BILD
BUILDING INFRASTRUCTURE LOCALLY FOR DECENTRALIZED WATER SYSTEMS

BILD is a collaborative global community of practice working to uncover opportunities, advance implementation, and spread transformative solutions related to decentralized water systems to support the efficient use and reuse of water.

March 2025

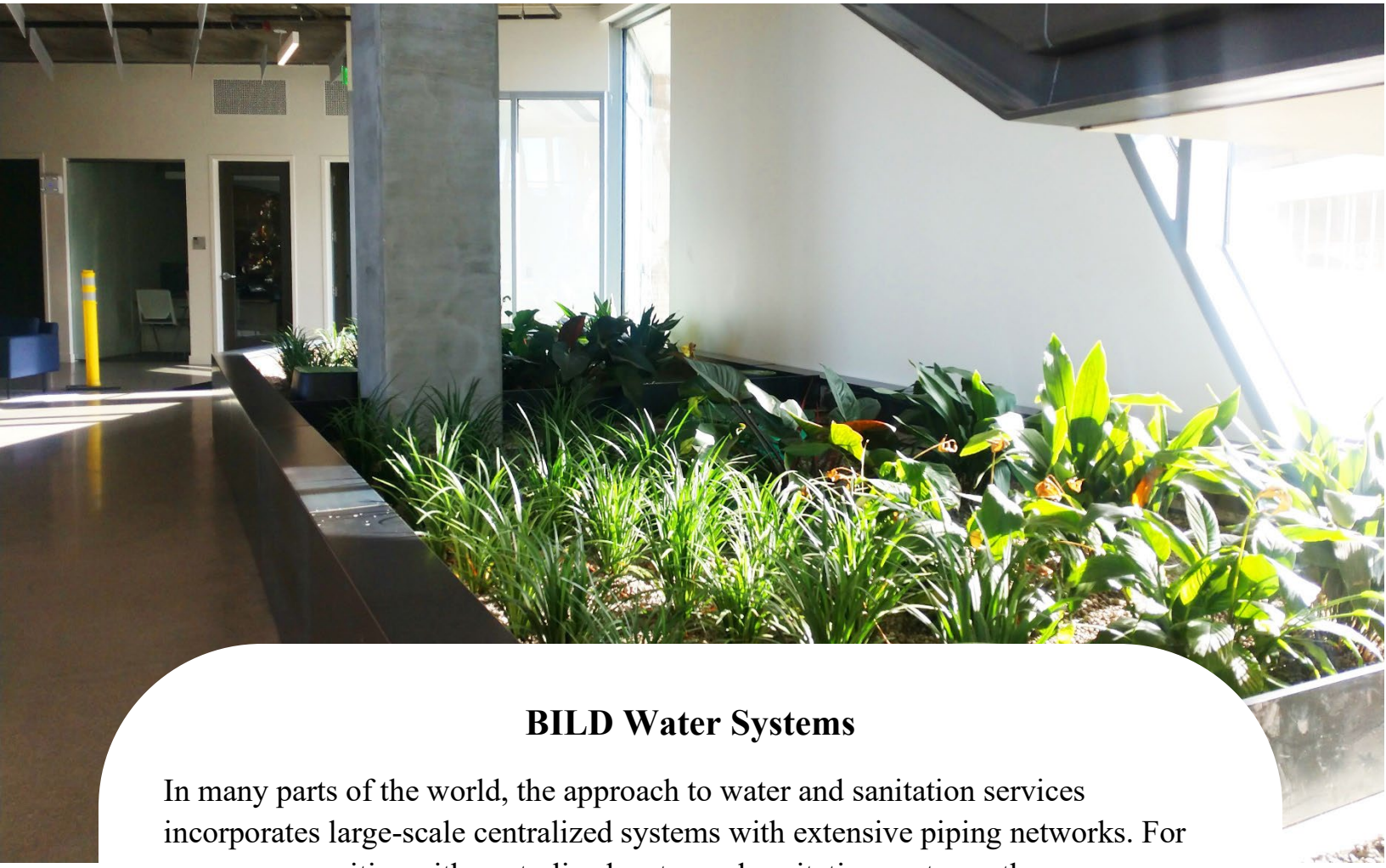
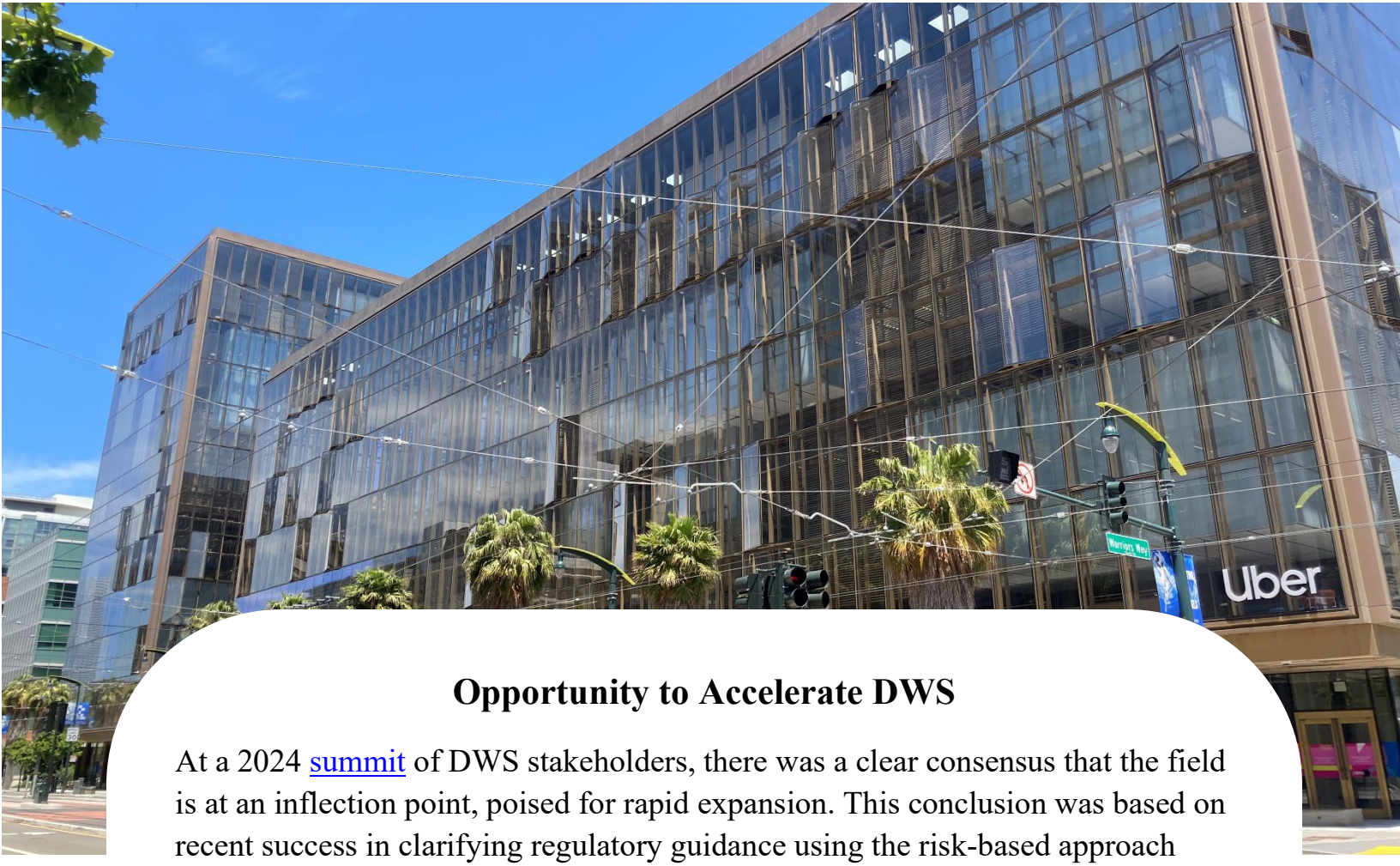


BILD Water Systems

In many parts of the world, the approach to water and sanitation services incorporates large-scale centralized systems with extensive piping networks. For some communities with centralized water and sanitation systems, they can pose economic, social, and environmental challenges to the communities they serve. Moreover, centralized water infrastructure may limit flexibility, adaptability, and overall resilience amidst emerging extreme events due to climate change.

To meet future water and sanitation challenges, we must transform not only our water infrastructure, but how we think about water by creating opportunities to engage and mobilize local communities. One promising approach is to incorporate decentralized water systems (DWS), also referred to as onsite water systems, that collect and treat diverse water sources for reuse within individual buildings and across multiple properties, thereby bringing communities in more direct contact with their water systems.

BILD is a new initiative of the National Blue Ribbon Commission for Onsite Water Systems (NBRC) and the Water Reuse Association to help build cross-sector coalitions to expand DWS and is currently seeking members to help guide new initiatives for implementation.



Opportunity to Accelerate DWS

At a 2024 summit of DWS stakeholders, there was a clear consensus that the field is at an inflection point, poised for rapid expansion. This conclusion was based on recent success in clarifying regulatory guidance using the risk-based approach developed by the NBRC and the growing number of businesses effectively conducting non-potable reuse at building and district scales globally. While the NBRC's emphasis on integrating science, policy, and implementation has been critical to advancing decentralized water reuse systems, the summit demonstrated the value of directly engaging stakeholders actively engaged in DWS beyond the public health agencies and water utilities represented in the NBRC. BILD is being formed to continue this active dialogue among regulators, utilities, design engineers, product manufacturers, operators, research organizations, non-governmental organizations, and academia to translate knowledge into action.

The 2024 NBRC Action Plan was developed in response to the summit, and describes a path forward for the basis of BILD. The plan focuses on four impact areas: public health, sustainable technology/innovation, capacity development, and communications. The Plan encompasses both continued steps to streamline implementation of the risk-based approach for water reuse and leverage the ability of DWS to address key sustainability goals beyond water scarcity (e.g., energy efficiency, nutrient management, and nature-based solutions).

To advance the risk-based approach, the plan calls for further definition of consistent treatment targets for an expanded range of end uses of water and scales, including single family homes. In addition, the definition of removal credits for a greater range of unit processes is emphasized.

The other elements of the path forward involve leveraging DWS to help optimize energy use, nutrient management, green space, and stormwater management. To date, many of these efforts have occurred on parallel paths rather than through an integrated system. While this approach may address specific local priorities (e.g., non-potable reuse in arid regions, green infrastructure for stormwater control in CSO communities), integrated systems may have broad applications and help facilitate "mainstreaming" of DWS. Accordingly, the plan includes specific actions to maximize energy efficiency and promote nature-based solutions (for both water and nutrient management) within a DWS approach.

Success at accelerating implementation of DWS depends, in large part, on thinking differently about how water services are provided, a significant challenge in any sector, but particularly in a risk-adverse sector like water services. Developing and actively communicating a clear vision for the multiple benefits of DWS, and how they may be integrated with centralized approaches, is one projected means of shifting perceptions.

An equally important element of ensuring the path forward is bringing diverse stakeholders, including practitioners, such as utilities, designers, operators, regulators, and researchers, into the process. While the NBRC's emphasis on integrating science, policy, and implementation continues to be critical to advancing decentralized water reuse systems, the summit demonstrated the value of directly connecting with stakeholders actively engaged in DWS, beyond the public health agencies and water utilities represented in the NBRC.

Expanding on the success of the NBRC but expanding the diversity of participants, BILD emphasizes concurrent focus on operational, regulatory, and technical issues through open exchange of ideas and actionable advancement. BILD strives to build coalitions to enable real world operations of systems which advance scientific and technical understanding, provide solutions to regulatory concerns, and streamline operations and maintenance.

BILD Goals

- Convene DWS practitioners to build relationships at a local, regional, and global scale, and to share and implement policies, best management practices, procedures, standards, and technologies for DWS.
- Disseminate knowledge on national and international health-risk based treatment guidance for implementation of DWS addressing various water sources, end uses, and scales.
- Establish partnerships among non-profit organizations, operators, product manufacturers, research organizations, and academia to implement DWS projects that are energy efficient, cost effective, incorporate nature-based solutions, and enable resource recovery.
- Address barriers to implementation, including improving access to funding, streamlining regulations, and equitable distribution across all communities.
- Increase public awareness of DWS and adoption of DWS oversight and management programs.
- Further training and workforce development opportunities.

BILD Guiding Principles

1 **Protect public health**

To secure a sustainable water future, we need diverse approaches to water management. We are committed to protecting public health and ensuring safe, secure, and reliable water use and reuse.

2 **Honor local context**

BILD sees great value in the implementation of DWS and at the same time, recognizes and respects that policy and infrastructure implementation will vary based on needs and context at the local level.

3 **Develop and follow science-based policy**

BILD projects will be driven by the best available knowledge related to risk-based assessment of exposure to potential contaminants, technology for treatment and monitoring, and life cycle assessment of different reuse scenarios.

4 **Collaboration**

Our partnerships are based on honesty, transparency, and respect that combine our strengths to meet our collective water goals.

5 **Integrate best practices**

The work of BILD is informed by best practices in the management, operations, and oversight of DWS.

6 **Advance equitable water solutions**

Advance solutions that support the needs of all people and engage local communities in the shared responsibility of water management.

BILD Impact Areas

Public Health

Goal: Ensure projects are protective of public health and support the integration of the latest science into regulations, policy, and industry standards.

Sustainable Technology/Innovation

Goal: Drive the development and adoption of sustainable technologies and innovative practices that include flexible treatment trains, resource recovery, nature-based solutions, and other energy efficient practices.

Capacity Development

Goal: Build the capacity to adopt DWS by supporting workforce development, providing technical assistance, and identifying financing opportunities.

Communications

Goal: Bolster communications, including tools and resources for public engagement and support the business case for DWS.

BILD Website: https://watereuse.org/educate/national-blue-ribbon-commission-for-onsite-non-potable-water-systems/bild/

Become a BILD Partner

BILD is an initiative of the NBRC and the WateReuse Association undertaken in partnership with the US EPA, state regulators, utilities, design engineers, product manufacturers, operators, non-governmental organizations, and academia working together in the spirit of collaboration to implement decentralized water infrastructure to address our water challenges. BILD is chaired by the SFPUC and convened by WateReuse Association.

BILD is recruiting additional participants to advance projects in the four impact areas: **public health, sustainable technology/innovation, capacity development, and communications**.

The inaugural BILD meeting was held virtually on March 5, 2025. Throughout the spring and summer of 2025, each impact area will be holding subsequent virtual work group meetings to achieve consensus on the key priorities, actionable next steps, and identify partners to complete actions.

If you are interested in participating in BILD, please contact Paula Kehoe, San Francisco Public Utilities Commission: pkehoe@sfwater.org and fill out this brief survey.

National Blue Ribbon Commission for Onsite Water Systems

The NBRC is comprised of public water and wastewater utilities and public health agencies from 15 states, the District of Columbia, the city of Toronto, the city of Vancouver, US EPA, and US Army Engineer Research and Development Center. The NBRC fosters powerful relationships with our members rooted in shared vision, purpose, and values to advance DWS. It is chaired by the San Francisco Public Utilities Commission.