This presentation premiered at WaterSmart Innovations

watersmartinnovations.com





Water Reuse in Urban Environments

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San Francisco Public Utilities Commission
October 4, 2018





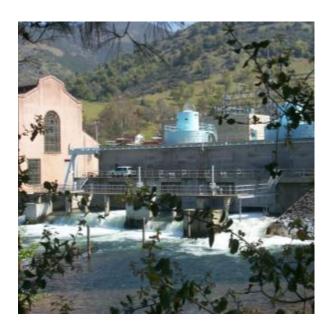
San Francisco Public Utilities Commission



Water: delivering high quality water every day to 2.7 million people



Wastewater: protecting public health and the environment



Power: generating clean energy for vital City services



San Francisco's Local Water Program

+ LOCAL WATER

Better together.

Conservation
Groundwater
Recycled Water



Opportunity to Re-think Building Design & How Water is Used





Buildings Produce Alternate Water Sources

from roofs and abovegrade surfaces Wastewater from toilets, dishwashers, kitchen sinks, and utility sinks Precipitation STORMWATER below grade Wastewater from GRAYWATER clothes washers, bathtubs, showers, and bathroom sinks-Nuisance groundwater from dewatering

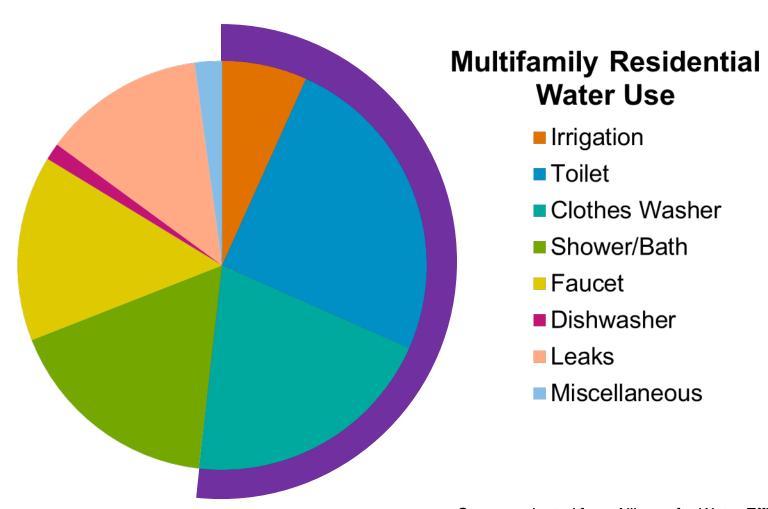
Precipitation collected

collected at or

operations



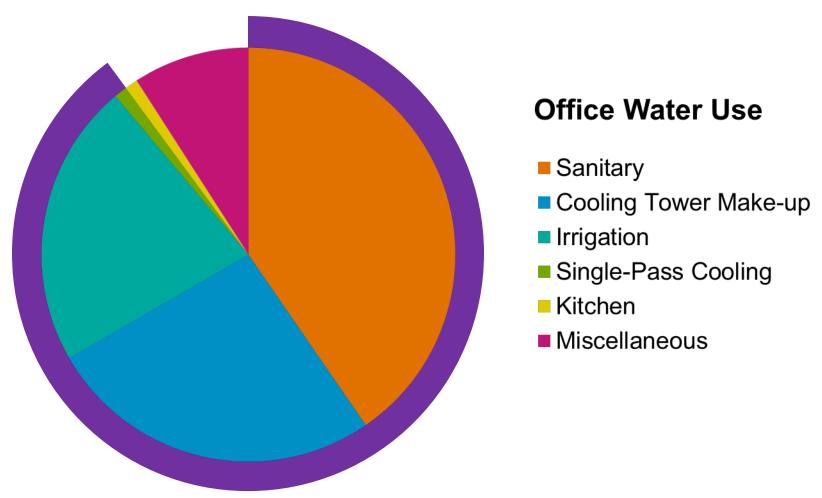
Up to 50% of Demands are Non-potable in Multi-family Residential Buildings



Source: adapted from Alliance for Water Efficiency



Up to 95% of Demands are Non-potable in Commercial Buildings



Source: USEPA



Innovative Onsite Non-potable Water Use at SFPUC Headquarters

Rainwater Harvesting System

- 25,000 gallon cistern
- Reuse for irrigation

Wetland Treatment System

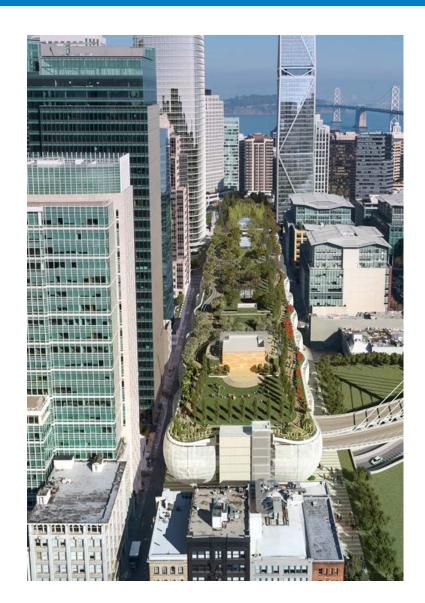
- Collects and treats building's wastewater
- Reuse for toilet flushing
- 5,000 gpd capacity







Developers Interested in Collecting & Treating Water Onsite





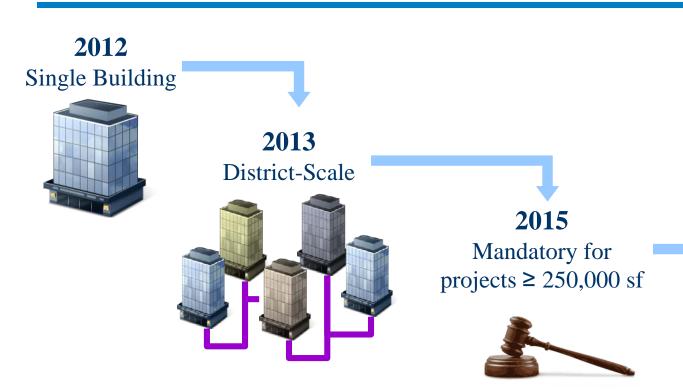


San Francisco Ordinance & Roles and Responsibilities

SFPUC	SFDPH	SFDBI	SFPW
Program Administration and Cross-Connection Control	Public Health	Construction	Right of Way and Mapping
Review onsite non- potable water supplies &	Issue water quality & monitoring requirements Review and approve nonpotable engineering report Issue permit to operate onsite systems Review water quality reporting	Conduct Plumbing Plan check and issue Plumbing Permit Inspect and approve system installations	Issue Encroachment Permits as needed for infrastructure in the Right-of-Way (if needed) Includes condition on a subdivision map or a parcel map requiring compliance with the Non- potable Ordinance prior to approval and issuance of said map (if applicable)



An Evolving Non-potable Water Program

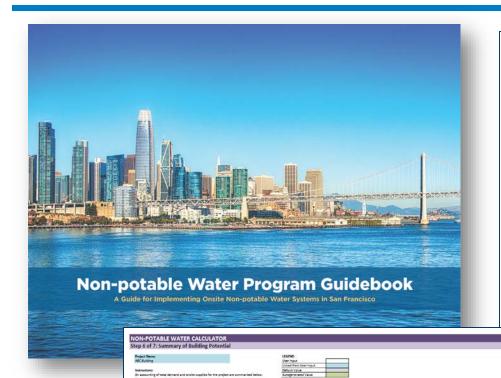


2016
Implementation
Requirements for
District-scale Systems





Technical and Financial Assistance



A. TOTAL DEMAND (No user input needed - auto-cal

Grant Assistance for Large Alternate Water Source Projects

Grant Assistance for Large Alternate Water Source Projects

Grant Guidelines and Terms



Grant Assistance Overview

The SFPUC's Grant Assistance for Alternate Water Source Projects (Grant Assistance) is a program designed to encourage retail water users to implement the on-site treatment and use of non-potable water including but not limited to rainwater, stormwater, graywater, foundation drainage, and blackwater. The goal is to maximize the use of nonpotable water for toilet flushing, irrigation, and other non-potable users. The SFPUC has approximately \$1,000,000 in funding available for two types of non-potable water projects:

1) district-scale projects that consist of two or more parcels that share treated alternate water sources or

2) building-scale projects that include any residential or non-residential building of at least 100,000 square feet or more. Grants will be awarded to those applicants who demonstrate they will significantly and permanently reduce or offset the use of existing drinking water supplies for non-potable applications.

Types of activities considered for funding include the installation of harvesting or collection systems for onsite sources, treatment systems to improve the water quality of on-site sources for beneficial reuse, and/or storage of the treated water. The SFPUC anticipates funding multiple projects. The deadline for applications for Calendar Year 2014 is December 31, 2014. Provision of grant funding is based on the eligibility of the proposed activity and availability of funds. Each application will be reviewed and evaluated on a case-bycase basis. Grant funding is available on a first come, first serve basis and is limited to \$250,000 per on-site project and \$500,000 per district-scale project. Projects that meet the Grant eligibility criteria for Districtscale Grant Assistance may not apply for Building-scale Grant Assistance.

Grant assistance will support customer efforts to implement sustainable water use practices in San Francisco.

vancing water supply reliability, this grant assistance will support the SFPUC's Phased aprovement Program Variant (WSIP) goals adopted by Resolution No. 08-200 on October SIP included a goal of developing an additional 10 million gallons per day (mgd) of locally resources.

is grant application package have the meanings described below

r Source – Non-potable source of water that includes graywater, rainwater, stormwater, age, and blackwater. The level of treatment and quality of the alternate water source shall be City's Department of Public Health and comply with all applicable federal, state, and local

perty owner that is a retail water customer of the SFPUC, proposing the installation of a district-scale treatment system on their property, and is seeking grant funds from the ternate water source project, pursuant to the instructions and guidelines set forth in this age.

ision by the SFPUC to provide grant funds, following the review and evaluation of a sation. An award is made through a Grant agreement.

astewater containing bodily or other biological wastes, as from toilets, dishwashers, kitchen sinks. Because of plumbing configurations, blackwater leaving a building generally includes

1



Hampton Inn Rainwater for Toilet Flushing



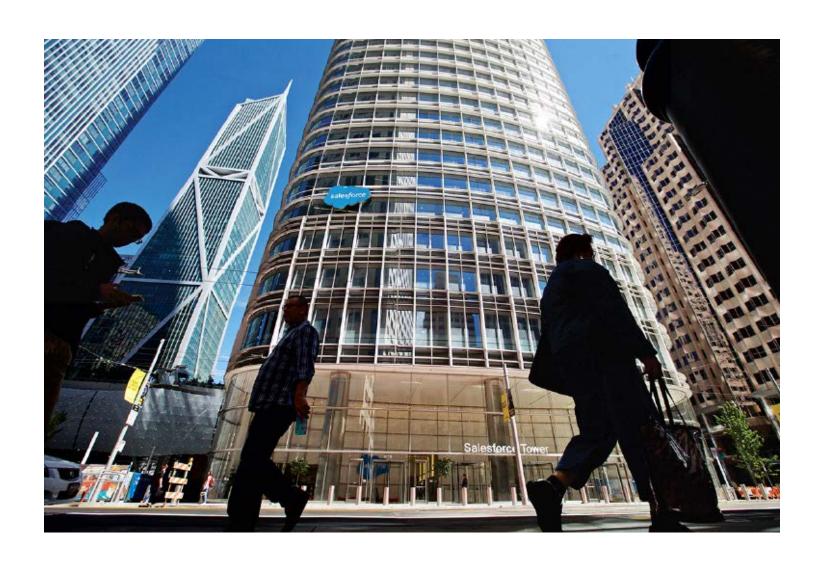


181 Fremont Graywater for Toilet Flushing





Salesforce Tower





Moscone Convention Center

Foundation Drainage for Flushing, Irrigation, and Street Sweeping





NRG-BART Project

Foundation Drainage for Downtown Steam Loop





Key Utility Considerations

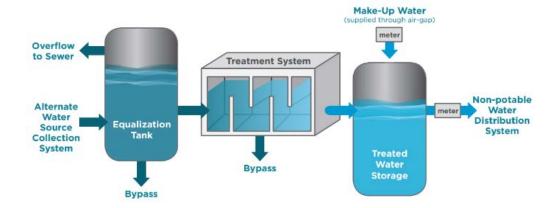
- Wastewater flows and odors
- Revenue impacts
- Capacity charge adjustments
- Excess use charges
- Policy synergies
- SFPUC capital projects





Key Program Considerations

- Water and sewer connections
- Backflow protection requirements
- Cross connection test prior to operation
- Operator capacity





SF Non-Potable Water Program Observations

- Interagency collaboration and requires dedicated staff for oversight and management
- Voluntary program before mandatory program
- Adapt to an evolving industry (technology, science and regulations)
- Cultural shift for utility
- Transforming the way we live and work in SF



Expanding Non-potable Water Program

- Expanding focus to include brewery process water onsite treatment and reuse
- Contact and non-contact uses
- Grant opportunities

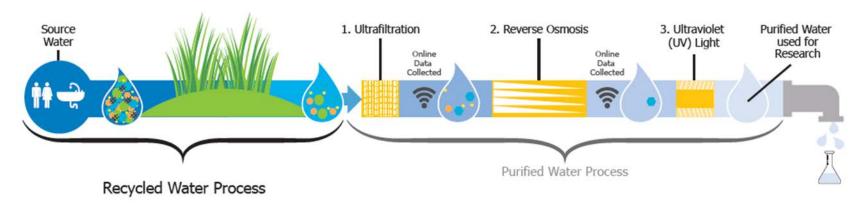




Piloting Purified Water Project

- Produce purified water from recycled water at SFPUC headquarters
- Research project including additional treatment and real time monitoring
- Community outreach and public education







Collaborating on a National Level

Innovation in Urban Water Systems San Francisco • May 2014











Addressing Barriers Water Quality and Governance





New Technical Guidance for Public Health Standards for Onsite Water Systems

Final Report

Risk-Based Framework for the Development of Public Health Guidance for Decentralized Non-Potable Water Systems



- Current water quality standards are not health risk based
- Risk-based pathogen Log Reduction Targets (LRTs) were established using a methodology that estimates the potential health risk associated with exposure to viruses, protozoa, and bacteria
- Methodology is based on widely accepted practices for potable reuse and drinking water

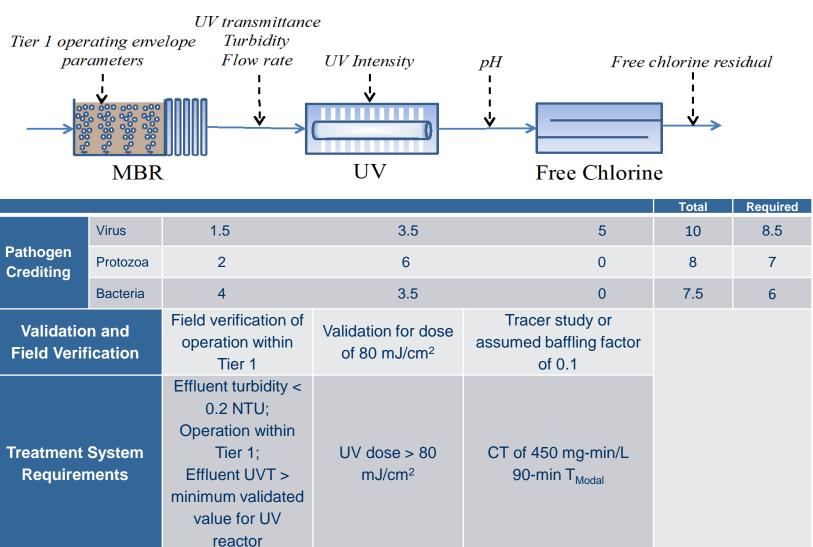




Log Reduction Targets				
Alternate Water Use Scenario	Enteric Viruses	Parasitic Protozoa	Enteric Bacteria	
Blackwater				
Outdoor use	8.0	7.0	6.0	
Indoor use	8.5	7.0	6.0	
Graywater				
Outdoor use	5.5	4.5	3.5	
Indoor use	6.0	4.5	3.5	
Roof Runoff				
Outdoor use	N/A	N/A	3.5	
Indoor use	N/A	N/A	3.5	
Stormwater				
Outdoor use	3.0	2.5	2.0	
Indoor use	3.5	3.5	3.0	

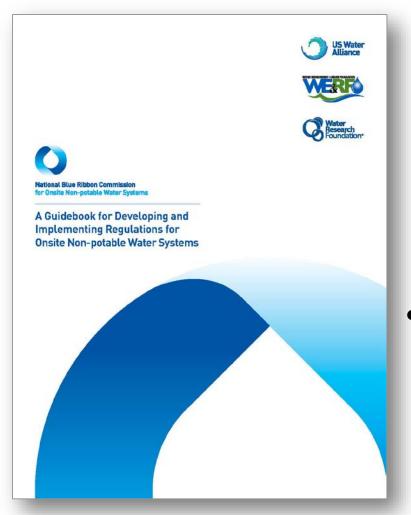


Example Blackwater Treatment Train





Guidebook for Developing and Implementing Policies for ONWS



- Model State Regulation
- Model Local Ordinance
- Program Rules to be implemented with the state regulation or local ordinance
- Intended to create nationally consistent treatment standards and management approaches from state-to-state



3 Pathways to Implementation

- States Develop Regulation and Local Authority Implements
- States Develop Regulation and Implements
- Local Authority Develops
 Regulation and Implements





Stakeholder Outreach CA Statewide Policy for Onsite Systems

STAKEHOLDER OUTREACH IN THE STATE OF CALIFORNIA



CALIFORNIA WATER POLICY CHALLENGE: Bridging the Gap between Water Innovation and Regulation in California

> Developing a Statewide Policy for Onsite Non-Potable Water Systems





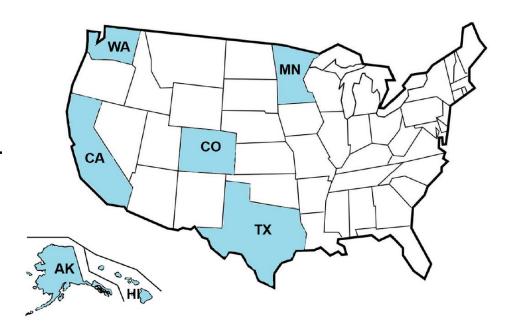


- SFPUC and AWE won the Imagine H20 California Water Policy Challenge
- SFPUC and AWE held 3
 stakeholder workshops in SAC,
 SF, and LA to gather feedback on
 a statewide policy
- Statewide policy focuses on establishing water quality standards & monitoring and reporting requirements for onsite non-potable water systems



Jurisdictions Moving Forward with Risk Based Approach

- San Francisco
- California, SB 966
- Colorado, Regulation #84
- Minnesota
- Washington State
- Texas, Hawaii, Alaska





Making the Utility Case for ONWS







 Report inspires One Water leaders to consider onsite water systems in their water resource and resilience planning

 Helps water and wastewater utilities and others understand the benefits and drivers behind onsite nonpotable reuse



Highlights of the Making the Utility Case Document

Drivers:

 Fostering system resilience, diversifying water supplies, managing stormwater, meeting regulatory requirements, deferring capital costs, and generating environmental and community amenities

Key Considerations for Implementation:

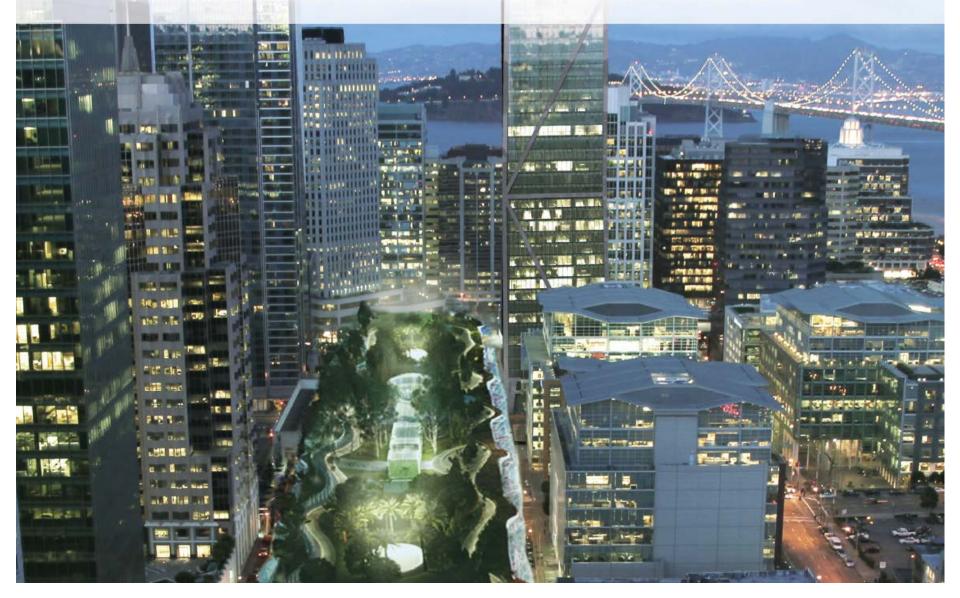
 Protecting public health, establishing oversight programs, addressing revenue impacts, and managing wastewater flows and odors

Role of Utility Leadership:

Educational and outreach, regulatory and permitting oversight,
 O&M, system integrator or owner

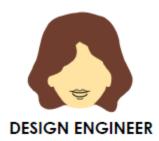
BLUEPRINT for Onsite Water Systems

A Step-by-Step Guide for Developing a Local Program to Manage Onsite Water Systems





Training Manual for Engineers, Operators, Utilities and Regulators









- Developing a guidance manual and training materials to identify the skills and knowledge required to design and permit treatment systems that meet the risk-based water quality standards
- Estimated completion late 2018/early 2019



National Blue Ribbon Commission for Onsite Non-potable Water Systems



THANK YOU

sfwater.org/np

