2020 STATE SUMMIT ON WATER REUSE

September 3, 10, 17, and 24, 2020

MEETING NOTES & SUMMARY

Overview

The 2020 State Summit on Water Reuse (Summit) was the second dedicated convening of state water sector regulators on the topic of water reuse. The Summit built upon the 2019 State Regulatory Summit on Water Reuse, providing a place for state regulators to share and learn about a range of water reuse issues. The 2020 Summit featured perspectives from 35 states and provided an opportunity for participants to share their thoughts and key questions with colleagues from around the country. The Summit agenda is included as Attachment 1.

As with the 2019 meeting, this Summit was envisioned to support ongoing coordination and dialogue among and between states regarding water reuse. While the Association of Clean Water Administrators (ACWA) and Association of State Drinking Water Administrators (ASDWA) hosted the 2019 meeting, ACWA and ASDWA were joined by the Association of State and Territorial Health Officials (ASTHO), the Environmental Council of the States (ECOS), and Ground Water Protection Council (GWPC) to co-host and plan the 2020 Summit. The Summit was planned and executed in collaboration with the U.S. Environmental Protection Agency (EPA)[1] and WateReuse Association as part of Action 2.2.2 (Enhance State Collaboration on Water Reuse) under the National Water Reuse Action Plan (WRAP).

Participation and Event Format

Consistent with COVID-19 safety guidance, the Summit was held virtually with sessions on each of the four Thursdays of September 2020. The completely virtual platform enabled a significant increase in participation; nearly 150 participants from 35 states attended one or more sessions at the 2020 Summit, compared to 40 participants at the in-person meeting in 2019. Representatives from the EPA and some other state-level representatives were also present. A list of participants is included in Attachment 2.

Each day of the Summit included a full group session, followed by two concurrent breakout sessions on different topics, and a full group report out to close out the days. The state association planning team selected meeting topics based on input from their members, as well as reflections on the 2019 meeting topics and current water reuse priorities. Each session included introductory remarks by a state representative or other participant, followed by open discussion and use of a virtual polling tool administered by the state associations. Some speakers used presentation slides to accompany their introductory remarks. The sections below contain meeting notes captured for each of the sessions.

Meeting Sessions/Topics *(Click on a session title to jump to that session summary.)*

- **Day 1—September 3**:
  - Full Group: Reuse Terminology and Developments in Reuse Across the States
  - Breakout A: Federally Unregulated Contaminants in the Reuse Context
  - Breakout B: Effective Training for State Staff and Facility Operators
- **Day 2—September 10:**
  - Full Group: Considering State Program Approaches to Regulating Water Reuse
  - Breakout A: Effective Public Health Communications in the Reuse Context
  - Breakout B: Fit-for-Purpose Specifications

[1] Note: The views expressed in this document are those of the authors and do not necessarily represent the views or policies of the U.S. EPA.

- **Day 3—September 17:**
  - Full Group: National Water Reuse Action Plan (WRAP)
  - Breakout A: Developments in Direct Potable Reuse
  - Breakout B: Developments in Produced Water Reuse and Other Alternative Water Sources
- **Day 4—September 24:**
  - Full Group: The Water Reuse and Permitting Nexus
  - Breakout A: Developments in Non-Potable Reuse at the Watershed Scale (Agriculture, Industrial, Municipal)
  - Breakout B: Stormwater and Aquifer Recharge Approaches to Maximize Co-Benefits

Identified Needs and Potential Action Items

With representatives from multiple state associations and EPA present for the Summit and the ongoing implementation of the WRAP (released February 2020), a primary meeting goal was to identify state needs and potential action items related to water reuse. Below are examples identified by meeting participants through moderated group discussions, polling questions, and participant comments. For additional context, these items are repeated in the pertinent meeting notes sections below.

Please note that perspectives and recommendations listed here and throughout the meeting notes do not necessarily represent the views of all participants or signify concurrence.

Federally Unregulated Contaminants in the Reuse Context

- Additional support from federal government on guidance/information about conducting risk assessments.
- Development of additional analytical methods to detect, monitor, and evaluate unregulated contaminants.
- Inclusion of professionals with toxicological knowledge/experience to work alongside engineers when addressing contaminants of emerging concern (CECs).

Effective Training for State Staff and Facility Operators

- Coordination with educators and technology providers to address training needs.
- Providing career path opportunities to retain skilled workforce.

Effective Public Health Communications in the Reuse Context

- Encourage communities to be proactive, rather than reactive ("be first, be right, be credible").
- Formation of advisory committees to help with communications and public engagement.
- Hiring and/or training staff to be familiar with communications strategies.
- Development of stakeholder-specific communications strategies and materials.
- Increased use of public surveys to gauge public concern.
- Development of pilot projects for obtaining higher levels of public acceptance.

Fit-for-Purpose Specifications:

- Additional analytical methods to be able to determine what is in certain sources of water.
- Additional science/processes to determine exposure doses and risks for different reuse applications.

- Communications resources for addressing public perception and concerns about water reuse.
- Training materials, especially for operators, specific to fit-for-purpose concepts.
- Guidance on regulation development for water reuse, particularly for states starting from scratch.

Developments in Direct Potable Reuse

- Increased public outreach to educate the public about water treatment and safety measures related to human consumption.
- More robust strategies for understanding the community's concerns and ensuring community confidence.
- Mechanisms to ensure that utilities are doing their part to educate the public (e.g., implementing and/or coordinating a communications plan).
- Develop ways to clearly convey an understanding of the complexity of DPR processes. DPR is a time, resource, and money intensive process. Educational tools may be needed to ensure entities and communities understand that upfront.
- Continued state-to-state sharing of effective practices, lessons learned, and needs for progress related to DPR.
- Establishing technical, managerial, and financial standards for DPR. One idea for a potential WRAP project would be to develop minimum technical, managerial, and financial requirements that an entity needs to satisfy in order to pursue a DPR project.
- Quick, accurate pathogen analytical methods and continued research funding for pathogens and chemicals to ensure more reliable data on processes.

Developments in Produced Water Reuse and Other Alternative Water Sources

- Continue to build a community/network interested in and participating in research on opportunities and challenges posed by produced water reuse.
- Develop a process(es) of prioritizing chemicals for further evaluation, standards development, and test method development.
- Additional test methods to evaluate concentrations of chemicals in produced water.
- Determine a quantitative value for water in areas to help drive decision making of whether treatment and reuse are viable.
- Transportation methods or approaches to minimize the costs to move treated produced water to a location for reuse.
- Local and regional studies on constituents related to produced water to provide more insight into the characteristic produced water in various areas.

Developments in Non-potable Reuse at the Watershed Scale (Agriculture, Industrial, Municipal)

- Improve and increase coordination between state agencies in the same region.
- Basin level evaluations, including impacts on instream flows, economic opportunities, and water rights.
- Continue research in treated produced water.
- Reliable treatment standards.
- Financial support/ incentives for communities.

- Correlation between Clean Water Act National Pollutant Discharge Elimination System (NPDES) discharge and reuse.
- Potentially leveraging federal resources to support states in these efforts.
- Technologies that address nutrients.
- Regional state consortium—ACWA, ASDWA and other organizations coordinating regional engagement where necessary, to support existing and future state needs.

Stormwater and Aquifer Recharge Approaches to Maximize Co-Benefits

- Greater buy-in at various levels—different water management programs, decision makers, the public—on stormwater capture and aquifer recharge approaches.
- Scientific data to develop groundwater quality standards that ensure protection of drinking water aquifers.
- More academic research and sharing related to stormwater capture and aquifer recharge approaches.
- Summary of approaches for performing and regulating stormwater capture and use and aquifer recharge across the country.
- Cost effective and reliable treatment options (with research demonstrating performance) to ensure protection of groundwater.
- Best management practices (BMP) manual that is based upon hydrologic conditions.
- Local evaluation tool to help determine the viability of aquifer storage and recovery (ASR)/managed aquifer recharge (MAR)/enhanced aquifer recharge (EAR).
- Incentivize the siting of well-designed stormwater capture projects on private land.

Next Steps

The Summit is just one example of continued engagement between state drinking water, clean water, and public health programs on the topic of water reuse. The state association planning team will evaluate options for future meetings and consider other opportunities to support state priorities, including the needs and potential action items identified through the Summit and other venues.

About the State Association Planning Team

The **Association of Clean Water Administrators (ACWA)** is the independent, nonpartisan, national organization of state, interstate, and territorial water program managers who, on a daily basis, implement the water quality programs of the Clean Water Act (CWA). ACWA serves as a liaison among the officials responsible for the administration of surface water protection programs and facilitates their communication with the Federal government. As the national voice of State and Interstate water programs, ACWA strives to protect and restore watersheds to achieve "clean water everywhere for everyone."

Primary Contact: Jake Adler (jadler@acwa-us.org)

The **Association of State Drinking Water Administrators (ASDWA)** is the independent, nonpartisan, national organization representing the collective interests of the drinking water program administrators in the 50 states, five territories, the District of Columbia, and the Navajo Nation who implement the Safe Drinking Water Act (SDWA) to ensure the protection of public health and the economy. ASDWA supports and represents the collective interests of its members in their administration of national drinking water program requirements within their states or territories.

Primary Contact: Wendi Wilkes (wwilkes@asdwa.org)

The **Association of State and Territorial Health Officials (ASTHO)** is the national nonprofit organization representing public health agencies in the United States, the U.S. Territories, and the District of Columbia, and over 100,000 public health professionals these agencies employ. ASTHO members, the chief health officials of these jurisdictions, formulate and influence sound public health policy and ensure excellence in state-based public health practice. ASTHO's primary function is to track, evaluate, and advise members on the impact and formation of public or private health policy which may affect them and to provide them with guidance and technical assistance on improving the nation's health.

Primary Contact: Nicholas Porter (nporter@astho.org)

The **Ground Water Protection Council (GWPC)** is a nonprofit 501(c)6 organization whose members consist of state ground water regulatory agencies that come together within the GWPC organization to mutually work toward the protection of the nation's ground water supplies. The purpose of the GWPC is to promote and ensure the use of best management practices and fair but effective laws regarding comprehensive ground water protection.

Primary Contact: Dan Yates (dyates@gwpc.org)

The **Environmental Council of the States (ECOS)** works to improve the capability of state environmental agencies and their leaders to protect and improve human health and the environment of the United States of America. ECOS provides leadership on environmental issues of national importance and plays a critical role in facilitating a quality relationship among and between federal and state agencies.

Primary Contact: Layne Piper (lpiper@ecos.org)

Day 1—September 3, 2020

Full Group Session—Reuse Terminology and Developments in Reuse Across the States

Welcome and Introduction

- **Shellie Chard (Oklahoma), Melanie Davenport (Virginia), and Tom Stiles (Kansas)** kicked off the Summit and provided an overview of the event.
    - The Summit is the second opportunity in as many years for states to come together to share valuable water reuse experience, discuss key issues, and interact and grow their networks related to water reuse.
    - Under Action 2.2.2 (Enhance State Collaboration) of the WRAP, a large team helped plan this Summit including ACWA, ASDWA, GWPC, ASTHO, and ECOS, as well as members of the EPA WRAP team.
    - Water reuse is a state-driven practice, and the word "reuse" means different things to different states. It is one of the purest examples of the nexus between the Clean Water Act and Safe Drinking Water Act as states pursue opportunities to expand water supplies and improve water quality.

Reuse Terminology and Developments in Reuse Across the States

- **Jake Adler (ACWA)** discussed the wide range of terms used in relation to water reuse across the nation and presented some observations from a recent survey on water reuse terminology and developments in reuse across the states.
    - Seven states responded to the pre-Summit terminology survey that was developed by the state associations and addressed 32 terms. Of that sample, most indicated that the terms used in state regulations or stakeholder discussions are sourced from and defined by legislation and other directives (i.e., sourced by reference), as informed by state-specific socioeconomic drivers.
    - A mix of statutory obligations, economic activities and drivers, and ecosystems leaves states in different places on reuse. Importantly, different drivers help set reuse priorities and actions.
    - Specific examples of terminology were discussed. For example:
        - MAR, ASR, and managed underground storage.
        - Unregulated contaminants, CECs, and constituents of concern (COCs).
        - Fit-for-purpose, source-based standards, and permitted source waters.
        - Industrial reuse types and other non-potable uses.
- **Wendi Wilkes (ASDWA)** summarized key information on the attendees and highlighted state developments in reuse that were submitted in the recent survey.
    - **Summit Attendees**
        - There is a wide range of experience among participants, from water reuse "gurus" to individuals taking their first dive into water reuse.
        - Expanded participation from about 45 people in 2019 to over 150 people across 35 states in 2020. About 17 percent of 2020 participants also attended the 2019 event.

- **State Highlights**
  - **Washington** state has an active Reclaimed Water Workgroup that is highly collaborative across multiple state departments.
  - **Montana** approved the first Class A-1 (most stringent standard) treatment facility for wastewater effluent reuse and is assisting other facilities to upgrade to achieve these treatment standards.
  - **Colorado** has added six new authorized uses for reused water, added treatment requirements for localized (decentralized) treatment systems, and developed its *Guidelines for Direct Potable Reuse for Colorado* (published in 2019).
  - **Oklahoma** developed rules for indirect potable reuse (effective September 2018) and two facilities are pursuing permits under these rules. The state is developing training and communications materials related to water reuse.
  - **Maryland** proposed a standard for non-potable, high quality municipal wastewater treatment (Class IV) with high potential for human contact as a guideline. The state is also developing regulations to implement a 218 Residential Graywater Law, exploring the potential for aquifer recharge and other indirect potable reuse approaches.

Breakout A—Federally Unregulated Contaminants in the Reuse Context

Welcome/Session Framing

- **Wendi Wilkes (ASDWA) and Nick Porter (ASTHO)** started the breakout discussion by framing some key issues related to unregulated contaminants and water reuse. They introduced common terminology, such as CECs and COCs (contaminants of concern); noted examples of current focus areas of concern and research, such as pharmaceuticals and per- and polyfluoroalkyl substances (PFAS); and noted the continuing need for analytical methods to evaluate sources of water for these constituents.

Discussion Leaders

- **Laura McLellan from the California State Water Resources Control Board** discussed the history of CECs in California and some of the state's current efforts.
  - Adopted in 2009, the state's Recycled Water Policy establishes requirements for goals for recycled water use and requirements for monitoring potable recycled water and groundwater recharge for CECs. It was clarified during discussion that stormwater recharge to groundwater is not specifically included in the Recycled Water Policy.
  - California is coordinating ongoing CEC monitoring efforts through a "CEC Initiative" that will support development of a statewide management strategy, including a framework for on-ramping and off-ramping CECs. The initiative's strategic plan is in draft phase.
  - California uses science-based advisory panels to evaluate CEC issues.
  - California continues to evaluate how it can use classes of chemicals (i.e., groupings, rather than individual chemical species or analytes) in evaluating risks to human health and the environment.
- **Diana Felton from the Hawaii Department of Health** discussed the Hawaii Recycled Water Program and noted that currently about 18 million gallons per day (MGD) of municipal wastewater effluent is reused across the state.

  - Hawaii conducted a research effort in 2017 to determine what constituents were present in treated reuse water in the state.
  - The study found various constituents (details included in presentation slides), including several pharmaceutical and personal care products.
  - Hawaii has seen success with reverse osmosis technology to remove constituents of concern.
  - Three key needs for continuing to address unregulated contaminants: more time, more staff, and more money!
- **Rose Galbraith from the New Mexico Department of Health (NMDOH)**[2] discussed experiences as an epidemiologist and New Mexico's approaches to unregulated contaminants, particularly related to private wells and produced water management.
  - The SDWA does not regulate private well drinking water for constituents of concern; however, one function of the NMDOH Private Wells Program (PWP) is collecting available private well water quality information as part of water quality surveillance activities. Through partner agencies, the PWP became aware of two communities with concerns of PFAS in their drinking water. The NMDOH has focused efforts on these communities with additional sampling and a public health response including development and dissemination of online and print educational materials.
  - New Mexico's surface water narrative standards can include enforcement of an "unregulated" contaminant if causing an exceedance (e.g., no toxics in toxic amounts). New Mexico's groundwater discharge regulations do not include unregulated contaminants for regulatory activities concerning reuse.
  - New Mexico's 2019 Produced Water Act addresses various regulatory aspects of reusing produced water. For example, it defines jurisdictional authority for regulating the use of produced water outside the oil field, requires state permitting, clarifies responsibility for handling spills, and requires the development of regulations for the reuse of water produced by oil and gas activities.
  - To further evaluate reuse of produced water, New Mexico State University and the New Mexico Environment Department entered into a memorandum of understanding to create a Produced Water Research Consortium, which is also included in WRAP Action 2.4.2. The NMDOH supports these efforts with representation on the Government Advisory Board and Technical Steering Committee with a focus on environmental health activities.

Questions/Discussion

- *Question: What CECs does the public currently have significant concern about in your state?*
  - **California:** PFAS and any other constituents that could be found in crops from irrigation water.
  - **Hawaii:** Pharmaceuticals including antidepressants with psychoactive compounds and sunscreens that damage coral reef populations.
  - **New Mexico:** PFAS and pharmaceuticals.
- *Question: Are states leaning toward (1) testing for numerous CECs, or (2) requiring treatment of select contaminants?*

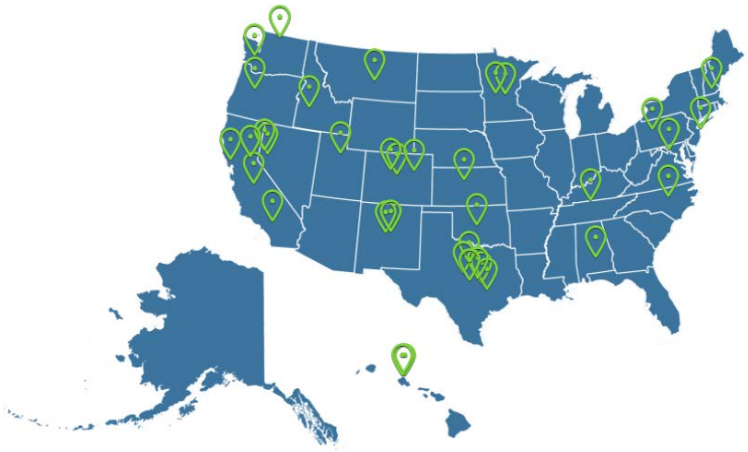
[2] This section was revised on December 8, 2020 following state input.

  - **California** generally uses multiple treatment strategies, but overall, applies both approaches.
- Additional help from toxicologists to assist state water engineers could be helpful for addressing CECs.
- There is a need for help from the federal government on analytical methods to help eliminate the "catch-22" between the supply and demand of methods to detect CECs.
- Many states do not have resources to conduct resource-intensive risk assessments. States could use federal support in this area. A key question is, how can states best ensure the public knows that states "have their bases covered" and that reused water is safe?
- Many pathways exist in our environment for exposure to PFAS, so a key question is, how can total exposure be reduced?
- Post-COVID-19, the public will be looking for assurance of virus destruction.

Interactive Participant Input

The state associations used a live polling tool to seek feedback and input from participants on several questions relevant to the breakout topic.

- **Where are you from?** *[Note that this response represents the participants that were present in the breakout session and answered the poll question. There may have been others present for the session from other states.]*



- **What challenges does your state face with unregulated contaminants that may impact water reuse?** *(Note: Some of the responses listed below were edited slightly to clarify and/or combine common themes.)*
  - PFAS
  - Lack of monitoring data, analytical methods (and detection limits), and toxicological standards
  - Time, money, and staff
  - Lack of clear public health language
  - Public perception and concerns about health risks, especially risks to children
  - Endocrine disruptors
  - Need to implement new rules and permits
  - Sampling issues

  - Unknowns and public health protection
  - Program-level monitoring and management of CECs in the reuse context
  - N-Nitrosodimethylamine, total suspended solids, blue-green algae
  - Source control in non-pretreatment cities
- **What are your state's <u>current efforts and best practices</u> related to unregulated contaminants?** *(Note: Some of the responses listed below were edited slightly to clarify and/or combine common themes.)*
  - **California** is developing a statewide CEC management strategy for proactive, rather than reactive, management of CECs.
  - **California** uses total organic carbon as a management benchmark for potable reuse. Total organic carbon reduction via dilution or advanced treatment with reverse osmosis and advanced oxidation processes are considered.
  - **Minnesota** has developed a non-regulatory framework for addressing CECs in drinking water based on state health-based guidance values, which includes monitoring programs, education, and outreach.
  - **Washington's** Department of Ecology and Department of Health are developing a chemical action plan.
  - **Utah** is working on a PFAS monitoring program for public wells.
  - **New Mexico** is tackling education and outreach, as well as leveraging resources through strategic partnerships. It also conducts "water fairs" for testing drinking water from private and domestic wells.
  - **Maryland** is working with their Health Department on Legionella and harmful algal bloom (HAB) monitoring, as well as PFAS monitoring.
  - **Kansas** implemented a public water supply HAB monitoring program.
  - Trying to stay abreast of research.
  - Following federal references and guidance.
  - Fund research to help fill data gaps.

<u>Overall Needs Identified During the Session</u>

- Additional support from federal government on guidance/information about conducting risk assessments.
- Development of additional analytical methods to detect, monitor, and evaluate unregulated contaminants.
- Inclusion of professionals with toxicological knowledge/experience to work alongside engineers when addressing CECs.

<u>Other Shared Resources</u>

- Minnesota Department of Health's study on "Perfluorochemicals in Homes and Gardens Study."
- U.S. Water Alliance Resources for Onsite Non-Potable Water Programs.

Breakout B—Effective Training for State Staff and Facility Operators

Welcome/Session Framing

- **Jake Adler (ACWA)** began with a recap of common themes from the 2019 Summit.
    - There is a need to increase awareness and capacity specific to operators.
    - There are diverse drivers presenting unique workforce challenges to states.
    - Technology can be technically advanced such that it can be a hinderance if operators were not trained to operate and maintain it and/or (1) if state training and guidance for operators has not yet incorporated said technological approach, or (2) state regulators are not certain of a technology's ability to continuously meet treatment requirements.
    - It is a challenge to balance technical assistance needs with capacity to provide assistance, and to determine how to deploy technical assistance to any given facility.
    - Operator certification programs are often designed in respective silos (i.e., separate programs for wastewater, drinking water, and reuse). Marrying wastewater and drinking water certification programs and integrating reuse is a difficult task.
- There are three main audiences for effective water reuse training: operators, state regulators, and state managers overseeing water and health programs.

Discussion Leaders

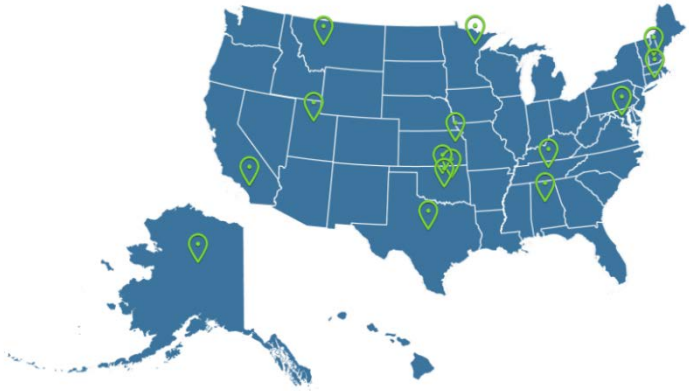
- **Jim Horne from the U.S. Environmental Protection Agency (EPA)** began with an overview of EPA perspectives on the U.S. water workforce and EPA's water workforce initiative.
    - Drinking water, wastewater, stormwater, and water reuse workforce are part of America's water sector workforce: those doing important work to keep the public safe.
    - Workforce resiliency can be achieved through a combination of equity, compassion, and trust.
    - EPA's Landscape chart explains workforce from a strategic standpoint:
        - Recruitment—Pipeline and promotion; challenge for water sector to gain visibility with new people coming into the water workforce.
        - Retention—Keeping folks in the organization once they are in the door; providing a career path, not just a job.
        - Competency—Training and certifications; comfort with new technologies.
        - Building Community Partnerships—Utilities partnering with organizations that can help build a stronger workforce.
    - "Enablers" impacting the entire sector:
        - Promotion (marketing and outreach)
        - Training and education
        - Legislation (e.g., funding to support the water workforce)
        - Tools and resources
        - Sector strategic planning (i.e., collaboration among water sector organizations)
        - Sector diagnostics and characterization of challenges
    - EPA developments:
        - Compilation of water workforce case studies—Undergoing review of EPA management, to be distributed within the next month.

    - Workforce Webinar Series (2020-2021) (brochures included in Summit materials).
    - New workforce grant through America's Water Infrastructure Act.
- **Shellie Chard from the Oklahoma Department of Environmental Quality** discussed various approaches and challenges related to training and workforce development.
    - Operator certification is a major challenge for the reuse workforce: determining necessary level of training, who is going to provide training, and applicability of training.
    - Oklahoma requires both drinking water and wastewater certifications and "Level A" lab licensure to run water reuse facilities. This has not been an impediment; Oklahoma has 8,000 certified operators, including 50 operators with the highest level of certification in both programs.
    - Oklahoma is integrating workforce and training issues into its state comprehensive plan.
    - Oklahoma is fortunate to develop relationships with technical assistance providers, including the Rural Water Association, and the Environmental Training Center at a college in Oklahoma. The Rural Water Association Apprenticeship Program allows recent high school graduates to obtain licenses, allowing them to apply for full-time positions.
    - Different states are approaching licensing differently.
    - Discussions with EPA regarding staff training are important in addressing how regulators bring Clean Water Act and Safe Drinking Water Act programs further together.
    - It is also important to train state and federal field staff, especially inspectors.

Interactive Participant Input

The state associations used a live polling tool to seek feedback and input from participants on several questions relevant to the breakout topic.

- **Where are you from?** *[Note that this response represents the participants that were present in the breakout session and answered the poll question. There may have been others present for the session from other states.]*



- **What contexts are most challenging relating to training and capacity needs?**
    - Retaining certified operators on staff and finding appropriate staff to be trained as operators in rural areas.

  - **Oklahoma** noted its rural workforce is the bulk of the workforce, and oftentimes, the same operator is managing wastewater, drinking water, and many other aspects related to utility maintenance and community engagement.
  - States struggle with attrition through retirement and staff turnover.
  - States are still in the regulatory development phase; obtaining funding for training and workforce is not a current consideration.
- **What are strategies and approaches that states are employing to address training and capacity needs?**
  - Working with education and industry early and often.
  - Ensuring state and existing operators are engaged.
  - Building appropriate training courses for operators and managing training in the context of your state.
  - Being thoughtful of workforce vision ahead of time; linking anticipated reuse strategies with operator and state staff training needs.
  - No need to reinvent the wheel; ensuring awareness of and access to existing training resources (e.g., the National Blue Ribbon Commission for Onsite Non-potable Water Systems integrates workforce and training needs into its work on onsite systems).

Questions/Discussion

- **Alaska** is just starting to envision a reuse training program. The abundance of very small communities in Alaska leaves the state primarily considering a decentralized approach.
- **Oklahoma** noted that integrating training needs into a regulatory/program development process should occur as early as possible, or before a reuse program is even developed. Oklahoma did not develop a training approach until late in the reuse regulatory process and may have benefitted by starting sooner.

Overall Needs Identified During the Session

- Coordination with educators and technology providers to address training needs.
- Providing career path opportunities to retain a skilled workforce.

Other Shared Resources

- Brochures shared by Jim Horne (EPA) were included in the State Summit Resource Library.
- National Blue Ribbon Commission for Onsite Non-potable Water Systems resources for decentralized reuse: https://watereuse.org/educate/national-blue-ribbon-commission-for-onsite-non-potable-water-systems/resources-for-onsite-non-potable-water-programs/.

Day 2—September 10, 2020

Full Group Session—Considering State Program Approaches for Regulating Water Reuse

Welcome and Introduction

- **Nick Porter (ASTHO)** opened the full group discussion by recapping topics from the first day of the Summit and introduced the three speakers who shared their varied experiences of developing water reuse programs in their states.

Considering State Program Approaches for Regulating Water Reuse

- **Dennis Greene from the New Hampshire Department of Environmental Services (NHDES)** described how New Hampshire is exploring options for implementing a water reuse program.
    - New Hampshire is a water rich state; however, southern New England is currently experiencing drought conditions, leading to drying wells and decreased public supply levels.
    - PFAS is an issue in New Hampshire and could be a future driver for water reuse.
    - New Hampshire wants to have the ability to tap into reused water when needed. In New England, water reuse is already being implemented at select venues, such as Gillette Stadium (very temporal, but has yielded great benefits).
    - A resort community asked NHDES to allow reuse in their buildings and for irrigation; however, the state does not currently have regulations in place to allow or prohibit water reuse. Therefore, New Hampshire is piloting a regulatory approach that uses a dual track scheme to compare a fit-for-purpose approach with a risk-based approach. New Hampshire is interested in assessing how either approach impacts cost, ease of implementation, protection of public health, and associated tradeoffs.
    - New Hampshire posed a few questions regarding implementation of a reuse program for future engagement with other state regulators:
        - Should states assessing the types of reuse New Hampshire is evaluating focus on bacteria controls, or also implement protozoa and virus controls?
        - Do states' reuse permits and permit conditions mirror wastewater permits, drinking water permits, or some combination of the two?
- **Noah Valenstein, Secretary of the Florida Department of Environmental Protection (FDEP),** described the regulatory framework for water reuse in Florida and explained some of the drivers and areas of focus for additional water reuse efforts in the state.
    - Reuse in Florida originated as a solution to eliminate discharges of wastewater to surface waters and to relieve strain on water supply due to population growth and tourism.
    - Florida currently reuses 48 percent of its water (820 MGD) for beneficial uses, approximately another 890 MGD is treated and discharged but could be beneficially reused.
    - Florida is currently implementing indirect potable reuse (IPR) regulations based on primary and secondary drinking water standards and is looking to promulgate rules to address DPR.

  - Florida's 2020 State Bill 712 directed FDEP to initiate potable reuse rule revisions for the state by December 31, 2020, and required a significant expansion of the existing regulatory framework for reclaimed water in order to implement potable reuse.
  - Challenges for reuse in Florida include:
    - Public perception.
    - Concerns about risks of irrigating citrus with CEC-contaminated water.
    - Long-term impacts to soil quality by irrigating with reuse water, namely sodium and chloride concentrations.
  - Florida wants to break through barriers to permitting to make it easier to enforce reuse.
- **Tressa Nicholas from the Idaho Department of Environmental Quality** described Idaho's water reuse program and provided her perspectives on developing an approach to regulating water reuse.
  - Idaho's first reuse permit was issued in 1989 and there are currently 144 permitted reuse sites in Idaho, encompassing a range of climates and precipitation amounts.
  - Examples of permitted reuse projects in Idaho include the City of Nampa, which treats water as a resource to be recovered and reused for the entire community, and the City of Hagerman, which recycles water to irrigate field crops during the growing season and limits nitrogen and phosphorus discharges to surface waters.
  - Idaho utilizes a fit-for-purpose approach for designing reuse rules.
    - Municipal facilities may have Class A (highest quality) through Class E waters.
    - Industrial facilities are permitted on a case-by-case basis.
  - Idaho is continuing to learn, staying in touch with other states, and looking to EPA and the WRAP to help further evaluate methods and risks of using recycled water.

Questions/Discussion

- *Question: To what level does Florida regulate and oversee pathogens?*
  - **Florida** implements basic disinfection requirements for reclaimed water (fecal coliform). When moving to DPR, FDEP will examine how those standards should be revised and how to address CECs and pharmaceutical and personal care products.
- *Question: How does Florida differentiate between IPR, groundwater recharge, surface infiltration, and direct discharge into aquifers?*
  - In **Florida**, rapid infiltration basins that are used for aquifer recharge to a drinking water source need to meet drinking water standards, treated as indirect reuse. There are some examples in which augmentation benefits have been justified and drinking water standards do not need to be met.
- *Question: How did Idaho recruit participants/communities to begin investing in opportunities for water reuse?*
  - **Idaho** developed a guidance committee to support development of rules and allow for yet-regulated stakeholders (future permittees) to be involved as early as possible.
- *Question: What funding and resources have New Hampshire, Florida, and Idaho utilized for developing their programs, and what funding sources are available for communities looking to implement reuse? The Clean Water State Revolving Fund (SRF) seems to be the main source.*
  - **New Hampshire** noted that reuse activities are being funded through SRF. It is the most-available funding source and mechanisms are already in place.

- **Florida** utilizes multiple funding sources, including a $40M state budget line item for alternative water supply, funding available for wastewater treatment upgrades, and individual programs targeted at ecosystem restoration.
- **Idaho** is strapped for SRF dollars and has partnered with the Department of Commerce to fund reuse projects in the past. The City of Nampa partnered with the Bureau of Reclamation and their WaterSmart and Title XVI programs.
- The Water Infrastructure Finance and Innovation Act (WIFIA) is a source that can be utilized for water reuse project funding.
- WRAP Action 2.6.1 will compile federal funding opportunities for water reuse.

Breakout A—Effective Public Health Communications in the Reuse Context

Welcome/Session Framing

- **Nick Porter (ASTHO)** provided framing remarks on the key considerations for public health communications regarding water reuse.
  - It is important for key terms to be defined and used appropriately when communicating with the public. Similar terms can have different meanings in different contexts.
  - Focus on what is being done, why it is being done, and by whom, to ensure the safety of reused water.
  - Engaging community groups and education systems (e.g., local schools and universities) can be useful to develop effective messaging tools.
  - Communities need guidance to implement water reuse rules and regulations.
  - Communicate more generally: why is reuse important?
  - Clear and consistent messaging across state and local entities is a best practice.
- **Wendi Wilkes (ASDWA)** reviewed the public health communications themes that were discussed at the 2019 Summit.
  - The same principles and best practices apply to communication about water reuse as to communication about other public health topics.
  - What is the appropriate role of regulators and utilities in public health communications?
  - The need for public engagement increases when recycled water is used for human consumption.

Discussion Leaders

- **Nancy Rice from the Minnesota Department of Health** spoke about developing and communicating Minnesota's 2018 interagency report, "Advancing Safe and Sustainable Water Reuse in Minnesota," and ongoing communications to advance the recommendations in the report.
  - The report was developed in response to public interest and inquiries regarding state policy and guidance on water reuse.
  - Three major groups to communicate with: (1) state and regional agency representatives, (2) stakeholders, and (3) the general public.
  - Interagency communications:

        - Minnesota's water laws were structured without reuse in mind. Communicating within the Department of Health and with other agencies has been necessary to develop understanding and agreement on jurisdiction and other aspects.
        - Minnesota formed an interagency water reuse workgroup and made materials publicly available. The public was invited to attend but not participate. The workgroup created a summary report to provide recommendations for the development of state policy for water reuse.
    - Stakeholder communication:
        - This is an ongoing effort, involving those who design, install, operate, maintain, and/or own systems.
        - Minnesota held four large meetings in conjunction with the interagency workgroup.
        - The meetings included facilitated breakout discussions to explore stakeholder objectives for water reuse.
    - General public communication:
        - Minnesota communicates with the general public through webpages and media releases.
        - Public forums are planned but have been delayed due to COVID-19 social distancing requirements.
    - Communication steps:
        - Have a plan—Identify the audiences to be reached, including those who will disagree.
        - Make your message—Use plain language but include all necessary details; messages should be tailored to specific audiences.
        - Tell the story of water reuse—Explain the reasons for implementation, benefits, and risks in a way that will connect with the audience.
- **Angela Zeigenfuse from the Washington State Department of Ecology** discussed communications associated with Washington's Reclaimed Water Rule, which was finalized in 2018.
    - Messages include justification of why water reuse is important. There is a perception water reuse isn't necessary because it rains a lot in Washington. In actuality, the climate varies throughout the state; the eastern half of the state is much drier. Increasing drought frequency and current reliance on rain and snowpack for water needs are drivers for reuse in Washington.
    - In Washington, "reclaimed" water is derived from domestic discharges; "reuse" refers to water recycled from agricultural or industrial discharges. Reused stormwater does not fit within the regulatory definitions. At this time, no one has applied for a direct potable reuse application in Washington.
    - To get their message out, Washington Department of Ecology:
        - Created a communications plan to identify stakeholders and develop a message.
        - Created a rule advisory committee including members from state and local government, public utilities, business associations, private sector environmental professionals, and environmental groups.

        - Maintained a current website updated with latest information and developments on the rulemaking.
        - Published "focus sheets"—fact sheets focused on specific subjects.
        - Published "The Purple Book" (Reclaimed Water Facilities Manual) providing technical guidance on the Reclaimed Water Rule.
        - Created a reclaimed water workgroup.
    - Using plain language is extremely important for people to understand technical content and the overall message.
    - Key talking points stress performance standards and public health protection:
        - Reclaimed water is a drought-resistant, safe source of water.
        - Treatment and testing are required to ensure safety; reclaimed water is not wastewater.
        - Washington Departments of Health and Ecology review every project proposal and monitor to ensure compliance with standards.
    - It is important to create clear documentation that is easy to digest and effectively communicate standards and requirements.

Questions/Discussion

- *Question: What outreach is appropriate to stakeholders that downplay the health risks? For example, some water distributors may oppose communications on risk or quality associated with recycled water. They are concerned that acknowledging the presence of risk will foster a negative public perception.*
    - **Minnesota** noted that what they experience is usually the opposite; stakeholders typically do not downplay the risks. However, Minnesota has encountered some stakeholders who see government involvement in reuse as unnecessary because "water is perfectly safe." They feel that communicating about managing public health risks places unnecessary emphasis on safety concerns.
- *Question: What are interactions like between the state agency and local officials? What are some recommendations for public health messaging for elected officials?*
    - **Minnesota** communicates with elected officials as with other groups of stakeholders. The form of interactions often varies depending on personalities. Some officials are interested in proceeding with and promoting water reuse, others are not interested in reuse regulations.
- *Question: Have you encountered opposition from news media on water reuse-related efforts?*
    - **Minnesota** has not encountered opposition from media but has faced opposition from stakeholder groups (primarily stormwater) who do not understand the approach, strategy, or intent.
    - It is important to have a consistent message in plain, understandable language.
    - Minnesota has not been moving towards potable reuse; it is likely there would be more opposition to potable reuse.

- *Question: Is consensus the goal? If so, has that been difficult to achieve with a diverse group of stakeholders?*
    - **Minnesota** is noticing a lot of similarities in concerns and objectives across a diverse range of stakeholders. Personal appeal is an effective strategy for gaining reuse acceptance across diverse groups of people.
- *Question: Minnesota has a group of communicators focused on water messaging. Are they self-selected or were they sought out?*
    - **Minnesota** Department of Health's Environmental Health Division has five communicators that work in different aspects of water; these people are experts in social science and risk communication.
- In **Washington**, old rules for water rights in the state have hindered reclaimed water activities.
- The LOTT Clean Water Alliance is a non-profit organization promoting indirect reuse in Olympia, Washington. Their website is a great example of how to communicate a complex project with the entire community.

Interactive Participant Input

The state associations used a live polling tool to seek feedback and input from participants on several questions relevant to the breakout topic.

- **What is your state doing to address public communication needs for water reuse?** *(Note: Some of the responses listed below were edited slightly to clarify and/or combine common themes.)*
    - Updating website
    - Demonstrations and pilot projects
    - Hiring a robust group of communicators who are familiar with risk communication science
    - Meetings, discussions, and workgroups with other agencies, stakeholders, and the public
- **What are the key challenges for public health communications around water reuse?** *(Note: Some of the responses listed below were edited slightly to clarify and/or combine common themes.)*
    - "Toilet to tap" perception
    - Documenting removal of contaminant including CECs
    - Communicating the nuances of technical issues
    - Helping people with diverse backgrounds understand the issues
    - Battling disinformation on risks often propagated through social media
- **What are the most effective methods of communication with the general public?**
    1. Social media
    2. Agency websites
    3. Community events and newsletters
    4. Radio/television

Overall Needs Identified During the Session

- Encourage communities to be proactive, rather than reactive ("be first, be right, be credible").
- Formation of advisory committees to help with communications and public engagement.
- Hiring and/or training staff to be familiar with communications strategies.

- Development of stakeholder-specific communications strategies and materials.
- Increased use of public surveys to gauge public concern.
- Development of pilot projects for obtaining higher levels of public acceptance.

Other Shared Resources

- Minnesota Department of Health Drinking Water Risk Communication Toolkit
- LOTT Clean Water Alliance (example of effectively communicating a complex project via webpage)

Breakout B—Fit-for-Purpose Specifications

Welcome/Framing Considerations

- The moderator briefly framed the concept of fit-for-purpose specifications and turned it over to the first discussion leader to further describe the topic and current efforts.

Discussion Leaders

- **Sharon Nappier from EPA** detailed how states have varying strategies for describing and implementing fit-for-purpose approaches and introduced EPA's work via the WRAP to compile fit-for-purpose specifications across the U.S. and internationally.
    - The intent of fit-for-purpose is to protect public health and the environment.
    - WRAP Action 2.3.1 will compile fit-for-purpose specifications for multiple sources of water for potential reuse and applications. The compilation is envisioned to be an accessible listing of specifications for water reuse with information on the scientific and technical basis for said specifications.
    - EPA hopes to include details on recycled water classes that states often use to designate fit-for-purpose treatment requirements, allowable beneficial uses, and end-point measurements.
    - The effort to compile fit-for-purpose specifications is being coordinated with WRAP Action 2.2.1 to create a compilation of state policies and approaches to water reuse.
    - Timing of these efforts is dependent on a few factors, but EPA and its partners are making progress and hope that an output will be ready within the next year.
    - The technical basis for fit-for-purpose specifications is envisioned to be used to inform risk-based analyses that may be addressed under WRAP Action 2.3.2.
- **Brandi Honeycutt of the Colorado Department of Public Health and Environment (CDPHE)** discussed water reuse-related regulations in Colorado and the future of reuse in the state.
    - Colorado has two current regulations that incorporate water reuse:
        - Regulation 84 includes reuse of municipal wastewater.
        - Regulation 86 includes reuse of grey water.
    - The state is going to develop direct potable reuse regulations that will be included in the state's regulation for drinking water, Regulation 11.
    - The state is evaluating a "One Water" regulatory approach to bridge the gap between sources and uses of reuse water, particularly for non-potable reuse.
    - Stakeholders are requesting that CDPHE streamline the state regulatory process that is required to permit new beneficial uses for recycled water.

  - Colorado is interested in a risk-based approach to water reuse. Lack of data has been a barrier in the state.
- **Brian Bernados from the California State Water Resource Control Board** discussed California's treatment specifications for recycled water.
  - California is moving along with five types of recycled water in state code. Uses of recycled water are based upon the treatment method utilized by a facility/permittee.
    - Most recycled water used in California has received tertiary level treatment; some has received advanced treatment.
  - California is working with other entities such as the National Water Research Institute as more or refined treatment technology comes about (such as UV disinfection) to ensure protection of human health.
    - For example, an expert panel performed a "Review of Criteria for Agricultural Irrigation Uses" and found that current regulations are protective of public health.
  - The state has built equations and models to help determine the level of treatment and dilution necessary for any associated regulatory standards to be protective of human health.
  - California is working on groundwater recharge and understanding the level of treatment achieved through surface spreading in various contexts.
  - The speaker shared the following relevant resources and offered to share other information and perspectives to Summit participants.
    - National Blue Ribbon Commission for Onsite Non-potable Water Systems
    - California's Division of Drinking Water's Recycled Water Information

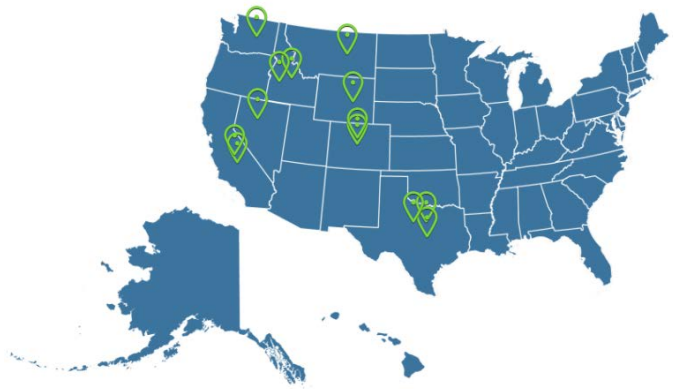
Questions/Discussion

- A participant noted that a risk-based focus has potential to create an environmental justice (EJ) gap and associated concerns. There are clear examples where exposure pathways can impact populations within a community differently, and public health research has historically not always been inclusive of all at-risk populations, which can result in fit-for-purpose requirements that cannot be verified to protect human health across the board. If states intend to expand permitted reuses and risk-based approaches, it is crucial to first answer the question: how can states and other jurisdictions protect vulnerable communities/populations and ensure that all populations state regulators serve are protected equally?
  - A participant from **California** concurred that EJ considerations in water reuse are crucial, noting that California has postponed permitting of some projects because of those concerns. California has a reputation for being more stringent and considerations like EJ drive that reputation. The state's water quality requirements and standards are stringent both "on paper and in practice."

Interactive Participant Input

The state associations used a live polling tool to seek feedback and input from participants on several questions relevant to the breakout topic.

- **Does your state have any reuse fit-for-purpose specifications in effect currently?** *[Note that this response represents the states that were present in the breakout session. A balloon icon on a state indicates "Yes."]*
    - California, Colorado, Idaho, Minnesota, Nevada, Texas, Washington, and Wyoming



- **What sources of water does your state reuse the most and/or see as having the highest potential for reuse in the future?**
    - General Responses:
        - Secondary effluent
        - Recycled domestic wastewater
        - Municipal wastewater
        - Industrial wastewater
        - Municipal for irrigation
    - State Specific Responses:
        - **Colorado**: Currently blackwater/reclaimed water. Probably will remain the same for source water but DPR will have a pretty good impact on reuse.
        - **New Mexico:** Investigating whether produced water can be used in a fit for purpose scenario. No actual use currently.
        - **Wyoming:** Treated wastewater, irrigation; treated produced wastewater, beneficial use; and grey water.
        - **Ohio:** Individual scale household grey water is allowed to be used for a soil based onsite surface or sub surface irrigation.
- **What are current efforts and resources related to development of fit-for-purpose specifications for water reuse in your state?**
    - **New Hampshire:** Pilot demonstration program for non-potable reuse (evaluation of different implementation approaches).
    - **California:** Expert Panels for DPR and Onsite Non-Potable Water Systems.
    - **Colorado:** We have someone on the Blue Ribbon commission; EPA partnership (on Action 2.3.1); published guidelines for DPR in Colorado.
    - **Nevada:** Pilot project for IPR.

  - **Wyoming:** Treated produced water, researching literature, drinking water standard.
  - **Montana:** We are engaging with potential permittees to treat water to the most stringent standards (A-1) based on desired uses.
  - **New Mexico:** Water reuse group with people from several state agencies.
  - **Unknown:** DPR and onsite reuse regulations are in process and development.
  - **Unknown:** State water planning through consultants.
- **What barriers / challenges does your state face to developing fit-for-purpose specifications for water reuse?**
  - **New Hampshire:** No laws or rules yet that allow water reuse. Starting from scratch!
  - **Colorado:** Exposure amount (how much do you ingest, inhale, touch for different uses)? What is the pathogen concentration in that dose and what is the risk from exposure? How can BMPs make up for water quality? What should the water quality be?
  - **Wyoming:** Treated produced water—toxic contaminants, lack of research.
  - **New Mexico:** Lack of regulations and standards for DPR projects, public perception, lack of science, lack of analytical methods available to determine what is in certain sources of water.
  - **New Mexico:** Public perception, operator training.
  - **Ohio:** The legislature has already defined recycled water as a source of water for direct potable reuse at the individual household scale; however, we do not have regulatory oversight of those systems except when under active construction or alteration permit.
  - Public perception, what to do with treatment residuals.

Overall Needs Identified During the Session

- Additional analytical methods to be able to determine what is in certain sources of water.
- Additional science/processes to determine exposure doses and risks for different reuse applications.
- Communications resources for addressing public perception and concerns about water reuse.
- Training materials, especially for operators, specific to fit-for-purpose concepts.
- Guidance on regulation development for water reuse, particularly for states starting from scratch.

Day 3—September 17, 2020

Full Group Session—National Water Reuse Action Plan (WRAP)

Welcome

- **Layne Piper (ECOS)** kicked off the full group discussion by recapping topics from the second day of the Summit and noted the value of hearing all the varied experience from the participants.
- **Aliza Furneaux (WateReuse Association)** gave a brief walkthrough of the 6connex virtual room and showcased the resource library where participants can find relevant resources and the slides from the Summit.

National Water Reuse Action Plan

- **Sharon Nappier, the National Program Leader for Water Reuse at the EPA Office of Water,** described the National Water Reuse Action Plan as a full water-sector plan that seeks to advance consideration of water reuse as part of an integrated water resources management approach. The WRAP is intended to help improve the security, sustainability, and resilience of our nation's water resources. Collaborative efforts are key to the effectiveness of the WRAP.
    - Acknowledging that different regional/local conditions may influence drivers for implementing water reuse (e.g., drought, reducing reliance on imported water, alternative approaches to stormwater management, reducing combined sewer overflows, avoiding groundwater overdrafts), the WRAP aims to reduce barriers that may be currently preventing water reuse.
    - Guiding principles for the WRAP include protecting public health, promoting collaborative actions, building on past experiences, working transparently and maintaining accountability, applying adaptive management, and promoting collaboration across states and a variety of partners.
    - The WRAP Online Platform serves as a repository for WRAP actions, including those that are active and others that have not yet been developed, to help provide a pipeline for future collaborations and new actions.
    - At the time of this Summit session, WRAP Action Leaders had completed 94 out of 259 WRAP action implementation milestones and created about 30 new milestones.
    - The following are current methods of outreach and engagement on the WRAP:
        - Publication of quarterly updates.
        - Regular meetings with WRAP Action Leaders to discuss progress across actions, new ideas, issues, etc.
        - Ongoing discussions with federal, state, local, and tribal stakeholders.
    - The next iteration of the Action Plan is envisioned to be released in Spring 2021 to highlight progress on the 37 developed actions, describe outputs/impacts of the efforts, and showcase any new actions and milestones.
    - Following are three main ways to get involved:
        - Support an existing action.
        - Propose a new action idea.
        - Provide input on a newly proposed action.
        - Stay in the loop by joining the WRAP listserv; reach out to waterreuse@epa.gov.

- **Jake Adler (ACWA)** presented a walkthrough of the WRAP Online Platform and introduced the following WRAP actions.
    - **2.2.2 Enhance State Collaboration of Water Reuse:**
        - Provide forums and opportunities for states to discuss and share information and experiences on programs and approaches for water reuse.
    - **2.2.1 Compile Existing State Policies and Approaches to Water Reuse:**
        - Compile pertinent information about existing state-level statutes, regulations, policies, programs, frameworks, and/or approaches currently in place for water reuse.
    - **2.3.1 Compile Existing Fit-for-Purpose Specifications:**
        - Compile existing fit-for-purpose specifications from the U.S. and internationally for different sources of water for potential reuse and end-use applications.
    - **2.2.6 Develop Informational Materials on How NPDES Permits Can Facilitate Water Reuse/Capture:**
        - Develop guidance for NPDES permit writers to help inform them of water reuse. Enable consideration and implementation of water reuse practices within the appropriate authority of NPDES permits.
    - **2.2.17 Propose U.S. Army Corps of Engineers Nationwide Permit Addressing Reuse:**
        - Propose a new nationwide permit to clarify the USACE general permitting of certain activities associated with water reuse projects.
    - **2.6.2A Clarify and Communicate Eligibility of Water Reuse in SRF Programs:**
        - Work with states to clarify the extent of the eligibility of water reuse projects by evaluating how EPA and individual states' Clean Water and Drinking Water SRF programs currently consider and communicate the eligibility of reuse projects for funding.
        - The following link is an example of an output from this action to display financial support for water reuse from the Clean Water SRF.
    - The following webpage provides links to select outputs from the WRAP.

Interactive Participant Input

The state associations used a live polling tool to seek feedback and input from participants on several questions relevant to the full group topic.

- **Have you visited the WRAP Online Platform?**
    - Yes: 36%
    - No: 64%
- **Are you aware of the WRAP quarterly updates?**
    - Yes: 20%
    - No: 80%
- **What frequency would you be interested in for a webinar on WRAP status and trajectory?**
    - Quarterly: 26%
    - Every 6-Months: 70%
    - Annually: 5%
    - Not Interested: 0%

Questions/Discussion

- *Question: Do WRAP actions align with your state's current and projected needs? Are there gaps or areas that should be reprioritized?*
    - A participant from **Colorado** noted that they felt the Action Plan does not sufficiently address the variety of approaches and conditions across the states, especially in terms of state funding. Summit discussions have shown how different the state program approaches are and that there is a range of full-time equivalents available to support reuse from state to state. For example, Colorado has one full-time equivalent for reuse, and has several staff people working in reuse from other programs. Also, Colorado is a headwater state, which is an important consideration for reuse and the quality of water that is discharged into headwaters. Water rights are a big issue that relates to water quality and public health. A comprehensive national program or approach must allow for some latitude and recognize variations across the country.
- *Question: How can we maximize state input and engagement on the WRAP actions and overall effort? Would you prefer to work through your state association or engage more directly?*
    - *Suggestion:* Surveys could provide a good place to capture thoughts.
    - *Suggestion:* A regional approach could be helpful; for example, EPA regions or even large watersheds could facilitate peer learning or sharing best practices in smaller and more manageable environment.
    - *Suggestion:* A regional approach would be beneficial and there is a need for a national approach for treated produced water.
- *Question: How do you envision the impact of the WRAP and the collective effort of the 37 action teams? What is a compelling measurement/gauge of progress and success?*
    - This question was not answered directly by the audience but remains a prompt for further consideration and future discussion.

Breakout A—Developments in Direct Potable Reuse

Welcome/Session Framing

- **Wendi Wilkes (ASDWA)** and **Nick Porter (ASTHO)** framed the topic of DPR and reviewed key themes of conversations and areas of interest from the 2019 Summit. Key highlights included:
    - The definition of DPR varies across states. DPR usually means treatment and distribution of reused water without using an environmental buffer.
    - There seems to be significant concern across states about pathogens and emerging contaminants around the practice of DPR.
    - It would be helpful to have national standards for piloting to identify what are the best parameters to use and the key things to look for in results for validation.
    - Need guidance for how to determine compliance for safety of DPR.
    - Operator training is necessary for DPR projects.
    - There is growing interest from smaller utilities in implementing DPR projects, though not all utilities may have the capabilities for DPR. It would be helpful to better understand what the minimum requirements for a utility are to implement DPR projects.

Discussion Leaders

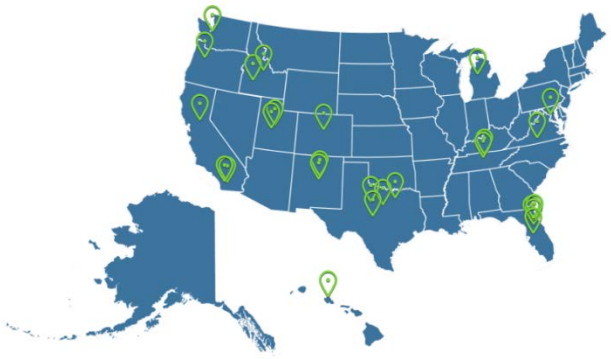
- **Joel Klumpp from the Texas Commission on Environmental Quality (TCEQ)** provided an overview on the TCEQ's case-by-case approach to DPR.
    - The state defines DPR as using wastewater effluent as a source for drinking water where water is NOT returned to a natural water body or an aquifer.
    - The main driver for DPR in Texas is water scarcity.
    - TCEQ has approved two DPR projects, located in particularly drought-stressed areas.
    - The reason TCEQ handles DPR projects with a case-by-case approach:
        - TCEQ has design rules that allow for alternative solutions on a case-by-case basis. Any treatment that is not included in TCEQ's rules needs to have a scientific review.
        - State standards are generally not allowed to be more stringent than federal standards. In this case, there are no federal standards for DPR.
        - TCEQ implemented its first DPR project in 2007 and at that time the state did not have the knowledge or experience to develop minimum design rules protective for all situations.
        - For each DPR project proposal, TCEQ requires entities to conduct a pilot followed by a full-scale verification study. The results of the pilot and the verification study allows TCEQ to set site-specific requirements for that project.
        - Case-by-case allows TCEQ flexibility and ensures that DPR approval and treatment is tailored for specific cases.
    - How TCEQ implements the case-by-case approach:
        - TCEQ coordinates with other entities like water rights groups to ensure that some stakeholders do not already have a claim on the water effluent.
        - The final approval of the DPR projects is led by Texas's drinking water program.
        - Each DPR project is reviewed as a separate project with site-specific requirements, which include the minimum treatment requirements.
        - The entity pursuing DPR needs to conduct a one-year effluent characterization study (the one-year period is to ensure that it captures all seasons) and assess pathogen concentrations. The DPR project needs to show that pathogens are at a limited level.
        - Both pilot and full-scale verification studies are required.
    - TCEQ considers that each DPR project includes three main components—treatment, operations, and monitoring—with safety a cross-cutting issue across all these components.
    - The main downside of this case-by-case approach is that it requires significant time and effort on the part of TCEQ staff.
- **Brandi Honeycutt (CDPHE)** provided an overview on Colorado's ongoing effort to develop regulations for DPR.
    - The state considers the following situations to be DPR:
        - Introducing purified water into raw water, but before a potable water distribution center.
        - Introducing purified water at a drinking water plant.
        - Introducing purified water into a potable water distribution center.

- Drivers to do DPR:
  - While non-potable reuse requires a separate distribution system and may be harder to implement, DPR utilizes the existing systems.
  - There is growing interest in Colorado around DPR from water suppliers (though no specific requests currently), hence CDPHE wants to be prepared and develop regulations in advance. DPR regulations would help water suppliers plan for DPR.
  - Drought resilience. The Colorado water plan predicts a significant gap of water by 2050 and DPR can help mitigate that gap.
  - Growing population.
  - Climate change.
- Colorado's regulatory framework includes:
  - Regulations (legally binding).
  - Policies (not legally binding, but they define how water quality division interprets regulations and where flexibility is allowed in specific requirements).
  - Guiding documents (with recommendations and practices to assist the regulated entities, staff, and the public).
- Colorado is implementing a thorough process to develop DPR regulations that involves multiple phases:
  - Phase 1 (completed): Conducted stakeholder meetings to identify what information should be included into regulations, policies, and the guiding documents.
  - Phase 2 (completed): An independent panel of national experts led by the National Water Research Institute was convened to help define the path toward DPR in Colorado. The Panel published Guidelines for Direct Potable Reuse in Colorado in 2019.
  - Phase 3 (upcoming): CDPHE will have a stakeholder process that will lead to regulation development. Grant funding has just been approved to initiate this effort.
  - Anticipated challenges:
    - Enhanced source control requirements and pretreatment will be required for DPR projects. Colorado does not have a delegated pretreatment program and therefore no authority, but it provides support to EPA's implementation of the program. The state has very little resources and funding for it.
    - Public acceptance may be an issue. Colorado does not have a public opinion poll at this point.
    - Once the regulation is adopted, Colorado will be limited in resources in being able to implement that regulation.

Interactive Participant Input

The state associations used a live polling tool to seek feedback and input from participants on several questions relevant to the breakout topic.

- **Where are you from?** *[Note that this response represents the participants that were present in the breakout session and answered the poll question. There may have been others present for the session from other states.]*



- **What current efforts or effective strategies is your state engaging in related to DPR?**
  - **California** convened an independent expert panel and advisory group to investigate the feasibility of developing uniform water recycling criteria for direct potable reuse. The expert panel determined it was feasible to write uniform criteria that could apply throughout the state.
  - **Colorado** is partnering with EPA Region 8 to help navigate the pretreatment process that will be needed for DPR projects. Colorado is also looking at other states like California and Texas for lessons learned and ways it can incorporate the work already done into their program/regulation.
  - **Florida** is familiar with potable water and treated wastewater to potable standards being used to recharge aquifers.
  - **Idaho** has the ability to allow DPR in rule, which would be approved on a case-by-case basis.
  - **New Mexico** has a water reuse work group comprised of different departments, including groundwater, drinking water and other. Additionally, the state has a water system proposing a DPR project that is pushing the processes forward. New Mexico has been working with a community that is working to implement DPR; the project has been in process for several years. The wastewater treatment plant side is complete. Funding for drinking water treatment is in place but design is not complete, and the community has not completed the required technical, managerial, and financial review.
  - **Oregon** is coordinating with the Department of Health (which has a branch focusing water resources and drinking public water issues) to ensure proposed DPR projects are protective of public health and water rights. Ensuring the facility has a robust public outreach program is critical. Oregon has a DPR project that is used to brew beer and create alcoholic beverages. Overall, Oregon tries to take an integrated approach to their water resources and coordinate across departments, since there are many entities

discharging water into the state and there's a need to come together to review these cases as they arise.
    - **Texas** has a case-by-case review of individual DPR projects to customize requirements and protect public health. The entity pursuing DPR projects should also conduct public outreach and ensure public acceptance: in attending one public meeting for one DPR project, TCEQ noticed that there were some community concerns, though the entity implementing the project assured the state that there is community acceptance.
    - **Washington** has the ability for DPR in rule, but standards will be approved on a case-by-case basis by the Department of Health and State Board of Health.
- **What challenges are you seeing related to adoption of DPR projects? What needs exist for continuing progress?**
    - Lack of regulations/standards allowing for DPR projects.
    - Lack of quick, accurate pathogen analytical methods. Participants indicated that it will be an evolutionary, challenging process to develop all necessary analytical methods—particularly methods to accurately detect emerging contaminants in reuse sources.
    - Public perception or lack of understanding the science.
    - Lack of understanding among utilities and communities about the complexity of the process.
    - Lack of funding and staff/resources (e.g., cost for sampling wastewater, cost for the treatment technologies such as UV, reverse osmosis, microfiltration).
    - Ensuring that DPR works "24/7/365."
    - Contaminants of emerging concern.
    - Potential changes for pretreatment permittees as DPR projects are being implemented.
    - Downstream water resources depletion.

Questions/Discussion

- States have different DPR approaches, with some states still in the very early stages.
- States will be in the driving seat on DPR in the future since no federal regulations are expected.
- Generating collaboration across various partners and departments within states (e.g., public health and environment departments) seems to be a critical success factor. Some states like New Mexico, Oregon, and Washington use these approaches to collaborate on DPR, which presents opportunities to learn from their experiences.
- Every community will have different concerns related to DPR. Entities pursuing DPR projects need to assess the suitability of the community and ability to engage the community and develop a sense of readiness to proceed with a DPR project.
- Need to have accurate and relatively inexpensive analytical methods to detect pathogens and chemicals.

Overall Needs Identified During the Session

- Increased public outreach to educate the public about water treatment and safety measures related to human consumption.
- More robust strategies for understanding the community's concerns and ensuring community confidence.

- Mechanisms to ensure that utilities are doing their part to educate the public (e.g., implementing and/or coordinating a communications plan).
- Develop ways to clearly convey an understanding of the complexity of DPR processes. DPR is a time, resource, and money intensive process. Educational tools may be needed to ensure entities and communities understand that upfront.
- Continued state-to-state sharing of effective practices, lessons learned, and needs for progress related to DPR.
- Establishing technical, managerial, and financial standards for DPR. One idea for a potential WRAP project would be to develop minimum technical, managerial, and financial requirements that an entity needs to satisfy in order to pursue a DPR project.
- Quick, accurate pathogen analytical methods and continued research funding for pathogens and chemicals to ensure more reliable data on processes.

Other Shared Resources

- Guidelines for Direct Potable Reuse in Colorado

Breakout B—Developments in Produced Water Reuse and Other Alternative Water Sources

Welcome/Session Framing

- The moderator briefly framed the concept of produced water reuse and noted some key considerations of recycling water within the oil field versus the use of recycled produced water off the oil field. The moderator then turned it over to the first discussion leader to further describe the topic and current efforts.

Discussion Leaders

- **Dan Yates from the Ground Water Protection Council** presented in place of Shellie Chard (Oklahoma Department of Environmental Quality) and discussed opportunities and challenges related to reusing produced water.
    - Due to drought issues, population growth, and competing water needs, any available water to offset available freshwater needs to be considered.
    - In 2017, the total volume of water produced from oil and gas exploration was about 1.2 trillion gallons.
    - The Produced Water Report was created to be a baseline document that lays out the knowns, unknowns, and challenges on the current state of produced water.
        - Even if this is 10 to 30 years in the future, now is the time to start talking about produced water and outline the challenges, gaps, and what research needs to be done.
        - As freshwater resources become more constrained, the ability to reuse produced water to offset demands offers both opportunities and challenges. Need to continue to build the community to research the opportunities and challenges of reusing produced water.
        - The opportunity for increased reuse of produced water depends on local conditions, water quality and quantity, geologic and demographic

characteristics, the amount of disposal through injection, infrastructure, costs, environmental issues, public perception, and more.
        - The Produced Water Task Force takes the preliminary work of the report and continues it through the GWPC organization and partnerships.
    - Oklahoma is currently working on water quality standards and considers produced water reuse as part of their state water plan. In May 2020, Oklahoma passed its Oil and Gas Produced Water and Waste Recycling Reuse Act, which clarifies that produced water and waste is owned by the producer until officially transferred to another entity. This was intended to help encourage the transformation of produced water into a usable resource and reduce injection into the ground.
    - The New Mexico Produced Water Research Consortium is focused on produced water in New Mexico and is included in the WRAP as Action 2.4.2. GWPC is contributing to this effort overall and has started an effort with the Consortium to collect and combine a variety of produced water data in one place to help with local decision making and policies.
- **Scott Anderson from the Environmental Defense Fund *(invited*)** spoke about in-field and off-field uses of produced water and presented some of the relevant concerns, current data gaps, and efforts.
    - The Environmental Defense Fund (EDF) is particularly interested in recycling produced water for use in wells within the oil field, provided that the water is not spilled and does not leak outside the well.
    - In EDF's view, there is not yet enough known about constituents and/or toxicity of produced water, including treated effluent, to enable a shift from disposal wells to surface discharge or other off field uses.
        - There is a lot of work to do to ensure regulatory agencies have standards that address what is already known about the waste streams and guard against the many unknowns.
    - EDF has identified 1,354 unique chemicals in produced water overall (though the actual number of chemicals is much higher).
        - About 325 of those chemicals have approved analytical methods.
        - Over 1,000 chemicals do not have approved analytical methods.
        - About 109 of the chemicals have federal surface water quality standards, and there is variation in how many state standards exist.
        - EDF believes there are more than 100 chemicals that lack standards currently, but it might be possible to create regulations and/or guidance in the near-term.
    - There is a need to be able to prioritize these chemicals that do not have standard limits and/or analytical methods for further study and regulatory action.
        - EDF helped publish a report in 2020 that explores an approach to prioritize chemicals found in produced water.
- **Jon Brant from the Center of Excellence in Produced Water Management (Center) at the University of Wyoming** discussed his focus to bring value to produced water, how it may be used, and research needs.

- The Center focuses on three main areas—technology development, resource extraction, and monetization—to help industry determine when to reuse or dispose of produced water.
- Wyoming, an arid state, is seeing interest in land application of treated water produced to irrigate potentially productive lands, while maintaining soil health. The state has issued its first permits to help study this approach.
- Total dissolved solids (TDS) and organic concentrations play an important role in maintaining a long-term soil quality, particularly because there is not enough natural precipitation to sufficiently manage soil salt concentrations over time.
- The variability in quality of produced water from place to place is a significant challenge.
    - Produced water in Wyoming is rather diverse in terms of salt and organic composition, but is on the lower end of the spectrum of TDS (about 10,000 to 30,000 mg/L).
    - In some states, the TDS levels are in the several hundred thousand mg/L range.
    - Composition of the TDS is also an important factor for reuse potential, and different types of uses can sustain different levels of TDS.
- Produced water is often injected into deep wells or held in surface impoundments. Surface impoundments must manage salt, metals, and organics over time as they become more concentrated.
    - There is a need to understand the transformation products of organics because the biological or oxidative products can be more harmful than the original compounds.
- The Center is also interested in creating a resource recovery train to extract rare-earth elements and precious metals to sell. They have worked on a survey to map these rare elements and precious metals to develop a tool to help show where resource extraction can be implemented and if it can be commercially viable.
    - Lithium is commercially viable, valuable, and of interest in some areas.
- Transporting produced water can have its own challenges, such as spillage and cost, as water is heavy. Water is mostly transported by trucks, and thus the location of the source and use are important factors for evaluating reuse potential.
    - One consideration is whether treated produced water could be used to help accelerate land reclamation efforts and reduce the number of seedings required.
    - The Center is developing GIS-based tools to better understand when and where to transport water because it isn't always obvious where water should go to be most impactful.
- This is not specific to the reuse of produced water, but the Center has a "disappearing roads initiative" to focus on how to build roads that do not leave a permanent scar once the activity ends.

Interactive Participant Input

The state associations used a live polling tool to seek feedback and input from participants on several questions relevant to the breakout topic.

- **What current efforts are your state engaging in related to reuse of produced water?**
    - **Wyoming:** Permitting treated produced water.
    - **WSWC:** (Regional perspective) looking at state and federal laws and policies that enable or inhibit reuse of produced water, and where that responsibility belongs (oil and gas, water quality, water rights, etc.).
    - **New Mexico:** The New Mexico Legislature passed the Produced Water Act in 2019, which gives NMED the authority to regulate discharges of produced water to surface and groundwater outside of the oil field. As mentioned, we have partnered with the New Mexico Consortium to evaluate science gaps and treatment efficiencies before we start down the road of developing regulations.
    - **Minnesota:** This would be a new area for the state.
    - **Montana:** Permitting discharges for livestock drinking water use.
    - **Texas:**
        - The City of El Paso desalinates brackish groundwater and is looking at resource recovery of concentrate waste for beneficial use in agriculture.
        - Research is taking place for agriculture reuse.
- **What barriers/challenges are you seeing related to reuse of produced water, or what needs exist for continuing progress?**
    - **EDF:** Understanding human health and aquatic life toxicity of constituents in produced water and their treatability.
    - **Texas:** Acceptance of safety for public health.
    - **Wyoming:** Toxicological limits for contaminates in produced water.
    - **WSWC:** Water is heavy to transport, so having local solutions is important, and sometimes that is a need for the local use of the reuse water, other times for the (economic) use of the other waste byproducts.
    - **New Mexico:** Public Perception.
    - **GWPC:** Aside from the work needed to meet local water quality standards, some additional work on potential uses or users' needs would be helpful (economic needs).

Questions/Discussion

- *Question: Last year at the summit, an identified challenge was getting information on chemicals and information from oil and gas companies. Is that still a challenge?*
    - **EDF** noted this is still a challenge. Much more research is needed to get a handle on the constituents in produced water. Further, most of the existing studies (approximately 70 to 80 percent) are in the Marcellus. If you look outside of the Northeast, there is very little published material on produced water.
    - **GWPC** explained there are technical and legal challenges for research institutes to get data from the industry. We need to see more local and regional studies and drive more research in different areas and on different constituents.
- *Question: Public perception and safety comes through on the poll related to challenges and barriers. Curious about people's perspective. Wyoming is issuing permits for land application. How does public perception come into play?*

  - **Wyoming** noted there may be a disconnect in the use and safety of produced water. Landowners seem to be agreeable, but there are concerns about degrading soils and crops. Education on the issue is important as most people don't know a lot about it.

- Discussion on the value of reused produced water:
  - Something missing in literature is understanding the value that different states and localities place on the water that could be recycled from produced water. There will still be residuals and solids that will need to be disposed, such as naturally radioactive material that has unique disposal concerns. There is a high cost to treat that water. Having a quantitative value on cost will be very helpful to drive this discussion. All kinds of treatment technology have been developed and will be developed, but until cost ranges are known, progress will be limited.
  - The market value of water is lower in many places that it should be. The cost of treatment can be 2 orders of magnitude greater than the market value. **Oklahoma** has a produced water working group charged with working towards produced water's use outside the oil field; they concluded that the practice was not ready for deployment due to the cost of treatment and the data/scientific knowledge gaps.
- Discussion regarding having test methods for chemicals in produced water:
  - **Wyoming** noted that another challenge is that once you identify the toxic limits you still must have a test method set up to achieve applicable detection limits. Testing can be very costly.
  - **EDF** reiterated that only about 24 percent of the 1,354 chemicals identified in produced water have test methods and it takes many years to create such methods.
  - Colorado State University is working on organics characterization; Idaho National Lab and the State of Wyoming are working on inorganics—which is challenging due to the salts and organics concentrations. It takes an incredible amount of time to develop those techniques; it is not small endeavor.

Overall Needs Identified During the Session

- Continue to build a community/network interested in and participating in research on opportunities and challenges posed by produced water reuse.
- Develop a process(es) of prioritizing chemicals for further evaluation, standards development, and test method development.
- Additional test methods to evaluate concentrations of chemicals in produced water.
- Determine a quantitative value for water in areas to help drive decision making of whether treatment and reuse are viable.
- Transportation methods or approaches to minimize the costs to move treated produced water to a location for reuse.
- Local and regional studies on constituents related to produced water to provide more insight into the characteristic produced water in various areas.

Day 4—September 24, 2020

Full Group Session—The Water Reuse and Permitting Nexus

Welcome and Introduction

- The moderator and **Dan Yates from GWPC** opened the final day of Summit by thanking all the participants and everyone involved in planning the Summit.
- The state association planning team members are looking forward to continued collaboration and conversation on water reuse.

The Water Reuse and Permitting Nexus

- **Shellie Chard from the Oklahoma Department of Environmental Quality** noted that different state approaches to regulating reuse have developed over the years without federal reuse regulations in place. She discussed Oklahoma's experience with permitting water reuse projects and areas for continued focus.
    - Oklahoma started permitting reuse in the 1930s and 1940s as a disposal method and, at that time, reused water was not thought of as a particularly viable resource.
    - Eventually, Oklahoma began looking at construction permitting and land application, since the state had experience with land applications from lagoon systems. Oklahoma created a set of rules to better regulate the approaches through protections and restrictions based on level of treatment.
    - In the mid to late 1990s, Oklahoma received requests from industries to use recycled water in their cooling towers and for other processes. In response, Oklahoma examined how to regulate the water transfer, with focus on the agreement between utility and industry.
    - Oklahoma suffered a 4- to 5-year drought worse than the dust bowl, which left many communities with significant water resource concerns (some within 30 days of running out of water). Fortunately, rains came, but in response to the drought Oklahoma focused on building a more sustainable water management structure through the following actions:
        - Issued Water for 2060, which establishes a state goal to use no more fresh water in 2060 as was used in 2010 while sustaining economic development, protecting public health, and ensuring safe drinking water.
        - Formed work groups focused on industries, including oil and gas, drinking water supplies, and water quality standards. These groups worked in conjunction with rulemaking and permitting processes.
        - Pursued rules dealing with construction and operation of water reuse systems. The permits detail treatment, monitoring requirements, and reporting requirements dependent on specific end uses. Approximately 135 permits have been issued to date.
        - Developed aquifer storage and recovery rules and looked at applicable state water quality standards, treatment technologies, and techniques (e.g., where to inject, how to withdraw, and what chemicals to use). The rules set out permitting processes through the underground injection control (UIC) program

and pulled unique water quality standards not typically thought of for UIC programs.

- Managing and disposing of rejected water from reverse osmosis is an issue as Oklahoma is an inland state. Oklahoma created a dual permitting program to allow for disposal of reverse osmosis reject water in a Class 2 or Class 5 well.
- Oklahoma has entered a "new world" of NPDES permitting with advances in reuse, including consideration of the location of NPDES discharge points and how the state deals with water quantity, water rights, and impacts to drinking water systems.
    - Some cities that control both drinking water and wastewater facilities are looking at putting the wastewater facility discharge point above the drinking water intake.
- Areas for further focus include:
    - Training for both drinking water and wastewater operators.
    - Technologies to help smaller systems pursue the right kind of reuse.
    - Public health protection.

- **Tom Stiles from the Kansas Department of Health and Environment** gave an overview of reuse activities and permitting approaches in Kansas.
    - The eastern portion of Kansas is riparian, while the western portion is strongly influenced by water appropriation. Therefore, diversity and hydrology influence the state's water reuse decisions.
    - Kansas recognizes water reuse as a tool to assist municipalities and publicly owned treatment works with complying with stringent nutrient limits and waste load allocations.
    - Overview of reuse in Kansas:
        - Many western towns in Kansas use treated wastewater to irrigate greenspaces, including baseball fields, golf courses, and cemeteries, along with some crops and sod farms. Irrigation with treated wastewater is not allowed for row crops or anything that is consumed by humans.
        - Kansas uses supplemental conditions in its NPDES permits to require certain practices for non-potable reuse. Some of these practices include irrigating at night, limiting drift and spray, prohibiting irrigation on frozen ground to limit public exposure, requiring signage to communicate to people that reclaimed wastewater is being used for irrigation, testing soils, and adhering to agronomic plans.
        - Fishing in water bodies supplied with recycled wastewater is required to be catch and release. The state prohibits consumption of fish that are exposed to recycled wastewater.
        - The state is focused on monitoring for pathogens and *E coli* in recycled water.
    - Local examples:
        - In the City of Lawrence, Kansas, there is an ongoing groundwater remediation effort where underlying ammonia- and nitrate-rich groundwater is skimmed off and is supplied to farmers as water and fertilizer supplements to irrigate row crops.

        - Dodge City, Kansas, offered their treated wastewater to local irrigators for crop irrigation in exchange for the irrigators' water rights for wells.
        - Ulysses, Kansas, directs its wastewater to wetlands prior to discharging. The wetlands serve as oases for recreational use.
    - Challenges:
        - Water quality and quantity must meet end use needs. As examples:
            - A soybean plantation did not need all delivered reuse water, creating an issue with waste stream runoff.
            - Wichita, Kansas, established limits on the amount of recycled water used because of elevated phosphorus concentrations.
        - Consumptive use in the basin cannot increase and a city is allowed 40 years to perfect their water rights. There is a long period of time for a city to entertain the option of utilizing water reuse. Once that is done, the consumptive use level is fixed.
    - Kansas is excited to be involved in this Summit and will look to various states, including Idaho and Oklahoma, for guidance and help related to reuse approaches.
- **David Smith from the EPA (Region 9)** provided overarching perspectives on permitting and water reuse and described progress on WRAP Action 2.2.6, which is focuses on permitting under the NPDES program.
    - Reuse has been left to individual states to develop regulatory frameworks, resulting in a complicated regulatory environment and a range of approaches.
        - One consideration and example is whether each state creates a separate permitting approach for reuse or relies on existing structures (e.g., NPDES, drinking water, UIC permitting).
        - There is a significant array of water rights issues and each state has different frameworks.
    - Permitting can both motivate and limit reuse. It is worth noting that NPDES and groundwater discharge permitting costs have sometimes encouraged dischargers to develop more efficient and effective water management plans, including reuse.
        - There is an opportunity to rethink NPDES permits to incentivize reuse and find a balance between recycling as much water as possible and protecting surface and groundwater quality.
    - There is a growing interest in stormwater reuse, which will create challenges for writing Municipal Separate Storm Sewer System (MS4) permits.
    - There is a perception that permitting can get in the way of reuse. WRAP Action 2.2.6 aims to work with states, local utilities, and stakeholders to tackle permitting issues and provide answers to guide and show the flexibilities in NPDES permitting.
        - Under WRAP Action 2.2.6, EPA is working closely with state associations and the planning team has convened a workgroup to identify relevant NPDES permitting questions. The planning team is now moving from framing questions to framing the answers.
        - The goal is to share varying approaches to interpreting the regulations and writing permits.

        - It would be helpful to continue to share examples of how water rights issues are addressed as part of water reuse projects. Unintentionally, the way water rights has been applied has been an impediment and sewersheds do not normally align with watershed boundaries.
    - EPA is interested in the challenges that states are facing and suggestions for navigating these situations. The more EPA can share information across agencies and associations the better.

Questions/Discussion

- Discussion regarding water rights considerations:
    - **Oklahoma** noted that water rights issues are very state specific and dealing with water rights agencies is different than regulatory agencies.
        - For example, in Oklahoma, water injected as part of an ASR project is considered reuse water and therefore not subject to the state's groundwater appropriation process.
        - Historically, discharges into surface water body become the base flow for purposes of appropriation.
        - With stream withdrawals, junior water rights holders downstream do not receive their full allocation.
        - Need to determine water rights regulations for lakes. There is some conversation about whatever goes in, water right holders have the right to take out, but that has not been codified.
    - **Kansas** noted that groundwater belongs to the state, not to the landowners. Every state has its own rules. In Kansas, all water is dedicated to the use; there is no individual ownership of water at all. Many state programs are prohibited under state law to interfere on water right matters. Kansas must consider water rights issues with reuse approaches.
    - **EPA** expressed interest in knowing whether addressing water rights is a priority issue for states in the consideration of water reuse.
    - An **ACWA** representative suggested that it may be helpful to create a compendium of examples illustrating how states deal with water rights challenges that arise with reuse. EPA noted that if there was strong interest this could potentially be done as part of Action 2.2.6, which is focused on NPDES permitting.
- Discussion regarding instream flows:
    - **EPA** noted that there is interesting research in California and other states, where people are evaluating what is the scientific basis for establishing minimum instream flow requirements. Are there current methods to account for instream flow needs? Is that an area of interest?
    - **Utah** noted it is a challenge to comprehensively evaluate how water reuse does or does not affect instream flows given the complexity of the state's water rights. There is a need to study at a basin scale whether there is a displacement of water that stays in the system and net zero on instream flow effects. To move beyond narrative requirements related to instream flows in permits, data is needed from comprehensive basin-level studies. Money and help are needed to perform this research and understand the

complexity of the hydrologic system to answer the question of how a water reuse projects impacts instream flows.
- The moderator asked participants if there any examples of others who have done this type of study and analysis before. No examples were offered but participants agreed an example would be helpful to see.

Breakout A—Developments in Non-potable Reuse at the Watershed Scale (Agriculture, Industrial, Municipal)

Welcome/Session Framing

- **Jake Adler (ACWA)** framed the topic of non-potable reuse at the watershed scale. Key highlights included:
  - Drought is one of the key drivers for water reuse. A recently released analysis by the National Oceanic and Atmospheric Administration (NOAA) shows that many states across the U.S. are impacted by drought, and drought is not just an issue for the western part of the country.
  - Improving resiliency is another important driver for pursuing water reuse, as states are looking to secure the necessary water supply for major sectors such as agriculture, but also for small communities that may be impacted by water scarcity.
  - Non-potable reuse presents an opportunity to achieve multiple objectives at the watershed level. One critical success factor will be a commitment to collaboration across co-regulators.

Discussion Leaders

- **Angela Zeigenfuse from the Washington State Department of Ecology** and **Tressa Nicholas from the Idaho Department of Environmental Quality** provided a joint presentation on non-potable reuse approaches in their states.
  - Washington, Idaho, and Oregon have been collaborating for a few years on non-potable reuse at the watershed level through the Columbia River effort.
  - Key drivers for pursuing non-potable reuse in both Washington and Idaho include drought, accommodating population growth, and adapting to climate change.
  - Coordination across state agencies and departments is important to initiating non-potable reuse efforts at the watershed level. As part of the watershed collaboration, Washington and Idaho have collaboration between their respective regional engineers. The states also have regular internal meetings to ensure everyone in the organization is on the same page. Idaho, for example, has quarterly permit writer meetings.
  - Washington:
    - Regulations related to non-potable reuse include the Reclaimed Water Use Act of 1992 and the Reclaimed Water Rule of 2018.
    - The state defines reclaimed water as being derived from domestic wastewater.
    - Washington also allows for industrial and agricultural water uses, but they are permitted under a different law since the source is not domestic wastewater.
    - Washington has 29 permitted facilities statewide (Class A or Class B).
    - Washington generates about 58 million gallons per day of reclaimed water.

- Idaho:
  - Idaho has had recycled water rules since 1989 and there are various uses for recycled water in the state. A high percentage of recycled water is used in agriculture for irrigation, but there are also other uses such as car washes.
  - Idaho currently has about 143 reuse permits and charges no fees for permits. Permits are funded 50 percent through a general fund and 50 percent through the Clean Water Act. Permits are issued for between 5 to 10 years for five classes of municipal permits (Classes A through E). Industrial permits are allocated on a case-by-case basis. Many permits in Idaho are for facilities near rivers.
  - Idaho treats discharge permits as being separate from reuse permits.
- Common challenges in Washington and Idaho:
  - Differences in the terminology/language that states use to describe similar concepts and processes. For example, Washington uses "reclaimed water" to describe water reuse, while Idaho uses "recycled water."
  - Water rights and lack of specific guidelines in the rules for water reuse permits. For example, Washington had a couple of State Supreme Court decisions that dealt with water rights and protecting streamflow, which were issued around the time when water reuse rulemaking was started. Washington made the decision at the time to set aside the water rights component of the rule and keep the language from the law to ensure work could continue on the Reclaimed Water Rule, allowing more time for the state to consider how to move forward on water rights. However, this meant that there were no guidelines on how to mitigate this issue for certain permittees. This only affects facilities that would discharge to freshwater but instead want to reclaim that effluent; there are many other permittees for which this case does not pose any issues.
- One potential opportunity shared by speakers for states considering non-potable reuse is to potentially define recycled water as a beneficial use in the state rules. For example, Idaho considers recycled water a beneficial use.
  - In the Idaho Recycled Water Rules, beneficial use is defined as: "*Any of the various uses which may be made of the water of Idaho, including, but not limited to, domestic water supplies, industrial water supplies, agricultural water supplies, navigation, recreation in and on the water, wildlife habitat, and aesthetics. The beneficial use is dependent upon actual use, the ability of the water to support a non-existing use either now or in the future, and its likelihood of being used in a given manner. The use of water for the purpose of wastewater dilution or as a receiving water for a waste treatment facility effluent is not a beneficial use*."

- **Erica Gaddis and Ken Hoffman from the Utah Department of Environmental Quality** provided insights into some Utah's approaches and challenges related to reuse and water management overall.
  - Utah is looking to overhaul its water-related regulatory system, including the divisions that have different oversight responsibilities related to water.

- Utah's largest basin is a terminal lake, the Great Salt Lake, and the state's main concern is the potential for water depletion in the future.
- Utah has its water rights separated from other regulations.
- Overall, there are more and more state agencies trying to figure out where reuse falls in their planning horizon. Water reuse seems to be at the nexus of different water divisions, and it will be important to embrace the one water approach at the state level so that all divisions and state agencies coordinate on different regulations concerning water reuse. There is also growing interest to implement water reuse in communities affected by water scarcity.

Interactive Participant Input

The state associations used a live polling tool to seek feedback and input from participants on several questions relevant to the breakout topic.

- **Do you collaborate with state reuse permit writers that are in states that share your watershed?**
  - Yes: 25%
  - No: 75%
- **What are terms that are different between your state and neighboring states? Key responses are listed below:**
  - Recycled water vs. reclaimed water
  - Consumptive use, designated use, and beneficial use
  - Type I and Type II
- **Do the staff in your program understand the motivations for water reuse in your state?**
  - Yes: 67%
  - No: 17%
  - Maybe: 17%
- **Do the staff in your program understand the drivers for water reuse in your neighboring states?**
  - Yes: 6%
  - No: 25%
  - Maybe: 69%
- **Does your state have any successful non-potable reuse projects that contribute to watershed- or regional-level goals? Please share any efforts that your state is currently engaging in and what has worked well in your state.**
  - **Colorado** addresses reuse as an integral part of the Colorado State Water Plan.
  - **Minnesota** has non-potable reuse efforts as they relate to MS4 permitting. The state is working with stakeholders to develop a more comprehensive water reuse policy.
  - **Tennessee** does not have any efforts on non-potable reuse for the moment but may be considering this type of initiative in the future.
  - **Washington** noted that the state has started developing a new nutrient general permit for Puget Sound—the "Nutrient General NPDES Permit"—which may help promote water reclamation in the future.
  - **Wyoming's** water reuse efforts include treated sewage, treated produced water, and the Boysen watershed plan.

- **What are some socioeconomic drivers or motivations towards non-potable reuse that you are observing or anticipating?**
    - When planning at watershed level, states should be thinking about opportunities to collaborate with their neighboring states.
    - Water reuse sits at the nexus of different water regulations, therefore coordination and communication across agencies and departments within the state and across states is crucial for this type of watershed efforts.
    - There seems to be an evolution in state water planning to embrace water reuse and move to a full-fledged one water concept considering key drivers such as drought and changing financial conditions for water.
- **What challenges have you encountered/are you encountering in implementing non-potable reuse broadly?**
    - Intersection with water rights (e.g., changing to a consumptive water use).
    - Developing a robust reuse program given the high upfront costs.
    - Lack of state/community resources to implement reuse initiatives: staffing, time, money, and training.
    - Concerns over detrimental effects to instream flows.
    - Need (requirement) for collaboration with other water agencies.
    - Public perception.
    - Differences in terminology that inhibit collaboration (e.g., "reclaimed water and recycled water," "beneficial use, consumptive use, and designated use," "Type I- and Type II").
    - High total organic carbon locking out some sectors to use reuse authorization.

Overall Needs Identified During the Session

These items were identified through response to the following polling question: What are your needs for advancing non-potable reuse in tandem with long-term planning and other objectives? What kinds of information, support, or change would support your states' progress?

- Improve and increase coordination between state agencies in the same region.
- Basin level evaluations, including impacts on instream flows, economic opportunities, and water rights.
- Continue research in treated produced water.
- Reliable treatment standards.
- Financial support/ incentives for communities.
- Correlation between NPDES discharge and reuse.
- Potentially leveraging federal resources to support states in these efforts.
- Technologies that address nutrients.
- Regional state consortium—ACWA, ASDWA and other organizations coordinating regional engagement where necessary, to support existing and future state needs.

Other Shared Resources

- NOAA U.S. Drought Vulnerability Rankings
- Drought Vulnerability in the United States: An Integrated Assessment
- Boysen Watershed Plan

Breakout B—Stormwater and Aquifer Recharge Approaches to Maximize Co-Benefits

Welcome/Session Framing

- The moderator noted that the topics of stormwater and aquifer recharge have a lot of overlap and terminology can be confusing when discussing these topics. The speakers will help better define and clarify terms, but will try to avoid going too far down the path of a terminology discussion. The moderator then turned it over to the speakers to better define the areas of conversation and share their perspectives.

Discussion Leaders

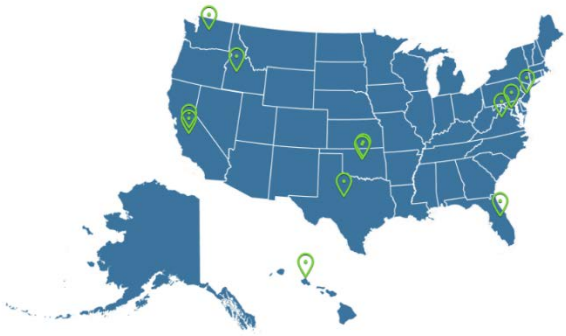
- **Dan Yates from GWPC** highlighted that since these two separate issues overlap, the planning team thought it made sense to put these two topics together for discussion.
    - Stormwater is a main source for aquifer recharge across the range of approaches, such as MAR, EAR, and ASR.
    - Broadly, GWPC considers ASR approaches to mean that there is an intent to recover and use the water at some point in the future after putting it into the ground. MAR approaches may be broader in their application and might not include physical recovery of the water.
    - GWPC has a workgroup focused on ASR-MAR issues and there are five or six states involved. The effort is relatively new and GWPC is open to bringing on more collaborators.
    - As part of WRAP Action 2.7.4, GWPC's ASR-MAR workgroup is also trying to address inconsistency in terminology related to aquifer recharge. Two main efforts on nomenclature:
        - GWPC is putting together a glossary of terms related to ASR to help with more effective communication.
        - The National Ground Water Association is working on a set of term definitions.
- **Kathy Alexander from TCEQ** discussed her experience with aquifer recharge and aspects of surface water rights, new legislation, and permitting in Texas.
    - Chapter 11 of the State's Water Code discusses how ASR is applied.
        - At the time Chapter 11 was passed, putting water with an appropriated water right into an ASR well required a time-intensive amendment to the water right. This was changed in 2015 with House Bill 655, which allowed an existing water rights holder to inject water into an ASR without amending the water right.
        - In 2019, House Bill 720 removed permitting barriers to ASR projects and recognized that aquifer recharge is a beneficial use. It also addressed evaporation credits, water rights, and the use of unappropriated water, including stormwater and flood flows.

  - To start an aquifer recharge project in Texas, a conservation plan must be developed, the beneficial reuses need to be determined, and the water must be available without affecting existing water rights.
  - The new rules also account for many reservoirs in Texas that have lost capacity due to sedimentation. The statute allows someone to amend their water rights to increase their diversion if storing water in an ASR.
  - These rules were just adopted in May 2020 and may change again. The new regulations on water rights will try to break down regulatory issues and make ASR projects more accessible.
- **David Smith from the EPA (Region 9)** shared his knowledge on stormwater management and aquifer storage. He expressed that there is a need to further explore the intersection between capturing and using stormwater and protecting groundwater quality, as well as the mechanisms used to oversee and implement different types of aquifer recharge.
  - There is encouragement from a national level to pursue stormwater management strategies (e.g., green infrastructure, low impact development) to retain water on site and release it to a receiving water. Typically, this is motivated by surface water quality concerns. It is often assumed that infiltrating stormwater through a soil matrix will be enough to protect groundwater quality, but this may not always be the case.
  - We must further our understanding of water quality concerns surrounding the injection and infiltration of stormwater.
    - Assessing the state of knowledge on technologies such as filter mediums, dry well designs, and injection methods can help to determine the source of these groundwater protection quality concerns. Then green infrastructure projects and surface water management strategies can better address these concerns.
    - From a science and technology standpoint, we need to ensure this knowledge is more widely shared.
  - This is a complicated regulatory environment in which to operate. Whether reusing stormwater or wastewater, one of the goals should be keeping groundwater clean. This can influence how stormwater permits and onsite retention and infiltration requirements are written.
    - UIC program provides a framework; implementation varies around the country.
    - State regulatory programs that are designed to protect groundwater quality do not always intersect with stormwater management planning.
  - WRAP Action 2.3.3 is focused on further evaluating opportunities and challenges related to urban stormwater capture and use.
  - Through involvement in the WRAP, interested states can explore and engage on reuse topics such as stormwater and aquifer recharge. EPA is interested to hear from the local and state levels to see where progress can be made.

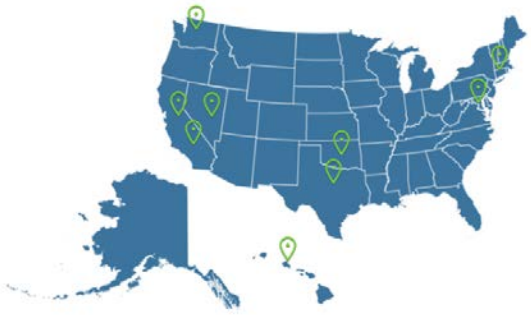
Interactive Participant Input

The state associations used a live polling tool to seek feedback and input from participants on several questions relevant to the breakout topic.

- **Are aquifer recharge approaches used in your state?** *[A balloon icon on a state indicates "Yes."]*



- **Are stormwater harvesting/reuse approaches used in your state?** *[A balloon icon on a state indicates "Yes."]*



- **What are current efforts or successful strategies your state is working on or using related to stormwater harvesting/reuse or aquifer recharge?**
    - **Washington, D.C.:** Aggressive regulated stormwater retention requirements lead to innovative capture and reuse stormwater management plans.
    - **Florida:** Mostly familiar with domestic wastewater aquifer recharge. Some permitted facilities are allowed recharge with Class A treated effluent back into the aquifer in Florida. Especially if they withdraw water out, they are required to put it back.
    - **Oklahoma:** Has developed ASR rules. Does not specify source of the water, so stormwater is eligible. Groundwater water quality standards must be met.
    - Enhanced recharge through Karst features to provide additional water to the aquifer.
    - Diverting dry weather flows in stormwater collection systems to wastewater collection systems to augment wastewater system flows and increase the volume of water available for reuse.
- **What topics do you need more information on related to aquifer recharge or stormwater harvesting/reuse? What research needs exist?**
    - **Hawaii:** Scientific data to develop groundwater quality standards that ensure protection of drinking water aquifers.
    - **Washington, D.C.:** More academic research sharing; USDA has hosted a lot of good research.
    - **Oklahoma:** Cost effective, reliable treatment options to ensure protection of groundwater.
    - Local evaluation tool to help determine the viability of ASR/MAR/EAR.

  - BMPs manual that is based upon hydrologic conditions.
  - How effective are commonly used stormwater infiltration and recharge technologies in removing regularly encountered pollutants in stormwater? What are the different approaches states use now to regulate stormwater recharge? What regulatory frameworks (NPDES, UIC, others) do states use now?
- **What are the major challenges/barriers your state faces with implementing aquifer recharge or stormwater harvesting/reuse?**
  - **New Jersey:** General "buy-in" from all parties due to concerns of potential aquifer contamination. General space for development of ASR wells, particularly in areas that are mostly allocated.
  - **Washington, D.C.:** Potable reuse compliance monitoring. Primacy and point of use access.
  - **Minnesota:** Lack of clear guidance to do so safely.
  - Determining appropriate point of compliance for remediation/treatment.
  - Most larger scale stormwater recharge projects have been on public land—how do we better incentivize siting of well-designed projects on private land? Conflicting perceptions that stormwater is all (1) pretty clean and easy to recharge or (2) heavily polluted.

Questions/Discussion

- Overview of approaches and drivers in Washington, D.C.:
  - There is 1.2-inch stormwater retention requirement for any major land use disturbance in Washington, D.C. All over the city, enhanced infiltration is needed to manage the flow of water. The driver for stormwater retention is to ensure that we don't provide excessive amount of stormwater to cause sewer overflows.
  - There are a lot of creative retention projects taking place, especially for projects with a small footprint. For example, the National Museum of African American History and Culture captures a significant amount of stormwater, which it uses for non-potable applications (e.g., toilet flushing, fountains). There is also potential for water reuse applications beyond grey applications and fountains.
  - From a stormwater perspective, there are requirements for specific media installation. There is a concern for stormwater pollutant runoff from impervious areas. The biggest concern is the areas of contaminated soil, when increasing infiltration, can contaminate groundwater supplies.
  - Virginia allows onsite stormwater BMPs, which are basically infiltration basins that discharge to surficial aquifers. The assumption is that these aquifers are already degraded with regard to groundwater quality.
- Discussion regarding feasibility of infiltration or ASR:
  - There are some instances where infiltration is not feasible. For example, if the underlying soil is unsuitable or it is above a contaminated site. In such instances, water may be treated on site and used for specific purposes (e.g., irrigation) or diverted to a wastewater collection system.

  - A participant from **Texas** noted that the Texas Water Development Board is reviewing instances where available water may not be feasible for ASR. Their research seeks to highlight example locations and their water management approaches.
  - A participant from **New Jersey** noted that New Jersey has a long history of groundwater and surface contamination. People are skeptical of ASR wells as a resource. A handful of permittees are using these wells, but there are always concerns about unregulated contaminants even if there was treatment, and about how much space is needed for the wells. Many parts of New Jersey already have their water rights accounted. Managing the space needed to store and capture that water can be very challenging.
- Discussion on relevant research, information, and examples of practices:
  - A participant noted that there is a lot of good research on the efficacy of filter media and treatment systems looking at their ability to remove pollutants. However, they were not aware of a resource that compiles all this information together.
  - A participant from **GWPC** noted that there are efforts that need to be done on matchmaking, where is the water available, who has water, and who needs it. GWPC recognizes that as an information gap.
  - A participant noted that there are about 50 facilities in California that are collecting and diverting dry weather flows from stormwater collection systems into wastewater collection systems for treatment during low flow times. Usually, the infrastructure is close together (e.g., storm drain adjacent to the collection system).
- Discussion regarding the complexity between stormwater, wastewater, and drinking water management:
  - It was noted that potable reuse presents regulatory complexity with different agencies typically managing wastewater, stormwater, and/or drinking water (including compliance monitoring).
  - It is hard enough to talk about the system of handoffs between wastewater and drinking water management agencies. The stormwater regulation framework is very different than wastewater, so people are struggling with the regulatory handoff between the stormwater and drinking water realms. There is generally greater acceptance of using groundwater aquifers as an intermediate storage point to provide lag time.
  - **Oklahoma** noted that from a regulatory standpoint, it is easier for Oklahoma municipalities to have productive conversations on drinking water, wastewater, and reuse programs where it is the same entity that provides all those services rather than outside parties. There have been some successful advances in this realm from municipalities all managing drinking water, wastewater, and stormwater within the city. For the point of compliance on the drinking water side, Oklahoma requires any water that comes out of the ground to meet drinking water standards or to go through a drinking water treatment system.

Overall Needs Identified During the Session

- Greater buy-in at various levels—different water management programs, decision makers, the public—on stormwater capture and aquifer recharge approaches.
- Scientific data to develop groundwater quality standards that ensure protection of drinking water aquifers.

- More academic research and sharing related to stormwater capture and aquifer recharge approaches.
- Summary of approaches for performing and regulating stormwater capture and use and aquifer recharge across the country.
- Cost effective and reliable treatment options (with research demonstrating performance) to ensure protection of groundwater.
- BMPs manual that is based upon hydrologic conditions.
- Local evaluation tool to help determine the viability of ASR/MAR/EAR.
- Incentivize the siting of well-designed stormwater capture projects on private land.

Attachment 1: Summit Agenda

2020 State Summit on Water Reuse

This virtual event will take place as a series of interactive discussions held on each Thursday in September and will be in conjunction with the WateReuse Association's 35th Annual Symposium. The primary goal of the State Summit on Water Reuse is to provide a place for state regulators to share and learn about a range of water reuse issues. The Summit will feature perspectives from many states and provide an opportunity for participants to share their thoughts and key questions with colleagues from around the country.

Summit Day 1 – September 3rd	
Time	**Session/Topic**
1:00 p.m. – 1:15 p.m.	**Welcome & Introduction**
1:15 p.m. – 1:50 p.m.	**Full Group: Reuse Terminology & Developments in Reuse Across the States** *ACWA & ASDWA will share insights from a recent survey on terminology and developments in reuse overall. There will be some time for Q&A and participant contributions.*
1:50 p.m. – 2:00 p.m.	Break/Transition to Breakout Sessions
2:00 p.m. – 3:00 p.m.	**Breakout A: Federally Unregulated Contaminants in the Reuse Context** **Breakout B: Effective Training for State Staff and Facility Operators** *During the breakouts, several state representatives will share perspectives related to the breakout topic to start discussion. There will be some Q&A time and an opportunity for interactive audience input on current challenges/needs and best practices/current initiatives related to the topic.*
3:00 p.m. – 3:15 p.m.	Break/Transition to Full Group Report Out
3:15 p.m. – 3:45 p.m.	**Full Group: Breakout Session Report Out & Closing** *Facilitators will provide a brief synopsis of topics discussed, key current initiatives, and needs identified by breakout participants. We will also briefly look forward to the next State Summit session.*

The State Summit on Water Reuse is hosted by the Association of Clean Water Administrators (ACWA), the Association of State Drinking Water Administrators (ASDWA), the Association of State and Territorial Health Officials (ASTHO), the Environmental Council of States (ECOS), and the Ground Water Protection Council (GWPC), in collaboration with the Environmental Protection Agency (EPA) and the WateReuse Association (WateReuse) as part of Action 2.2.2 (Enhance State Collaboration on Water Reuse) under the National Water Reuse Action Plan.

2020 State Summit on Water Reuse

Summit Day 2 – September 10th	
Time	**Session/Topic**
1:00 p.m. – 1:15 p.m.	**Welcome & Introduction**
1:15 p.m. – 1:50 p.m.	**Full Group: Considering State Program Approaches to Regulating Water Reuse** *Representatives from several states will give an overview of their current approaches, drivers, challenges, and/or plans for regulating water reuse. There will be some time for Q&A and participant contributions.*
1:50 p.m. – 2:00 p.m.	Break/Transition to Breakout Sessions
2:00 p.m. – 3:00 p.m.	**Breakout A: Effective Public Health Communications in the Reuse Context** **Breakout B: Fit-for-Purpose Specifications (including an update on WRAP Action 2.3.1)** *During the breakouts, representatives from several states and/or the EPA will share perspectives related to the breakout topic to start discussion. There will be some Q&A time and an opportunity for interactive audience input on current challenges/needs and best practices/current initiatives related to the topic.*
3:00 p.m. – 3:15 p.m.	Break/Transition to Full Group Report Out
3:15 p.m. – 3:45 p.m.	**Full Group: Breakout Session Report Out & Closing** *Facilitators will provide a brief synopsis of topics discussed, key current initiatives, and needs identified by breakout participants. We will also briefly look forward to the next State Summit session.*

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2020 State Summit on Water Reuse

Summit Day 3 – September 17th	
Time	**Session/Topic**
1:00 p.m. – 1:15 p.m.	**Welcome & Introduction**
1:15 p.m. – 1:50 p.m.	**Full Group: National Water Reuse Action Plan (WRAP)** *Representatives from EPA and state associations will give an overview of the WRAP, the current status and progress to date, key state-related actions, and thoughts on next steps. There will be time for Q&A and participant contributions.*
1:50 p.m. – 2:00 p.m.	Break/Transition to Breakout Sessions
2:00 p.m. – 3:00 p.m.	**Breakout A: Developments in Direct Potable Reuse** **Breakout B: Developments in Produced Water Reuse and other Alternative Water Sources** *During the breakouts, representatives from several states and partner organizations will share perspectives related to the breakout topic to start discussion. There will be some Q&A time and an opportunity for interactive audience input on current challenges/needs and best practices/current initiatives related to the topic.*
3:00 p.m. – 3:15 p.m.	Break/Transition to Full Group Report Out
3:15 p.m. – 3:45 p.m.	**Full Group: Breakout Session Report Out & Closing** *Facilitators will provide a brief synopsis of topics discussed, key current initiatives, and needs identified by breakout participants. We will also briefly look forward to the next State Summit session.*

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2020 State Summit on Water Reuse

Summit Day 4 – September 24th	
Time	**Session/Topic**
1:00 p.m. – 1:15 p.m.	**Welcome & Introduction**
1:15 p.m. – 1:50 p.m.	**Full Group: The Water Reuse and Permitting Nexus** *Representatives from several states and state associations will share perspectives and best practices related to the connections between water reuse and permitting programs. There will be some time for Q&A and participant contributions.*
1:50 p.m. – 2:00 p.m.	Break/Transition to Breakout Sessions
2:00 p.m. – 3:00 p.m.	**Breakout A: Developments in Non-potable Reuse at the Watershed Scale (e.g., agriculture, industrial, municipal)** **Breakout B: Stormwater and Aquifer Recharge Approaches to Maximize Co-Benefits** *During the breakouts, representatives from several states and partner organizations will share perspectives related to the breakout topic to start discussion. There will be some Q&A time and an opportunity for interactive audience input on current challenges/needs and best practices/current initiatives related to the topic.*
3:00 p.m. – 3:15 p.m.	Break/Transition to Full Group Report Out
3:15 p.m. – 3:45 p.m.	**Full Group: Breakout Session Report Out & Closing** *Facilitators will provide a brief synopsis of topics discussed, key current initiatives, and needs identified by breakout participants. We will also briefly close out the 2020 State Summit.*

The State Summit on Water Reuse is hosted by the Association of Clean Water Administrators (ACWA), the Association of State Drinking Water Administrators (ASDWA), the Association of State and Territorial Health Officials (ASTHO), the Environmental Council of States (ECOS), and the Ground Water Protection Council (GWPC), in collaboration with the Environmental Protection Agency (EPA) and the WateReuse Association (WateReuse) as part of Action 2.2.2 (Enhance State Collaboration on Water Reuse) under the National Water Reuse Action Plan.

Attachment 2: Summit Participants List

2020 State Summit on Water Reuse

PARTICIPANTS LIST

States

Name	Affiliation
Sandra Lee	Alabama Department of Environmental Education
Emily Anderson	Alabama Department of Environmental Management
Daphne Lutz	Alabama Department of Environmental Management
Carrie Bohan	Alaska Department of Environmental Conservation
Fatima Ochante	Alaska Department of Environmental Conservation
Niki Lajevardi-Khosh	Arizona Department of Health Services
Mir Ali	California State Water Resources Control Board
Randy Barnard	California State Water Resources Control Board
Brian Bernados	California State Water Resources Control Board
Robert Brownwood	California State Water Resources Control Board
Jing Chao	California State Water Resources Control Board
Erica Kalve	California State Water Resources Control Board
Tricia Lee	California State Water Resources Control Board
Amanda Magee	California State Water Resources Control Board
Laura McLellan	California State Water Resources Control Board
Karen Mogus	California State Water Resources Control Board
Sarita KC	Choctaw Nation of Oklahoma
Elizabeth Lemonds	Colorado Department of Public Health
Brandi Honeycutt	Colorado Department of Public Health and Environment
Tyson Ingels	Colorado Department of Public Health and Environment
David Kurz	Colorado Department of Public Health and Environment
Nathan Moore	Colorado Water Quality Control Division
Ali Hibbard	Connecticut Department of Energy and Environmental Protection
Julienne Bautista	D.C. Department of Energy and Environment
Joshua Rodriguez	D.C. Department of Energy and Environment
Heather Warren	Delaware Division of Public Health
Douglas Beason	Florida Department of Environmental Protection
Carolin Ciarlariello	Florida Department of Environmental Protection
Marian Fugitt	Florida Department of Environmental Protection
Belinda Oliver	Florida Department of Environmental Protection
Alexandra Spencer	Florida Department of Environmental Protection
Noah Valenstein	Florida Department of Environmental Protection

2020 State Summit on Water Reuse

Name	Affiliation
Audra Burchfield	Florida Department of Health
Kimberly Duffek	Florida Department of Health
Robin Eychaner	Florida Department of Health
David Hammonds	Florida Department of Health
Anna Truszczynski	Georgia Environmental Protection Division
Joan Corrigan	Hawaii Department of Health
Diana Felton	Hawaii Department of Health
Joanna Seto	Hawaii Department of Health
Zhaohui Wang	Hawaii Department of Health
Michael Miyahira	Hawaii Department of Health
Tyler Fortunati	Idaho Department of Environmental Quality
Tressa Nicholas	Idaho Department of Environmental Quality
Adam Oliver	Idaho Department of Environmental Quality
MaryAnna Peavey	Idaho Department of Environmental Quality
Jerimiah Fenton	Idaho Department of Environmental Quality
Bob Campbell	Iowa Department of Natural Resources
Mark Moeller	Iowa Department of Natural Resources
Thomas Stiles	Kansas Department of Health and Environment
Cathy Tucker-Vogel	Kansas Department of Health and Environment
Kirk Tjelmeland	Kansas Water Office
Matt Unruh	Kansas Water Office
Carey Johnson	Kentucky Division of Water
Saeid Kasraei	Maryland Department of the Environment
Anita Anderson	Minnesota Department of Health
Tannie Eshenaur	Minnesota Department of Health
Nancy Rice	Minnesota Department of Health
Dana Vanderbosch	Minnesota Pollution Control Agency
Joanna McLaughlin	Montana Department of Environmental Quality
Maya Rao	Montana Department of Environmental Quality
Amy Steinmetz	Montana Department of Environmental Quality
Lindsey Phillips	Nebraska Department of Environment and Energy
Shelley Schneider	Nebraska Department of Environment and Energy
Katrina Pascual	Nevada Department of Conservation and Natural Resources
Linh Kieu	Nevada Department of Environmental Protection
Rich Johnson	Nevada Division of Environmental Protection
Elizabeth Kingsland	Nevada Division of Environmental Protection

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Name	Affiliation
Andrea Seifert	Nevada Division of Environmental Protection
Micheline Fairbank	Nevada Division of Water Resources
Mitchell Locker	New Hampshire Department of Environmental Services
Dennis Greene	New Hampshire Department of Environmental Services
Brandon Carreno	New Jersey Department of Environmental Protection
Emily Wagner	New Jersey Department of Environmental Protection
Rose Galbraith	New Mexico Department of Health
Srikanth Paladugu	New Mexico Department of Health
Lynette Guevara	New Mexico Environment Department
Sarah Holcomb	New Mexico Environment Department
Judith Kahl	New Mexico Environment Department
Shelly Lemon	New Mexico Environment Department
Joe Martinez	New Mexico Environment Department
Rebecca Roose	New Mexico Environment Department
Tanya Trujillo	New Mexico Environment Department
Jill Turner	New Mexico Environment Department
Emily Worthen	New Mexico Environment Department
Adrienne Sandoval	New Mexico Oil Conservation Division
Christina Chiappetta	New York Department of Environmental Conservation
Poonam Giri	North Carolina Department of Environmental Quality
Vivien Zhong	North Carolina Department of Environmental Quality
Mitchell Murray	North Dakota Department of Environmental Quality
Jesse Gray	Northwest Florida Water Management District
Selina Potter	Northwest Florida Water Management District
Rachel Townsend	Ohio Department of Health
Travis Archer	Oklahoma Department of Environmental Quality
Gregory Carr	Oklahoma Department of Environmental Quality
Kay Coffey	Oklahoma Department of Environmental Quality
Elizabeth Denning	Oklahoma Department of Environmental Quality
Toby Harden	Oklahoma Department of Environmental Quality
Patrick Rosch	Oklahoma Department of Environmental Quality
Roshini Schroeder	Oklahoma Department of Environmental Quality
Shellie Chard	Oklahoma Department of Environmental Quality
Karen Steele	Oklahoma Department. of Environmental Quality
Pat Heins	Oregon Department of Environmental Quality
Geoff Rabinowitz	Oregon Department of Environmental Quality

2020 State Summit on Water Reuse

Name	Affiliation
Kevin McLeary	Pennsylvania Department of Environmental Protection
George Garden	Tennessee Department of Environment and Conservation
Angela Jones	Tennessee Department of Environment and Conservation
Jennifer Tribble	Tennessee Department of Environment and Conservation
Kath Alexander	Texas Commission on Environmental Quality
Marlo Berg	Texas Commission on Environmental Quality
Erin Guerra	Texas Commission on Environmental Quality
Joel Klumpp	Texas Commission on Environmental Quality
Thomas Starr	Texas Commission on Environmental Quality
Craig Stowell	Texas Commission on Environmental Quality
Daniel Collazo	Texas Water Development Board
Andrea Croskrey	Texas Water Development Board
Kristie Laughlin	Texas Water Development Board
Erica Gaddis	Utah Department of Environmental Quality
Ken Hoffman	Utah Department of Environmental Quality
John Mackey	Utah Department of Environmental Quality
Chris Nelson	Utah Department of Health
Craig Miller	Utah Division of Water Resources
Melanie Davenport	Virginia Department of Environmental Quality
Valerie Rourke	Virginia Department of Environmental Quality
Tony Singh	Virginia Department of Health
Frances Bothfeld	Washington State Department of Ecology
Sharlett Mena	Washington State Department of Ecology
Angela Zeigenfuse	Washington State Department of Ecology
Steve Deem	Washington State Department of Health
Mamdouh Elaarag	Washington State Department of Health
Lily Barkau	Wyoming Department of Environmental Quality
Richard Cripe	Wyoming Department of Environmental Quality
Kevin Frederick	Wyoming Department of Environmental Quality
Colin McKee	Wyoming Department of Environmental Quality
Todd Parfitt	Wyoming Department of Environmental Quality
Tom Kropatsch	Wyoming Oil and Gas Conservation Commission

2020 State Summit on Water Reuse

Associations

Name	Affiliation
Jake Adler	Association of Clean Water Administrators (ACWA)
Julia Anastasio	Association of Clean Water Administrators (ACWA)
Rosie Kay	Association of Clean Water Administrators (ACWA)
Nicholas Porter	Association of State and Territorial Health Officials (ASTHO)
Alan Roberson	Association of State Drinking Water Administrators (ASDWA)
Wendi Wilkes	Association of State Drinking Water Administrators (ASDWA)
Marla Stelk	Association of State Wetland Managers
Layne Piper	Environmental Council of the States (ECOS)
Mark Layne	Ground Water Protection Council (GWPC)
Mary Musick	Ground Water Protection Council (GWPC)
Mike Paque	Ground Water Protection Council (GWPC)
Dan Yates	Ground Water Protection Council (GWPC)
Peter Zaykoski	New England Interstate Water Pollution Control Commission
John Balay	Susquehanna River Basin Commission
Adel Abdallah	Western States Water Council
Michelle Bushman	Western States Water Council
Jessica Reimer	Western States Water Council

2020 State Summit on Water Reuse

Federal / Other

Name	Affiliation
Scott Anderson	Environmental Defense Fund
Jon Brant	University of Wyoming
Joan Carlson	U.S. Department of Agriculture - Forest Service
Karen Vyverberg	U.S. Department of Agriculture - Forest Service
Samantha Bishop	U.S. Environmental Protection Agency
Elizabeth Do	U.S. Environmental Protection Agency
Ryan Graydon	U.S. Environmental Protection Agency
Emily Isaacs	U.S. Environmental Protection Agency
Sharon Nappier	U.S. Environmental Protection Agency
David Smith	U.S. Environmental Protection Agency
Heather Strathearn	U.S. Environmental Protection Agency