve part of Rancho Mirage, another 10 million gallon facility to improve service to La Quinta, a 2.5 million gallon reservoir to

An isolated system, La Quinta Polo Estates, was connected to the lower La Quinta system to improve service.

Phase one of a three-phase project to improve cathodic protection to 14 miles of pipeline carrying domestic water from Mecca to the Hot Mineral Spa area was completed to reduce the threat of deterioration to the pipe.

With the Environmental Protection Agency's plan to reduce the amount of arsenic allowable in drinking water (see water quality article) the district participated in a pilot project study for arsenic removal in the Mecca area. Several wells in the Mecca-Thermal area, well within current EPA standards, will exceed the new standards. The district is seeking the best method of complying at the least cost to water users in those areas.

Underground storage—This 4 million gallon concrete reservoir above Canyons of the Bighorn was buried when completed.



Lake Cahuilla cleaning—It took big equipment for the removal of the massive buildup of silt that accumulated in the terminal reservoir on the Coachella Canal during the last 15 years. A popular recreation area, the lake is primarily a storage reservoir for irrigation water from the Colorado River.



Among the irrigation division highlights of the year was the receipt of a \$100,000 state grant to develop a

Irrigation system lake desilted

study to analyze the efficiency of the irrigation distribution system in the Oasis area.

A distribution system to parts of Oasis was not included in the construction of the original system in the late '40s and early '50s so some farmers in the area must now rely exclusively on wells instead of Colorado River water. This is contributing to a ground-water overdraft in the agricultural area.

Improvements were also made to the telemetry control system in the Oasis area to allow better remote monitoring of distribution facilities. Also for better control and monitoring, similar improvements were made along the upper reaches of the Coachella Branch of the All American Canal and additional "tattletales" were added to catch and report water waste in delivery systems.

Lake Cahuilla, the terminal reservoir on the Coachella Branch of the All American Canal, was nearly emptied for the second time in its more than

30-year history last year. About 15 years of silt buildup was removed and the lake was modified to make cleaning easier in the future.

When originally built, a hole was included so most of the lake could be drained while maintaining a water supply for fish.

Primary purpose of the lake is to store Colorado River water delivered in excess of farmers' orders and to draw from when farmers' orders exceed water ordered from the river. Farmers can order water 24 hours in advance of delivery but it takes that water three days to flow here from Imperial Dam near Yuma. CVWD irrigation experts order water from the river based on historic use, projected weather conditions and current crop patterns but an unanticipated hot spell or rain can change farmers' orders.

Before Lake Cahuilla was built, excess flows had to be dumped in the Salton Sea and excess farmers' orders caused water rationing.

While most irrigation water from the district is delivered by gravity, CVWD does have a few pump stations to elevate water in its irrigation laterals to higher ground. One of these in Indio had to be moved during the last year to accommodate the widening of Jefferson Street.

2002 farm production totals

Calendar year figures for Coachella Valley land irrigated with Colorado River water

Value of year's production \$528,932,830

Total acreage irrigated (includes double cropping) 70,363

Average gross value per acre \$7,517

Crop	Acreage	Yield in tons	Value per acre ¹	Total value
Fruit	32,084	275,562.7	\$8,471	\$271,790,734
Cantaloupes	950	9,633.0	2,971	2,822,469
Dates	6,753	27,282.1	10,653	71,942,950
Figs	96	138.2	1,729	165,997
Grapes (table)	12,224	103,781.8	9,662	118,103,643
Grapefruit	1,765	20,951.4	4,516	7,969,925
Honeydew melons	65	599.1	2,786	181,059
Lemons and limes	4,579	50,577.3	9,179	42,029,773
Mangos	54	77.8	1,669	90,108
Olives	91	131.0	1,729	157,352
Oranges and tangerines	3,641	23,446.2	3,832	13,950,501
Peaches	37	78.1	2,444	90,420
Tomatoes	465	9,407.0	15,375	7,149,282
Strawberries	300	848.1	4,710	1,412,935
Watermelons	1,064	28,621.6	5,380	5,724,320
Vegetables	24,098	297,838.3	\$5,955	\$143,501,733
Artichokes	681	8,046.7	7,125	4,852,158
Bell peppers	3,119	57,556.5	9,146	28,524,985
Bok choy	219	2,208.4	4,493	984,061
Broccoli	2,246	14,431.7	3,561	7,998,033
Carrots	3,242	56,423.8	4,302	13,947,955
Cauliflower	946	9,470.9	6,157	5,824,591
Celery	373	14,082.4	10,148	3,785,357
Corn (sweet)	2,624	21,926.1	2,783	7,301,406
Cucumbers	50	196.1	4,469	223,447
Eggplant	331	3,778.4	8,253	2,731,758
Green beans	805	3,292.1	4,839	3,895,151
Lettuce	4,552	42,217.5	6,405	29,155,422
Okra	364	2,184.0	5,976	2,175,264
Onions (dry)	433	11,041.5	6,997	3,029,788
Oriental vegetables	289	2,914.3	4,493	1,298,601
Parsley	80	805.1	4,485	358,761
Potatoes	749	10,598.4	3,328	2,492,732
Radishes	258	2,601.7	4,493	1,159,305
Spices	801	8,077.3	4,493	3,599,238
Spinach	1,640	23,270.0	11,595	19,016,211
Squash	296	2,715.4	3,877	1,147,509
Forage	3,926	20,399.4	\$530	\$2,079,046
Alfalfa hay	1,822	16,161.1	856	1,558,742
Sudan hay	646	3,540.0	473	305,544
Pasture (irrigated)	1,325	14,972.5 animal units/ month	129	170,537
Wheat	133	698.3	333	44,223
Nursery	927	—	\$21,860	\$20,263,812
Fish Farms	1,341	4,143.7	\$13,744	\$18,431,133
Golf Courses	5,811	—	\$9,123	\$53,014,460
Polo Fields	447	—	\$9,123	\$4,078,035
Turf Grass	1,729	117,779.5	\$9,123	\$15,773,877

¹Rounded off to the nearest dollar.



