

NATIONAL WATER REUSE ACTION PLAN



WRAP QUARTERLY UPDATE

April–June 2022

A Message from Dan Yates, Executive Director of the Ground Water Protection Council (GWPC)

Now in its third year, the WRAP ought to be recognized as one of the most successful national collaborative water protection and conservation efforts. As the country continues to deal with drought and water management issues, the WRAP serves as a guiding platform to link national efforts, organizations, and agencies on water reuse. The WRAP has also played a valuable role in connecting the state water associations with each other and other stakeholders, allowing us to share important information about successes and challenges within the broader water reuse community.

The GWPC and its member states have several interests in water reuse. Importantly, water reuse efforts around the country help address the depletion of our groundwater resources. To date, our primary contributions to the WRAP have been through our work in establishing a vibrant Aquifer Storage and Recovery-Managed Aquifer Recharge ([ASR-MAR](#)) community; focusing on the potential of produced water reuse; and supporting the Annual State Water Reuse Summit team comprised of state associations. In May, our team held an ASR-MAR [webinar](#) for the states, and we are planning an additional webinar focused on direct potable reuse. As the various state water associations continue to aid our respective members on water reuse topics, having the national WRAP and its many stakeholders engaged helps bolster our efforts and continues to provide that important connective tissue between states, federal agencies, national groups, and the private sector. Over the next year, we will continue our support of state programs, including groundwater protection, source water protection, and underground injection control. GWPC will continue the ASR-MAR webinar series as well as several efforts on produced water knowledge transfer. We view groundwater as one of our most precious and vulnerable natural resources and believe water reuse will play a key role in protecting these waters in the future.

The status table below includes brief updates on all WRAP actions. Abbreviations are defined at the end of this document.

Seeking Feedback on Proposed WRAP Actions

One new proposed WRAP action is summarized below, with more information available on the [Online Platform](#). We welcome feedback on this proposed action via waterreuse@epa.gov through August 26, 2022.

Water Information Availability: Identify Opportunities to

Implement Water Reuse within the Beverage Industry ([Action 5.7](#), led by GHD)

Beverage production is water intensive. For example, on average, breweries use 4 to 12 gallons of water per gallon of beer and produce considerable volumes of liquid and solid wastes which require disposal. Action leaders plan to assess where in the beverage manufacturing process water can be recycled to not only make production more water efficient, but help manufacturers reduce operating costs and meet sustainability goals

IN CASE YOU MISSED IT

Our Water Reuse Program monthly update listserv messages highlight relevant actions and events. Issues from this past quarter are available online:

- [April update](#)
- [May update](#)
- [June update](#)

their customers and markets are demanding. Through a series of meetings—comprising representatives from beverage manufacturers, the water sector, and regulatory bodies—action leaders aim to 1) identify opportunities for water reuse during beverage production, 2) assess possible challenges to implementing identified opportunities, and 3) develop resources to help advance water reuse in the beverage industry. Outputs should provide information needed for beverage manufacturers to implement water reuse at their facilities.

Newly Active WRAP Action

WRAP actions seek to advance water reuse planning and implementation across the country. Actions are organized by strategic theme to help focus efforts and inspire future action. We are pleased to announce that a previously proposed action is now underway:



Technology
Development
and Validation

Develop an NSF Protocol for Deployable Greywater Reuse Systems in Military Operations ([Action 4.8](#), led by APHC)

- ✓ **Strategic theme tie-in:** To help the military produce sustainable quantities of clean and safe recycled water, APHC is collaborating with NSF International and DOD Joint Medical Services to develop an NSF protocol to evaluate the performance of deployable and decentralized non-potable greywater reuse treatment systems not intended for permanent installations.

Completed WRAP Actions

Four WRAP actions were completed this quarter, demonstrating productivity and progress across several strategic themes. The [completed WRAP action summaries](#) were developed with action leaders and highlight action impacts, lessons learned, and potential future activities.



Policy
Coordination

[Align Tools to Promote Best Management of Unused/Expired Pharmaceuticals](#)

([Action 2.9](#), led by LACSD in collaboration with seven partners)

LACSD and action partner organizations helped foster more consistent messaging on best practices for drug disposal to minimize unnecessary introduction of pharmaceuticals into water. The action team created a [summary](#) of online pharmaceutical disposal messaging used by over 30 federal, state, and local agencies; the private sector; and nongovernmental organizations. The team also updated the [Flush3P.org](#) website to include information about keeping drugs out of wastewater and water, developed two [fact sheets](#) about an EPA rule banning healthcare facilities and reverse distributors from flushing hazardous waste pharmaceuticals, and supported a [national survey](#) to gather information about outreach materials and methods wastewater and water agencies can use to enhance public education about chemicals of emerging concern and pharmaceuticals. Outputs that will be disseminated to state and local pretreatment program staff, such as the fact sheets, can help inform existing and future efforts, including WRAP actions related to pretreatment and communication.



Technology
Development
and Validation

[Support Water Reuse Through DOE's Water Security Grand Challenge](#)

([Action 4.3](#), led by DOE in collaboration with five partners)

In October 2018, DOE announced the [Water Security Grand Challenge](#) to help address an array of water resource challenges and opportunities. The Water Security Grand Challenge is a DOE-led framework to advance transformational technology and innovation to meet the global need for safe, secure, and affordable water. The [Waves to Water Prize](#) awarded \$3.3 million to teams developing small, modular, wave-energy-powered desalination systems, which can deliver clean water to communities for disaster relief and to remote communities throughout the globe. The [Solar Desalination Prize](#) accelerated the development of low-cost desalination systems that use solar thermal power to produce clean drinking water from salt water. These systems will help advance the use of nontraditional water sources, ensure water

security, and improve the resilience of U.S. infrastructure. The [Water Resource Recovery Prize](#) awarded \$500,000 to multidisciplinary teams rethinking conventional wastewater treatment and moving toward resource recovery in municipal wastewater. Resource recovery, which includes water reuse, can help lower the cost of wastewater treatment by extracting additional value from wastewater. DOE also held the [Future of Water Infrastructure and Innovation Summit](#) to advance these innovative practices and technologies throughout the water sector.



Finance
Support

[Compile Existing Federal Sources for Water Reuse and Develop an Interagency Decision Support Tool](#)

([Action 6.1](#), led by EPA)

EPA provided greater clarity regarding the eligibility of water reuse and other water infrastructure projects through existing federal funding programs. EPA held focus groups and meetings with stakeholders to develop specifications for a potential decision support tool to help potential customers identify federal funding programs. EPA's [Water Infrastructure and Resiliency Finance Center](#) may use these specifications and recommendations to update the [Water Finance Clearinghouse](#) to enhance its capability to help communities access funding. In engaging with various federal agencies, the action team identified several federal funding programs that can support water reuse infrastructure. EPA created a [website](#) that summarizes these funding sources to help potential applicants easily identify funding for projects.



Integrated
Research

[Coordinate and Promote Water Reuse Technology in Federal SBIR Programs](#)

([Action 7.5](#), led by EPA)

Federal SBIR Programs fund small businesses and startups to stimulate technological innovation and increase commercialization of these technologies. EPA improved the coordination and integration of water reuse across SBIR programs to help address water reuse technology gaps, such as by compiling a [list](#) of SBIR reuse projects funded by various federal agencies. Since 2020, EPA has included new water reuse topics in the annual SBIR solicitations related to treatment and monitoring as well as urban and agricultural applications. To date, EPA has [awarded](#) \$1.5 million in SBIR Program dollars to 11 different U.S. small businesses developing new water reuse technologies. The SBIR-WRAP collaboration provided mentoring support and other resources to this portfolio of reuse projects. To illustrate paths to commercialization, EPA profiled five previous SBIR small businesses in a [document](#) that showcases the simultaneous challenges and opportunities surrounding the commercialization of new technologies in the water reuse space. Collectively, activities in this action helped institutionalize water reuse as a topic in EPA's SBIR Program and supported the development of innovative reuse technologies.

We welcome federal, state, tribal, local, and water sector partners to propose actions to advance water reuse. Ideas for new actions may be sent to waterreuse@epa.gov. For information about how to propose, lead, or collaborate on a WRAP action, visit [this webpage](#).

Status Update on WRAP Actions

* Completed actions are those in which all supporting milestones are completed and no additional milestones will be added.

Shortened Action Title and Number	Action Leader(s)	Brief Update
Integrated Watershed Action		
Prepare Case Studies of Successful Water Reuse Applications (Action 1.2)	Aliza Furneaux (WateReuse)	The action team is finalizing case studies that explore how communities incorporated water reuse into their integrated water management plans. The case studies involve recycled water used for onsite non-potable water reuse, surface water augmentation, and potable reuse.
Leverage EPA's Water Partnership Programs (Action 1.4)	Yeana Kwagh (EPA), Jeff Lerner (EPA)	The Urban Water Utilities and Infrastructure Report has received final comments from the Urban Water partners and is in the process of finalization. The report will develop anchor utility water equity strategies in 10 Urban Waters Partnership cities that address water supply and infrastructure issues. This project is an ongoing national effort of the Urban Waters Program.
Develop Case Studies of Low-Input Solutions (Action 1.5)	Layne Piper (ECOS)	ECOS is scoping water reuse systems in Arizona, Nebraska, and Minnesota for potential case study development. These projects may be considered low-input because they leverage existing infrastructure, climate patterns, and/or partnerships to help lower or offset costs and provide energy-efficient solutions to community water needs.
Address Barriers to Water Reuse in Agriculture (Action 1.6)	Anne Thebo (Pacific Institute), Rabia Chaudhry (EPA), Kruti Ravaliya (FDA), Jean McClain (University of Arizona), Audrey Draper (USDA)	FDA is drafting an infographic illustrating on-farm water sources, pathways, and potentially beneficial agricultural reuse applications. The steering committee for the TreWAG 2022 workshop (October 23–27) is considering including a policy session to engage with U.S. policymakers, utilities, and professionals who will already be in Israel for the Israel Water Reuse U.S. Delegation (Action 11.1) the following week (October 30–November 3).
Policy Coordination		
Compile Existing State Policies and Approaches to Water Reuse (Action 2.1)	Jake Adler (ACWA), Alan Roberson (ASDWA), Sharon Nappier (EPA), Greg Fogel (WateReuse)	The action team has begun to compile and organize state policy and regulatory documents.
Enhance State Collaboration on Water Reuse (Action 2.2)	Jake Adler (ACWA), Alan Roberson (ASDWA), Ashley Harper (EPA)	GWPC led the first webinar in the collaborative reuse webinar series for states in May 2022. The ASR-MAR webinar was recorded and attended by about 70 state regulators across 19 states and Washington, D.C. The slide deck is available here . ASDWA will host the second webinar on direct potable reuse, which is anticipated to occur in summer 2022.
Enhance Wastewater Source Control Through Local Pretreatment Programs (Action 2.4)	Cynthia Finley (NACWA), Claudio Ternieden (WEF)	NACWA is developing an online resource library for case studies and other relevant documents that show how pretreatment pollution prevention programs can be incorporated into water reuse programs.

Shortened Action Title and Number	Action Leader(s)	Brief Update
Develop Materials on How CWA NPDES Permits Can Facilitate Water Reuse (Action 2.6)	Justin Mattingly (EPA), Kevin Weiss (EPA), Sean Rolland (ACWA)	The final white paper, Navigating the NPDES Permitting Process for Water Reuse Projects: Strategies to Enable Recycling and Project Water Quality , was published in March 2022. The white paper summarizes key items and strategies to consider when permitting water reuse projects and draws upon specific case studies that illustrate those strategies.
Utilize Existing Working Groups to Coordinate Federal Engagement (Action 2.7)	Sharon Nappier (EPA)	The Interagency Sustainability Working Group, Interagency Water Working Group, and National Drought Resilience Workgroup are continuing to convene with their partners. The next quarterly Water Reuse Interagency Working Group meeting is scheduled for July 2022.
Leverage Existing USDA Programs for Consideration of Agricultural Water Reuse (Action 2.12)	Alan Gillespie (USDA)	In January 2022, NRCS included drought mitigation as an EQIP-CIC focus area option for fiscal year 2022. USDA expanded the list of conservation practices eligible for financial assistance through conservation incentive contracts to include drainage water management and irrigation water management. More information on EQIP-CIC can be found here .
Integrate Water Reuse into FEMA Hazard Mitigation Programs (Action 2.14)	Josh Human (FEMA), Justin Mattingly (EPA)	In May 2022, the Council of Infrastructure Financing Authorities hosted the first of a series of webinars for promoting an EPA and FEMA partnership on disaster recovery assistance. The webinar, titled <i>Get Prepared to Help Communities Recover More Quickly from a Disaster</i> , can be viewed here .
Support Local and Regional Reuse Projects (Action 2.16)	Eric Rosenblum , Greg Fogel (WaterReuse)	The action team prepared a report and companion summary document to explore how agencies can successfully work together to develop recycled water resources. The report offers an analytical framework for understanding the dynamics of interagency collaboration, supported by a detailed analysis of case studies in different U.S. regions. It also includes a summary of lessons learned, questions and exercises to facilitate utility collaboration, and an annotated bibliography of references for further study.
Propose Nationwide Permit Addressing Reuse (Action 2.17)	Jennifer Moyer (USACE)	The NWP relating to construction of water reclamation facilities (NWP 59) was published in December 2021 and can be found on the USACE website . The permit has been live for 60 days and can now be used.
Incorporate Onsite Reuse Research into Codes and Standards for Premise Plumbing (Action 2.18)	William Platten (EPA), Rabia Chaudhry (EPA), Paula Kehoe (NBRC for ONWS), Taylor Nokhodian (NBRC for ONWS)	The action team has continually engaged with the different codes and standards organizations (e.g., NSF International, ICC, IAPMO, GSA). Each organization has begun to strategize and develop work plans for updating relevant codes and standards within premise plumbing for onsite water treatment, storage, and distribution.
Science and Specifications		
Compile Existing Fit-for-Purpose Specifications (Action 3.1)	Sharon Nappier (EPA)	The REUSExplorer successfully launched in January 2022. The next end-use data will include agriculture, landscape, and livestock watering applications. EPA has given a handful of presentations (most recently at the AWWA ACE conference in June 2022) to demonstrate the tool for water reuse sector participants. Action leaders are planning a fall public webinar (date TBD).

Shortened Action Title and Number	Action Leader(s)	Brief Update
Convene Experts on Urban Stormwater Capture and Use (Action 3.3)	Justin Mattingly (EPA), Chris Kloss (EPA), Danielle Johnson (JFW), Seth Brown (NMSA), Richard Luthy (ReNUWit), Greg Fogel (WaterReuse), Claudio Ternieden (WEF)	The final convening report, Pure Potential: The Case for Stormwater Capture and Use , was published in March 2022. The report lays the groundwork for establishing a unified community of practice around SCU and presents a strategic framework for coordinated action to address the most important challenges to widespread SCU implementation in urban areas. The action team is planning an infographic to supplement the report.
Develop Research and Tools to Support ONWS (Action 3.4)	Paula Kehoe (NBRC for ONWS)	NBRC continued to advance the operator certificate program for onsite non-potable water systems. Subject matter experts continued to define the knowledge and skills needed to operate onsite systems.
Assess Specifications of Wastewater in Food Animal Protein Processing Facilities (Action 3.5)	Jay Garland (EPA)	EPA continues sampling to characterize the quality of animal protein processed in wastewater, with a focus on the occurrence and density of zoonotic pathogens and chemicals of concern. The Agency plans to complete the sampling by winter 2023. The analysis of both microbiological and chemical contaminants is ongoing, and EPA expects to publish the results in fiscal year 2024.
Viral Pathogen and Surrogate Approaches for Assessing Treatment Performance (Action 3.6)	Sarah Ludwig-Monty (EPA)	EPA hosted the Viral Pathogens in Water Reuse Grantee Symposium in June. The symposium served as the kickoff meeting to highlight presentations from five grantee institutions conducting research on existing and novel surrogates for detecting and monitoring human enteric viral pathogens and surrogates in water reuse applications.
Develop Papers on Emerging Public Health Topics in Reuse (Action 3.7)	Ashley Harper (EPA), Kruti Ravaliya (FDA)	The first draft issue paper, tentatively titled <i>Antimicrobial Resistance in Water Reuse Systems: Potential Relevance for Public Health</i> , is under development.
Assess Regulatory Programs for Produced Water Reuse (Action 3.8)	Nichole Saunders (EDF), Cloelle Danforth (EDF)	EDF continues its research into produced water and regulations and references applicable to its reuse. EDF expects to complete two white papers on its research regarding surface water and land application scenarios by the end of 2022.
Technology Development and Validation		
Implement New Mexico Produced Water Research Consortium (Action 4.2)	Rebecca Roose (NMED), Lynette Guevara (NMED)	The New Mexico PWRC issued a second request for proposals to advance its year three research agenda and hosted a public webinar on the consortium's research goals and accomplishments.
Support Air-Cooling Condensate Water Reuse in Large Buildings (Action 4.5)	Thomas Lawrence (ASHRAE), Bob Boulware (Design Aire), Pete DeMarco (IAPMO), Greg Eades (EPA), John Wammes (WW), Fred Betz (ASHRAE), Jay Garland (EPA), Gaby Schubert (WTA), Michael Jahne (EPA)	The action team will meet in August for a presentation by Dr. Michael Jahne (EPA) on the condensate risk characterization project. EPA completed sampling for the project and is analyzing results. Publication and stakeholder presentations are anticipated in fiscal year 2023.

Shortened Action Title and Number	Action Leader(s)	Brief Update
Implement and Manage the NAWI Energy-Water Desalination Hub (Action 4.6)	Mark Philbrick (DOE), Peter Fiske (NAWI), Meagan Mauter (NAWI)	NAWI is planning to announce awards for a funding opportunity on autonomous water and precision separations this year. In May 2022, NAWI released a request for proposals for a pilot systems program, which allows applicants to design, build, operate, and test desalination and water reuse treatment systems that produce clean water from non-traditional water sources, such as brackish water, seawater, produced and extracted water, and wastewater. DOE completed a peer review of the NAWI Energy-Water Desalination Hub in June 2022.
Evaluate Low-Input Methods to Remove Pharmaceutical Residues (Action 4.7)	Clinton Williams (USDA)	The action team submitted its annual research project report. Action partners from Pennsylvania State University are writing a paper on the selection of biochar material with high sorption potential for selected emerging contaminants, which will be submitted for publication in 2023.
Develop an NSF Protocol for Deployable Greywater Reuse Systems (New Action 4.8)	Christopher Childs (APHC)	APHC developed an action implementation plan and will begin work on the action milestones.
Water Information Availability		
Foster USDA Watershed-Scale Pilot Projects to Share Water Information (Action 5.1)	Alan Gillespie (USDA)	NRCS's CIG program announced awards in December 2021, with \$2.4 million awarded to three proposals focused on water resources: <i>Low-Tech Process Based In-Stream Structures to Increase Climate Resiliency in the Great Plains</i> ; <i>On-Farm Water Capture and Reuse: Performance Demonstration, Economic Feasibility, and Design Tool Development</i> ; and <i>Mesoscale AI-Based Root-Zone Soil Moisture Monitoring for Efficient Farm Irrigation</i> . Trials with the CIG awardees will be conducted until 2023.
Identify Monitoring Practices for Reuse Applications (Action 5.2)	Erin Partlan (WRF)	The action team is almost finished conducting surveys and interviews to better understand current practices and needs for monitoring process performance and water quality at potable reuse facilities. A final workshop took place in March 2022 and a report is in progress.
Develop National Integrated Water Availability Assessments (Action 5.4)	Brian Clark (USGS)	USGS is continuing to plan toward the implementation of its water availability assessments.
Quantify the National Volumes of Water Potentially Available for Reuse (Action 5.5)	Ashley Harper (EPA), Patrick Dube (WEF), Greg Fogel (WaterReuse)	This action builds on the 2018 WEF ReNEW Water Project to quantify the current amount of municipal wastewater reuse and potential volumes available for reuse. WEF has finished collecting data by surveying its members and other sources. The team is currently analyzing the data to update estimates of the potential for municipal wastewater reuse. The WEF team expects to complete the updated report in 2022. The action team also chose to prioritize stormwater as another source of water for quantifying reuse potential.
Reflect Water Usage of Materials in a Life Cycle Dashboard (Action 5.6)	Priscilla Halloran (EPA), Jarrold Bridge (EPA), Wesley Ingwersen (EPA)	EPA presented its current approach for estimating direct water use by industry sector to its technical working group experts. EPA will use this feedback to update the approach, then integrate it into data models in the coming months.

Shortened Action Title and Number	Action Leader(s)	Brief Update
Finance Support		
Communicate Eligibility of Water Reuse in State Revolving Fund Programs (Action 6.2A)	Justin Mattingly (EPA), Kiri Anderer (EPA)	Updates to the <i>Drinking Water State Revolving Fund Eligibility Handbook</i> have been delayed due to other priorities. In lieu of this milestone, the action team published a Drinking Water SRF water reuse eligibility fact sheet in 2020. The action team will also publish a fact sheet on funding drought resiliency projects with the Clean Water SRF that will provide an overview of the activities eligible for funding and highlight successful projects.
Compile and Promote Existing USDA Resources for Rural Communities (Action 6.4)	Steve Polacek (USDA)	USDA is collecting data on state engineers and related reuse projects in Florida, California, and Idaho under the Water and Waste Disposal Loan and Grant and the Water and Waste Disposal Technical Assistance and Training Grant.
Develop Reclamation’s Large-Scale Water Reuse Funding Opportunity (Action 6.5)	Amanda Erath (Reclamation)	Reclamation developed its action implementation plan and will begin work on the action milestones.
Integrated Research		
Develop a Coordinated National Research Strategy (Action 7.2)	Julie Minton (WRF)	In spring 2022, WRF held a potable reuse research summit at the WateReuse Symposium, which included state of science presentations from national experts and breakout sessions to develop research needs for topics of interest. Participants developed a research needs survey based on workshop results and launched the survey at the symposium to prioritize research needs. State of science and research needs presentations on four potable reuse subtopics are available here . A summit report with survey results is being prepared and will be released in October 2022.
Increase Understanding of Current Aquifer Storage and Recovery Practices (Action 7.4)	Mike Paque (GWPC), Justin Mattingly (EPA), Kara Goodwin (EPA)	By fall 2022, EPA aims to publish a report on the current state of practice and research associated with water reuse for EAR and ASR, as well as a report on the current state of aquifer recharge and ASR practices regulated by the UIC program.
Develop Reclamation’s Advanced Water Treatment Research Roadmap (Action 7.6)	Yuliana Porras-Mendoza (Reclamation)	At the WateReuse Symposium in March 2022, Reclamation shared its progress on compiling research needs that support augmenting water supplies by treating impaired water sources. Reclamation anticipates finalizing and posting the research roadmap on its website in the coming months.
Life-Cycle Analysis to Support Cost-Effective Enhanced Aquifer Recharge (Action 7.7)	Jacquelyn Bell (EPA)	As part of its STAR program, EPA closed the request for applications for EAR research in January 2022. EPA deemed six applications eligible and has completed all levels of review for these applications as of May 2022. EPA chose one awardee and expects to award this funding opportunity in September 2022.

Shortened Action Title and Number	Action Leader(s)	Brief Update
Outreach and Communications		
Compile and Develop Outreach and Communication Materials (Action 8.1)	Ben Glickstein (WaterReuse), Aliza Furneaux (WaterReuse)	WaterReuse convened a group of communication professionals to revise the action implementation plan and add new seven new action milestones. The team plans to collect existing resources and information about water reuse communications to collate into a library.
Establish a Water Reuse Champion Award Program (Action 8.4)	Aliza Furneaux (WaterReuse), Jon Freedman (SUEZ), Chuck Chaitovitz (U.S. Chamber of Commerce), Joanna Spigonardo (University of Pennsylvania Water Center)	WaterReuse, the U.S. Chamber of Commerce, SUEZ, and the University of Pennsylvania Water Center scoped the Industrial Water Reuse Champions Award program. They anticipate administering the award in spring 2023.
Engagement with Disadvantaged and Rural Communities on Water Reuse (Action 8.5)	Rabia Chaudhry (EPA)	TA support is currently ongoing for a small Idaho community to be funding-ready for the Clean Water SRF program. A second and final case study community in California has been identified for potentially moving the needle forward on reuse. In June 2022, Bruce Macler, an action partner, conducted a reuse training session at NRWAs in-service training for state Rural Water Association staff in Anaheim, California. Rabia Chaudhry (EPA) presented a three-pronged approach on TA for small communities at the AWWA ACE Conference in June 2022 consisting of train the trainer, direct pilots TA, and incorporating reuse into the national EPA BIL-funded TA effort.
Develop Public Health Communication Tools for Reuse (Action 8.6)	Jonathan Yoder (CDC), Mia Mattioli (CDC), Ashley Harper (EPA), Rabia Chaudhry (EPA)	EPA, SCCMA, and Valley Water collaborated on various articles for a special issue of the SCCMA Bulletin on water and health that features water reuse. EPA also drafted content for CDC’s website that provides information to medical health professionals and to the public about recycled water.
Highlight Water Reuse Opportunities in the National Pretreatment Program Framework (Action 8.7)	Jan Pickrel (EPA), Justin Mattingly (EPA)	The action team met with EPA’s regional pretreatment coordinators to discuss how the pretreatment program can support water reuse. This feedback will inform future engagement with stakeholders about potential knowledge gaps and training needs.
Workforce Development		
Support and Promote Opportunities for Creating a Skilled Workforce (Action 9.2)	Jim Horne (EPA), Greg Fogel (WaterReuse), Barb Martin (AWWA), Claudio Ternieden (WEF)	AWWA collaborated with EPA to prepare a compilation of available water reuse/advanced water treatment training resources. AWWA will further engage states and stakeholders on water reuse and advanced water treatment workforce needs later this year and develop recommendations to expand operator training in 2023.

Shortened Action Title and Number	Action Leader(s)	Brief Update
Metrics for Success		
Facilitate Implementation of the National Water Reuse Action Plan (Action 10.3)	Sharon Nappier (EPA)	The Water Reuse Interagency Working Group was formally established in May 2022 under the BIL to develop and coordinate actions, tools, and resources to advance water reuse across the United States. EPA launched a new webpage on the working group that lists the 15 federal agencies that are participating and continuing leadership on the WRAP.
International Collaboration		
Facilitate U.S.-Israel Collaboration on Water Reuse (Action 11.1)	Sharon Nappier (EPA), Adam Schalimtzek (MoEP), Omer Bab (MoEI)	The action team continues to prepare an in-person delegation mission to Israel, planned for fall 2022. WaterReuse held an informational briefing about the delegation and is confirming participants. The team continues to discuss other opportunities for collaboration, including professional dialogues, webinars, and treWAG 2022 .
Develop and Highlight Case Studies Relevant to International Contexts (Action 11.3)	Rabia Chaudhry (EPA), Clémentine Marie Stip (The World Bank)	The action team created a shortlist of over 20 water reuse projects that action partners have begun scoping for potential case study development. Example projects include the Pikes Peak Visitor Center (Colorado), Cloudcroft (New Mexico), and the Water and Sewer Challenge (Alaska).
Complete Actions*		
<p>Inclusive of the following completed actions:</p> <ul style="list-style-type: none"> • Develop Federal Policy Statement to Support Consideration of Water Reuse (Action 1.1) • Complete the EPA Study of Oil and Gas Extraction Wastewater Management (Action 2.3) • Align Tools to Promote Best Management of Unused/Expired Pharmaceuticals (Action 2.9) • Conduct Outreach and Training with Tribes to Build Water Reuse Capacity (Action 2.15) • Support Water Reuse Through DOE’s Water Security Grand Challenge (Action 4.3) • Compile Federal Funding Sources and Develop Interagency Decision Tool (Action 6.1) • Support and Communicate WIFIA Funding (Action 6.2B) • Coordinate and Promote Water Reuse Technology in Federal SBIR Programs (Action 7.5) • Raise Global Awareness and Preparedness for Water Reuse and the WRAP (Action 11.2) 		
47 Active Actions 9 Complete Actions	40 Unique Action Leaders	324 Milestones Completed

Abbreviations Used in This Document

ACWA	Association of Clean Water Administrators	FDA	U.S. Food and Drug Administration	NWP	Nationwide permit
APHC	U.S. Army Public Health Center	FEMA	U.S. Federal Emergency Management Agency	ONWS	onsite non-potable water system
ASDWA	Association of State Drinking Water Administrators	GSA	U.S. General Services Administration	PWRC	Produced Water Research Consortium
ASHRAE	American Society of Heating, Refrigerating, and Air-Conditioning Engineers	GWPC	Groundwater Protection Council	Reclamation	U.S. Bureau of Reclamation
ASR	aquifer storage and recovery	IAPMO	International Association of Plumbing and Mechanical Officials	ReNUWit	Reinventing the Nation’s Urban Water Infrastructure
ASR-MAR	aquifer storage and recovery—managed aquifer recharge	ICC	International Code Council	SBIR	Small Business Innovation Research
AWWA	American Water Works Association	JFW	Johnson Foundation at Wingspread	SCCMA	Santa Clara County Medical Association
BIL	Bipartisan Infrastructure Law	LACSD	Sanitation Districts of Los Angeles County	SCU	stormwater capture and use
CDC	Centers for Disease Control and Prevention	MoEI	Ministry of Economy and Industry (Israel)	SRF	State Revolving Fund
CIG	Conservation Innovation Grant	MoEP	Ministry of Environmental Protection (Israel)	STAR	Science to Achieve Results
CWA	Clean Water Act	NACWA	National Association of Clean Water Agencies	TA	technical assistance
DOD	U.S. Department of Defense	NAWI	National Alliance for Water Innovation	UIC	Underground Injection Control
DOE	U.S. Department of Energy	NBRC	National Blue Ribbon Commission	USACE	U.S. Army Corps of Engineers
EAR	Enhanced Aquifer Recharge	NMED	New Mexico Environment Department	USDA	U.S. Department of Agriculture
ECOS	Environmental Council of the States	NMSA	National Municipal Stormwater Alliance	USGS	U.S. Geological Survey
EDF	Environmental Defense Fund	NPDES	National Pollutant Discharge Elimination System	WEF	Water Environment Federation
EPA	U.S. Environmental Protection Agency	NRCS	Natural Resources Conservation Service	WIFIA	Water Infrastructure and Finance Innovation Act
EQIP-CIC	Environmental Quality Incentives Program—Conservation Incentive Contract	NRWA	National Rural Water Association	WRF	Water Research Foundation
		NSF	National Science Foundation	WTA	Water Tech Alliance
				WW	Water Works, Inc.