

# This presentation premiered at WaterSmart Innovations

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# Alternate Water Sources Program Overview

**WaterSmart Innovations 2012**

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# Presentation Outline

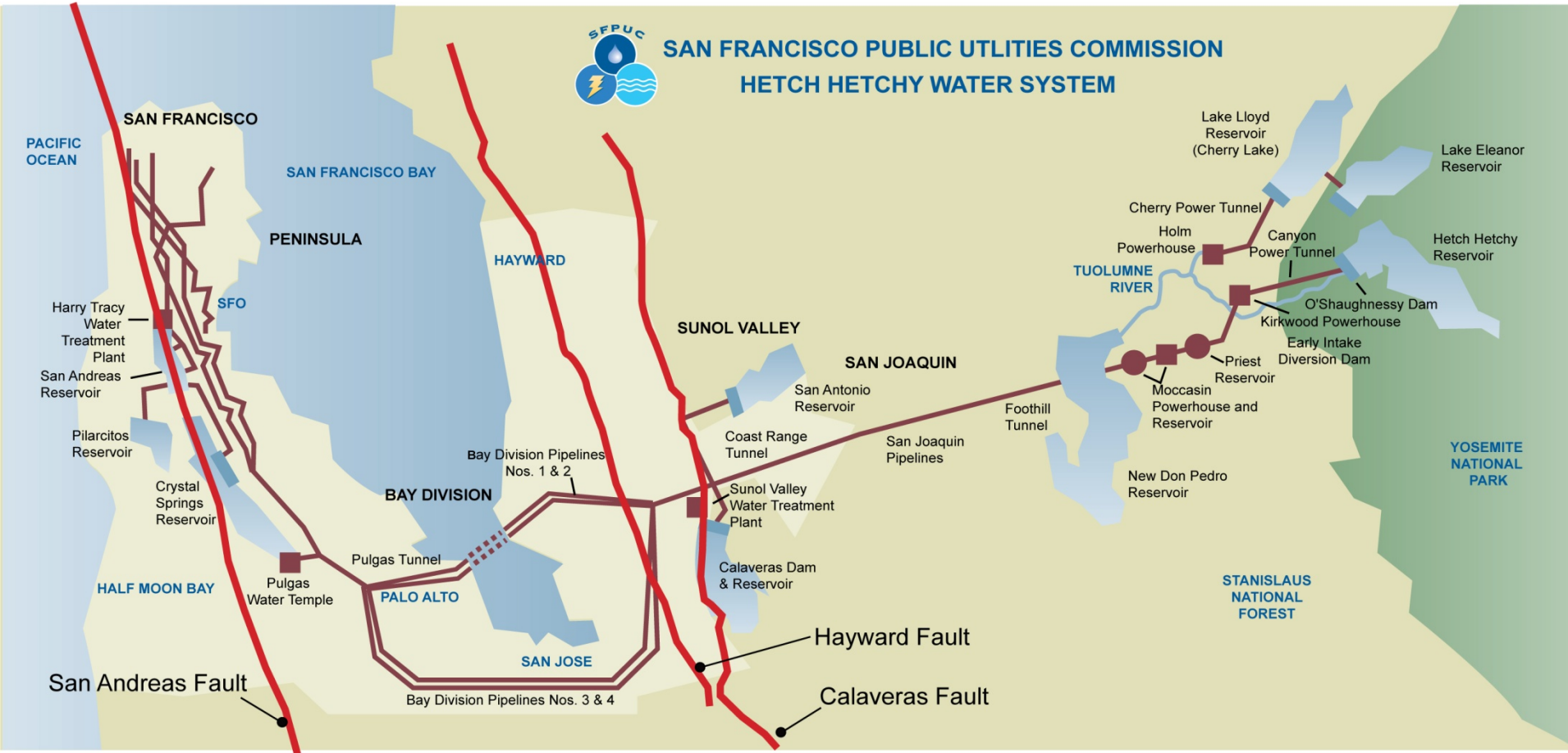
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- About the SFPUC
- Alternate Water Sources
- Residential and Commercial Programs
- Next Steps

# Services We Provide



# Regional Water System





# Diversify Our Water Supply Portfolio

- Conservation: reduce demands by 4 mgd
- Recycled Water: produce 4mgd
- Local Groundwater: develop potable supply 4mgd

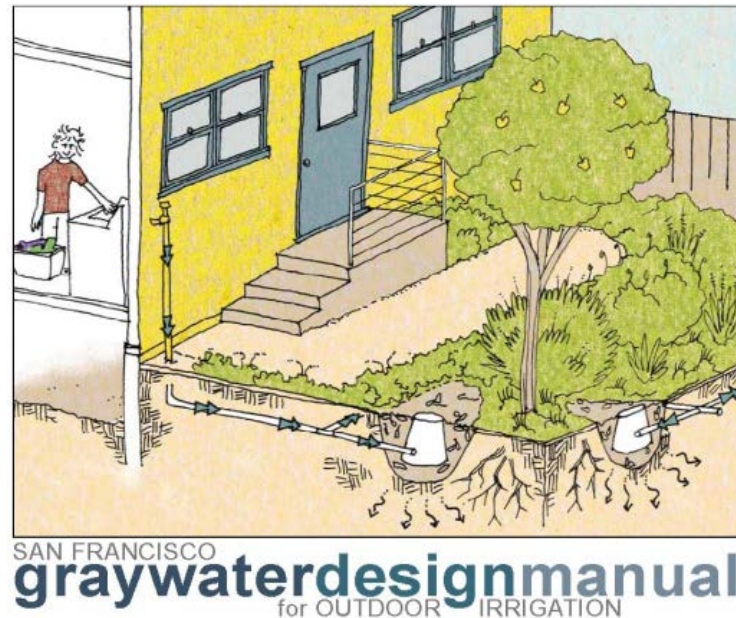


# Alternate Water Sources



# Residential Programs

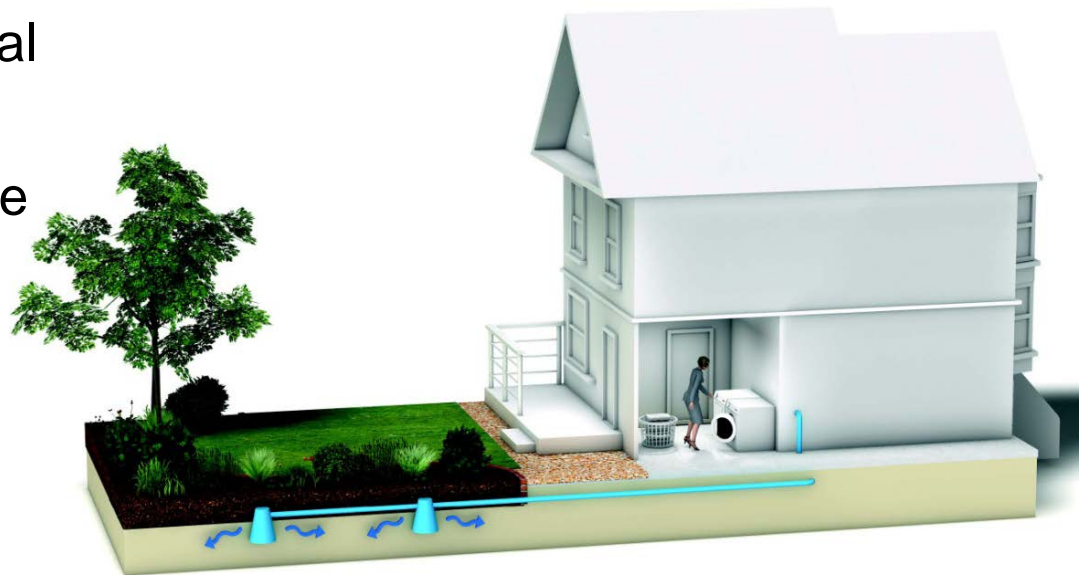
- Rainwater Harvesting Program
- Residential Graywater Program






# Laundry to Landscape (L2L) Incentive

- Launched April 2011
- Provides kit of parts, training workshop and manual, on-site help, follow-up survey
- Small market
- Enhancements since launch:
  - Updated design manual
  - Tool lending kit
  - On-site tech assistance
  - More kit components



# L2L Participation

April 2011 – August 2012	Quantity
Applications received	92
L2L kits sold	56
Declined from further participation after submission of application	11
Training workshops held	11
Application approved but participant hasn't attended a workshop	9
Participant attended workshop but hasn't purchased L2L kit	14



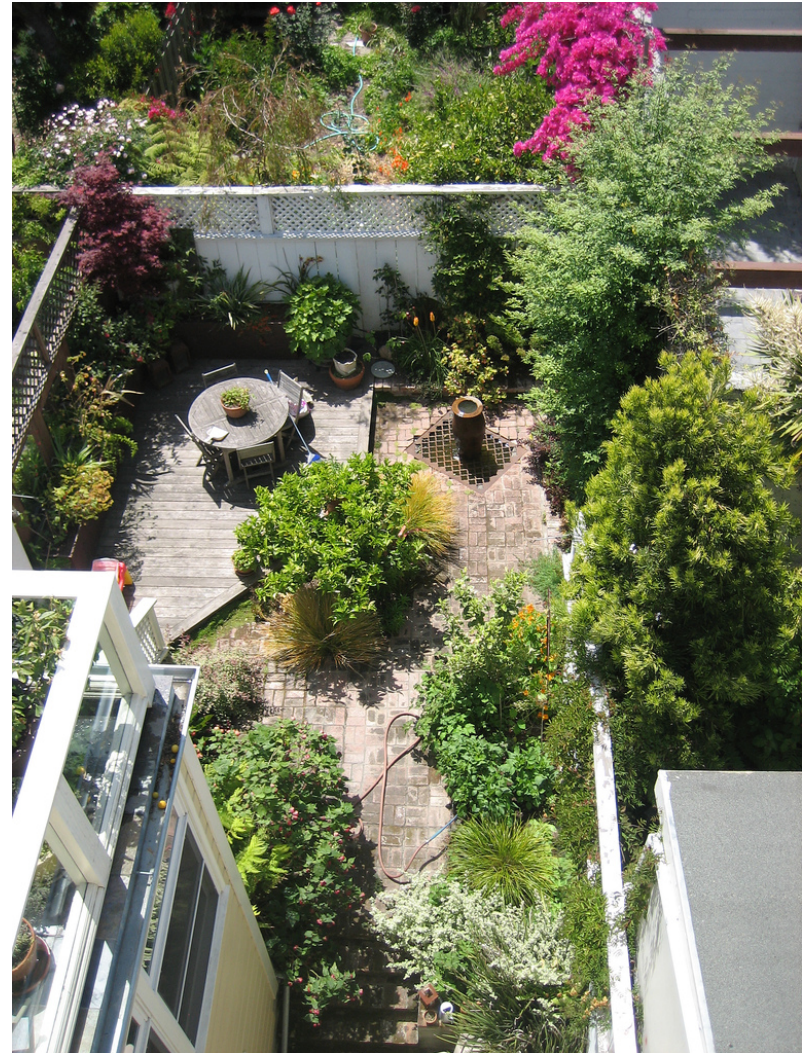
Reasons for Not Participating Further in Program	
Concerned about damage to landscape	Top-loading clothes washer produces more water than needed for irrigation
Water savings didn't seem worth effort	Interior laundry room has no crawl space or means of getting the pipe outside
Washer more than 40 feet from backyard	Installation seemed too complicated

# L2L Survey Findings

Survey Question	Average Response
What motivated you to participate?	Help the environment, save water, reduce bill
How did you irrigate before installing a L2L system?	Hand-watered
What was your experience in installing the kit?	No difficulties; 6 hired installers
Did the kit cover all the costs for installation?	No, required additional \$20
Are you using graywater to irrigate existing plants or new landscaping?	70% existing plants 30% new plants
Have you noticed any changes in plant health?	No
What type of plants are you irrigating?	Fruit trees and edible plants
Have you noticed a decrease in your water bill?	Most no, a few yes
Total irrigated area of your landscape?	630 square feet
Total irrigated area using graywater?	193 square feet

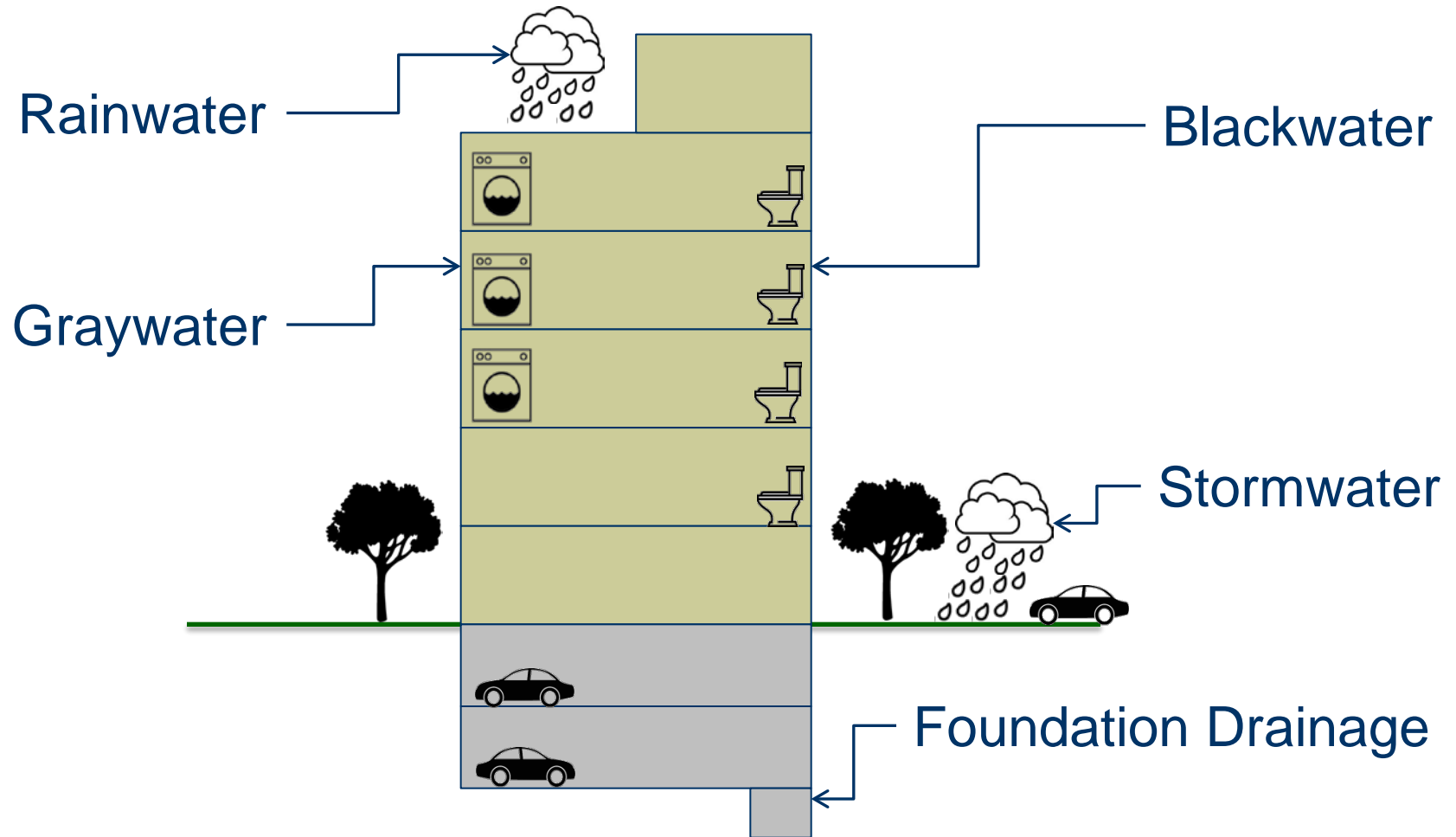
# L2L Participant Water Use

- One year pre- and post-install:
  - 13 sites increased water use
  - 2 sites reduced water use
  - 2 sites had no change in use
- Challenges
  - Hard to pin point cause of change
  - Very small landscape areas
  - Less than 1 CCF (748 gallons) hard to measure
- Will continue to analyze

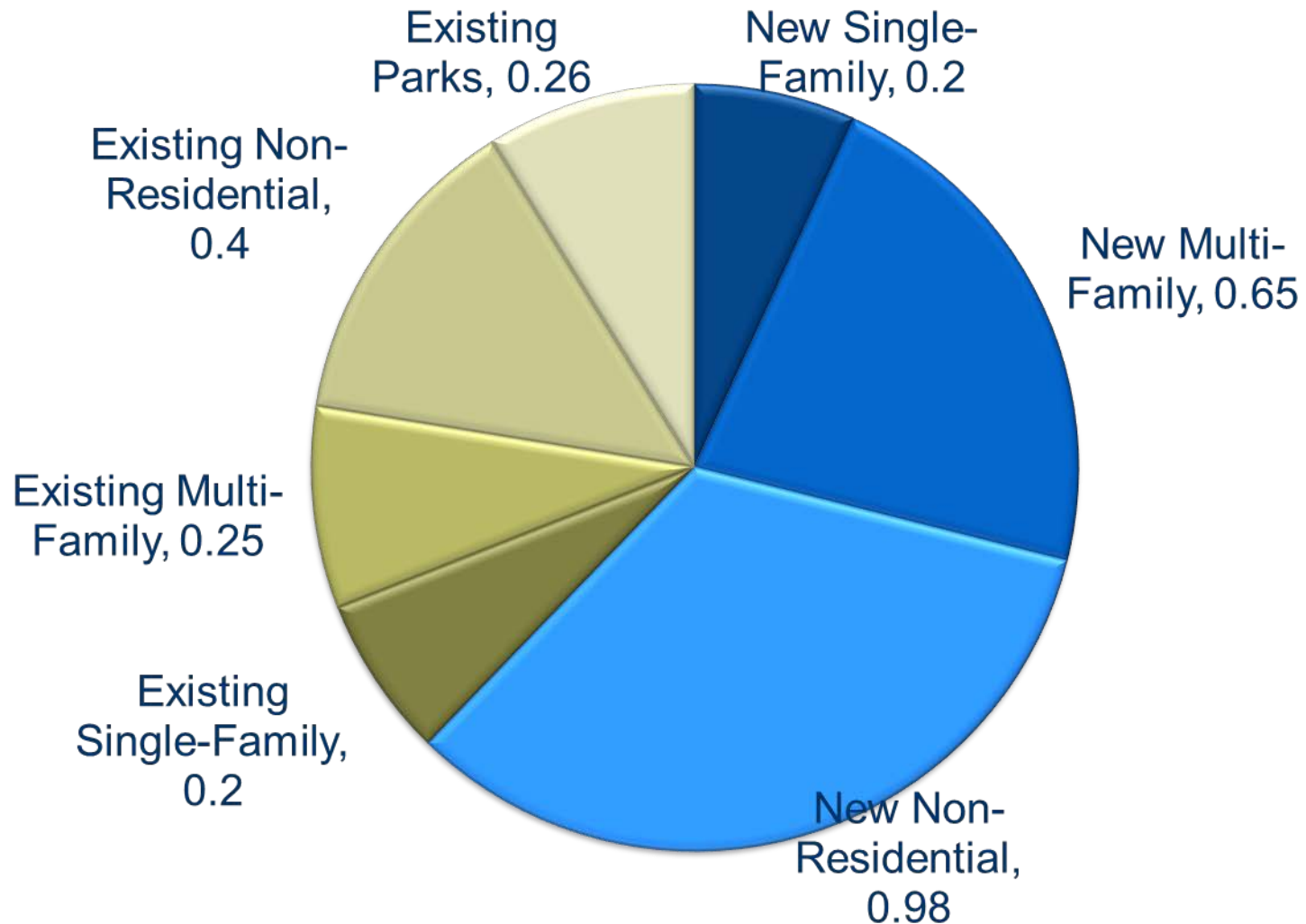




# Commercial Opportunities in San Francisco



# Potable Offset Investigation (mgd)



# Large Scale Alternate Water Sources



**NEW YORK:** Solaire High-Rise Residences utilizes an on-site MBR system that recycles 100% of the building's wastewater for use in toilets, cooling towers, and irrigation



**SEATTLE:** The Cascadia Center practices net zero water design using harvested rooftop rainwater to meet 100% of the building's interior water needs



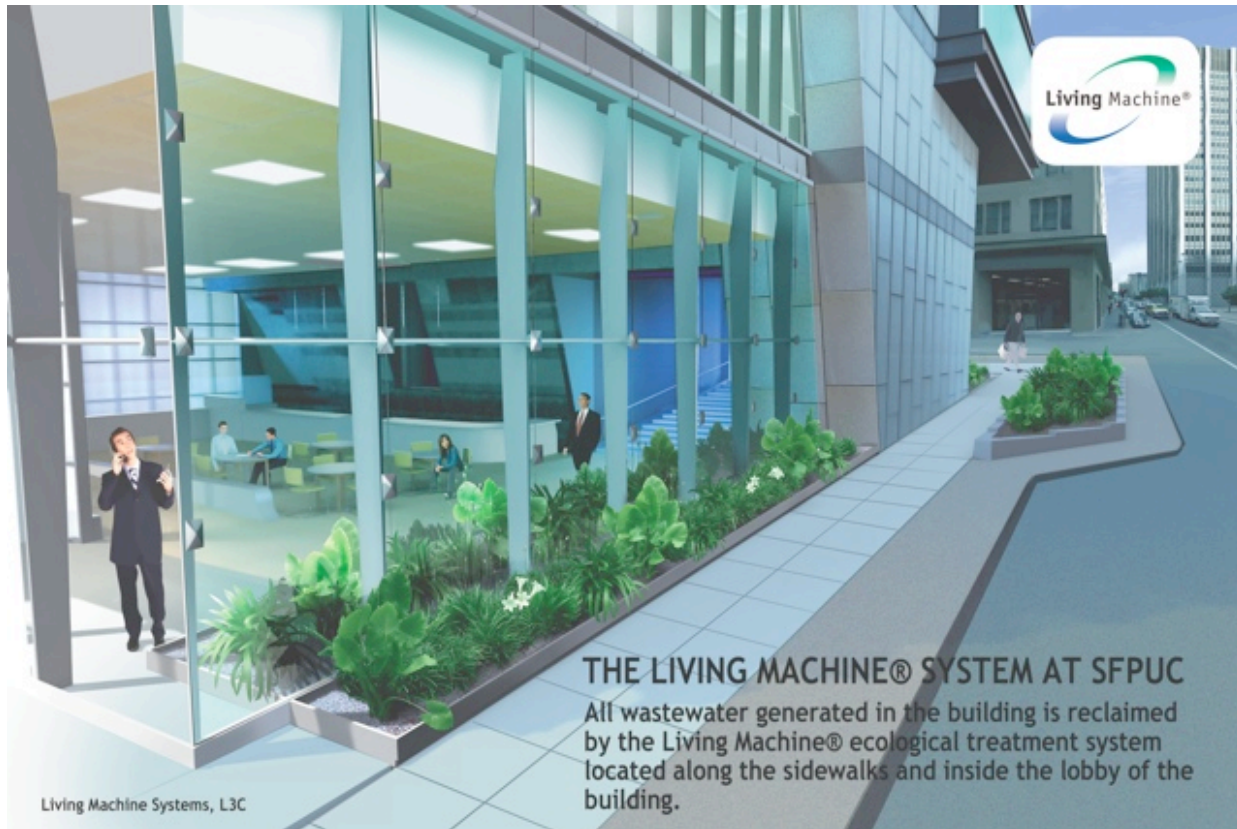
**PORTLAND:** has several large-scale on-site reuse systems operating in mixed use developments. Bud Clark Commons is a LEED Platinum project incorporating a graywater reuse system



**TOKYO:** on-site reuse is required in some urban locations in the city and there are currently over 1,500 building or district-wide systems providing nearly 61% of demands with non-potable supplies

# On-site Non-potable Water Use: Under Construction

- SFPUC New Headquarters— blackwater & graywater for flushing toilets





# On-site Non-potable Water Use: Under Development

- Transbay Transit Center – rainwater & graywater for flushing toilets



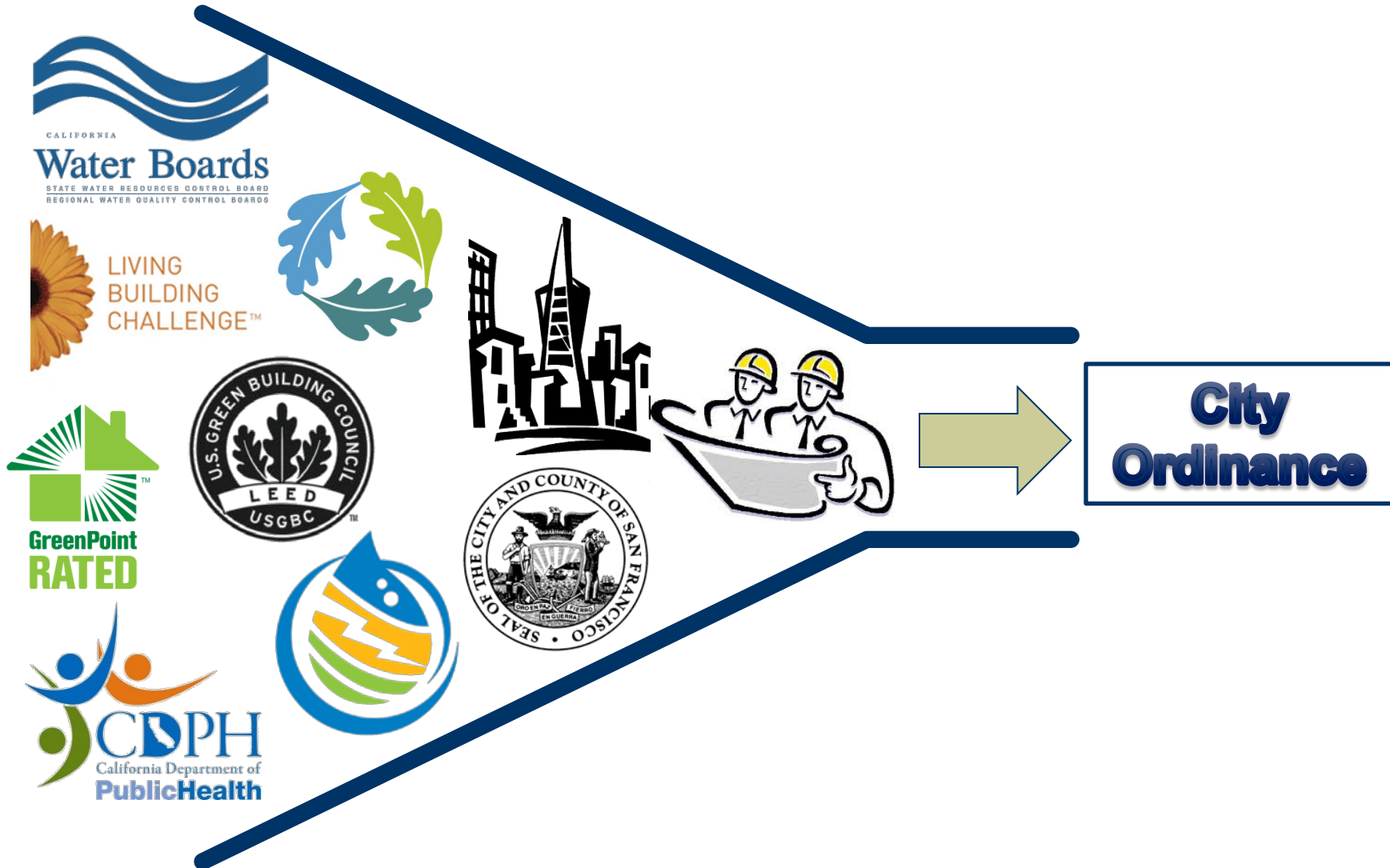


# On-site Non-potable Water Use: Innovative Projects Proposed

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- Moscone Center
  - Foundation drainage for irrigation
- PG&E, 2270 Folsom
  - Foundation drainage for toilet flushing
- Public Safety Building
  - Graywater for toilet flushing & irrigation

# Challenges for Developers



# Role of City Agencies

SFPUC	SFDPH	SFDBI
Program Administration	Public Health	Construction
<p>Review on-site non-potable water supplies &amp; demands</p> <p>Administer citywide project tracking &amp; annual potable offset achieved</p> <p>Provide technical support &amp; outreach to developers</p> <p>Provide financial incentives to developers</p>	<p>Issue water quality &amp; monitoring requirements</p> <p>Review and approve non-potable engineering report</p> <p>Issue permit to operate on-site systems</p> <p>Review water quality reporting</p>	<p>Conduct Plumbing Plan check and issue Plumbing Permit</p> <p>Inspect and approve system installations</p>





# Water Quality Criteria

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## **SFDPH Role: Ensure Protection of Public Health and Set Standards:**

- Blackwater reuse will be consistent with Title 22 Disinfected Tertiary Recycled Water
  - Commercial Graywater and Rainwater limits will be consistent with forthcoming 2013 State codes
  - SFDPH will set criteria for foundation drainage not addressed at the state level
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- SFDPH will permit onsite systems and require monitoring and reporting

# System Construction

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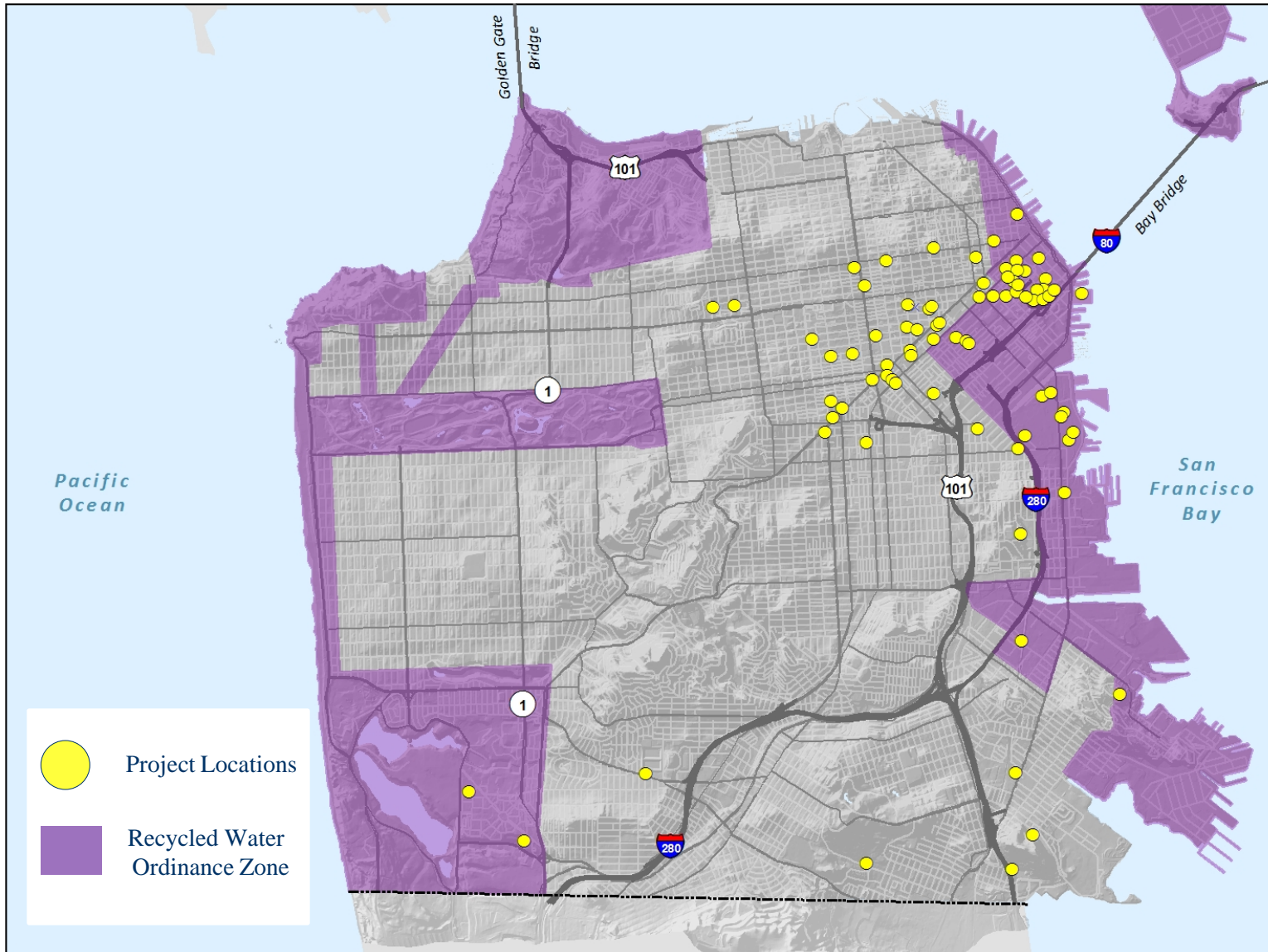
Propose common pipe for all nonpotable applications:

- Pipe labeling will identify nonpotable water type – “Recycled”, “Nonpotable”, “Onsite Treated Nonpotable”, “Rainwater”, etc
- Consistent with proposed 2013 plumbing code

Municipal recycled water as make-up/backup supply to onsite nonpotable water systems:

- Where RW not available, potable water will be supplied
- Would require the same backflow protection as potable
- Consistent with proposed 2013 plumbing code

# Location of Future Slated Developments Over 100,000 sf



# Potential Potable Water Savings

Building Type	Building Size (GSF)				% Potable Water Reduction
	40K	100K	200K	500K	
	Potable Water Offset (gpy)				
Office	119,000	285,000	562,000	1.3 M	78%
Mixed Use Development	175,000	424,000	841,000	2.1 M	22%



# Typical Costs for Treatment Systems

## Estimated Range of Capital Costs for On-site Non-potable Water Systems

Building Size (sf)	Treatment Systems (\$M)	Dual Collection Plumbing (\$M)	Dual Distribution Plumbing (\$M)	Total Capital Cost (\$M)	% of Building Construction Cost
500,000	0.3 - 0.4	1.1 – 1.8	1.6 –2.6	3.1 – 4.8	2.9% - 3.5%
200,000	0.2 - 0.3	0.5 – 0.7	0.6—1.0	1.3 – 1.9	3.1% - 3.5%
100,000	0.1 - 0.3	0.2 – 0.4	0.3—0.5	0.8 – 1.0	3.6% - 3.7%
40,000	0.1 – 0.3	0.1 – 0.2	0.1—0.2	0.4 – 0.5	4.3% - 5.5%

# Promote On-site Water Reuse

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- The SFPUC proposes to offer financial assistance to new projects that replace potable water use with alternate water sources
- Proposed projects shall be 100,000 sf or more
- Proposed projects shall replace potable water use for one of the following:
  - All toilet flushing demands or
  - Reduce 40% of potable water use

## Next steps

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- Pass Ordinance (Sept 2012)
- Finalize Rules and Regulations
- Developer Guidebook
- Move on to district-scale water resource sharing
  - State regulatory hurdles
  - Private, public, public-private ownership models
  - Incorporating into demand planning and projections

# Conclusion

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## The Non-potable Water Use Program will:

- Coordinate City agencies and streamline the process for developers
- Lessen combined sewer impacts from new developments
- Replace the use of drinking water for toilet flushing and irrigation in new large developments and commercial structures

# Thank You!

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