



Pioneering On-site Water Reuse

In 2012, San Francisco became the first U.S. city to adopt a local ordinance, enabling buildings to collect and treat on-site water for non-potable uses, such as toilet flushing and irrigation. Recognizing the absence of national or state regulations, the San Francisco Public Utilities Commission (SFPUC) developed a comprehensive oversight and management program to ensure these systems protect public health. Working in close collaboration with city departments, including the Department of Public Health, Building Inspection, and Public Works, the SFPUC created a streamlined permitting process for alternate water sources like rainwater, stormwater, graywater, and blackwater.

The city's first blackwater reuse system was piloted at the SFPUC headquarters. In 2015, the ordinance was expanded to require on-site water reuse systems for new commercial, mixed-use, and multi-family developments over 250 000 square feet. Subsequent amendments in 2016 and 2021 further clarified district-scale implementation and enhanced water-saving opportunities in new developments.

 **REDUCE**

 **RECOVER**



SAN FRANCISCO, CALIFORNIA, USA



STORMWATER



INDUSTRIAL



CHALLENGES FACED

Implementing on-site water reuse systems raised concerns about reduced wastewater flows, potential odor issues, and utility revenue impacts. Internally, SFPUC had to address institutional resistance stemming from fears that declining flows could disrupt the municipal sanitation system. To manage this, SFPUC developed a wastewater hydraulic analysis process to assess flow and odor impacts for each project, with citywide modeling showing minimal effects.

TECHNOLOGIES & SOLUTIONS USED

Mission Rock is a 113,312 m² (28-acre) mixed-use development in San Francisco's Mission Bay that includes parks, open spaces, and residential, commercial, and retail buildings. In partnership with the SFPUC, the initial project phase built the city's first district-scale blackwater treatment system to meet the non-potable water ordinance. Located within an office building, the system treats wastewater for reuse in irrigation, toilet flushing, and cooling towers, reducing potable water demand by about 44,664 m³ (11.8 million) gallons per year.

IMPACT & INSIGHTS



Using non-potable water presents an opportunity to reduce potable water demands in multi-family residential, commercial, and mixed-use buildings. In multi-family residential buildings, replacing the demand for toilet and urinal flushing and clothes washing with non-potable water can offset up to 40% of the indoor water use for commercial buildings. Using non-potable water for toilet and urinal flushing can offset up to 75% of indoor water use. Additional non-potable water demands include irrigation and cooling towers.

LESSONS LEARNED



- Select specific alternate water sources to include.
- Identify approved non-potable uses.
- Define standards by source and/or use.
- Integrate with building codes and permits.
- Define ongoing monitoring and reporting rules.
- Develop permitting for system setup and operation.
- Continuously evaluate and promote best practices.

“**The SFPUC has found that conservation-related measures, including on-site water reuse, are among the most cost-effective ways to manage water supplies.**”