

Progress Update on Water Conservation, Supply Diversification and Resource Management

California Urban Water Agencies' Water Supply Reliability Report

August 2012



CALIFORNIA URBAN WATER AGENCIES

California Urban Water Agencies' Water Supply Reliability Report

1. Introduction and Objective

The future of California depends on a reliable, high-quality water supply. Water agencies in California face numerous uncertainties and challenges to providing supply reliability, such as population and economic growth, increasingly stringent water quality and environmental regulations, aging infrastructure, climate change, and potential catastrophic events such as earthquakes and floods. Through water management planning and investments in projects and programs, water agencies have been working to overcome these challenges and provide a reliable water supply to California residents and businesses.

Established in 1990, the California Urban Water Agencies (CUWA) is a non-profit corporation of 10 major urban water agencies that collectively deliver drinking water to approximately two-thirds of California's population. CUWA's mission is to work together to promote a reliable, high-quality water supply for California. The figure below lists the member agencies and their general locations.

As of 2010, 64% of the state's population resides within the areas served by CUWA member agencies



The objective of this paper is to demonstrate CUWA agency water management actions and leadership in achieving a reliable water supply for California. As highlighted in this report, CUWA agencies are taking leadership roles in the important areas of water conservation, supply diversification and infrastructure improvements. Together, they are maximizing development of cost-effective local supplies, reducing reliance on additional imported water supplies, and working to ensure that existing imported supplies are secure and reliable for the 24 million people served by the CUWA agencies.

This report helps demonstrate that a multi-faceted approach to providing a reliable supply is needed, and there is no "silver bullet" resources strategy that will resolve all of the State's water supply challenges. There also cannot be a "one-size-fits-all" approach; each water agency's resource strategies will be unique to their local conditions. CUWA agencies' initiatives play a critical role in sustaining the social and economic fabric of the State of California.

1.1 Meaning of Reliability

Although the meaning and measurement of "water supply reliability" can vary widely, it has been defined for the purposes of this report as "the ability to meet water demands

consistently.” More specifically, this means consistently meeting demands across the full range of climatic conditions (e.g., wet, normal, dry) and meeting acceptable service standards during catastrophic events (i.e., levels of service may be slightly reduced to less than 100 percent of water demand on a temporary basis during severe droughts or catastrophic events). CUWA agencies have been addressing three primary aspects of water supply reliability—demand management, supply diversification, and infrastructure and system reliability improvements—which are described in this report.

1.2 2010 Urban Water Management Plans

Urban Water Management Plans (UWMPs) provide an excellent “snap shot” of urban water agencies’ existing supplies and demands, along with their long-range plans for future reliability. Every five years since 1985, California’s urban water agencies have been required by the State Water Code to develop and submit UWMPs to California’s Department of Water Resources (DWR); CUWA’s 10 members have submitted their 2010 UWMPs. Water agencies use their UWMPs to assess the reliability of their water supplies in both normal and dry water years, and to identify a reliable mix of resources and conservation measures to meet future demands.

For this white paper, CUWA agencies compiled data from their 2010 UWMPs to better understand combined water management strategies, urban per capita water use trends, future water supply development plans and the continued role of imported water sources. In evaluating planned investments in water supply reliability, it was also necessary to look

historically at what has been accomplished since 1990. Many of the CUWA agencies began investing in reliability well before 2010, and it is critical to capture the full efforts of these agencies in the areas of water conservation, supply development and infrastructure reliability.

1.3 CUWA Agency Investments

Over the last 20 years, CUWA agencies have invested more than \$20 billion in projects and programs that provide reliable, high-quality water supplies. These investments have also been supplemented by grants and funds from other water agencies and entities within the CUWA service areas (i.e., member agencies of a wholesale agency). As described throughout this report, these investments have supported extensive programs in water conservation, comprehensive water supply diversification strategies, and ongoing infrastructure improvements to improve system reliability within CUWA agency service areas. CUWA agencies plan to continue investing in water supply reliability over the next 20 years and anticipate similar levels of spending on future projects and programs to meet water demands in 2030 and beyond. Although CUWA agencies face funding challenges with decreased water revenues, they are committed to continuing these investments.

Throughout this report, major CUWA agency investments are highlighted to provide the reader with specific examples of the types of projects being implemented to provide continued reliability.



Voluntary Transfer of Conserved Agricultural Water to San Diego Region (San Diego County Water Authority)

SDCWA receives conserved agricultural water under a Water Conservation and Transfer Agreement between SDCWA and the Imperial Irrigation District. Under the agreement, SDCWA will receive 90,000 AF in 2012, and ramp up to approximately 200,000 AF by 2021.

The All-American and Coachella canal lining projects also provide 77,000 AF of conserved water per year for the San Diego region.

CUWA investments in water supply reliability over the past 20 years*:

- \$4B Water Conservation and Supply Diversification
- \$17B System Reliability Improvements

**Not including CUWA wholesale customer investments, or full infrastructure renewal and replacement costs.*



Diamond Valley Lake (Metropolitan Water District of Southern California)

After the drought of 1987-1992, MWDSC and its member agencies recognized the important role of storage in providing water supply reliability. Diamond Valley Lake (DVL) has a storage capacity of 810,000 AF. This nearly \$2 billion reservoir was completed in 1999. It stores imported SWP and Colorado River water during years of ample supplies. Up to half of DVL’s capacity is dedicated to emergency storage, with the remainder available to augment supplies during dry years and for seasonal operations.

2. Demand Management

Demand management is an integral part of CUWA member agencies' long-term water management strategies to provide water supply reliability. As stated in the California Water Code: "Demand Management means those water conservation measures, programs and incentives that prevent the waste of water and promote the reasonable and efficient use and reuse of available supplies." Demand management has the additional benefit of reducing energy and chemicals used for water and wastewater treatment and pumping, which reduces greenhouse gas emissions and other environmental impacts. Conservation savings, which are a means to achieve demand management, are a key resource for CUWA member agencies and an integral element of their long-term water management strategies. Conservation savings replace the need to secure other supplies to meet future demands. Also, like any water supply, conservation savings require planning, investment, and implementation. As such, CUWA agencies count conservation savings as a source of supply in their future diversified water supply portfolios. This section highlights past achievements and projected savings.

2.1 CUWA Agency Leadership on Demand Management

2.1.1 Total Conservation Savings

CUWA agencies – both retail and wholesale agencies – have aggressively invested in water conservation programs and pursued plumbing code changes since at least 1990. Wholesale agencies have active programs and policies to support, and in some cases implement, regional conservation efforts for the retail agencies within their service areas. In addition to the wholesalers' regional programs, individual retail agencies independently implement local conservation programs.

CUWA agency investments to support conservation programs, including compliance with California Urban Water

All CUWA Agencies are Making Steady Progress on Total Water Savings

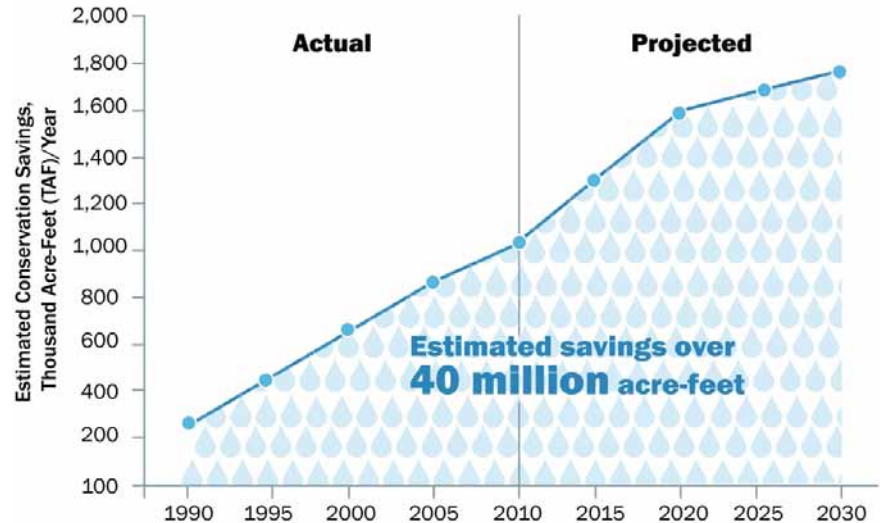


Figure 1.

Conservation Council (CUWCC) Best Management Practices (BMPs), have been on the order of \$1 billion over the last 20 years. These investments are in addition to the investments made by other water agencies and entities within CUWA service areas. Conservation programs are working and, as shown in Figure 1, have already achieved significant conservation savings—estimated at about 1 million acre-feet per year (MAF/YR) in 2010 within the collective CUWA agency service area. Water savings are expected to continue to grow, up to 1.8 MAF/YR by 2030. Continued CUWA agency leadership in the area of demand management will help achieve these future savings through agency-sponsored programs and changes in plumbing codes and regulations. Between 1990 and 2030, CUWA agencies estimate that conservation efforts will save a cumulative total of 40 MAF of water.

For the purposes of this report, the term "conservation savings" is essentially the same as demand reductions that

are achieved through both active and passive conservation. Active conservation is the direct result of agency-sponsored programs. Passive conservation results indirectly from plumbing code changes, appliance standards, ordinances and changes in customer behavior through education and public outreach activities. Details related to the CUWA agencies' water conservation programs and actions are included in their individual UWMPs.

2.1.2 Trends in Gallons Per Capita Water Use

The Water Conservation Act of 2009 (SBx7-7) requires each urban retail agency to establish in its UWMP a reduction goal for 2020 as compared to a baseline to help the State achieve a 20 percent statewide reduction in daily per capita water use. Failure to achieve 2020 per capita usage targets jeopardizes agency eligibility for future State funding opportunities.





City of San Diego Advanced Water Purification Facility (City of San Diego Public Utilities Department)

In June 2011, the City began operating and testing a 1-mgd demonstration-scale facility at the North City Water Reclamation Plant. The \$11.8 million Advanced Water Purification (AWP) Facility project is examining the feasibility of using advanced water treatment technology on recycled water to augment supplies in a local reservoir. The AWP Facility is comprised of a multiple barrier treatment train consisting of microfiltration/ ultrafiltration, reverse osmosis, and ultraviolet light/advanced oxidization. If successful, the facility will ultimately produce up to 16 million gallons of purified water per day, reduce the demand for imported water and become the first indirect potable reuse/reservoir augmentation project in California.

CUWA's Retail Agencies are **on Track** to Meet 20 x 2020, but... It's Early and There is **More Work to Do**

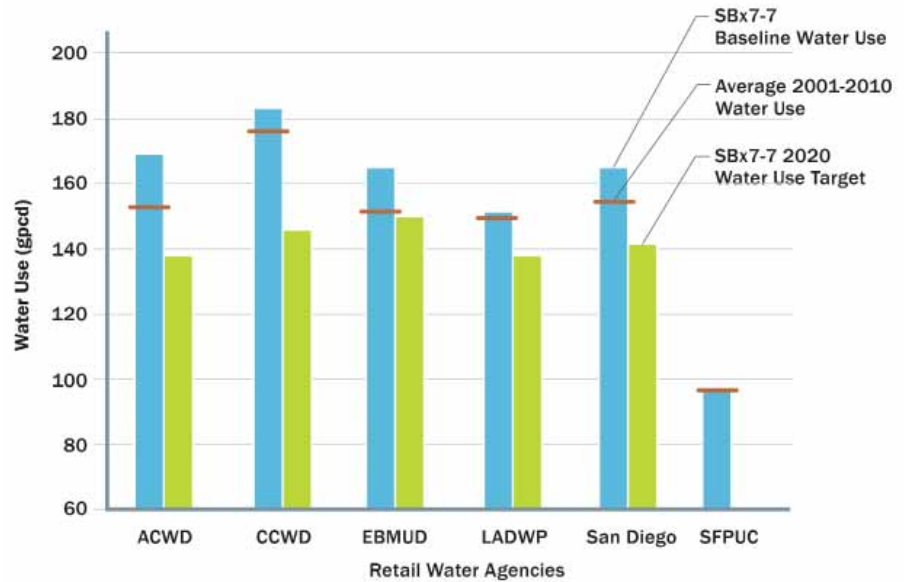


Figure 2.
Notes:

- Although CUWA's wholesale agencies (MWDSC, SCVWD, SDCWA, and Zone 7) are not required to establish water use targets, they have active programs and policies to support retail agencies' efforts on water conservation to meet 20 x 2020 statewide.
- As a retail agency with a baseline <100 gpcpd, SFPUC is exempt from the gpcpd reduction requirement, but continues to implement conservation programs to achieve further demand reductions.
- The CUWA agencies' SBX7-7 baseline water use will vary depending on the 10-year averaging period selected from 1994-2010.

Figure 2 shows water usage in gallons per capita per day (gpcpd) for CUWA retail water agencies. The SBx7-7 legislation has defined gpcpd as total potable water use divided by the total population served in an agency's service area. Each agency's baseline water use (calculated over a 10- to 15-year period) and 2020 water-use target is shown. Because the legislation established four possible methods for calculating 2020 goals to allow for special conditions at the local level, not all agencies have a straight 20 percent reduction as a goal.

The figure also shows each retail agency's average water use between 2001 and 2010 to illustrate recent patterns relative to the 2020 targets. The figure demonstrates that CUWA retail agencies are on track to meet the 20 percent statewide reduction by 2020, but the agencies realize the need to sustain their current

conservation efforts and explore options to increase efforts in order to consistently meet the targets.

CUWA's wholesale water agencies play a unique role in advancing the State's goal of 20 percent reduction in per capita water use by 2020. CUWA wholesale water agencies implement conservation programs and policies through a combination of regionally and locally administered water conservation measures in partnership with or on behalf of their member retail agencies. CUWA wholesale water agencies have adopted policies and invested hundreds of millions of dollars in conservation programs over the last 20 years—often exceeding any statutory requirements—to help ensure that long-term water supply reliability goals are met and to help their member agencies comply with State legislative mandates. CUWA's wholesale agencies are not

included in Figure 2 because they are not required to establish water use targets; however, in accordance with SBx7-7, they have documented conservation efforts in their 2010 UWMPs.

Figure 2 shows that per capita water use levels can vary significantly among urban water agencies. A number of factors contribute to these variations, including:

- Land use patterns as reflected in the proportions of water use sectors served by each agency (e.g., percent single-family residential vs. multi-family residential vs. commercial, etc.)
- Local climate (e.g., temperature and rainfall)
- Socio-economic conditions (e.g., employment, income)

These factors will also influence per capita water usage differently over time. Factors such as land use changes and socio-economic conditions generally change slowly over time. Local climatic conditions can change from month to month and year to year, and their impacts can be observed immediately.

In tracking recent per capita water usage, it is important to consider that 2010 was a unique year with very low water use, as a result of a number of factors, such as the economic recession, a previous three-year drought, and wet-year conditions with considerable precipitation in the late spring and early fall.

The gpccd targets identified in Figure 2 for the year 2020 are preliminary, and all agencies will finalize their baseline and 2020 target in their 2015 UWMPs. It should be noted that the targets were primarily derived from projected 2000 census population data. The targets published in the 2015 UWMPs will be based on 2010 census population projections, which are generally lower than the 2000 census population projections. Lower population numbers would result in higher per capita water usage in 2015 UWMPs; however, the volume of water savings will generally still be in place regardless of the per capita use ratio.

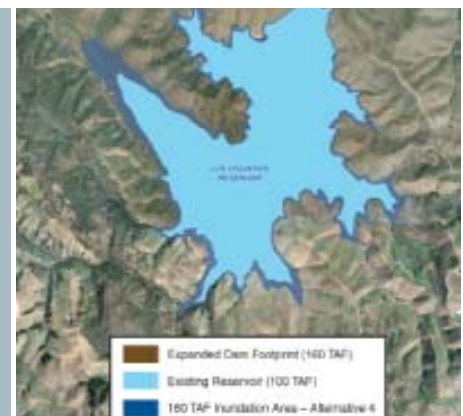


City of Los Angeles Water Recycling Program (LA Department of Water and Power)

The City of Los Angeles has invested approximately \$230 million in recycled water since the late 1970s. LADWP delivers approximately 8,000 AF/YR of recycled water directly and provides another approximately 35,000 AF/YR of recycled water to West Basin Municipal Water District. Approximately 30,000 AF/YR of that recycled water is used for environmental purposes. To meet its 2035 goal of 59,000 AF/YR, LADWP is developing a recycled water master planning document to identify projects to expand recycled water deliveries. These projects include expanding the recycled water distribution system, also known as “purple pipe”, to achieve 29,000 AF/YR for irrigation and industrial uses. The remaining 30,000 AF/YR will be accomplished through a groundwater replenishment project.

Los Vaqueros Reservoir Expansion Project (Contra Costa Water District)

CCWD owns and operates the Los Vaqueros Reservoir that improves water quality for CCWD customers, provides stored water for emergencies and improves Delta habitat. Water is pumped into the reservoir through state of the art fish screens during high water flows when the water is generally low in salts and other contaminants, and when impacts to Delta fisheries are low. The reservoir allows CCWD to reduce or eliminate seasonal water pumping when sensitive fish species are in the area and shift pumping between various intake locations. The dam was raised to an elevation of 521 feet, which expanded the reservoir’s capacity from 100,000 AF to 160,000 AF.



2.2 Managing Future Demand

CUWA agencies expect demand to continue to grow as population served increases; however, as can be seen in Figure 3, the growth in demand is far less than population growth due to conservation efforts as demonstrated previously in Figure 1. From 1990 to 2010, population grew by 25 percent (19 to 24 million), but total water use stayed nearly the same (around 5 MAF). In looking ahead, population is expected to increase by 47 percent from 1990 to 2030, while the agencies expect to hold the increase in water demand to 15 percent or less. The direct effect of the conservation programs' water savings can be seen in Figure 3; the total urban demand could have grown by an estimated 45 percent or more, essentially tracking population growth.

Even with steady population growth, CUWA Agencies are effectively Managing Water Demands

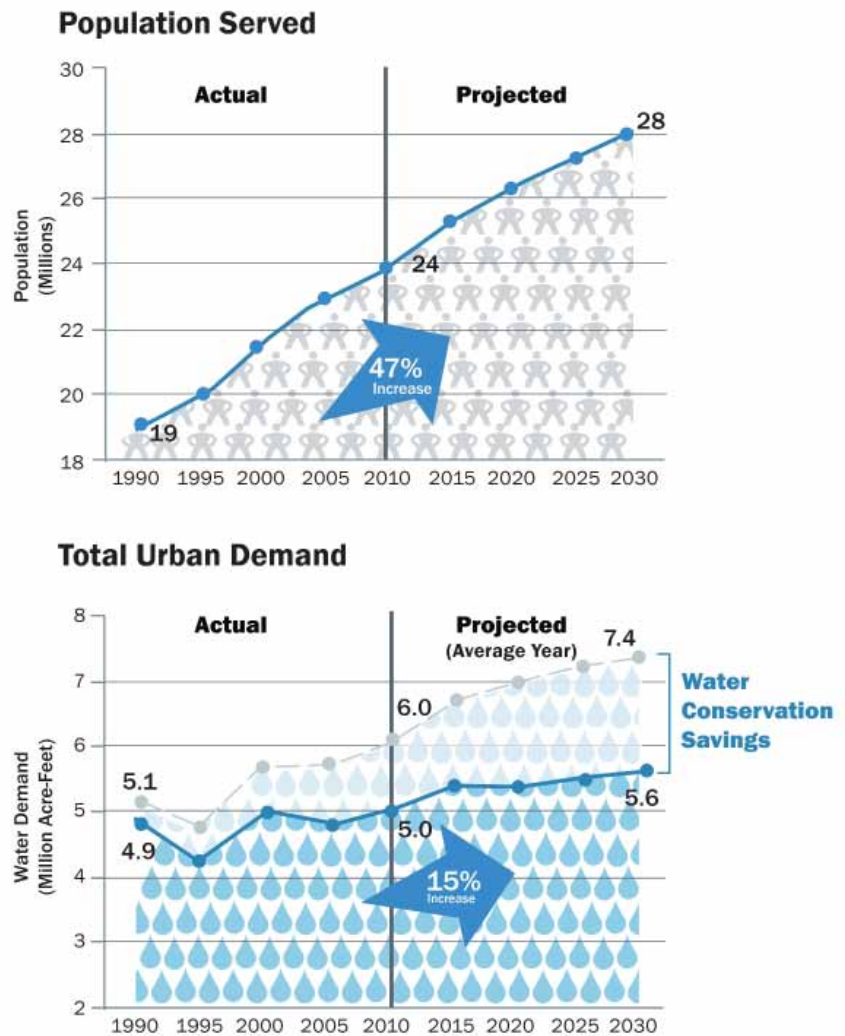


Figure 3.

Harding Park and Sharp Park Recycled Water Projects (San Francisco Public Utilities Commission)

SFPUC has implemented two projects to replace drinking water used to irrigate Harding Park and Sharp Park golf courses with recycled water. The Harding Park Recycled Water Project replaces drinking water used for irrigation with recycled water supplied by the North San Mateo County Sanitation District, a subsidiary of Daly City.

The Sharp Park Recycled Water Project brings recycled water from the Calera Creek Water Recycling Plant in Pacifica. SFPUC's share of costs for the two projects combined is \$14 million. These projects will reduce the San Francisco Regional Water System's dependency on a single source of water, decrease demand on surface water, provide a drought-resistant water source, and decrease wastewater discharges to the Pacific Ocean.



2.2.1 Demand Uncertainty

Uncertainty exists and is part of any forecasting activity. Uncertainty in determining future water demands includes long-term changes in demographics, lifestyle, and effects of climate change. In the short-term, there is uncertainty in how the recent multi-year drought and the economic downturn have affected the demands observed in recent years.

Over the last several years, water demands dropped dramatically, with the decline generally attributed to a combination of weather, economic issues and water conservation efforts related to the three-year drought. It is uncertain as to how each of these items specifically influenced demands. To improve demand forecasting, water agencies are trying to understand the extent to which these individual factors did influence the decline, and to what extent demand may rebound as conditions return to normal. These factors require additional data and time to better understand, and agencies will reassess conditions in their 2015 UWMP updates. Figure 4 provides an example of rebound periods that have historically occurred after temporary demand suppression.

2.3 Looking Ahead

Each CUWA agency has established conservation goals and developed demand management programs for its service area. CUWA members will continually examine the effectiveness of water conservation programs and assess progress toward goals. Programs will be revised and new programs developed as needed to achieve conservation targets

2010 Water Demands were Unique, Given Climatic and Economic Conditions Some Rebound Could Occur in the Future

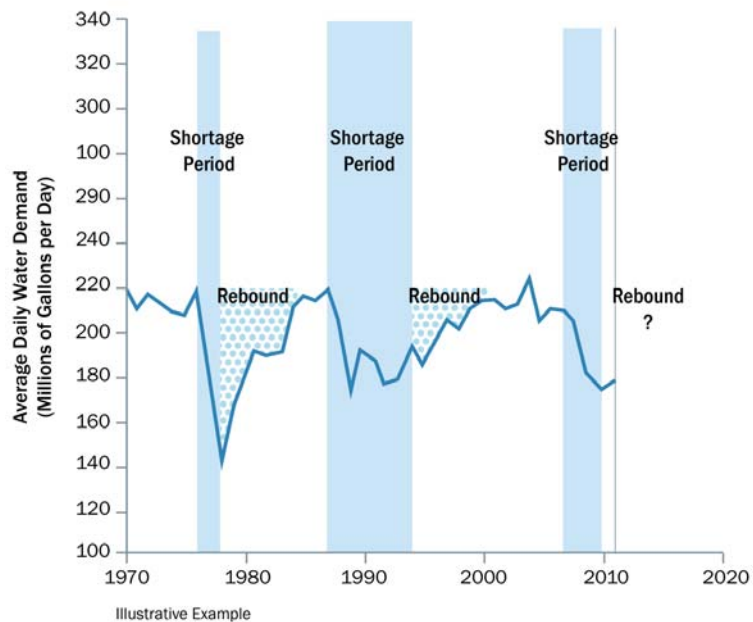


Figure 4.

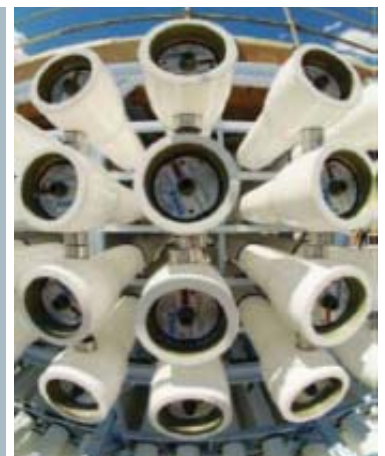
as future water demands change with increased population. It will be increasingly important to involve land use agencies, manufacturers, building contractors, landscape architects, landscape contractors and others in promoting water conservation in the future. While water agencies have a significant role to play, an integrated approach with other sectors will be needed to achieve ongoing water management goals.

3. Supply Diversification and System Reliability

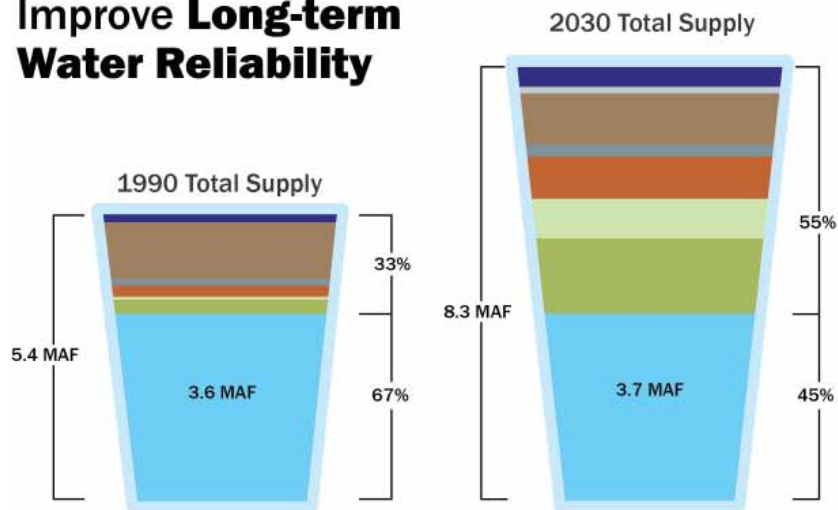
CUWA agencies face numerous supply challenges and uncertainties associated with continuing to provide a reliable water supply. This section discusses the leadership actions taken by CUWA agencies to manage these challenges both in the past and into the future.

Silicon Valley Advanced Water Purification Center – Advanced Recycled Water Project (Santa Clara Valley Water District)

The SCVWD and the City of San Jose propose to expand the South Bay Water Recycling (SBWR) system to provide recycled water to landscape, agricultural and industrial users in north Santa Clara County. The SBWR program is the largest urban water reuse project in northern California; it delivers more than 20 mgd in the summer to 550 existing customers and numerous new customers through approximately 100 miles of pipelines. The new 8-mgd reverse osmosis advanced treatment facility will enhance recycled water quality, expand marketability and increase recycled water delivery while protecting groundwater basins. The project will also provide a reliable, drought-proof water supply and reduce dependence on imported water from the Delta.



Beyond 20 x 2020 CUWA Agencies are Diversifying Water Supplies to Improve Long-term Water Reliability



Normal/Average Year Supply Diversification – 1990 to 2030

Category	Volume (AFY)	
	1990	2030
Recycled Water	100,000	579,000
Water Transfers	-	76,000
Groundwater	1,180,000	1,289,000
Ocean/Brackish Desalination	8,000	182,000
Other Local Supplies	198,000	310,000
Ag Efficiency Transfer to Urban	6,000	398,000
Conservation Savings	259,000	1,780,000
Imported Water	3,623,000	3,734,000

Figure 5.

3.1 Supply Planning and Diversification of Water Supplies

As discussed in Section 2, CUWA agencies will continue to aggressively implement water conserving measures, but they face multiple challenges to providing future water supply reliability. Taking into account these challenges, a single approach or “silver bullet”, like conservation, cannot be the only strategy. While conservation will continue to be a core water management strategy, agencies will also need to continue to improve reliability, diversify their water portfolios, and develop new supplies.

In the 2010 UWMPs, CUWA agencies address the need to diversify supplies to reduce reliance on additional imported water sources to meet future demands. This diversification comes from developing local resources and other innovative supply options, such as the voluntary

transfer of conserved agricultural water to urban uses. Figure 5 highlights CUWA agencies’ collective portfolio of water supplies in 1990, compared to the more diverse mix of normal/average year resources planned to meet water demands in 2030, as documented in the 2010 UWMPs. Although agencies typically plan supplies to meet a range of conditions (e.g., dry years), normal/average year conditions were selected for the purposes of this report to enable consistent comparisons across CUWA agencies.

Also as shown in Figure 5, imported water will continue to provide a core source of supply for CUWA agencies. Imported supplies have been defined broadly to include any water delivered from outside a water agency’s service area, including State Water Project, Central Valley Project, Colorado River, LA Aqueduct, and Sierra supplies such as Hetch Hetchy and Mokelumne River. CUWA agencies have

invested heavily over many decades to develop systems that provide imported water as the base component of their supply portfolios. The volume of imported water used by CUWA agencies is projected to remain at about the same level in 2030 as it was in 1990 – 3.7 MAF. Water demand growth will largely be met by diversifying with new, local sources of supply. With this growth of local supplies, the imported portion of the total CUWA water portfolio will drop to a much lower percentage—from about two-thirds (67 percent) in 1990 to less than half (45 percent) of the total needs in 2030.

California’s urban population centers developed in areas far from the major surface water sources, based on the ability to import these supplies to the urban regions. For this reason, imported supplies will always be a core source of supply, and CUWA agencies are actively taking steps to preserve its reliability. As

an example, several CUWA agencies are actively involved and have invested funds in preparing the Bay-Delta Conservation Plan that aims to achieve the co-equal goals of ecosystem restoration and water supply reliability.

CUWA agencies' investments in local storage provide greater flexibility in meeting demands during periods of shortage. Increased storage capabilities can generally enable CUWA agencies to import less water during dry years and rely more heavily on supplies previously imported during normal or wet years and held in storage.

In addition to preserving existing imported supplies, CUWA agencies have been proactively investing in developing new supplies to improve self-sufficiency and future water supply reliability. Over the last 20 years, CUWA agencies have invested on the order of \$3 billion in new supply projects and programs (not including operation and maintenance costs, and in addition to \$1 billion invested in conservation as described above). Since 1990, they have been working on several significant new sources of supply, as described below.

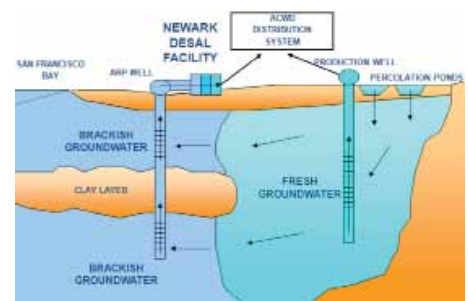
Recycled water. Several CUWA agencies have been pursuing recycled water projects, as noted in the featured examples in this paper, including the City of San Diego's Advanced Water Purification Facility, SCVWD's Silicon Valley Advanced Water Purification Center, SFPUC's Harding Park and Sharp Park Recycled Water Projects, and the LADWP Recycled Water Master Plan, among others. CUWA agencies have been actively engaged in helping to refine proposed recycled water regulations and legislation to encourage the development of local water supplies, while protecting public health. Recycled water is expected to grow six-fold from

100,000 AF in 1990 to an estimated 580,000 AF by 2030.

Groundwater. A few CUWA agencies already rely heavily on local groundwater supplies and have long been taking actions to protect the sustainability of those supplies. Other CUWA agencies are looking to further develop and improve local groundwater supplies through projects that address water quality issues and that augment groundwater through conjunctive use and/or recharge. However, because most CUWA agencies already have relatively sophisticated groundwater management programs, the potential for additional groundwater development is projected to be only about 10 percent from 1990 to 2030.

Ocean/Brackish Desalination. CUWA agencies are pursuing desalination of ocean and/or brackish groundwater for potable and non-potable purposes. The ACWD Newark Desalination Facility is Northern California's first brackish water desalination project. Desalination supplies are expected to grow more than 20-fold, between 1990 (about 8,000 AF) and 2030 (approximately 182,000 AF).

Agricultural Efficiency Transfer to Urban. Beyond urban water conservation programs, CUWA agencies have also been actively partnering with agricultural interests to implement water management programs that achieve more efficient use of state water resources on agricultural lands (e.g. canal lining). The savings from such programs can be transferred to urban uses, without adversely affecting the existing agricultural use. A few major projects are in progress to achieve an increase from 6,000 AF in 1990 to nearly 400,000 AF in 2030, including San Diego County Water Authority's Water Conservation and Transfer Agreement with the Imperial Irrigation District.



Newark Desalination Facility (Alameda County Water District)

Northern California's first brackish water desalination facility, the Newark Desalination Facility, produces potable water by removing salts and other minerals from brackish groundwater in portions of the Niles Cone aquifer that were previously impacted by seawater intrusion from the San Francisco Bay. The Facility provides ACWD with improved water supply reliability, increased water production capacity, improved water quality and reduced reliance on imported supplies while achieving groundwater basin protection and reclamation.

Built in 2003, the capacity was recently doubled to 12.5 mgd in 2010. Total investment is \$61 million.



The Freeport Regional Water Authority Intake and Pump Station (East Bay Municipal Utility District and Sacramento County Water Agency)

The FRWA Intake and Pump Station, sponsored jointly by the EBMUD and SCWA, is a key facility of the overall \$922 million Freeport Regional Water Project (FRWP). The Intake and Pump Station conveys up to 185 mgd of raw water diverted along the Sacramento River near the town of Freeport. EBMUD receives up to 100 mgd used for drought relief; SCWA receives up to 85 mgd to meet the needs of new development and ease the use of groundwater. Completed in 2011, the FRWA Intake construction cost was \$120 million.

Water Transfers. In addition to the agricultural efficiency transfers described above, CUWA agencies also pursue long-term water transfers (contracts for purchases) from other agencies. Transfers are expected to grow from zero in 1990 to 76,000 AF in 2030.

Other Local Supplies. CUWA agencies are also pursuing other means to tap local surface water supplies, including developing and managing reservoirs to capture local runoff and developing supplies from local watersheds. These supplies are largely weather dependent and are projected to increase from about 200,000 AF to 310,000 AF in 2030, assuming normal-year conditions.

Conservation Savings. Conservation savings are a significant component of future water supply portfolios for CUWA member agencies. As described above, CUWA agencies have invested heavily in conservation savings over the last few decades and are committed to continuing conservation investments, not only to comply with SBx7-7, but more importantly to provide for future water demands. CUWA agencies will continue to implement existing measures, and will emphasize new measures to reduce outdoor water use and further refine plumbing codes and regulations in the future. As shown in Figure 5, these actions are expected to result in an increase in conservation savings by nearly seven times, from about 260,000 AF in 1990 to 1.78 MAF by 2030.

Though most of the projects featured in this paper are related to storage, conveyance and reuse, CUWA agencies are also investing in alternative water supplies and related infrastructure, such as stormwater capture projects that provide dual benefits of increasing groundwater recharge and improving local water quality through reducing surface water discharges of pollutants.

3.2 System Infrastructure and Reliability

In addition to the new supplies highlighted in the diverse resource mix described above, CUWA agencies also continue to invest in other facility enhancements and programs to restore, preserve and improve the reliability of existing supplies. Water supply reliability includes both water availability and the necessary infra-

CUWA agencies are making ongoing system investments to further improve reliability

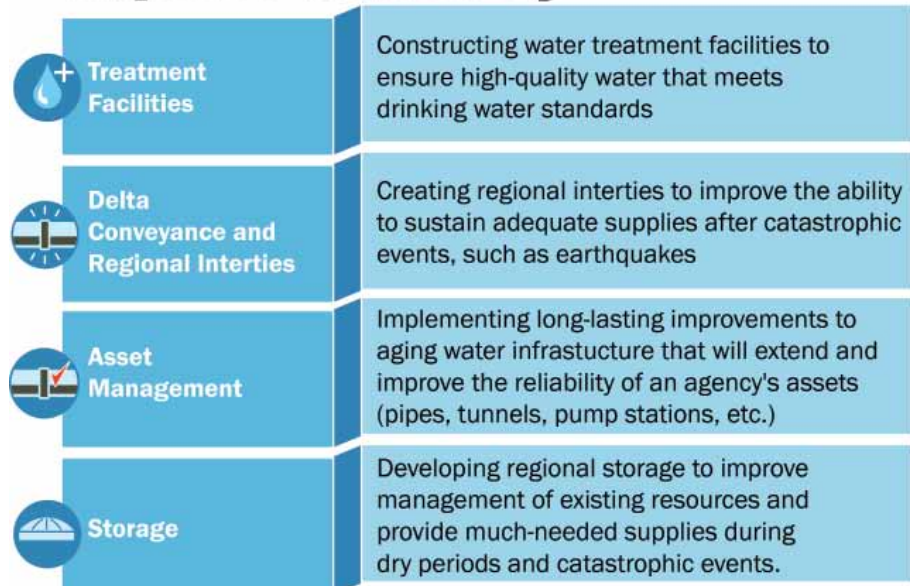


Figure 6.

structure required to transport, treat and store it. Through projects such as storage facilities and regional interties, CUWA agencies are taking steps to more efficiently manage existing supplies. They are also investing in treatment facilities and asset management programs to sustain the quality of supplies and infrastructure required to deliver water reliably in the future. Figure 6 provides a summary of the type of system reliability investments made by CUWA agencies.

It is estimated that CUWA agencies have invested around \$17 billion in system reliability improvements in the last 20 years (not including operation and maintenance costs).

CUWA agencies have successfully completed several significant storage and conveyance projects, including three featured in this report – MWDSC’s Diamond Valley Lake, CCWD’s Los Vaqueros Reservoir Expansion and EBMUD’s Freepoint Intake and Pump Station.

3.3 Looking Ahead

The one certainty in planning for and providing a reliable supply of water is that supply challenges and uncertainties will continue to exist. Through long-term planning, CUWA agencies will continually examine their water reliability strategies and supply goals, accounting for uncer-

ainties. The results summarized in this report reflect the projects identified in the CUWA agencies’ 2010 UWMPs. With each periodic update of their UWMPs, CUWA agencies will forecast water demands, taking into account conservation efforts, and identify the reliable mix of supplies, including new projects, necessary to manage uncertainties and meet demands under varying hydrologic conditions.

4.0 Conclusion

This report has demonstrated that CUWA agencies are taking effective water management actions to achieve a reliable water supply for California. Specifically, the report highlighted the following accomplishments and planned actions:

Since at least 1990, CUWA agencies have aggressively invested in water conservation programs and pursued plumbing code changes to achieve current savings of 1 MAF/YR in 2010 within their collective service areas. With continued efforts, annual savings are predicted to reach 1.8 MAF/YR by 2030; an estimated 40 MAF of total savings will have been achieved between 1990 and 2030.

CUWA retail agencies are on track to achieve the mandated 20 percent per capita statewide reduction in water

demands by 2020. While agencies are encouraged by their progress on conservation, it is very early in the process, and 2010 was a unique year. CUWA agencies will continue to promote water-use efficiency to sustain long-term behaviors, with more emphasis on reducing outdoor water use and further evolving standards, codes and regulations.

CUWA's wholesale agencies are also leaders in water conservation and play a unique role in advancing the State's goal of 20 percent reduction in per capita water use by 2020. CUWA wholesale water agencies implement conservation programs and policies through a combination of regionally and locally administered water conservation measures, in partnership with or on behalf of their member retail agencies. Water savings that CUWA agencies have been able to achieve are even more impressive when viewed against the backdrop of continuous population growth. Even with a 47 percent predicted population growth from 1990 to 2030, CUWA agencies are working to manage the increase in demand to 15 percent over the same time frame.

Though conservation savings are projected to grow six-fold from 1990 to 2030, agencies will still need to diversify their water portfolios and develop new supplies to meet future demands of a growing population. Significant new sources of supply since 1990 and their expected yield in 2030 include:

- **Recycled water** – increasing from 100,000 to an estimated 580,000 AF/YR
- **Groundwater** – increasing from about 1.2 to 1.3 MAF/YR
- **Ocean/Brackish Water Desalination** – increasing from about 8,000 to 182,000 AF/YR

- **Agricultural Efficiency Transfer to Urban (i.e., transfer of conserved agricultural water to urban use)** – increasing from 6,000 to nearly 400,000 AF/YR
- **Water Transfers** – increasing from zero to about 76,000 AF/YR.

Imported water (e.g., CVP, SWP, Hetch Hetchy, Colorado River, LA Aqueduct, Mokelumne River and other Sierra supplies) will continue to provide a core source of supply for CUWA agencies, staying at largely the same volume from 1990 to 2030 (about 3.7 MAF/YR), but the aggregated imported water drops to a much lower percentage, from about two-thirds (67 percent) to less than half (45 percent) of the 10 CUWA agencies' total supply.

Being a core source of supply, CUWA agencies are actively taking steps to preserve the reliability of existing imported supplies. As an example, several CUWA agencies are actively involved and have invested funds in preparing the Bay-Delta Conservation Plan that aims to achieve the co-equal goals of ecosystem restoration and water supply reliability.

Overall, CUWA agencies have invested more than \$20 billion on projects and programs to achieve water conservation savings and supply diversification (\$4 billion), and improvements in infrastructure and system reliability (\$17 billion). Although CUWA agencies face funding challenges with decreased water revenues, they are committed to continuing these investments.

CUWA agencies are confident that implementing the strategies, projects and programs outlined in their respective UWMPs will enable them to continue providing a reliable water supply to the 24 million people they serve.



Bay Delta Conservation Plan: Achieving Co-Equal Goals

The Bay Delta Conservation Plan (BDCP) is being prepared to achieve the co-equal goals of ecosystem restoration and water supply reliability. Several CUWA member agencies that receive water supply from the State Water Project (SWP) and the Central Valley Project (CVP) have invested in developing the BDCP and the accompanying Delta Habitat Conservation and Conveyance Program. As part of the BDCP, an isolated water conveyance facility through the Delta is envisioned to be constructed sometime in the early 2020s. Proponents of the isolated water conveyance facility believe it will bring greater water supply reliability to SWP and CVP contractors, particularly in the event of an earthquake and/or multiple levee failures.



Mocho Groundwater Demineralization Plant (Zone 7 Water Agency)

As part of the Livermore-Amador Valley's Master Water Recycling Permit to help manage salt loading in the groundwater basin and support the implementation of regional recycled water projects, Zone 7 constructed a 6.1 million gallon per day groundwater demineralization facility. Coming online in 2009 with the help of a Proposition 50 Grant, the facility improves delivered water quality to customers while exporting up to 4,000 tons of salt per year from the basin.

