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Common Response 5: Public Water Agencies' Water Management Practices

Overview

This Common Response provides a summary and references to statewide water management efforts and includes information on three of the larger State Water Project (SWP) participating public water agencies, including Santa Clara Valley Water District, which is also a Central Valley Project (CVP) contractor.¹ These agencies' actions serve as examples of the significant steps being taken by participating public water agencies to increase local and regional supplies and manage future water demand within their service areas. Some comments on the Draft Environmental Impact Report (EIR) suggested that public water agencies are not doing enough or that they could be doing more to improve local water use efficiency or rely more on local water supplies.

This Common Response discusses further the foundational aspects of California's water supply, demands, and storage and delivery systems described in Chapter 6, *Water Supply*. Chapter 6 describes the state's hydrologic variability and the vast interconnected system of surface reservoirs, aqueducts, and water diversion facilities constructed by state, federal, and local agencies. These include large water infrastructure projects such as the SWP and the CVP; a summary of SWP and CVP systems and each project's water delivery history and primary contracting agencies; and alternative sources of water, such as recycled water, desalinated water, and stormwater. Chapter 6 also describes the limitations on available surface water and groundwater; potential impacts of climate change that pose significant challenges to meeting the state's water demands; and factors influencing current and future demands, such as population growth, agricultural use, and environmental purposes.

Readers of this Common Response may wish to consult the California Department of Water Resources' (DWR) online glossary (<https://water.ca.gov/Water-Basics/Glossary>), which contains definitions of terms related to water resources.

Background

Water Supply Diversification

Water is a limited resource, and the ability of public water agencies to deliver water supplies to communities will be stressed under future climate conditions, population growth, water quality problems, and competing demands. Diversifying water supplies means moving away from dependence on one water source, such as imported water or groundwater, by incorporating local and regional solutions, including conservation and efficiency, water recycling and reuse, rainwater and stormwater harvesting, and desalination. Diversification identifies other water supply sources available to public water agencies that reduce risks to water supply while recognizing that each water supply has different risks and strengths and is driven by the uniqueness of the service area. No single alternative water supply method is appropriate for every region and situation.

¹ DWR holds water supply contracts with 29 public entities located throughout the state, collectively referred to as public water agencies or water contractors. These water contractors in turn deliver water to wholesalers or retailers or deliver it directly to agricultural and municipal and industrial water users.

Diversifying water supplies has multiple benefits, among them improved water quality, better flood management, and more reliable surface and groundwater supplies. Diversification may also provide opportunities for restored and enhanced ecosystems. To realize the benefits of diversification, significant investments must be made at the state, local, and regional levels. Public water agencies at every level must collaborate on effective strategies to deal with outdated infrastructure, unsafe drinking water, flood risks, and depleted groundwater aquifers.

In response to these challenges, public water agencies have developed ways to increase system flexibility and resiliency: for example, public water agencies can invest in projects and programs to lower consumer demands and develop alternative supplies. Most recently, the state developed the *California Water Resilience Portfolio* (California Natural Resources Agency et al. 2020), which aligns regional challenges with opportunities, and the *California Water Plan* (California Department of Water Resources 2023a), which provides a broad set of resource management strategies to help local agencies and governments manage water and related resources. These collaborative efforts and strategies will help public water agencies sustain the ability to provide adequate and reliable high-quality water supplies within their service areas by preparing for new water supply threats.

Evolution of Water Resource Management

In the past, water resource management plans were developed to help ensure long-term water supply reliability for agriculture, industries, and municipalities. In recent years, water resource management planning approaches have expanded to consider climate change and the increasing variability in water supplies and demands.

Tremendous effort has been put into developing strategic plans for sustainably managing and developing water resources at state, regional, and local levels. Programs and plans have been developed to make existing supply go further and to provide flexibility in order to ensure the state's limited and variable water supply is used as efficiently as possible.

As an example, the *California Water Plan* presents the status and trends of California's water-dependent natural resources, its water supplies, and its agricultural, urban, and environmental water demands for a range of plausible future scenarios, which supports decision making at the local levels about water supply investments. Programs also include integrated regional water management and water management planning.

Integrated Regional Water Management

Integrated regional water management is a collaborative effort to identify and implement water management solutions on a regional scale that will increase regional self-reliance, reduce conflict, and manage water to concurrently achieve social, environmental, and economic objectives (California Department of Water Resources 2023c). This approach delivers higher value for investments by considering all interests, providing multiple benefits, and working across jurisdictional boundaries. Examples of multiple benefits include improved water quality, better flood management, restored and enhanced ecosystems, and more reliable surface and groundwater supplies.

As a result of the Regional Water Management Planning Act (SB 1672, Costa 2002, codified at California Water Code [Wat. Code] §§ 10530–10546), state funding has supported and advanced integrated, multibenefit regional projects. Cities, counties, water districts, community and environmental groups, Tribes, and others throughout the state have worked collaboratively to

organize and establish 48 regional water management groups, covering over 87% of the state's area and 99% of its population (California Department of Water Resources 2023f).

With integrated regional water management, regions have been able to take advantage of opportunities that are not always available to individual water suppliers, leading to reduced dependence on imported water and better use of local supplies, enhanced use of groundwater with greater ability to limit groundwater overdraft, increased supply reliability and security, and improved water quality. The extent to which regions have carried these out has been driven by economics, environment, engineering, and institutional feasibility considerations.

Having a range of tools available provides the flexibility needed to cope with changing and uncertain future conditions. Integrated regional water management provides a mechanism for tailoring management strategies to each of California's unique regions. As no single package of management tools can address the needs of all regions, each region has its portfolio of water management strategies.

Urban and Agricultural Water Management Planning

DWR is responsible for implementing statewide urban and agricultural water use efficiency programs, strengthening local drought resilience, managing the California Irrigation Management Information System, and collecting and analyzing data on California urban and agricultural land and water use under the 2018 water conservation legislation (Senate Bill [SB] 606, Hertzberg; Assembly Bill [AB] 1668, Friedman). As part of these responsibilities, DWR collects data and monitors water suppliers' compliance with the reporting requirements that govern water management laid out in the Water Conservation Act of 2009 (SB X7-7, Steinberg, Statute of 2009, codified at Wat. Code §§ 10608–10608.64). Reporting requirements are defined in the code for urban water management plans (Wat. Code § 10608.20(b)(1)–(4)) and agricultural water management plans (Wat. Code § 10845(a)–(c)). DWR is tasked with reviewing such plans to ensure they address the requirements identified in the Water Code and submitting a report on its findings to the state legislature on a 5-year cycle. Information gathered through these plans is useful for local, regional, and statewide water planning (California Department of Water Resources 2023e).

Urban Water Management Plans

Under the Urban Water Management Planning Act (Wat. Code §§ 10610–10657), urban water suppliers that either provide over 3,000 acre-feet of water annually or serve more than 3,000 urban connections are required to submit a completed urban water management plan to DWR every 5 years. These plans support the suppliers' long-term resource planning to ensure that adequate water supplies are available to meet existing and future water needs. Per Water Code Sections 10609, 10610–10656, and 10608, Urban water suppliers must provide detailed information in their water management plans on their water supply management practices, including the following.

- An assessment of the reliability of water sources over a 20-year planning time frame.
- A description of demand management² and conservation measures.
- A water reliability assessment, drought risk assessment, and water shortage contingency plan.

² As defined in Wat. Code § 10611.5, "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."

- A discussion of the use and planned use of recycled water.

Agricultural Water Management Plans

Together, SB X7-7, the associated Agricultural Water Management Planning Act (Wat. Code §§ 10800–10853), the Agricultural Water Measurement Regulation (23 Cal. Code Regs. §§ 597–597.4), and AB 1668 (Statute of 2018), which is a water management bill, require agricultural water suppliers serving more than 25,000 irrigated acres (excluding recycled water deliveries) to adopt and submit to DWR an agricultural water management plan. These plans must include reports on the implementation status of specific efficient water management practices that were required under SB X7-7. In addition, AB 1668 (Wat. Code § 10608.48(a)–(i)) requires that agricultural water suppliers develop and include an annual water budget, drought plan, and quantification of water use efficiency in their agricultural water management plan.

Most agricultural irrigation water is used very efficiently: that is, water that is not used on one farm is used on another and can also be used to charge groundwater. As agriculture accounts for approximately 80% of all water used in California, seemingly small improvements in agricultural water use efficiency can significantly stretch supplies. DWR works with the agricultural community and other interested parties to find solutions for improving agricultural water use efficiency and to meet state agricultural water management and measurements requirements.

Legislation and Implementation Actions

The State continues to promote increases in efficiency and support water management actions implemented at regional and local levels as part of a comprehensive and integrated approach. Common Response 8, *Relationship to Other Plans, Projects, Policies, and Programs*, describes a comprehensive list of statewide and regional efforts, including those listed here, to support water management actions as part of a comprehensive strategy.

- *California Water Resilience Portfolio* (California Natural Resources Agency et al. 2020): This document guides state agencies' efforts to develop a comprehensive strategy for building a climate-resilient water system and ensuring healthy waterways through the twenty-first century. Efforts are documented through the *California Water Resilience Portfolio Progress Report*, including coordination between state, regional, and local agencies to address regional and local water challenges.
- *California Water Plan* (California Department of Water Resources 2023a): This strategic plan for integrated water management relies on a diversified portfolio of water management tools. The 2023 update is under development.
- Sustainable Groundwater Management Act 2014 (State Water Resources Control Board 2023): The California State Legislature adopted the Sustainable Groundwater Management Act, which established a statewide framework to help protect groundwater resources over the long term. This act requires local agencies to form groundwater sustainability agencies in high- and medium-priority basins. Groundwater sustainability agencies then develop and implement groundwater sustainability plans to avoid undesirable results and mitigate overdraft within 20 years. The Sustainable Groundwater Management Act is derived from a three-bill legislative package, including AB 1739 (Dickinson), SB 1168 (Pavley), and SB 1319 (Pavley), as well as subsequent statewide regulations.

- The Water Conservation Act of 2009 (SB X7-7): This bill required a statewide 20% percent reduction in urban per capita water use by 2020. Water suppliers were required to make incremental progress toward their goals by reducing per capita water use by at least 10% by 2015. The bill required that urban water retail suppliers determine baseline water use and set reduction targets according to specified requirements and that agricultural water suppliers prepare plans and implement efficient water management practices.
- SB 606 and AB 1668 (California Department of Water Resources 2023d): Together, SB 606 and AB 1668 lay out a long-term water conservation framework for California. Programs and incentives are organized around four primary goals: (1) use water more wisely, (2) eliminate water waste, (3) strengthen local drought resilience, and (4) improve agriculture water use efficiency and drought planning.
- Integrated Watershed Management Grants Program (California Department of Water Resources 2023b): DWR offers several grant programs that support integrated water management activities addressing environmental stewardship, water supply reliability, public safety, and economic stability. Public agencies are eligible for most of the grant programs, but other applicants may also be eligible, depending on the program. Programs include environmental restoration, drought, flood, groundwater, integrated regional water management, water quality or drinking water, water supply or management, and water use efficiency.
- Delta Reform Act of 2009 (SB X7-1, Simitian): This bill reforms policy and governance for the Sacramento–San Joaquin Delta (Wat. Code §§ 85000–85350). The Delta Stewardship Council was established by SB X7-1 to develop, adopt, and commence implementation of a comprehensive resources management plan for the Delta, referred to as the *Delta Plan*, on or before January 1, 2012 (Wat. Code § 85300). The *Delta Plan* was adopted in May 2013 and has been amended several times since.
- *Delta Plan*: With the passage of the Delta Reform Act and the implementation of the *Delta Plan*, state and local agencies proposing covered actions in the Delta must certify that the action is consistent with applicable policies in the *Delta Plan* (Wat. Code § 85225; 23 Cal. Code Regs. § 5002 (b)). Among other policies, certain water supply covered actions must show consistency with Delta Plan Water Resource Policy 1: Reduce Reliance on the Delta through Improved Regional Water Self-Reliance (Delta Stewardship Council 2018:122–123; codified at 23 Cal. Code Regs. § 5003). Water Resource Policy 1 requires, among other things, that DWR show how the water suppliers that will receive water supply benefits from the Delta Conveyance Project have reduced their reliance or improved regional self-reliance, either as a reduction in the volume of water from the Delta or as a reduction in the percentage of water from the Delta in their overall supplies (23 Cal. Code Regs. § 5003(c)(1)(C)).

Examples of Public Water Agencies' Management Practices

DWR is and has been involved in several statewide water conservation and water management programs, including urban and agricultural water management plans and the water conservation provisions of SB X7-7, SB 606 and AB 1668, and AB 1420 Amended (Laird 2007, which amended the Urban Water Management Planning Act to require that suppliers receiving grants implement demand management measures). Yet these far-reaching programs do not give DWR authority to mandate or impose conservation requirements on suppliers or regional agencies. Water suppliers and regional agencies generally are the lead agencies implementing water conservation, water use efficiency, and other water management practices.

Overall, SWP participating public water agencies serve 27 million people and 750,000 acres of irrigated farmland, and CVP participating public water agencies serve about 2.5 million people and 3 million acres of farmland (State Water Contractors 2023; Bureau of Reclamation 2022). The following describes how three of the larger SWP and CVP participating public water agencies are implementing different strategies and activities to conserve water, to manage demand and supply efficiently, and to develop local sources of water, driven by the unique characteristics and geography of their service area.

These descriptions build on information provided in Appendix 3C, *Defining Existing Conditions, No Project Alternative, and Cumulative Impact Conditions*, and in the sections titled *No Project Alternative* found in Chapters 5 through 32.

The Metropolitan Water District of Southern California

The Metropolitan Water District of Southern California (Metropolitan) is a public water agency and regional water wholesaler. It is a voluntary cooperative of 26 member agencies that purchase some or all their water from Metropolitan. These member agencies directly or indirectly provide water for 19 million people across six Southern California counties. Metropolitan is governed by a 38-member board of directors made up of representatives from each of Metropolitan's member agencies. The mission of Metropolitan is to provide its 5,200-square-mile service area with adequate and reliable supplies of high-quality water to meet present and future needs in an environmentally and economically responsible way.

Metropolitan draws on supplies from the Colorado River through the Colorado River Aqueduct, which it owns and operates; from Northern California via its participation in the SWP; and from storage agreements, exchanges, and transfer arrangements with other agencies both in California and in other western states. Demands on Metropolitan also are managed through conservation and local resource programs. An increasing percentage of Southern California's water supply comes from conservation, water recycling, and recovered groundwater.

Conservation and local resource development occur at the local and regional levels; regional approaches have proven to be cost-effective and beneficial for all Metropolitan member agencies. These programs increase water supply reliability and reduce the region's reliance on imported water supplies to meet future demands. They decrease the burden on Metropolitan's infrastructure, reduce system costs, and free up conveyance capacity to benefit all system users. These programs help the region adapt to the impacts of climate change and advance the legislative intent that Metropolitan increase "sustainable, environmentally sound, and cost-effective water conservation, recycling, and groundwater storage and replenishment measures" (Metropolitan Water District of Southern California 2023). Local conservation programs may be more limited in scope and target, but can also benefit the region, which is why Metropolitan provides funding to many of its member agencies to implement programs that benefit their respective service areas. In total, these local and regional investments have contributed to a decline in imported water use of almost 40 percent since 1990, while the population within Metropolitan's service area has grown by almost 30% during that same time (Metropolitan Water District of Southern California 2023).

Conservation and Water Use Efficiency

To encourage efficient water use behavior, Metropolitan has several initiatives that include financial incentives, as well as educational, advertising, and outreach programs.³ Metropolitan also supports legislation, smart building codes, and device and appliance standards that ensure continued water savings over time. Since 1990, Metropolitan has invested \$864 million in conservation rebates and programs resulting in almost 3.7 million acre-feet of cumulative water savings (Metropolitan Water District of Southern California 2023). Metropolitan's estimated regional potable water use declined from 209 gallons per capita daily in 1990 to 129 gallons per capita daily in 2021 (Metropolitan Water District of Southern California 2023). This reduction and continued decline are attributed to regional investments in conservation programs, legislation, and long-term conservation program investments by Metropolitan. Further advances in water use efficiency will be driven by regional investments in conservation programs, legislation, and education and outreach campaigns that promote a strong water use efficiency ethic. Metropolitan's ongoing investments in conservation and water use efficiency include the following.

- Residential rebates for turf replacement, high-efficiency toilets, high-efficiency clothes washers, and smart irrigation controllers.
- Commercial conservation incentives for water-saving devices and projects, including landscape transformation from water-intensive to water-wise, drought-tolerant landscapes.
- A Water Savings Incentive Program providing customized commercial, industrial, institutional, agricultural, and large landscape project incentives.
- Long-term studies and funding for research and development related to innovative water savings devices, technologies, and strategies.
- Expanded collaboration with the Southern California Gas Company to develop and implement joint water and energy efficiency incentive programs.

Communications and Outreach

Metropolitan's water supply system is being tested like never before. While climate change continues to threaten supply resiliency, what remains certain is the need to conserve, reuse, and recycle as much as possible. Engaging Southern California's many diverse communities is not a one-size-fits-all approach, which is why Metropolitan fosters a strong presence on multimedia platforms as well as community-based outreach to nonprofit organizations, educators, elected officials, and the news media. Some of these efforts are described here.

- Advertising and outreach campaigns that include paid multimedia conservation campaigns and coordination with plant nursery industry partners.

³ Water conservation produces reductions in water demands either directly as a result of conservation programs such as rebate or incentive programs, as a result of changes in requirements for plumbing fixtures in plumbing codes, or through water saved by retail customers attributable to the effect of changes in the real (inflation-adjusted) price of water (Metropolitan Water District of Southern California 2021). Urban water use efficiency involves the implementation of methods or technologies resulting in the same beneficial residential, commercial, industrial, and institutional uses with less water or increased beneficial uses from existing water quantities. Agricultural water use efficiency is increased through the application of less water to achieve the same beneficial productivity or by achieving more productivity while applying the same amount of water.

- Producing outreach materials in multiple languages including English, Spanish, Chinese, Korean, Vietnamese, Tagalog, and Armenian.
- Working closely with reporters, producers, and editors from local, regional, national, and international media outlets to inform articles and radio and TV news reports on water supply conditions and to remind audiences of the need to conserve.
- A Community Partnering Program and other outreach efforts focused on participation on workgroups, boards, research projects, and educational efforts.
- Working with school districts, county offices of education, nonprofits, parents, and formal and informal educators to provide water-focused STEAM (science, technology, engineering, art, and math) curriculum, grants, and outreach programs.

Local and Regional Resources Development

Since 1982, Metropolitan has invested in local projects that contribute to regional water supply reliability. Local resources are climate-resilient and lessen the region's dependence on imported supplies tied to snowpack conditions. The value of regional reliability is all the more elevated today in the face of critical shortage conditions on the Colorado River and in the SWP, the two main sources of imported water supplies for Southern California.

Metropolitan's Local Resources Program provides financial incentives to encourage local development of recycled water, treatment of degraded groundwater for municipal use, and seawater desalination.⁴ As of fiscal year 2021–2022, Metropolitan has invested a cumulative \$724 million to fund 88 recycled water projects and 28 groundwater recovery projects that have produced about 4 million acre-feet of water in total (Metropolitan Water District of Southern California 2023). In fiscal year 2021–2022, Metropolitan provided about \$8 million for production of 56,000 acre-feet of recycled water for non-potable and indirect potable uses (Metropolitan Water District of Southern California 2023). Metropolitan financed another \$8 million to support projects that produced about 59,000 acre-feet of recovered groundwater for municipal use (Metropolitan Water District of Southern California 2023). Additionally, local agencies, through other funding sources, produced 393,000 acre-feet of recycled water, including wastewater discharged to the Santa Ana River that percolates into downstream groundwater basins, as well as 60,000 acre-feet of recovered groundwater (Metropolitan Water District of Southern California 2023). Metropolitan's ongoing investments in local resources development also include the following.

- Pursuit of the Pure Water Southern California project, which at full scale would produce and deliver up to 168,000 acre-feet per year of purified recycled water. Initially, purified water from the program would be used for indirect potable reuse. Ultimately, purified water from the program would be delivered for direct potable reuse at two Metropolitan water treatment plants.

⁴ Water recycling or water reuse is the process of treating, storing, and distributing wastewater for beneficial use. Direct reuse is the use of recycled water that has been transported from a wastewater treatment plant to a reuse site without passing through a natural body of either surface or groundwater. Indirect reuse is the use of recycled water indirectly after it has passed through a natural body of water after discharge from a wastewater treatment plant. Groundwater recovery or remediation involves extracting contaminated groundwater from an aquifer, treating it, and then either returning it to the aquifer or using it for agricultural or municipal purposes. Desalination is a treatment process to remove salts from water to produce a water of lesser salinity than the source water.

- An Onsite Retrofit Program that provides financial incentives for the conversion of potable irrigation and industrial systems to recycled water.
- A Future Supply Actions Funding Program to provide low-cost, low-risk investments for addressing technological, regulatory, and institutional barriers to new supplies.

Regional Storage Portfolio

A key component of water management, storage enables the capture of surplus amounts of water in normal and wet climate and hydrologic conditions when it is plentiful for supply and environmental uses. Stored water can then be used in dry years and in conditions where augmented water supplies are needed to meet demands. An important part of Metropolitan's water supply capability is the amount of water in its storage facilities. Over the past two decades, Metropolitan has developed a large regional storage portfolio that includes both dry-year and emergency storage capacity. Totalling approximately 6 million acre-feet, Metropolitan's storage portfolio includes reservoirs, conjunctive use and other groundwater storage programs within the service area, and groundwater and surface storage accounts outside the service area delivered through the Colorado River Aqueduct and the SWP (Metropolitan Water District of Southern California 2021). Approximately 750,000 acre-feet of total stored water is reserved for use in the event of supply interruptions from earthquakes or similar emergencies (Metropolitan Water District of Southern California 2021).

Metropolitan partners with local agencies to store imported surface water in groundwater basins for use in times of shortage under conjunctive-use agreements.⁵ Metropolitan currently has nine storage projects with nearly 212,000 acre-feet of storage capacity (Metropolitan Water District of Southern California 2023). This allows Metropolitan to store up to 53,000 acre-feet per year and withdraw up to 71,000 acre-feet annually during shortage years. In fiscal year 2021–2022, Metropolitan extracted about 18,500 acre-feet of previously stored water to support the ongoing drought effort. In fiscal year 2021–2022, Metropolitan delivered 24,000 acre-feet of replenishment supplies to help recharge local groundwater basins. Since 1984, Metropolitan has made 4.2 million acre-feet of cumulative replenishment deliveries to local basins (Metropolitan Water District of Southern California 2023).

Colorado River Aqueduct Supplies and Programs

Metropolitan's Colorado River Aqueduct supplies include Metropolitan's basic Colorado River apportionment, as well as supplies that result from existing and committed programs that have been developed over the last several decades. These supplies and programs work together with Metropolitan's Colorado River storage programs to ensure that, when needed, Metropolitan can deliver up to Metropolitan's Colorado River Aqueduct capacity of 1.25 million acre-feet (Metropolitan Water District of Southern California 2021). Some of Metropolitan's Colorado River Aqueduct programs are described here.

⁵ Conjunctive use or management involves the coordinated and planned management of both surface and groundwater resources to maximize the efficient use of the resource: that is, the planned and managed operation of a groundwater basin and a surface water storage system combined through a coordinated conveyance infrastructure. Water is stored in the groundwater basin for later and planned use by intentionally recharging the basin during years of above-average surface water supply. Surface water and groundwater resources typically differ significantly in their availability, quality, management needs and in their development and use costs. Managing both resources together, rather than in isolation from one another, allows water managers to use the advantages of both resources for maximum benefit.

- The Imperial Irrigation District/Metropolitan Water District Conservation Program, where Metropolitan funds water efficiency improvements within Imperial Irrigation Districts' service area in return for the right to divert the water conserved by those investments.
- The Palo Verde Land Management, Crop Rotation, and Water Supply Program, where participating farmers are paid to reduce their water use by not irrigating a portion of their land. Water savings are then made available to Metropolitan.
- The Bard Seasonal Fallowing Program, where participating farmers in Bard are paid to reduce their water use by not irrigating their land between the late spring and summer months.
- The Southern Nevada Water Authority and Metropolitan Storage and Interstate Release Agreement, which allows Southern Nevada Water Authority's conserved Colorado River water supplies to be made available to Metropolitan when there is space available in the system.

Watershed Initiatives

Metropolitan's responsibility is not just to ensure water supply reliability and quality, but to do so in an environmentally responsible way. Metropolitan focuses on a range of issues that include watershed health, stormwater collection, salinity management, and habitat restoration and preservation—all impacted by climate change. Water quality protection at the source for Metropolitan's imported supplies is also a priority and one made especially difficult in drought conditions that have consequences for ecosystems and human communities alike.

Kern County Water Agency

The Kern County Water Agency (KCWA) was created in 1961 by a special act of the State Legislature and serves as the local contracting entity for the SWP. The KCWA is the second-largest participant in the SWP and has long-term contracts to provide SWP water to 14 local districts. Due to the arid or semi-arid nature of much of its service area, the KCWA also manages an extensive groundwater banking system that can store approximately 5.7 million acre-feet for use during dry years. The KCWA participates in management activities related to flood control, water quality, and water conservation, with the overall goal of preserving and enhancing Kern County's water supply. Related major facilities managed or operated by the KCWA include (1) the Cross Valley Canal, which conveys water from the SWP California Aqueduct to urban Bakersfield and groundwater banking recharge sites; (2) the Henry C. Garnett Water Purification Plant, which provides up to 72 million gallons per day of treated (potable) water to retail water purveyors; and (3) the East and North Feeder (and related) facilities, which provide conveyance and pumping capacity for water distribution to KCWA member districts.

Due to limited annual precipitation in much of the KCWA service area, extensive management and conservation measures are implemented for both agricultural and urban water use. Specifically, this includes the noted groundwater banking system and additional efforts, as summarized here.

- **Groundwater Banking:** This program is widespread across the KCWA, with all local districts participating (even those not overlying groundwater basins). Generally, groundwater banking involves recharging groundwater basins through infiltration in large percolation (or spreading) basins during wet years (when excess water is available) and withdrawing the "banked" water in dry years when the availability of water is more limited. To effectively manage this program, the KCWA and member districts operate approximately 800 production wells and 200 monitoring wells (to track aquifer levels) in the Kern Subbasin of the San Joaquin Valley

Groundwater Basin, as well as 350 production and monitoring wells in the Kern River Alluvial Fan area. The use of groundwater banking allows the KCWA to effectively manage and correlate water use with climatic and seasonal variations in available supply.

- **Agricultural Water Conservation:** Kern County is the most productive agricultural county in California. In 2021, nearly 850,000 acres of agriculture were harvested, producing more than \$8.3 billion of gross revenue (Kern County Department of Agriculture and Measurement Standards 2022; California Department of Food and Agriculture 2023). Local agricultural operations are dependent on imported water supplies, with Kern County agricultural operators implementing a number of innovative management practices to reduce water use and conserve water resources. Specifically, these include the use of (1) highly efficient irrigation methods to maximize the amount of irrigation water actually used to meet crop requirements (i.e., as opposed to water loss from effects such as evaporation); (2) drip and low-volume application methods to reduce waste from excess runoff and infiltration; and (3) the use of laser land leveling to achieve more uniform water distribution.
- **Urban Water Conservation:** As noted for agriculture, urban water use in Kern County is dependent on imported supplies due to the arid climate and limited local resources. The KCWA has implemented educational outreach programs regarding the importance of water resources and conservation for over 20 years. These efforts are focused on students in 1st through 12th grades, with programs designed to complement local classroom curricula that are offered free of charge to all public and private schools in Kern County. Specific topics covered in the outreach programs include water treatment, water supply, groundwater, and the use of water for agricultural operations. The KCWA also facilitates Project WET (Water Education for Teachers), which provides environmental education to promote awareness, appreciation, knowledge, and stewardship of water resources. Annual Project WET workshops are offered free of charge to all Kern County 1st- through 12th-grade teachers.
- **Kern County Case Study: Lost Hills Water District:** As the reliability of the SWP has decreased over time, it has become increasingly important for Kern County water districts to implement demand management measures to ensure that water is used efficiently throughout the region. Lost Hills Water District (LHWD), one of the local districts that receives SWP water from KCWA, provides an example of the efforts being implemented in Kern County. LHWD encompasses approximately 70,000 acres, of which approximately 32,000 acres have been consistently farmed in the last five years. LHWD does not overlie the useable groundwater basin and, therefore, is reliant on SWP deliveries to supply crops with water. In 1990, approximately 42% of crops grown in LHWD used furrow irrigation. As of 2009, the use of furrow irrigation had been eliminated and 98% of irrigation systems had been converted to micro-irrigation systems. It is estimated that growers invested nearly \$43 million to convert their irrigation systems. Additionally, LHWD has invested approximately \$6 million on lining 17.4 miles of delivery canals within the district, which has resulted in an annual water conservation of approximately 4,300 acre-feet per year.

Santa Clara Valley Water District

The Santa Clara Valley Water District (Valley Water) is the primary water resources management agency for Santa Clara County, providing water supply, flood protection, groundwater management, and environmental stewardship for approximately 2 million residents. Valley Water manages 10 local surface reservoirs and associated creeks, recharge facilities, groundwater basins, and three water treatment plants. Valley Water supplies wholesale water to 13 local water retail agencies,

1 which then deliver water to their customers in Santa Clara County. Eight of Valley Water's retailers
2 also receive water from the San Francisco Public Utilities Commission's Regional Water System.

3 Since the 1930s, Valley Water's water supply strategy has been to maximize the conjunctive
4 management of surface water and groundwater supplies in order to enhance water supply reliability
5 and avoid land subsidence. Local groundwater resources make up the foundation of the County's
6 water supply but need to be augmented by Valley Water's comprehensive water management
7 activities to reliably meet the needs of county residents, businesses, agriculture, and the
8 environment. These activities include managed recharge of imported and local supplies and in-lieu
9 groundwater recharge through the provision of treated surface water and raw water, water
10 conservation, and recycling.

11 Imported water diverted from the Delta watershed is an important component of Valley Water's
12 current water supply portfolio. On average, imported water from both the CVP and the SWP
13 accounts for about 40% of Santa Clara County's water supply (Santa Clara Valley Water District
14 2019). Over the past 10 years, imported water supplies from the SWP and the CVP provided more
15 than 95% of the water treated at Valley Water's three drinking water treatment plants and nearly
16 half the water used to recharge local groundwater basins. Another 15% of Santa Clara County's
17 water supply is delivered through the San Francisco Public Utilities Commission's Regional Water
18 System. The remainder of the County's water sources are local, with 25% of the County's supply
19 coming from local surface water and natural groundwater recharge, 15% from water conservation,
20 and 5% recycled water (Santa Clara Valley Water District 2019).

21 **Ensuring Future Reliability through Local Actions**

22 Valley Water is in the process of updating its Water Supply Master Plan, and preliminary analysis
23 indicates that there are future scenarios in which available water supplies are insufficient to meet
24 projected demands. The challenge to meet water supply needs is exacerbated by projected future
25 climate conditions, such as increases in severity and frequency of drought conditions. To address
26 this, Valley Water is evaluating a portfolio of actions to secure its existing supplies and
27 infrastructure, increase water conservation and reuse, and optimize and improve system reliability
28 and flexibility. Local projects include expansive water conservation efforts, potable reuse projects,
29 and surface reservoir seismic retrofit projects to remove reservoir capacity operating restrictions.

30 **Conservation and Demand Management**

31 Valley Water has made significant investments to manage demands for water and continues to be a
32 leader in water conservation in the region. Water conservation programs and policies implemented
33 since 1992 have been influential in reducing water demand countywide, as reflected by the relative
34 stability of demand since the late 1990s despite population growth. Long-term average water use in
35 Santa Clara County is approximately 310,000 acre-feet per year. Water use would be an estimated
36 80,000 acre-feet higher without ongoing combined water conservation efforts by Valley Water,
37 water retailers, and the Santa Clara County community (Santa Clara Valley Water District 2021a).

38 Over time, Valley Water has implemented over 20 different ongoing water conservation programs
39 that use a mix of incentives and rebates, free device installation, one-on-one home visits, site
40 surveys, and education to reduce water use countywide (Santa Clara Valley Water District 2021b).
41 Specific conservation measures include promoting the use of advanced metering infrastructure;
42 business and homeowner rebates for removing lawns; graywater rebates; rebates for the
43 installation of rain barrels, cisterns, and rain gardens; and mandatory watering restrictions during

severe droughts—outside of those periods, permanent and voluntary watering restrictions remain in place. Future conservation measures will also include partnerships to construct stormwater capture basins, a significant flood-managed aquifer project, and leak repair incentives.

As a result of Valley Water’s investment in water conservation, water use in Santa Clara County decreased by 8% despite a 25% increase in the county’s population over the past 20 years (1990–2020). As reaffirmed in the 2019 Water Supply Master Plan, Valley Water’s long-term water conservation targets established a savings target of 99,000 acre-feet per year by 2030 and 109,000 acre-feet per year by 2040 from a baseline year of 1992 (Santa Clara Valley Water District 2021b). In 2021, Valley Water developed its *Water Conservation Strategic Plan* to identify new or improved strategies to reach its long-term savings targets as well as future water use objectives required by the State’s conservation framework (AB 1668 and SB 606). Additionally, Valley Water works collaboratively with its water retailers to engage in regional water conservation messaging campaigns with wide-reaching impact.

Recycled and Purified Water

Valley Water’s Board Policy E-2.4 calls for the development and maintenance of potable and non-potable reuse as part of its strategy to ensure a reliable, clean water supply for the future (Santa Clara Valley Water District 2022). Over the past decade, Valley Water has advanced water reuse in the county by leading water reuse planning efforts, developing wholesale recycled water programs, and constructing new infrastructure. Currently, recycled water is about 5% (18,000 acre-feet) of the county’s water supply and is distributed for non-potable uses such as landscape irrigation, industrial cooling, and dual plumbed facilities (Santa Clara Valley Water District 2021a). Valley Water has set a goal to meet 10% of Santa Clara County’s total water demands with recycled and purified water for non-potable and potable reuse by 2025. Valley Water has also established a long-term goal of producing up to 24,000 acre-feet per year of purified water for potable reuse by the year 2040 (Santa Clara Valley Water District 2021a).

In 2014, Valley Water constructed the Silicon Valley Advanced Water Purification Center, a nationally recognized pilot facility, to develop purified water. The center can produce up to 8 million gallons of purified water per day and serves as a demonstration facility and centerpiece for public outreach and education (Santa Clara Valley Water District 2021a). Purified water is blended with tertiary treated water to create high-quality recycled water that can be used by a wide variety of customers. The center has demonstrated the effectiveness of advanced treatment technologies to produce purified water and has set the stage for Valley Water to begin a potable reuse program.

Valley Water is currently implementing its Purified Water Project, which will take treated wastewater from the Palo Alto Regional Water Quality Control Plant, further treat it using advanced purification processes, and convey the purified water to Valley Water’s Los Gatos Recharge Ponds, where the purified water will be used to augment local groundwater supplies. The Purified Water Project is Valley Water’s first phase toward meeting its potable reuse goal and is anticipated to produce 11,200 acre-feet per year of purified water (Santa Clara Valley Water District 2021a). Valley Water continues to work with other wastewater agencies to evaluate opportunities for future potable reuse projects.

Seismic Retrofit of Local Reservoirs

Valley Water manages 10 dams and surface water reservoirs with a total storage capacity of about 166,000 acre-feet. Currently, five of Valley Water’s 10 reservoirs are operating under various levels

of restricted capacity due to seismic stability concerns, reducing total storage capacity to about 63,000 acre-feet. These are Almaden, Anderson, Calero, Coyote, and Guadalupe reservoirs. As seismic retrofit projects for each reservoir are completed, operational restrictions on the reservoir will be lifted, increasing Valley Water's ability to capture local surface supplies.

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