EBMUD

Recycled Water Strategic Plan Update

SUMMARY | DECEMBER 2024

EBMUD is serving the community responsibly and sustainably

Providing leadership and assurance to achieve a viable water future on which the community can rely.

East Bay Municipal Utility District (EBMUD) serves more than 1.4 million East Bay customers within a service area spanning more than 332 square miles. It is one of only a handful of large water utilities in California that provides both drinking water and wastewater services to a large urban area.

EBMUD is committed to providing water responsibly and sustainably, as a reliable supply of clean water is necessary for the environmental, economic, and social wellbeing of the region. EBMUD's recycled water program began in 1971. As demands change and future supplies become more uncertain due to climate change, EBMUD continues to explore opportunities to develop locally controlled, drought-resilient supplies through recycled water. Today, EBMUD continues to plan, develop, and implement recycled water projects throughout the water service area to reduce demand on drinking water supplies and steadily progress toward meeting a goal of serving 20 million gallons per day (mgd) of recycled water by 2050.

Recycled water promotes a reliable, diversified water by:

- **Helping delay or eliminate the need for more potable water facilities**
- **Sustaining the economy with increased water supply reliability**
- **Protecting the San Francisco Bay by reducing treated wastewater discharges**
- **Safeguarding community and private investments in parks and landscaping with a drought-resistant water supply**
- **Contributing to a green and healthy environment**
- **Providing a locally controlled water supply**

EBMUD's existing recycled water projects have the capacity to produce approximately 9 mgd of recycled water. Recycled water uses include irrigation, cooling towers, and industrial boilers.

The Recycled Water Strategic Plan (RWSP) Update evaluates EBMUD's existing recycled water portfolio and identifies, assesses, and prioritizes additional water reuse opportunities to meet the 20 mgd goal and provide a clear and flexible plan to success.

1991
Water Recycling Master Plan first prepared

Identified potential water reuse opportunities for irrigation, cooling towers, and industrial boilers through this comprehensive plan

1993
Water Supply Management Program

Established water recycling goal of 14 mgd by 2020 to offset potable supply to meet indoor and outdoor water needs and reduce the severity of water rationing during future droughts

2010
Recycled Water Master Plan

Identified and prioritized an expanded portfolio of recycled water projects

2012
Water Supply Management Program 2040

Identified and recommended solutions to meet dry-year water needs and set a water recycling goal of 20 mgd to help satisfy increased customer demand through 2040

2019
Recycled Water Master Plan Update

Maintained water recycling goal of 20 mgd by 2040 with non-potable reuse and plan to evaluate purified water opportunities in the future

2024
Recycled Water Strategic Plan Update

Provided a long-term approach to meet the 20 mgd recycled water goal by 2050 through non-potable reuse and purified water opportunities

EBMUD is implementing a mindful and deliberate approach to create a sustainable water future

Thoroughly assessing every reuse opportunity to meet the needs of the community.

To develop the RWSP Update, EBMUD methodically evaluated its existing recycled water portfolio and reassessed opportunities for both non-potable and potable reuse considering factors such as climate variability, wastewater supply availability, changes in the regulatory landscape, and changes in water usage and demands. EBMUD assessed reuse opportunities through a multiple-criteria decision analysis framework based on relative benefit and cost. The relative benefit evaluation considered qualitative factors such as social, environmental, complexity, and risk. The cost evaluation considered capital costs that reflect construction, and unit costs that reflect operating costs over the project's 30-year service life.

To produce relevant and viable reuse opportunities, EBMUD secured critical input from local stakeholders and considered findings from recent studies that provided valuable context and a wealth of data. EBMUD leveraged this feedback and knowledge to identify reuse projects that offer the highest value and formulate a roadmap to successful implementation.

Assess ever-changing dynamics

Each project alternative was evaluated considering ever-changing factors such as climate variability, population shifts, development, wastewater supply availability, and the regulatory landscape.

While change and uncertainty are ever-present, EBMUD carefully factored these dynamics into the assessment process.

Engage stakeholders and key findings

This report integrates current data and studies on reuse projects with input gathered through surveys and public meetings with stakeholders to inform technical updates and options for recycled water.

EBMUD collected feedback and combined this input with key findings from detailed study documents to evaluate viable recycled water opportunities.

Evaluate project opportunities

EBMUD evaluated potential recycled water project opportunities considering feasibility and affordability in combination with updated conditions and emerging technologies.

EBMUD's assessment resulted in three recommended non-potable reuse projects to progress toward the 20 mgd recycled water goal and identified purified water concepts for future consideration.

Evaluation Process

Using a holistic process, EBMUD identified, assessed, and prioritized water reuse opportunities to continue progress toward reaching the 20 mgd recycled water goal.

Benefit and Value Criteria → **Financial Considerations**

Environmental and Social Objectives

Distribution of Benefits

What regions/populations are serviced by the new supply and how are the benefits distributed?

Environmental Challenges

Would the project impact environmentally sensitive areas, like streams and wetlands?

Chemical and Energy Use

How many chemicals and how much energy would the project require?

Wastewater Discharge

Would the project reduce nutrient discharge to San Francisco Bay?

Complexity and Risk

Long-term Operational Viability

Would the project be challenging for EBMUD staff to manage, operate, maintain, and staff in the future?

Design and Construction

Does the project have difficult engineering or construction obstacles?

Regulatory

Would the project's construction and operation require numerous permits, easements, etc.?

Institutional

How much time, challenges, and requirements are needed with internal and external partners to implement the project?

Cost

Unit Cost

How much will the project cost per acre-foot of water delivered to the community?

Capital Costs

How much would the project cost to develop?

Operating Costs

What ongoing chemical, labor, maintenance, and electrical costs are required to keep the project operational?

Result: A Roadmap to Success

Out of this detailed analysis, the 2024 report provides insight into project alternatives that go beyond achieving the 20 mgd goal and address the needs of the community to deliver dependable, reliable, and sustainable water solutions.

EBMUD is creating a flexible program that can adapt to ever-changing water needs

Navigating uncertainty and change by remaining nimble as the community and environment evolved since the 2019 Recycled Water Master Plan.

Increasing variability of available water

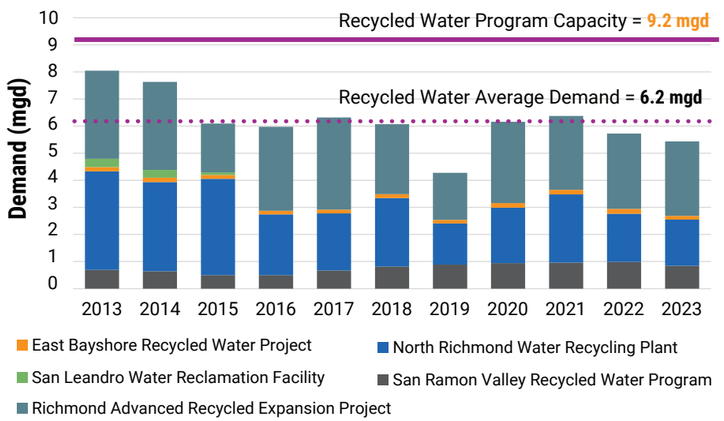
EBMUD recognizes that climate variability has the potential to adversely impact the reliability of existing water resources. Although there is uncertainty regarding the precise timing and severity of climate impacts, recent studies suggest that water demand and usage could increase because of warmer climate and result in increased frequency of rationing due to water supply shortages.

EBMUD will continue taking actions to understand, mitigate, and adapt to climate variability to inform planning efforts for future water supply, water quality, and infrastructure, and to support water and wastewater infrastructure investment decisions.

Decreasing demand

EBMUD has seen reduced recycled water demands and wastewater flows since 2010, despite an increase in the number of users. Droughts, rationing, conservation, legislative/regulatory changes, changing land uses (e.g., closing of Golden Gate Fields), and evolving industrial uses (such as decreasing industrial footprint with the rise of single family homes) all contribute to a decrease in the overall demand for water.

Because the overall demand for water has decreased, the need for recycled water to meet demand has decreased as well.



Actual recycled water use over the last decade has averaged 6.2 mgd—the system has a current capacity of 9.2 mgd.

Reduced recycled water demands, refinery industry changes, increased conservation, and decreased wastewater flows all contribute to uncertainty and challenges to EBMUD's current recycled water program. The effects of climate variability, characterized by rising sea and groundwater levels, changing weather patterns, droughts, and increased coastal flooding have the potential to affect existing water supplies through changes in the timing, amount, and form of precipitation, as well as the quality of surface runoff and resultant demands. These changes can affect all elements of water supply systems, from watersheds to reservoirs, conveyance systems, and treatment plants. EBMUD's wastewater flows are also vulnerable to these changes as increased water conservation and the combination of higher temperatures coinciding with more infrequent rainfall could result in lower flows to the wastewater collection system and the typical associated increase in concentrations of target constituents. This could present challenges to existing non-potable reuse projects and any future water reuse projects for the region.

As future supplies become more uncertain due to climate variability, changing industrial demands, and increased water conservation, EBMUD will continue exploring opportunities to develop locally controlled, drought-resilient supplies, such as recycled water. Continuing regional collaboration efforts and long-term planning work will allow adaptation with cost-effective solutions that will protect EBMUD assets and future investments, including the expansion of EBMUD's water reuse program.

Changing industrial demands

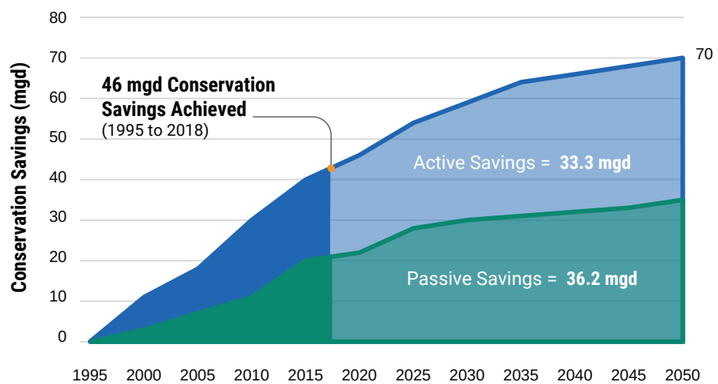
Legislative actions such as California Governor Newsom's Executive Order N-79-20 (zero emission passenger cars/light trucks by 2030), can impact the refinery industry's operations and water demands. These customers also have very specific water quality requirements that can be challenging to meet given the wastewater source quality and conventional recycled water treatment technologies. Costly investments in treatment are likely required to expand the potential use of recycled water within this customer base.

These challenges and uncertainties result in an overall decrease in the amount of recycled water used from this customer base and potential investment in future expansion of reuse projects.

Increasing water conservation efforts

Since 2019, the State has been working toward conservation goals that are expected to reduce urban water use by more than 400,000 acre-feet by 2030, which will help California adapt to water supply impacts brought on by climate variability. The State's "Make Conservation a California Way of Life" regulation was adopted July 3, 2024, and is expected to further reduce outdoor water use (impacting some non-potable project demands) and reduce indoor water use, both of which will reduce flows to wastewater treatment plants (WWTP).

Water conservation efforts impact proposed recycled water projects by reducing demand projections and reducing wastewater flows for recycled water supplies.



Water conservation is designed to promote reasonable and efficient use of supplies. EBMUD has taken specific actions that will increase conservation and therefore reduce demands.

Active savings result from the concerted effort of EBMUD and its customers to practice using water efficiently to reduce unnecessary water usage.

Passive savings are those that require no behavior change by EBMUD customers, such as the replacement of old indoor fixtures and appliances with more efficient ones.

EBMUD is optimizing the investments made to the existing system

By leveraging the full potential of these projects, the community can offset potable water use by using more than **9 mgd** of recycled water for irrigation, commercial, and industrial uses.

North Richmond Water Recycling Plant

2023 ACTUAL USE: 1.7 MGD
EXISTING CAPABILITY: **4 MGD**

Built in 1996, this facility supplies tertiary recycled water for cooling towers at the Chevron Richmond Refinery. The recycled water is sourced from West County Wastewater secondary effluent. While the facility has a design capacity of 5.4 mgd, it typically produces about 4 mgd.

Richmond Advanced Recycled Expansion Project

2023 ACTUAL USE: 3.3 MGD
EXISTING CAPABILITY: **3.5 MGD**

Constructed in 2010, this project supplies high-purity recycled water for boilers at the Chevron Richmond Refinery. The recycled water is sourced from West County Wastewater secondary effluent.

East Bayshore Recycled Water Project

2023 ACTUAL USE: **0.14 MGD**
EXISTING CAPABILITY: **0.2 MGD**

This facility began recycled water delivery in 2008 and currently supplies recycled water primarily for landscape irrigation. The recycled water is sourced from EBMUD's main WWTP, also known as Special District No. 1 (SD-1).

San Leandro Water Reclamation Facility

2023 ACTUAL USE: 0 MGD
EXISTING CAPABILITY: **0.2 MGD**

This facility was constructed in 1998 to provide secondary treated and disinfected recycled water for irrigation.

NOTE: As of 2024, this project has not been in service since 2015.

San Ramon Valley Recycled Water Program

2023 ACTUAL USE: 0.85 MGD
EXISTING CAPABILITY: **1.3 MGD**

Dublin San Ramon Services District (DSRSD) and EBMUD created this program in 1995 through a joint powers authority referred to as the DSRSD-EBMUD Recycled Water Authority (DERWA). The recycled water is sourced from DSRSD's WWTP.

EBMUD is bolstering its water portfolio

Building up the existing system to provide expanded sources of recycled water to serve local communities.

After an extensive and collaborative evaluation process, EBMUD recommended non-potable reuse projects that offer several benefits over some of the other reuse projects considered. The presence of existing commitments and established partnerships make for projects that align well with EBMUD objectives. This recommended project list does not account for the implementation of any customer-led satellite projects, such as those being explored by the University of California Berkeley, Rossmoor Community, Diablo Country Club, and the Sequoyah Country Club. EBMUD remains supportive of these customer-led efforts to develop, self-finance, permit, and operate these satellite projects that would contribute toward EBMUD's water reuse goals. Also, while not featured below, EBMUD anticipated that the Chevron Refinery will make an additional 0.5 mgd influent flow available by 2030 to allow an increase in the recycled water production of the Richmond Advanced Recycled Expansion Project.

San Ramon Valley Recycled Water Program - Phases 3 and 5

Landscape Irrigation | San Ramon, Danville, Blackhawk

Expansion of a successful project that has already provided billions of gallons of recycled water since 2006.

DSRSD and EBMUD developed this program in 1995 through a joint powers authority (DERWA). EBMUD planned, designed, and is constructing the program in phases. Phase 1 is complete, and Phase 2 is nearing completion pending the final connection of the Crow Canyon Country Club. Portions of Phase 3 recycled water pipeline and the R3000 recycled water reservoir are already constructed.

Phases 3 and 5 would build on EBMUD's successful partnership with DSRSD by extending distribution system infrastructure and securing additional supplies to serve landscape irrigation customers in San Ramon, Danville, and the Blackhawk Country Club. Phase 3 would consist of an additional 3 miles of pipe and the new R3000 Pump Station along Dougherty Road corridor. Phase 5 would encompass an additional 2.8 miles of pipe. Both phases would require customer retrofits for landscape irrigation.

Benefits: Although each phase is a relatively small project, this well-established landscape irrigation program leverages existing infrastructure and should continue to be a high priority as long as funding and source supply are available.

Challenges: EBMUD and DSRSD need to secure additional wastewater or other supplemental supplies to meet peak summer recycled water customer demands. DERWA is negotiating a long-term agreement with Central Contra Costa Sanitary District, with plans to secure supplemental supplies by 2026.

East Bayshore Recycled Water Project Expansion

Landscape Irrigation and Industrial Uses | Alameda, Emeryville, and Oakland

Building on previous phases to continue to provide a sustainable, drought resilient supply.

This program, which began delivering water to customers in 2008, is a multi-phase project that provides tertiary-treated recycled water from the EBMUD Main WWTP to a wide array of customers.

EBMUD completed the East Bayshore Recycled Water Project Expansion Alternatives Study in April 2024. Based on findings from that study, the preferred East Bayshore Recycled Water Project Expansion adds an additional 0.7 mgd of capacity and conveys recycled water to portions of Alameda, Emeryville, and Oakland—requiring approximately 8.3 miles of new recycled water pipeline ranging in size from 6 to 16 inches.

Benefits: The project leverages existing infrastructure, particularly distribution system backbone pipelines in Oakland. The project offers EBMUD some flexibility in how to move forward with future phases, and implementation can be sequenced based on the recycled water demands and funding.

Challenges: Existing water quality is not ideal for irrigating sensitive plant species and is not suitable for industrial use or ventilation and cooling systems. Results of the East Bayshore Water Quality Improvements Pilot Study indicate that the required treatment upgrades to reduce ammonia and total dissolved solids are not cost-effective at this time. The expansion will need to remain focused on landscape customers.

Phillips 66/Rodeo Renewed Energy Complex

Industrial Use | Rodeo

Partnering with a local industrial customer to deliver a substantial amount of recycled water that would help free up potable water for other uses.

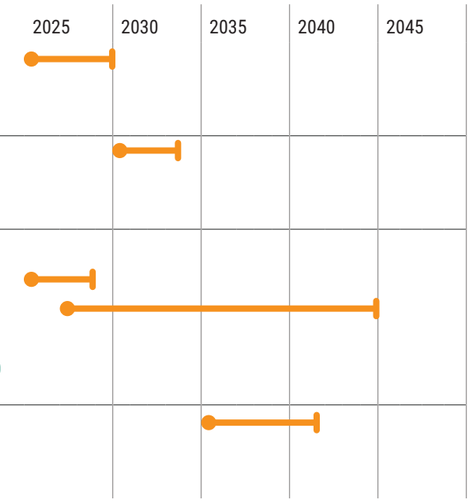
In 2005, EBMUD and Phillips 66 executed a memorandum of understanding to evaluate the feasibility of providing recycled water to its refinery facility in Rodeo. The project consisted of transporting available effluent from the Pinole Hercules Water Pollution Control Plant and the Rodeo WWTP for use in its boilers and cooling towers. Total demand for the project has fluctuated over the years, and with the refinery's transition from refining crude oil to producing renewable fuels by the end of 2024, the Rodeo Renewed Energy Complex has an anticipated recycled water demand for boiler feed and cooling tower uses of approximately 2.8 mgd.

The proposed project would include treatment facilities, a new pump station, and a new pipeline. The treatment facilities include membrane filtration, a biological aerated filter, reverse osmosis, and ultraviolet disinfection. The new Rodeo pump station would convey the secondary effluent from the Pinole Hercules Water Pollution Control Plant and the Rodeo WWTP to the Phillips 66 Refinery fence line through the new pipeline. An existing pipeline would be used to convey treated effluent beyond the fence line to new treatment facilities on the refinery site.

Phase 1 includes up to 1.4 mgd of recycled water produced on site from the refinery effluent, assuming this portion of the project would be fully funded by Phillips 66. Phase 2 could produce up to 2.8 mgd of recycled water for boiler feed and/or cooling tower make-up water from a new treatment facility.

Benefits: This project would deliver a significant amount of recycled water (up to 2.8 mgd) to a single customer, with comparatively few pipelines required due to the short distance between the sources of wastewater and the Phillips 66 Refinery.

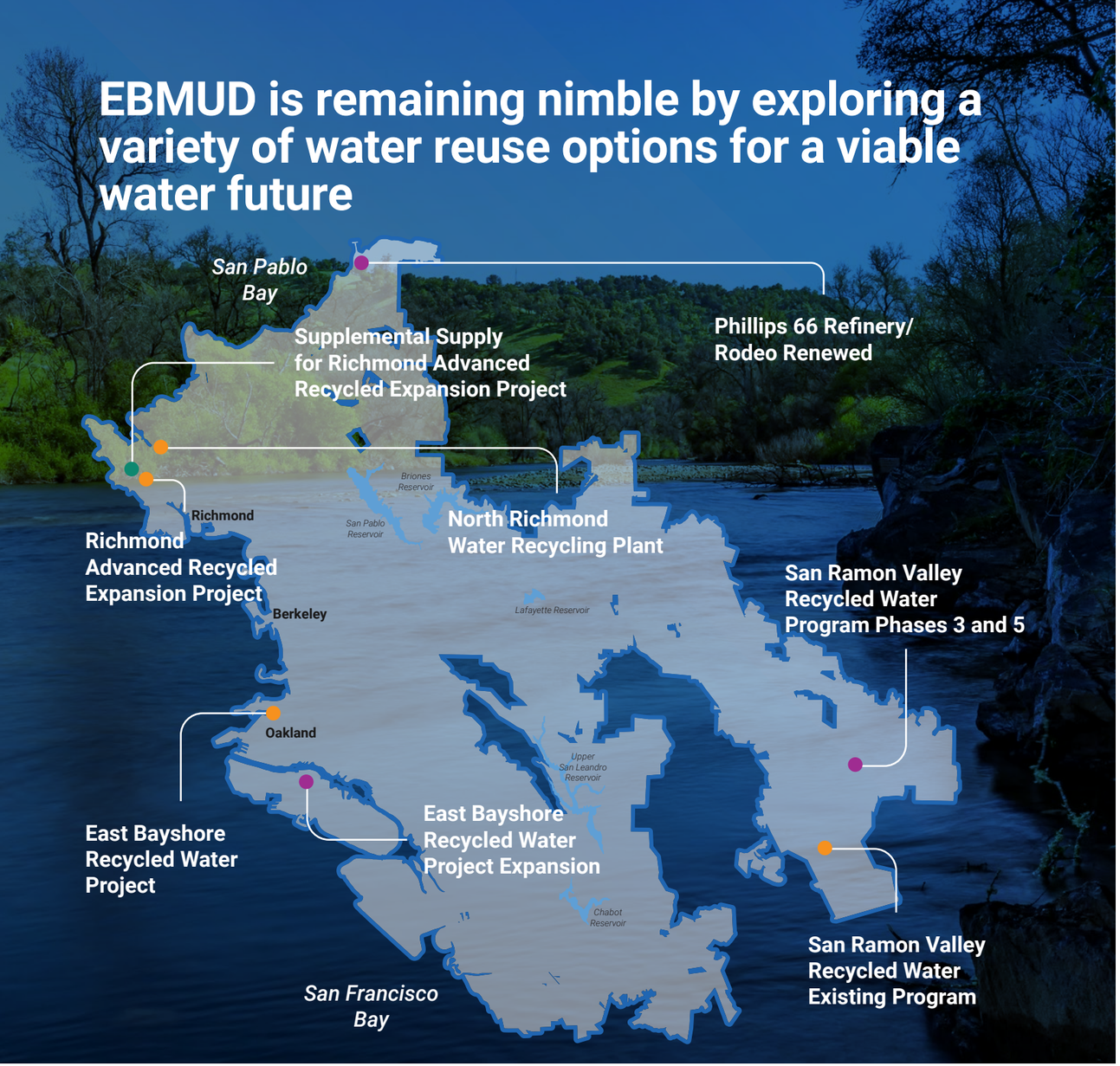
Challenges: The project has institutional challenges due to the involvement of four public agencies and one private entity, with agreements needed to divide responsibilities for operating the pump station, pipeline, and treatment facilities. The treatment facility would be located on Phillips 66 Refinery property.



Moving Ever Closer to EBMUD's Goal

Implementing these three projects in addition to the projects already in operation will help EBMUD move closer to the 20 mgd by 2050 reuse goal by increasing recycled water system capacity to more than **13 mgd**.

EBMUD is remaining nimble by exploring a variety of water reuse options for a viable water future



Capacity of Existing Non-potable Reuse Projects: **9.2 mgd**

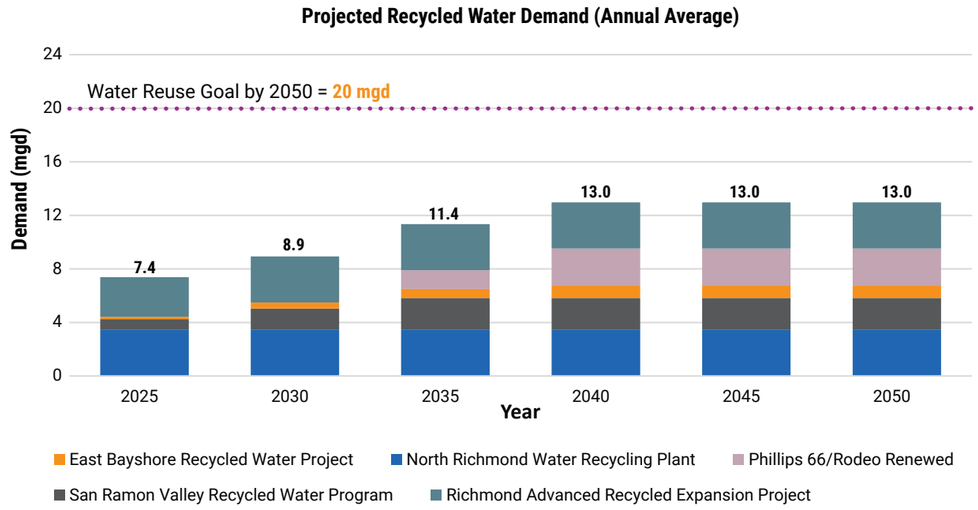
Capacity of New Non-potable Reuse Projects: **4.4 mgd**

New Supplemental Supply: **0.5 mgd**

Total Planned Non-potable Program Capacity : **13.6 mgd**

Remaining open to a broad range of options

The three recommended non-potable reuse projects support EBMUD's steady progress toward reaching its recycled water goal of 20 mgd by 2050; however, non-potable reuse projects alone are not expected to bridge the gap and reach the full 20 mgd. While other non-potable reuse projects that could help EBMUD reach the 20 mgd goal have been identified as part of this report and other previous planning efforts, those projects have implementation challenges and institutional complexities, and are cost prohibitive. To reach the full 20 mgd goal, EBMUD may need to consider adding purified water to its long-term water supply portfolio.



Deepening Understanding and Perspective

EBMUD will continue to evaluate the need for potable reuse (i.e., purified water) options as part of future studies and assessments to determine when they are the right fit for EBMUD and its communities.

Urban Water Management Plan: This plan is updated every 5 years; it assesses water supply and demand over 30 years and outlines actions to address future uncertainties.

Water Needs Analysis: This study is a thorough assessment of EBMUD's water needs accounting for changes in demand, supply availability, and climate variability impacts.

Water Supply Management Program Update: This program-level effort estimates EBMUD's water supply needs over a 30-year horizon and proposes a diverse portfolio of policy initiatives and projects to ensure that those needs can be met in dry years.

Closing the Gap to Achieve the Full 20 mgd Goal

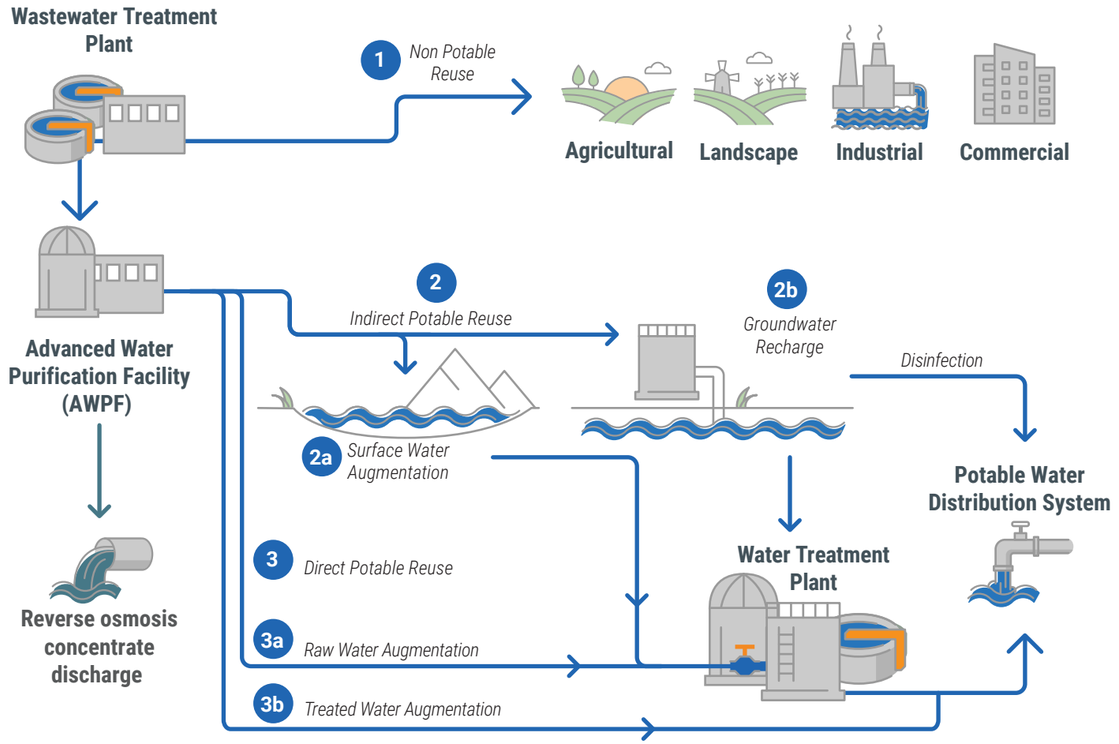
With the new direct potable reuse regulations in effect, purified water opens the door to a more resilient and sustainable future for EBMUD's water resources and offers a pathway to achieving the full **20 mgd** recycled water goal.

EBMUD carefully assessed purified water options to be prepared and ready should the need to move forward with these types of projects ever be warranted.

Harnessing the potential of purified water is part of EBMUD's environmental stewardship

Deepening understanding of the flexibility and range of benefits that purified water and non-potable reuse can bring.

1. **Non-potable Reuse**: Recycled water that is not used for drinking but is safe to use for irrigation, industrial uses, or other non-drinking water purposes; currently the only type of reuse practiced by EBMUD
2. **Indirect Potable Reuse:** Blending purified water with water supply through groundwater recharge or surface water augmentation in a reservoir or groundwater basin that acts as a buffer for retaining and diluting the reuse supply before treating
   - 2a **Groundwater Recharge:** Using constructed facilities to increase water supply in a groundwater aquifer (natural underground water storage) that spread water across infiltration basins or percolation ponds (surface spreading) or pump water directly into the subsurface through injection wells (subsurface injection)
   - 2b **Surface Water Augmentation:** Adding purified water to a surface water reservoir to increase water supply
3. **Direct Potable Reuse:** The treatment and distribution of purified water using engineering controls, without an environmental buffer, in the form of raw or treated water augmentation
   - 3a **Raw Water Augmentation:** Blending purified water with other supplies immediately upstream of a water treatment plant
   - 3b **Treated Water Augmentation:** Introducing purified water directly into a potable (drinking) water distribution system downstream of a water treatment plant



Updated regulations provide structure and flexibility for purified water facilities.

Because water reuse regulations are focused on making wastewater safe for public use and consumption, California regulators developed criteria for purified water facilities that are among the most rigorous and robust potable reuse regulations and requirements in the nation. Public health protection criteria include requirements for treatment, monitoring, and effluent water quality for the designated end use, such as surface water augmentation and groundwater recharge. Environmental discharge criteria include water quality requirements to protect surface water and groundwater quality for all designated beneficial uses. These regulations have updated requirements for more rigorous treatment, monitoring, and reporting for purified water facilities.

While containing many prescriptive requirements, the regulations do incorporate opportunities for flexibility. This flexibility helps pursue novel approaches that offer advantages in terms of project size and overall cost.

Why purified water?

Improved Reliability

Potable reuse projects enhance reliability by providing agencies with a locally controlled and drought-resistant source of supply. These projects help limit dependence on traditional potable water resources (rivers, reservoirs, groundwater) that are typically more susceptible to climate variability. Having a locally controlled resource helps agencies better prepare for future uncertainties.

Regulatory Guidance

With the adoption of California-specific direct potable reuse regulations there is clearer vision of the steps and requirements needed to consider and implement direct potable reuse projects. The new regulations encompass a broad range of obligations, including treatment requirements, monitoring protocols, source control, reporting, and more. These regulations help safeguard public health and help guide agencies.

Flexibility

Purified water that adheres to the potable reuse regulations can be used for any potable purpose (i.e., not limited to recycled water uses) and can be adapted to meet the specific demands or needs of the community. This helps maximize the flexibility and reliability compared to the more restricted uses of recycled water. Its flexibility also helps limit the need to construct and maintain dual distribution systems as customers are free to use one kind of water for their needs.

Safe Water Supply

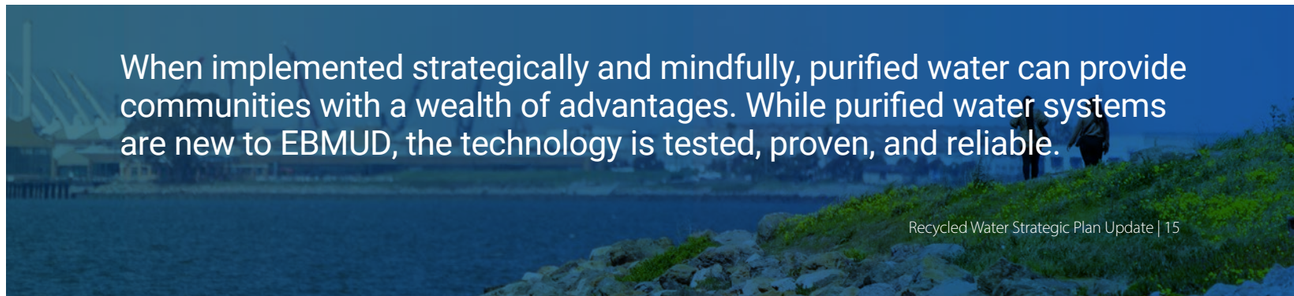
To protect public health, potable reuse systems rely on proven technologies that purify recycled water to make it suitable for human consumption as potable water. Multiple treatment and operational barriers help produce water that meets or exceeds all standards of water quality. The AWPFs that produce the purified water must be operated by highly trained and certified operators.

Economic Resilience

While the up-front capital costs for purified water projects can be high, there are several purified water concepts available to EBMUD with comparable unit costs to the non-potable reuse projects recommended as part of this RWSP Update. Investing in these types of projects can help create new kinds of green jobs in the public and private sectors.

Environmental Benefits

Implementing purified water projects can reduce extraction/depletion of traditional freshwater resources, reduce overall wastewater discharge to natural water bodies, promote recovery of a resource (wastewater) that is otherwise treated as waste, and help meet long-term water resource sustainability goals. Purified water can also help improve sustainability by reducing energy use and mitigating environmental impacts related to conveying imported supplies to the region.

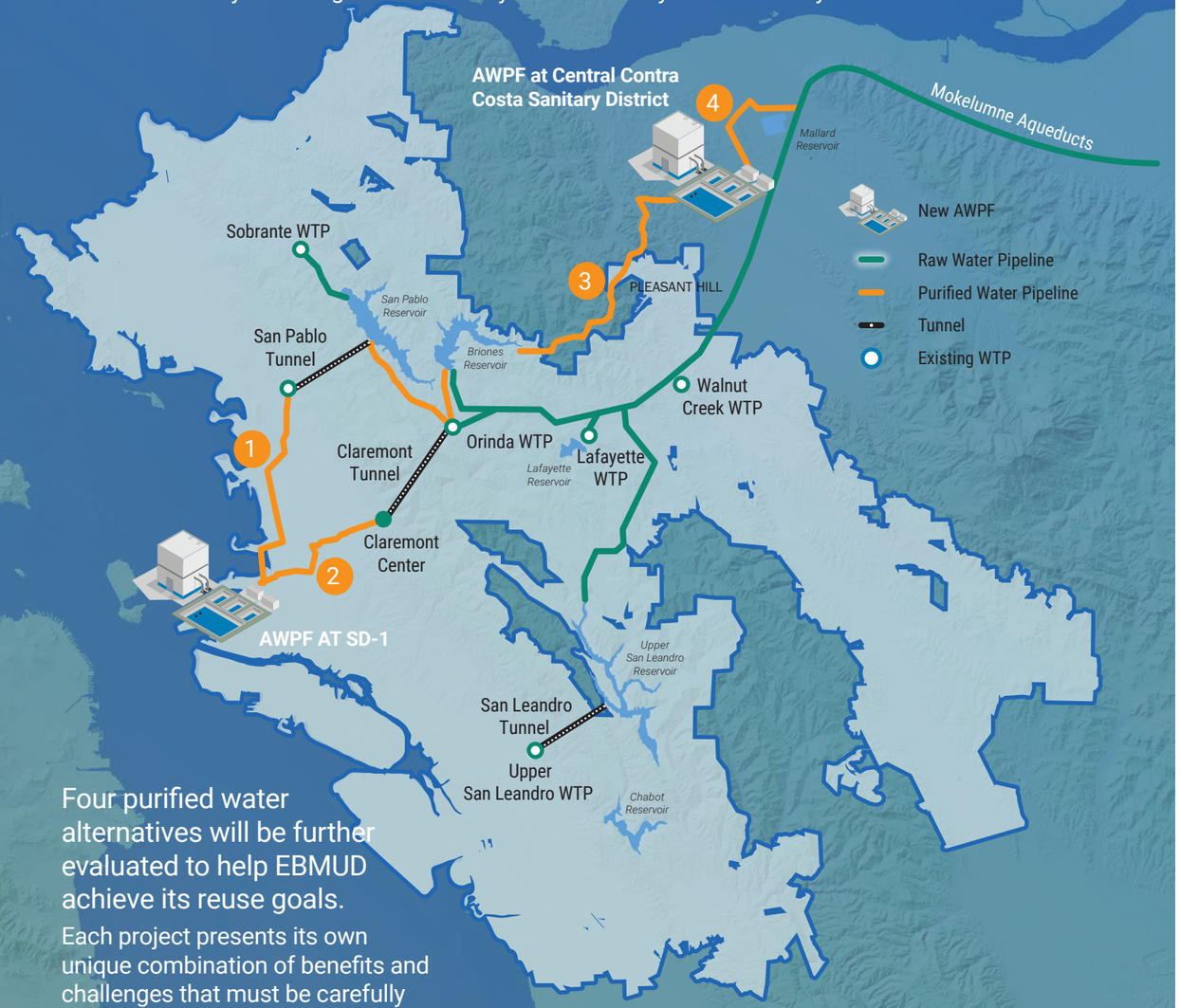


When implemented strategically and mindfully, purified water can provide communities with a wealth of advantages. While purified water systems are new to EBMUD, the technology is tested, proven, and reliable.

EBMUD is embracing the power of possibilities

Responding to changing dynamics by exploring the value purified water can bring to the community.

EBMUD is committed to meeting the **20 mgd** goal. Perhaps more importantly, EBMUD is dedicated to selecting the right project that best serves the needs of the community and integrates into the system efficiently and effectively.



Four purified water alternatives will be further evaluated to help EBMUD achieve its reuse goals.

Each project presents its own unique combination of benefits and challenges that must be carefully considered prior to inclusion into EBMUD's water supply portfolio.

As part of this update, EBMUD developed and reassessed close to 40 purified water alternatives. The analysis considered available sources of treated wastewater within or immediately adjacent to EBMUD's water service area, all forms of potable reuse, and infrastructure needs to convey the purified water from the new AWPFs to their anticipated delivery point. Purified water may become an increasingly more attractive option in the next 10 to 20 years depending on EBMUD's demand for water, availability of existing supplies, and improved clarity with regard to the type of secondary wastewater treatment upgrades that are planned for nutrient removal.

1 Surface Water Augmentation at Briones Reservoir from SD-1

Uses available effluent from EBMUD's SD-1 WWTP and a new AWPF located adjacent to the existing SD-1 WWTP in Oakland. Purified water would be conveyed to the Briones Reservoir through a new pump station and 13-mile-long, 42-inch pipeline. With a storage capacity of 60,500 acre-feet (AF), it is the largest among the five terminal reservoirs EBMUD manages. Once in the reservoir, the purified water may be drafted back through the Briones Aqueduct and continue to the Orinda Water Treatment Plant (WTP) for treatment and distribution.

Leverages the largest EBMUD-managed reservoir with capacity to supply all EBMUD's WTPs

Production Capacity: **30 mgd**

Capital Cost: $1,210 million

Unit Cost: $3,600 per AF

Dry Year Unit Cost: $11,900 per AF

2 Treated Water Augmentation through EBMUD's Claremont Center

Involves constructing a new AWPF that would purify available effluent from the SD-1 WWTP and convey it to the Claremont Center for distribution. The Claremont Center is part of EBMUD's existing water distribution system and currently receives water from the Orinda WTP via a 3.4-mile underground tunnel. The treated water is then distributed throughout the western portion of EBMUD's service area (Oakland and Berkeley). This project requires the least pipeline infrastructure investment (4.6 miles of 42-inch pipe) relative to the other similarly sized projects originating at the SD-1 WWTP.

Maximizes blending and distribution of purified water while minimizing negative impacts on system hydraulics

Production Capacity: **30 mgd**

Capital Cost: $990 million

Unit Cost: $3,500 per AF

Dry Year Unit Cost: $11,600 per AF

3 Surface Water Augmentation at Briones Reservoir from Central Contra Costa Sanitary District

Involves augmenting Briones Reservoir with purified water produced at a new AWPF. The facility would produce up to 17.9 mgd of purified water that would be conveyed approximately 11 miles to Briones Reservoir using a new pump station and 30-inch pipeline. The new AWPF would be constructed near the existing Central Contra Costa Sanitary District WWTP in Martinez, which would supply the new facility's feed flow. This project will require a high degree of coordination between EBMUD and Central Contra Costa Sanitary District.

Provides layout flexibility as the proposed site is not as space constrained as EBMUD's SD-1 location

Production Capacity: **17.9 mgd**

Capital Cost: $740 million

Unit Cost: $3,700 per AF

Dry Year Unit Cost: $12,200 per AF

4 Raw Water Augmentation at Mokelumne Aqueducts

Involves constructing a new raw water augmentation AWPF near the existing Central Contra Costa Sanitary District WWTP. Purified water would be conveyed via a new 30-inch pipeline approximately 3.5 miles to the Mokelumne Aqueducts near Mallard Reservoir. Approximately 90 percent of EBMUD's source water comes from the Mokelumne River and is delivered via the Mokelumne Aqueducts, traveling through the Central Contra Costa Sanitary District service area very close to the Central Contra Costa Sanitary District WWTP. The purified water would be blended with raw water in the aqueducts prior to delivery to the WTPs.

Includes operational flexibility to EBMUD water supply and treatment operations with connections to both Mokelumne Aqueducts 2 and 3

Production Capacity: **17.9 mgd**

Capital Cost: $655 million

Unit Cost: $3,600 per AF

Dry Year Unit Cost: $11,900 per AF

Achieving **20 mgd by 2050** is attainable

Each step along the way is carefully and mindfully planned to support the ultimate goal—providing sustainable solutions to deliver safe, clean water to local communities.

Share Enthusiasm

Equipping the community with knowledge about water reuse opportunities and benefits

Maximize Investments

Optimizing existing project investments to maximize the amount of recycled water delivered to the community

Continue Momentum

Implementing non-potable reuse projects that provide the highest value and positive impacts for the community

Gain Understanding

Strengthening awareness and analysis of needs through detailed assessments

Choose Flexibility

Providing options to select the right project as the need arises that can best serve the community while meeting the 20 mgd goal

Implementing the **Roadmap to Success**

Providing stability through an uncertain future via unwavering commitment to a reliable and sustainable water future.

EBMUD

Brown AND Caldwell

Woodard & Curran

Data instincts
Public Outreach Consultants

Additional Reading

Scan the QR code to access the detailed technical report.