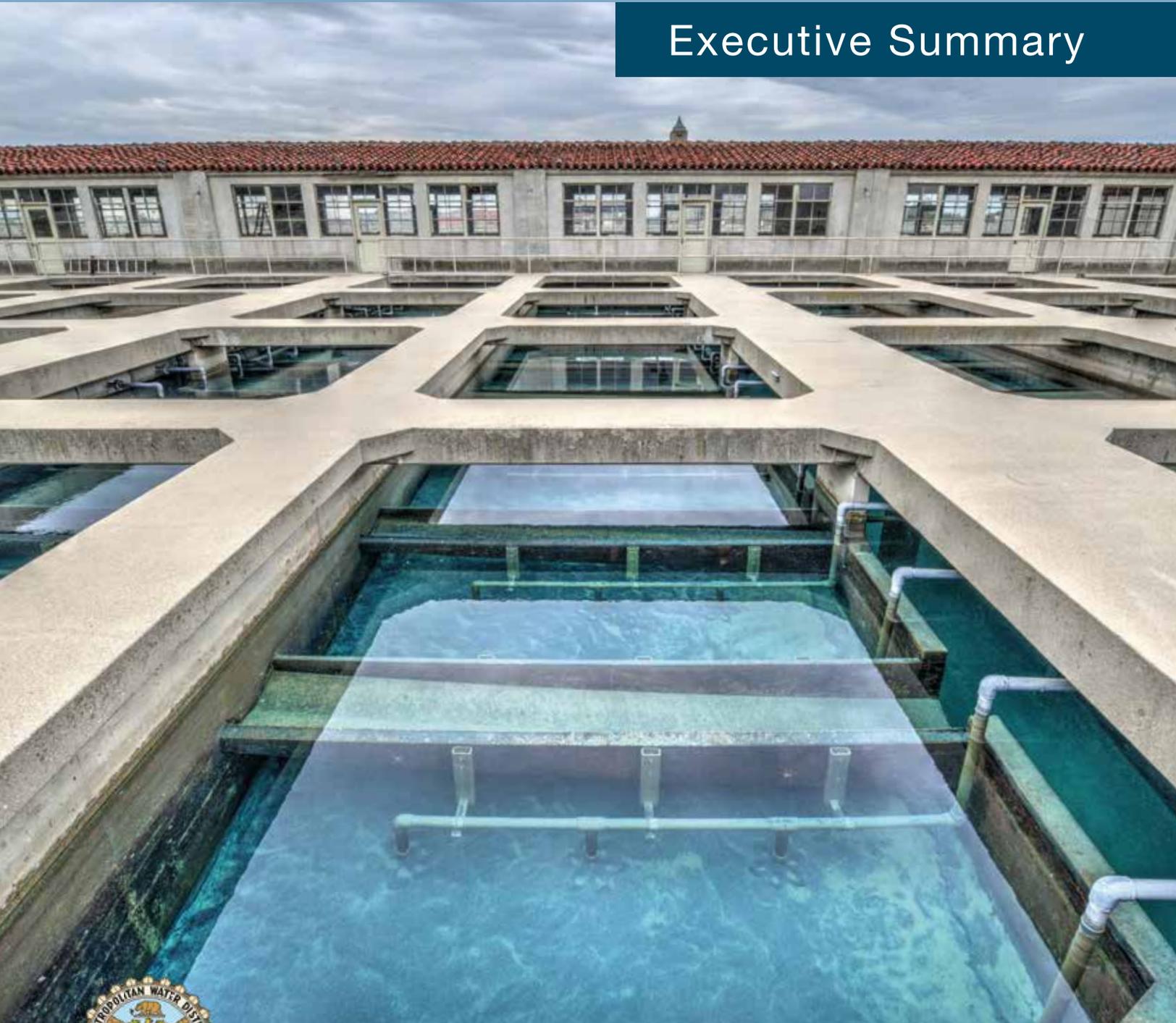


Integrated Water Resources Plan 2015 UPDATE

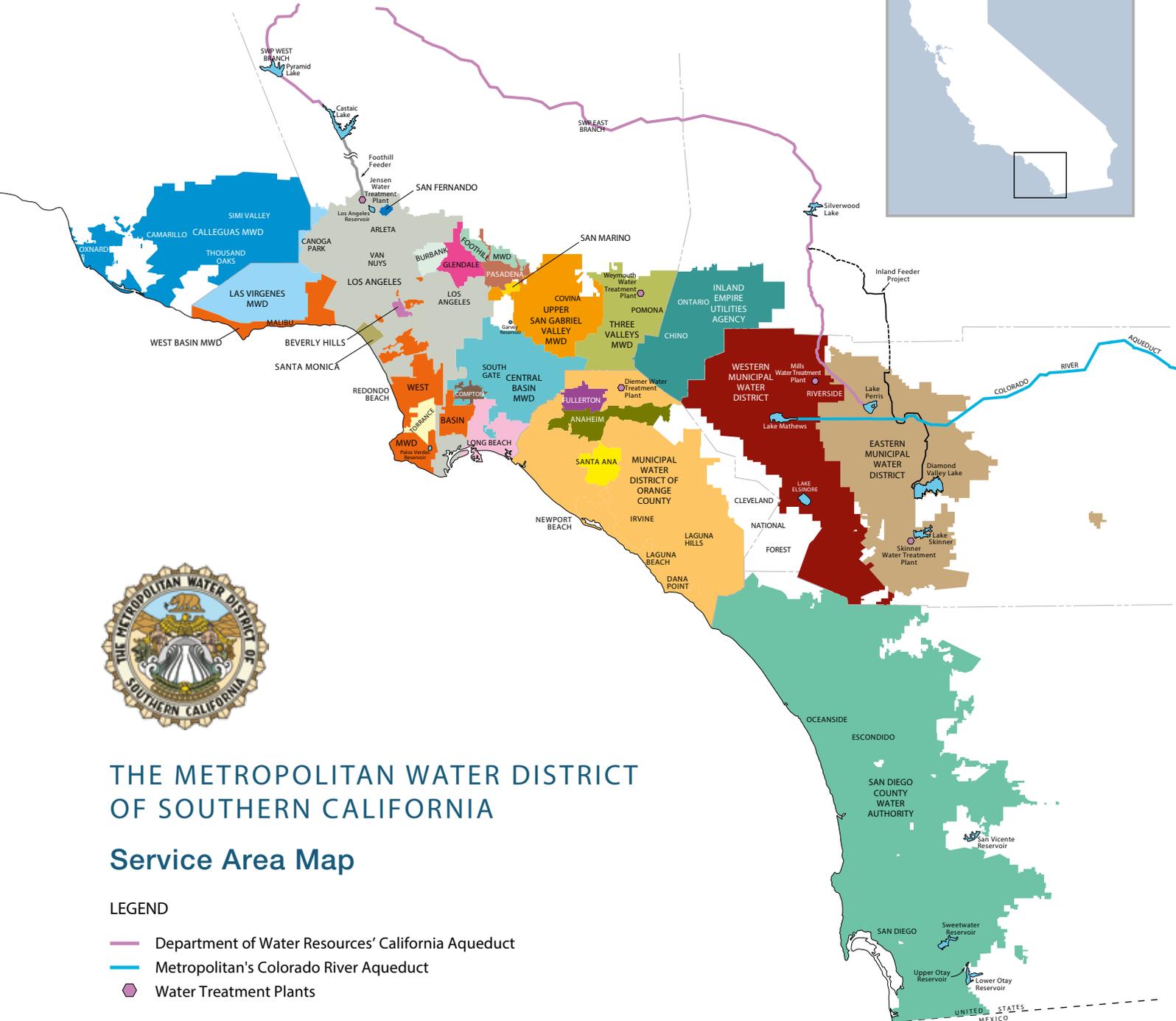
Executive Summary



This page intentionally left blank

WATER TOMORROW

Integrated Water Resources Plan



THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

Service Area Map

LEGEND

- Department of Water Resources' California Aqueduct
- Metropolitan's Colorado River Aqueduct
- Water Treatment Plants

Executive Summary

WHO IS METROPOLITAN

The Metropolitan Water District of Southern California is the Southland's water provider for a six-county region with a population of nearly 19 million. From the engineered gravity-flow of the Colorado River Aqueduct, to sustainable water recycling and groundwater replenishment, to today's investments in innovation – Metropolitan thinks ahead.

OUR MISSION

The mission of the Metropolitan Water District of Southern California is to provide its service area with adequate and reliable supplies of high-quality water to meet present and future needs in an environmentally and economically responsible way.

In California water, uncertainty comes with the territory. Being unprepared for tomorrow, however, is simply not an option. The Metropolitan Water District of Southern California prepares for tomorrow with an evolving long-term water strategy known as its Integrated Water Resources Plan, or IRP. The inaugural IRP was adopted in 1996, with updates in 2004 and 2010. The 2015 IRP Update continues the tradition of assessing and adapting to changing conditions facing Southern California.

The fundamental goal of the IRP is for Southern California to have as reliable a water system for tomorrow as the region has enjoyed for decades, regardless of the challenges that emerge along the way. Metropolitan plans to meet this goal through an adaptive management strategy that is the cornerstone of the 2015 IRP Update.

Metropolitan was authorized by the California Legislature in 1928 to advance a regional approach to water supply in Southern California. Metropolitan's initial mission was to construct the 242-mile Colorado River Aqueduct to its service area on the Southern California coastal plain. Metropolitan's service area had an assessed property valuation of approximately \$2 billion at the time. Now Metropolitan serves a six-county service area with a property valuation of approximately \$2 trillion. Metropolitan imports supplies from both the Colorado River and Northern California via the State Water Project while investing in a variety of storage, local supply and conservation initiatives.

Metropolitan has a long record of promoting alternatives to imported water supplies, dating back to the 1980s. With the IRP, that process became more formalized as a long-term strategy and official policy. Metropolitan has steadily diversified the future water portfolio for Southern California with each revision to the IRP. This update is no exception. Investments to maintain the reliability of imported supplies are complemented by an expansion of local supply development along with a reduction in demand through a variety of conservation and water use efficiency initiatives.

The necessary suite of actions evolves over time based on the water conditions of tomorrow. Updating the IRP creates a new baseline for managing into the future.

SETTING THE 2015 IRP UPDATE RELIABILITY TARGETS

The 2015 IRP Update reliability targets identify developments in imported and local water supply and in water conservation that, if successful, would provide a future without water shortages and mandatory restrictions under planned conditions. For imported supplies, Metropolitan looks to make investments in additional partnerships and initiatives to maximize Colorado River Aqueduct deliveries in dry years. On the State Water Project, Metropolitan is looking to make ecologically-sound infrastructure investments so that the water system can capture sufficient supplies to help meet average year demands and to refill Metropolitan’s storage network in above-average and wet years. Lowering regional residential per capita demand by 20 percent by the year 2020 (compared to a baseline established in 2009 state legislation),

reducing water use from outdoor landscapes and advancing additional local supplies are among the planned actions to keep supplies and demands in balance. Today’s best estimates about future conditions are a sound basis for establishing reliability targets. Table ES-1 shows the 2015 IRP Update supply reliability and conservation targets. These targets represent a combined total of 723,000 acre-feet of increased conservation savings and supply production by the end of the forecast period; of these, 485,000 acre-feet are from the total conservation target and 238,000 acre-feet are from the total supply reliability target. These targets represent the projected levels of imported supplies, local supplies and water conservation necessary to meet the 2015 IRP Update reliability goals.

TABLE ES-1
2015 IRP Update Total Level of Average-Year Supply Targeted (Acre-Feet)

| | 2016 | 2020 | 2025 | 2030 | 2035 | 2040 |
|------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|
| Retail Demands before Conservation | 4,878,000 | 5,219,000 | 5,393,000 | 5,533,000 | 5,663,000 | 5,792,000 |
| Total Conservation Target | 1,034,000 | 1,096,000 | 1,197,000 | 1,310,000 | 1,403,000 | 1,519,000 |
| Retail Demands after Conservation | 3,844,000 | 4,123,000 | 4,196,000 | 4,223,000 | 4,260,000 | 4,273,000 |
| Minimum CRA Diversion Target | 900,000 | 900,000 | 900,000 | 900,000 | 900,000 | 900,000 |
| Average Year SWP Target | 1,202,000 | 984,000 | 984,000 | 1,213,000 | 1,213,000 | 1,213,000 |
| Total Local Supply Target | 2,199,000 | 2,307,000 | 2,356,000 | 2,386,000 | 2,408,000 | 2,426,000 |
| Total Supply Reliability Target | 4,301,000 | 4,191,000 | 4,240,000 | 4,499,000 | 4,521,000 | 4,539,000 |

ACHIEVE ADDITIONAL CONSERVATION SAVINGS

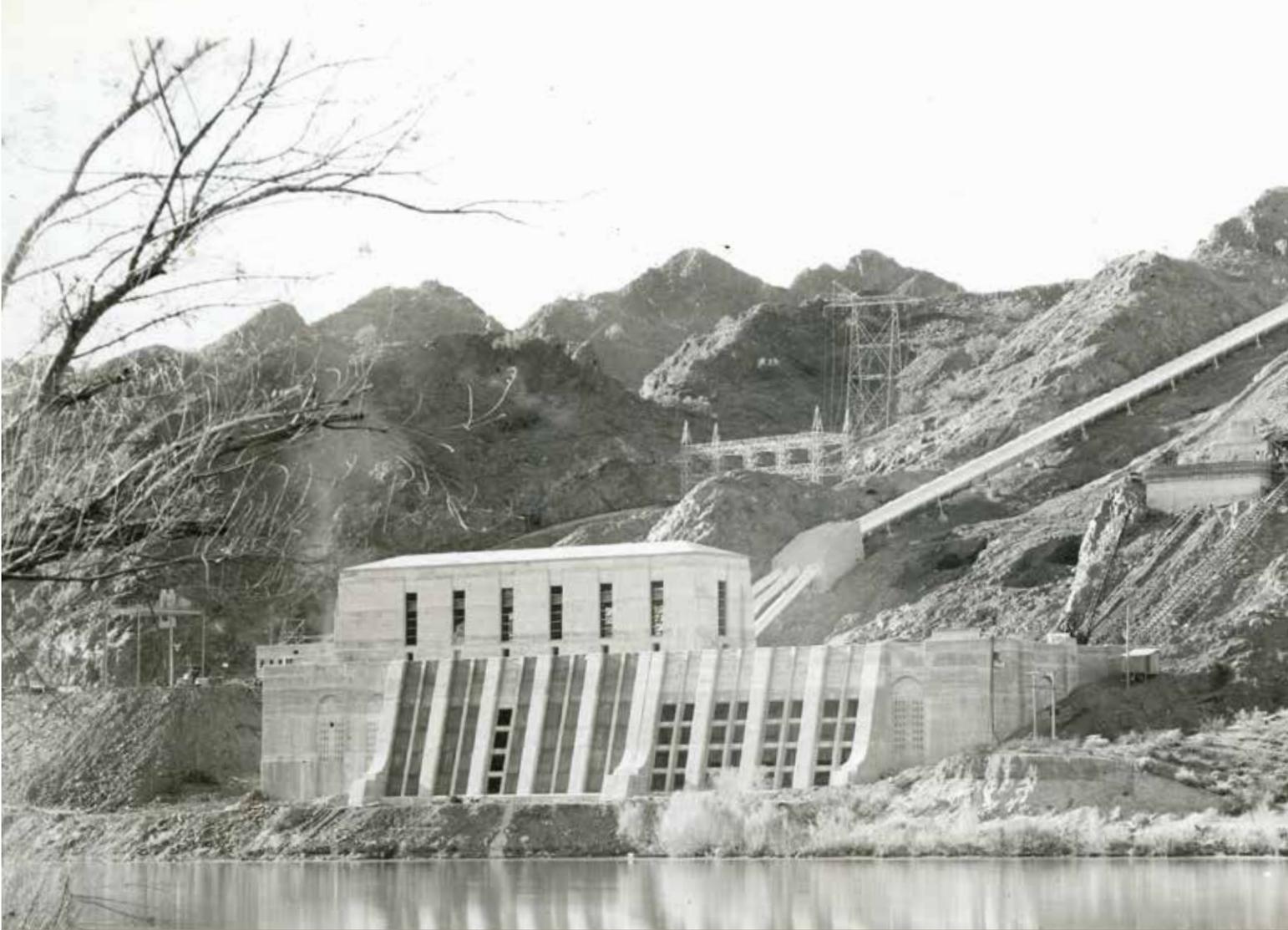
Pursue further water conservation savings of 485,000 acre-feet annually by 2040 through increased emphasis on outdoor water-use efficiency using incentives, outreach/education and other programs.

DEVELOP ADDITIONAL LOCAL WATER SUPPLIES

Develop 230,000 acre-feet of additional local supplies produced by existing and future projects. The region would reach a target of 2.4 million acre-feet by 2040, a key to providing water supply reliability into the future.

MAINTAIN COLORADO RIVER AQUEDUCT SUPPLIES

Develop programs to ensure that a minimum of 900,000 acre-feet is available when needed, with access to 1.2 million acre-feet in dry years.



Past Successes

The original 1996 IRP prepared Southern California to meet current water demands and conditions. A vision 20-years in the making has allowed the region to withstand significant hardship imposed by record years of heat and drought. Southern California uses less imported water than it did a generation ago even though the population has grown by five million people. And a strong commitment to developing local resources, including new and emergency storage with 6 million acre-feet of capacity, has ensured greater reliability. With the vision in the 2015 IRP Update, Southern California can continue these achievements.

STABILIZE STATE WATER PROJECT SUPPLIES

Manage SWP supplies in compliance with regulatory restrictions in the near-term for an average of 980,000 acre-feet of SWP supplies. Pursue a successful outcome in the California WaterFix and California EcoRestore efforts for long-term average supplies of about 1.2 million acre-feet.

MAXIMIZE THE EFFECTIVENESS OF STORAGE AND TRANSFER

Develop a comprehensive strategy to pursue transfers and exchanges to hedge against shorter-term water demands and supplies imbalances until long-term solutions are in place.

CONSIDERING RISKS/FACTORING IN CHANGES

Uncertainty is a given in today's water world. Planning for reliability has to take uncertainty into consideration. Metropolitan cannot with absolute certainty predict what supply initiatives will fare perfectly or miss the mark, but the 2015 IRP Update process does consider the many potential risks. Diversifying the water portfolio provides an important hedge against risk, but also adds complexity to the process of considering the many positive and negative scenarios of how supplies may be affected by future conditions. Through the 2015 IRP Update process, foreseeable challenges and risk scenarios were identified that point to the potential of 200,000 acre-feet of additional water conservation and local supplies needed to address these risks.

FUTURE SUPPLY ACTIONS

Future water supply and demand conditions may be beyond any reasonable estimate that can be made today. That said, water agencies can take actions in the coming years to position themselves for what could be a very different future. Metropolitan's 2015 IRP Update calls for considering Future Supply Actions, which are important steps to prepare the region to adapt to water supply condition changes that are different than what is currently anticipated. These steps range from exploring the feasibility of new local supply options, investing in water-saving technologies, acquiring land and proposing ways to reduce regulatory impediments to supply development. The 2010 IRP Update referred to these forward-looking steps as Foundational Actions.



ADAPTIVE MANAGEMENT

Adaptive water management, as opposed to a rigid set of planned actions over the coming decades, is the most nimble and cost-effective manner for Metropolitan and local water districts throughout Southern California to effectively prepare for the future. An adaptive management approach is nothing new. It began to evolve with Metropolitan's first IRP in 1996, after drought-related shortages in 1991 prompted a rethinking of Southern California's long-term water strategy. Reliance on imported supplies to meet future water needs has decreased steadily over time, replaced by plans for local actions to meet new demands. The 2015 IRP Update continues to build a robust portfolio approach to water management.

Continued on page 8...

The development of the 2015 IRP Update reflects the intensely collaborative nature of water planning in Southern California, involving member agencies and numerous stakeholders.

The 2015 IRP Update Process

Developing a long-term water strategy for a region as complex as Southern California does not happen in a vacuum. Metropolitan is the largest regional water cooperative of its kind in the nation. The development of the 2015 IRP Update reflects the intensely collaborative nature of water planning in Southern California, involving member agencies and numerous stakeholders.

The 2015 IRP Update focuses on ascertaining how conditions have changed in the region since the last IRP update in 2010. This involves developing new reliability targets to meet the evolving outlook of the region's reliability needs, assessing strategies for managing short and long-term uncertainty and communicating technical findings. The 2015 IRP Update also identifies areas where policy development and implementation approaches are needed. These discussions will follow the adoption of this report, and involve extensive interaction with Metropolitan's Board of Directors and member agencies.

Metropolitan faces challenging circumstances with its traditional sources of imported supplies from Northern California and the Colorado River. Using feedback and input from numerous stakeholders, Metropolitan makes projections of the availability of these supplies from a range of potential scenarios. Water agencies throughout the region also offer visions of their futures through their Urban Water Management Plans. These and other planning documents provide important insight into both local supplies that are likely to come on line in the near future, as well as supplies with a more uncertain future. Any robust outlook about supplies must take into account the many variables that face all the potential sources of water for the region.

What's In The Numbers:

The 2015 IRP Update Technical Approach

Outlook of Demands and Supplies

Metropolitan and its member agencies have developed a wide array of water supplies, both local and imported, and a large portfolio of water storage programs. These existing water supplies are compared with the outlook of regional demands to assess what water supply reliability would look like without new investment. Even without investment in new water supplies or water conservation, these existing water supplies and programs will continue to provide water and water management. The question is whether they are sufficient to meet future demands.

Demands

Retail-level water demands, or the total amount of water that customers use, are largely a function of Southern California's future population and its expected level of water use. These two factors have been shifting over time. Population increases are estimated to be less than previously projected. Per-person water use has declined over the past 25 years as water conservation efforts increase.

Conservation

Water conservation serves the important regional function of reducing the demand for imported water supplies and thereby making regional water system capacity and storage available and accessible to meet the needs of users in the region.

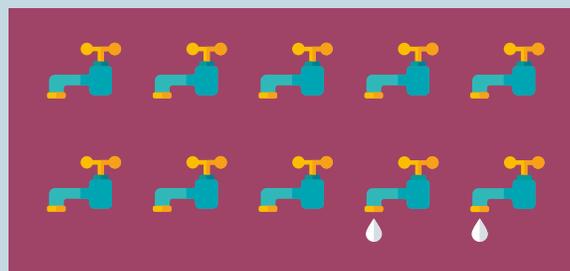
Local Supplies

Local supplies are a significant and growing component to the region's diverse water portfolio. Local supplies can provide over half of the region's water in a given year, and it is important to maintain these supplies. Similar to water conservation, local supplies serve the important function of reducing demands for imported water supplies and thereby making regional water system capacity and storage available and accessible to meet the needs of the region.

Groundwater: Groundwater is the production of water extracted from underground aquifers. Many people in Southern California depend on groundwater as a primary source of water supply.

Recycled Water: Recycled water is wastewater that has been treated so that it can be beneficially used for a variety of purposes ranging from landscape irrigation to groundwater recharge.

Seawater Desalination: Seawater desalination utilizes advanced technology to convert ocean water to potable water. The constant availability of ocean water is one of the key benefits.



“Do Nothing” Case

By 2040, restrictions
eight out of ten years.

Los Angeles Aqueduct: The city of Los Angeles Department of Water and Power, a Metropolitan member agency, imports water from the eastern Sierra Nevada through the LAA.

Local Surface Water: Local surface water resources consist of runoff captured in storage reservoirs and diversions from streams.

Other Identified Resources: There are other local resources, including graywater and on-site stormwater capture and use that have the potential for future development. Current development is on a smaller scale with studies and pilot projects underway.

Imported Supplies

Imported water from Metropolitan serves as an additional source of supply to its 26 member agencies. For many member agencies, their primary source of water is produced locally.

The State Water Project: The SWP provides an additional water supply to the region from Northern California via the Feather River in the northern Sierra Nevada Mountains, down into the Sacramento River and then across the Delta.

The Colorado River Aqueduct: The CRA originates at Lake Havasu on the Colorado River and winds through a series of pump stations and reservoirs through the California desert to its terminal reservoir at Lake Mathews in Riverside County.

Storage and Transfers: Storage reserves and water transfers are essential to ensuring reliability for the region, and for guarding against risk and uncertainty. Over the past two decades, Metropolitan has developed a large regional storage portfolio that includes both dry-year and emergency storage capacity.



The Regional Water Balance

The projection of both demands and supplies over the next 25 years is the basis for determining what levels of actions are necessary in the 2015 IRP Update adaptive management strategy. In order to evaluate the results of a water balance analysis, a number of metrics can be evaluated to determine if individual water balance outcomes are reliable or not. The IRP looked at the frequency and depth of allocations or mandatory rationing— allocations occur when the region’s storage resources reach a point of depletion where limitations are imposed in an attempt to stretch remaining resources to be prepared for future shortage conditions.

Two scenarios were modeled to look at future water supply reliability:

The “Do Nothing” Case

The first step in determining the remaining need is to evaluate the balance of existing levels of supplies against future projections of demands. Constructing a “Do Nothing” water balance provides a picture of what future reliability would look like with no additional actions or investments in water supply or demand management. The “Do Nothing” analysis determines whether additional developments that help to balance supplies and demands are needed to ensure reliability into the future.

Modeling results show that under a “Do Nothing” case, the probability of supply allocation increases dramatically over time, reaching an 80 percent likelihood in 2040. This finding is a reminder that working to maintain a reliable water system is never done. In this case, “doing nothing” and making no further investments in water supply and demand management would impose a huge cost on all Southern Californians.

The “IRP Approach” Case

The next step is to evaluate the balance of targeted future levels of supply development against future projections of demands. The “IRP Approach” case builds in the additional development targeted for CRA, SWP, conservation and local supplies:

Colorado River Aqueduct: Develop programs to ensure that a minimum of 900,000 acre-feet is available when needed, with access to 1.2 million acre-feet in dry years.

State Water Project: Manage SWP supplies in compliance with regulatory restrictions in the near-term for an average of 980,000 acre-feet of SWP supplies. Pursue a successful outcome in the California WaterFix and California EcoRestore efforts for long-term average supplies of about 1.2 million acre-feet.

Conservation: Pursue further water conservation savings of 485,000 acre-feet annually by 2040 through increased emphasis on outdoor water-use efficiency using incentives, outreach/education and other programs.

Local Supplies: Develop 230,000 acre-feet of additional local supplies produced by existing and future projects. The region would reach a target of 2.4 million acre-feet by 2040, a key to providing water supply reliability into the future.

Findings

The results of the “IRP Approach” analysis show that the probabilities of supply allocations decrease slightly in the near-term, and are substantially ameliorated in the longer-term. Successful implementation of the 2015 IRP Update targets is the key to providing for a robust water supply mix that will ensure a high degree of reliability into the future.



Reliability Strategy

Effective modeling of supply and demand can point out the need to take action. Crafting the right strategy is an entirely different exercise. Lessons from history are to be learned. New possibilities are to be realized.

Overall, the 2015 IRP Update represents a refinement – not an overhaul – of Southern California’s water management strategy. Similar to the 2010 IRP Update, the 2015 IRP Update looks to local solutions to close any potential gap between supply and demand. In this refinement, the 2015 IRP Update projects a need for more than 723,000 acre-feet of growth in imported and local supplies and reduced water demands from conservation. This reliability target encompasses the 25-year horizon of the plan and it frames the upcoming Implementation Policy discussion process with Metropolitan’s Board of Directors and member agencies.

Within the overall strategy, there are potential new planning shifts for the years to come. The potential completion of the California WaterFix and a modernized water system in the Delta, for example, would create a new physical ability to move additional supplies in average and above-average years. In addition to providing water for storage management, this could also create opportunities for new markets and partnerships. Likewise, the long-time success of Metropolitan’s land management program on the Colorado River in the Palo Verde Valley points to the potential of new partnerships with farming communities on the river to stabilize the supply/demand future on the Colorado River.

The 2015 IRP Update represents an evolving point of Southern California’s future water strategy that will undoubtedly adapt in expected and perhaps surprising ways in the years to come.



Conclusions

The mission of the Metropolitan Water District is to provide its service area with adequate and reliable supplies of high-quality water to meet present and future needs in an environmentally and economically responsible way. This is not a singular mission. It reflects the diversity of the challenges of balanced water management and the many facets of any successful IRP.

Overall, Southern California is in an enviable position to approach tomorrow. A generation of diversification of the region's water portfolio provides an asset base and choices on how to adapt to changes ahead.

The Delta water system and ecosystem improvements being advanced by the state and federal administrations, for example, would advance California's official co-equal goals of improving the Delta ecosystem and providing a more reliable water supply for the state. Shoring up the reliability of Metropolitan's baseline imported supplies has proven to be a highly cost-effective investment that protects broad public interests as well as Southland ratepayers.

Looking locally to close the gap between supplies and demands, while making the necessary investments and initiatives to maintain the reliability of imported supplies, is a responsible approach from a regional and statewide perspective. This achieves California's policy for all regions to reduce their reliance on the Delta to meet future needs, while building upon imported supplies in ways that further diversify the Southern California water portfolio.

This vital planning exercise has served Southern California well for a generation. The 2015 IRP Update represents a further step in the iterative planning process of a "living" strategic plan that evolves and adapts as needed to address the needs of the next generation.

This page intentionally left blank



THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA
mwdh2o.com