National Blue Ribbon Commission for On-site Non-Potable Water Systems [ONWS]

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PNWS-AWWA section conference

Vancouver, WA May 3rd, 2019

A RIVER RUNS THROUGH IT

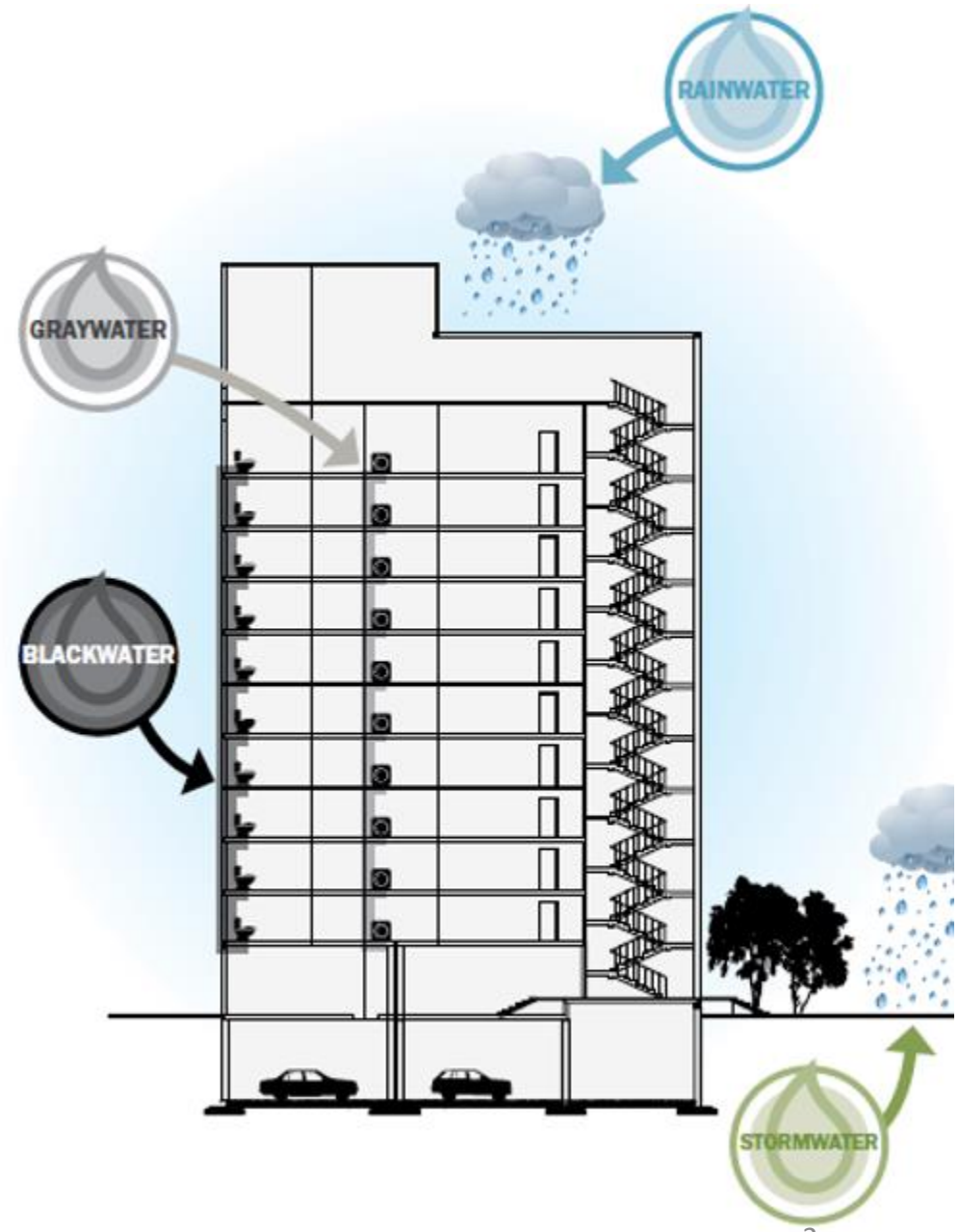
2019 PNWS-AWWA CONFERENCE
VANCOUVER, WASHINGTON

So: What is an ONWS?

Onsite Non-potable Water System (ONWS): A system in which water from local sources is collected, treated, and used for non-potable uses at the building to district/ neighborhood scale, generally at a location near the point of generation. Also known as a decentralized system.

Currently, there are no national water quality standards or guidelines for onsite non-potable water systems in the United States

[and the EPA is not interested in adding these to the Federal Register!]



Why do water utilities need to know about ONWS?

- Some are driven for water supply, demand management, resilience issues.
- Others are being brought into conversations and looked to for guidance, support, and regulation.

Natural Organic Recycling Machine (NORM) at Hassalo on Eighth, Portland, OR. Photo courtesy of Jim G. Maloney/Biohabitats, Inc

Now that we know what an ONWS is; what are the drivers for these systems?

- I understand states such as California and Texas and other dry climate/drought regions. But why are there legislative pushes in not so dry areas?
- Colorado / Denver story-
- Minnesota?
- Hawaii
- Arizona
- Oregon (still moving in Salem)
- Washington (did not mover through this session)

EARTH JOURNAL

With all those lakes and aquifers, could Minnesota run short of water? Um, yes.

By Ron Meador | 02/24/2016

Email Facebook Twitter

MinnPost photo by Andrew W

Ron Meador chatting with Dr. Deborah Swackhamer during Monday night's Q&A segment.

What other drivers might there be - for I am not convinced? (said the rainy city of Portland, OR)

- Fostering system resilience [think Cascadia Subduction Zone]
- Managing stormwater and reducing pollution
- Meeting policy and regulatory requirements [coming to your State legislators soon – going Green]
- Generating environmental and community amenities
- Creating opportunities for public-private partnerships that meet market demands
- Inspiring innovation in technology

How do utilities fit in?

US Water Alliance

THE Water Research FOUNDATION

National Blue Ribbon Commission for Onsite Non-potable Water Systems

- 2016 Commission was formed
- Made up of 33 representatives from municipalities, water utilities, and public health agencies from 11 States and District of Columbia.
- Working group to develop standards and guidelines for safe, sustainable systems.

Here are the steps taken by the Blue Ribbon Commission to get to a usable document

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

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

- A Guidebook for Developing and Implementing Regulations for Onsite Non-potable Water Systems.

List of Commissioners

Chair

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Director of Water Resources, San Francisco Public Utilities Commission

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Co-Chief Executive Officer, The Water Research Foundation
Rob Renner
Co-Chief Executive Officer, The Water Research Foundation

Okay – so how does an ONWS work?

Alternate Water Sources

Buildings, including commercial and multi-family residential buildings, generate several types of alternate water sources. The most common types of alternate water sources produced by buildings and covered in this document include:

- **Roof Runoff:** precipitation from rain or snowmelt events that is collected directly from a roof surface not subject to frequent public access.
- **Stormwater:** precipitation runoff from rain or snowmelt events that flows over land and/or impervious surfaces (e.g., streets, parking lots, and rooftops). Stormwater includes runoff from roofs with frequent public access.
- **Domestic Wastewater or Blackwater:** wastewater originating from toilets and/or kitchen sources (e.g., kitchen sinks and dishwashers).
- **Graywater:** wastewater collected from non-blackwater sources, such as bathroom sinks, showers, bathtubs, clothes washers, and laundry sinks.

Non-potable End Uses

Alternate water sources can be used for a variety of non-potable uses within and outside a building. The most common indoor use is toilet and urinal flushing, which can represent approximately 25 percent of the total water demand in a residential building and up to 75 percent of the total water demand in a commercial building. Other potential non-potable water demands include irrigation, cooling/heating applications, process water, and clothes washers. These additional applications can increase the non-potable water demand up to 50 percent for residential buildings and up to 95 percent for commercial buildings.

The non-potable end uses covered in this report include:

- Indoor Use:
  - Toilet and urinal flushing
  - Clothes washing
- Unrestricted Irrigation:
  - Ornamental plant irrigation
  - Dust suppression

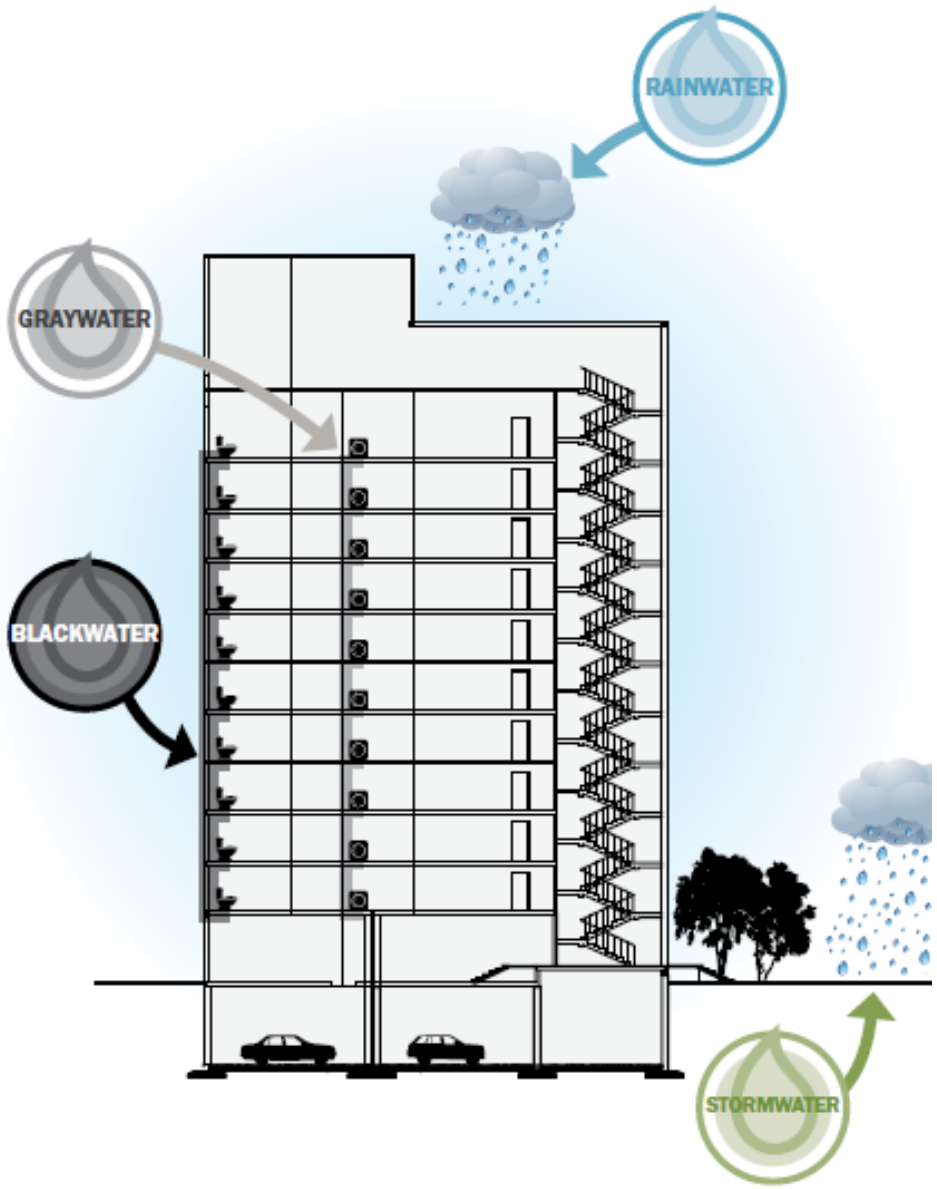
STEP 2 Select the Types of Alternate Water Sources

To establish manageable parameters for your program, identify the specific types of alternate water sources that will be approved for collection and treatment. The amount of resources and staff needed for a program can increase with the number of alternate water sources that are incorporated. Therefore, the selection of a single water source, such as rainwater, may be ideal for initiating a program with the potential to incorporate additional water sources as the program progresses.

Buildings, including commercial and multi-family residential buildings, generate a number of different types of alternate water sources. The most common types of alternate water sources produced by buildings include:

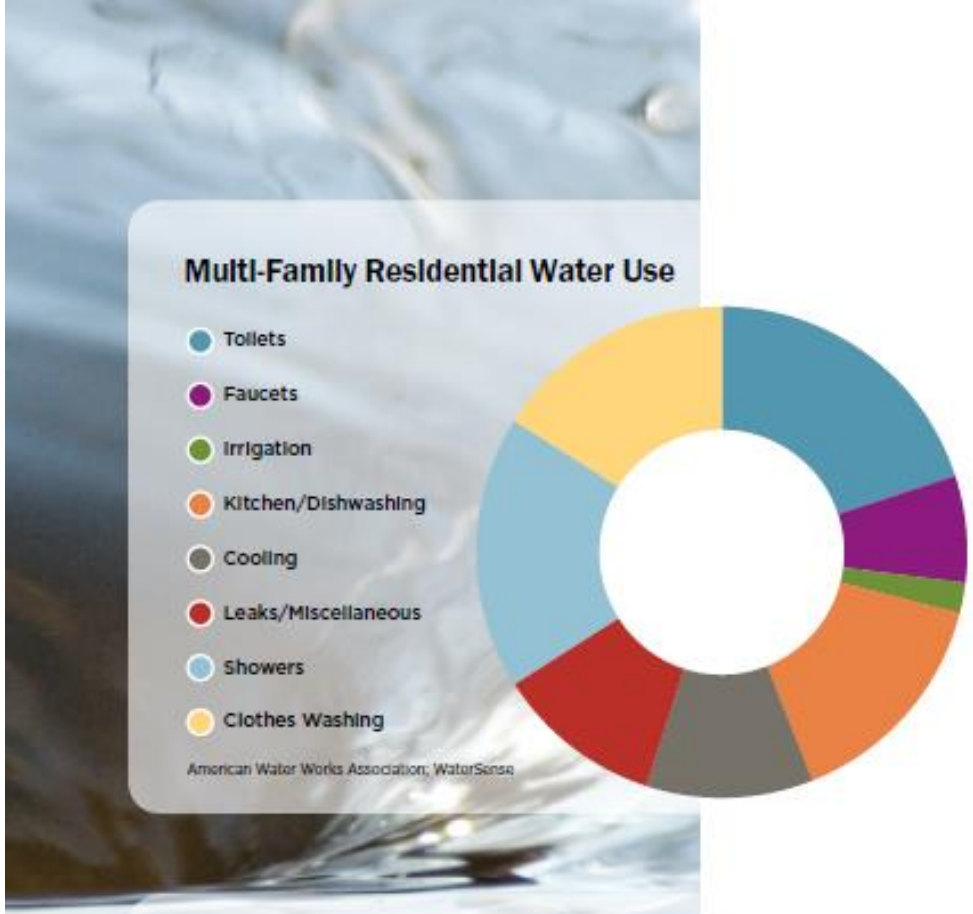
- **Rainwater** – precipitation collected from roofs;
- **Stormwater** – precipitation collected from ground plane;
- **Graywater** – wastewater from bathtubs, showers, bathroom sinks, and clothes washing machines; and
- **Blackwater** – wastewater from toilets, dishwashers, kitchen sinks, and utility sinks.

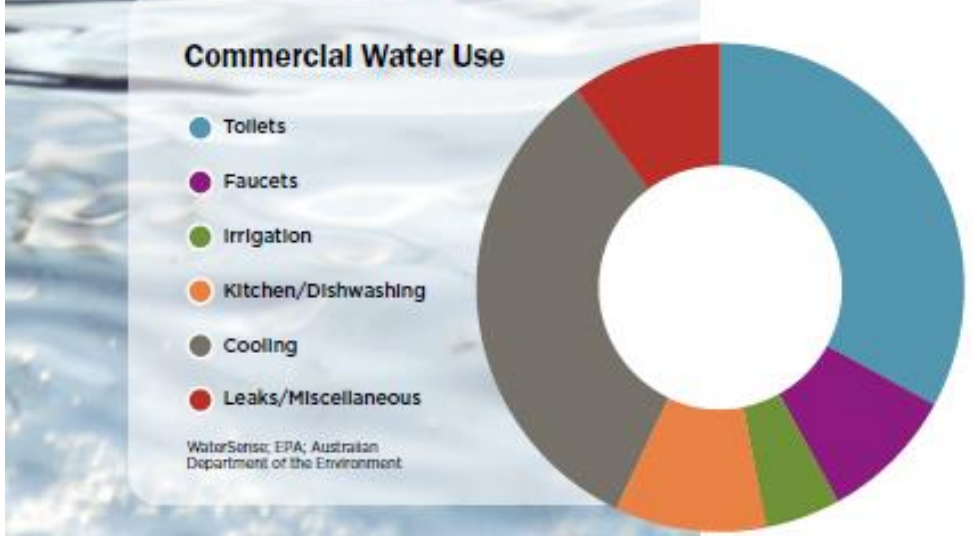
Terminology and definitions may vary across regions or sectors. When identifying the specific alternate water sources for your program, use the same terminology and definitions that are contained in the local building, plumbing, and health codes and guidelines that will regulate the onsite water systems. Using consistent definitions will help streamline implementation of the program and minimize confusion by developers.



STEP 2 Outcome

Narrow the specific types of alternate water sources covered in the program.





STEP 3 Identify End Uses

Alternate water sources can be used for a variety of non-potable uses within and outside a building. It is important to identify the specific non-potable end uses (e.g., irrigation) that will be allowed in the program and describe how and where the end use is allowed (e.g., spray or sub-surface irrigation).

The most common indoor use is toilet/urinal flushing, which can represent approximately 25% of the total water demand in a residential building and up to 75% of the total water demand in a commercial building (assuming no cooling demand). Other potential non-potable water demands include irrigation, clothes washers, cooling/heating applications, and process water. These additional applications can increase the non-potable water demand up to 50% for residential buildings and up to 95% for commercial buildings.

Incorporating multiple end uses may result in a more complex program structure but potentially more widespread application of non-potable water. The specific type of alternate water sources and end uses selected serve as the foundation of your program. As with alternate water sources, using consistent definitions will help streamline implementation of the program and minimize confusion by developers.

STEP 3 Outcome

Classify specific non-potable end uses for your program.

Table 1

Log reduction targets for 10^{-4} per person per year benchmarks for ONWS using blackwater, graywater, or roof runoff

Water Use Scenario	Enteric Viruses	Parasitic Protozoa	Enteric Bacteria
Domestic Wastewater or Blackwater			
Unrestricted Irrigation	8.0	7.0	6.0
Indoor Use	8.5	7.0	6.0
Graywater			
Unrestricted Irrigation	5.5	4.5	3.5
Indoor Use	6.0	4.5	3.5
Roof runoff			
Unrestricted Irrigation	Not applicable[1]	No data[1]	3.5
Indoor Use	Not applicable[1]	No data[1]	3.5

Notes:

1. States and/or local regulators can define the LRTs for virus and protozoa for roof runoff systems using one of the following suggested options:
   - Assign LRT values based on stormwater LRTs
   - Conduct research on the presence of virus and protozoa in roof runoff and assign LRT values based on research

Source: Adapted from Sharvelle et al., 2017 (Table 3-3, page 26).

Table 2

Log reduction targets for 10^{-4} per person per year benchmarks for ONWS using stormwater

Water Use Scenario	Enteric Viruses	Parasitic Protozoa	Enteric Bacteria
Stormwater (10^{-1} dilution)			
Unrestricted Irrigation	5.0	4.5	4.0
Indoor use	5.5	5.5	5.0
Stormwater (10^{-3} dilution)			
Unrestricted Irrigation	3.0	2.5	2.0
Indoor use	3.5	3.5	3.0

Source: Adapted from Sharvelle et al., 2017 (Table 3-3, page 26).

What kind of scale was envisioned (at least this is all that we worked on)?

Implementation Scale

The alternate water sources and non-potable end uses addressed in this document are limited to ONWS at the following implementation scales:

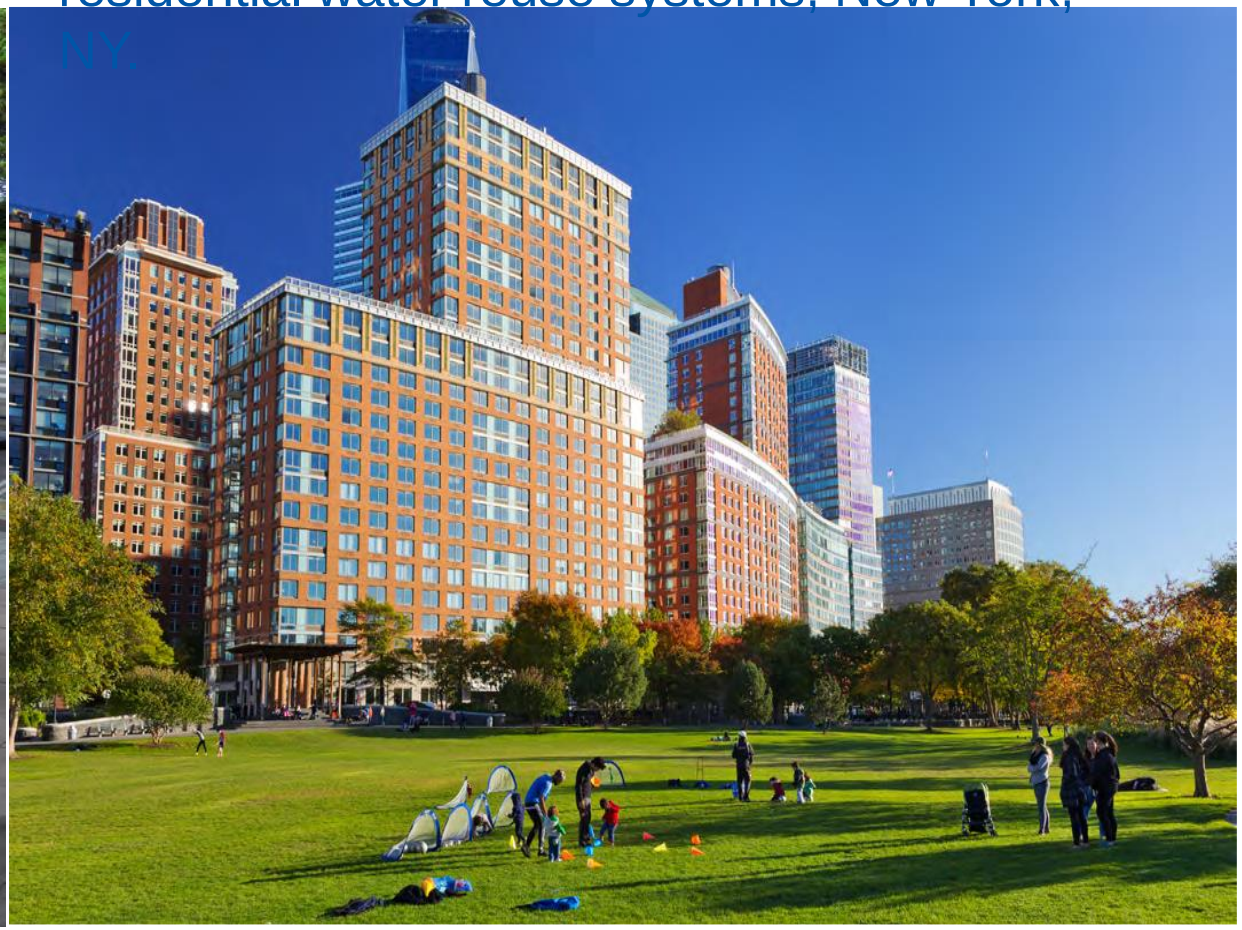
- Multi-family Buildings
- Commercial Buildings
- Mixed-use Buildings
- District-scale Projects

Where are we on regulations?

- State by State determination
  - California = September 2018 Senate Bill 966 directed the State Water Resources Control Board to develop risk-based water quality standards for ONWS.
  - Oregon = currently HB 3182 A is in the Senate, develops a pathway for adopting risk-based water quality standards for ONWS.
  - Washington = recent efforts to move risk-based standards through the legislature were not successful. Likely to come back.
  - Idaho = ?

Natural Organic Recycling Machine (NORM) at Hassalo on Eighth, Portland, OR. *Photo courtesy of Jim G. Maloney/Biohabitats, Inc.*

Battery Park City redevelopment area, home to six
residential water reuse systems, New York, NY.



Santa Monica Urban Runoff Recycling Facility

Gillette Stadium, Foxborough, MA

San Francisco Public Utilities Commission

Questions? You bet there are questions…

- Who is going to regulate these systems? OR-DEQ or OHA?

  WA- Dep't of Ecology or Dep't of Health?
- What kind of certification(s) will be required and who administers and manages these certs?
- What kind of monitoring and reporting requirements will there be?
- Who is going to perform design reviews? Is there code from which provide reviews?
- How do we make really sure these systems do not intermingle with the drinking water supply?
- Who owns and maintains these systems?