

# NATIONAL WATER REUSE ACTION PLAN

## COMPLETED ACTION



**Action 2.18** Incorporate Water Quality and Onsite Reuse Research into Codes and Standards for Premise Plumbing

## Background

Decentralized onsite non-potable water systems (ONWS) in buildings can provide resilience against climate impacts, including drought and flooding, by reducing the burden on a city's centralized water and wastewater networks. A complex set of local and voluntary plumbing codes and standards address the movement of the water within buildings, on-premises delivery of potable water from a public drinking water treatment plant and any onsite non-potable reuse systems. Potable water must meet Safe Drinking Water Act (SDWA) standards when it arrives from a public drinking water treatment plant, and the water should continue to meet SDWA standards as it travels through a building. However, there are no similar national regulations for ONWS applications. Instead, premise plumbing codes are used to address any potential concerns. Plumbing codes and standards, typically set by national codes and standards organizations, are then adopted by local jurisdictions. Historically, codes have focused on water delivery characteristics such as flow and pressure; fewer codes exist for chemicals and pathogens. Thus, there is a need to incorporate the latest science and risk-based framework treatment targets into codes and standards to safely advance ONWS.

This action built on the NBRC for ONWS's engagement with standards and codes organizations (ICC, IAPMO and NSF International) to align plumbing codes and standards with microbial log reduction targets for onsite treatment developed using the quantitative microbial risk-based framework. As part of the action, all action partner organizations each made progress toward the incorporation of the latest science in their codes or standards.

## Accomplishments/Impact

- NSF International incorporated log reduction targets and credits into the latest version of the [NSF/ASNI 350 standard](#). NSF International published the latest version of the standard in March 2024.
- IAPMO incorporated log reduction targets into their Water Efficiency and Sanitation Standard (WE-Stand) Guide Criteria (for blackwater and stormwater reuse) and into their Guide Criteria Z1324 (for onsite reuse in multi-family, residential and commercial buildings).
- ICC formed a workgroup to propose updates for onsite water reuse codes for the 2026 code update cycle. The ICC workgroup submitted the proposed updates in October 2023.
- GSA published the updated [P100 standard](#) in May 2024. The updated P100 standard better identifies onsite water reuse standards for public buildings and references the REUSExplorer for regulations. These updates were incorporated to the P100 as part of larger efforts to achieve water net zero targets in

## Action Team

### Action Leaders

- **U.S. Environmental Protection Agency (EPA)**
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  - William Platten, Office of Groundwater and Drinking Water ([platten.william@epa.gov](mailto:platten.william@epa.gov))
- **National Blue Ribbon Commission (NBRC) for Onsite Non-potable Water Systems (ONWS)**
  - Paula Kehoe ([pkehoe@sflower.org](mailto:pkehoe@sflower.org))
  - Taylor Nokhoudian ([tnokhoudian@sflower.org](mailto:tnokhoudian@sflower.org))

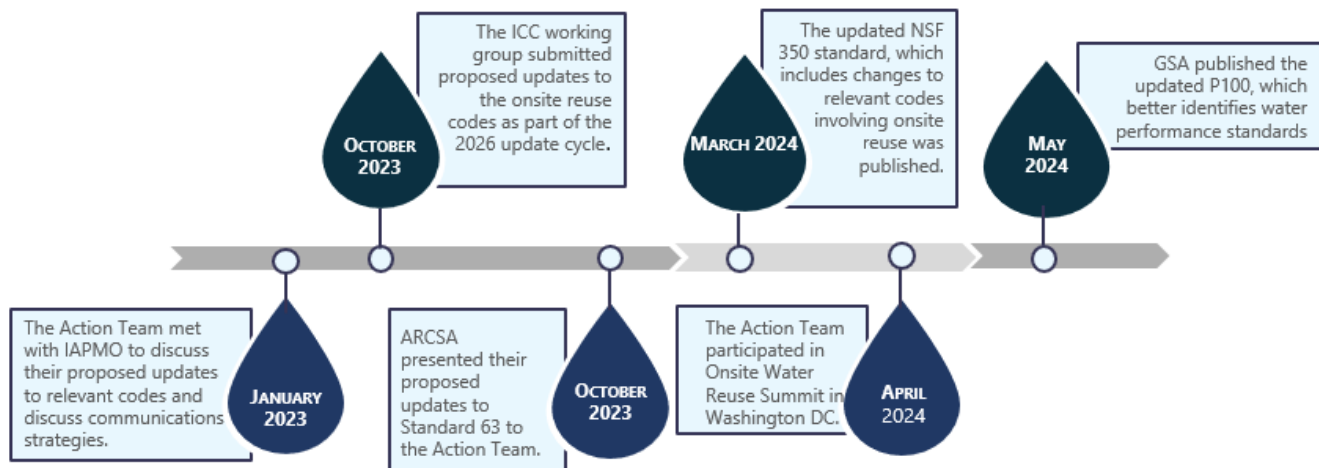
### Action Partners

- **American Rainwater Catchment Systems Association (ARCSA)**
- **U.S. General Services Administration (GSA)**
- **International Association of Plumbing and Mechanical Officials (IAPMO)**
- **International Code Council (ICC)**
- **NSF International**

federal buildings, which include a 25% target for potable water reuse or infiltration.

- ARCSA is currently working with IAPMO on incorporating log reduction targets into ARCSA/ASPE/ANSI [Standard 63](#): Rainwater Catchment Systems Plumbing Engineering.
  - This engagement led to the development of a new WRAP action, the goal of which is to raise awareness of opportunities for onsite rainwater and stormwater reuse. (*WRAP [Action 5.9](#): Identify Opportunities and Address Barriers to Nonresidential Onsite Rainwater and Stormwater Catchment Systems*)
- As a culminating action activity, action team members developed and participated in the Onsite Water Reuse Summit: Integration of Science, Policy, and Operation for Safe and Effective Implementation held in Washington, DC on April 10-11, 2024 (see [summary notes](#) and [presentation slides](#)). Attendees learned about new research, ways to finance onsite systems and lessons from treatment operators. The summit included a panel discussion on aligning building codes and standards for onsite water reuse featuring representatives from EPA, IAPMO, ICC, ARCSA, NSF and GSA.

## Action Implementation Process





## Potential Future Activities

Future activities to continue incorporating onsite water reuse into building codes and promote implementing onsite water reuse into buildings could include:

- NBRC development of a roadmap to identify next steps on scaling-up onsite reuse. The roadmap could be informed by input received during the Onsite Water Reuse Summit, members of the NBRC and the action team.
- Continued engagement by the action team at future events. For example, an onsite reuse track has been proposed for the [2025 WaterReuse Symposium](#).
- Continued engagement of action leaders with building code organizations to support incorporation of the proposed onsite water reuse updates into relevant code documents.

## Additional Resources

- [Technical resources for onsite non-potable water programs from the National Blue Ribbon Commission](#).
- [EPA resource on maintaining of water quality in buildings for public safety](#).
- [Technical reports by the National Institute of Standards and Technology \(NIST\) identifying water quality research needs for premise plumbing](#).
- [IAPMO's Water Efficiency and Sanitation Standard](#).
- [IAPMO IGC 324-2019, Alternate Water Source Systems for Multi-Family, Residential, and Commercial Use](#).
- U.S. General Services Administration (2021). [P100 Facilities Standards for the Public Buildings Service](#).