



SAN FRANCISCO'S

# CLIMATE ACTION PLAN 2021

WATER SUPPLY ADDENDUM 2023



## FORWARD

Persistent droughts, rising temperatures and other impacts of a changing climate are forcing water planners to thinking to ensure there is a reliable supply of water for residents, businesses, industries, and governments today and well into the future. After the release of the [Climate Action Plan \(CAP\)](#) in December 2021, SF Environment began collaborating with the [San Francisco Public Utilities Commission Water Resources Division](#) to issue an addendum to the CAP that introduces a new Water Supply chapter which will focus on how San Francisco plans to address and secure water supplies that are being impacted by multiple challenges, including climate change.

The team started working together in Spring 2022, leveraging templates and processes used to develop the 2021 CAP, and then began drafting initial content, including draft strategies and actions, chapter narrative, key accomplishments, and other supporting data that would be included in the new chapter. In December 2022, SFE and SFPUC joined together to hold a public workshop to explain the context for current and new programs and policies to address water supply challenges, share draft content, and take questions to understand community concerns and priorities.

In Spring 2023, Water Resources Division staff worked with SFPUC Equity staff to conduct a racial equity assessment for the draft Water Supply chapter using the Racial and Social Equity Assessment Tool (R-SEAT) that SFE created for the 2021 CAP. The tool, which consists of a series of questions covering five themes and 17 impact areas meant to explore the fair distribution of the benefits of climate action as well as the root causes of racial disparities, includes a scale to consider the level of equity achieved, distinguishing between transactional and transformational change. Findings from the R-SEAT process informed changes to proposed actions and the chapter narrative.

The strategies and actions listed in this chapter have been incorporated into the City's annual monitoring, evaluation, and reporting process for the Climate Action Plan, which includes data indicators for key strategies designed to help track and communicate CAP implementation. This information will enable the City and stakeholders to better understand the impacts of the CAP actions and to monitor collective progress over time.

## ACKNOWLEDGEMENTS

The San Francisco Climate Action Plan Water Supply Addendum was developed in collaboration between the San Francisco Environment Department and the San Francisco Public Utilities Commission. The following people contributed to this project:

### **San Francisco Environment Department**

Tyrone Jue, Cyndy Comerford, Richard Chien, Sraddha Mehta, Sylvan Ludewigt, Mark Nicholas

### **San Francisco Public Utilities Commission, Water Resources Division**

Steven Ritchie, Paula Kehoe, Manisha Kothari, Taylor Nokhoudian, Julie Ortiz, Jennifer Ly, Rickie Cleere, Michael Perlstein, Rory O'Toole



## **LAND ACKNOWLEDGEMENT<sup>1</sup>**

The Commission on the Environment acknowledges that we occupy the unceded ancestral homeland of the Ramaytush Ohlone peoples, who are the original inhabitants of the San Francisco Peninsula. We recognize that the Ramaytush Ohlone understand the interconnectedness of all things and have maintained harmony with nature for millennia. We honor the Ramaytush Ohlone peoples for their enduring commitment to wahrep, mother earth. As the indigenous protectors of this land and in accordance with their traditions, the Ramaytush Ohlone have never ceded, lost, nor forgotten their responsibilities as the caretakers of this place, as well as for all peoples who reside in their traditional territory. We recognize that we benefit from living and working on their traditional homeland. As uninvited guests, we affirm their sovereign rights as First Peoples and wish to pay our respects to the Ancestors, Elders and Relatives of the Ramaytush Community. As environmentalists, we recognize that we must embrace indigenous knowledge in how we care for San Francisco and all its people.

## **DISCLAIMER**

This Climate Action Plan (CAP) articulates broad policy objectives to achieve equitable climate action. The CAP does not approve, fund, or authorize implementation of any specific projects. Each implementation project will be reviewed and approved over time and follow protocols and best practices for adoption, which may require additional public review, review by City decision-makers, and/or environmental review under the California Environmental Quality Act. As a result of those reviews, there may be alternatives and mitigation measures developed that may be implemented as well.

# Water Supply

---

**Climate change is affecting water resources across California. In its response to climate change and its impacts, the City must continue to provide high-quality, reliable water service and explore innovative strategies to increase the resilience of its water supply.**

Water is our most essential resource. However, increasing pressures on water supplies from extended periods of drought, population growth, regulatory challenges, and the many uncertainties brought about by climate change are threatening water security, so new approaches are needed to meet these challenges.

The San Francisco Public Utilities Commission (SFPUC) helps protect and stretch these supplies in many ways: by partnering with the community to implement robust conservation programs, by minimizing the need for additional water to serve new developments through pioneering an onsite water reuse program, by recycling wastewater resources to deliver water for large parks and golf courses, by utilizing local groundwater supplies to supplement surface water supplies, and by investigating alternative water supply options – such as purified water and desalination - to ensure sufficient water for future needs. As water supplies statewide continue to be affected by dynamic forces including climate change, diversifying the City’s water supply portfolio is critical to providing a high-quality and reliable water service while protecting these precious resources.

# Accomplishments



Residential per capita water use in San Francisco is **42 gallons per person per day**

Westside Enhanced Water Recycling Project when complete, will provide approximately **2 million gallons per day** of recycled water to irrigate Golden Gate Park, Lincoln Park Golf Course, and the San Francisco Zoo

  
**32.3 million** gallons of recycled water was used for irrigation in FY 2021-22

Deployed automated water meter technology estimated to save **54 million gallons per year** notifying customers about leaks

 **Up to 48 million** gallons per day of additional dry year supplies are being planned

## SECTOR GOALS:

**Diversifying water supply options during non-drought and drought periods**

**Improve use of new water sources and drought management, including groundwater, recycled water, conservation, and transfers**

**Maintain gravity-driven water delivery system**

## CONTEXT

Managed and operated by the SFPUC, the Regional Water System (RWS) collects water from the Tuolumne River in the Sierra Nevada, as well as from protected East Bay and Peninsula watersheds, and groundwater stored in a deep aquifer located in San Francisco and San Mateo counties, to deliver high-quality drinking water to 27 wholesale customers in Alameda, Santa Clara, and San Mateo Counties, as well as the Groveland Community Services District in Tuolumne County, serving 2.7 million residents and businesses in the Bay Area. San Francisco County is the single largest customer receiving retail water supplies from the RWS.

Beyond the City boundaries, San Francisco owns watershed lands that protect water supplies. Refer to the Healthy Ecosystems chapter for examples of how the City is engaging in resource management best practices to protect these natural lands.

The SFPUC has been studying the impacts of climate change on water supply. The recently completed “[Long Term Vulnerability Assessment and Adaption Plan](#)” (December 2021) concluded that while climate change will exacerbate impacts from other external drivers of change, it is not the single most important driver of vulnerability for the RWS, and that changes in demand and instream flow requirements will have more impacts on the RWS than changes in mean annual temperature and precipitation. While the uncertainties associated with climate change and the risk to water supply are difficult to predict, it is critically important to continue evaluating the impacts of climate change and address these considerations in the SFPUC’s water supply planning<sup>1</sup>.

Although San Francisco has successfully led with conservation, more must be done to safeguard water resources from external risks. The SFPUC is currently

<sup>1</sup>[https://sfpuc.org/sites/default/files/about-us/policies-reports/LTVA\\_AdaptationPlanSFPUC\\_execsummary.pdf](https://sfpuc.org/sites/default/files/about-us/policies-reports/LTVA_AdaptationPlanSFPUC_execsummary.pdf)

The lands on which the SFPUC water system reside are the ancestral homelands of Indigenous peoples who have been stewards to their natural resources for millennia. In the upcountry region of Tuolumne County, SFPUC plans to collaborate with Indigenous groups around the stewardship of watershed lands. Scheduled to open in late 2023, the Alameda Creek Watershed Center in Sunol will educate the public about the watershed, the regional water system, and the history and heritage of the Muwekma Ohlone people through interpretive and interactive exhibits. Walter Kitundu's multimedia art exhibit titled Ruupaywa, after the Ohlone Chochenyo word for "the eagle," will pay tribute to the history of the Muwekma Ohlone people while recognizing their continued presence and power.



implementing water supply diversification projects, such as the San Francisco Groundwater Supply Project which will sustainably leverage that resource to supplement the City's drinking water supply now and into the future. It is also completing the Westside Enhanced Water Recycling Project, which will provide approximately 2 million gallons per day of recycled water to irrigate Golden Gate Park, Lincoln Park Golf Course, and the San Francisco Zoo.

Additionally, through the Alternative Water Supply Program, the SFPUC is looking at new and diverse water supply options such as in lieu groundwater recharge, a process of providing an alternate supply source for an end use (such as irrigation) so that the groundwater pumping can be avoided to help naturally recharge the aquifer for later use, as during droughts when supplies

are scarce. Meanwhile, the SFPUC is committed to investing in technological innovations and other tools that can increase supply or reduce demand, particularly during droughts.

“ It is more important than ever to be responsible with our water. We must adapt to a changing world by diversifying our water supplies, collaborating with our community, and innovating to prepare for the future.”

-Steve Ritchie, Assistant General Manager, Water Enterprise, San Francisco Public Utilities Commission

## Leading with Conservation

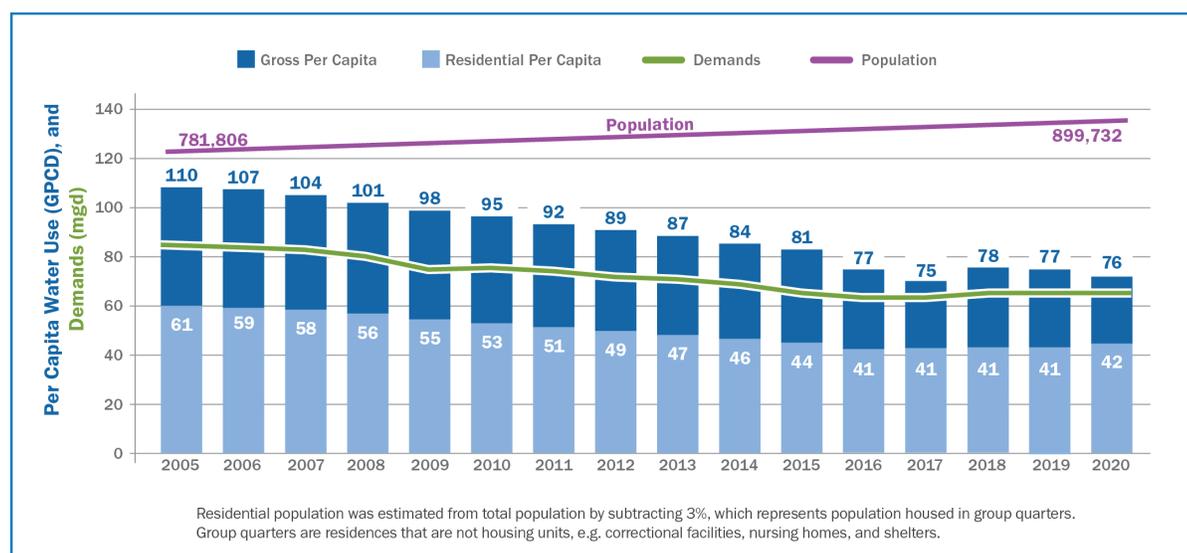
San Franciscans have been and remain committed to water conservation as a way of life. Conservation significantly reduces water use in homes, apartment buildings, and non-residential buildings. For over 30 years, the [SFPUC's water conservation program](#) has promoted efficient water use to its customers. Core services include indoor and outdoor [Water-Wise Evaluations](#), financial incentives for replacement of old plumbing fixtures, free water-efficient plumbing devices, landscape efficiency programs, tools to monitor water use, and extensive outreach and education.

Customer water savings assistance programs and local water efficiency requirements have played a major role in significantly reducing in water use in San Francisco. The SFPUC estimates that conservation programs and plumbing codes have resulted in savings of approximately 5.5 million gallons per day (mgd) since 2005. By 2045, water savings are expected to reach an additional 4.2 mgd. Through these efforts, San Francisco per capita water use continues to be one of the lowest of any City in the state<sup>2</sup>.

Moving forward, the SFPUC will continue to utilize a mix of voluntary incentives, assistance services, tools to help customers understand and manage their water use, education and outreach, and indoor and outdoor

<sup>2</sup> [https://sfpuc.org/sites/default/files/programs/local-water/SFPUC\\_2020\\_UWMP2020\\_%20FINAL.pdf](https://sfpuc.org/sites/default/files/programs/local-water/SFPUC_2020_UWMP2020_%20FINAL.pdf)

FIGURE 1: SAN FRANCISCO POPULATIONS AND PER CAPITA WATER USE TRENDS



water efficiency mandates to ensure that every drop counts.

## Exploring New Innovations

Innovation has been at the heart of the SFPUC since it started delivering water over one hundred years ago. This tradition continues as new solutions are needed to address all water challenges, including future shortages.

Through the Innovations Program, the SFPUC tests new ideas, technologies, and research to find new ways to conserve and reuse water, recover resources, and diversify water supply. For example, the onsite wastewater treatment system at the SFPUC headquarters building is being upgraded to incorporate a permanent, purified water component that will demonstrate the ability to treat wastewater to levels that meet proposed drinking water standards.

These efforts lean on partnerships with the community, industry, developers, technology vendors, and others to ensure the long-term sustainability of San Francisco's water resources. For instance, the SFPUC has worked with the S.F. Botanical Garden and Hummingbird Farm to test the ability to produce irrigation water using atmospheric water generation technology that extracts water from the air using solar power; this technology also has the potential to produce water that meets drinking water standards. Another recent success of

the Innovations Program has been realized through investments in the form of grants to San Francisco breweries to collect, treat, and reuse large quantities of process water (cleaning tanks, bottles, and equipment) generated onsite, providing significant water savings. Other initiatives being testing include the integration of wastewater heat recovery in onsite water reuse systems to reduce building energy consumption, costs, and emissions, and deploying leak detection technologies to reduce losses of potable water from the SFPUC distribution system.

Finally, as San Francisco continues to experience periods of intense drought and rainfall, it needs to adapt to both flood and drought emergencies. The SFPUC is investing in infrastructure to meet these needs through projects such as the Vista Grande Drainage Basin Improvement Project, which will divert stormwater to Lake Merced to better manage stormwater flows and improve stormwater quality. The SFPUC's investment in green infrastructure projects is also helping the City take advantage of the natural processes of soils and plants in order to slow down and filter stormwater to keep it from overwhelming the City's sewer system.

## Expanding Local Water Supplies

The RWS has served the San Francisco Bay Area for almost a hundred years and will continue to be the cornerstone of water supplies for the San Francisco

region. Challenges such as climate variability, droughts, earthquakes, regulatory changes, and population growth require the development of new water supplies and creative solutions to meet future needs.

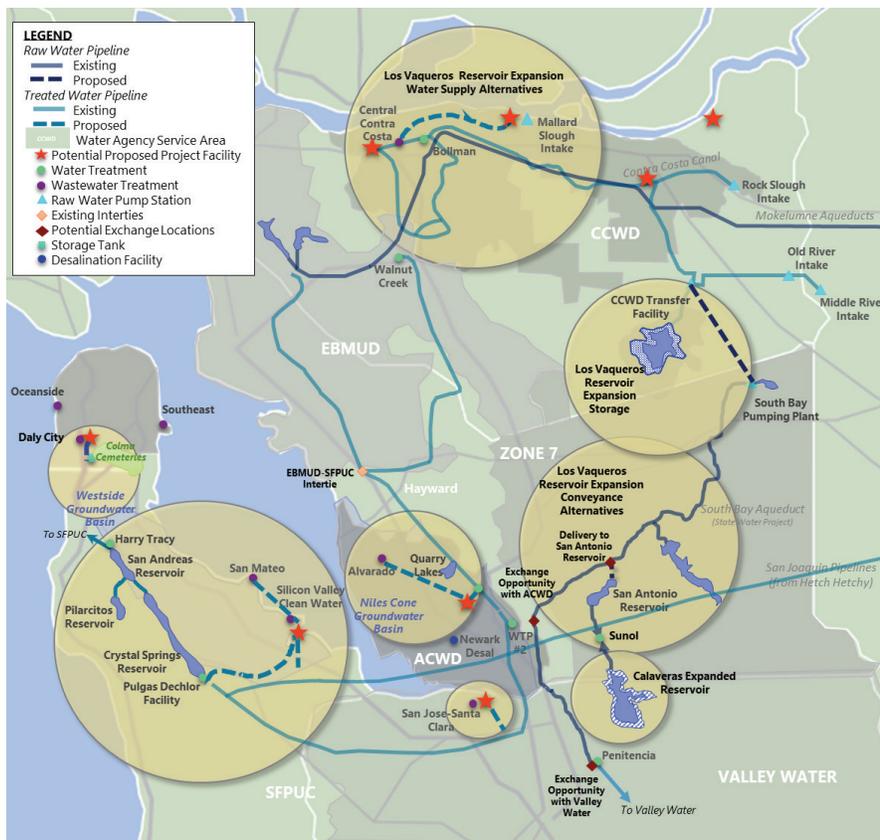
The RWS makes up about 97% of total retail water supplies for San Francisco, while the remaining portion is a combination of locally produced groundwater, recycled water, and non-potable water. Leveraging these local sources to augment the RWS will increase the resiliency of San Francisco’s water supply.

The SFPUC’s Recycled Water Program is actively working to meet the City’s most significant irrigation needs at Golden Gate Park, Lincoln Park Golf Course, and the San Francisco Zoo. The City’s Non-potable Water Ordinance mandates non-potable supplies produced onsite (such as from faucets and laundry) are treated and used for toilet flushing and irrigation in new developments. The development of local groundwater is allowing the SFPUC to supplement drinking water sources by blending a small amount of groundwater

with water supplied by the RWS. The groundwater source is from the Westside Basin aquifer which is located beneath Golden Gate Park and the Sunset District in San Francisco, and extends southward to Burlingame in San Mateo County. The Westside Basin has been studied extensively and the SFPUC maintains a groundwater monitoring network in addition to regularly testing water from production wells and reservoirs to ensure that water delivered to customers meets all health-based State and Federal drinking water standards after blending.

In addition, new water supply options such as expanding storage, in-lieu groundwater recharge, water transfers or exchanges, which are the direct delivery or indirect substitution of water from another supplier, respectively; purified water, and desalination of ocean, bay or brackish water, are being evaluated as part of the Alternative Water Supply Program. These new water supplies that become available through alternative sources can compensate for potential supply shortages

FIGURE 2: ALTERNATIVE WATER SUPPLY PROJECTS IN SFPUC’S SERVICE AREA



expected systemwide by 2045.

Through these investments and implementation of these programs, it is estimated that by 2045, the SFPUC will develop 4 mgd of local ground water supply, 2.5 mgd of local recycled water supply, and 1.5 mgd of potable water savings from onsite non-potable water reuse, in addition to water savings from conservation and future additional alternative supplies.

## Balancing Continued Service with Affordability

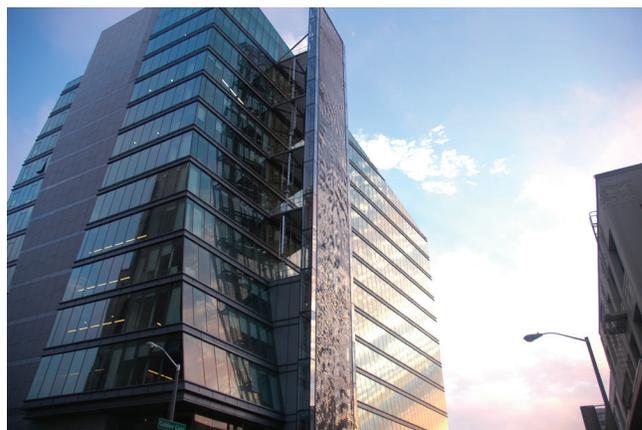
California recognizes the human right to clean, safe, and affordable water. In 2020, SFPUC adopted a racial justice resolution which asserts that water is a human right. Providing high-quality, reliable water service to customers will require investing in the resilience of the water system, which will come at a cost. SFPUC must consider the financial impact of increasing rates, particularly on low-income communities and communities of color that are more likely to be burdened by the rising cost of water. Unless affordability programs are advanced alongside SFPUC water supply strategies, rate increases could contribute to a pattern of community displacement and economic hardship in San Francisco.

Today, water utility costs are a burden for San Francisco's low-income communities and communities of color. For example in Bayview Hunters Point, a community with a majority Black, Asian and Latinx population, there is a statistically larger number of water cost burdened households (18%) who are estimated to spend more than 2.5% of their household income on water and wastewater bills, compared to the rest of the City (10%). Similarly, among water cost burdened households, Asian residents make up the majority (52%) followed by Hispanic residents (19%).

Low-income residents have also experienced substantial increases in their account balances since the onset of the COVID-19 pandemic; as of the end of 2022, nearly 40% of Citywide single-family arrearages (past due bills) were in just two of San Francisco's lowest income zip codes that are majority communities of color: 94112, which includes the Excelsior and Cayuga Terrace, and 94124, Bayview Hunter's Point. In response to these historic arrearages accrued during COVID, SFPUC leveraged state and federal resources

to obtain arrearage relief payments for its customers; it also streamlined enrollment processes to help more customers access discounts, and piloted an arrearage management program to offer steep discounts for low-income residents from the most cost-burdened zip codes. Future programs like these, in addition to continued and expanded relief from the SFPUC Customer Assistance Program, will be critical to ensure water affordability and affirm the human right to water for all customers.

Future SFPUC programming may also facilitate more opportunities for youth education, workforce development, and inclusive hiring from environmental justice and low-income communities to address social inequities that have contributed to the ongoing affordability and displacement crises in San Francisco.



---

## Strategies Overview

To address the challenges of drought, wildfires, regulatory changes, climate change, and other uncertainties, San Francisco must remain committed to diversifying our water supplies, maintaining the RWS, and improving the use of new sources of water. The strategies listed below provide a pathway for managing our water resources so that we can provide better outcomes for our customers and the environment.

# STRATEGY

Invest and implement demand management programs.

# WS.1



### WHAT WOULD SUCCESS LOOK LIKE?

Achieve an estimated 4.2 million gallons a day (mgd) of water savings between 2020 and 2045 per the SFPUC's 2020 [Retail Water Conservation Plan](#) (or as per future Conservation Plan updates).



### GHG REDUCTION POTENTIAL BY 2030

Reduced water use through conservation can reduce electricity and gas used to distribute and heat water.



### ESTIMATED COST BY 2030

\$906 per acre foot of water savings, per 2020 Retail Water Conservation Plan.



### CLIMATE METRIC

Meet state-mandated efficient indoor residential water targets that start in 2024.



### EQUITY METRIC

% of low-income/EJ demographics reached through targeted conservation messaging and enrolled in programs.

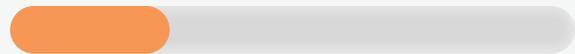
## Supporting Actions

- WS.1-1 Continue to implement current conservation measures noted in the SFPUC's 2020 [Retail Water Conservation Plan](#), and on our website at [www.sfpuc.org/savewater](http://www.sfpuc.org/savewater).
- WS.1-2 Continue to implement current conservation measures and upcoming new measures noted in the SFPUC's 2020 Retail Water Conservation Plan.
- WS.1-3 Prepare updated 2025 Retail Water Conservation Plan and implement current conservation assistance measures noted in the plan.
- WS.1-4 Continue to implement conservation assistance measures outlined in 2025 and future-year Water Conservation Plans.

## COMMUNITY BENEFITS



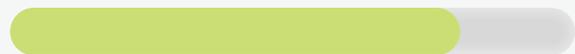
RACIAL AND SOCIAL EQUITY\*\*



JUST TRANSITION



HEALTH



RESILIENCE

Invest and implement innovative programs to reduce water use and develop new water supplies

## WS.2



### WHAT WOULD SUCCESS LOOK LIKE?

Successful scaling up of the most cost-effective and impactful innovative programs such as pipeline distribution system leak detection, heat recovery in onsite water reuse systems, and brewery process water reuse.



### GHG REDUCTION POTENTIAL BY 2030

Reduced water use through conservation can reduce electricity and gas used to distribute and heat water.



### ESTIMATED COST BY 2030

N/A. Funding to come from SFPUC operating and capital as actions are ongoing or planned and aligned with agency level of service goals.



### CLIMATE METRIC

Annual growth in deployment of innovative water projects.



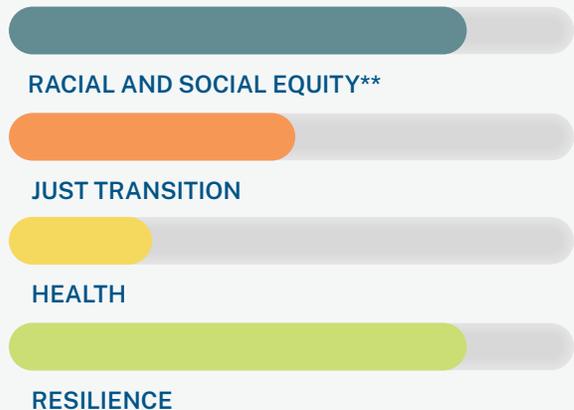
### EQUITY METRIC

# of innovative projects conducted in communities with environmental justice burden as identified in the [EJ Communities Map](#).

## Supporting Actions

- WS.2-1 Continue to implement the pilot atmospheric water generation project to test the viability of the technology to produce water for irrigation in a community garden setting.
- WS.2-2 Continue to encourage breweries to reuse process water onsite via SFPUC's Onsite Water Reuse Grant Program.
- WS.2-3 Continue to encourage the integration of heat recovery in onsite water reuse systems. Explore opportunities for other pilot atmospheric water generation projects.
- WS.2-4 Continue to implement the Innovations Program.
- WS.2-5 Implement demonstration facilities for purified water.

### COMMUNITY BENEFITS



# STRATEGY

Invest and implement supply augmentation programs

# WS.3



### WHAT WOULD SUCCESS LOOK LIKE?

Additional water supply available through storage expansion, purified water, and other alternative water sources to make up for potential supply shortages by 2045.



### GHG REDUCTION POTENTIAL BY 2030

Some supply augmentation programs may generate new GHG emissions compared to current surface water supplies.



### ESTIMATED COST BY 2030

N/A. Funding to come from SFPUC operating and capital as actions are ongoing or planned and aligned with agency level of service goals.



### CLIMATE METRIC

Annual quantity of water supply reuse and recycling.



### EQUITY METRIC

# people in communities as identified in [EJ Communities Map](#) and other disadvantaged communities (outside of San Francisco) exposed to utility jobs.

## Supporting Actions

- WS.3-1 Continue to implement the San Francisco Groundwater Supply Project, which allows the SFPUC to supplement drinking water sources by blending a small amount of groundwater with water from the San Francisco RWS.
- WS.3-2 Continue to implement San Francisco's Onsite Water Reuse Program, which requires new development projects of 100,000 gross square feet or more to install and operate an onsite water reuse system.
- WS.3-3 Continue planning, evaluation of technical viability, energy efficiency, and future climate scenarios.
- WS.3-4 Implement demonstration facilities for purified water.
- WS.3-5 Design and construction of alternative water supply projects.
- WS.3-6 Continue to operate and monitor groundwater projects for maximum benefit and sustainability.

### COMMUNITY BENEFITS

