



STATE REGULATORY SUMMIT ON WATER REUSE

September 8, 2019
San Diego, CA

MEETING NOTES



Overview

The State Regulatory Summit on Water Reuse (Summit) was the first formal in-person convening between ACWA and ASDWA members on the topic of water reuse. EPA representatives and some other state-level representatives were also present. The Summit was intended to share information and perspectives among agencies and programs and is envisioned to be the part of an ongoing dialogue surrounding water reuse. As such, the meeting format included an introductory opening by a state representative relevant to the session topic followed by open discussion. A list of participants is included [below](#).

Primary Meeting Goals

- Sharing existing practices between states.
- Identifying needs of the state programs.
- Prioritizing actions for ASDWA/ACWA.
- Point of interaction with EPA on water reuse and the National Water Reuse Action Plan (WRAP).

Meeting Sessions/Topics (links provided for navigation to applicable notes sections below)

- [Welcome and Introductions](#)
- [Overview of the draft National Water Reuse Action Plan & Next Steps](#)
- [Source Water Discussion: Characteristics, Known/Current Reuse, Reuse Potential and Research Needs](#)
- [Agriculture and Environmental Flow: Matching Needs with Use](#)
- [Potable and Residential/Public Access: Matching Needed Use with Water Available for Reuse](#)
- [Potable Reuse: Matching Needed Use with Water Available for Reuse](#)
- [Produced Water: Matching Needed Use with Water](#)
- [Constituents of Emerging Concern and Treatment Effectiveness Monitoring, Assessment, and Response](#)
- [Public Outreach and Communication](#)
- [Training for Reuse Systems](#)

Identified Needs & Potential Action Items

With representatives from ACWA, ASDWA, and EPA present for the meeting and the September release of the [draft National Water Reuse Action Plan \(WRAP\)](#), a primary meeting goal was to identify state needs and potential action items related to water reuse. Following are examples identified by meeting participants (for additional context, these are 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.

Overall

- Given its role with the WRAP, EPA could help states interface with other federal agencies in dialogues about water reuse. This may include ensuring that federal agencies on WRA Symposium panel discussion are aware of ACWA & ASDWA and their related roles.
- Process control is critical to the industry. Need to have testing methodology everyone can understand, process control, and operator education.

Source Water Discussion: Characteristics, Known/Current Reuse, Reuse Potential and Research Needs

- Compilation of existing state standards for water reuse. This could potentially include an analysis or statement of why different states have taken the approaches they have chosen (i.e., rationale).
- Additional assessment of “exposures” to non-potable reclaimed water to better understand the risks.
- Alternative test methods related to water reuse and ensuring the methods are up to date.
- Research related to test methods for CECs.

Potable Reuse: Matching Needed Use with Water Available for Reuse

- Need a list of pathogens and unregulated contaminants for finished water.
- Need to update tables for DPR.
- Utilities could use guidance on how to study pathogen treatment credits or log treatment values.
- Could use 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 (e.g., average or instantaneous values)

Constituents of Emerging Concern and Treatment Effectiveness Monitoring, Assessment, and Response

- Need to find ways to deal with CECs as groups or classes of chemicals rather than individual chemicals/compounds.
- Need enhanced industrial pretreatment of wastewater in communities to help reduce constituents in wastewater that are challenging for reuse applications.
- Water sector professionals should be connected to work with staff that review and approve pesticides as a framework to prevent products from ending up in wastewater.
- Society of Risk Analysis and other groups should be involved in the efforts related to CECs and identifying/communicating risk.
- Create better or more effective analytical tools for CECs.

Public Outreach and Communication

- General sentiment that it would be helpful to have more resources for outreach related to water reuse in the states.
- Partner with research organizations to help with public health messages.

Training for Reuse Systems

- Need to look for ways to bridge the gap between wastewater certification and drinking water certification.
- Help operators recognize what they *don't know* so they can self-study, get training, and then seek certification.
- There needs to be more effort to engage the medical community and those outside water agencies to educate them about water reuse so they can help share information/consistent messages related to water reuse across communities.
- State staff also need to come up to speed on water reuse issues, not only operators.

- Would be great if EPA/Congress could help fund more circuit rider-type programs in states to help with education to support operator certification.
- ACWA Water Resources Management Committee may be a forum for ACWA to take on some issues surrounding water reuse training, especially for state staff.

Next Steps

- ASDWA and ACWA will work to take the needs and actions identified through the Summit and prioritize them. ASDWA and ACWA leadership will evaluate next steps for carrying forward actions and partnering with other organizations to fulfill identified needs.
 - *Take needs and actions identified through the meeting to ASDWA and ACWA boards for consideration for 2020 and beyond.*
- This meeting is a good demonstration of drinking water and clean water programs coming together. Will evaluate options for possible future meetings.
 - *Consider holding a second Summit in 2020 with ASDWA and ACWA members.*
- Will work with EPA on prioritizing some proposed actions for engagement on the draft National Water Reuse Action Plan.
 - *Respond to EPA regarding the WRAP.*
- Alan Roberson (ASDWA) led a panel discussion report out of this Summit at the conclusion of the WRA Symposium.

About ASDWA & ACWA

The **Association of State Drinking Water Administrators (ASDWA)** represents the drinking water program administrators in the 50 states, five territories, the Navajo Nation, and the District of Columbia. ASDWA's members regulate and provide technical assistance and funding for the nation's 150,000 public water systems (PWS) and coordinate with multiple partners to ensure safe drinking water for our nation's over 300 million people that are served by a community water system (CWS).

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

The **Association of Clean Water Administrators (ACWA)** is the independent, nonpartisan, national organization of state, interstate and territorial clean water program managers, who on a daily basis implement the water quality programs of the Clean Water Act (CWA). For more than half a century, ACWA has supported its members with information, programming, technical support and collaborative opportunities that increase state and interstate capacity and effectiveness.

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

Participants List

States

- California: Shahla Farahnak (ACWA), Laura McLellan (ACWA), Karen Mogus (ACWA), Darrin Polhemus (ASDWA)
- Colorado: Brandi Honeycutt (ASDWA)
- Hawaii: Joanna Seto (ASDWA)
- Idaho: Andrew John, Tressa Nicholas
- Kansas: Cathy Tucker-Vogel (ASDWA)
- Kentucky: Pete Goodman (ACWA and ASDWA)
- Maryland: Matthew Rowe (ACWA)
- Minnesota: Anita Anderson (ASDWA)
- New Mexico: Rebecca Roose (ACWA), Adrienne Sandoval
- Nevada: Elizabeth Kingsland (ACWA), My-Linh Nguyen (ASDWA)
- Oklahoma: Shellie Chard (ACWA and ASDWA), Karen Steele (ACWA)
- Tennessee: George Garden (ACWA)
- Utah: Erica Gaddis (ACWA), Ken Hoffman (ACWA), Marie Owens (ASDWA)
- Virginia: Valerie Rourke
- Washington: Steve Deem (ASDWA), Mamdouh El-Aarag, Jocelyn Jones, Lucy Peterschmidt
- Wyoming: Rich Cripe (ACWA), Kevin Frederick (ACWA and ASDWA)

Associations

- Association of Clean Water Administrators (ACWA): Julia Anastasio, Frances Bothfeld, Jasper Hobbs
- Association of State Drinking Water Administrators (ASDWA): Alan Roberson, Wendi Wilkes
- New England Interstate Water Pollution Control Commission (NEIWPC): Peter Zaykoski

Federal

- Environmental Protection Agency (EPA): Jake Adler, Ryan Albert, Jeff Lape, John Ravenscroft, Dave Smith, Deborah VacsRenwick, Kara Goodwin

Welcome and Introductions

Wendi Wilkes, ASDWA, & Frances Bothfeld, ACWA

- First joint convening between ACWA & ASDWA focused on water reuse;
 - Representatives from 16 state water programs present at the meeting
- Potential for an annual convening
- Meeting goals:
 - Provide a forum for states to learn from each other
 - Identify common needs to advance and manage water reuse at the state level
 - Determine priority actions for ASDWA and ACWA as well as EPA and other industry stakeholders
 - Create an opportunity for states to interface with EPA

Overview of the draft National Water Reuse Action Plan & Next Steps

Jeff Lape, EPA Office of Water

- The draft National Water Reuse Action Plan (WRAP) will be announced on 9/10 by David Ross, Assistant Administrator of EPA's Office of Water. EPA has facilitated the draft's development and input from ACWA & ASDWA has been critical.
- WRAP includes 46 proposed actions by 10 strategic objectives (e.g., policy coordination, technology development, communication and outreach, workforce development).
- During the 90-day comment (or "commitment") period, EPA is seeking input on priorities and commitments from organizations across the water sector to lead/collaborate on priority actions.

Questions/Discussion

- State representatives acknowledged that not everyone embraces reuse—can compete with water revenues; also impacts downstream water rights.
- For a longtime the focus of water reuse has been on municipal wastewater effluent but there are many other source waters that often get overlooked.
 - Jeff Lape (EPA) noted that to help demonstrate the significant potential for water reuse the WRAP identifies five categories of water (municipal wastewater, agriculture, industry, oil and gas produced water, stormwater) for potential reuse that exceed a combined discharge volume of 300BGD.
- *What does the federal leadership and coordination look like in this process?*
 - About 10 federal agencies were engaged in development of the draft WRAP and engagement will continue to grow (e.g., GSA involvement regarding federal buildings).
 - In addition to EPA, leaders from six other federal agencies will participate in the draft WRAP announcement plenary discussion regarding water reuse (Department of Agriculture, the U.S. Department of Energy, Department of Interior, Department of the Army, Bureau of Reclamation, the White House Council on Environmental Quality).
- *What are the long-term resources available for implementation of the plan?*

- It is unclear what EPA or other agencies will commit to at this moment. The vision is that the federal partners and other stakeholders will collectively commit to supporting priority actions.
- *What is appropriate role for EPA in implementing WRAP actions?*
 - For many actions, EPA may not have a role and for other actions EPA may be a leader or collaborator.
- To help the ongoing discussion about relative priority of the proposed actions in the WRAP and potential leaders/partners, some participants completed an action worksheet.

Identified Needs & Potential Action Items

- Given its role with the WRAP, EPA could help states interface with other federal agencies in dialogues about water reuse. This may include ensuring that federal agencies on WRA Symposium panel discussion are aware of ACWA & ASDWA and their related roles.

Source Water Discussion: Characteristics, Known/Current Reuse, Reuse Potential and Research Needs

Introduction by Brandi Honeycutt, Colorado Department of Public Health & Environment

- Colorado has a regulation for reclaimed domestic wastewater ([Reg 84](#)) for uses such as landscape irrigation, dust control, and cooling water.
 - Evaluating adding crop and hemp irrigation to this regulation.
- Colorado requires log reduction targets based on the type of water and intended use (e.g., indoor use requires greater log reduction); used considerations from [WERF's risk-based framework for non-potable water reuse](#) while developing logarithmic reduction goals.
- Colorado has been evaluating concentrated pathogen loads for smaller systems (e.g., hotels, small cities and towns) based on wastewater characteristics.
- Gray water for showers, baths, laundry, and sink water is regulated through Colorado [Reg 86](#).
- Colorado has received interest from a utility on use of reclaimed water from oil and gas and this issue is coming up as part of the stakeholder process.
- Lately, industrial reuse and aquifer storage recovery (ASR) have not been a focus of CDPHE.
- Colorado is working on an ASR pilot project with Denver Water.

Introduction by Anita Anderson, Minnesota Department of Health

- Overall, Minnesota is water rich state but has regional issues; have floods and droughts occurring in different parts of the state.
- Forty to fifty systems in the state use wastewater for irrigation and other non-potable uses.
- Other source waters (e.g., stormwater, graywater, blackwater, industrial) are driving reuse in the state.
- Minnesota is working on understanding broad range of water sources and trying to determine what systems really need to be tested. Some plumbing codes have been helpful but are not always risk-based or set up for ongoing review of the systems (just focus on installation).
- Overall it has fallen to the health department to determine what is “safe” for reuse.
- Minnesota is conducting ongoing research regarding reuse of stormwater.

- The state could use additional assessment of “exposures” to non-potable reclaimed water to better understand the risk.

Questions/Discussion

Discussion items related to characteristics, known/current reuse, reuse potential, and research needs:

- Process control is critical to the industry.
 - Need to have testing methodology everyone can understand, process control, and operator education.
 - Source water characterization is important.
- Utilities must be well-resourced to bring a water reuse project to bear. In California agency fees may be on the order of \$100k-\$200k but there is a lifetime investment to continue research and understanding the technology, impacts, etc. and communicating with the public.
- An investment that people often forget about is the publicity and outreach campaign; for example, Orange County, CA spends \$8M a year on education and outreach.
- Test methods/monitoring requirements:
 - Many people want to use alternative test methods that may be more accurate than currently available methods.
 - Methods and indicators are a big deal; how do systems know when to take an action and what that action ought to be? Engineers, especially for potable reuse projects, have a lot of responsibility to ensure proper operation and protection of human health and the environment.
 - **Idaho** uses Title 22 Standards. Some sites have requested alternative indicator organisms to Total Coliform. Some sites have requested alternative testing methods (those outside of approved EPA methods for wastewater) and have worked on pilot studies in an attempt to demonstrate performance. More national guidance is needed on alternative indicator organisms and testing methods.
 - **California** does not require CEC monitoring for non-potable projects.
 - **New Mexico** noted that of 1,000 or more constituents in oil and gas produced water only about 25% of these have an approved test method. The state legislature is asking the state to evaluate other uses of oil and gas produced water. More research is needed on test methods.

Identified Needs & Potential Action Items

- Process control is critical to the industry. Need to have testing methodology everyone can understand, process control, and operator education
- Compilation of existing state standards for water reuse.
 - This could potentially include an analysis or statement of why different states have taken the approaches they have chosen (i.e., rationale).
- Additional assessment of “exposures” to non-potable reclaimed water to better understand the risks.
- Alternative test methods related to water reuse and ensuring the methods are up to date.
 - The states are looking to EPA for help in this area.

- Additional collaborations around test method evaluation among a smaller subset of states interested may be helpful to move this initiative forward (e.g., those interested in produced water may be able to come together and focus on that issue).
- Research related to test methods for CECs.

Agriculture and Environmental Flow: Matching Needs with Use

Introduction by Erica Gaddis, Utah Department of Environmental Quality

- Utah is one of the driest states in the nation (top 5) while it also has one of the highest water use rates (80% for agriculture) and is one of the fastest growing states (will double population in next 30 years).
- The state will need to convert some water rights from agricultural to municipal; key issue is that municipal water rights allow complete extinction of a water resource.
- State water reuse snapshot:
 - Discharge about 110 billion gallon per year from municipal sources; reuse about 2% of that volume with 1/3 to golf courses/industry and 2/3 to agriculture and irrigation...this means there is significant potential to promote water reuse and make it work as part of the water portfolio.
 - Utah's state regulations regarding water reuse are dated and have potential for thoughtful updates. One noted challenge is that state laws do not allow environmental flows to be a type of beneficial use.
- Much of the population uses water from the Great Salt Lake which is a terminal basin (currently close to historic low levels and must avoid an Aral Sea or Mono Lake type scenario). Water reuse could mean diverting some waters that might otherwise make their way to the Great Salt Lake.
 - How does the state to address/balance this issue and factors (economics, water rights, seasonal needs)?
- States recognize that water reuse is not the "panacea" to solve all water resource issues. It is nuanced, especially in western states with water rights issues.

Questions/Discussion

What is an appropriate role for water quality agencies in the water reuse realm, especially regarding promotion of groundwater recharge?

- There are differing roles and requirements at least partially influenced by the state's organization. Several approaches follow:
 - **Oklahoma's** water quality standards are established by the organization that also oversees water quantity issues and policy; aquifer recharge rules are now in place after significant efforts.
 - **Virginia** requires a "cumulative impact analysis" (CIA) when changing from typical discharge to using that discharge for a consumptive use. When CIA indicates that water reuse will adversely impact downstream beneficial uses, typically during periods of low instream flow, must reduce consumptive use due to reuse and may need provide an alternate water supply for the reclaimed water end user under these circumstances.
 - **Colorado** requires an "agronomic analysis" primarily related to nitrogen uptake.

- **California** houses water rights, quality, and reuse under one overall umbrella; requires reporting of wastewater discharge and recycled water volume to allow for analysis of potential reuse. Instream flows and ensuring minimum flows is a significant issue and area of focus.
- **Washington** requires an “impairments analysis” related to planned discharge reductions and has established minimum instream flow requirements.
- **Wyoming** follows UIC program regulations that require water injected into aquifers for future reuse and recovery to meet federal MCLs.

Elevated chloride levels can happen due to repeated reuse especially in western states; can chlorides be an impact on agricultural use?

- Various states noted that elevated salt levels can be an issue for agriculture, and some are encouraging the use of gypsum to improve absorption rates. As the water gets saltier for agricultural use then it can lead to greater volumes of water needed based on crop tolerance (i.e., not a 1-gal to 1-gal replacement ratio).
- Nutrient management plans are often used as a tool to help issues related to sodium levels.
- **Oklahoma** noted it has a healthy soils program that works with agricultural extension offices and conducts soils testing across the counties.

Potable and Residential/Public Access: Matching Needed Use with Water Available for Reuse

Introduction by Tressa Nicholas, Idaho Department of Environmental Quality

- Idaho has a policy in rule to promote reuse and it has been supporting reuse efforts since 1989. The state has 138 active reuse permits for municipal and industrial reuse and there are more cities actively interested in a reuse permit. Reuse efforts allow beneficial use of water and helped keep about 2,000 tons of nitrogen out of streams last year.
- Rule for water reuse was last updated in 2012. Reuse guidance is currently being updated.
- Public access to reclaimed water is guided through “buffer zones,” which are protective of public health by limiting exposure to potential pathogens.
- In Idaho there are five classes of reclaimed water: A through E, with A being most protective. Class A does not require buffer zones and can be used anytime. Classes B through E do require buffer zones and have periods of restriction; water cannot leave the site.
- Have developed a microbial risk-based approach for determining buffer zones.
- Residents can bring “purple pipe” to their house for Class A water.
- The state maintains positive relationships with permittees, working collaboratively to determine appropriate requirements on a case-by-case basis.

Questions/Discussion

How are states handling requirements for edible crops?

- **Idaho’s** Class A and B waters can be used for edible crops.

- **Colorado's** highest quality of reclaimed water (category 3+ which requires higher levels of disinfection and filtration to decrease risk of being exposed to or ingesting pathogens) can be used for residential community gardens. Commercial crops under the Produce Safety Rule do not require highest levels (can use categories 2 and 3).
- **New Mexico State University** is studying produced water for agricultural applications (e.g., use on food crops) as there are not currently state standards for this use.

What efforts are underway regarding crop uptake of CECs (not just pathogens)?

- **Colorado** noted that stakeholders are concerned about CEC uptake in reclaimed water. Some studies show that level of CEC uptake into the edible portion of plants is significantly less than the daily allowable consumable amount. Research was not done for every CEC (more for pharmaceuticals), but currently research shows uptake is not above the maximum daily dose.
- **Washington** will be doing more CEC research. If standards are set, then they would be included in permits. The [LOTT study](#) in the Pacific Northwest was noted as a resource/reference worth being aware of.

Discussion items related to groundwater monitoring:

- **California** noted that good agronomic practices (e.g., application rates) can lead to reduced monitoring requirements.
- **Virginia** noted that irrigation rates with reclaimed water must match evapotranspiration rates, so that leaching to groundwater is minimized and groundwater monitoring is not necessary.

Potable Reuse: Matching Needed Use with Water Available for Reuse

Introduction by Shellie Chard, Oklahoma Department of Environmental Quality

- Many considerations for how to get water where it is needed. Following are two key examples from the experiences of colleagues from Texas and Kansas:
 - Terrible drought in TX caused “emergency” conditions which led Wichita Falls, TX down the path of direct potable reuse to construct a \$50M facility as an interim/emergency solution. Due to timing and cost, some aspects of the project were planned for a future phase. Once the rains came the emergency was over, the reservoir was full, and the facility was mothballed for a while. Since the DPR project was decommissioned, the City has been working on a permanent IPR project which is nearly complete, as originally planned.
 - Be careful using the term “emergency” and consider what happens when the emergency is over. As far as rules go, Texas decided to move forward on a case-by-case basis for water reuse applications.
 - Kansas was forward thinking to address flooding and high flows in the Arkansas River by capturing, treating with ozone treatment, and injecting into the aquifer to stop a saltwater plume and enhance drinking water quantity.

- Oklahoma uses reclaimed water for in various ways (e.g., golf course irrigation, crop irrigation for various types of crops, indirect potable, stormwater capture). The state developed a categorized system and has various types of rules in place for water reuse.
- Oklahoma has consciously avoided talking about water reuse in terms of “emergencies” but rather as a more sustainable or flexible approach to water management.

Questions/Discussion

What states have regulations for injection of reclaimed water into groundwater?

- CA, HI, ID, MD, NM, NV, OK, WA

List of perspectives from Texas (presented on their behalf) on potable reuse:

- Need a list of pathogens and unregulated contaminants for finished water.
- Need to update tables for DPR.
- Utilities could use guidance on how to study pathogen treatment credits or log treatment values.
- Could use 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 (e.g., average or instantaneous values).

There was concurrence on these needs from other states.

General perspectives/discussion on potable reuse:

- Treatment will continue to evolve, and thus environmental buffers will need to continue to evolve.
- River/reservoir modeling is not straightforward. Often requires a PhD to do high-level modeling to answer the questions of what treatment and time is needed to provide an adequate environmental buffer.
- **California** is currently working on developing DPR regulations, though they noted there isn’t a magic formula to make direct potable reuse simple; there will always be some necessary level of study and will still need to focus site by site.
- **Nevada** has a policy to protect all existing and potential underground sources drinking water against deterioration in quality and noted that permitted injection into groundwater aquifer must meet drinking water standards.
- **Maryland** noted it has interest from many wanting to treat wastewater to drinking water standards and inject into the groundwater. There are some concerns with matching injectate water with existing ancient water to change chemistry of aquifer and/or with unwanted chemicals showing up in aquifers.
 - Some relevant examples noted by participants included: (1) in Arizona where disinfection byproducts were showing up in the groundwater, and (2) GenX at a facility in North Carolina.

- Another example was mentioned related to efforts near a sensitive aquifer in San Antonio where water was treated for managed aquifer storage to match existing water chemistry in the aquifer rather than drinking water standards.

Identified Needs & Potential Action Items

- Need a list of pathogens and unregulated contaminants for finished water.
- Need to update tables for DPR.
- Utilities could use guidance on how to study pathogen treatment credits or log treatment values.
- Could use 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 (e.g., average or instantaneous values).

Produced Water: Matching Needed Use with Water

Introduction by Kevin Frederick, Wyoming Department of Environmental Quality

- Produced water is often viewed as a waste product. It is often injected into an aquifer/well that is not a source water; produced water can also be evaporated.
- Fracturing jobs can often use more than 1M gallons on a typical well and high demand for freshwater resources have depleted groundwater resources in some areas, causing tension between using freshwater supplies for oil and gas development and other needs. Drought conditions then exacerbate problems.
- Nearly 1 million gas wells across the country that produce ~21.2 billion barrels of produced water each year (900B gallons/year; equivalent to 1.5 million Olympic size pools)
- Primarily oil and gas produced water is more of an issue for western states; in recognition of how to deal with this tension, the Groundwater Protection Council has started to work together and developed a report recently entitled the [Produced Water Report](#).
- West of 98th Meridian; states can discharge produced water onto the ground surface; water must be suitable for us for livestock and/or wildlife.
- Use of produced water outside oil field is relatively small but seeing more interest.
- There are key concerns with toxicity of VOCs and sVOCs in produced water and what are appropriate contaminant levels for livestock watering.

Questions/Discussion

How do we gain more information from industry regarding produced water (e.g., chemicals used)?

- Partnership with American Petroleum Institute and ~20 oil and gas companies to help create GWPC report; said they would see what they can do to release more information but there may be competition issues and there is a constant fear of litigation.
- Some states have started requiring petroleum companies to report additives.

- Most states using an online system called “[Frac Focus](#)” – mechanism for state oil and gas commissions to report chemicals that were used on a fracturing job.
- NEPA process has sometimes helped to encourage/require collaboration with the producer; without an analogous mechanism at the state level it can be hard, if not impossible, to make the collaboration and information sharing happen.
- Water reuse approaches may be a leveraging mechanism to get the necessary information from the companies.

General perspectives/discussion on produced water:

- Cheaper to just inject produced water into the ground...trucking water is expensive...how do we incentivize the reuse of produced water?
- Drinking water standards are based on risk and treatment abilities. Are there concerns for other constituents such as those that are naturally occurring radioactive materials?
- **California** noted there are some examples of using reclaimed produced water for irrigation in central CA.
- **New Mexico** noted it is seeing a shift from injection wells to large mid-stream water companies with networks of lay-flat pipelines to gather water and bring to a central location for treatment.

Constituents of Emerging Concern and Treatment Effectiveness Monitoring, Assessment, and Response

Introduction by Karen Mogus, California Water Resources Control Board

- California has been evaluating CECs for a long time as there are a lot of chemicals which are not monitored or regulated.
- There is a lack of analytical methods for many CECs and we don’t know toxicological effects for many of them which makes it challenging to study and make decisions.
- Some CECs are very persistent in the environment (e.g., PFAS) and may be much easier to control at the source than further down the line. Source control is key, but in many cases, there is not a mechanism to make that happen.
- Need enhanced industrial pretreatment of wastewater in communities to help reduce the number of constituents in wastewater that are challenging for reuse applications.
- Water sector professionals should be connected to work with staff that review and approve pesticides as a framework to prevent products from ending up in wastewater.
- California has a [Recycled Water Policy](#) (adopted 2009, revised 2013, amended 2018 for additional CECs).
- California has focused significantly on PFOA/PFAS in the past year.
 - Added PFOA and PFAS for monitoring in recycled water for groundwater recharge. Using Method 537 revision 1 or 537.1 tests for PFOA/PFAS (14 or 17 constituents; must analyze and report all).
 - Looked at all exposure pathways to help set advisory levels.
 - Worked with Division of Drinking Water to issue orders for landfill and drinking water facilities to monitor if within a radius of a likely sources of contamination.
 - Have reduced the PFOA and PFAS trigger levels.

- Aiming to get product manufacturers to evaluate products to find alternatives.
- Using Orange County Sanitation District water data and citizen scientists to work on the PFOA/PFAS issue.
- Holding a PFAS summit in December 2019.
- Still have many data issues as the state needs baseline levels for comparison and toxicity thresholds (human, fish, wildlife).
- California does not yet have a suggested treatment unit for PFOA/PFAS but has seen that going through reverse osmosis and granulated activated carbon filters removes PFAS.
- Need to find ways to deal with CECs as “groups of chemicals” rather than individual compounds.
- The state is using PFOA/PFAS as case study to deal with CECs overall. Moving away from targeted chemistry to bioanalytical tools.

Questions/Discussion

General perspectives/discussion on CECs:

- Some participants noted that risk models need to be looked at hard as there is a lot of supposition; need to work within the level of knowledge and science that we have now.
- CECs are NOT just a water reuse problem and the Society of Risk Analysis and other groups should get involved. Policymakers want to know how much uncertainty exists within any given model (especially those related to human health); the more players we have doing risk assessments is very critical.
- The [Michigan PFAS study](#) on the Huron River may be a good resource for people to review/reference.

Identified Needs & Potential Action Items

- Need to find ways to deal with CECs as groups or classes of chemicals rather than individual chemicals/compounds.
 - EPA could potentially help with a framework for this approach.
- Need enhanced industrial pretreatment of wastewater in communities to help reduce constituents in wastewater that are challenging for reuse applications.
- Water sector professionals should be connected to work with staff that review and approve pesticides as a framework to prevent products from ending up in wastewater.
- Society of Risk Analysis and other groups should be involved in the efforts related to CECs and identifying/communicating risk.
- Create better or more effective analytical tools for CECs.

Public Outreach and Communication

Introduction by Brandi Honeycutt, Colorado Department of Public Health & Environment

- Terminology matters when communicating about water reuse. For example, public prefer “purified water” than “reclaimed wastewater.”
- Communication must happen upfront to get everyone understanding what reuse is—talk to the public, government, scientists, doctors, etc.

- Drought resilience and climate change messaging can be effective when discussing water reuse as a part of the solution.
- Public surveys can be very helpful to gauge what the public is concerned about and their current level of understanding. Consider demographics.
- Demonstrations (pilots) often lead to higher levels of acceptance.

Questions/Discussion

How do states define/communicate DPR vs. IPR?

- **Washington**—DPR = pipe to pipe, no environmental buffer; IPR = groundwater recharge
- **California**—IPR has an effective environmental buffer and is intentionally planned for reuse not just wastewater discharge. “Raw water augmentation” and “treated water augmentation” are statutorily defined.

What are responsibilities of state agencies in communicating about water reuse? What resources do you provide?

- Various perspectives and approaches discussed about state agency communication methods and roles. There was a general sentiment that it would be helpful to have more resources for outreach regarding water reuse.
- Following are some examples of communication and outreach methods and approaches related to reuse. They are listed below to demonstrate a range of approaches.
 - **Colorado**—The state implements the regulations and state programs while individual utilities do outreach to stakeholders surrounding reuse. If permitting direct potable reuse the state would have a more robust stakeholder input/engagement process.
 - **New Mexico**—Different level of outreach if doing a rulemaking vs. working with an individual utility. The closer to human consumption = need more stakeholder engagement. Some issues require engagement with the legislature.
 - **California**—Has requirements for permittee interaction with the public in discharge permits. The state is partnering with research organizations to help with public health messages related to water reuse.
 - **Idaho**—Has operator certification requirements for reuse sites for municipal Class B through E recycled water sites and provides training for the operator certification for these sites. Explains the state’s position and view towards water reuse. This helps the city and others with having a consistent message. The DEQ reuse website does need updating to have a consistent message. Idaho also has been hosting a Water Reuse Conference for more than a dozen years and last year the conference had over 500 participants.
 - **Virginia**—Works with localities to ensure reuse is done in a manner that is protective of the environment and public health. DEQ has a webpage that provides information about how the agency regulates water reclamation and reuse, procedures to obtain permits as necessary, and links to other useful information related to water reuse.
 - **Oklahoma**—The state participates in speaking engagements with various groups (e.g., Kiwanis, Rotary, universities) to get information out and gauge what questions are being asked.

- **Washington**—Developed a “toolkit” for more consistent messaging and [created a water reuse website](#).

Identified Needs & Potential Action Items

- General sentiment that it would be helpful to have more resources for outreach related to water reuse in the states.
- Partner with research organizations to help with public health messages.

Training for Reuse Systems

Introduction by Shellie Chard, Oklahoma Department of Environmental Quality

- Three focus areas to training: (1) operators, (2) inspectors and permit writers, and (3) those overseeing inspectors and permit writers.
- In Oklahoma, “A level” operator requires training in water, wastewater, and chemistry.
- There needs to be more effort to engage the medical community and those outside water agencies to educate them about water reuse so they can help share information/consistent messages related to water reuse across communities.
- Various states handle certified operator requirements for water reuse system in different ways. For example:
 - For potable reuse in Colorado an operator would need wastewater and drinking water certification.
 - California and Nevada are working with the local AWWA section to establish a certification for reuse for operators ([advanced water treatment operators certification](#)) to have in addition to the standard wastewater or drinking water certification.
 - Idaho, California, and Washington are three key states to watch to see how operator certification programs/requirements develop.

Questions/Discussion

What are state approaches and perspectives on training/guidance?

- Need to look for ways to bridge the gap between wastewater certification and drinking water certification.
- Help operators recognize what they *don't know* so they can self-study, get training, and then seek certification.
- State staff also need to come up to speed on water reuse issues, not only operators.
- **Idaho** requires reuse sites to have a certified operator. Idaho has operator certification requirements for municipal reuse sites for Class B through E recycled water sites and provides preparatory training for the operator certification exams for the required licenses.
- **Nevada** regulatory programs are implementing new contracts to provide TA for (small/rural) communities to support operator trainings in water treatment and reclamation. Regulatory trainings for the drinking water program are normally conducted by state staff. Advanced water treatment operator certification development for water reuse applications is being coordinated between the CWA and SDWA programs.

- **Washington** has developed the [Reclaimed Water Facilities Manual: The Purple Book](#). Have identified some interim training steps of gaining on-the-job experience before getting official certification through testing.
- **Hawaii** has a contracted circuit rider program (RCAC).
- **New Mexico** noted that in-field technical assistance is important but shouldn't be at the expense of not having a robust training program overall. The state needs to find a way to empower operators.
- **California** created a training academy and posts recorded trainings online for staff to take as trainings, use at conferences, etc.

Identified Needs & Potential Action Items

- Need to look for ways to bridge the gap between wastewater certification and drinking water certification.
- Help operators recognize what they *don't know* so they can self-study, get training, and then seek certification.
- There needs to be more effort to engage the medical community and those outside water agencies to educate them about water reuse so they can help share information/consistent messages related to water reuse across communities.
- State staff also need to come up to speed on water reuse issues, not only operators.
- Would be great if EPA/Congress could help fund more circuit rider-type programs in states to help with education to support operator certification.
- ACWA Water Resources Management Committee may be a forum for ACWA to take on some issues surrounding water reuse training, especially for state staff.