Price $5.25

OUR WATER OUR FUTURE

2009 Update

The Status and Future of the San Diego Region's Water Supply

A Special Publication of the
San Diego Chapter, California Landscape Contractors Association

At the heart of the uncertainty about the future of San Diego's water supplies is the Harvey O. Banks Pumping Plant, the point where water from the Sacramento/San Joaquin River Delta is pumped to the south. As many as six species of endangered fish threaten to severely limit supplies from the State Water Project in the future. How much water will be available after environmental issues in the Delta are resolved? The answer is unknown. See pages 3, 6 and 13 for details.

Uncertainty Defines the Future of San Diego Water Supplies

In 1993, the San Diego Chapter of the California Landscape Contractors Association (CLCA) commissioned a document called "Our Water, Our Future" to answer the most basic questions about water. With the facts, CLCA thought its members could do a better job educating clients, employees, water-use decision makers and the media.

As in 1993, San Diego, California and the Southwest face the possibility of an extended drought. More than ever, CLCA members and all San Diegans must be as informed as possible about water. Where does it come from now? Where will it come from in the future? How does the San Diego region use the water it has? What kinds of conservation measures are being proposed for each use?

To be of assistance, CLCA has commissioned a 2009 update of the 1993 document. The intent of this update was initially to answer the same questions as before, and some new ones, while reviewing how 2008 predictions compare with projections for 2010 and 2020 relative to water supply, demand, use, conservation, issues, and cost.

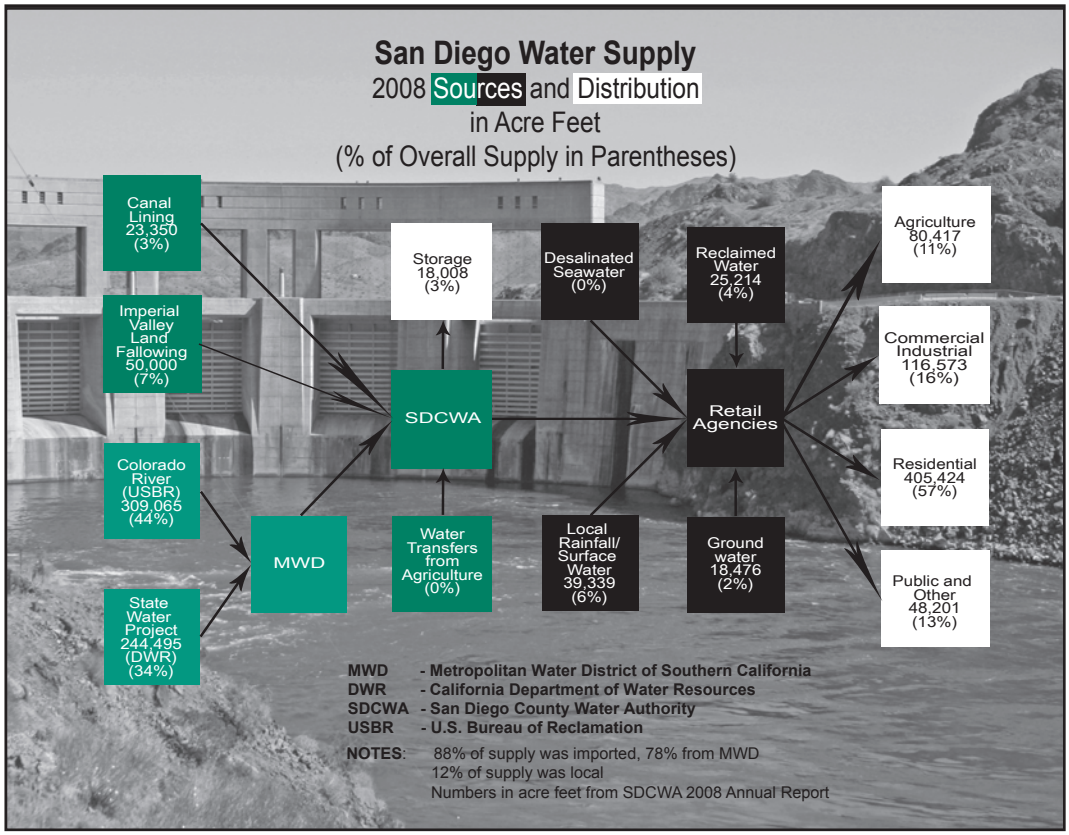
Much has stayed the same since 1993, including the need for additional water supplies, greater conservation, and resolution of a number of key policy issues. But much has changed. Legal battles over endangered species of fish in the Sacramento/San Joaquin Delta are raging and questions about the availability of future sources of water are being raised.

These questions have made the future of water supplies uncertain. As a result, this publication will take a different course than in 1993. Instead of being the defining document about the status and use of water, it will, instead, attempt to define the uncertainty.

Table of Contents

The Water Suppliers

Water flows to San Diego through a complicated series of aqueducts, pipelines, pump stations and reservoirs operated by four major agencies.



BUREAU OF RECLAMATION (USBR)

The Bureau of Reclamation manages and operates the lower Colorado River system while annually delivering nine million acre feet of water from lower Colorado River reservoirs. Colorado River water is delivered to the Metropolitan Water District of Southern California via MWD's Colorado River Aqueduct.

CALIFORNIA DEPARTMENT OF WATER RESOURCES (DWR)

The Department of Water Resources (DWR) is responsible for constructing, operating, and maintaining the State Water Project (SWP) which serves more than 18 million people. Water from the State Water Project is delivered to the Metropolitan Water District of Southern California via DWR's California Aqueduct.

METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA (MWD)

The Metropolitan Water District of Southern California (MWD) was created in 1928, following passage of a bill by the California legislature to provide supplemental water to Southern California cities and communities. MWD delivers more than two billion gallons of water per day to 26 member agencies in a 5,200 square mile area which, in turn, serve approximately 300 cities and unincorporated communities with 18 million people in their respective jurisdictions. MWD obtains its water from two primary sources: the Colorado River, through the Bureau of Reclamation, and the State Water Project, operated by the California Department of Water Resources.

SAN DIEGO COUNTY WATER AUTHORITY (SDCWA)

The San Diego County Water Authority (SDCWA) was established as a public agency in 1944 to import water for its member agencies, ensuring that county residents will have a safe, reliable source of water. SDCWA's service area encompasses 951,142 acres and supplies water to 3.1 million San Diego residents through its 24 member agencies.

The Water Retailers

After receiving water from SDCWA or producing its own local water supply, 24 SDCWA member agencies provide water to consumers throughout the San Diego region. The City of San Diego is the largest of these retail agencies. San Diego uses approximately 35 percent of the region's supply, produces the most reclaimed water, and serves 1.3 million people. The complete list of the region's water agencies follows:

Cities

City of Del Mar
City of Escondido
City of National City
City of Oceanside
City of Poway
City of San Diego

Military

Camp Pendleton Marine Corps Base

Water Districts

Carlsbad Municipal Water District
Fallbrook Public Utility District
Helix Water District
Lakeside Water District
Olivenhain Municipal Water District
Otay Water District
Padre Dam Municipal Water District
Rainbow Municipal Water District
Ramona Municipal Water District
Rincon del Diablo Municipal Water District
San Dieguito Water District
Santa Fe Irrigation District
South Bay Irrigation District
Sweetwater Authority
Vallecitos Water District
Valley Center Municipal Water District
Vista Irrigation District
Yuima Municipal Water District

The Sources of Water: MWD Supplies

MWD receives supplies from two sources: the Colorado River and the State Water Project.

The Colorado River

The Colorado River has never failed to provide California its full allocations of 4.4 million acre feet annually since that amount was set by a 1964 U.S. Supreme Court decision to settle a dispute between Arizona and California. Five hundred and fifty thousand (550,000) acre feet of the first tier (fourth priority) rights are allocated to MWD. Historically, MWD had second tier (fifth priority) rights to 612,000 acre feet and actually received about 800,000 acre feet more Colorado River water than now because Arizona and Nevada were not taking their full allocations. Since 2003, the Colorado River has only provided MWD with its first tier allocation, losing access to more than 50 percent of its supply. MWD has an agreement with the Palo Verde Irrigation District to fallow land and buy 118,000 acre feet of Colorado River water saved annually. An agreement with the Imperial Irrigation District provides another 105,000 acre feet. The total base amount of water available annually is 773,000 acre feet, unless a prolonged drought or climate change invalidate historical supply availability. Because climate change scientists believe there may be an overall trend to a drier Southwest, threatening even the relatively secure Colorado River supplies, they are working with scientists to refine precipitation models that will provide more reliable predictions. According to DWR publications, the 1922 Colorado River Compact that guides allocation "was negotiated based on the wettest period of the measured hydrologic record." No matter what modeling is chosen, "all alternatives point to the likelihood of future shortages, representing a significant departure from historical conditions under which Colorado River water supplies were highly reliable."

Likely Supplies 2020: *773,000 acre feet (AF)*
Possible Additional Supplies: *Varies from year-to-year*

The State Water Project (SWP)

The State Water Project (SWP) is a water diversion project that takes water from the Delta formed by the junction of the Sacramento River and the San Joaquin River. The water diverted is pumped out of the Delta at the Harvey O. Banks Pumping Station *(see photo page 1)*. Because of the large amount of water pumped from the Delta, in conjunction with degraded water quality from agricultural runoff and urban wastewater treatment plants, as many as six species of fish could be under the protection of state or federal endangered species acts, prompting legal activity which threatens to severely limit the amount of water that can be diverted from the Delta. MWD has allocation rights to 1.9 million acre feet of SWP water, but averages about 64 percent of the allocation. State facilities needed to take full advantage of the allocation were never completed. Because of pumping restrictions to protect endangered fish in the Sacramento/San Joaquin Delta, only 35 percent of the contract amount was allocated in 2008. While no supply estimate from the SWP is certain at this time, some experts believe 20 percent of the SWP allocation is likely the lower limit. This roughly corresponds to the 391,407 acre feet provided to MWD in 1991, the worst year of the 1987 - 1992 drought. Future supplies are dependent on legal and environmental challenges. *See page 13 - "Seven Potential Challenges to San Diego's Water Supply."*

Likely SWP Supplies 2020: *391,407 AF (approximately 20% of the full allocation and the amount available in 1991, the worst year of the 1987-1992 drought)*
Possible Additional SWP Supplies: *819,000 AF (the difference between the ten-year average of 1,210,249 AF and the amount obtained during the worst year of the 1987-1992 drought)*

MWD Contingencies

MWD's Water Surplus and Drought Management Plan has initiated pipeline projects, additional storage capacity, and transfer agreements from agricultural users to help maintain supplies. When supplies are normal, MWD purchases and stores water in reservoirs or groundwater basins for availability in times of drought. The following MWD supplies are available during drought, unless the drought is an extended one:

Arvin-Edison/Metropolitan Water Management Program: *75,000 AF*
Other Central Valley Groundwater Storage: *115,000 AF*
Diamond Valley Lake: *200,000 AF*

The construction of Diamond Valley Lake, which holds 800,000 acre-feet, has extended MWD's drought resistance. However, storage is only as good as the water available to fill it, and until issues with the State Water Project are resolved, finding excess water for storage might be difficult. The last eight years have been consistently drier than normal, and, instead of adding to reserves that would augment normal supplies, storage has been drawn down. The 399,000 acre feet from the sources above that might be available must be shared with all of MWD's customers, so San Diego's portion is likely to be less than 100,000 acre feet.

Likely Supplies 2020: *66,300 AF (assumes 17% to SDCWA - see preferential rights below)*
Possible Additional Supplies: *31,200 AF (assumes 25% to SDCWA)*

How MWD Allocates Supplies to SDCWA and Preferential Rights

SDCWA purchases water from MWD and resells it to San Diego's retail agencies. If there is plenty of water available to MWD, San Diego will get what it needs. That has historically been approximately 25 percent of MWD's total deliveries. At any time, MWD could allocate according to member agency **preferential rights** where an agency's right to water is determined by its total historic payments to MWD from property taxes, stand-by charges, and readiness-to-serve charges. Preferential rights have never been invoked, and it is hoped they won't be. If they were, San Diego could receive as little as 17 percent of MWD's total supply. Concern about preferential rights has historically loomed large in the minds of those concerned with the future of San Diego's water supply.

NOTE: *For purposes of this document, it is assumed that SDCWA will obtain either 25 percent or 17 percent of various MWD water sources. In reality, MWD obtains its total supply for the year from the Colorado River and the State Water Project and, unless preferential rights are invoked (17 percent), a percentage is not applied. Twenty-five percent is the long-term average.*

The Sources of Water: SDCWA Supplies

While SDCWA has a primary role of purchasing water from MWD, the agency has also taken on the task of finding additional imported supplies to augment MWD supplies and those produced locally in San Diego.

IID Conservation and Transfer Programs

One of SDCWA's most important accomplishments in recent years was the IID Water Conservation and Transfer Agreement which arranged for the Imperial Irrigation District (IID) to transfer conserved agricultural water and deliver the unused water to SDCWA. Conservation will initially be achieved by fallowing land (not use it for agriculture). The agreement will begin to transition from land fallowing to other conservation measures beginning in 2013. The water is transported via MWD's Colorado River Aqueduct and exchanged for water shipped to San Diego. The agreement provided 50,000 acre feet in 2008 and will bring 190,000 acre feet to San Diego by 2020 and 200,000 acre feet by 2023, providing an important source of supply to the region. A cloud on the agreement is a lawsuit against IID by Imperial County. However, implementation is proceeding as the lawsuit works its way through the court.

Verifiable Supplies 2020: *190,000 AF*
Possible Additional Supplies: *10,000 AF by 2023*

Lining the All-American and Coachella Canals

Another important source of confirmed water is a conservation effort to line the All-American and Coachella Valley canals. By lining the canals, water does not seep into the ground. The conserved water is delivered to SDCWA, providing 77,700 acre feet annually.

Verifiable Supplies 2020: *77,700 AF*
Possible Additional Supplies: *None known*

Dry-Year Water Transfers

When demand exceeds supplies, water agencies look to purchase other sources of water. The majority of water rights in California belong to farmers in Northern California. The farmers' water agencies are a potential source of alternate supplies during shortages. Demand has also increased the price, so any available supplies will likely be expensive.

Verifiable Supplies 2020: *TBD*
Possible Additional Supplies: *TBD*

The Cost of Water: Now and in the Future

Source of Water Supply	Cost to Develop or Purchase	Cost to Deliver to San Diego (Wheeling Charge)	Total Cost to Develop, Purchase and/or Deliver to San Diego
COST OF CURRENT SUPPLIES[6]			
Surface Water/Local Rainfall	$200	N/A	$200
Current MWD Supplies Untreated	$159 -$275	$253	$412 - $528
SDCWA Melded Rate Untreated[5]	$527	N/A	$527
SDCWA Melded Rate Treated[5]	$695	N/A	$695
Current MWD Supplies Treated	$326 - $442	$253	$579 - $695
Dry Year Water Transfers	$250 - $425	$348	$598 - $773
Land Fallowing and Canal Lining	$300 - $400	$278 - $390	$578 - $790
Ground Water Recovery	$750 - $900	N/A	$750 - $900
Recycling for Irrigation[2]	$1,000 - $1,500	N/A	$1,000 - $1,500
COST OF FUTURE SUPPLIES[6]			
Future MWD Supplies Untreated[1]	$237 - $410	$377	$614 - $787
Future MWD Supplies Treated[1]	$486 - $659	$377	$863 - $1,036
Recycling for Potable Reuse[4]	$1,630	N/A	$1,630
Seawater Desalination[3]	$1,200 - $1,900	N/A	$1,200 - $1,900
COST OF CONSERVATION			
Conservation[7]	$195 - $1,000	N/A	$195 - $1,000

The sources of water available to San Diego come with varying costs. The chart to the left reflects the current knowledge of the cost to produce the water and/or deliver it to San Diego. The costs provided should be reviewed with the following caveats in mind:

1. Future MWD supplies are based on the price of current MWD supplies plus the impact of rate increases totaling 31 percent that are expected to be in place by 2012. Those figures are trending upward as of this publication date.
2. Recycling for irrigation presumes the costs after secondary treatment.
3. Desalination development cost presumes no incentives from MWD. MWD has currently promised a $250 per acre foot incentive to reduce the cost to retail agencies.
4. Recycling for potable reuse also presumes the cost after secondary treatment.
5. Current SDCWA melded rates to retail agencies are shown for perspective. These rates include a $64 per acre foot transportation charge.
6. To deliver the water to the consumer generates additional costs for treatment and distribution. These costs vary between retail agencies and could range from $300 to $500 per acre foot depending on the agency and how it calculates that cost.
7. Water conservation is not a supply. It is included here to understand how the cost of supply compares with the cost of reducing demand through conservation.

The Sources of Water: Local Supplies

In addition to receiving water from SDCWA, the 24 local retail agencies produce water resources within their own jurisdictions. These strategies lead to an ever-more-diverse mix of water available in the San Diego region and have begun to reduce the need for imported water from MWD. The numbers here are verifiable supplies from SDCWA's 2005 Urban Water Management Plan. Verifiable supplies are those "with adequate documentation regarding implementation and supply utilization."

Recycled Water

Recycled water continues to be a growing part of the water supply portfolio with 25,214 acre feet provided in 2008. SDCWA considers the goal of 45,548 acre feet of recycled water by 2020 to be a verifiable supply, with an additional 6,732 AF possible. The City of San Diego is scheduled to produce 15,200 acre feet for non-potable use by 2020. The City could produce as much as 39,000 acre feet of recycled water from the region's two largest reclaimed water plants but must first decide whether to purify the water for use in a potable reservoir *(see box below)* or to build more pipelines for landscape and industrial use. In 2008, the City produced 13,198 acre feet of recycled water. Sixteen San Diego area water agencies have current or future plans to develop additional recycled supply. *See page 8 for more information.*

Verifiable Supplies 2020: *45,548 AF*
Possible Additional (Not Verifiable) Supplies: *6,732 AF*

Desalinated Seawater

Desalinated seawater has long been talked about as a future source of potable water for San Diego. A plant planned in Carlsbad at the Encina Power Plant is projected to provide 56,000 acre feet of water by 2012. This is considered a verifiable supply. The approval process has been contested by environmental organizations that felt the approval process was not sufficient, primarily because of damage to marine life by the ocean water intakes. They also felt the plant would set a precedent for approval of additional facilities without appropriate environmental protection. Additional concerns are that desalination is still a costly source of new water *(see page 4 for details)* and that the high use of energy to both produce the water and move it to the distribution system is too great, particularly in the context of the production of greenhouse gases. Poseidon Resources, the developer, has promised to meet all environmental concerns and says the plant will be carbon neutral. SDCWA will begin a study in 2009 to evaluate the potential for a seawater desalination plant in the South Bay near the border and is finalizing a feasibility study that could produce between 56,000 and 186,000 acre feet on Marine Corps Base Camp Pendleton.

Verifiable Supplies 2020: *56,000 AF*
Possible Additional Supplies: *56,000 to 186,000 AF on Marine Corps Base Camp Pendleton*

Local Rainfall/Surface Water

The terminology "local rainfall" is interchangeable with "surface water." Surface water available, on average, will be 22,284 acre feet during dry years and 59,649 acre feet during normal years. These are considered verifiable supplies.

Verifiable Supplies 2020 (Dry Years): *22,284 AF*
Verifiable Additional Supplies (Normal Years): *37,365 AF*

Brackish Groundwater

Brackish groundwater is water in underground basins that is too salty for use without treatment. Potable water is recovered from these basins using a reverse osmosis process, similar to that used for seawater desalination, that could provide 11,400 acre feet if fully exploited. This is considered a verifiable supply.

Verifiable Supplies 2020: *11,400 acre feet*
Possible Additional Supplies: *None known*

Well Water

Well water will continue to be used where it is available and could provide as much as 10,800 acre feet in dry years and 19,775 acre feet in normal or average years. Well water is also considered a verifiable source.

Verifiable Supplies 2020 (Dry Years): *10,838 AF*
Verifiable Additional Supplies (Normal Years): *8,937 AF*

Other New Sources Of Water

Two other sources of water that might become more prominent are capturing residential gray water and harvesting rainfall. Gray water use has not expanded due to the difficulty of the regulatory process. Reports of people capturing rainwater from their properties continue to grow. The City of Tucson has published a guide to harvesting rainwater that could be useful to those interested in pursuing that option.

Places Where Wastewater Is Recycled To Potable Standards

While San Diego completes a pilot study to determine the feasibility of recycling wastewater for potable use, two major facilities in the country have successfully implemented similar programs.

The Orange County Water District built Factory 21 in 1976, a facility that recycled wastewater for injection into a large groundwater basin. This keeps existing groundwater supplies from becoming salty from seawater intrusion and provides potable water that meets all California Department of Health Services drinking water standards. Factory 21 has been replaced by larger facilities that are part of the district's Groundwater Replenishment Program.

For more information: *http://www.gwrsystem.com/*

The only full-scale facility in the U.S. where repurified water is placed into a drinking water reservoir is in Fairfax County, Virginia. In 1978, the Upper Occoquan Service Authority replaced eleven secondary wastewater treatment plants with a regional wastewater recycling plant that treats 54 million gallons per day. These new supplies are placed into the 11 billion gallon Occoquan Reservoir, a principal drinking water supply for Northern Virginia and Washington D.C.

For more information: *http://www.uosa-construction.org/*

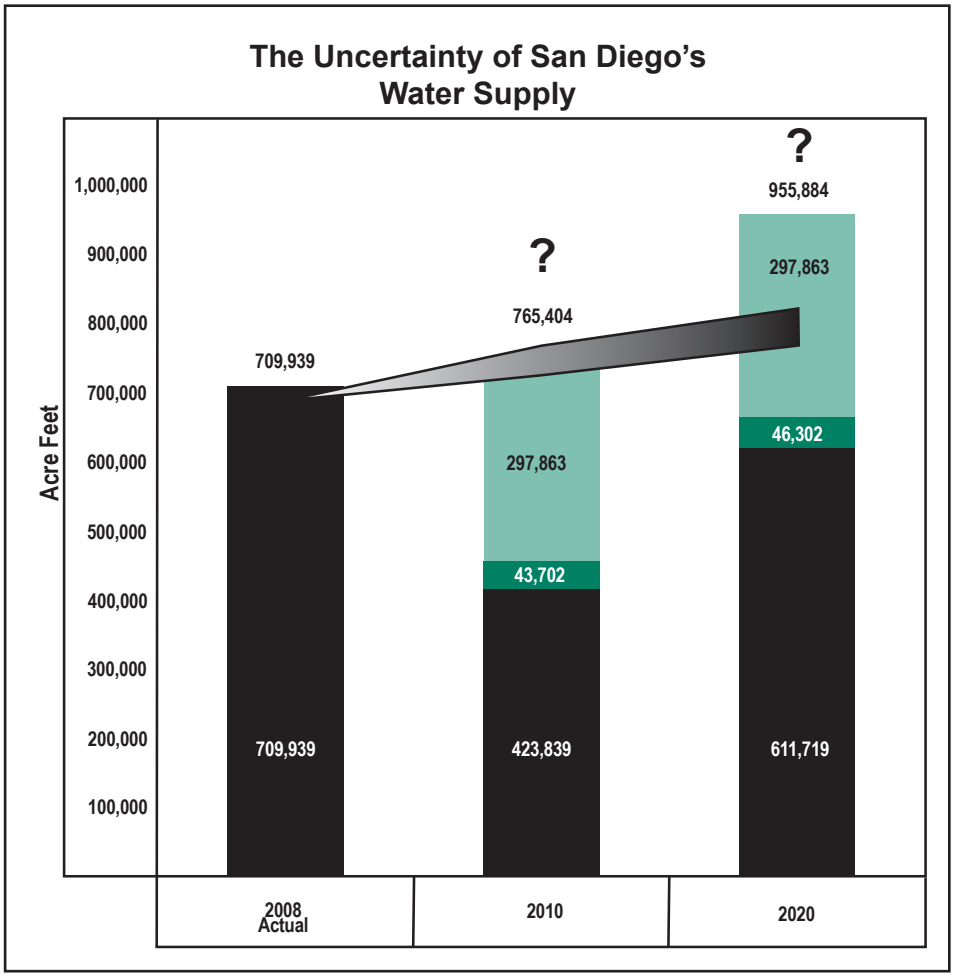
What Is the Range of Water Uncertainty?

As seen in the previous pages, there is great uncertainty about the status of water supplies to San Diego, primarily driven by the potential for loss of supply from the State Water Project. The chart on this page attempts to illustrate the range of uncertainty about San Diego's water supplies by making assumptions based on official documents and historical supply. The key to the chart is explained below, All numbers are in acre feet.

Relatively Certain Supplies. The black bars represent supplies that are relatively certain in 2010 and 2020. This would include all MWD supplies from the Colorado River, SDCWA supplies, and verifiable local dry year supplies. The State Water Project supply is presumed to be 391,407 acre feet, the amount provided to MWD in 1991, the worst year of the 1987-1992 drought (this is approximately 20 percent of the SWP allocation and an amount some experts assume to be worst case). The amount of water provided to SDCWA from MWD is presumed to be capped at 17 percent of MWD's total availability, meaning preferential rights have been invoked. 2008 is the actual supply for the most recent complete water year. Improvements in 2020 come from desalination, recycled water, and supplies from the IID conservation program.

Additional Local Supplies. The dark green bars represent additional verified local supplies from rainfall and wells available during normal years not available in dry years.

The Uncertainty: Additional Supplies Using Historical Averages. The light green bars represent the addition of State Water Project water as if the average supplies over the last ten years (1,210,049 acre feet) are available. In addition, the 25 percent historical average of MWD supplies is assumed. As a result, the difference between 25 percent of MWD supplies and the 17 percent assumed in the black bars is also added. This is the range of water supply that is uncertain.



The chart above is not a prediction of water supply, nor is it an official representation of water supply by any agency or a combination of agencies. It uses official water agency numbers as a base, and asks some "what if" questions. What if State Water Project water to MWD was limited to the worst year in recent history? What if SWP water was the average of the last 10 years? What if preferential rights were invoked by MWD and only 17 percent of MWD water went to SDCWA? What if the historical average of 25 percent of MWD water went to SDCWA? Until the legal and environmental issues surrounding the Sacramento/San Joaquin Delta are resolved, these questions are likely to persist and create continued uncertainty about San Diego's water supply.

Demand. This represents the range between demand in dry years and demand in normal years. Water conservation efforts are assumed to have been successfully implemented. These are the SDCWA demand numbers used:

2008 Actual:	691,939 AF
2010 Dry Local Year:	767,650 AF
2010 Normal Local Year:	715,450 AF
2020 Dry Local Year:	825,560 AF
2020 Normal Local Year:	771,510 AF

? Storage and Transfers. What will supplies in storage and transfers contribute? In recent history, shortages have been made up by excess water from normal years that has been put into storage and agricultural transfers. What if there is little or no excess in most normal years?

What Is an Acre Foot (AF)?

Throughout this document the volume of water is referred to in acre feet. An acre foot equals 325,851 gallons, the amount used by two average families in one year. An acre foot would cover a football field to a depth of one foot.

Estimates of Water Use in the San Diego Region

Two primary sources of information about water use are presented publicly in water agency documents and in the media. The first shows the amount of water used by four major categories as shown below from SDCWA's 2008 Annual Report.

1. Regional Water Use in 2008	Amount in %
Agriculture	12%
Commercial and Industrial	17%
Residential	59%
Public and Other	13%

The second set of data shows how water is used in a "typical home," generally imagined as a standard three- or four-bedroom, two-bath home with landscaping. These numbers vary by water agency, depending on demographics, climate, and other variables. The City of San Diego's water conservation brochure indicates this typical single family residential use:

2. City of San Diego Single Family Residential Use	Amount in %
Outdoor Irrigation	55%
Toilets	12%
Clothes Washers	12%
Showers/Baths	8%
Faucets	8%
Leaks	3%
Dishwashing	1%
Other Use	1%

Public perceptions generated from this kind of data can create incomplete pictures. For example, it is widely believed that urban landscape irrigation comprises 55 percent of the region's total water use, primarily because of perceptions of "typical" single family use. This might not provide an accurate picture of overall use and how we can best save water in the region.

In 1993, CLCA worked with SDCWA to combine these two sources of information so a single view of overall water use could be obtained. SDCWA provided CLCA with a breakdown of overall water use with the categories listed in Chart 4 on this page. From the analysis of this data, the relative contributions of agriculture, urban indoor use, urban outdoor water use, and distribution system losses can be understood. In 1993, the analysis looked like the chart below:

3. Agriculture, Indoor, and Outdoor Use in 1993	Amount in %
Agriculture	19.1%
Urban Indoor Use	49.5%
Urban Outdoor Use	28%
Distribution System Losses	3.4%

Urban indoor use includes all the activities that run San Diego's commercial, industrial, and governmental organizations, and residential indoor use. Urban outdoor use primarily consists of landscape irrigation, but also includes swimming pools, washing cars, and other residential and non-residential outdoor uses.

4. Overall Water Use Categories	Amount in %
Agriculture	?
Residential Toilets	?
Commercial, Industry, Government Indoor Use	?
Residential Showers and Baths	?
Landscape Irrigation, Single Family Homes	?
Commercial, Industry, Government Outdoor Use	?
Residential Laundry	?
Landscape Irrigation, Multi-Family Unit	?
Residential Faucet Use - Cooking and Cleaning	?
Public Landscape Irrigation	?
Distribution System Losses	?
Other Residential Outdoor Use	?

Unfortunately, the data collected in 1993 is no longer collected, so SDCWA was unable to replicate the overall use information provided previously. In preparing this document, a number of calculations were made, reviewing multiple studies both regionally and nationally that have analyzed water use in both the residential and commercial/industrial sectors. The analyses arrived at results that were very similar to the 1993 findings. Without the data from each of the region's retail agencies to combine into a whole, SDCWA found these analyses unsupportable, so they are not reproduced here. In general, those analyses found that urban outdoor water use, consisting of primarily landscape irrigation, was somewhere between 29 and 39 percent of overall use. Assuming multipliers that weigh more heavily toward landscape use results in these estimates:

5. Agriculture, Indoor, and Outdoor Use in 2008	Amount in %
Agriculture	12%
Urban Indoor Use	45%
Urban Outdoor Irrigation	39%
Distribution System Losses	4%

It is hoped that future studies will provide a broader understanding of how water is used and can be conserved in the region. Those studies might include assessments of the number of homes that use no water for irrigation because of the lack of money, time or interest. Other categories worthy of exploration are the amount of water used for sanitation (toilets and hand washing) in the commercial, industrial and governmental sectors, and the amount of water lost through public water distribution systems and leaks on private property. With this information, even more effective decisions can be made about water use and conservation.

San Diego and Water Recycling

Recycled Water Overview

Reclamation is the process of collecting and treating wastewater to make it usable again. Legally, according to California state law (Title 22), reclaimed (recycled) water must be clean enough to swim in but is not considered clean enough to drink. By producing non-potable recycled water for use on landscaping, potable water is freed for other uses, and total supplies are increased. Recycled water pipelines, sprinkler heads, meter boxes and other irrigation equipment are color-coded purple to distinguish recycled water systems from drinking water systems. Planning, financing and implementing recycled water distribution facilities are the responsibility of retail water agencies.

The First Steps

The San Diego region has a long history of developing recycled water supplies. In 1959, the City of Santee began developing seven lakes by reclaiming wastewater to create a recreational boating, fishing and swimming resource. The Padre Dam Municipal Water District now manages the process and produces more than 600 acre feet annually. Padre Dam plans to increase output to 800 acre feet by 2010.

Another early innovator was the Otay Water District. In the late 1960s it began water recycling with a small plant affectionately named "Miss Stinky." Otay now has the largest recycled water network in San Diego County, and recycled water accounts for 15 to 20 percent of Otay's total water usage. The Ralph W. Chapman Water Recycling Facility produces up to 1.3 million gallons daily (MGD) of recycled water. Up to six MGD is also purchased from the City of San Diego's South Bay Water Reclamation Plant.

The City of San Diego's efforts date back to 1981 and a facility in Mission Valley called Aqua I that used water lilies to reclaim 25,000 gallons of wastewater daily. It was followed by Aqua II which could treat 180,000 gallons of water for use by CalTrans on adjacent freeways. A third pilot plant in the San Pasqual Valley in 1991 treated one million gallons daily for agriculture and landscape irrigation.

A Federal Lawsuit and an EPA Grant

The City of San Diego once had a goal of recycling 140,000 acre feet annually and distributing 70,000 acre feet. In June 1992, the San Diego City Council approved a system capable of recycling 33,000 acre feet annually. Two years later, in 1994, the City settled a federal lawsuit over its waiver from the Clean Water Act for the Point Loma Wastewater Treatment Plant with an agreement to create a two-phase water recycling program. A Phase One recycling plant would be constructed in North City between 1992 and 2003, and two additional plants, one each in Mission Valley and Otay Valley would be constructed in Phase Two between 2003 and 2050. The agreement included treating 45 MGD to reclaimed quality by 2010. San Diego now has the capacity to treat 45 MGD through construction of two facilities, 30 million MGD at the North City Water Reclamation Plant (NCWRP) and 15 MGD at the South Bay Water Reclamation Plant (SBWRP).

Current Capacity and Distribution

Completed in 1997, NCWRP is capable of producing 26,000 acre feet annually. The plant distributes recycled water for irrigation and industrial use through 79 miles of pipelines to the communities of Olivenhain, Mira Mesa, Miramar Ranch North, Scripps Ranch, University City, Torrey Pines, Santaluz, Poway, and Black Mountain Ranch. The recycled water is distributed to 645 water meters, including 195 customers in Poway. As many as 200 customers adjacent to the system could be connected if regulations or incentives encouraged it. The SBWRP opened in 2002 and is located in the Tijuana River Valley. It can provide up to 13,000 acre feet of recycled water to the South Bay and provides water to the Otay Water District. The combined production of recycled water from both plants in 2008 was 13,198 acre feet. Excess water from the plants is sent to the ocean via one of two ocean outfalls.

Recycling Wastewater To Potable

As in 1993, recycling wastewater to potable standards is a sensitive subject. Potable recycled water that would meet health standards could be delivered to consumers for $1,630 per acre foot, including the cost of moving that water to one of San Diego's potable water reservoirs (called Indirect Potable Reuse). In 1998, opponents of recycling wastewater for potable use called it "Toilet to Tap," which hardened the public perception that drinking recycled wastewater was equal to drinking toilet water. In addition, when the last major drought ended in 1993, memories became short about the critical need to recycle water. As a result, the concept of recycling wastewater for potable reuse has lacked public and political support.

An SDCWA regional survey in April 2009 shows that, faced with possible water shortages, public perception might be changing. Sixty-three percent of survey respondents favored adding recycled water that had received advance treatment to drinking water supplies. This compares with a 28 percent favorable response in a 2005 survey.

In 2008, the City of San Diego approved funding for an $11.8 million pilot project to test the feasibility, cost, and maintenance of health standards that would be required to use potable storage facilities for indirect potable reuse.

Those objecting to the use of recycled water for potable purposes fear exposure to water that has carried human waste, chemicals and other contaminants. In particular, concerns exist that viruses cannot be easily removed from recycled water. Proponents point out that drinking water from the Colorado River and the Sacramento-San Joaquin Delta contains wastewater effluent from upstream cities such as Las Vegas and Sacramento that has only been treated to secondary standards but is treated to drinking water standards before it is delivered to customers.

To utilize all of the City's recycled water capacity, one or a combination of the following scenarios must be in place:

Scenario 1. Sufficient pipelines to distribute all the water used, storage of recycled water during the rainy season when demand is low, and pricing incentives or regulations to encourage using recycled water.

Scenario 2. A pipeline to a potable water reservoir where highly purified recycled water can be placed in the existing potable supply and further treated to drinking water standards.

Best Management Practices and Water Conservation

Best Management Practices (BMPs)

To whatever degree potential new sources of supply fail to meet demand, water conservation will have to make up the difference - either by mandated cutbacks in emergencies or by implementation in advance of what the authorities call "Best Management Practices" (BMPs). Most water agencies have signed a memorandum of understanding (MOU) with the California Urban Water Conservation Council (CUWCC) to implement water conservation BMPs. The CUWCC was created to increase efficient water use statewide through partnerships among urban water agencies, public interest organizations, and private entities. Signers also agree to report their BMP activities to the CUWCC.

BMPs include such activities as retrofitting homes and businesses with low-flow plumbing fixtures and appliances, encouraging water efficient landscapes, and providing water audits, incentives and rebates. They are distinguished from measures taken during a drought which often require temporary life-style changes. The new BMPs are organized into five categories of programs:

1. **Utility Operations** - to make sure water agency operations are promoting water efficiency.
2. **Education** - providing public outreach and education in schools.
3. **Residential** - focused on replacement of fixtures.
4. **Commercial, Industrial, and Institutional** - aimed at a ten percent reduction in use over the next ten years.
5. **Landscape** - implementing the concepts of water budgeting in landscapes large and small.

BMPs are also included in the Urban Water Management Planning Act and identified as demand management measures. Detailed information about BMPs and other water saving information can be found at the CUWCC's web site: *www.cuwcc.org*.

Conservation History

In 1993, the San Diego Region hoped for a 16.5 percent reduction in water demand by 2010 relative to a 1990 base year. Implementation of BMPs by the San Diego County Water Authority and its member agencies was expected to result in 71,000 acre feet of permanent conservation from 1990 conservation levels. According to the 2005 Urban Water Management Plan, the 2010 projection has been reduced to 56,792 acre feet, and statistics show that the goal is achievable since conservation savings in 2008 totaled more than 55,000 acre feet. Conservation also played a key role in maintaining a balance between demand and supply. The regional demand for water has increased from 647,000 acre feet in 1990 to 691,931 acre feet in 2008, an increase of only six percent, while population increased by 21 percent. The 1993 projections of 2010 demand were 902,000 acre feet while current projections for 2010 demand are between 715,450 and 767,650 acre feet.

Conservation Accomplishments

Conservation levels to-date have been accomplished primarily by the installation of residential low-flow plumbing fixtures and the reduction of agricultural demand through the loss of planted acreage. In addition to measurable conservation achieved by changes in water fixtures, public and school education programs have played a role in changing water use habits. Efforts are shifting to commercial/industrial/institutional fixtures and equipment and landscape irrigation.

Conservation Incentive Programs

At the time of publication, program funding from wholesale utilities had been depleted due to unprecedented participation rates. The following chart lists program offerings typically available to provide water conservation incentives for residences, businesses, public agencies, and agriculture. These incentives include rebates for fixtures and equipment and surveys or audits of irrigation systems to ensure they are operating efficiently.

Conservation Incentive Programs
High-Efficiency Clothes Washer Rebates
High-Efficiency Toilet and Upgrade Rebates
Residential Surveys and Landscape Audits
Weather-Based Irrigation Controller Rebates
Synthetic Turf Rebates
Rotating Nozzle Rebates
Water Savings Performance Program
Grants for Irrigation Repairs and Upgrades
Managed Landscapes Pilot (Irrigation Management) Program
Cooling Tower Conductivity Controllers for HVAC Equipment
pH/Conductivity Controllers for HVAC
Medical Steam Sterilizer Retrofits
Dry-Vacuum Medical Pumps
Pressurized Water Brooms

MWD budget cuts and a new reservation system to gain access to these programs mean they may not be as available as in the past. Information about these incentives can be found at the Metropolitan Water District of Southern California, the San Diego County Water Authority, and/or local water retailers. The following contact information can help to begin the process:

MWD: Be Water Wise
http://www.bewaterwise.com

SDCWA: 20 Gallon Challenge
http://www.20gallonchallenge.com/programs.html

For information from local water retailers:
http://www.sdcwa.org/about/member-agencies.phtml#contact

Regulations to Address Water Use and Allocation

Given the uncertainty of future supplies of water; state, regional and local elected bodies and water wholesalers and retailers have been preparing and implementing regulations. These laws seek to better conserve water and to equitably address water allocations when demand exceeds both supply and the ability of voluntary conservation to close the gap. The regulations take shape in three forms: best management practices (known as BMPs), landscape ordinances, and drought ordinances.

Best Management Practices (BMPs)

As discussed on page 9, BMPs include toilet replacement programs, hiring conservation coordinators, conducting public education programs, water audits, and rebates for water efficient equipment.

Landscape Ordinances

In 1992, the State of California passed AB 325, which required all local jurisdictions to adopt a landscape water conservation ordinance by 1993. As a result, DWR created a Model Water Efficient Landscape Ordinance to reflect the State policy. The objectives of this ordinance are to:

1. Promote the values and benefits of landscapes while recognizing the need to invest water and other resources as efficiently as possible.
2. Establish a structure for designing, installing and maintaining water-efficient landscapes in new projects.
3. Establish provisions for water management practices and wastewater prevention for established landscapes.

AB 2717

In 2004, AB 2717 was passed. It requested the California Urban Water Conservation Council (CUWCC) to convene a stakeholder task force to evaluate and recommend proposals for improving the efficiency of water use in new and existing urban irrigated landscapes in California. Based on this charge, the task force adopted a set of 43 recommendations, essentially changing the AB 325 legislation of 1990 and updating the Model Water Efficient Landscape Ordinance. The legislation also calls for upgrading CIMIS *(see page 10)*.

AB 1881

In 2006, the Water Conservation in Landscaping Act of 2006, AB 1881, was passed. This legislation enacted many of the recommendations made by the CUWCC Landscape Task Force. AB 1881 requires:

1. DWR to update the model ordinance, reflecting the provisions of AB 2717, not later than January 1, 2009.
2. Local agencies to adopt the updated model ordinance or equivalent not later than January 1, 2010, or the state version will be automatically adopted by statute.
3. The Energy Commission, in consultation with DWR, to adopt performance standards and labeling requirements for landscape irrigation equipment, including controllers, moisture sensors, emission devices, and valves to reduce the wasteful, uneconomic, inefficient, or unnecessary consumption of energy or water.

The model ordinance requires a Landscape Documentation Package which includes general project information, a water efficient landscape worksheet, a soil management report, a landscape design plan, an irrigation design plan, and a grading design plan. The water efficient landscape worksheet must contain hydrozone information for each irrigation point of connection, calculations of the maximum applied water allowance per year (MAWA), and the estimated total water use (ETWU) per year. One of AB 1881's stipulations requires a certified water manager to oversee construction of new and rehabilitated landscapes for public agency and private development projects with a landscape area equal to or greater than 2,500 square feet.

A group of San Diego region stakeholders, including CLCA, has been working with SDCWA to develop a model landscape ordinance in hopes the region's cities and the County of San Diego will adopt all or most of the ordinance to promote consistent regional practices.

Drought Ordinances

SDCWA also completed a Drought Management Plan with three elements: (1) voluntary conservation, (2) temporary supply enhancement (such as storage of excess water from previous years and purchase of water on the transfer market), and (3) mandatory cutbacks. SDCWA has also developed a model drought ordinance with four levels to encourage agency consistency on reduction levels and water use restrictions. It identifies four drought levels:

1. **Drought Watch** - where notice is given that supply shortages are likely and a voluntary reduction of up to 10 percent in demand is encouraged and requested.
2. **Drought Alert** - where cutbacks in supply necessitate up to a 20 percent reduction, met primarily by outdoor restrictions.
3. **Drought Critical** - where up to a 40 percent cutback is required and met by severely limiting outdoor use and eliminating issuance of new water meters unless new water use is offset.
4. **Drought Emergency** - where more than 40 percent cutbacks are needed and irrigation can only be used for maintenance of trees, landscaping for fire protection and erosion control, and limited maintenance of parks and fields.

Each water retailer will reduce customer demand by education, restrictions, allocations or pricing. It is up to each agency to determine what to put in their ordinances. Customers should check with member agencies to learn about water restrictions in their area.

MWD'S Water Supply Drought Allocation Plan

Because the majority of San Diego's water supply comes from MWD, a reduction of water from that agency will likely trigger drought allocations. This mechanism will begin when MWD announces a percentage reduction in water supply for the coming year. SDCWA, in turn, will calculate a reduction in supply to the retail agencies based on a historical base period, adjusted for conservation, growth and development of local supply. Retail agencies will implement demand restrictions and other methods to reduce demand. Pricing penalties will apply to each agency in the chain if they fail to meet their allocation.

Landscape and Irrigation Industry Improvements

New Water-Saving Technology

In the sixteen years since the first edition of "Our Water, Our Future," much has changed in the landscape industry, including the development of a new wave of automated technology that promises to more efficiently and accurately monitor and distribute the water needed for any type of plant. The new technology can be found in a broad range of equipment. They include controllers, weather stations, sensors, pressure regulators, spray heads, rotary nozzles, bubblers, and drip systems. The landscape and irrigation industries having been aggressively developing this technology so they can make a difference in the kind of plants and landscapes San Diegans can enjoy in a limited-water environment.

Implementing Water- Saving Strategies

These tools can be of tremendous help in saving water, but they are only effective if installed correctly. Riding the wave of this new technology is a new breed of landscape specialists with the training and skills to recommend, install, and maintain the equipment that can minimize water use while protecting the investment in landscapes that make residential, business and public properties more livable.

Knowing how to incorporate horticulturally correct systems, properly program irrigation controllers, and recognize differences in irrigation zones for sun and shade are all important. The new breed of landscape specialist also has an increasing awareness of the need to promote "California Friendly" landscapes. Property owners should contact local irrigation equipment suppliers and landscape contractors with the training, certifications, and know-how to make the installations correctly. The extra investment in expertise up front will result in savings on water bills in the future.

Landscape Training and Certifications

In addition to new technology, landscape professionals continue to upgrade their professional training. Courses are available through universities, water districts, and industry groups. Both management and operational staff continue to be certified in water efficient practices. Certifications that indicate proficiency in water management include CLCA's Water Management Certification and programs by the Irrigation Association and others. For more information, go to the web sites listed below or contact SDCWA or your local water agency for additional opportunities.:
http://clca.us/water
http://www.irrigation.org/certification

Landscape Watering Calculators

Among the coolest tools for understanding water efficient use are the landscape water calculators that can be found online. MWD has one at: *www.bewaterwise.com/calculator.html*

How Much Water Is Needed?

Professional landscape contractors are able to determine "water budgets," the amount of water needed for irrigation, in part, by utilizing the information explained below.

Evapotranspiration

Evapotranspiration (ET) is "the quantity (depth) of water transpired by plants, retained in plant tissue, and evaporated from adjacent soil surfaces during a specified time." ET estimates are needed to determine how much irrigation water is needed to keep crops, lawns, gardens, and trees healthy and productive.

What is Reference ETo?

Reference ETo is the evapotranspiration (ET) rate of healthy grass, completely covering the ground to a uniform height of 3-to-6 inches, and having an adequate supply of water and extensive fetch. This standard reference is determined in inches or millimeters. With a known ETo, weather stations can be established on these standard grass surfaces to measure weather conditions and estimate ET. Once ETo is known, then the irrigation requirements can be calculated for a specific plant type in the same microclimate as the station. The requirements for each plant type are captured in what is known as the crop coefficient (a numerical value for each plant type relative to ET).

The Formula

This is the formula developed by the State of California (AB 325) to determine water needs on a specific irrigated area: *ETo x (Crop Coefficient / Irrigation System Efficiency) - (Effective Precipitation) x Area = Required H20 (in inches).* In Southern California, rainfall is not factored in because the little rain received often runs off and offers very little moisture to plants on a consistent basis.

Why ETo Is Important

ETo is important for determining water budgets, for calculating regional water needs for irrigation by plant type, and for the operation of the new wave of automated technology helping to more efficiently use San Diego's limited supplies of water.

What Is CIMIS?

The California Irrigation Management Information System (CIMIS) is a network of more than 120 automated weather stations in California managed by DWR with assistance from many local water and governmental agencies. The project began in 1980 with the technical assistance of UC Davis. The first station was launched in 1982. These weather stations collect real-time weather data such as temperature, wind speed, and incoming solar radiation. In addition, reference evapotranspiration (ETo) is computed from the data to assist farmers and landscape managers with their irrigation management operations. Six active CIMIS stations are located in San Diego County.

Looking Back at 1993 - What Did We Know?

The original version of "Our Water, Our Future" showed significant foresight about the future status of water in 2010, thanks to the water experts at the agencies interviewed in 1993. As we approach that milestone, here are some projections that came true, some that didn't and some that haven't changed.

Some Projections That Came True

Supply. Normal supply was projected to be about 700,000 acre feet by 2010. In 2008, San Diego supplies were 709,939 acre feet.

Colorado River Excess Water. The excess supply MWD received from the Colorado River was lost, as predicted, when Arizona and Nevada took their full allocation. Both MWD and SDCWA have firm agreements to utilize water from the Imperial Irrigation District and the Palo Verde Irrigation District. In addition, banking agreements for the use of Lake Mead were accomplished. Finally, shortage and surplus criteria for the river were approved and implemented in 2008.

Diamond Valley Lake. The Diamond Valley Lake reservoir came to fruition. Then called the Domenigoni Reservoir, this new storage facility near Hemet was completed by MWD on schedule in 1999. It has helped to weather recent low-rainfall years and to more effectively mix Colorado River water with water from the State Water Project while providing a measure of protection should a major earthquake strike.

Local Water Storage. The San Diego County Water Authority hoped it would be able to bring on new water storage to meet emergency needs in the event of a failure of the aqueduct system. SDCWA has embarked on an Emergency Storage Project resulting in completion of a new reservoir in Olivenhain, near-completion of additional storage at Lake Hodges, and raising the dam at San Vicente while better connecting all three to SDCWA's pipeline distribution system. These projects will also provide increased reliability after a major earthquake.

Water Reclamation Plants. The City of San Diego has built two water reclamation plants since 1993, the North City Water Reclamation Plant in Mira Mesa and the South Bay Water Reclamation Plant in the Tijuana River Valley. The two plants have a total capacity to treat 45 million gallons of wastewater daily and can produce 39,000 acre feet of recycled water annually. In 2008, 13,198 acre feet were produced. Sixteen San Diego agencies have implemented or plan to have water recycling.

Indoor Water Conservation. An aggressive plan to replace residential toilets because of a 1992 state law has resulted in replacement of many standard flush toilets with low flush models (1.6 gallons per flush (gpf)), and new ultra low flush models are now being sold (1.28 gpf). These efforts, along with the wide distribution of low-flow shower heads, have had an impact in reducing water use despite population increases.

Agricultural Use. Agricultural use of water was projected to be reduced from 19.1 percent to 15 percent, the amount used in 2007, and was down to 12 percent in 2008. "Our Water, Our Future" said that "the major component of conservation in the future will come from loss of agriculture because urban growth, and increasing costs will cause farmers to reduce planted areas." Those trends are continuing.

Pricing Structures. Pricing structures were being developed to encourage conservation savings in 1993. Tier 1 and Tier 2 rates to MWD member agencies were implemented and incentives were increased. Most retail agencies have incremental block rate structures.

Kern Water Bank. A combination of groundwater programs called the Kern Water Bank has resulted in MWD developing significant storage in Kern County through an agreement with the Semitropic-Rosamund Water Storage District. SDCWA has also invested in the Semitropic water bank and has another storage agreement to use a water bank in the Antelope Valley. MWD and SDCWA continue to seek additional storage options.

Some Projections That Didn't Come True

Demand. Demand was estimated to reach 902,000 acre feet by 2010. As of 2008, demand was 691,931.

Seawater Desalination. A seawater desalination plant was projected to be built in South San Diego Bay and was expected to produce 20,000 acre feet annually. It was never built, but plans are moving forward to review South Bay possibilities again. In the interim, a plant in Carlsbad is on track to come online by 2012 that will produce 56,000 acre feet of water. In addition, SDCWA is finalizing a feasibility study that could produce between 56,000 and 186,000 acre feet on Marine Corps Base Camp Pendleton.

Some Projections That Haven't Changed

Fisheries Protection. Measures to protect salmon and smelt species in the Delta were a known need in 1993, and "Our Water, Our Future" said this: "If any of the species found in the Delta needs to be placed on the threatened or endangered species list, all bets could be off for additional supply to the south until compatible solutions can be found." All bets are off for water from the State Water Project until a series of legal decisions related to salmon and smelt species listed as endangered are resolved. This will likely involve fisheries protection measures to maintain water flow and quality while providing an environmentally sound way to transfer water to the south.

South Delta Facilities. Reinforcing the Delta levees was known to be critically important in 1993. Discussions are underway, but a long-term solution is not yet ready for implementation.

Los Banos Grandes Reservoir. If fisheries protection and Delta improvements were put in place, it was thought that a large reservoir in Northern California could capture excess runoff during wet years. This was not accomplished.

Recycling Wastewater to Drinking Water Standards. As in 1993, discussions about recycling wastewater to potable standards are on hold until a pilot study determines the feasibility of purifying wastewater to drinking water standards versus distributing it in a separate system for landscape and industrial use.

Seven Potential Challenges to San Diego's Water Supply

1. Legal Challenges to Water from the Delta

Five species of fish are listed under state or federal endangered species acts: winter run Chinook salmon, spring-run Chinook salmon, Delta smelt, North American green sturgeon, and the Central Valley steelhead. The longfin smelt also is being considered for listing under the California Endangered Species Act by the California Fish and Game Commission, and several environmental organizations are lobbying to list it federally.

The status of each species is analyzed in a legally binding biological opinion that determines whether an action such as taking water from the Delta would jeopardize the species, make changes to its critical habitat, and whether incidental take of the species is allowable. Critical habitat also must be listed. Several opinions have been completed and others are scheduled to be completed early in 2009. The existing biological opinions are being challenged by several lawsuits. Legal challenges to State Water Project supplies could have a range of impacts. Here are some examples:

- During the winter and spring of 2007-2008, deliveries to MWD from the State Water Project were curtailed by 250,000 acre feet to protect the Delta smelt while a new biological opinion was being completed.

- A judge found that State Water Project operators "had failed to demonstrate that interim operations . . . would not threaten irreparable harm . . ." The decision could affect the timing and volume of flows.

- An April 18, 2007, Statement of Decision by an Alameda County Superior Court found that DWR was "illegally 'taking' listed fish through operation of the State Water Project export facilities." The judge ordered DWR to "cease and desist from further operation" unless the State Department of Fish and Game authorizes operation. That decision is on appeal, stopping the cease and desist order until the outcome of the appeal is decided by July 31, 2009.

- The outcome of a Natural Resources Defense Council lawsuit against the Department of the Interior initially set 2009 DWR allocations at 15 percent of contracted amounts for 2009. If implemented, MWD only would have received 277,000 acre feet from the State Water Project.

- Emergency regulations adopted by the California Fish and Game Commission for the longfin smelt could reduce Delta exports by between 310,000 and 700,000 acre feet.

- Four State Water Project contractors north of the Bay-Delta pumping plant assert they should receive a full amount of water because they are located "in the area of origin" of the water they are entitled to receive. If successful, the action would reduce supplies to MWD by 25,000 to 40,000 acre feet annually.

2. Loss of Delta Levees Because of Earthquakes

Delta levees are badly in need of very expensive repairs, and a massive failure of the levees because of a major earthquake or another catastrophe could result in a disaster that would inundate residential and commercial developments, flood farmlands, and create a brackish Delta environment because of the intrusion of salt water from San Francisco Bay. State Water Project deliveries might be stopped for an indefinite period of time, perhaps years, until repairs were made.

3. Loss of Delivery Because of Earthquakes in San Diego or Southern California

Much has been done in recent years to extend the period of time reliable water supplies would be available in the event an earthquake ruptured pipelines or otherwise stopped the flow of water to the San Diego region. The threat still remains, however, and incrementally adding storage projects and local sources of supply will continue to help minimize loss of water should water supplies be cut off for an indeterminate amount of time.

4. Climate Change Resulting in Long-Term Reductions in Precipitation and Water Availability

The current drought could be similar to other droughts over the past 100 years when variability in weather patterns has produced less water than normal. However, a number of well-respected climate scientists believe the pattern of reduced precipitation is part of an overall shift in climate that might mean the Southwest will generally have much less water in the future from the Colorado River Basin and/or the State Water Project. While work continues to better predict future conditions, some respected scientists indicate the possibility of a 30-to-50 percent reduction in available Colorado River supply in future decades.

5. Population Growth in California and the Southwest

The populations of California, Arizona, and Nevada continue to grow, and San Diego's population is no exception. Demand and competition for increasingly limited supplies of water will stress sources of water, and those who provide and use that water. San Diego and the entire state will have to be innovative in maintaining its population and its economy in the midst of future conditions with limited water resources.

6. Believing Water Use for Southern California Is More Important Than Environmental Use in the Delta

Southern California water users have traditionally argued that the economic value of water transported to Southern California is more important than the environmental value of that water to the Sacramento-San Joaquin Delta, one of the largest ecosystems of its kind in the world. In addition to pressure to use more of its water for agricultural and urban uses, the Delta is partially replenished from wastewater treatment plants and agricultural runoff that stress it even further. The fact that no less than five and ultimately six fish species are listed as endangered speaks to the health of the entire Delta ecosystem. Southern California water users will need to respect and support the restoration of that ecosystem if significant amounts of State Water Project water are to be available in the future.

7. Doing Nothing

The decisions about water supply for the state and the San Diego region necessary to meet all the economic, agricultural, and environmental needs will be expensive and politically difficult. However, the biggest threat of all would be to do nothing because of that difficulty and cost.

What Are the Next Steps?

Water is critical to the future of CLCA and to the life San Diegans have come to enjoy in our beautiful region. The future of water is up to all of us – as CLCA members and as citizens. Here's what we can do to assure a green future for San Diego.

What Can All of Us Do?

1. Knowing your water facts is more important than ever! This document was prepared to give you a head start in that regard.
2. Ask to be put on the San Diego County Water Authority's mailing list for newsletters and information by calling (858) 522-6700 or visiting the 20 Gallon Challenge web site at *www.20gallonchallenge.com*. Ask to be put on the mail and e-mail lists for your retail water agency, too.
3. Use water-wise practices both indoors and outdoors.
4. Aggressively eliminate water waste and poor irrigation practices.
5. Use the latest technologies and strategies to make your property water-wise and "California Friendly." Use no more than .7 ETo on combined landscaped areas.
6. Hire a certified CLCA water manager to ensure your landscape is professionally maintained in a water-wise manner.

What Can CLCA Members Do?

1. Get involved with the members of your local water board. Make sure they have a copy of this document to show them what your association is doing to stay educated about water. With 24 water agencies in the San Diego region, landscape contractors need to let the representatives on their board know what they are doing to save water and that they care about the region's water future.
2. Become a CLCA certified water manager so you know how to save the maximum water for your clients. One of AB 1881's stipulations requires a certified water manager to oversee construction of new and rehabilitated landscapes for public agency and private development projects with a landscape area equal to or greater than 2,500 square feet. Those who are certified will not only be able to save water and save their customers money, they will be in far greater demand than those without certification. Make sure your employees become certified, too.
3. Get involved with CLCA's volunteer committees - especially the Water Committee.

The California Landscape Contractors Association

CLCA is the nation's oldest and largest organization of licensed landscape and irrigation contractors. Also included in its membership are landscape architects, landscape suppliers, educators, public employees and students.

CLCA, San Diego Chapter
info@clcasandiego.org
www.clcasandiego.org
(888) 900-2522

This document was produced for CLCA by Nettleton Strategies

"Bringing together information and people to resolve complex public policy and business issues."
www.nettstrategies.com

Primary Sources of Information and Other Links

San Diego County Water Authority 2005 Urban Water Management Plan (UWMP)
http://www.sdcwa.org/manage/2005UWMP.phtml
San Diego County Water Authority 2008 Annual Report
http://www.sdcwa.org/about/annual_2008.pdf
Metropolitan Water District of Southern California, 2005 Urban Water Management Plan
http://www.mwdh2o.com/mwdh2o/pages/yourwater/RUWMP/RUWMP_2005.pdf
City of San Diego Water Reuse Study, March 2006
http://www.sandiego.gov/water/waterreusestudy/involvement/fd2006.shtml
City of San Diego 2005 Urban Water Management Plan
http://www.sandiego.gov/water/pdf/uwmpfinal.pdf
State Model Water Efficient Landscape Ordinance - AB 1881
http://www.owue.water.ca.gov/docs/WaterOrdIndex.cfm

Thank You to Contributors and Reviewers

CLCA is grateful to representatives of the water agencies who assisted in providing information for this document.

No endorsements are appropriate because of the delicate and uncertain nature of water decisions pending both in the courts and the board rooms of the various water agencies. Information was provided by the Bureau of Reclamation, Metropolitan Water District of Southern California, California Department of Water Resources, City of San Diego Water Department, San Diego County Water Authority, and Otay Water District. In addition, several well-respected water consultants reviewed one or more drafts and provided additional confidence that the objectives of fairness and accuracy were being met.

Finally, while the perspectives of the presentation may differ from official presentations, every effort was made to assure those perspectives were based on fact and not opinion so CLCA members, the public, decision makers, and the media can rely on what has been presented.

NOTE: *Water agencies often consider conservation a "supply source." This publication considers conservation a "reduction in demand." As a result, percentages may differ from those in official documents.*