PureWater Colorado

Direct Potable Reuse Mobile Demonstration Outreach Summary Report

February 2022

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Outreach Summary Report

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Executive Summary

As outlined in the Colorado Springs Utilities Integrated Water Resource Plan, direct potable reuse (DPR) was identified as one option for meeting the future water needs of Colorado Springs. Colorado Springs Utilities received a grant from the Colorado Water Conservation Board for a DPR demonstration project, named PureWater Colorado Direct Potable Reuse Mobile Demonstration. We collaborated with Colorado School of Mines and Carollo Engineers to build and operate a mobile treatment trailer that could serve as a scaled model of the DPR process and public education and outreach tool. In addition, the mobile treatment system has been used for operator training on advanced treatment processes, scientific and engineering investigations into optimization of the treatment process and monitoring systems, and to support development of new State of Colorado regulations for DPR,

The PureWater demonstration resided at our J.D. Phillips Water Resource Recovery Facility (JDPWRRF) from June 2021 until May 2022. Following the completion of the operational period, the Colorado School of Mines will take ownership and manage the mobile unit, making it available as a continuing resource for DPR outreach and water treatment research for other communities.

Public engagement is critical to the acceptance of potable reuse. As water supply stressors like extended drought and wildfires increase in the West, it's necessary to provide transparent communication, build customer and stakeholder confidence, and address public concerns around methods that can stretch available resources. This requires a comprehensive program of public awareness and education.

Colorado Springs Utilities developed a strategic DPR Outreach and Education Plan (Attachment A) to define the goals, key messages, stakeholders and tactics for the project while the demonstration trailer was available to us. Identified tactics included website content development, FAQ sheets, newsletters, customer bill inserts, community and stakeholder presentations, treatment trailer tours, community event participation, a comprehensive media push and support of local beverage-makers who produced products using purified water from the demonstration facility. (See Attachment B, Communications Plan). Outreach conducted between June - December 2021 included:

Direct Potable Reuse Outreach Summary	
50	Tours conducted
945	Tour attendees
85	% tour attendees who tasted purified water
3	Community event booths
760	Soda tastings at community events
4	Public presentations
101	Presentation attendees
11	School and college tours
2	Media events
10+	Local, regional and national media stories
2	Videos produced internally
36,254	Social media impressions

DPR demonstration trailer

The overarching outreach goal of the PureWater Colorado Mobile Demonstration was to increase public awareness of DPR. Outreach focused on answering the "what" and "why" of DPR for our community. This project and its components set the foundation for a future public acceptance campaign should DPR be incorporated in Colorado Springs Utilities' sustainable water plan as a mechanism for stretching our available supplies.

Outreach Team

The Colorado Springs Utilities project outreach team included:

- Birgit Landin – Community Education Specialist Sr. (Outreach Team Co-Lead)
- Donene Dillow – Environmental Specialist Sr. (Outreach Team Co-Lead)
- Jennifer Kemp – Public Affairs Specialist (Communications)
- Ted Skroback – Public Affairs Specialist (Creative support)
- Jerry Duncan – Engineer 1 (Beverage Partner Liaison)
- Lisa Halcomb – Administrative Specialist (Tour Registrations, Logistics)
- Ryan Maecker – Public Affairs Specialist Sr. (Stakeholder Relations)

Outreach main contact:

Birgit Landin | Community Education Specialist Sr.
Colorado Springs Utilities | Community Relations
121 S. Tejon Street, 4th Fl. | MC: 940 | Colorado Springs, CO 80903
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Outreach Goals

Direct potable reuse is a relatively new concept for the public in Colorado and has not been implemented in the state of Colorado as of the time of this demonstration. However, a DPR system has operated in Big Spring, Texas since 2013, and several other DPR systems are being planned and designed across the southwestern U.S. (e.g., El Paso, Texas). In Colorado, multiple Front Range communities are considering DPR, and the Colorado Department of Public Health and Environment is currently developing regulations for its use in the state. The primary goal of Colorado Springs Utilities' DPR outreach was to introduce DPR to our customers and inform them on why we are considering its use. The education component provided a foundation on which future public acceptance campaigns could be built.

Outreach goals are identified in the Strategic Outreach and Education Plan (Attachment A) and the Communications Plan (Attachment B), and summarized as follows:

Goal: Foster meaningful dialogue with stakeholders and influencers about DPR in Colorado Springs that increases awareness and builds acceptance of this reuse alternative.

Objective: We will provide tours of the PureWater Mobile Demonstration unit and presentations of the DPR process to targeted stakeholder groups during the time the unit is located at the J.D. Phillips Resource Recovery Facility.

Goal: Increase community awareness and understanding of the DPR process.

Objective: We will share key messages about the mobile demonstration project and DPR/reuse mechanisms with our employees and customers through internal and external channels available to us.

Goal: Preserve our customers' trust in our water system processes.

Objective: We will maintain and/or increase our customer trust score in the planned 2022 water longitudinal study and next Cogent survey through on-going outreach and transparency around our exploration of DPR as a mechanism for stretching our reusable supplies.

Key Messages

Education was based on three primary messages:

1. Direct potable reuse (purified water) provides a safe, reliable, and sustainable drinking water source.
2. Using purified water is good for the environment.
3. Purified water is a water source that is locally controlled and may be a wise way to manage our water resources in the most cost-effective manner.

Tag line: Recycling water for a sustainable Colorado future

Elevator Speech: The PureWater Colorado Demonstration provides a mobile unit for cleaning recycled water to a level that meets or exceeds all drinking water standards. Through use of a multi-barrier purification process, we will demonstrate how to produce safe and sustainable drinking water from locally controlled resources, making this an efficient, cost-effective, and environmentally friendly water source.

Additional messages are outlined in the Strategic Outreach & Education Plan (Attachment A).

Audiences/Stakeholders

The following audiences and stakeholders were identified:

- Customers – Residential, Commercial, Industry
- Utility Board, Colorado Springs Executive Leadership, Employees
- State and Local Elected Officials
- Academic/Education Leaders
- Military
- Business Organizations
- Civic Groups
- Environmental Groups
- Water Organizations
- Medical, Public Health and Water Quality Experts

These audiences are detailed further in the Strategic Outreach and Education Plan (Attachment A). Particular effort was made to include leaders from traditionally underrepresented communities to foster diversity, equity and inclusion.

Outreach Tactics and Results

The project outreach team developed a list of more than 350 key stakeholders to whom we sent personal tour invitations. Public tours and key messages were promoted through multiple communication channels to extend our reach to customers and the region.

We worked with our Business Account Managers to share project information and send tour invitations to our small, medium and large managed accounts. Our governance group coordinated VIP tours for local and state elected officials and helped share messages through their business networks. Recognizing that employees are our best ambassadors, we made concerted effort to educate them and provide employee tours. Building internal stakeholder awareness and understanding of the technical aspect of DPR, its fit in our system, and the potential benefit to our sustainable water supply was critical to gaining acceptance.

Customers/key stakeholders

- Smart Home e-newsletters - sent to 150,000 residential customers, July 2021
- First Source e-newsletters - sent to 9,000 business customers, Sept 2021
- Connection newsletter - bill insert, sent to 200,000 residential and business customers also offered in electronic format that customers can click, Sept. 2021
- Earned media – media event August 4, 2021, 10+ local news stories, national coverage through Associated Press November 2021 (Attachment C)
- Social Media – Twitter, Facebook, Instagram - 36,254 total impressions. (Attachment C)
- Project web page on Springs Utilities website: https://www.csu.org/Pages/DirectPotableReuse.aspx
- Video storytelling – two videos produced in-house: "Advanced water recycling demonstration trailer" and "Meeting Colorado's future water supply gap"; one video produced by Associated Press "Colorado residents taste recycled water".
- Community events with soda tasting – three public events (150-Year Downtown Celebration, Buses at the Brewery, Cool Science Festival). NOTE: The coronavirus pandemic prohibited more event participation.
- Presentations – four community presentations: Brewshed Alliance Liquid Lecture series, Science on Tap, Peak Producers Luncheon, League of Women Voters.
- Public tours of mobile demonstration at JDPWRRF – conducted 50 tours with a total of 945 attendees. 85% of tour attendees opted to taste the purified water.
- Beverages – partnered with six beverage makers to create soda, beer and hard seltzer with purified water from the demonstration. Soda was served at community events. Beer and hard seltzer were served at the breweries, and coasters and other informational materials were used to convey educational messaging regarding the source of water used for beverage production.

Employees

- Insight newsletter – sent to approximately 2,000 employees/intranet feature story
- WatErgy presentation Lunch & Learn – attended by approximately 100 employees
- Employee tours of the demonstration – conducted eight employee tours

Utilities Board/City Council (same council serves in both capacities)

- Overview of project in weekly communications prior to tour

- VIP tour
- Direct Potable Reuse web page
- Daily news clips and media updates
- Recorded WatErgy presentation

DPR webpage provided project information, factsheet, FAQs and tour registration links

Collaterals

Carollo Engineers had developed the PureWater Colorado logo for the 2018 direct potable reuse project hosted by Denver Water. For consistency, we kept this logo with their permission. Carollo also designed the banners for the purification processes, which we printed and hung in the tour tent. We kept the color scheme from the PureWater Colorado logo and tied it to our own branding.

In addition to the development of the Direct Potable Reuse webpage, Springs Utilities created a Reuse fact sheet as an event and tour handout, a Frequently Asked Questions (FAQ) document, and an event display with postcard handout (Attachment D). We provided students with the Water Reuse activity booklet created by Project Wet. Colorado Springs Utilities was a contributing member to the development of this activity book.

PureWater Colorado logo with added tagline used on outreach items

We customized promotional items for giveaways to strategic audiences: large public gatherings, tour attendees and VIPs. These items were selected based on a reuse/recycle theme and included:

- Sticker
- Magnet
- Cork coaster
- Bar coaster
- Lip balm
- Jar opener
- Reusable tote bag
- Reusable straw
- Color changing stadium cup
- Pint glass

DPR outreach items

Outreach Schedule

Public outreach events began in June 2021 and concluded in December 2021. The full Outreach Schedule (Attachment E) is summarized below:

Direct Potable Reuse Outreach Summary	
50	Tours conducted
945	Tour attendees
85	% tour attendees who tasted purified water
3	Community event booths
760	Soda tastings at community events
4	Public presentations
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150 Year Celebration event purified water soda tasting

Tours

Providing tours of the PureWater Demonstration trailer helped us achieve our goal to bring awareness of DPR to the public. The tours included two components: "why" we are pursuing DPR and "what" the purification process involves. A tour guide script was developed (Attachment F) to accompany these components. Guides were trained on both parts but could choose which section they preferred to lead (Tour Guide 1 = the "why" or Tour Guide 2 = the technical aspect "what").

Tours were conducted outside under shade tents and included a walk through the trailer followed by optional purified water tasting. Due to permitting considerations, tour participants could not exceed 24 per day. Although CDPHE did not have regulatory jurisdiction over the demonstration facility, CDPHE staff were proactively advised of the treatment processes and monitoring protocol. The 24-person limit did not apply to school tours because students were not served purified water.

Participants were divided into two groups that rotated between the two guides/topics. This allowed for optimal distancing and adherence to COVID-19 precautions.

Tour Timeline

Start Time	End Time	Session Length (minutes)	Topic	Comments
0 min.	10	10	Introduction and split group	Both Tour Guide 1 & 2
10	30	20	Session 1 – Why we are considering DPR	20 minutes for each group – includes Q&A and rotation
30	50	20	Session 2 – Purification process in Demonstration trailer	20 minutes for each group – includes Q&A and rotation
50	60 min.	10	Water tasting/ promo items	Final Q&A

Total tour = 60 minutes

Posters assisted with storyline of why DPR was being considered

Water samples served as visual aids for tour attendees learning about the purification process

The entire PureWater Colorado Mobile Demonstration team was led by Kirk Olds, System Planning and Projects Managing Engineer at Colorado Springs Utilities, and included employees from many different departments with varied job titles.

PureWater Demonstration Team: back row – Ted Skroback, Birgit Landin, Jerry Duncan, Bill Hoyt, Jason Messamer, Kirk Olds, Sage Church, Gregg Roderick; front row – Shaun Thompson, Jennifer Kemp, Sarah Wilson, Donene Dillow, Jane Zook, Tara Kelley, Lisa Halcomb

Tour guides:

- Bill Hoyt (Tour Guide 1 & 2)
- Birgit Landin (Tour Guide 1)
- Donene Dillow (Tour Guide 1 & 2)
- Gregg Roderick (Tour Guide 2)
- Jane Zook (Tour Guide 1)
- Jason Messamer (Tour Guide 1)
- Jerry Duncan (Tour Guide 2)
- Kirk Olds (Tour Guide 1 & 2)
- Lisa Halcomb (Logistics Guide)
- Melissa Wetzig (Tour Guide 1)
- Sage Church (Tour Guide 2)
- Sarah Wilson (Logistics guide)
- Shaun Thompson (Tour Guide 2)
- Tara Kelley (Tour Guide 1 & 2)

Tour Scheduling

We selected the Constant Contact Event Registration platform for managing tour invitations because this tool allowed for a registration cap, included surveys and generated automatic tour reminders. Tour invitations (Attachment G) could be customized for specific groups with individualized registration links for each tour.

A total of 50 tours were conducted between June and December 2021. This included eight employee tours, 18 special request tours, 3 VIP elected officials tours, 11 school tours and 10 general public tours. Tour times were selected based on request or scheduled to coincide with

lunchtime, after hours or weekends to accommodate as many customers and interested parties as possible.

Beverages

An excellent way to introduce the public to purified water is through beverages created with purified water from the demonstration trailer. We partnered with six beverage makers to create non-alcoholic and alcoholic drinks. Free soda samples were served at community events. Beer and hard seltzer were available for purchase at the breweries. Beverages were packaged in kegs except for approximately 500 cans of beer made at the request of Carollo, who designed the label for the cans. Storybook Brewing created a special amber ale with purified water and canned the beer (photo on right).

Beer made with purified water

Thank you to these beverage makers for their support through products made with purified water from the mobile demonstration:

- The Carter Payne – fruit forward non-alcoholic sodas
- StoryBook Brewing – Gnomish Beer Goggles pale ale, Recycle Amber ale, Raspberry hard seltzer and black cherry soda
- Black Forest Brewing Company – Colorado Strong IPA
- Local Relic Artisan Ales – Pure Barleywine
- Metric Brewing – PureWater lager
- Crazy Mountain Brewery – brewing in first quarter 2022

Feedback

Colorado Springs Utilities fielded a Customer Insights survey prior to the DPR Demonstration that encompassed a wide variety of water topics to inform our nonpotable planning. We learned from this survey that a majority of customers were not ready to accept purified water as a drinking water source.

The education goals of the PureWater Demonstration were to increase awareness of DPR as a viable mechanism for stretching our reusable supplies. Thus, the tour registration included a limited pre-tour survey and post-tour survey to evaluate awareness. The following results provide qualitative data from a self-selected, highly engaged group of respondents. We estimate that 20% of tour participants were general public customers. The remaining tour attendees were comprised of water professionals, scientists/engineers or utilities employees.

The tour survey data (Attachment H) shows that an increase in awareness and knowledge regarding DPR was achieved:

How knowledgeable are you with purifying recycled water?		
Level of knowledge	**Pre Tour (%)**	**Post Tour (%)**
Not at All	27.2	0
Somewhat knowledgeable	34.6	4.8
Moderately knowledgeable	24.9	42.4
Very knowledgeable	13.3	52.8

Pre tour responses	309
Post tour responses	125

The pre/post DPR demonstration tour survey included a free form response. Analysis of responses was conducted by University of Colorado, Colorado Springs (UCCS) Professor Sean Williams and concluded the following general lessons (Attachment H):

- The staff who facilitated the tours did a good job
- People acknowledged the importance of DPR for the future
- Some room for improvement existed in delivering the tours
- Many people tasted the samples as evidence of their acceptance
- A few people were inspired by the tours.

Conclusion

Colorado Springs Utilities conducted a successful direct potable reuse outreach and education project that met our goals as stated in our strategic plan. We fostered meaningful dialogue with stakeholders and influencers about potential future DPR use in Colorado Springs that increased awareness and began building acceptance for this reuse alternative. We increased community awareness and understanding of the DPR purification process to preserve our customers' trust in our water systems and the drinking water we deliver to their taps. In seven months, we conducted presentations, events, tours and a media/mass communications push resulting in over 1,800 in-person touch points and a media reach in the tens of thousands. Verbal feedback and survey results indicate that our customers have an increased understanding of DPR and the need for it in our community. The outreach program created a solid foundation for a possible future public acceptance campaign.

Outreach Resource Acknowledgements

We would like to acknowledge the resources and insights provided by Denver Water from the 2018 DPR demonstration project they hosted on behalf of utilities across Colorado, as well as Carollo Engineers for their assistance with creating branding, a logo, banner designs, trailer wrap, beverage label and review of key messages and the tour guide script.

We thank WateReuse for providing permission to use their purification process animations in our videos. In addition, outreach framework, messaging and terminology development was influenced by WateReuse guidance documents, specifically "Helping People Understand Potable Reuse: A Flexible Communication Plan".

Thank you to the City of San Diego and Katz and Associates for sharing their DPR video scripts and educational best practices.

We appreciate the support of Professor Sean Williams with UCCS for bringing his students on the DPR tour, surveying them for unique insights after the tour, and providing analysis of all post tour attendee responses.

We would like to acknowledge the time and expertise of our video interviewees: Kirk Olds, Colorado Springs Utilities; Tzahi Cath, School of Mines; John Rehring, Carollo Engineers; Tyson Ingels and Brandi Honeycutt, Colorado Department of Public Health and Environment.

Finally, we would like to thank the Colorado Springs Utilities management for supporting the direct potable reuse demonstration and the Colorado Water Conservation Board for awarding the grant to conduct this project.

Kevin Reidy with the Colorado Water Conservation Board (CWCB) enjoys a drink of refreshing purified water. This demonstration was generously supported by a grant from the CWCB as part of its Colorado Water Plan programs to identify and implement sustainable water supply solutions across the state.

Attachment A

Strategic Outreach and Education Plan

STRATEGIC OUTREACH AND EDUCATION PLAN

PureWater Colorado Direct Potable Reuse Mobile Demonstration – Recycling water for a sustainable Colorado future

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STRATEGIC OUTREACH AND EDUCATION PLAN

PureWater Colorado Direct Potable Reuse Mobile Demonstration – Recycling water for a sustainable Colorado future

Background

Colorado Springs Utilities has received a grant from the Colorado Water Conservation Board for a direct potable reuse demonstration project. In this project, Utilities will collaborate with the Colorado School of Mines to help advance the science and regulatory framework for direct potable reuse in Colorado. Colorado Springs Utilities has been a statewide leader in water reuse, pioneering the use of treated wastewater for irrigation in the early 1960s, reusing about 11% of reclaimed water through their nonpotable system, and reusing 20% water supply through exchanges. This research and demonstration of treatment processes will help raise awareness and educate a broad range of stakeholders about the safety and value of purified water.

Under Colorado water law, water providers have the ability to reuse source water when it is considered non-native to its basin. Water providers across Colorado have the responsibility to plan for a sustainable water future. Potable reuse is becoming more prominent across the country, particularly in areas facing the impacts of climate change, growing populations and potential water supply shortages. While there are hurdles associated with potable reuse, potable reuse expands the ways we can reuse our water and manage our supplies.

Project Description

Colorado Springs Utilities is collaborating with Colorado School of Mines' research center, WE^{2}ST Water Technology Hub, on this demonstration of direct potable reuse, also known as PureWater Colorado or PureWater. This partnership promotes research and the development of treatment and reuse of water in energy- and water-intensive industries. Colorado Springs Utilities, Colorado School of Mines and Carollo Engineers will construct a mobile treatment trailer to be operated initially in Colorado Springs at the J.D. Phillips Water Resource Recovery Facility (JDPWRRF). After completion of the operational period at the JDPWRRF, the Colorado School of Mines will manage the mobile unit and make it available as a continuing resource for research.

The PureWater Colorado Direct Potable Reuse Mobile Demonstration project will use an innovative, advanced water purification process train without reverse osmosis to produce safe, high-quality drinking water. The project is designed to test and demonstrate a potential, long-term reuse option for water in our service territory and across Colorado.

The PureWater Colorado treatment process will include: ozonation, biofiltration, micro/ultrafiltration, granular activated carbon, ultraviolet light/advanced oxidation, and chlorination. The PureWater Colorado Direct Potable Reuse Mobile Demonstration project goals are to document elimination of pathogens, near-total removal of trace organic constituents and the production of high-quality water that is protective of public health.

This demonstration project is expected to begin construction in Q4 2020 at Colorado School of Mines, be transported to Colorado Springs in April 2021 and remain operational at the JD Phillips Water Resource Recovery Facility into 2022. Some of the water produced may be used to brew beer and make beverages to help raise awareness and to show how this water purification process operates. The demonstration will help build confidence about the safety of this water source. Small tour groups will have an opportunity to sample the PureWater on-site. Beverages made from this purified water can be available at public outreach and education events.

Partnerships with equipment vendors and other water service providers were developed to share in overall project costs and maximize the education and engagement opportunities.

Public Education and Outreach

Public engagement is critical to the success of potable reuse projects. As water stressors continue to grow and potable reuse expands, it is necessary to provide transparent communication, build customer and stakeholder confidence, and address public concerns, all of which require a comprehensive program of public involvement and education.

As part of this education, customers and stakeholders need to understand the context of water supply and demand in our local community, state and region. It is essential to inform them of where their water comes from and why we need alternative water solutions. It also is crucial to expand their understanding about how water is used, treated, reclaimed and then discharged into rivers and streams for downstream use or reused locally. Inclusion of the natural water cycle as a part of the conversation is important: all water is used and reused, every day.

Understanding direct potable reuse in this larger context will improve public understanding of the feasibility, viability and opportunity to support our growing community long term.

Outreach Goals

1. Implement a proactive and sustained public education and outreach process.
2. Foster meaningful dialogue with stakeholders and influencers.
3. Build community understanding and support for possible, future PureWater implementation.

Outreach Objectives

1. Colorado Springs Utilities is participating in this project to explore the economic and environmental option of reusing our transmountain water supplies through direct potable reuse. Expanding the way we reuse our transmountain supplies will maximize the water supplies we do have in our long-term future.
2. Begin the conversation about direct potable reuse in Colorado Springs and foster public understanding to help build public trust, awareness and confidence in this reuse alternative.
3. Assure our customers that direct potable reuse water is being researched as a potential long-term solution that may be implemented within the next 20 years.
4. Demonstrate the efficiency, safety and quality of direct potable reuse water.
    a. Show that potable reuse is a viable solution in Colorado, as directed in Colorado's Water Plan and Utilities' Integrated Water Resource Plan.
    b. PureWater is not a new supply – it is another mechanism to make efficient use of our reusable water supply.
    c. Demonstrate how Utilities will approach treatment to ensure that water produced is safe to drink.
5. Affirm all project partners as forward-thinking, responsible entities concerned about Colorado's water supply and have consistent messaging with all demonstration project partners and aligned with other Utilities water resource initiatives (regionalization, water waste, etc.).
6. Preserve customers' understanding of our safe potable water treatment practices.

Target Audiences

STATE AND LOCAL ELECTED OFFICIALS

- Colorado Springs Utilities Board
- El Paso County Commissioners
- Colorado Springs Mayor and Executive Leadership
- Local elected officials
- State lawmakers

WATER ORGANIZATIONS

- WateReuse Colorado (partner)
- Colorado Water Conservation Board (grantor)
- Castle Rock Water
- Denver Water
- Aurora Water
- Plum Creek Water Reclamation Authority
- Regional Water Providers (Security, Fountain, Tri-lakes, Donala, Manitou Springs, Cherokee Water, Stratmoor, etc.)
- RMSAWWA
- Water Education Colorado
- Water Research Foundation
- West Slope Groups (TBD)
- Colorado Water Resources Review Committee
- Ark Basin Roundtable members

ACADEMIC/EDUCATION LEADERS

- Colorado College
- University of Colorado - Colorado Springs (UCCS)
- United States Air Force Academy (USAFA)

- Pikes Peak Community College (PPCC)
- Local School Districts – D-2, D-3, D-8, D-11, D-12, D-14, D-20, D-49

INDUSTRY PROFESSIONALS

- TBD

BUSINESS ORGANIZATIONS

- Colorado Springs Chamber/EDC
- Restaurant Association
- Downtown Partnership
- Development community
- Water Engineering Companies

CIVIC GROUPS

- CONO
- Community Associations

MILITARY

- Fort Carson
- Peterson Air Force Base
- Schriever Air Force Base
- United States Air Force Academy

ENVIRONMENTAL GROUPS

- Green Cities Coalition
- Western Resource Advocates
- Water Sentinels
- Sierra Club
- Alliance for Water Efficiency

MEDICAL, PUBLIC HEALTH AND WATER QUALITY EXPERTS

- Colorado Department of Public Health and Environment
- El Paso County Health Department
- Medical professionals
- PPACG (Water Quality group)

MEDIA

- KOAA
- KKTV
- KRDO
- FOX 21
- Gazette
- Independent

MULTICULTURAL LEADERS AND GROUPS

- TBD

BEVERAGE CHAMPIONS

- Brewshed Alliance
- Bristol Brewery – will make beer with purified water
- Crazy Mountain Brewery – will make hard seltzer with purified water
- Black Forest Brewing Company – will make hard seltzer with purified water
- The Carter Payne – will make soda with purified water

TOP PRIORITY TOUR GROUPS IDENTIFIED*

- State Legislature's Water Resources Review Committee
- CDPHE Water Regulatory Group
- CWCB Board + Key Staff
- Municipal Water Managers
- AWWA/WRF/Association Leaders
- Bureau of Reclamation Treatment Engineering Group
- Partners/Sponsors
- "University Day"
- Press/Media Day"
- WQ Control Commissioners

- Utilities Executive Management
- Utilities Employees
- City of Colorado Springs; Local Economic Development
- County/Other Local Government
- Utilities Board/UPAC
- Beverage Producers
- Select Water Tour Participants

*Tours held at the J.D. Phillips Water Resource Recovery Facility while the treatment trailer is in production. Audiences will be combined; non-transferrable, invite only, established weekly tour times/days and invitees may choose from a few different dates for their convenience. Must have registration process & assure no more than 24 attend/taste test the water. *

Key Messages

SHORTENED PROJECT TITLE FOR GENERAL PUBLIC:

PureWater Colorado Demonstration – Recycling water for a sustainable Colorado future

Top 3 Key Messages:

1. **Direct potable reuse (purified water) provides a safe, reliable, and sustainable drinking water source.**
2. **Using purified water is good for the environment.**
3. **Purified water is a water source that is locally controlled and may be a wise way to manage our water resources in the most cost-effective manner.**

Elevator Speech: The PureWater Colorado Demonstration provides a mobile unit for cleaning recycled water to a level that meets or exceeds all drinking water standards. Through use of a multi-barrier purification process, we will demonstrate how to produce safe and sustainable drinking water from locally controlled resources, making this an efficient, cost-effective and environmentally friendly water source.

Additional Messages – Project Overview:

- **General Public** - Colorado Springs Utilities, Colorado School of Mines, and Carollo Engineers are partnering on the Pure Water Colorado Mobile Demonstration, which takes recycled water that's been used in homes and businesses and through a multi-step treatment and purification process produces safe water that meets or exceeds all drinking water standards (purified water). The PureWater Colorado Direct Potable Reuse Mobile Demonstration is intended to show how water providers in Colorado can use existing technology to maximize current supplies and have another way to produce safe, reliable, and sustainable drinking water.

- **Colorado Springs Utilities employees** – Advanced water purification, as demonstrated in the PureWater Colorado Direct Potable Reuse Mobile Demonstration, is safe for

people and the environment. Colorado Springs Utilities is always preparing for the future and expects this treatment process to be part of our water resource management practices 20+ years from now.

- The PureWater Colorado Direct Potable Reuse Mobile Demonstration involves a partnership with the Colorado School of Mines and Carollo Engineers. The demonstration will be constructed in a mobile unit for a short-term demonstration which will be located at the J.D. Phillips Water Resource Recovery Facility. Colorado Springs Utilities plans to conduct tours of the PureWater Colorado Mobile Demonstration treatment trailer and use the purified water to produce a limited supply of beverages (beer, hard seltzer & soda) for tasting.
- Other entities supporting the project with monies and/or in-kind support include Denver Water, Castle Rock Water, Plum Creek Water Reclamation Authority and WateReuse Colorado.

- **State lawmakers and regulators** – The PureWater Colorado Direct Potable Reuse Mobile Demonstration represents a viable option for managing water in Colorado's semi-arid climate. The Colorado Department of Public Health and Environment (CDPHE) recognizes the need to include direct potable water reuse as a future water source for drinking water, consistent with recommendations contained in the Colorado Water Plan, and is developing regulations.

- **Water industry leaders and influencers** – Colorado water providers are testing innovative technologies to improve use of reusable water sources that can potentially address gaps in water supply for some providers and improve efficiency of water operations for others. The PureWater Colorado Direct Potable Reuse Mobile Demonstration will provide useful information to reinforce the proven viability of this water management tool.

Additional Messages – Purpose

- Colorado Springs is the largest city in Colorado that is not located on a major water source. Delivering water to our community is one of our biggest challenges and successes.
- Our planners have always looked ahead – 50 years in advance – to ensure our community has the water it needs when it needs it.
- Water reuse has been identified in the State of Colorado's Water Plan and Utilities' Integrated Water Resource Plan (IWRP) as an important tool in closing the future supply-demand gap.
- Colorado Springs Utilities currently reuses 100% of our reusable water sources. Purified water technology would give us another efficient, environmentally responsible way to reuse water and meet current and future water demands.
- Prolonged periods of drought and climate variability require our water supply planners to look at all available water management strategies. Recycling water is a growing trend

locally, nationally and internationally, and one which water providers in Colorado are researching.

- With water resources in the United States, especially the western U.S., becoming more constrained, purified water – the process which recycles water by purifying it to drinking water standards – can provide a locally controlled option for managing our supplies.
- The Colorado Water Conservation Board has awarded Colorado Springs Utilities a grant to create a mobile treatment unit to showcase treatment processes water providers could use to purify reclaimed water to drinking water standards (PureWater Colorado Direct Potable Reuse Mobile Demonstration).
- Colorado Springs Utilities has partnered with water quality experts and engineers at the Colorado School of Mines and Carollo Engineers to develop the portable treatment unit.
- The PureWater Colorado Direct Potable Reuse Mobile Demonstration will demonstrate an advanced purified water treatment process to educate the public on direct potable water reuse as a new and innovative way of providing safe, reliable and sustainable water to our community long before we implement such technologies on a larger scale. Since this treatment system is mobile, water providers across the state can conduct similar demonstrations at their facilities. This project starts at Colorado Springs Utilities, but will have a state-wide benefit in years to come.
- The PureWater Colorado Direct Potable Reuse Mobile Demonstration will allow Colorado Springs Utilities to better understand the viability of utilizing purified water technologies to meet our community's future water needs by obtaining valuable information on resource management, financial, and environmental benefits of this solution for our customers and community.
- Colorado Department of Public Health and Environment is working on statewide direct potable reuse regulations; demonstration projects such as this PureWater Colorado Direct Potable Reuse Mobile Demonstration can provide valuable information to support the regulatory process.
- While we do not believe direct potable reuse (purified water) in Colorado Springs is imminent, this project allows us to better analyze potential financial and environmental impacts, including:
    - Saving on pumping costs
    - Quality and cost of treating tertiary (regulation 84) reclaimed water
    - Potential water losses compared to other reuse options, such as system or transit loss
    - Downstream river and aquifer water quality and management
- Purified water:
    - Uses proven technology to treat reclaimed water and provide a safe water source.
    - Uses multiple treatment barriers to remove pollutants from water.
    - Is sustainable water management that is a locally controlled and is drought and wildfire resilient.
    - For many water providers, it would allow them to optimize the use of water rights.

Additional Messages – Sustainable Supply

- As a part of responsible water planning, Colorado Springs Utilities is always exploring innovative ways to stretch our valuable water supplies.
- Purified water is safe, high-quality drinking water that Colorado Springs Utilities, along with many Colorado water providers, is investigating as a potential option in our long-term future.
- Colorado Springs pioneered the recycling of treated wastewater for non-potable uses, such as irrigating golf courses and parks, by opening one of the first reuse systems in the country in the early 1960s. Non-potable water meets levels deemed safe for non-drinking purposes whereas purified water would be treated to drinking water standards and used for potable purposes. Today, approximately 10 to 15 percent of our water demands are met with non-potable water. We are able to produce up to 10 million gallons of non-potable water per day.
- Colorado Springs Utilities currently reuses the water we are legally allowed to through exchanges, our non-potable system, ground water augmentation and water sharing/leases. We anticipate that in our long-term future, purified water will be an additional mechanism to allow us to fully leverage the supplies we have.
- Previous testing in Colorado, California, Texas, and Florida has already proven the ability of existing technologies to purify recycled water to potable standards. While we closely monitor the purified water quality produced by the PureWater Colorado system, we are focused more on the statewide educational benefits of the demonstration and how it supports the wise use of water and responsible water planning in the arid Mountain West.
- Purified water is not a new supply – rather it is another mechanism to make efficient use of our water supply. Recycling water for drinking water is being implemented in other states and was part of a 2018 demonstration project hosted by Denver Water and other Front Range water providers on behalf of Colorado's water utilities and WateReuse Colorado.

Additional Messages – Technology/ Safety

- Purifying water is a "multi-barrier process" designed to remove pollutants from water.
- Proven engineered treatment processes are used to purify water to a level that is safe to drink.
- The purified water will be routinely tested, including utilizing real time online sensor technology to confirm water quality and that the treatment processes are functioning properly. Water quality data will be provided to the Colorado Department of Public Health and Environment.
- The purified water will comply with or exceed state and federal drinking water standards.
- The advanced purification process produces water that is purer than most bottled waters (source: WateReuse Association).

- Purified water is currently used to supplement drinking water in many communities such as Big Spring, TX and Windhoek, Namibia. To date, no adverse human health effects have been documented from the augmentation of drinking water supplies with purified water (source: WateReuse Association).
- The amount of water on the planet does not change - through the hydrological cycle all water has been used and reused since the beginning of time. Purified water processes replicate what happens in nature, but in an engineered and closely monitored system.
- If your community is downstream from another community (as is the case for most of the United States), you are likely reusing water. Likewise, communities downstream from you are likely reusing your water (known as de facto water reuse).

Frequently Asked Questions

Key FAQs

1. **What is direct potable reuse?**

The process of using treated wastewater for drinking water is called potable water reuse. In Direct Potable Reuse (DPR), reclaimed water is first treated at a water reclamation facility, then continues to an advanced drinking water treatment plant and finally is distributed to customers. This water is also known as purified water and meets all state and federal drinking water quality regulations.

2. **Where does it fit in our water supply portfolio?**

Colorado Springs Utilities collects surface water from three river basins (Arkansas, Colorado and South Platte) and transports a majority of it from 100 miles away in order to meet the water needs of our community. We currently reuse the water we are legally allowed to through exchanges, our non-potable system, ground water augmentation and water sharing/leases. We anticipate that in our long-term future, purified water will be an additional mechanism for leveraging the supplies we have.

3. **Why is the potable reuse project needed?**

Colorado Springs is the largest city in Colorado that is not located on a major water source. Delivering water to our community is one of our biggest challenges and successes. Our planners have always looked ahead – 50 years in advance – to ensure our community has the water it needs when it needs it. Prolonged periods of drought and climate variability require our water supply planners to look at all available water management strategies.

The PureWater Colorado demonstration and advanced purified water technology fits with our commitment to environmental stewardship and reuse of our limited water supplies. What we learn will help us continue to plan for and develop cost-effective, reliable, high-quality water for our customers.

4. **What purpose will it serve?**

Purified water is a sustainable water source that is locally controlled and may be a wise way to manage our water resources in the most cost-effective manner.

Purified water technology would provide Colorado Springs Utilities another efficient, cost effective and environmentally responsible means to ensure the continued ability to reuse 100% of our reusable water sources to meet future water demands.

5. **How safe is the water?**

Purified water is safe for human consumption. Multiple layers of advanced treatment technologies ensure that the purified water created in this treatment demonstration meets all state and federal drinking water regulations. According to studies conducted by the WateReuse Association, purified water is cleaner than bottled water and no adverse human health effects have been documented from the augmentation of drinking water supplies with purified water.

6. **How will it be monitored to ensure safety?**

Purified water will be routinely tested, including grab samples and real time online sensor technology to confirm acceptable water quality. The results of the testing will be provided to the Colorado Department of Public Health and Environment, the regulatory agency tasked with ensuring safety for human consumption, to document that the purified water complies with or exceeds state and federal drinking water standards.

7. **How much will it cost?**

Currently this is a long-term, potential solution, therefore it is impractical to estimate how this solution would impact water rates for our customers. The economic viability of the treatment technology utilized for purified water will continue to be evaluated against costs for pumping and treating water, especially as regulations become stricter and costs for water go up.

8. **When will it be implemented?**

Evaluating the use of purified water is part of our 20-year planning horizon. The potential use of purified water will be monitored over time as the technology becomes more cost effective, regulations change, and the City's water demand grows.

Additional FAQs

What is the PureWater Colorado Direct Potable Reuse Mobile Demonstration?

Colorado Springs Utilities, Colorado School of Mines, and Carollo Engineers are partnering on the PureWater Colorado Direct Potable Reuse Mobile Demonstration, which takes recycled water that's been used in homes and businesses, through a multi-step purification process to produce water that meets or exceeds all drinking water standards. This project will demonstrate how Colorado water providers can use existing technology to reuse water to provide safe, reliable and sustainable drinking water.

Why is Utilities conducting a purified water demonstration?

The PureWater Colorado Demonstration utilizes purified water technology and fits with our commitment to environmental stewardship and reuse of our limited water supplies. What we learn will help us continue to plan for and develop cost-effective, reliable, high-quality water for our customers.

What is direct potable reuse?

The process of using treated wastewater for drinking water is called potable water reuse. In Direct Potable Reuse (DPR), reclaimed water is first treated at a water reclamation facility, then continues to an advanced drinking water treatment plant and finally is distributed to customers. This water is also known as purified water and meets all state and federal drinking water quality regulations.

What is reclaimed water?

Historically, reclaimed water (also called recycled water) is wastewater that is treated to a suitable standard for non-potable purposes such as irrigation, commercial or industrial use. However, with more advanced treatment, reclaimed water can also be treated to drinking water quality.

What is purified water?

Purified water, also known as direct potable reuse, is a way to recycle water using a technique where reclaimed water is purified to drinking water standards.

How is purified water made?

Purifying water is a "multi-barrier treatment process" designed to remove pathogens and pollutants from water. Proven engineered treatment processes are used to purify water to a level that is safe to drink.

The PureWater processes include Ozonation, Biofiltration, Ultrafiltration (UF), Granular Activated Carbon (GAC), Ultraviolet (UV) Disinfection and Chlorine.

Step 1: **Ozonation** 	Ozone is a gas produced by subjecting oxygen molecules to high electrical voltage. This strong oxidant degrades organic matter and pathogens, then breaks down into dissolved oxygen.
Step 2: **Biofiltration** 	Water flows through carbon filters covered with beneficial aerobic bacteria that thrive in the presence of oxygen. This process removes organic matter and trace chemicals in the water.
Step 3: **Microfiltration** 	The water is then pushed through membranes with tiny pores to filter out suspended solids, bacteria, and protozoa. Membrane pores are 100x smaller than the width of a human hair!
Step 4: **Granular Activated Carbon** 	During this step, water flows through activated carbon granules like the filters in Step 2 or a kitchen sink filter. The large surface area of the activated carbon absorbs additional organics and trace chemicals.
Step 5: **UV/Advanced Oxidation** 	This step generates high energy ultraviolet light for disinfection. When combined with hydrogen peroxide, it can create high energy radicals that further inactivate pathogens and degrade trace chemicals.
Step 6: **Chlorination** 	Dosing the water with chlorine at the end of the treatment process further inactivates pathogens and provides a residual disinfectant to ensure the water remains safe to drink on its way to homes and businesses.

How does the purified water treatment process compare to the water treatment process currently used at the Water Treatment Plants?

Our existing water treatment plants use a traditional water cleaning process that includes four main steps: coagulation/flocculation, sedimentation, filtration and disinfection. The PureWater Colorado Direct Potable Reuse Mobile Demonstration project uses an innovative, 6-step advanced water purification process without reverse osmosis to produce safe, high-quality drinking water. These steps include: ozonation, biofiltration, micro/ultrafiltration, granular activated carbon, ultraviolet light/advanced oxidation, and chlorination resulting in the

elimination of pathogens, near-total removal of trace organic constituents and the production of high-quality water that is protective of public health.

Is purified water safe for consumption?

Yes. Multiple layers of advanced treatment technologies ensure that the purified water created in this treatment demonstration meets all state and federal drinking water regulations and is suitable for human consumption. Purified water will be routinely tested, including grab samples and real time online sensor technology to confirm acceptable water quality. The results of the testing will be provided to the Colorado Department of Public Health and Environment, the regulatory agency tasked with ensuring safety for human consumption, to document that the purified water complies with or exceeds state and federal drinking water standards. According to studies conducted by the WateReuse Association, purified water is cleaner than bottled water and no adverse human health effects have been documented from the augmentation of drinking water supplies with purified water.

Why use purified water?

Purified water is a sustainable, locally controlled water supply that helps communities get the most benefit out of their existing water supplies and may insulate against water shortages due to climate variability. It helps reduce the need to develop costly new water supplies from distant sources.

Where is the purified water produced by the mobile demonstration project going?

The mobile demonstration trailer can produce approximately 300 gallons per hour. Water that is going to be used for consumption will be discharged to totes and held until laboratory analysis has been completed to ensure it meets drinking water criteria. Any water that is not intended to be used for beverage production or tastings will be put back into the water resource recovery process.

Who else has or is conducting this type of project?

Several communities in Colorado are actively involved in the outreach and research around purified water including Denver Water, Aurora Water, and Castle Rock Water. Full-scale potable reuse systems are operational in Texas and California, and similar demonstration or "pilot" systems have been operated at numerous sites around the country. The PureWater Colorado mobile demonstration system is similar in many ways to the direct potable reuse system that was operated in Denver in early 2018.

How is direct potable reuse regulated?

Currently, neither the Environmental Protection Agency (EPA) nor the Colorado Department of Public Health and Environment (CDPHE) have direct potable reuse regulations, but they both offer guidelines. Utilities is an active member in the statewide stakeholder group working to

support a regulation and CDPHE has committed resources to develop a regulatory framework potentially as early as 2022.

What is the path forward for regulatory approval of direct potable reuse in Colorado and how do demonstration projects like this contribute to this effort?

Direct potable reuse (also known as purified water) has not received regulatory approval in Colorado. The Colorado Department of Public Health and Environment is responsible for establishing a regulation in Colorado. Projects like this PureWater Colorado mobile demonstration can support state regulators as they continue to pursue regulatory development.

What about this PureWater Colorado Direct Potable Reuse Mobile Demonstration Project is different related to research and regulations?

Unlike past demonstration projects where a temporary treatment system has been constructed, used for a limited time, then dismantled after the project is complete, Colorado Springs Utilities and the Colorado School of Mines will construct an enduring mobile treatment trailer, available for follow-on projects, demonstrations and research across Colorado. The treatment train within the trailer will be flexible enough to test different process equipment, vary operational parameters, and allow for varied treatment options.

Is purified water new?

No, purified water is not a new concept. Although it has not yet been widely adopted, purified water (also known as direct potable reuse) has been used since 1968 in Windhoek, Namibia and since 2013 in Big Spring, Texas.

Why isn't purified water being used more widely?

Purified water has not been widely adopted because, thus far, most communities have been able to maintain an adequate water supply without using direct potable reuse. In the past, high treatment costs and public acceptance have also played a role. However, both factors are changing. With growing global population and changing climates, more cities are investigating purified water as a way to ensure responsible use and reuse of water for their residents. In addition, stricter regulations on wastewater discharges to the environment are making it more cost effective to treat reclaimed water for potable use.

Do we have to save water if we incorporate purified water in our water supply portfolio?

Yes, water conservation and the efficient use of water have always been and will continue to be a vital part of managing our water supply even if purified water is added to our water supply portfolio.

Does purified water help us reduce our dependency on Colorado River water?

Colorado Springs Utilities will continue to rely on our Colorado River water supplies. Colorado River water is a source that Colorado Springs Utilities is allowed to fully consume and we already fully reuse this supply today through exchanges. Using purified water is a mechanism that could provide more efficient reuse of the Colorado River supplies in the future.

How does purified water affect our return flows to Fountain Creek and our downstream commitments?

Water supplies we use from transmountain basins are fully consumed. Through the use of purified water, less return flows may be released to Fountain Creek for exchange downstream in the future.

Is uncontrolled growth the reason we need to recycle water?

We live in a semi-arid climate and have experienced extended drought across the state for decades. Exploring different ways to be “wise users” of water just makes sense for our community. Reuse is identified in our long-term planning as part of our balanced water portfolio to create a sustainable water future for anticipated growth. We don’t regulate growth, but we are obligated to serve the needs of our community.

We currently use recycled water in our non-potable system and are exploring different mechanisms for incorporating it into our potable system in the future. Direct Potable Reuse is one example of how it could be incorporated. Direct Potable Reuse is a safe, reliable and sustainable drinking water resource that could help us maximize our reusable supplies.

Why pursue regional water and wastewater services if we’re planning to use purified water for our customers?

A critical component to any potential regional water and wastewater service will be having mechanisms for regional water providers to reuse their water. Many smaller districts do not have tools to reuse the groundwater supplies they currently rely on. Establishing purified water or other reuse systems promotes sustainability and resiliency. Pursuing the infrastructure and/or technology together as a region would be a benefit to our customers as well through cost-sharing and cost recovery.

If purified water is added to our system, this water will be provided to our customers and any regional partners collaborating on the system.

Terminology

Purified water – is recycled water treated with advanced technology to a purified state that meets all federal and state drinking water standards and is suitable for human consumption.

Direct Potable Reuse (DPR) - is reclaimed (recycled) wastewater that has been treated to an appropriate level for potable use. DPR consists of introducing highly purified recycled water either directly into the water supply that feeds a water treatment plant, or directly into the distribution system.

Indirect Potable Reuse (IPR) - In IPR, highly purified wastewater is introduced into an environmental buffer before being reused for potable purposes. The buffer may be a groundwater aquifer or surface water reservoir.

Non-potable water is water that is not of drinking quality, but may still be used for many other purposes, such as irrigation and industrial uses, depending on its quality.

Potable Reuse refers to water that meets all federal and state drinking water standards and is suitable for human consumption. Potable reuse may be accomplished by indirect potable reuse (IPR) or direct potable reuse (DPR).

Potable water - The term “potable” water means “suitable for human consumption.”

Reused/Recycled/Reclaimed water is water used more than one time before it passes back into the natural water cycle. It is wastewater which has been treated or purified to a level that allows for reuse for beneficial purposes. Water reuse, including potable reuse, happens naturally all over our planet — on rivers and water bodies everywhere.

The terms “potable reuse”, “purified water” and “PureWater” may be used interchangeably as part of the PureWater Colorado Direct Potable Reuse Mobile Demonstration.

Project Tactics

Roles:

System Projects and Planning Division – Executor of project/ assigns roles and responsibilities

Water Resources and Demand Management – Collaborative support for water strategy and water community interactions

Public Affairs – Implementation of communications and public relations

**See related PureWater Colorado Demonstration Public Affairs Plan for detailed communications tactics.*

Positioning, Messaging, Branding and Logo: The positioning and messaging is designed to meet various stakeholder interests and concerns and position PureWater as a potential reuse solution for Utilities in our long-term future. Utilities may leverage what already has been done by Carollo/Denver Water and use the PureWater Colorado brand and logo.

Fact Sheets, FAQs: Collateral pieces to support the positioning and messaging. Best to leverage, where possible, what Carollo/Denver Water already has done.

Tour Brochure, Infographics, Signage and Demonstration Video: These components will support the demonstration project and educate customers. They may be used both online and are important for the project demonstration tours. Utilities can leverage the work of Carollo/Denver Water.

Media Coverage: Managed by CWC according to positioning, messaging and issues concerns.

Communication Training: Important that all SMEs and staff connected with this project receive the same training and use the same messaging throughout the project effort.

Articles in Trade Publications, Speaking Engagements/Briefings: These will be designed to demonstrate Utilities forward-thinking efforts, environmental stewardship and technological advancement.

Stakeholder and Customer Surveys/Discussions: The objective of these efforts are to identify/benchmark what stakeholders/customers understand and believe, tailor messages and education around their key concerns and information needs and provide tours, materials and demonstration programs that promote wider understanding and acceptance of PureWater. Discussions should address current beliefs such as: don't trust filtering process/system, it's unhealthy/unsafe to drink; just don't want to/feel comfortable drinking and don't want to drink "sewer water."

Invite-Only Tours*: The demonstration tours are the "meat" of the outreach effort and target only key decision makers and stakeholders. The tour "window" is from July-Sept so there must be careful management of the audience and events to best meet the project objectives.

* A condition for the PureWater Colorado demonstration project is that we ensure we do not meet the definition of a Public Water System. This is important because if we fall under the definition of a PWS the project must then comply with the Colorado Primary Drinking Water Regulations (regulation 11).

Beverage Partnerships and Events*: TBD

*The use of the water as an ingredient, e.g. beer, soda, is regulated as a food not drinking water. (5 CCR 1002-11 §11.3(60) "Public Water System" provisions = serving an average of at least 25 individuals daily at least 60 days/yr.

WateReuse Symposium: The focal "end game" of this project is to present the work and its technological advancements at this trade symposium held in Denver (Sept 13-16, 2020). Due to the 2020 pandemic this project goal could not be completed. Since the Symposium will not be in Denver again during the Demonstration operational period the project public outreach goals have been slightly broadened to take advantage of the ability to operate the Demonstration for an extended period.

Demonstration Trailer at Family Event(s): The best general outreach for this project are Colorado Springs family events where the interest in innovation and science are high. These events are the What If Festival (September) and the Cool Science Festival (October).

School Water Education Programs: Public outreach for PureWater messaging can be seamlessly incorporated into the existing Water Wise 6th grade program and Water Quality high school program that connects with approximately 3,000 students and their families per year. The trailer may also be transported to select high schools for engineering day events and environmental club activities.

Tactics Timeline

SEE CHART BELOW

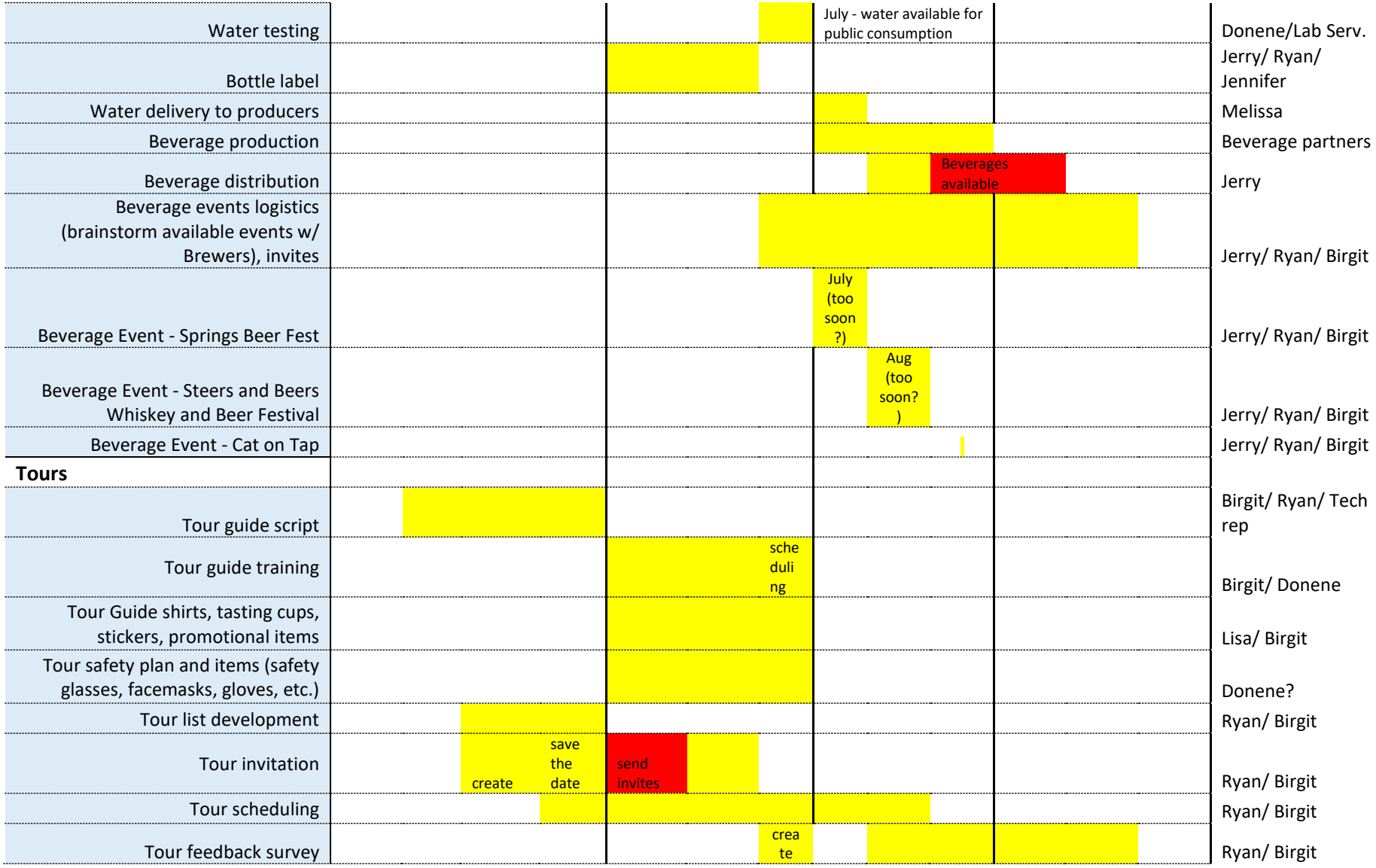
Direct Potable Reuse Education & Outreach
2021

12/21/2020

	Timeframe	In Progress	Completed	Intense effort

	Dec-20	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Owner
***Outreach Goals**: 1. Implement a proactive and sustained public education and outreach process. 2. Foster meaningful dialogue with stakeholders and influencers. 3. Build community understanding and support for possible, future PureWater implementation.*														
Trailer Operation	Trailer construction at School of Mines				Commissioning at JDP		water testing	fully operational onsite			mobile			
Public Materials														
Strategic Outreach Plan														Ryan/ Birgit
Key Messages														Ryan/ team
FAQs														Ryan/ Jerry
Public Affairs Plan														Ryan/ Jennifer
Fact sheet/ Brochure														Jerry/ Jennifer
Trailer signage														Carrollo/ Jennifer
Posters for community events														Jennifer/ Birgit
Swag - glasses, hats, t-shirts					TBD									Lisa/ Jennifer
Public hand-outs, stickers, collateral														Lisa/ Jennifer
Info booth														Jennifer/ Ryan
Media briefing						before Urban Water Cycle Tour								Jennifer/Kirk

Industry Publication			TBD		Donene/ Kirk
Technical briefings for public and stakeholders		TBD	TBD	TBD	Donene/ Kirk
Watergy employee presentation			TBD		Donene/ Kirk
Internal communications - Insights, blog, etc.		TBD	TBD	TBD	Jennifer
Public communications - socila media, Connections, Home Smart, etc.			TBD		Jennifer
WateReuse Symposium presentation					TBD
Videos					
Video 1 - The WHAT of DPR					
Video 1 - storyline, content & script					Jennifer/ Ted
Video 1 - collect construction footage					Ted
Video 1 - interviews					Ted/ Jennifer
Video 1 - final		Video 1 complete			Ted
Video 2 - The WHY of DPR					
Video 2 - storyline, content & script					Jennifer/ Ryan/ Ted
Video 2 - B roll footage					Ted
Video 2 - interviews					Ted/ Jennifer
Video 2 - final		Video 2 complete			Ted
Video Misc - use in Insight, promos, for media snippet					Ted, ??
Beverages					
Coordination with beverage producers					Jerry/ Ryan


Water testing
July - water available for public consumption
Donene/Lab Serv.
Bottle label
Jerry/ Ryan/ Jennifer
Water delivery to producers
Melissa
Beverage production
Beverage partners
Beverage distribution
Beverages available
Jerry
Beverage events logistics (brainstorm available events w/ Brewers), invites
Jerry/ Ryan/ Birgit
Beverage Event - Springs Beer Fest
July (too soon ?)
Jerry/ Ryan/ Birgit
Beverage Event - Steers and Beers Whiskey and Beer Festival
Aug (too soon?)
Jerry/ Ryan/ Birgit
Beverage Event - Cat on Tap
Jerry/ Ryan/ Birgit
Tours
Tour guide script
Birgit/ Ryan/ Tech rep
Tour guide training
sche duli ng
Birgit/ Donene
Tour Guide shirts, tasting cups, stickers, promotional items
Lisa/ Birgit
Tour safety plan and items (safety glasses, facemasks, gloves, etc.)
Donene?
Tour list development
Ryan/ Birgit
Tour invitation
create
save the date
send invites
Ryan/ Birgit
Tour scheduling
Ryan/ Birgit
Tour feedback survey
crea te
Ryan/ Birgit

Tours begin - 20 groups; 25 days of tours offered				Tours begin		Tour guides
Media Tour		Media before June info booths				Jennifer
Utilitity Board Tour						Donene/ Ryan
Stakeholder tours						Donene/ Ryan
Public tours						Ryan/ Birgit
Employee tours						Donene/ Ryan
Water Tour stop				9/9?		Ryan/ Birgit
On-site school tours (no water served)					?	Birgit
Community Events						
Urban Water Cycle tour - info booth only		6/5 &6 ?				Birgit/ Donene
Efficiency Expo Info booth		12-Jun				Birgit
What If Festival				9/11?		Birgit
Cool Science Festival					9-Oct	Birgit
Sustain a Fest			Jul			Birgit
Manitou Springs Common Wheel Art Festival				?		TBD
Labor Day Lift Off Balloon Festival				?		TBD
Taste of Chamber/EDC				Sept ?		TBD

Discussion with Denver Water

- Steve Snyder at Denver Water invited us to reach out to him if we have questions as we move through this project. **Steve Snyder** | Public Affairs | Executive Communications **Denver Water** | d: 303-628-6160 | c: 303-903-2852 steve.snyder@denverwater.org | http://www.denverwater.org

- Tell us about your lessons learned; your biggest PureWater challenges and successes?
  - PureWater Colorado 2018. Steve Snyder from Denver Water interviewed. Team effort with WateReuse Colorado and others. All came to be as part of 100th anniversary. In 2017 marketing team considering unique ways to celebrate. Came up with idea of micro-brew, 100th anniversary Denver Water beer. CEO wanted it to be with recycled water. This led to WRCO, Carollo Engineering and Denver Water to come up with "pilot project" to demonstrate reused water at Denver Water's recycling plant. This plant is a nonpotable producing plant (biggest customer is Xcel Energy for cooling tours).
  - Carollo donated all the equipment through deals with suppliers. Treatment process in middle of plant. Declaration Brewery created a beer and wine from another group, all using recycled water.
  - Partnered with WRCO to offer scholarships for college students from sales of beer and wine.
  - It was an extremely rushed process-January learned of the project, conducted tours in March, May was beer/wine. Only had treatment components for two months to produce purified water. Should have been a 12-18 month project.
  - Folks in water quality lab really worked very hard to get the work done and sampling done to meet the timeline. (The trace organics CECs had a long turnaround time.)
  - Would have been nice to have more time and were learning on the fly.
  - They did this project to pave the way for others to do projects like this.
  - Construction was multiple, individual units built at the same time—Denver Water connected all of these completed units.
- What were the biggest issues that arose and how did you address them?
  - Did a lot of tours and outreach. Had a media day. Most of this was geared at people in industry (CWCB, CDPHE, etc.). These people had passing familiarity to what we were doing. It was still interesting to see that there was still apprehension from those knowledgeable folks about doing the taste test for the water. You can't underestimate the apprehension related to sampling this water. Once they tasted it, "it tastes like water."
  - One of the hurdles with providing the taste test straight from the 5-step process, water quality folks feared it would taste different because it did not move through their distribution process. Put the water through a Brita filter before they did the taste test. Specifically related to the chlorine residual and the difference in taste.
  - Tour logistics: did specific outreach to stakeholders for tours—only had very limited time to conduct tours (2 months) to reach specific stakeholders. It was focused on the regulation/water community and some elected officials and a media day but very targeted tours and not public outreach.

- Why did you make the decision to leave your brand off of the direct potable reuse project? What were the benefits/challenges to positioning your PureWater Colorado project as a WateReuse program?
    - This was a challenging decision. We are all focused on this idea that we have a limited resource, etc. and that we all have to think about the next 50 years. Talking to water resources folks (reuse in general is a big piece of what we are looking at right now—considering a one water system on site for Denver Water building—reusing water from the building for toilets, etc.). But, it's not something we'll do in next 15-20 years so going out and branding this and owning it to say it's something we support and own might be mixed message to customers.
    - Worried about providing a mixed message—wanted to state that reuse is a future option and others may do reuse before Denver Water.
    - General public "involved" indirectly through news that came out of the media day/tour. Also have website (TAP) with written stories, videos, etc. in social media and had two or three stories created just online about PureWater. This also was very controlled messaging. They do enable comments on the website. There were probably a handful of comments on the stories and about 3:1, good to bad, applauding the idea of Denver Water doing this. (This audience is generally more engaged/interest in water.)
    - Given this, should we have public engagement events like What If Festival and/or Cool Science Festival?
- Would you recommend/is it possible to use the same brand (PureWater Colorado) and collateral materials you employed in the 2018 project.
    - Carollo developed the PureWater Colorado logo and no one really owns that brand so it's available to use. Denver Water does not own this and didn't take the rights to this.
    - Do we want to make this distinct to Colorado Springs? Is it better to be consistent and build on statewide and national efforts? We could go either way.
    - Follow-up meeting with Pat and Kirk set for 12/23 3 pm to discuss more about the pros/cons of this concluded in using PureWater brand and logo.
    - The idea behind Denver Water project was to kick off this exploration across Colorado.
- The messaging we've seen other entities use (and we are using (seems confusing for customers and stakeholders. Among the terms of "direct potable reuse," "potable reuse," "purified water," etc., what worked best as a consistent way to refer to direct potable reuse?
    - Their communication plan used the words purified and PureWater Colorado. Defined "purified water" and what PureWater is in the project.
    - A lot of it built on other research across the country about how the public reacts to certain terms. "Purified" resonates, and, getting regulators to get behind it helps confirm the water quality. "Safe to release back into the environment" is a good message through lots of research. "Cleaned" and "purified" works a lot better than "treated water." This aligns with how others across Colorado are talking about it. Don't say it "came through the wastewater treatment plant".
- Would you be willing to share your messaging/speaking points? What worked best?

- Don't invite Dan DeRudie (sp?) to a Press Conference (Fox affiliate in Denver). Always good to be careful about who you invite but can't prevent this kind of thing 100%.
- Working with lots of different partners, definitely want to make sure everyone speaks the same language.
- Always come back to key messages
- Anticipate goofy questions and "ick" factor

– What recommendations do you have for us around conducting tours and those logistics.
  - Provided training to the tour guides. Steve has a copy of this training and can share this with us. They had a script: bulleted speaking points.

– What recommendations do you have for us around conducting the beverage programs/events?
  - Steve did not have a lot to do with this. One of the Denver Water marketing people who conducted these events would have more to share—we could schedule a follow up call through Steve.
  - Beer was sold through the microbrew company and sold at Declaration Brewery and they did get it into a number of stores. Proceeds from that (part of) went back to WERCO for scholarships.
  - What messaging was on that label and did the sales go well?
  - Beer targeted towards 100th celebration and label reflects that. One says "brewed from purified water."
  - Beer itself was something that Denver Water owned and told public that it was brewed with purified water. Did not promote it heavily nor externally. More of an employee celebration.

– How were surveyed attitudes and opinion information used as part of your learning/next steps?
  - Did not do this because of the timeline they had.
  - If you do have a little more time, if you can get some early feedback on outreach and tours to help shape things from there, it would be really good. Denver had such little time they could not do that.
  - They did have specific key messages no matter who did the talking and that did not prevent negative press—it may happen.

Recommended Survey/Discussion Questions for Stakeholder/Tour Participants

(WaterReuse 2018 Program)

1. What is your opinion about water supplies in Colorado: do you think they are adequate for all uses today? How about future water supply uses?
2. Are you familiar with uses for recycled water? What uses are you most familiar with? Where?
3. Do you personally have any concerns or questions about any of those uses of recycled water?

4. Before we requested time to meet with you, had you heard anything about ways to maximize recycled water use in Colorado? If yes, what did you hear and how or in what context did you hear about it?
5. In relation to your organization/members or constituency/business, what are your biggest interests or concerns associated with recycled water?
6. Colorado Springs Utilities is interested in raising awareness about the potential for augmenting our drinking water supplies with highly cleaned recycled water, which is also known as potable reuse. Potable reuse would ensure a local water supply for the city or region where it is implemented. Do you have any questions or concerns about the concept of potable reuse?
7. What information do you need to feel more comfortable with the concept of augmenting drinking water supplies with highly cleaned recycled water, which is also called purified water?
8. What about your constituency/members of your organization – what information do you think they would need to feel more comfortable with the concept of potable reuse?
9. WateReuse Colorado is committed to raising awareness about potable reuse and increasing local water supplies. Do you think this is an important goal? What suggestions do you have that can help them achieve this goal?
10. How do you stay up-to-date about issues related to water or water supply in in the region or state? (Word of mouth, email, newspapers, newsletters, television, radio, direct mail, social media, etc.)
    a. Would you be interested in receiving updates regarding recycled water or potable reuse?
    b. How often would you like to receive information?
11. Do you have any other suggestions about how we can communicate with stakeholders, residents and businesses in this area about recycled water and the concept of potable reuse?
    - Do you have regular meetings where we could make a presentation about this topic?
12. How can we get on your schedule? Do you send electronic or written communication to your membership? Can we include a written article about beneficial recycled uses?
13. Who and/or what do you think are the most trusted sources of public information in your community? How about in this region?
14. Who else do you think we should meet with to discuss the options to maximize recycled water use for Colorado or related issues?
15. Are there any other issues you want to discuss or suggestions as we continue this outreach effort?

Attachment B

PureWater Colorado Mobile Demonstration Project Communications Plan

Colorado Springs Utilities
It's how we're all connected

PureWater Colorado Mobile Demonstration Project Communications Plan

Executive Summary

Direct Potable Reuse (DPR), or purified drinking water, was identified as a future water source in the 2017 Integrated Water Resource Plan (IWRP). DPR is the process of cleaning recycled water from our resource recovery facilities to meet or exceed drinking water standards, then reusing that water in our potable water system.

The implementation timeline for DPR was originally slated for 15-20 years from now; however, a rapidly accelerating population in Colorado Springs, combined with two decades of drought in the West that is exacerbating demands on Colorado's natural water sources, has required we consider implementation sooner rather than later. This is in line with other Front Range communities that are exploring reuse in some form in their potable water system plans. Statewide discussion around DPR has led to current efforts to develop rules and regulations around its use as a drinking water source.

Colorado Springs Utilities received a grant from the Colorado Water Conservation Board in 2019 for a direct potable reuse (DPR) demonstration project. The project's strategic plan outlines our collaboration with the Colorado School of Mines to help advance the science and regulatory framework for direct potable reuse in Colorado. The demonstration of treatment processes through the mobile unit is designed as an education outreach initiative to help raise awareness and educate a broad range of stakeholders about the safety and value of purified water as a precursor to a future public acceptance campaign and implementation of direct potable reuse in our community.

The Mobile Demonstration unit is slated to be delivered to our J.D. Phillips Resource Recovery Facility in late spring/early summer and will begin processing recycled water using the Advanced Purification process. This recycled water will not be used in our public system, but instead will be made available for sampling during tours of the mobile unit, as well as to select local brewer and beverage makers for development into products that can be sampled at community outreach events.

The mobile unit is anticipated to be on site for at least one year during which time targeted community and statewide stakeholders will be invited to tour the unit and learn more about the science and safety behind DPR. In addition, local stakeholders and our customers will learn how DPR provides an efficient and environmentally friendly means of developing a locally controlled water source for the Colorado Springs community that can supplement our existing water sources.

Customer and Workforce Communications (CWC) is supporting the PureWater Colorado Mobile Demonstration Project through development of collaterals and external communications that support the outreach initiative.

Situation Analysis

Under Colorado water law, water providers can reuse source water when it is considered non-native to its basin. More than 60% of Colorado Springs Utilities water comes from non-native sources. We are a statewide leader in water reuse, pioneering the use of treated wastewater for irrigation in the early 1960s, reusing about 11% of reclaimed water through our non-potable system, and reusing 20% of our water supply through exchanges.

Potable reuse, or purified water (recycled water that meets drinking water standards) is becoming more prominent across the country, particularly in areas facing the impacts of climate change, growing populations and potential water supply shortages. Reuse is identified as one viable solution to these challenges. It is part of Colorado's Water Plan, as well as our own Integrated Water Resource Plan (IWRP). While there are hurdles associated with potable reuse, it expands the ways we can reuse our water and manage our supplies.

Water providers across Colorado have the responsibility to plan for a sustainable water future. Potable (drinkable) reuse is being consider by many communities in Colorado and regulations around its use are currently being developed.

We are collaborating with Colorado School of Mines' research center, WE^2ST Water **Technology Hub, on a demonstration of direct potable reuse, also known as PureWater** Colorado or PureWater. This partnership promotes research and the development of treatment and reuse of water in energy- and water-intensive industries. Colorado Springs Utilities, Colorado School of Mines and Carollo Engineers is constructing a mobile treatment trailer to be operated initially in Colorado Springs at the J.D. Phillips Water Resource Recovery Facility (JDPWRRF). After completion of the operational period at the JDPWRRF, the Colorado School of Mines will manage the mobile unit and make it available as a continuing resource for research.

Partnerships with equipment vendors and other water service providers were developed to share in overall project costs and maximize the education and engagement opportunities.

The PureWater Colorado Direct Potable Reuse Mobile Demonstration project will use an innovative, advanced water purification process train without reverse osmosis to produce safe, high quality drinking water. The project is designed to test and demonstrate a potential, long-term reuse option for water in our service territory and across Colorado.

Pandemic-related delays postponed construction of the mobile demonstration unit, but it is now on track to be delivered to Colorado Springs Utilities June 1, 2021 and remain operational at JDPWRRF into 2022. Some of the water produced will be made available to brewers and other beverage produces to help raise awareness and promote the flavor and quality of the water. The demonstration will help build confidence about the safety of this water source. Small tour groups consisting of key stakeholders and the public will have an opportunity to sample PureWater on site. The DPR Outreach, Education and Communication Team has planned attendance at a number of community events throughout the summer and fall to assist in promoting the project and generating public tours.

This plan focuses on key messages and communication tactics that support the Mobile Demonstration Project's strategic plan for outreach and education.

Strategic Alignment

Reuse is part of our balanced portfolio in the IWRP, and DPR is identified as a future water source for drinking water as part of reuse. The mobile demonstration project, in support of future DPR implementation, aligns with our strategic focus areas of Reliability and Relationships:

- Reliability
    - Optimize operations and infrastructure
    - Plan, build and maintain assets and infrastructure

- Relationships
    - Provide safe, resilient and modern utility services
    - Support the community
    - Focus on the customer

Planning

Communications for the demonstration project address the project as an educational outreach initiative and are specific to the introduction of direct potable reuse and the advanced purification (science) behind the process of producing DPR. As the project's lifespan at Colorado Springs Utilities wraps up, communications should transition to the next stage. This plan applies to Stage I.

I. **Introduction to DPR and demonstration (2021-2022)**
II. Sustained communications/evergreen messages (timeline TBD, but could be 1-10 years)
III. Bringing DPR/IPR online (TBD)

Messaging and language development around the PureWater Colorado Mobile Demonstration is informed by previous work done on Direct Potable Reuse consumer research by Water Reuse Colorado, Denver Water, the City of San Diego and others. The PureWater Colorado logo used for this project was developed by Water Reuse Colorado and was chosen to provide consistency in messaging now and in the future when the demonstration is "passed forward" to other Colorado communities.

Water Reuse Colorado, as part of the national Water Reuse organization, is a coalition of water utilities, businesses and other organizations helping to pave the way for reuse in the state. Their consumer research helped identify factors, such as misinformation, surrounding reuse that has contributed to community resistance for water resource projects and provided some tactics to help stronger public support. This research shows that more education around the science behind potable reuse will be beneficial in gaining public trust.

In addition, we've considered research across the country about how the public reacts to certain terms. "Purified" resonates, and, getting regulators to get behind it helps confirm the water quality. "Safe to release back into the environment" is a good message to incorporate. "Cleaned" and "purified" are terms preferred over "treated water." This language aligns with how others across Colorado are talking about Direct Potable Reuse.

Communications Goals & Objectives

Goal: Foster meaningful dialogue with stakeholders and influencers about DPR in Colorado Springs that increases awareness and builds acceptance of this reuse alternative.

Objective: We will provide tours of the PureWater Mobile Demonstration unit and presentations of the DPR process to targeted stakeholder groups during the time the unit is located at the J.D. Phillips Resource Recovery Facility (**tasked to IM and Community Relations**)

Goal: Increase community awareness and understanding of the DPR process.

Objective: We will share key messages about the mobile demonstration project and DPR/reuse mechanisms with our employees and customers through internal and external channels available to us.

Goal: Preserve our customers' trust in our water system processes.

Objective: We will maintain and/or increase our customer trust score in the planned 2022 water longitudinal study and next Cogent survey through on-going outreach and transparency around our exploration of DPR as a mechanism for stretching our reusable supplies.

Public engagement is critical to the success of potable reuse projects. As water stressors such as extended drought continue to grow and potable reuse expands, it is necessary to provide transparent communication, build customer and stakeholder confidence, and address public concerns, all of which require a comprehensive program of public involvement and education.

The PureWater Demonstration communication plan seeks to improve customers' and stakeholders' general knowledge of water supply and demand in our local community, state and region. This includes increasing awareness of where their water comes from and why we need alternative water solutions, *with emphasis that the quality of their water remains intact.* The education should also expand their understanding of how water is already used, treated, reclaimed, and then discharged into rivers and streams for downstream use or reused locally.

Inclusion of the natural water cycle as a part of the conversation is crucial: ***all water is used and reused, every day.***

Audiences/stakeholders

The following target audiences have been identified in the outreach/education strategic plan:

Internal Customers

- Colorado Springs Utilities Board
- Officers and Employees

State and Local Elected Officials

- El Paso County Commissioners
- Colorado Springs Mayor/Executive Leadership
- Local elected officials
- State lawmakers

Academic/Education Leaders

- Colorado College
- Univ of Colorado-Colorado Springs (UCCS)
- United States Air Force Academy (USAFA)
- Pikes Peak Community College (PPCC)
- Local School Districts

Military

- Fort Carson
- Peterson Air Force Base
- Schriever Air Force Base
- United States Air Force Academy

Environmental Groups

- Green Cities Coalition
- Western Resource Advocates
- Water Sentinels
- Sierra Club
- Alliance for Water Efficiency

Business Organizations/Civic Groups

- Colorado Springs Chamber/EDC
- Restaurant Association
- Downtown Partnership
- Development community
- Water Engineering Companies
- CONO
- Community Associations

Water Organizations

- WateReuse Colorado (partner)
- Colorado Water Conservation Board
- Castle Rock Water
- Denver Water
- Aurora Water
- Plum Creek Water Reclamation Authority
- Regional Water Providers (Security, Fountain, Tri-lakes, Donala, Manitou Springs, Cherokee Water, etc.)
- RMSAWWA
- Water Education Colorado
- Water Research Foundation
- West Slope Groups (TBD)
- Colorado Water Resources Review Committee
- Ark Basin Roundtable members

Medical, Public Health and Water Quality Experts

- Colorado Department of Public Health and Environment
- El Paso County Health Department
- Medical professionals
- PPACG (Water Quality group)

Tactics

In addition to personal stakeholder engagement, we will employ earned, owned, and shared communication channels to deliver our messages.

The tactics below outline recommendations for appropriate messaging for the identified target audiences.

Our customers/ratepayers

- Smart Home and First Source e-newsletters
- Connection newsletter
- Social Media
- Direct Potable Reuse web page
- Blog link via above four channels
- Video storytelling via above two channels plus targeted tour invitations
- Earned media
- Community events (IM and Community Relations),
- Public tours of mobile demonstration at J.D. Phillips RRF (IM and Community Relations)

Our employees

- Insight newsletter/URSULA rotator
- Social media and blog pushed via social media
- Video storytelling via above two channels
- Direct Potable Reuse web page
- Daily news clips and media updates provided by CWC
- WatErgy presentations and Lunch & Learns

Utilities Board/City Council

- Memo in weekly comms prior to tour
- Tours
- Direct Potable Reuse web page
- Daily news clips and media updates provided by CWC
- Recorded WatErgy presentation

Key Stakeholder Groups – water orgs

- Media Release w/links to DPR web page and FAQ resources
- Direct email w/ invitation to tour (IM and Community Relations),

Key Stakeholder Groups – local (civic groups/elected officials/chambers)

- Direct email w/invitation to tour (IM and Community Relations)
- Presentations (IM and Community Relations)
- Speaking engagements (IM and Community Relations)

Key Stakeholder Groups – state (elected officials/public health/environmental)

- Media Release w/links to DPR web page and FAQ resources
- Direct email w/invitation to tour (IM and Community Relations)
- In-person meetings (IM and Community Relations)

Timeline

See spreadsheet for specific dates

March 2021: WatErgy presentation INTERNAL (employees, managers)

June 2: Demonstration trailer arrives at J.D. Philips WRRF

June 2-30: Trailer commissioned, test tours begin, community speaking engagements

July 1-31: Employee tours, water org tours, community speaking engagements

July 31: First public outreach event

August 4: Media event

August 5: First public tour

Aug – Oct, 2021: General public tours, water org tours, public outreach events, beer and soda products available

Key Messages

- **Direct potable reuse-DPR (advanced purified water) provides a safe, reliable, and sustainable drinking water source.**
    - *Advanced purified water is safe for human consumption. Multiple layers of advanced treatment technology ensure that the advanced purified water created in this treatment demonstration meets all state and federal drinking water regulations. According to studies conducted by the WateReuse Association, advanced purified water is cleaner than bottled water and no adverse human health effects have been documented from the augmentation of drinking water supplies with advanced purified water.*
- **The water quality our customers have come to expect will not change with the additional of Direct Potable Reuse.**
    - *As identified in our 2019 Water Longitudinal Study:*
        - *84% of those surveyed think Colorado Springs Utilities' water quality is better than the rest of the nation;*
        - *Maintaining standards for taste and quality of water were seen as being most important in planning for future water supply.*
    - *Advanced purified water would be added to our current potable (drinking water) system.*
- **DPR can help us stretch our reusable supplies.**
    - *Our non-native water supplies can be used to extinction. We currently reuse these supplies through exchanges, our non-potable system, ground water augmentation and water sharing/leases. Our long-term planning includes*

exploration of advanced purified water as an additional mechanism for leveraging the reusable supplies we have.

- **Climate variability, including extended drought, requires our water supply planners to look at all available water management strategies.**
    - *Colorado Springs is the largest city in Colorado not located near a major water source. Delivering water to our community is one of our biggest challenges and successes, and involves an intricate system of tunnels, pipes and reservoirs spanning hundreds of miles and crossing the Continental Divide.*
- **Advanced purified water is a water source that is locally controlled and may be a wise way to manage our water resources in the most cost-effective manner.**
    - *The economic viability of the treatment technology utilized for advanced purified water will continue to be evaluated against costs for pumping and treating water, especially as regulations become stricter and costs for water go up.*
    - *The PureWater Colorado demonstration and advanced purified water technology fits with our commitment to environmental stewardship and reuse of our limited water supplies. What we learn from the demonstration will help us continue to plan for and develop cost-effective, reliable, high-quality water for our customers.*

- **The PureWater Colorado Mobile Demonstration is designed to test and demonstrate a potential, long-term reuse option for water in our service territory and across Colorado.**
    - *The project is a collaborative effort between Colorado Springs Utilities, Colorado School of Mines and Carollo Engineers, with grant support from the Colorado Water Conservation Board.*
    - *Regulations governing Direct Potable Reuse in Colorado are currently being developed in cooperation with the Colorado Department of Public Health & Environment.*

- **Implementation of Direct Potable Reuse in our community is still years away.**
    - *The potential use of advanced purified water will be monitored over time as the technology becomes more cost effective, regulations change, and the city's water demand grows.*

Elevator Speech

The PureWater Colorado Demonstration provides a mobile unit for cleaning recycled water to a level that meets or exceeds all drinking water standards.

Through use of a multi-barrier purification process, we can demonstrate how to produce safe and sustainable drinking water from locally controlled resources, making this an efficient, cost-effective, and environmentally friendly water source for our community.

Attachment C

Media Summary

Attachment 7 – Media Summary

Earned and Social Media coverage of PureWater Colorado Direct Potable Reuse Mobile Demonstration:

Media event 08-04-21 – special tour for local news outlets

Colorado Springs Independent
https://www.csindy.com/news/local/drinking-wastewater-its-an-option-whose-time-has-come-says-colorado-springs-utilities/article_e99dd32a-f54c-11eb-a02c-5b937174e83b.html

KOAA (exclusive coverage 08-03-21)
https://www.koaa.com/news/covering-colorado/use-it-again-and-again-the-future-of-colorado-springs-water

KOAA – second story
https://www.koaa.com/news/covering-colorado/academics-plus-application-building-the-future-of-colorado-springs-water

KRDO
https://krdo.com/news/2021/08/04/colorado-springs-utilities-demonstrating-innovative-water-recycling-technology/

Fox21 (Not available to download)
https://app.criticalmention.com/app/#/clip/public/94f28ef8-acbb-4a76-984a-99b34061bd36

Additional media coverage

Salt Lake Tribune 08-23-21
https://www.sltrib.com/news/2021/08/23/utahns-are-you-ready/

KRDO second story 10/14/21
https://krdo.com/news/2021/10/14/colorado-springs-utilities-showing-off-future-of-water-reuse/

Associated Press story "As cities grow, wastewater recycling gets another look" and pickups (25+ outlets picked up, a few listed below):
https://apnews.com/article/climate-business-los-angeles-wastewater-denver-54ea3460a275d86432db4d9664b07649

https://www.usnews.com/news/news/articles/2021-11-10/as-cities-grow-wastewater-recycling-gets-another-look

https://www.thedenverchannel.com/news/local-news/as-cities-grow-wastewater-recycling-gets-another-look

https://www.wvnews.com/newsfeed/us/as-cities-grow-wastewater-recycling-gets-another-look/image_4f8a15df-f629-5eb9-a4f3-a7bf9dd6f00d.html

https://theeagle.com/news/national/as-cities-grow-wastewater-recycling-gets-another-look/article_c16275f0-fc94-5a23-addb-dd5cdee6bd91.html

https://www.bakersfield.com/ap/national/as-cities-grow-wa+stewater-recycling-gets-another-look/image_69efb705-5fc5-526d-9aec-ef4a794bbc1f.html

https://elkodaily.com/news/state-and-regional/as-cities-grow-wastewater-recycling-gets-another-look/article_78ce7bd2-a02e-5295-8e4f-1291c5b921d6.html

https://www.msn.com/en-us/news/topvideos/as-cities-grow-wastewater-recycling-gets-another-look/vi-AAQxzhk

Newsletters, other forums

Arkansas River Basin Water Forum Quarterly publication 10-14-21
https://mailchi.mp/b5f90d2546fb/arbwf-fall-newsletter?e=bb0484bb16

Colorado School of Mines
https://youtu.be/hGxw4zvzFsY

Social Media summary

Total Facebook posts: 5

Total Facebook post reach: 5,093

Facebook Events: 9

Total Facebook events reach: 5,931

Total Facebook reach: 11,024

Total Instagram posts and ads: 3

Total Instagram reach: 5,958

Total Tweets: 9

Total tweet impressions: 10,362

Total LinkedIn posts: 3

Total LinkedIn impressions: 8,910

Total social media reach: 36,254

DPR Social media metrics

Total Facebook posts: 5

Total Facebook post reach: 5,093

Facebook Events: 9

Total Facebook events reach: 5,931

Total Facebook reach: 11,024

Total Tweets: 9

Total tweet impressions: 10,362

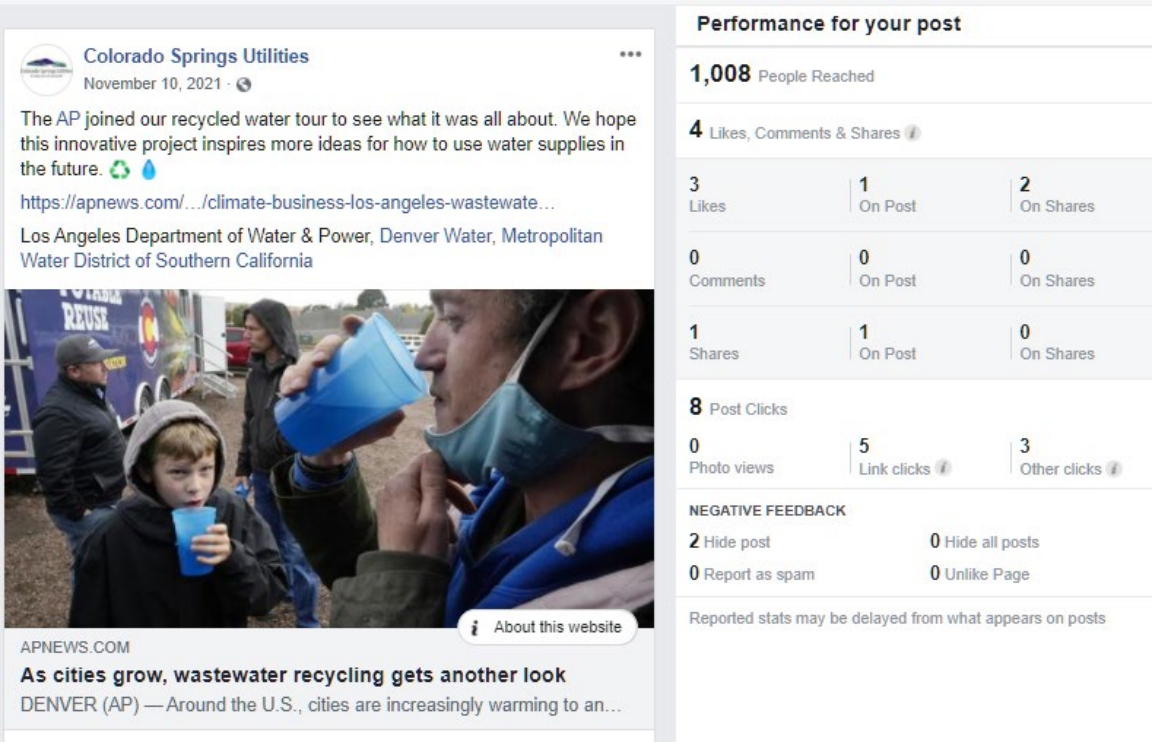
Total LinkedIn posts: 3

Total LinkedIn impressions: 8,910

Facebook Events – "Recycled water demo" included 8 individual event dates

Event	Budget Spent	Reach	Responses	Ticket Clicks
Past Events				
THU, SEP 16, 2021 Fall Landscape Care	--	1723	21	--
SAT, OCT 23, 2021 Recycled water demo 4205 Mark Dabling Blvd · Colorado...	$60.00	5300	41	--
MON, JUL 12, 2021 Science on Tap 21 S Tejon St · Colorado Springs, CO	--	631	12	--

Facebook Posts



Colorado Springs Utilities
October 22, 2021 ·

Last chance! The final public tour of our purified recycled water demo is tomorrow at 10am. Sign up ASAP to see this awesome process up close.

Carollo Engineers, Inc. Colorado School of Mines

SAT, OCT 23, 2021

Recycled water demo

4205 Mark Dabling Blvd, Colorado Springs, CO 80907,...

★ Interested

You like Colorado Springs Utilities

690	7	Boost unavailable
People reached	Engagements	

Performance for your post

690 People Reached

2 Likes, Comments & Shares

1 Likes	1 On Post	0 On Shares
1 Comments	1 On Post	0 On Shares
0 Shares	0 On Post	0 On Shares

5 Post Clicks

0 Photo views	2 Link clicks	3 Other clicks

NEGATIVE FEEDBACK

1 Hide post	0 Hide all posts
0 Report as spam	0 Unlike Page

Reported stats may be delayed from what appears on posts

Video Details

The metric Average Watch Time is not available for posts published before August 25, 2016.

Colorado Springs Utilities...

0:59 · Shared on 10/13/2021 · Owned · Appears in 0 posts · View Permalink · Copy Video ID

Total Video Performance

Minutes Viewed	0
1-Minute Video Views	--
10-Second Video Views	0
3-Second Video Views	120
Average Video Watch Time	--
Audience retention	
Audience and Engagement	

Colorado Springs Utilities
October 8, 2021 ·

We'll be at the Cool Science Carnival Day at UCCS on Saturday with free samples of our purified recycled water. ♻ 💧 Come do a taste test with us!

SAT, OCT 9, 2021

2021 Cool Science Carnival Day at UCCS

UCCS · Colorado Springs, CO

★ Interested

You like UCCS

841	17	Boost unavailable
People reached	Engagements	

Performance for your post

841 People Reached

8 Likes, Comments & Shares

8 Likes	8 On Post	0 On Shares
0 Comments	0 On Post	0 On Shares
0 Shares	0 On Post	0 On Shares

9 Post Clicks

0 Photo views	4 Link clicks	5 Other clicks

NEGATIVE FEEDBACK

0 Hide post	0 Hide all posts
0 Report as spam	0 Unlike Page

Reported stats may be delayed from what appears on posts

Back

Post details

Video | Post | Shares

See Metrics for All Videos

Colorado Springs Utilities
September 15, 2021 ·

This is a game changer. We're purifying recycled water and it's safe to drink. It's a demo right now, but could stretch our future water supply. 💧 ♻ Come see for yourself on a free tour.

Colorado School of Mines Carollo Engineers, Inc.

CSU.ORG

Water recycling for the future

Learn more

2,434	233	Boost again
People reached	Engagements	

Boosted on Sep 16, 2021 — Completed
By Ellen Thommesen

People Reached	1.4K	Link clicks	37

View results

26 — 3 Comments 4 Shares

Performance for your post

2,434 People Reached

0 3-Second Video Views

42 Reactions, Comments & Shares

26 Like	22 On Post	4 On Shares
4 Love	4 On Post	0 On Shares
8 Comments	6 On Post	2 On Shares
4 Shares	4 On Post	0 On Shares

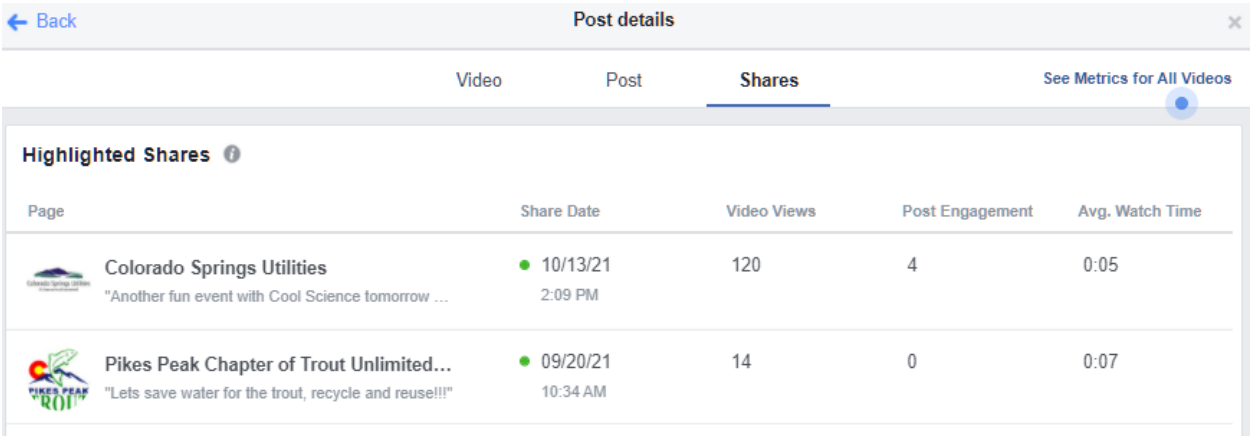
191 Post Clicks

62 Clicks to play	44 Link clicks	85 Other clicks

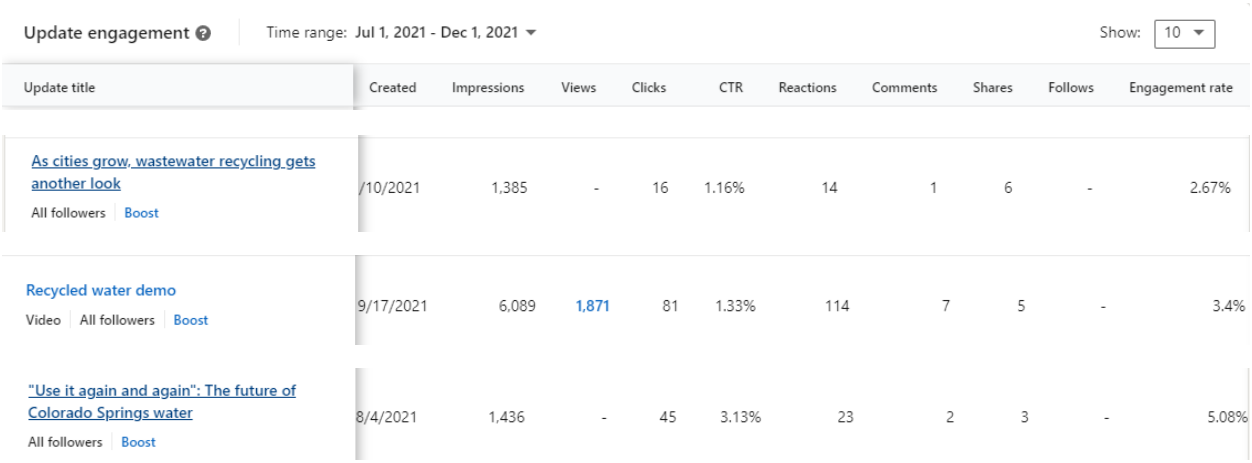
NEGATIVE FEEDBACK

2 Hide post	0 Hide all posts
0 Report as spam	0 Unlike Page

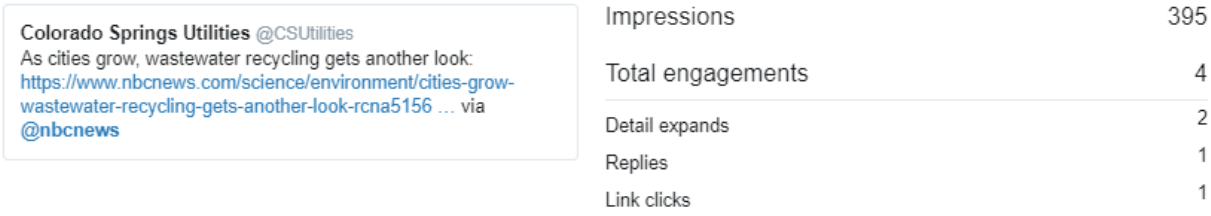
Reported stats may be delayed from what appears on posts



LinkedIn



Twitter



Colorado Springs Utilities @CSUtilities
Last chance! Our final public tour of purified recycled water is tomorrow at 10am. 📝 Sign up today to see this awesome process up close:
http://www.csu.org/Pages/Events/DPROct23.aspx …

@CarolloTweets @coschoolofmines #water #coloradosprings pic.twitter.com/6cJ4rubRPV

Impressions	1,143
Media views	206
Total engagements	28
Media engagements	6
Likes	5
Link clicks	4
Detail expands	4
Profile clicks	4
Retweets	3
Replies	1
Hashtag clicks	1

Colorado Springs Utilities @CSUtilities
More fun with **@CSCoolScience** this week - join a tour of our purified recycled water system on Thursday afternoon. This process isn't being used anywhere else in Colorado yet. Sign up before it's too late!
http://www.csu.org/Pages/Events/DPROct14.aspx …
https://twitter.com/CSUtilities/status/1446634013213532165 …

Impressions	999
Total engagements	8
Link clicks	4
Detail expands	2
Retweets	1
Likes	1

Colorado Springs Utilities @CSUtilities
We'll be at the Cool Science Carnival Day at UCCS tomorrow (Saturday, Oct. 9) with free samples of our purified recycled water. ♻️💧 Come do a taste test with us!
http://www.coolscience.org/cool-science-carnival-day.html …
pic.twitter.com/DdrWq1bRQb

Impressions	1,886
Media views	342
Total engagements	15
Media engagements	6
Detail expands	4
Likes	2
Link clicks	2
Retweets	1

Colorado Springs Utilities @CSUtilities
Want to taste our purified recycled water? We're teaming up with **@CSCoolScience** to add another public tour of our demo on Oct. 14, plus we'll be handing out free samples at the Cool Science Carnival Day at **@UCCS** this weekend. http://csu.org/pages/events.aspx …
pic.twitter.com/gWrosyQ5Qd

Impressions	378
Total engagements	2
Retweets	1
Likes	1

Colorado Springs Utilities @CSUtilities
This is a game changer. We're purifying recycled water and it's safe to drink. It's a demo right now, but could stretch our future water supply. 💧♻ Come see for yourself on a free tour: http://csu.org/Pages/DirectPotableReuse.aspx … **@coschoolofmines @CarolloTweets** pic.twitter.com/uPokoqVACs

Impressions	2,260
Media views	393
Total engagements	80
Detail expands	28
Media engagements	19
Likes	13
Retweets	8
Link clicks	6
Profile clicks	5
Replies	1

Colorado Springs Utilities @CSUtilities
Thanks **@KOAA** for covering our advanced water recycling demonstration 💧🌲. This demonstration fits in a trailer!

Tours for the public are now open, find a time to learn about the future of water reuse: https://www.csu.org/Pages/DirectPotableReuse.aspx …

https://www.koaa.com/news/covering-colorado/use-it-again-and-again-the-future-of-colorado-springs-water …

Impressions	803
Total engagements	11
Link clicks	7
Likes	2
Detail expands	2

Colorado Springs Utilities @CSUtilities
Come say hi to us at Buses at the Brewery on Saturday! 🚌 We'll be serving free samples of soda made with purified recycled water. 💧

@BristolBrewing #reuse #water https://twitter.com/BristolBrewing/status/1413604236114468866 …

Impressions	822

Colorado Springs Utilities @CSUtilities
We hope to see you at 6:30pm tonight for Science on Tap at **@JackQuinnsPub**. Join us and learn about direct potable reuse and how it fits into Colorado Springs' water future (and future brews!). 💧 **@CSCoolScience**

http://coolscience.org/science-on-tap.html … pic.twitter.com/trSP8MDld5

Impressions	876
Total engagements	8
Likes	3
Link clicks	2
Media engagements	1
Detail expands	1
Profile clicks	1

Colorado Springs Utilities @CSUtilities
Join us for Science on Tap at **@JackQuinnsPub** on Monday, July 12 at 6:30pm to learn about direct potable reuse and how it fits into Colorado Springs' water future (and future brews!). 💧 **@CSCoolScience**

http://coolscience.org/science-on-tap.html … pic.twitter.com/MybxzDKR9t

Impressions	800
Total engagements	2
Media engagements	1
Likes	1

The Peter D. Binney Water Purification Facility is the final stop in purifying Aurora's second use water.
Photo by PHILIP B. POSTON/Sentinel Colorado

When Aurora buys one bucket of water, it's really buying multiple buckets of water. Each drop of water will likely be used over and over again.

The growing city approaching 400,000 residents isn't interested so much in acquiring single-use water anymore, said Greg Baker, spokesperson for Aurora Water. With its Prairie Waters potable reuse system, Aurora can recapture and reuse about 95% of the city's water, so having multiple uses written into water rights agreements has become a top priority as water rights are likened to gold in the West — expensive and often hard to come by.

Aurora's method — sterilizing wastewater from toilets, sinks and factories and then piping it back into homes and businesses as tap water — is catching on across the U.S.

In the Los Angeles area, plans to recycle wastewater for drinking are moving along with little fanfare just two decades after similar efforts in the city sparked such a backlash they

had to be abandoned. The practice, which must meet federal drinking water standards, has been adopted in several places around the country, including nearby Orange County.

“We’ve had a sea change in terms of public attitudes toward wastewater recycling,” said David Nahai, the former general manager of the Los Angeles Department of Water and Power.

The shifting attitudes around a concept once dismissively dubbed “toilet to tap” come as dry regions scramble for ways to increase water supplies as their populations boom and climate change intensifies droughts. Other strategies gaining traction include collecting runoff from streams and roads after storms, and stripping seawater of salt and other minerals, a process that’s still relatively rare and expensive.

Though there are still only about two dozen communities in the U.S. using some form of recycled water for drinking, that number is projected to more than double in the next 15 years, according to WateReuse, a group that helps cities adopt such conservation practices.

In most places that do it, the sterilized water is usually mixed back into a lake, river or other natural source before being reused — a step that helps make the idea of drinking treated sewage go down easier for some.

In Aurora, the process is thanks to the Prairie Waters system, which was opened in 2010. It starts south of Weld County along the Platte River, where Aurora holds water rights that can be used “to extinction,” meaning nearly endlessly.

“Essentially, this means that the water residents use for washing, laundry, showering, as well as some of the water from lawn watering, stays in the South Platte River Basin,” Aurora Water explains.

About a dozen wells on the basin pull water through hundreds of feet of sand and gravel to purify the water. Next, the water is pumped into basins of more sand and gravel where filtration continues. Finally, pipes take the water to three different pump stations, which lift the water 1,000 feet over a ridge and back to the Peter D. Binney Purification Facility, near Aurora Reservoir.

From there the water is treated and pumped back out to the city’s thousands of homes and businesses, where the cycle begins all over again.

“We’ve truly ingrained re-use into our mentality here,” Baker with Aurora Water said. The agency plans to continue adding wells along the project as needs grow. Aurora’s population is expected to double within the next 30 to 40 years.

Currently, the facility treats about 50 million gallons of water each day.

The confluence of Sand Creek and the South Platte is just below the Robert W. Hite Treatment Facility. Fifty percent of Aurora's water rights are in the South Platte River, from where the 95% of Aurora's water comes as second use. Photo by PHILIP B. POSTON/Sentinel Colorado

Funding for more wastewater recycling projects is on the way. The bipartisan infrastructure bill passed by Congress has $1 billion for water reuse projects in the West, including the $3.4 billion project in Southern California.

And tucked into the federal budget reconciliation package being debated is $125 million in grants for alternative water sources nationwide that could include reuse technologies.

Plans for expansion of the Aurora Prairie Waters project are ever-evolving and so there isn't a build out budget attached, Baker said.

The Southern California project would be the nation's largest wastewater recycling program, producing enough water to supply 500,000 homes, according to the Metropolitan Water District, which serves 19 million people in Los Angeles and surrounding counties.

In Colorado, over two dozen facilities already recycle water for non-drinking purposes, which is more affordable than cleaning it for drinking — Aurora started its own irrigation program back in the '60s. But growing populations mean cities could need to pull additional supply from the Colorado River, which is already strained from overuse.

At that point, it might make sense to start recycling for drinking purposes as well, said Greg Fisher, head of demand planning for Denver Water.

To warm residents to the idea of recycling waste water into drinkable tap water, Colorado Springs Utilities is hosting a mobile exhibit that shows how wastewater recycling works. On a cold, rainy afternoon, dozens of visitors showed up to learn about the carbon-based purification process and sample the results, which several noted tasted no different than their usual supply.

The recycling process typically entails disinfecting wastewater with ozone gas or ultraviolet light to remove viruses and bacteria, then filtering it through membranes with microscopic pores to remove solids and trace contaminants.

Not all water can be recycled locally. Often, Western communities are required to send treated wastewater back to its source, so that it can eventually be used by other places that depend on that same body of water.

“You have to put the water back into the river because it’s not yours,” said Patricia Sinicropi, executive director of WateReuse.

As a result, much of the country already consumes water that’s been recycled to some degree, simply by living downstream from others. It’s why drinking water undergoes stringent sterilization even when it’s pulled from a river or lake that looks clean.

Encouraged by efforts in other cities, even places with stable water supplies are considering recycling their own wastewater. After a poll showed broad support for the idea in Boise, Idaho, city officials began studying plans to recharge local groundwater with treated wastewater.

“We need to be managing for the potential impacts of climate change,” said Haley Falconer, a senior manager in the city’s environmental division.

That’s why Aurora’s water acquisition efforts have focused on multiple uses. Even the city’s recent purchase of water in the London Mine, located near Alma in Park County, met this criteria.

“This sale provides a large amount of water for a growing municipal entity without diverting tributary water from the basin. As a non-tributary water source, it can be used and reused by Aurora ‘to extinction,’” the city wrote of the $34 million deal, which was completed in 2018. “Reuse increases the water available to meet new demands and reduces the quantity of additional acquisitions.”

Connor Sonnenberg, foreground left, and Billy Kinn, foreground right, drink wastewater that was sterilized at the PureWater Colorado Mobile Demonstration using a method that involves carbon-based purification, Thursday, Oct. 14, 2021, in Colorado Springs, Colo. Across the U.S., cities are increasingly embracing the idea of sterilizing wastewater from toilets, sinks and factories, and piping it back into homes and businesses for drinking. (AP Photo/Brittany Peterson)

The Southern California project, which still needs to undergo environmental review and finalize its funding plan, would also lessen the region's need to pipe in water from afar. In exchange for financing from water agencies in Nevada and Arizona, the area is ceding some of its share of the Colorado River.

"We're taking advantage of a water supply that's right here in our backyard," said Deven Upadhyay, chief operating officer for the Metropolitan Water District.

Officials emphasize the project uses technology that's been used safely elsewhere, including in Israel and Singapore. The reassurances have become critical after a separate Los Angeles wastewater treatment plant, which uses a different process to purify water for irrigation and industrial purposes, flooded and spilled sewage into the ocean in July.

"The last thing that any of us want is one of these projects that have a water quality hiccup that sets back public perception," Upadhyay said.

Education was a big part of the Prairie Waters project more than a decade ago. Baker with Aurora Water said without that piece the city could have run into problems like other places, but Aurorans seemed to be receptive to conservation efforts. Like Colorado Springs, Aurora also invited residents to taste test the water. It's some of the best in the country.

Baker said in the decade Aurora has been running Prairie Waters there hasn't been one complaint about the quality of the water, and that's the point.

"The goal is to be indistinguishable from our mountain sources," he said.

— Managing Editor Kara Mason contributed to this story

Nothing Icky About ‘Toilet-to-Tap': Water Recycling Explained

By Bobby Magill | July 16, 2021 6:01AM ET

Wastewater that recently swirled down a toilet bowl may be coming to your tap, in purified form, especially if you’re in a drought-stricken area where drinking water is increasingly scarce.

More municipal water systems in the West are considering water recycling, known in some places as “toilet-to-tap.” And Congress may begin supporting the idea as water systems scramble to find secure water supplies amid a decades-long drought driven by climate change, which may be the worst the region has experienced in more than a millennium.

Here’s a look at the context for a national discussion about water recycling, how it’s regulated, and what’s at stake.

1. What is water recycling?

It’s the process of purifying and reusing water that has been flushed down the toilet or goes down the drain.

There are three kinds of water recycling:
• Non-potable reuse of wastewater for grass irrigation and industrial uses.
• Indirect potable reuse of treated wastewater that’s sent into rivers or underground to mingle with surface or groundwater, and later purified and used for drinking.
• Direct potable reuse of treated and purified wastewater for drinking.

Indirect potable reuse has been used throughout the country for decades. But direct “flush to faucet” reuse is rare, although accounting for up to 8% of all effluent produced in the U.S., according to the Environmental Protection Agency’s 2017 Potable Reuse Compendium.

A water system in Big Spring, Texas, was one of the first in the U.S. to start directly recycling wastewater in 2013. Today, Southern California is among the largest regions that’s either planning or already using water recycling projects. San Diego expects 40% of its water supply to come from recycled water by 2035.

2. Isn’t drinking (former) toilet water gross?

Maybe in theory, but the reality is recycled water can be even cleaner than most tap water.

Several different technologies exist to filter out waste, pathogens, odors, and other pollutants. Reverse osmosis, for example, uses membranes so tight that only water molecules can pass through, removing minerals, calcium, chlorine, salts, and other solids, according to the San Diego County Water Authority.

“Purified water produced in California with state-of-the-art technologies is higher quality than most bottled water,” the San Diego County Water Authority says on its website.

3. Why are water systems considering it?

Extreme heat and drought in the West, combined with urban growth, are straining already limited water supplies and compounding water availability challenges.

“You see more and more communities running out of options—especially inland communities,” which are pumping their aquifers dry, said Tzahi Y. Cath, a civil engineer at the Colorado School of Mines who is helping Colorado Springs directly recycle its wastewater.

As the West’s drought wears on, utilities can recycle their wastewater directly, helping them tap into a water supply that’s nearly continuously recyclable with minimal loss, Cath said.

Even with drinking water being used to water lawns in some areas, up to 90% of tap water can be recovered through wastewater recycling, Cath noted.

4. What role does government play?

While the EPA doesn’t regulate recycled wastewater, states do have to ensure that all drinking water complies with the federal Clean Water Act and the Safe Drinking Water Act.

Former EPA Administrator Andrew Wheeler released a National Water Reuse Action Plan last year calling for reusing municipal wastewater, stormwater, and water from oil and gas operations.

Few states have developed regulations for direct potable reuse so far. California law requires the California State Water Resources Control Board to adopt water recycling criteria for direct potable reuse by the end of 2023. Florida issued draft rules in May.

In Colorado, where the population of about 5.75 million is expected to double by 2050, the state’s long-term water plan includes wastewater recycling as a major component. The Colorado Department of Public Health and Environment is writing a regulation governing direct potable reuse and expects to finalize the rule by 2023.

5. Is water recycling a political issue?

Congressional Democrats see it as key to solving water supply challenges in the West, especially in California and Arizona. Rep. Grace Napolitano (D-Calif.) has introduced two water recycling bills: The Water Recycling Investment and Improvement Act (H.R. 1015) would offer grants to water agencies for new projects; the Large-Scale Water Recycling Project Investment Act (H.R. 4099) would fund major water recycling projects. Neither measure has Republican support.

A Republican-supported bill, the Wastewater Infrastructure Improvement Act (H.R. 3218), sponsored by Rep. David Rouzer (R-N.C.), would help to fund water reuse projects, mainly those that recycle stormwater and wastewater indirectly. That bill lacks Democratic support.

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NEWS > COVERING COLORADO

"Use it again and again": The future of Colorado Springs water

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Colorado Springs utilities demonstrating the future of reusing water. It is happening with a functioning system that takes reclaimed water and returns it to drinking water quality.


By: Bill Folsom

Posted at 8:35 PM, Aug 03, 2021 and last updated 4:58 PM, Aug 04, 2021

COLORADO SPRINGS — A demonstration now, will likely be part of extending the Colorado Springs water supply in the future. "Able to use that water until it doesn't exist

anymore, in other words there's no downstream user that has claim on that, so we can use it again and again," said Colorado Springs Utilities, Water Engineering Manager, Kirk Olds. Colorado Springs Utilities is introducing a mobile water recycling demonstration unit.

The project is a collaboration among leading water engineers in the state. Colorado Springs Utilities, Colorado Springs Utilities, Colorado School of Mines and Carollo Engineers are working together on the project.

The demonstration is a functioning system that takes reclaimed water and returns it to drinking water quality. It happens through advanced water purification technology. “Produce a high-quality water that is similar to water quality that folks are used to getting through our system," said Olds.

Colorado Springs Utilities water managers want people to understand how this kind of water engineering can lower the impact of drought and help with demand caused by growth. “It's one we're counting on in terms of our water supply future,” said Olds.

Because of its potential for not only the Colorado Springs water supply, but also the rest of the state, the Colorado Water Conservation Board funded the project with a grant. Tours open August 5, 2021, for anyone from the public who wants to see the system in operation and water samples after treatment.

Click here to learn more about the PureWater Colorado Mobile Demonstration.

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https://www.csindy.com/news/local/drinking-wastewater-its-an-option-whose-time-has-come-says-colorado-springs-utilities/article_e99dd32a-f54c-11eb-a02c-5b937174e83b.html

Drinking wastewater? It's an option whose time has come, says Colorado Springs Utilities

Pam Zubeck
Aug 4, 2021

Kirk Olds, Colorado Springs Utilities' manager of water engineering/project management, briefs the media in front of the trailer containing a water reuse apparatus.

Photos by Pam Zubeck

First, you have to get past the "ugh" factor.

"It's a real thing," Tara Kelley, manager of wastewater treatment for Colorado

Springs Utilities, admits.

That "ugh factor" comes when offered a swig of recycled wastewater that promises to be part of the city's future — satisfying customers' water needs in a time of climate change, dwindling water supplies and competing uses.

While other countries and San Diego, California, have long used water from recycled sewage water for domestic purposes, it's a new thing in Colorado, which has yet to develop and adopt regulations for "direct potable water reuse."

On Aug. 3, Springs Utilities invited the media to hear about an experimental project in which the utility cooperated with the Colorado School of Mines and Carollo Engineers to develop a mobile unit containing a 5-gallons-per-minute apparatus. It's currently staged at the J.D. Phillips Water Resource Recovery Facility on Mark Dabling Boulevard.

As the population grows and the planet heats up — a decades-long drought has drastically reduced water in Lake Mead and Lake Powell reservoirs — a solution must be found to offset depleted supplies from the Colorado River. The river, source of 65 percent of Colorado Springs Utilities' supply, has been over-appropriated, meaning those owning water rights to it will face shortages.

That's why Utilities is eying reusing water for integration into its Sustainable Water Plan, though officials couldn't say when its customers might start drinking direct reused potable water.

While Utilities saw water demand drop by 9 percent in July due to rainfall, it's not a dependable strategy to look to the skies and hope for more rain in the summer and snow in the winter to fill reservoirs that feed customers' taps, says Utilities spokesperson Jennifer Kemp.

"We like to have all these tools in our tool belt," Kemp says. "It gives flexibility when our sources might be strained."

Most of Colorado Springs' water supply comes from outside native basins, such as the Colorado River, for which the city has rights for use to extinction. That means it can be reused multiple times, unlike native water, like from the Pikes Peak system, that can only be used by the city once before it must be released for other users through Fountain Creek and other channels.

Kirk Olds, Utilities' manager of water engineering/project management, says the city has successfully used nonpotable water for irrigation for decades and could expand that system. But there's a point at which it's no longer economical to build that system, he says.

Also, the city already reuses water through "exchanges," a complicated system in which water is traded with other users for other water rights.

No water provider in the state reuses direct potable water using the new system to treat wastewater, previously treated to a discharge standard, for human consumption.

Olds says it's not yet clear how much a direct potable water system would cost to handle a significant portion of the millions of gallons a day delivered in Colorado Springs, because there are too many factors that play into the cost. However, it's a concept worth further study and investment in the demonstration project, which was several years in the making.

As the scale is increased for volume, the cost diminishes, he says, unlike extending nonpotable systems and conveyance lines, for which the price increases as scale increases.

"We know as we go into the future, we need to reuse our water supply," Olds says. "With climate variability and competing uses in Colorado, we're always looking for ways to be more effective and efficient with water use."

Competing uses include domestic, agricultural and recreational usage.

"It's not a new water supply, but it's another way we can use the water supply designated for that purpose [various classes of usage]," he says. "Recycling water in this fashion gives us another local source."

Funded with a $350,000 Colorado Water Conservation Board grant to advance the state's 2016 Colorado Water Plan, the demonstration project is called Purewater Colorado and is termed a "state of the art non-membrane treatment system."

Utilities' Kirk Olds checks the readings inside the mobile unit that turns treated sewage water into drinkable water.

Here's how it works:

Water is pumped from a water treatment plant into a system that injects ozone gas into the water, which degrades organic matter and breaks it down into dissolved oxygen. This process destroys microorganisms and breaks down trace chemicals.

Next, the water passes through biologically activated carbon filters covered with "aerobic" bacteria, which thrive on the presence of oxygen. This process consumes organic matter and removes trace chemicals.

Step three is called microfiltration. Water is pushed through tiny pores in a ceramic membrane to remove microscopic particles, including suspended solids, bacteria and protozoa.

After that, the water flows through carbon granules to remove trace chemicals and organic matter.

Advanced oxidation then takes over. The process generates high energy UVC light, creating a process that produces high energy radicals, which damages the DNA of any microbes or viruses, robbing them of the ability to replicate.

Finally, chlorination adds chlorine to further inactivate pathogens, and a residual disinfectant ensures water is safe to drink. The water is tested to be sure it meets all the standards for human consumption.

Olds says the Purewater project promises to allow the city to reuse water at least once and perhaps more often.

The carbon-based system sucks up much less water than other methods, such as reverse osmosis, which can drink up to 20 percent of the water that's being prepared for reuse.

Christopher Bellona, associate professor of Civil & Environmental Engineering at Colorado School of Mines, says he's been working on direct potable water use since he was a graduate student in 2001. Now, 20 years later, he's part of the team that put together what he had labeled a "pipe dream" — the Purewater project.

He foresees reuse will be "an integral part of supply management" in the era of climate change, population growth and diminishing supplies.

Olds promises "no discernable difference" in look or taste "from what comes out of the tap today."

Asked if Springs Utilities customers will be told when reused water is flowing through pipes to their homes, Olds says yes.

"We're telling the story today," he says, noting there will be "full disclosure" if and when Purewater is scaled to the size to feed the reused water into the city's pipes.

"When this happens, it will not be a surprise," he adds.

If questions arise about whether this will rescue Utilities customers from conservation measures, the answer is no.

Pat Wells, Utilities' general manager of water supply and demand management, says, "Water use efficiency goes hand in hand with reuse."

He predicts the city will continue finding ways for its customers to use water more efficiently and build in certain curtailments in the development rules used by both the city and El Paso County, as well as building codes that call for more efficient appliances indoors.

Asked about the downsides of the Purewater system and ones like it that might emerge for broad, large-scale use, Wells says water reuse is superior to losses experienced by using a traditional system of non-reuse, such as through evaporation, transit and legislated reductions to certain users as supplies dwindle and more calls are made on river systems.

But he does mention two concerns: the cost of new systems, which hasn't been priced out yet, and "public acceptance."

Can you tell the difference between first-use water and water that's been recycled from treated sewage?

Which brings us to the taste test Utilities set up at the news conference for those on hand to try for themselves.

One tank was labeled "current drinking water," another, "purified drinking

water."

The latter had no discernible difference in look or taste to the normal tap water.

But, hey. Don't take our word for it. Sign up for your own taste and tour of the mobile Purewater unit here.

Pam Zubeck
Senior Reporter

Pam Zubeck is a graduate from Emporia State University. She worked at the Tulsa Tribune before coming to Colorado Springs, where she spent 16 years at the Gazette and in 2009 joined Colorado Publishing House.

Academics plus application buildi Colorado Springs water

Photo by: Bill Folsom

Reclaimed water purified to drinking water quality by a new system being demonstrated by Colorado Springs Utilities

By: Bill Folsom

Posted at 6:33 PM, Aug 04, 2021 and last updated 2:07 PM, Aug 05, 2021

COLORADO SPRINGS — Colorado Springs Utilities (CSU) is demonstrating a sophisticated system for cleaning and reusing water. "This treatment process would unique to the state of Colorado and even nationally or internationally," said Carollo Engineers', Jason Assouline.

Engineers and academics who worked with CSU water innovators say they are heari from a growing number of communities looking into the possibility of collecting use and returning it to drinking water quality.

Recent Stories from koaa.com

KOAA NEWS5 SOUTHERN COLORADO

“Drought, climate change, wildfires and things like that, we're starting to target addi water resources that maybe we didn't really target before,” said Colorado School of M Associate Professor, Christopher Bellona.

Colorado School of Mines is a leading institution for research and development in th of Water Engineering. “We do a lot of fundamental research, but we also do a lot of a research.

The water purification demonstration trailer developed in collaboration with CSU is evidence of the university’s research plus application philosophy.

Report a typo

News

By Jessica Gruenling

August 4, 2021 8:40 PM Published August 4, 2021 12:53 PM

Colorado Springs Utilities demonstrating innovative water recycling technology

KRDO

COLORADO SPRINGS, Colo. (KRDO)-- Colorado Springs Utilities partnered with the Colorado School of the Mines and

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Utahns, are you ready to drink your recycled toilet water? A mobile lab aims to prove you can.

A Colorado project could save a lot of water, but does Utah have the appetite for it?

(Joe Del Nero | Colorado School of Mines) The PureWater mobile Lab created by a team of researchers at the Colorado School of Mines. The Lab recycles wastewater into high-quality drinking water.

By Luke Peterson | Aug. 23, 2021, 6:00 a.m. | Updated: 8:13 a.m.

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Water recycling is nothing new. In fact, it's what water does best.

You probably first learned about the water cycle back in first grade. You may not, however, have considered how long the return trip should be between when you take a drink of water, expel that water, and, well, drink it again.

A mobile lab created by researchers in Colorado Springs, Colorado wants you to get comfortable with cutting down the time from toilet to tap water — by a lot.

"We wanted to build something that we could take to communities and show that we can take just about any wastewater and turn it directly into drinkable water," said Tzahi Cath, a professor of civil and environmental engineering at the Colorado School of Mines.

In the past week Utahns have witnessed the air simultaneously filled with smoke, rain and hail. With climate change, we can expect the unexpected.

"What we've seen all this summer is rapid climate change," said Tara Bishop, a research ecologist for the Maintaining Resilient Dryland Ecosystems science program of the US

Forest Service. "The wildlife and the people of Utah cannot keep pace."

Adapting to that change, said Bishop, may mean getting outside of our comfort zone in unexpected ways.

Recycled toilet water on wheels

sourced for their affordability and availability.

In addition to highly sophisticated monitors, it goes through six steps of filtration and purification — from prefiltration to catch large objects, to ozone, waste-consuming microorganisms, carbon filters, and chlorine and ultraviolet treatments.

Like a traveling roadshow, the lab moves from one Colorado community to another. At each stop, the show is the same — untreated wastewater enters at one end of the trailer, and clean, high-quality drinking waters comes out the other.

(Joe Del Nero | Colorado School of Mines) Dr. Tzahi Cath (left) and graduate student Mason Manross (right) monitoring the filtration system inside the mobile PureWater Lab in Colorado Springs, Colorado.

Colorado is currently writing the rules for direct recycling of wastewater to potable (drinkable) water. The mobile lab, as much as anything, is a public relations campaign on wheels aimed at proving there is nothing to fear from directly recycled water.

“I was the first one to drink water from the trailer,” Cath said, “so I took personal responsibility here.”

The professor explains some are skeptical of drinking the recycled water, but others are excited because they understand the importance of this innovation.

“They understand we have technologies that can treat the water to a high level,” Cath said, “sometimes even higher quality than the drinking water in our pipes.”

Lessons for Utah from Colorado

Dwindling water levels across Utah’s reservoirs and lakes, combined with dire warnings from the United Nations about the state of our global climate, add urgency to learning lessons from neighboring dry states.

While Arizona is perhaps the leader in water innovation in the west, Colorado has done its fair share, even pioneering the recycling of wastewater for irrigation in the 1960s.

• Clearwater — This is water that came out of your pipes but didn't touch any contaminant, such as when you let the water run in your shower while waiting for it to get warm.

• Greywater: This is "lightly used" water from activities such as taking a shower or rinsing vegetables.

• Blackwater: Is water that went down your toilet.

With the PureWater Lab, Colorado is paving the way for direct recycling of all three types of water for consumer use. Utah has yet to produce policies that allow for widespread greywater or even clear water recycling, though some private companies are trying to make that easier.

The PureWater Lab also serves as a test bed for improved water technologies and processes.

"We collect a lot of data from water treatment facilities, but we don't do much with the data after we collect it," said Cath. "We'll use statistical models and machine learning to try to improve the process and the technology."

This learning could lead to safer water, greater water conservation, and minimizing the use of chemicals in water treatment.

First, it could be used to provide water in cases of natural disasters that render normal drinking water unsafe, even feeding the mobile lab water from lakes or streams for recycling rather than wastewater.

Second, it could serve as a model for both testing and creating public awareness to solutions in other areas of environmental concern such as air quality.

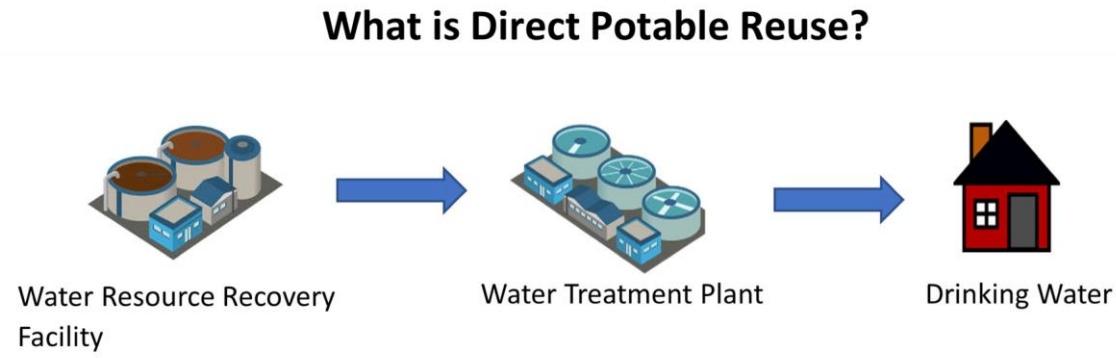
Ultimately, though, the focus is on water.

“In Utah and Colorado we need to think very creatively about where water comes from and where it goes, and what we can do to preserve both its quality and its quantity,” said Cath. “While recycling wastewater may not sound appetizing, we need to pursue every angle if we are to have a future here.”

Solutions in practice

- Interested in doing your own grey water recycling in Utah? Here’s a quick guide from Utah State University.
- Want to try your hand at rainwater harvesting? Here are some useful tips.
- Tara Bishop (U.S. Forest Service) uses a sustainable garden watering system based on terra cotta pots called olla irrigation. Learn more about it here.

[redacted]



Colorado Springs Considering Direct Potable Reuse to Diversify its Water Portfolio

Written By: Birgit Landin, Colorado Springs Utilities

Colorado Springs Utilities is exploring direct potable reuse (DPR) as one option for future long-term solutions to help meet the growing demand for water in Colorado Springs and throughout the state.

In some states it's known as "purified recycled water", but its real name is direct potable reuse - or DPR - and it's something Colorado Springs Utilities is exploring to stretch their reusable supplies in the face of increasing water scarcity.

In a nutshell, direct potable reuse is the process of taking water that has been cleaned at a wastewater treatment facility and cleaning it further at a water treatment facility to yield safe, high quality drinking water that can be reused in a community's potable system.

To demonstrate the process, Colorado Springs Utilities partnered with Colorado School of Mines and Carollo Engineering to build a demonstration purification process housed in a 28-foot trailer and funded in part through a grant from the Colorado Water Conservation Board. The resulting PureWater Colorado Mobile Demonstration is the first mobile demonstration of a carbon-based advanced water purification process in the country.

Colorado Springs Utilities has long looked ahead to plan for water. Given that it is not located on a major body of water, their water planners must be resourceful in considering how best to use available water supplies. They pioneered the development of a non-potable system for their customers in the 1960s as a way to maximize their reusable supply and have developed multiple iterations of their sustainable water plan over the years, the most recent approved by their board of directors in 2017. The plan identifies five key areas that make up a balanced portfolio to meet the anticipated water demands of their growing community. To anticipate future needs, advanced modeling was used to consider multiple scenarios that differed based on changing factors such as climate variability, hydrology, customer demand, and population growth.
One critical element in meeting future water needs is water reuse. Colorado Springs sources half its raw water outside its native Arkansas River Basin. When reuse is considered, imported (transbasin) water accounts for about 70% of the city's total water supply.

Complicated water laws in Colorado allow water rights holders to reuse water collected from outside their native basin until it is completely consumed. There are five mechanisms to reuse water: non-potable reuse, water exchanges, augmentation, indirect potable reuse and direct potable reuse.

Colorado Springs Utilities already fully reuses their transbasin water rights through their non- potable system, augumentation, and water exchanges with other water right holders in the Arkansas River Basin. Direct potable reuse presents an opportunity to build flexibility into their reusable supply, one that is environmentally friendly and cost-effective in the face of future diminishing demand on their non-potable system.

The Colorado Department of Public Health & Environment is currently conducting a

The PureWater Colorado Demonstration is a mobile unit that shows the advanced purification process behind direct potable reuse: cleaning recycled water to a level that meets or exceeds all drinking water standards.

stakeholder engaged process to develop regulations for direct potable reuse in our state and the PureWater Mobile Demonstration is helping to advance the supporting science and the need for public outreach and education.

Specifically, it is allowing Colorado Springs Utilities to educate its customers and other stakeholders and to explore and better understand the potential benefits and constraints of DPR, including:

- raw water quality for potable treatment;
- potable water quality;
- reduced conveyance (transportation) pumping and associated energy consumption;
- reduced conveyance infrastructure;
- reduced transit losses (e.g. evaporation); and
- presence and removal of emerging contaminants of human health concern.

Information on the need for the project, technology of the purification process, safety of the water, effect on overall water supply can be found on Colorado Springs Utilities' DPR web page.
requesting a special tour of the advanced purified water trailer, or tasting beverages made from the purified water. Visit https://www.csu.org/Pages/DirectPotableReuse.aspx to learn more.

See for yourself how water of the future could be made by viewing the demonstration videos,

By Spencer Soicher
October 14, 2021 10:37 PM
Published October 14, 2021 10:44 PM

Colorado Springs Utilities showing off future of water reuse

KRDO

COLORADO SPRINGS, Colo. (KRDO)-- A group of Colorado engineers are working to develop a way to safely recycle water from toilets back into drinking water.

Colorado Springs Utilities has partnered with the Colorado School of the Mines and Carollo Engineers to create innovative mobile technology that purifies recycled wastewater to drinking water levels.

The PureWater Colorado Mobile Demonstration is used to show a mobile version of a carbon-based direct potable reuse process. It's something water usage experts think people in Colorado Springs are eventually going to need.

"We're the second-largest city in the state," Kirk Olds with CSU told KRDO. "We're not located on a significant waterway or river, and so that poses some unique challenges for the community in terms of its sustainability long term, unfortunately."

Olds says there are a couple of ways to turn nonpotable water into drinking water. One method is through what's called reverse osmosis.

But what makes this mobile lab unique is that it's specifically designed for the type of water we have in Colorado, using carbon filtration technology instead.

"The reason that carbon-based technology makes sense for a utility like Colorado Springs, or frankly many of our Front Range peers, is that much of our water supply is first-use, so it is not highly mineralized or doesn't have a lot of those total dissolved solids in the water."

Olds says to think of dissolved solids like putting salt in water. It disappears over time and you don't see it, but if you taste it, it's definitely there.

But in Colorado, we have fewer minerals in our water and can bypass the more expensive and lengthy reverse osmosis process.

"It's absolutely scalable," Olds says. "All of the technologies that are used inside this trailer are used in water treatment processes today. The combination and sequence of them is what's somewhat unique."

With a limited water supply in the colorado springs area, CSU believes this is eventually the future of *some*, but not all of your drinking water.

They just hope customers will be open to the idea when they inevitably incorporate it on a larger scale.

Associated Press

As cities grow, wastewater recycling gets another look

More places around the U.S. are eyeing the practice of recycling wastewater for reuse in homes and businesses as tap water

By AP

Wednesday, Nov 10, 2021 6:10

DENVER (AP) - Around the U.S., cities are increasingly warming to an idea that once induced gags: Sterilize wastewater from toilets, sinks and factories, and eventually pipe it back into homes and businesses as tap water.

In the Los Angeles area, plans to recycle wastewater for drinking are moving along with little fanfare just two decades after similar efforts in the city sparked such a backlash they had to be abandoned. The practice, which must meet federal drinking water standards, has been adopted in several places around the country, including nearby Orange County.

“We've had a sea change in terms of public attitudes toward wastewater recycling," said David Nahai, the former general manager of the Los Angeles Department of Water and Power.

The shifting attitudes around a concept once dismissively dubbed “toilet to tap" come as dry regions scramble for ways to increase water supplies as their populations boom and climate change intensifies droughts. Other strategies gaining traction include collecting runoff from streams and roads after storms, and stripping seawater of salt and other minerals, a process that's still relatively rare and expensive.

Though there are still only about two dozen communities in the U.S. using some form of recycled water for drinking, that number is projected to more than double in the next 15 years, according to WateReuse, a group that helps cities adopt such conservation practices.

In most places that do it, the sterilized water is usually mixed back into a lake, river or other natural source before being reused - a step that helps make the idea of drinking treated sewage go down easier for some.

Funding for more wastewater recycling projects is on the way. The bipartisan infrastructure bill passed by Congress has $1 billion for water reuse projects in the West, including the $3.4 billion project in Southern California.

And tucked into the federal budget reconciliation package being debated is $125 million in grants for alternative water sources nationwide that could include reuse technologies.

The Southern California project would be the nation's largest wastewater recycling program, producing enough water to supply 500,000 homes, according to the Metropolitan Water District, which serves 19 million people in Los Angeles and surrounding counties.

In Colorado, over two dozen facilities already recycle water for non-drinking purposes, which is more affordable than cleaning it for drinking. But growing populations mean cities could need to pull additional supply from the Colorado River, which is already strained from overuse.

At that point, it might make sense to start recycling for drinking purposes as well, said Greg Fisher, head of demand planning for Denver Water.

which several noted tasted no different than their usual supply.

The recycling process typically entails disinfecting wastewater with ozone gas or ultraviolet light to remove viruses and bacteria, then filtering it through membranes with microscopic pores to remove solids and trace contaminants.

Not all water can be recycled locally. Often, Western communities are required to send treated wastewater back to its source, so that it can eventually be used by other places that depend on that same body of water.

“You have to put the water back into the river because it's not yours,” said Patricia Sinicropi, executive director of WateReuse.

As a result, much of the country already consumes water that's been recycled to some degree, simply by living downstream from others. It's why drinking water undergoes stringent sterilization even when it's pulled from a river or lake that looks clean.

Encouraged by efforts in other cities, even places with stable water supplies are considering recycling their own wastewater. After a poll showed broad support for the idea in Boise, Idaho, city officials began studying plans to recharge local groundwater with treated wastewater.

“We need to be managing for the potential impacts of climate change," said Haley Falconer, a senior manager in the city's environmental division.

The Southern California project, which still needs to undergo environmental review and finalize its funding plan, would also lessen the region's need to pipe in water from afar. In exchange for financing from water agencies in Nevada and Arizona, the area is ceding some of its share of the Colorado River.

“We're taking advantage of a water supply that's right here in our backyard,” said Deven Upadhyay, chief operating officer for the Metropolitan Water District.

Officials emphasize the project uses technology that's been used safely elsewhere, including in Israel and Singapore. The reassurances have become critical after a separate Los Angeles wastewater treatment plant, which uses a different process to purify water for irrigation and industrial purposes, flooded and spilled sewage into the ocean in July.

“The last thing that any of us want is one of these projects that have a water quality hiccup that sets back public perception,” Upadhyay said.

———

Metz, who reported from Carson City, Nevada, is a corps member for the Associated Press/Report for America Statehouse News Initiative. Report for America is a nonprofit national service program that places journalists in local newsrooms to report on undercovered issues.

The Associated Press receives support from the Walton Family Foundation for coverage of water and environmental policy. The AP is solely responsible for all content. For all of AP's environmental coverage, visit https://apnews.com/hub/environment.

Connor Sonnenberg, foreground left, and Billy Kinn, foreground right, drink wastewater that was sterilized at the PureWater Colorado Mobile Demonstration using a method that involves carbon-based purification, Thursday, Oct. 14, 2021, in Colorado Springs, Colo. Across the U.S., cities are increasingly embracing the idea of sterilizing wastewater from toilets, sinks and factories, and piping it back into homes and businesses for drinking. (AP Photo/Brittany Peterson)

You might also like

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Nov 16, 2021

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Nov 16, 2021

Attachment D

Collaterals:

Factsheet

FAQs

Postcard

Banners

Tour Guide Posters

Colorado Springs Utilities
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PUREWATER COLORADO DEMONSTRATION

A look at the science behind Direct Potable Reuse

Water supply in Colorado

Colorado is one of the driest states in the U.S. It is critical to start planning new ways to meet future water demands, especially amid a quickly growing population, limited local water supplies and the impacts of a variable climate.

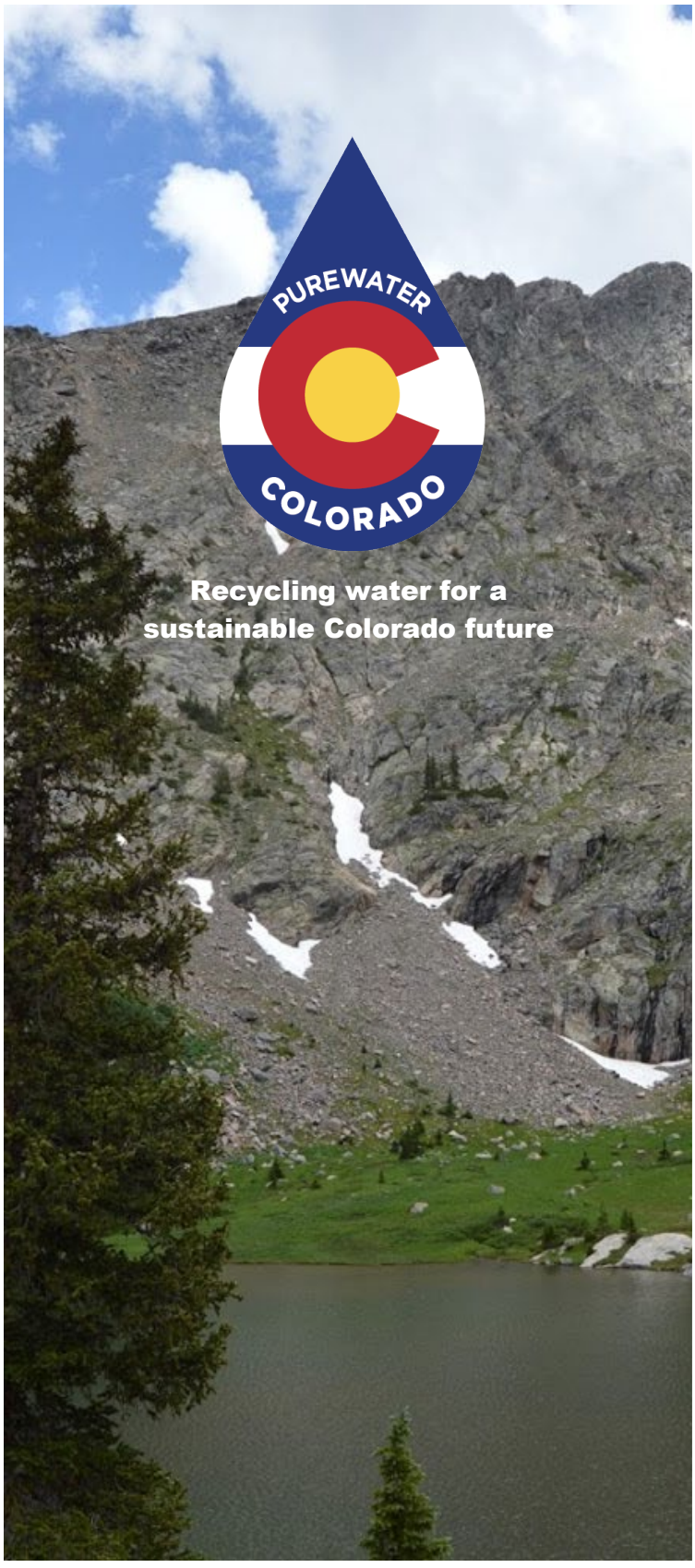
Innovation for Colorado's future

The PureWater Colorado Demonstration project uses advanced treatment technologies to produce safe, reliable and sustainable drinking water. This purified water is locally controlled and may be a wise way to manage our water resources in the most effective manner.

The project aligns with Colorado Springs Utilities' commitment to environmental stewardship and reuse of our water supplies. What we learn will help us continue to plan for and provide cost-effective, reliable, good quality water for our customers.

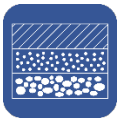
Take a PureWater Colorado Mobile Demonstration tour

csu.org/Pages/DirectPotableReuse.aspx



The water purification process

Purified water begins with water that's been used in the community and cleaned at a water reclamation facility. The water purification process used by the PureWater Colorado Mobile Demonstration is a multi-barrier approach of consecutive treatment steps that work together to remove or destroy contaminants. The process includes water quality monitoring and safeguards to ensure the produced water is safe to drink.

Step 1: **Ozonation** 	Ozone is a gas produced by subjecting oxygen molecules to high electrical voltage. This strong oxidant degrades organic matter and pathogens, then breaks down into dissolved oxygen.
Step 2: **Biofiltration** 	Water flows through carbon filters covered with beneficial bacteria which thrive in the presence of oxygen. This process removes both bulk and trace organics in the water.
Step 3: **Microfiltration** 	The water is then pushed through membranes with tiny pores to filter out suspended solids, bacteria, and protozoa. Membrane pores are 100x smaller than the width of a human hair!
Step 4: **Granular Activated Carbon** 	During this step, water flows through activated carbon granules like the filters in Step 2 (without the beneficial bacteria) or a kitchen sink filter. The large surface area of the activated carbon absorbs additional bulk, organics and trace chemicals.
Step 5: **UV/Advanced Oxidation** 	This step generates high energy ultraviolet light for disinfection. When combined with hydrogen peroxide, it can create high energy radicals that further inactivate pathogens and degrade trace chemicals.
Step 6: **Chlorination** 	Dosing the water with chlorine at the end of the treatment process further inactivates pathogens and provides a residual disinfectant to ensure the water remains safe to drink on its way to homes and businesses.

This project is brought to you by:

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PUREWATER COLORADO DEMONSTRATION
Frequently Asked Questions (FAQs)

What is the PureWater Colorado Demonstration?

Colorado Springs Utilities, Colorado School of Mines, and Carollo Engineers are partnering on the PureWater Colorado Direct Potable Reuse Mobile Demonstration, which takes recycled water that's been used in homes and businesses, through a multi-step purification process to produce water that meets or exceeds all drinking water standards. This project will demonstrate how Colorado water providers can use existing technology to reuse water to provide safe, reliable and sustainable drinking water.

What is direct potable reuse?

The process of using treated wastewater for drinking water is called potable water reuse. In Direct Potable Reuse (DPR), reclaimed water is first treated at a water reclamation facility, then continues to an advanced drinking water treatment plant and finally is distributed to customers. This water is also known as purified water and meets all state and federal drinking water quality regulations.

Where does it fit in our water supply portfolio?

Colorado Springs Utilities collects surface water from three river basins (Arkansas, Colorado and South Platte) and transports a majority of it from 100 miles away in order to meet the water needs of our community. We currently reuse the water we are legally allowed to through exchanges, our non-potable system, ground water augmentation and water sharing/leases. We anticipate that in our long-term future, purified water will be an additional mechanism for leveraging the supplies we have.

Why is the potable reuse project needed?

Colorado Springs is the largest city in Colorado that is not located on a major water source. Delivering water to our community is one of our biggest challenges and successes. Our planners have always looked ahead – 50 years in advance – to ensure our community has the water it needs when it needs it. Prolonged periods of drought and climate variability require our water supply planners to look at all available water management strategies.

The PureWater Colorado demonstration and advanced purified water technology fits with our commitment to environmental stewardship and reuse of our limited water supplies. What we learn will help us continue to plan for and develop cost-effective, reliable, high-quality water for our customers.

What purpose will it serve?

Purified water is a sustainable water source that is locally controlled and may be a wise way to manage our water resources in the most cost-effective manner.

Purified water technology would provide Colorado Springs Utilities another efficient, cost effective and environmentally responsible means to ensure the continued ability to reuse 100% of our reusable water sources to meet future water demands.

Over

How safe is the water?

Purified water is safe for human consumption. Multiple layers of advanced treatment technologies ensure that the purified water created in this treatment demonstration meets all state and federal drinking water regulations. According to studies conducted by the WateReuse Association, purified water is cleaner than bottled water and no adverse human health effects have been documented from the augmentation of drinking water supplies with purified water.

How will it be monitored to ensure safety?

Purified water will be routinely tested, including grab samples and real time online sensor technology to confirm acceptable water quality. The results of the testing will be provided to the Colorado Department of Public Health and Environment, the regulatory agency tasked with ensuring safety for human consumption, to document that the purified water complies with or exceeds state and federal drinking water standards.

How does the purified water treatment process compare to the water treatment process currently used at the Water Treatment Plants?

Our existing water treatment plants use a traditional water cleaning process that includes four main steps: coagulation/flocculation, sedimentation, filtration and disinfection. The PureWater Colorado Direct Potable Reuse Mobile Demonstration project uses an innovative, 6-step advanced water purification process without reverse osmosis to produce safe, high-quality drinking water. These steps include: ozonation, biofiltration, microfiltration, granular activated carbon, ultraviolet light/advanced oxidation, and chlorination resulting in the elimination of pathogens, near-total removal of trace organic constituents and the production of high-quality water that is protective of public health.

How much will it cost?

Currently this is a long-term, potential solution, therefore it is impractical to estimate how this solution would impact water rates for our customers. The economic viability of the treatment technology utilized for purified water will continue to be evaluated against costs for pumping and treating water, especially as regulations become stricter and costs for water go up.

When will it be implemented?

Evaluating the use of purified water is part of our 20-year planning horizon. The potential use of purified water will be monitored over time as the technology becomes more cost effective, regulations change, and the City's water demand grows.

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Colorado School of Mines

carollo

Colorado Water Conservation Board
Department of Natural Resources

TODAY WE WORK FOR TOMORROW

Colorado Springs Utilities
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Recycling water for a sustainable Colorado future. Sign up for a free tour of the PureWater mobile demonstration trailer at csu.org.

WHY POTABLE REUSE?

Direct potable reuse is a way to maximize the water we all depend on. Communities choose to reuse water for many reasons:

SAFE, RELIABLE AND SUSTAINABLE WATER SUPPLY

Potable reuse uses proven technology to purify recycled water to provide a safe drinking water source that is independent of climate or weather.

ENVIRONMENTAL BENEFITS

Potable reuse allows us to leave more water in rivers, lakes and streams for fish, plants and wildlife and reduce nutrient loads.

PART OF THE PLAN

This method of purifying and reusing water is being explored as part of our sustainable water plan.

The PureWater Colorado Mobile Demonstration Project is sponsored by:

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COLORADO
Colorado Water Conservation Board
Department of Natural Resources

MINES

The PureWater Colorado Purification Process

- Starts with wastewater that has been cleaned.
- Six steps later, the water is purified and safe for drinking.

Project Contributors

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The Colorado Center for a Sustainable WE²ST
Water-Energy Education, Science and Technology

COLORADO
Colorado Water Conservation Board
Department of Natural Resources

COLORADO
Higher Education Competitive Research Authority

DENVER WATER

suez

WATEREUSE COLORADO

AQUA-AEROBIC SYSTEMS, INC.
A Metawater Company

ReNUWIt
Re-inventing the Nation's URBAN WATER INFRASTRUCTURE

NGL Energy Partners LP

REALTECH INC.

NSF

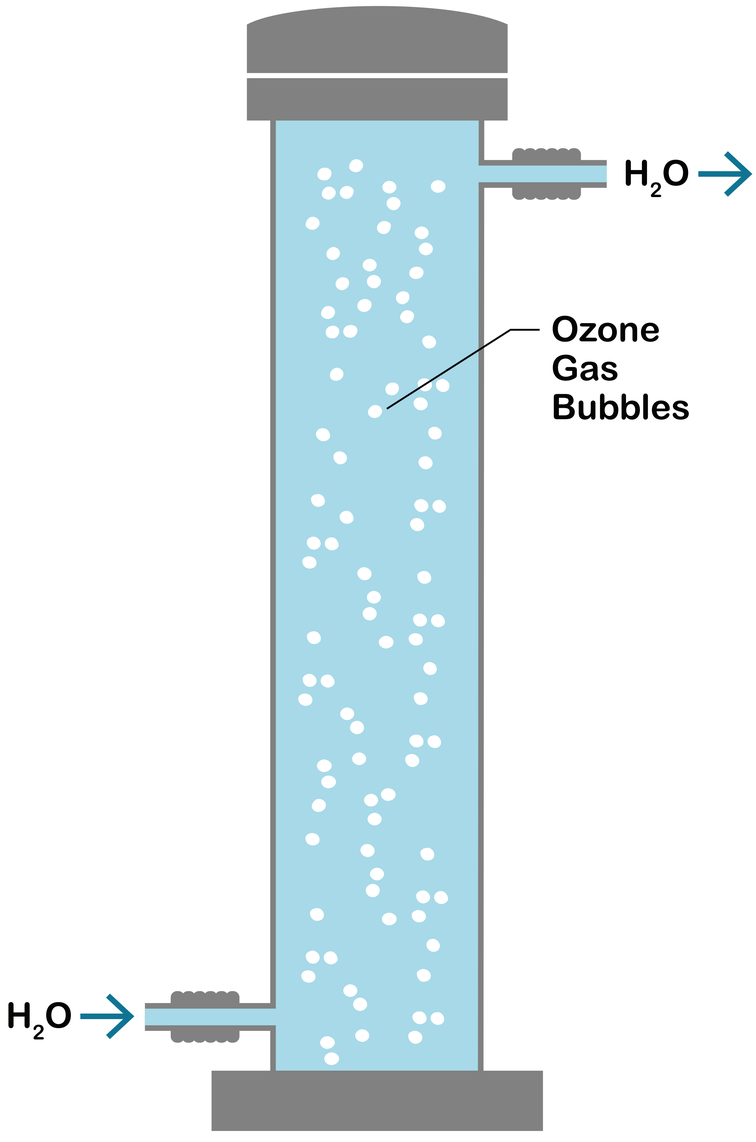
CASTLE ROCK Qwater
Securing our future *drop by drop*

PLUM CREEK WASTEWATER AUTHORITY

PUREWATER COLORADO

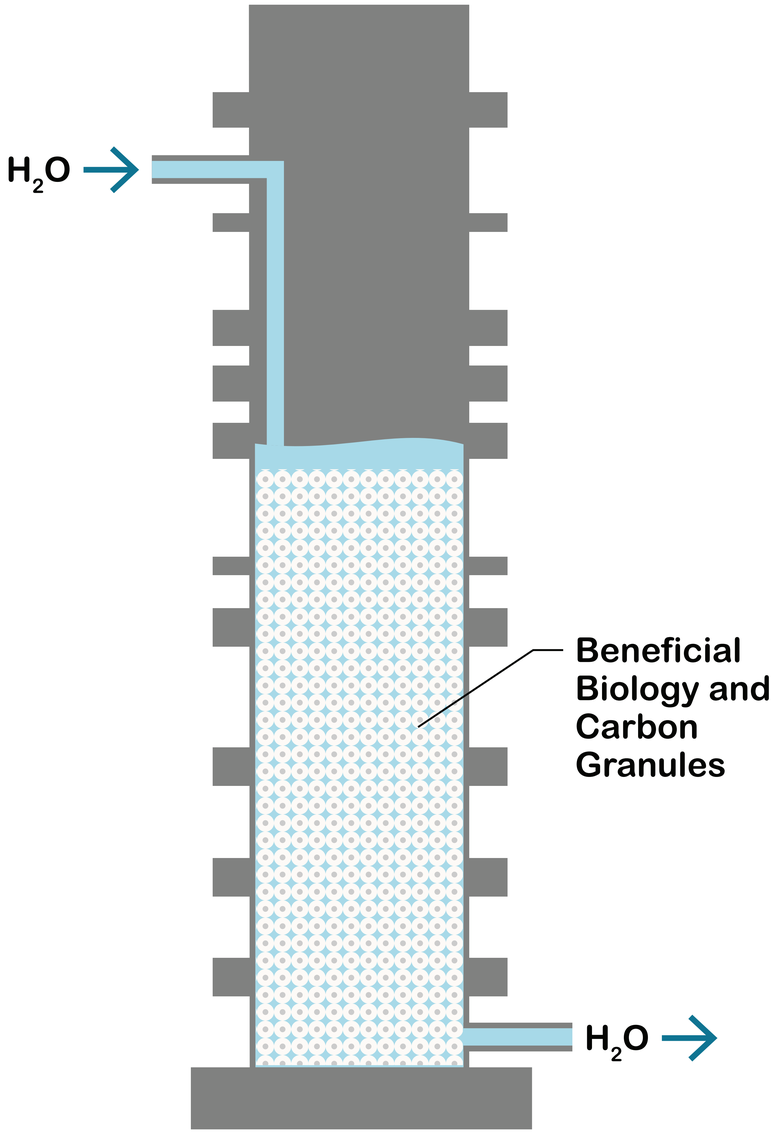
#1. Ozonation

- Ozone is a gas produced by subjecting oxygen molecules to high electrical voltage.
- Prior to the next steps, the ozone degrades organic matter and breaks down into dissolved oxygen.
- This process:
  - Destroys microorganisms.
  - Breaks down trace chemicals.



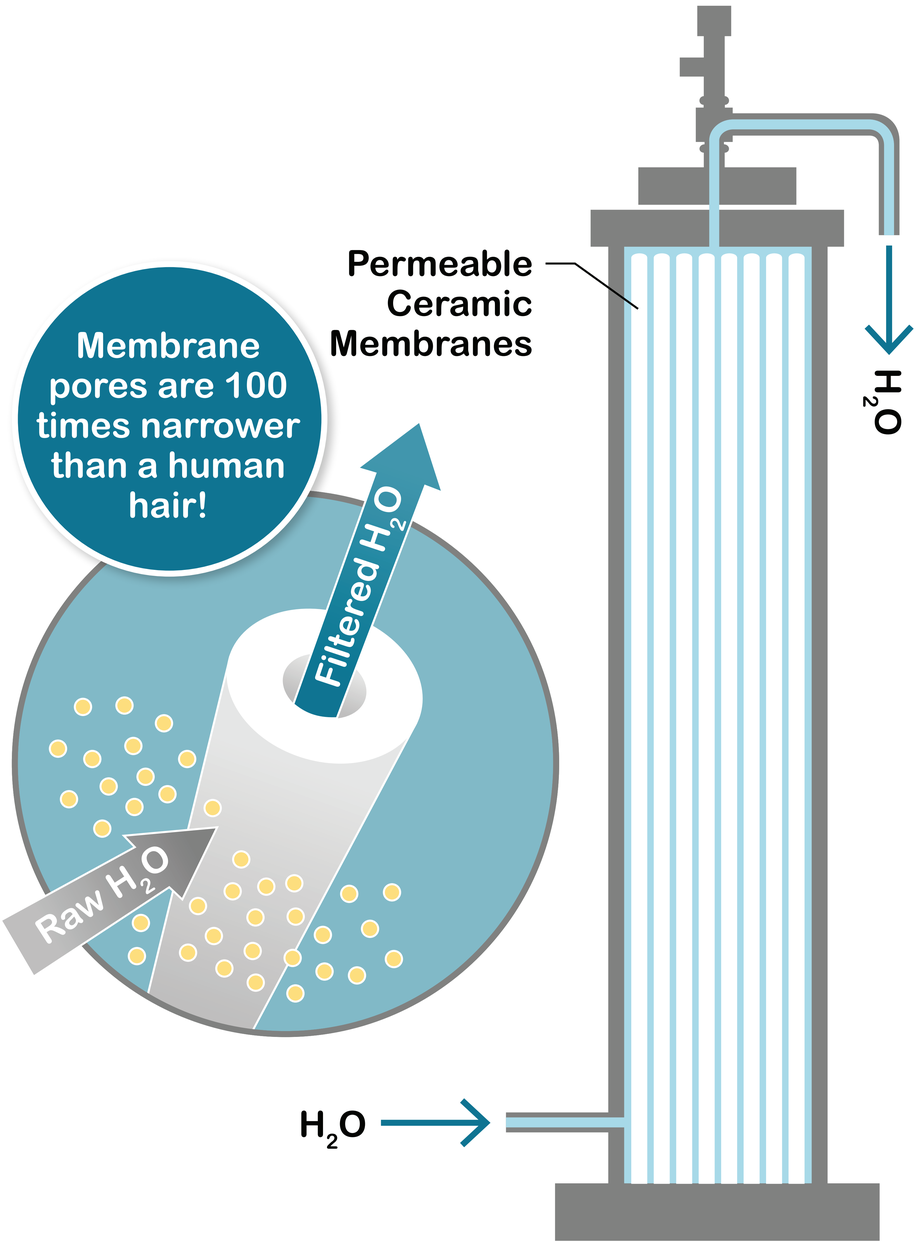
#2. Biofiltration

- Water is sent through biologically activated carbon filters that are covered with "aerobic" bacteria, which thrive in the presence of oxygen.
- This process:
  - Consumes organic matter.
  - Removes trace chemicals.



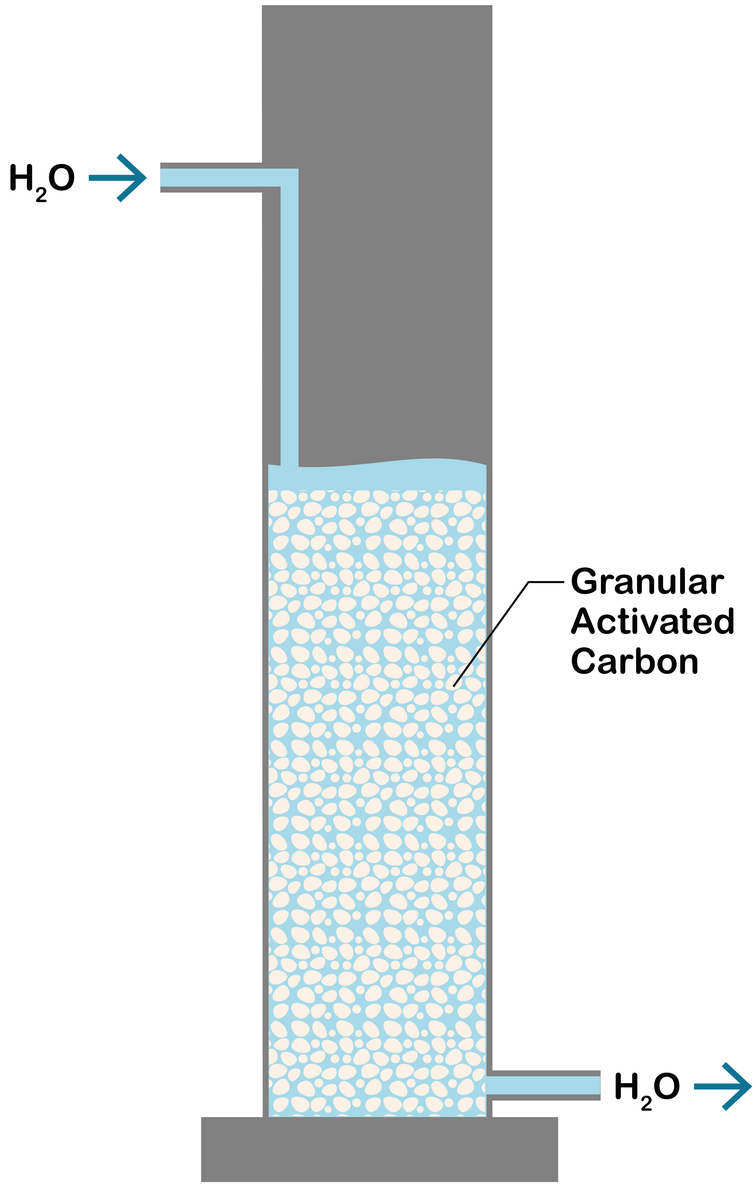
#3. Microfiltration

- Water is pushed through tiny pores in a ceramic membrane.
- This process:
  - Removes microscopic particles including suspended solids, bacteria, and protozoa.



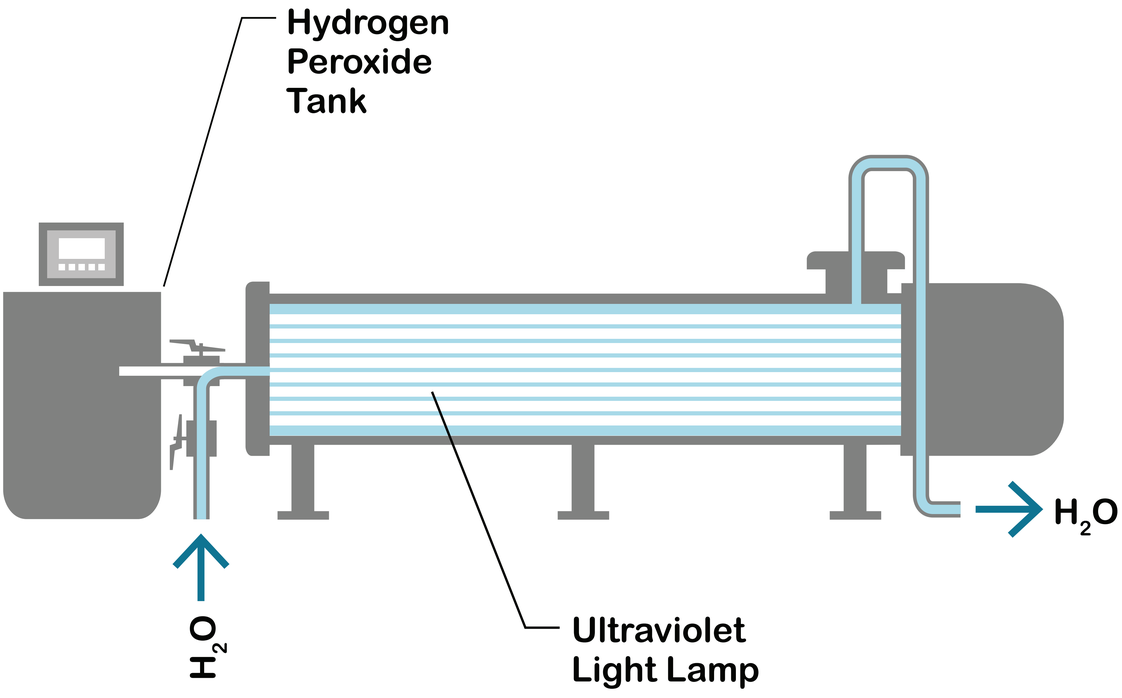
#4. Granular Activated Carbon

- Water flows through carbon granules.
- This process:
  - Removes trace chemicals.
  - Removes organic matter.



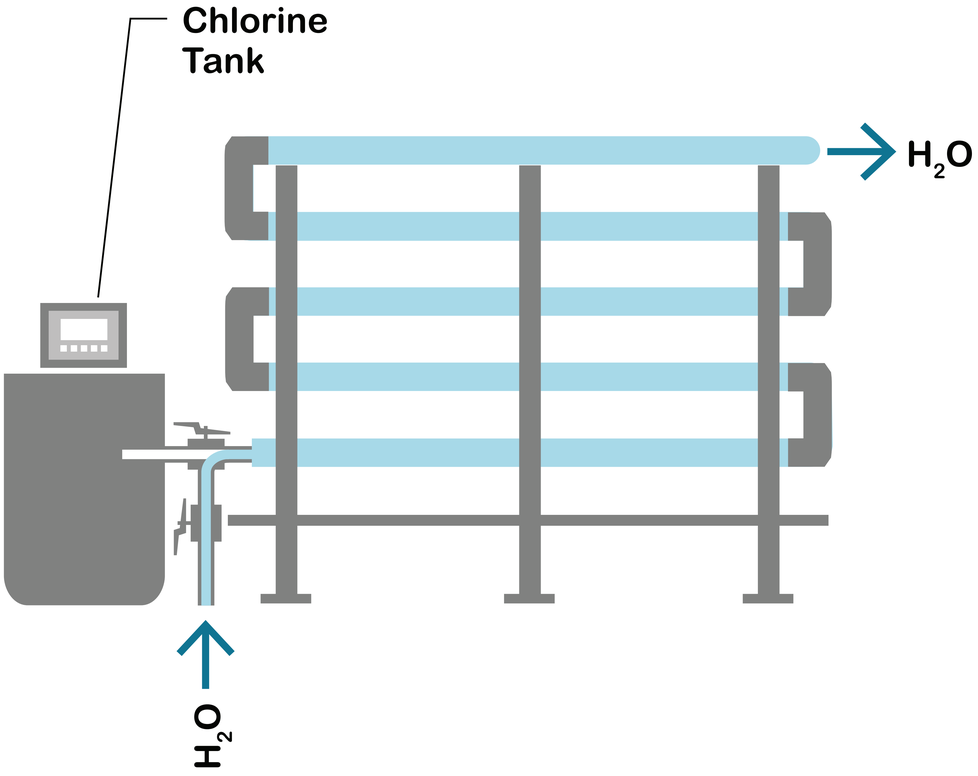
#5. UV/ Advanced Oxidation

- Generates high energy UVC light.
- Creates a chemical reaction that produces high energy radicals.
- This process:
  - Damages the DNA of any microbes or viruses, leaving them unable to replicate.
  - Destroys remaining trace chemicals.



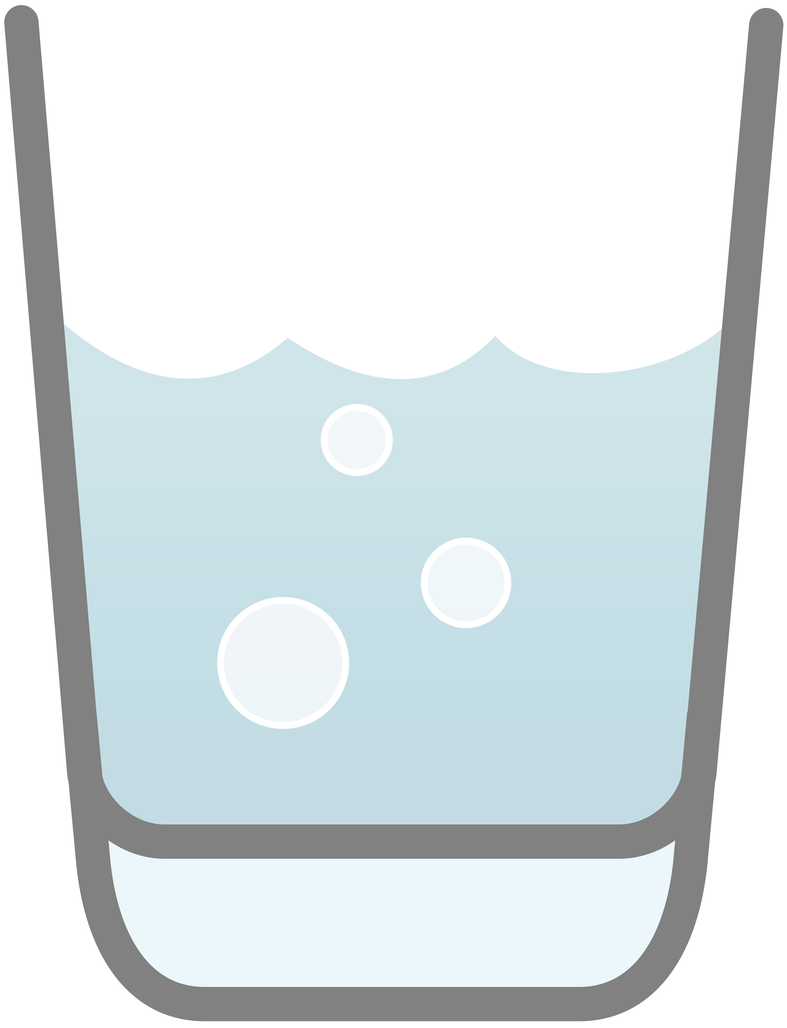
#6. Chlorination

- Adding chlorine at the end of the treatment process further inactivates pathogens.
- A residual disinfectant ensures water remains safe to drink all the way to homes and businesses.



Purified Water

- The water is tested and monitored and must meet or exceed all drinking water standards.
- At the end of all the treatment processes, we are left with safe, clean drinking water – from a locally available source!



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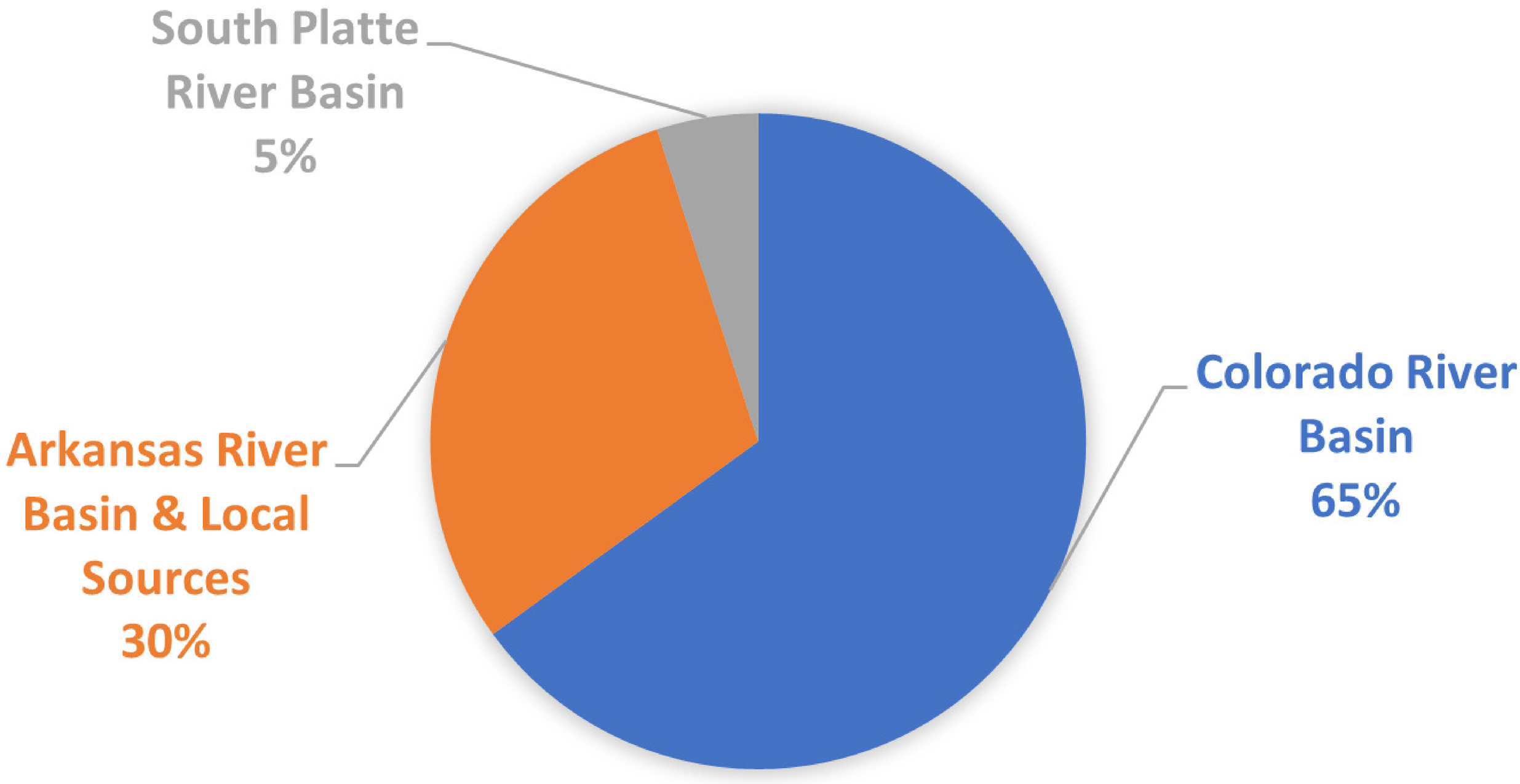
COLORADO SPRINGS UTILITIES WATER SUPPLY



WATER SYSTEM MAP

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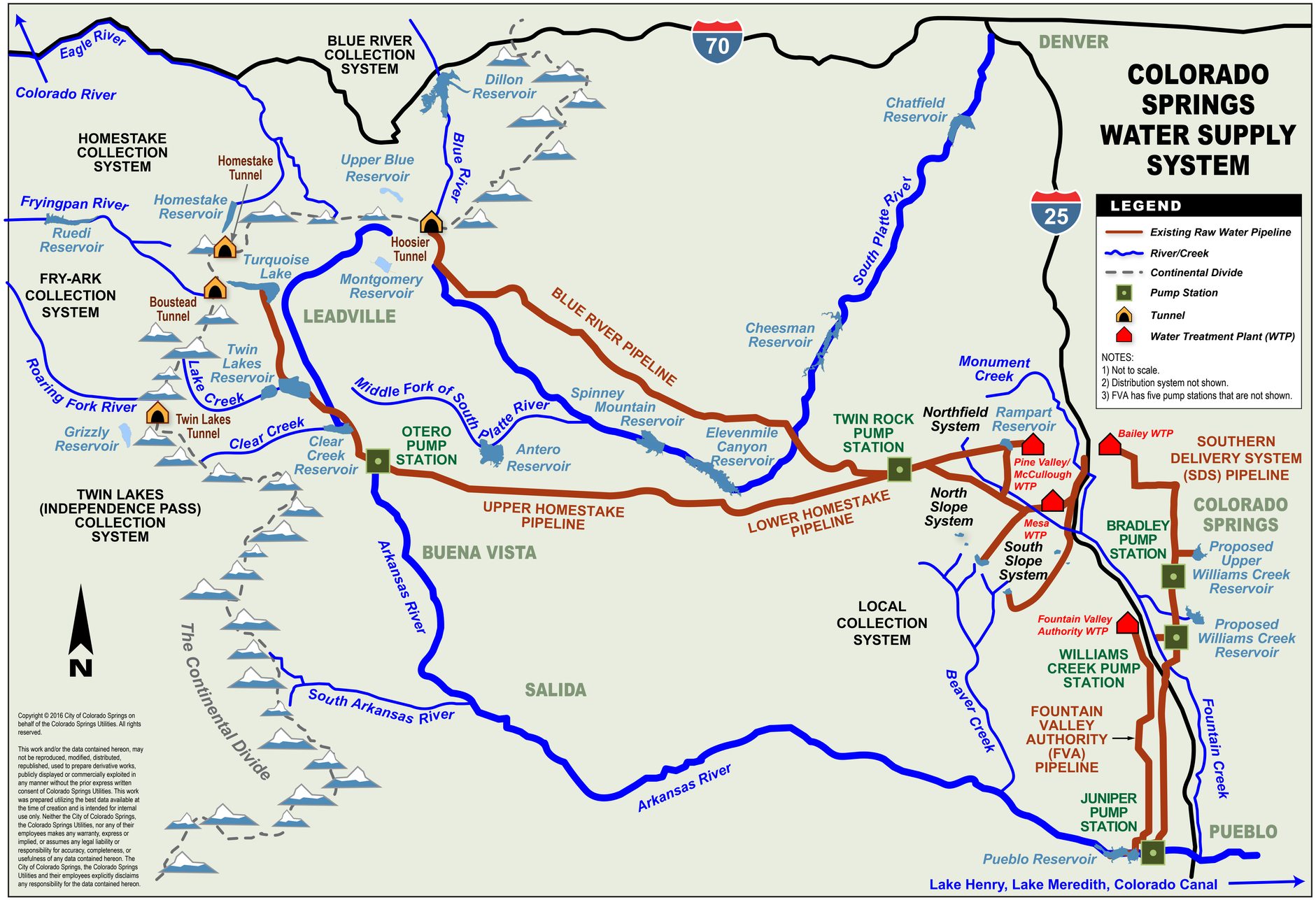

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INTEGRATED WATER RESOURCE PLAN (IWRP)

Colorado River Projects	Agricultural Transfers	Demand Management	Storage	Reuse
10,000-15,000 acre-ft/year of new supply	15,000-25,000 acre-ft/year of new supply	11,000-13,000 acre-ft/year of new supply	90,000-120,000 acre-ft of new or enlarged Arkansas Basin storage	50 to 75 MGD of IPR and 1,200-2,500 acre-ft/year of new Nonpotable demand

All components are necessary to assure sufficient, reliable water supply for Colorado Springs

Reuse is Part of Water Supply

Non-potable Reuse
(currently using)

Exchanges
(currently using)

Indirect Potable Reuse
(future possibility)

Direct Potable Reuse
(future possibility)

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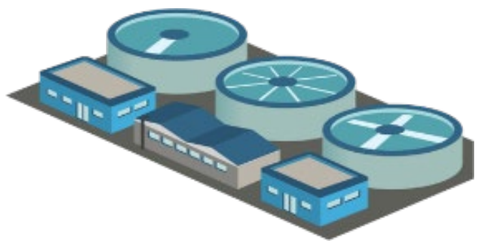
WHAT IS DIRECT POTABLE REUSE?

Water Resource Recovery Facility



Water Treatment Plant

Drinking Water

Direct Potable Reuse (DPR): cleaning recycled water to a level that meets or exceeds all drinking water standards.

HOW DIRECT POTABLE REUSE COULD HELP OUR CUSTOMERS:

- Clean, safe future water source
- Reliable, locally controlled
- Sustainable
- Environmentally friendly
- Cost effective
- Resistant to climate effects

AVAILABLE REUSE MECHANISMS

Colorado Springs Utilities

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Non-potable reuse

WRRF

Irrigation/Commercial/Industrial Users

Exchange

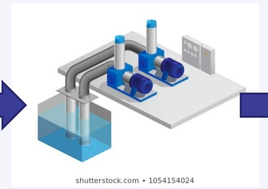
WRRF

Surface water discharge

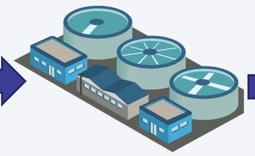
Agricultural users

Water Court

Storage



Conveyance



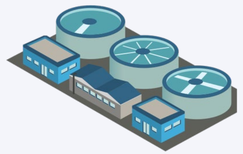
WTP

Potable Use

Indirect potable reuse (IPR)

WRRF

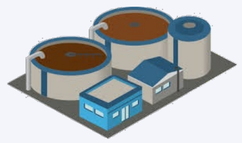
Environmental Buffer



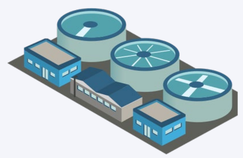
WTP

Potable Use

Direct potable reuse (DPR)



WRRF



WTP

Potable Use

PUREWATER TREATMENT STEPS

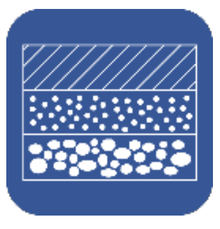
Step 1:

Ozonation

Ozone is a gas produced by subjecting oxygen molecules to high electrical voltage. This strong oxidant degrades organic matter and pathogens, then breaks down into dissolved oxygen.

Step 2:

Biofiltration



Water flows through carbon filters covered with beneficial aerobic bacteria that thrive in the presence of oxygen. This process removes organic matter and trace chemicals in the water.

Step 3:

Microfiltration

The water is then pushed through membranes with tiny pores to filter out suspended solids, bacteria, and protozoa. Membrane pores are 100x smaller than the width of a human hair!

Step 4:

Granular Activated Carbon

During this step, water flows through activated carbon granules like the filters in Step 2 or a kitchen sink filter. The large surface area of the activated carbon adsorbs additional organics and trace chemicals.

Step 5:

UV/Advanced Oxidation

This step generates high energy ultraviolet light for disinfection. When combined with hydrogen peroxide, it can create high energy radicals that further inactivate pathogens and degrade trace chemicals.

Step 6:

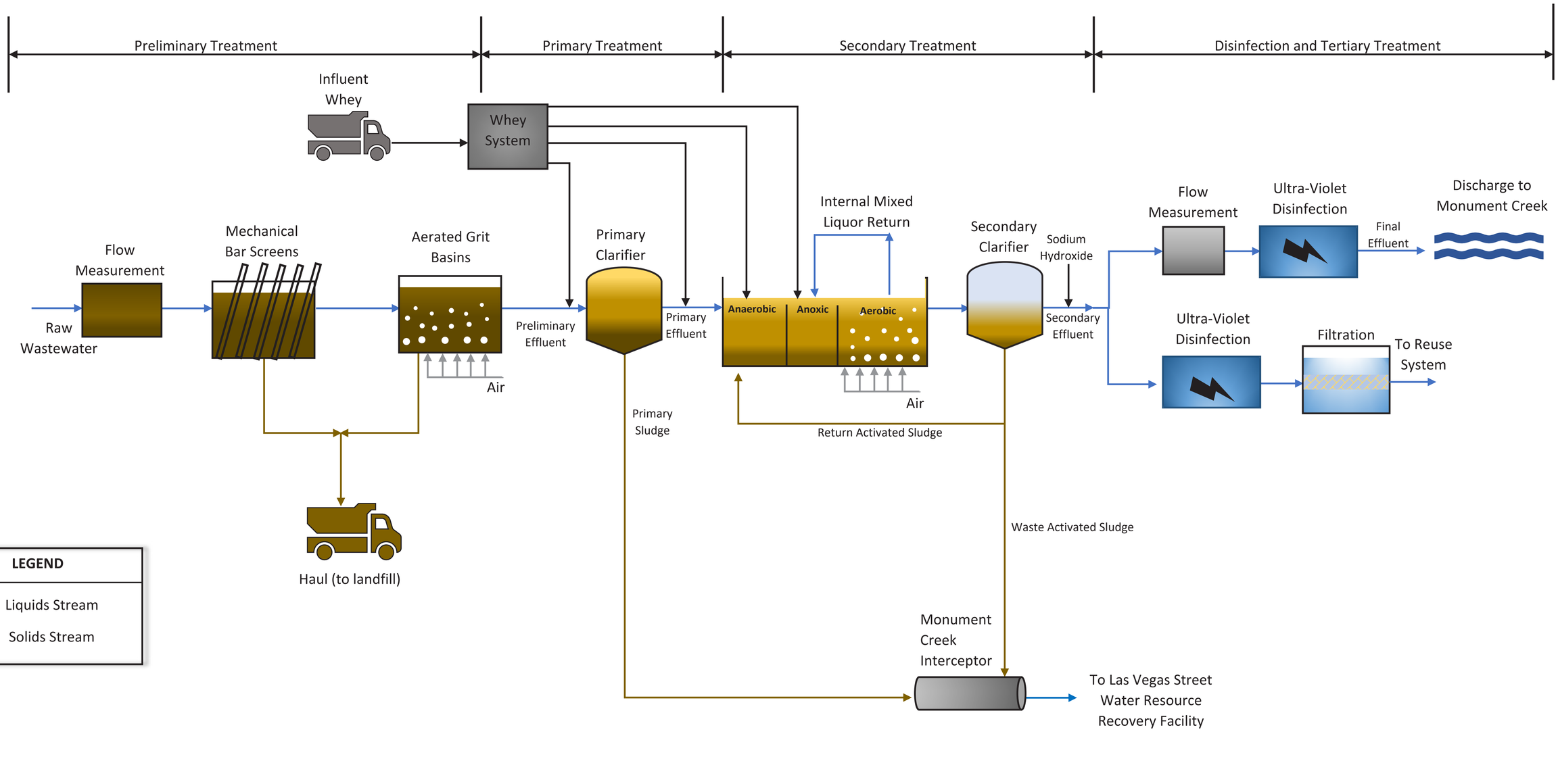
Chlorination

Dosing the water with chlorine at the end of the treatment process further inactivates pathogens and provides a residual disinfectant to ensure the water remains safe to drink on its way to homes and businesses.

JD PHILLIPS PROCESS FLOW DIAGRAM

Colorado Springs Utilities

It's how we're all connected



Attachment E

Outreach Schedule

PureWater DPR TOUR Schedule

Tour length = 1 hour (intro, walk-through, Q&A,
Max tour participants is 24
Tastings available after 7/15

PureWater DPR EVENT Schedule | **Presentations** | **PureWater DPR COMMS Schedule**

												1,000 ea	500 ea Cat. 3	600 ea Cat. 2	100 ea Cat. 1	500 ea
# of Tours Needed	**Who**	**Tour Date**	**Tour Day**	**Start Time**	**End Time**	**Tour Guide 1 - What and Why of DPR**	**Tour Guide 2 - How/Technical process**	**Logistics Guide**	**Registration #**	**Actual Attendee #**	**Water Tasting #**	**Stickers, Magnets, Jar opener, Lip balm,bar coaster**	**Mood cup**	**Tuck & Toss & Cork Coaster**	**Blue pint glasses and straw**	**WET Reuse activity book**
1	Employee Test Tour 1	17-Jun	Thursday	3:00	4:30	Sage	Birgit	NA	16	16	na					
	Brewshed Alliance Liquid Lecture	17-Jun	Thursday	6:00	7:00	Donene	Jerry	NA		14						
1	Employee Test Tour 2	30-Jun	Wednesday	2:00	3:00	Jason	Jerry	Donene	22	22	na					
	UB Tour invitation/information	2-Jul														
1	WRCO	9-Jul	Friday	12:00	1:30	Donene	Jason A.	Lisa	27	17	na	X	X	X		
	Science on Tap Lecture	12-Jul	Monday	18:30		Jerry			na	27	na	X				
	SmartHome customer newsletter	13-Jul	Tuesday													
1	CSU Employees BAMs, CI, PAD	14-Jul	Wednesday	9:00	10:00	Birgit	Donene	Lisa	22	18	na	X				
	Insight story	15-Jul	Thursday													
	Email to General group sent	15-Jul	Thursday													
1	Denver Water	20-Jul	Tuesday	10:00	11:00	Jane	Jerry	Sarah	8	7	na	X	X	X		
1	Officer & UB & GM	21-Jul	Wednesday	11:45	12:45	Tara	Kirk	Birgit, Donene	27	20	na	X	X	X	X	
	Videos completed	21-Jul	Wednesday													
	Sweeps pitch, CS/Denver broadcast, TBD															
	Media Release w/tour invite	26-Jul	Monday													
	Social Media push START	28-Jul	Wednesday													
	150 year Festival (Downtown)	31-Jul	Saturday	1:00	8:00	festival slots	filled	as of 7/1/21	na	600	Soda	X			prize	X
	Media - Bill Folsum special invite	2-Aug	Monday	5:45	7:00	Kirk	NA	NA	1	1	1					
	Carollo trailer visit	2-Aug	Monday	1:00		Donene	NA	NA	3							
1	CSU - Water, WW Operations Tour 1	3-Aug	Tuesday	8:00	9:00	Melissa	Sage	Birgit	32	20	19	X				
	Tour Guide Training (mandatory)	3-Aug	Tuesday	1:00	3:00											
1	Media	4-Aug	Wednesday	10:30	11:30	Tara	Kirk	Donene	?	16	16					
1	General Public Tour #1	5-Aug	Thursday	10:00	11:00	Birgit	Jerry	Lisa	19	13	8	X	X	X		
1	RDM All-Hands Tour	5-Aug	Thursday	1:30	3:00	Tara	Donene	Lisa	29	22	16	X				
	Buses @ the Brewery (Bristol)	7-Aug	Saturday	11:00	3:00	Donene	Jerry			40		X				
1	General Public Tour #2	10-Aug	Tuesday	1:00	2:00	Tara	Sage	Lisa	15	16	13	X	X	X		
1	CSU Employees - General #1	12-Aug	Thursday	9:00	10:00	Melissa	Jerry	Sarah	18	16	14	X				
1	CDPHE/ CWCB/ Industry Professional	13-Aug	Friday	11:00	12:00	Donene	Jerry	Birgit	24	18	17	X	X	X		
1	General Public Tour #3	14-Aug	Saturday	10:00	11:00	Birgit	Bill	NA	12	11	8	X	X	X		
1	General Public Tour #4	18-Aug	Wednesday	11:30	12:30	Birgit	Sage	Sarah	21	23	20	X	X	X		
1	Jacobs Engineering Tour	20-Aug	Friday	1:30	2:30	Kirk	Kirk	Lisa	8	8	8	X	X	X		
1	General Public Tour #5	25-Aug	Wednesday	9:00	10:00	Tara	Bill	Sarah	14	10	10	X	X	X		
1	General Public Tour #6	31-Aug	Tuesday	5:00	6:00	Birgit	Sage	Sarah	17	12	11	X	X	X		
1	State Legislators #1	1-Sep	Wednesday	9:00	10:00	Kirk	Jerry	Donene	5	8	8	X	X	X		
1	State Legislators #2	2-Sep	Thursday	2:00	3:00	Donene	Sage	Lisa	8	3	6	X	X	X		
	Peak Producers Presentation	7-Sep	Tuesday	4:00	7:00	Jerry	Ryan	NA		50						
1	General Public Tour #7	14-Sep	Tuesday	12:00	1:00	Birgit	Bill	Sarah	22	19	18	X	X	X		
1	CSU Employees - General #2	15-Sep	Wednesday	9:00	10:00	Tara	Shaun	Sarah	21	13	13	X				

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PureWater DPR TOUR Schedule

Tour length = 1 hour (intro, walk-through, Q&A,
Max tour participants is 24
Tastings available after 7/15

PureWater DPR EVENT Schedule | **Presentations** | **PureWater DPR COMMS Schedule**

												1,000 ea	500 ea Cat. 3	600 ea Cat. 2	100 ea Cat. 1	500 ea
# of Tours Needed	**Who**	**Tour Date**	**Tour Day**	**Start Time**	**End Time**	**Tour Guide 1 - What and Why of DPR**	**Tour Guide 2 - How/Technical process**	**Logistics Guide**	**Registration #**	**Actual Attendee #**	**Water Tasting #**	**Stickers, Magnets, Jar opener, Lip balm,bar coaster**	**Mood cup**	**Tuck & Toss & Cork Coaster**	**Blue pint glasses and straw**	**WET Reuse activity book**
1	School Tour - Doherty HS AP Biology	15-Sep	Wednesday	1:00	2:30	Birgit	Bill	Sarah	32	16	NA	X				
1	Colorado College Water Class	16-Sep	Thursday	10:45	11:45	Donene	Gregg	Lisa	22	22	23					
1	Private - ADA accomodation	17-Sep	Friday	2:30	3:30	Donene	Donene	Donene	3	3	4	X	X	X		
	Carollo Photo Shoot	20-Sep	Monday	8:00	10:00	NA	NA	Donene (water)	3	5	6					
1	UCCS Water Class	21-Sep	Tuesday	8:30	10:00	Kirk	Shaun	Sarah	30	28	15	X				
1	Scout Troop 40698	25-Sep	Saturday	10:00	11:00	Birgit	Gregg	NA	20	19	NA	X				X
1	School Tour - Rogers Elementary	28-Sep	Tuesday	9:30	11:30	Jane & Birgit	Gregg	Sarah	44	38	NA	stickers only				X
	UB Water Tasting	29-Sep	Wednesday	10:00	11:00	NA	NA	Kirk/Donene	10	6	7 (5th fl emp.)				X	
1	Friends of Mesa Road Garden	29-Sep	Wednesday	9:00	10:30	Birgit	Gregg	Lisa	15	12	11	X	X	X		
1	Carollo Staff Tour	30-Sep	Thursday	2:00	3:00	Donene	Kirk	Birgit	10	10	9	X	X	X		
	Social Media - Cool Science Fest	30-Sep														
	Special water tasting requests	1-Oct	Friday	NA	NA	NA	NA	Donene			3					
1	Pikes Peak Society of Women Engineers	5-Oct	Tuesday	5:00	6:00	Donene	Gregg	Sarah	15	15	14	X	X	X		
1	CSU Employees - General #3	6-Oct	Wednesday	9:00	10:00	Birgit	Gregg	Sarah	21	17	16	X				
1	Metro Water Recovery	8-Oct	Friday	9:30	10:30	Jason	Donene	Lisa	9	8	8					
	Cool Science Festival (UCCS) - Info Booth and Soda - **SHIFT 1**	9-Oct	Saturday	9:30	12:00	Birgit	Shaun	NA		120	na	X				X
	Cool Science Festival (UCCS) - Info Booth and Soda - **SHIFT 2**	9-Oct	Saturday	11:30	2:00	Birgit	Sarah	NA				X				X
	Cool Science Festival (UCCS) - Info Booth and Soda - **SHIFT 3**	9-Oct	Saturday	2:00	4:30	Donene	Sage	NA				X				X
1	PP National Society of Professional Engineers	12-Oct	Tuesday	4:30	5:30	Tara	Gregg	Sarah	7	5	5	X	X	X		
1	General Public Tour #9	13-Oct	Wednesday	12:00	1:00	Jason	Sage	Sarah	25	22	18	X	X	X		
1	Cool Science Tour	14-Oct	Thursday	4:00	5:30	Birgit	Shaun	Donene	8	20	21 (Kirk)	X	X	X		
	Associated Press and KRDO media coverage at tour	14-Oct	Thursday	4:00	5:30	Kirk	Jennifer									
	Arkansas River Basin Water Forum Newletter article	14-Oct	Thursday			Birgit	Jennifer									
1	Public Tour #11	19-Oct	Tuesday	11:00	12:00	Jason	Gregg	Jane	7	7	7	X	X	X		
1	City Regional Parks, Trails and Open Space Division	21-Oct	Thursday	10:00	11:00	Jason	Tara	Donene	13	17	16	X	X	X		
1	Rocky Mtn. Water Environment Assoc. Water Technologies (IWT) Committee	22-Oct	Friday	2:30	3:30	Donene	Kirk	Jane	17	14	14	X	X	X		
1	General Public Tour #10	23-Oct	Saturday	10:00	11:00	Jason	Bill	Donene	14	9	10	X	X	X		

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PureWater DPR TOUR Schedule

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1	Ftn Creek Watershed District	25-Oct	Monday	2:00	3:00	Tara	Donene	Lisa	16	10	9	X	X	X		
1	School Tour - Fountain Ft. Carson Middle School Group 1	27-Oct	Wednesday	9:30	11:00	Birgit/Sarah	Gregg/ Bill	Jane	45	47	NA					
1	School Tour - Fountain Ft. Carson MS Group 2	27-Oct	Wednesday	11:45	1:15	Birgit/Sarah	Shaun/ Steve	Jane	45	49	NA					
1	School Tour - Pikes Peak School of Expeditionary Learning	28-Oct	Thursday	9:00	11:00	Birgit/ Sarah	Gregg	Jane	46	52	na	X				X
1	Dominion	28-Oct	Thursday	1:00	2:00	Birgit	NA	Lisa	6	6	6	X	X	X		
1	PPCC Students	1-Nov	Monday	10:15	12:00	Birgit	Gregg	Sarah	21	16	14	X	X	X		
1	Partners and Bev Champions Celebration	2-Nov	Tuesday	3:30	4:30	Donene	~~Kirk~~ Sage	Birgit	12	12		X	X	X	X	
1	School Tour - ASD20 Homeschool Academy #1	3-Nov	Wednesday	10:00	12:00	Birgit	Gregg	Sarah	23	25	NA	X				X
1	School Tour - ASD20 Homeschool Academy #1	4-Nov	Thursday	10:00	12:00	Jane & Birgit	Gregg	Sarah	45	49	NA					
1	School Tour - ASD20 Homeschool Academy #1	5-Nov	Friday	10:00	12:00	Jane & Birgit	Jerry	Sarah	45	51	NA					
	Arkansas River Basin Roundtable presentation	8-Dec	Wednesday	12:30	1:00	Kim G.	Julia G.	NA		20						
50	**Total Tours from June - Dec. 2021**															

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Attachment F

Tour Guide Script

PureWater Colorado Demonstration – *Recycling water for a sustainable Colorado future*

2021

Tour Guide Instructions and Script

Preamble: Tour Guide Instructions
Welcome visitors and clearly describe what the visitor will see. Consider safety and security issues of both the visitor and the resource. Tour guides help visitors understand and appreciate the facility without being seen as an advocate for "marketing or selling" a particular decision. Tour guides can also record questions that were not answered and get others on the project team to contact the visitor. Tour guides encourage visitors "to spread the word" so others will visit.

Tour guides should:

- Be enthusiastic
- Be engaging
- Speak clearly and at a reasonable pace – directly into the microphone
- Be committed to the goals of showing rather than telling
- Incorporate the project key messages
- Get contact information for follow up when asked a question they are unable to answer. Tour guides should try to be responsive to answer short questions if they are confident of the answer – while being mindful of time constraints.
- Repeat a question before answering it.

Tour guides should *not:*

- Answer a question unless they are sure they know the answer – Instead, they should get contact information and follow up after the tour.
- Try not to come off as such an expert that tour guests are uncomfortable asking questions.
- Criticize viewpoints instead of expressing that prior personal experiences may be different
- Argue with or try to facilitate a dialogue or debate between participants.

<u>Dealing with difficult people:</u>
Should a participant be difficult, it is best for the tour guide to simply deflect:

- "I understand that this is your point of view, but let's allow others to make up their own mind."
- "We have only a short time together, let me make certain that someone follows up with the information you need. I have noted your question/concern."

Tour Guide Script/Speaking Points – ALL GUIDES SHOULD MEMORIZE KEY MESSAGES and ELEVATOR SPEECH. The remaining script is for guidance.

Tagline: Recycling water for a sustainable Colorado future.

Top 3 Key Messages:

1. **Direct Potable Reuse (purified water) provides a safe, reliable, and sustainable drinking water source.**
2. **Using purified water is good for the environment.**
3. **Purified water is a water source that is locally controlled and may be a wise way to manage our water resources in the most cost-effective manner.**

Elevator Speech:

The PureWater Colorado Demonstration provides a mobile unit for cleaning recycled water to a level that meets or exceeds all drinking water standards. Through the use of a multi-barrier purification process, we will demonstrate how to produce safe and sustainable drinking water from locally controlled resources, making this an efficient, cost-effective and environmentally friendly water source.

We are taking treated water from the Water Resource Recovery Facility and cleaning it further to make purified drinking water.

<u>Approved TERMS:</u>

- Direct Potable Reuse vs. DPR
- Purified water vs. Direct Potable Reuse
- Treated water vs. reclaimed water when referring to water from the Water Resource Recovery Facility
- Cleaned vs. Treated
- Recycling water
- Reusing water

TOUR TIMELINE

Start Time	End Time	Session Length (minutes)	Topic	Comments
0 min.	10	10	Introduction and split group	Both Tour Guide 1 & 2
10	30	20	Session 1	20 minutes for each group – includes Q&A and rotation
30	50	20	Session 2	20 minutes for each group – includes Q&A- and rotation
50	60 min.	10	Water tasting/ promo items	Final Q&A

Total tour = 60 minutes

Tour Guide checklist & tips

- ☐ Get to JDP at least 30 minutes before tour time.
- ☐ Set up fans
- ☐ Turn off loud equipment
- ☐ Test microphones
- ☐ Inspect trailer to ensure items are stowed, labels visible etc.
- ☐ Greet guests and interact with them
- ☐ Ask participants to come closer
- ☐ Speak directly into mic and turn with the mic
- ☐ Stick to approved terms and consistent messages – no acronyms
- ☐ Tour Guide 2 – pass out infosheet inside trailer; acknowledge tight space, visitors can step outside anytime

Logistics Guide Tasks (see full task list on separate document)

- ☐ Set out tour signs
- ☐ Direct traffic
- ☐ Check off attendees
- ☐ Set up tent with swag items, tasting supplies and water
- ☐ Get microphones to tour guides
- ☐ Set up fans inside trailer

TOUR GUIDE 1 & 2 - INTRODUCTION

- Thank you for coming to see the PureWater Colorado Demonstration. We appreciate you taking time to see how drinking water of the future may be produced. **Colorado Springs Utilities is hosting this project in partnership with Colorado School of Mines and Carollo Engineers, we all welcome you here today. This project is made possible by a grant from the Colorado Water Conservation Board.**
- **Colorado Springs Utilities is the largest community-owned, not-for-profit, four-service utility in the nation. For almost 100 years, we have provided Colorado Springs with safe, reliable and competitively priced electric, natural gas, water and wastewater services.**

    - *Introduce yourselves and what you do*
    - *Get to know your audience* – have everyone introduce themselves (if smaller group), or do a show of hands for types of visitor – "Interested Citizen", "Industry, Business or Military sector", "Water Professional", "Education &/or Health", etc.
    - Raise hand if you are familiar with direct potable reuse; if you've never heard of it before; if you are somewhere in the middle.
    - Q&A – Colorado Springs is not located on a major source of water so the majority of our water must be brought to town. How many miles has our water traveled to get here? Answer = 100 miles.

- **Today you are going to learn about how we can produce a safe and reliable source of water using an advanced water purification technology. This demonstration facility purifies treated wastewater and creates a valuable asset: safe, clean drinking water.**
- **This trailer is the only MOBILE, CARBON-BASED direct potable reuse demonstration in the country. Colorado Springs Utilities is very proud to be part of this innovative project using proven treatment processes.**
- Before we get started, a few logistics to cover:
    - *Length of tour: 60 minutes – 10 minute intro, 20 minute outside "why DPR" session, 20 minute tour through trailer, 10 minute tastings and wrap-up.*
    - *Pictures are allowed.*
    - *Touching components inside the trailer is not allowed for health and safety reasons.*
    - *Safety: closed-toed shoes required, masks recommended if unvaccinated, watch your step, inside the trailer is a tight fit, please step outside anytime – front and back exits available however, steps are only available on front entrance so watch for large step down from the back door, sunscreen available, etc.*
    - *Restroom – porta potty onsite*
    - *Questions so far?*

SPLIT GROUP

- *Group will be split into two so that more can be seen inside the trailer. One group will start outside where the guide will provide background information on our water system while the other group tours through the trailer to see the technology behind making purified water. Include time for Q&A. Then the groups will switch but tour guides stay and repeat their spiel. At the end we'll have optional tasting of the purified water and further questions and answers.*

TOUR GUIDE 1 – OUTSIDE – The "WHY" of Direct Potable Reuse

- **Colorado is one of the driest states in the country and with climate variability and a population that's expected to nearly double between now and 2050, we need to maximize water resources to the fullest extent possible.**
- To best decide how to do that, in 2016, the Colorado Water Conservation Board developed the first ever Colorado Water Plan which charted a path forward to meet the water demands expected to materialize in the next 30 years and beyond.
- While no one strategy alone will solve Colorado's water supply issues, a portfolio of water efficiency, responsible water supply development and expanded water reuse has the potential to close the supply-demand gap.
- In Colorado Springs, water has been our greatest challenge and our greatest success. As mentioned in the introduction, **we import over half of our water from as far as 100 miles away from the western slope of the state.** This is because we don't have a major source of water nearby. *(Show Water Supply pie chart and Water System Map posters).*
- As you can see from the water supply chart, the majority of our water comes from the Colorado River Basin. Over 41 million people depend on this water and our water rights must be used as effectively as possible for our community. **Water right laws allow water brought in from a basin outside our local area to be reused until it is completely consumed.**
- Colorado Springs Utilities outlined 5 methods to meet the water demand for our community for the next 50 years in our Integrated Water Resource Plan known as our Sustainable Water Plan, available on our website. (*Show poster of Balanced Portfolio for Water Supply – fondly referred to as the skittle diagram. Skittle candy packets available to hand out.)*
- One of the areas to meet a sustainable future water supply is expanding water reuse. **There are four ways to reuse water. Currently we reuse our water through our non-potable system and water exchanges. This demonstration explores the option of direct potable reuse as another method of water reuse to increase the tools in our water supply toolbox.** *(show reuse methods poster and explain steps for the 4 ways to reuse water:*
    - *1) Non-potable – taking treated water from the Water Resource Recovery Facility and using it for non-drinking purposes such as watering grass, industry, etc.);*
- Colorado Springs Utilities operates one of the first non-potable water reuse systems in the state. Currently about 10% of our treated wastewater is reused within our service territory for nondrinking purposes.
    - *2) Exchanges – getting credit for the treated wastewater released downstream to trade with other users.*
- We also reuse 20% of our water through exchanges, which is a paper accounting of water rights that allows us to maximize our water rights. An analogy for water exchanges would be like a bank. You deposit your paycheck into the bank but can pull out money at an ATM across town somewhere else.
    - *3) Indirect Potable Reuse – putting treated wastewater into an environmental buffer such as a stream or groundwater before pulling it back out to purify into drinking water;*
- Colorado Springs Utilities is also evaluating Indirect Potable Reuse but we have limited environmental buffers to use. This process is currently used by water providers such as Aurora Water and Caste Rock Water.

    - *4) Direct potable Reuse – taking treated wastewater, purifying it and putting it into the water distribution system).*
- To ensure a sustainable water supply in the future, Colorado Springs Utilities is looking to maximize our water supply by exploring the use of purified water, thus this direct potable reuse demonstration project.
- **Direct Potable Reuse – What is it?** *(show DPR poster)*
    - **Direct potable reuse (DPR) is highly treated recycled water that goes directly into a public water system's distribution system for delivery to customers. In direct potable reuse, water is first treated at a water reclamation facility, it then continues to an advanced drinking water treatment plant to be purified and finally is distributed to customers.** *(show poster)*
    - **The treated water produced at this, and our other Water Resource Recovery Facility on Las Vegas Street, already meets stringent water quality regulations before being released to Fountain Creek. It's not a stretch to clean it further to drinking water standards.**
    - This more direct method involves using advanced technological processes to recover and purify water that is typically released to the environment. **This is the normal urban water cycle approach performed in a more intentional, planned manner to maximize the available water supplies.**
- In practically every major watershed in the country, water goes through the urban water cycle where drinking water is used, cleaned at a Water Resource Recovery Facility, then mixed with natural waters to again become source water for the next downstream user.
- The direct potable reuse approach replicates the natural water cycle – the water we use today is the same water that has been on Earth since before the dinosaurs. Recycling and reusing water has continued throughout history, but it can be done faster with advanced technology. **Water should be judged by its quality, not its history.**
- The PureWater Colorado Demonstration project will use an innovative, advanced water purification process to produce safe, high-quality drinking water from recycled water. The project is designed to test and demonstrate a potential, long-term reuse option for water in our service territory and across Colorado.
- Direct Potable Reuse fits with our organization's commitment to environmental stewardship.
    - **Direct Potable Reuse (purified water) provides a safe, reliable, and sustainable drinking water source.**
    - **Using purified water is good for the environment.**
    - **Purified water is a water source that is locally controlled and may be a wise way to manage our water resources in the most cost-effective manner.**
        - Water not native to our basin can be reused multiple times until it is fully consumed meaning we depend less on our Colorado Water imports;
        - less energy is needed for conveyance and transmission;
        - water from our WRRF is often of higher quality than some natural waters so it requires less treatment;
        - we'll experience less water loss through evaporation and seepage by releasing water downstream.
    -
- There are communities all over the country currently using or looking at similar projects to create new, locally available supplies of water such as Texas, Florida, California and here in Colorado.

- Regulations for direct potable reuse in Colorado are currently being developed by the Colorado Department of Public Health and Environment. This demonstration can help inform those regulations.
- **We are *evaluating* direct potable reuse now, but it has not been implemented (is not being distributed to the community) and no decisions have been made at this time as to whether/when it might be. Informing those decisions is one of the purposes of operating this demonstration.**

(Point out process banners in tent) Purifying water is a "multi-barrier treatment process" designed to remove pathogens and pollutants from water. Proven engineered treatment processes are used to purify water to a level that is safe to drink.

- You will have a chance to see the water purification steps inside the trailer.
- We will have this PureWater mobile treatment unit in Colorado Springs for up to a year. Thereafter it will go back to School of Mines and be available for other Colorado communities to test with their systems.

TOUR GUIDE #1 – Q & A *(SWAP groups)*

TOUR GUIDE 2 – INSIDE THE TRAILER – The "How/Technical" of Purified Water

The Water Purification Process

- Today we will see the water purification processes for the PureWater Colorado Demonstration Project. **The processes you see here are similar to the way we currently make drinking water at our water treatment plants, except additional steps are included to ensure the recycled water is as clean as the water we provide to your homes & businesses today.**
- Let's walk through the facility to see the technology up close. Please ask questions anytime along the way.
    - Each of these processes provides specific cleaning and purification and they work together to form a multi-barrier process for purifying the water.
    - The PureWater Colorado Demonstration Project's water purification process starts with water that has been cleaned here at the JD Phillip Water Resource Recovery Facility.
    - At the JD Phillips Water Resource Recovery Facility, and our other Water Resource Recovery Facility on Las Vegas Street, we collect water that has been used in day-to-day activities such as cooking, washing dishes, doing laundry, showering, using the restroom, etc. The used water gets cleaned through multiple processes to remove solids, particles and pathogens such as bacteria. The resulting cleaned water is called "treated" wastewater and is either released into the creek for downstream users or reused in town for non-drinking purposes such as watering grass at golf courses, parks, cemeteries, or industrial purposes such as the cooling towers at the power plant.
    - The processes for wastewater treatment differ from the advanced treatment that is used here in the demonstration trailer. A poster inside the tent shows a diagram of the water resource recovery cleaning process for those interested in more detail.

- The treated water has already been cleaned to a fairly high level. What if – instead of releasing the water to the creek - we could clean that water further to a level that is safe to drink? It can be done! I will show you the advanced treatment processes inside this trailer that accomplishes this feat. Six steps are used to purify the water so that it is safe to drink. Let's go through each step in more detail.

1. **Ozonation**:
   - Ozone is a strong oxidant that is produced by subjecting oxygen molecules to a high electrical voltage.
   - The ozone is then consumed by organic matter and breaks down into dissolved oxygen.
   - This part of the process destroys microorganisms, breaks down up to 90% of a variety of contaminants, and adds oxygen to the water which is beneficial for the microbes in the next step in the process.

2. **Biofiltration:**
   - Next the water is sent through a biologically active filter that is covered with beneficial "aerobic" bacteria, which thrive in the presence of oxygen.
   - This part of the process consumes up to 50% of organic matter and removes chemical pollutants.

3. **Microfiltration:**
   - In this step, the water is pushed through ceramic membranes with tiny pores. The pores are 1/100th the diameter of a human hair.
   - This process removes microscopic particles including suspended solids, bacteria and protozoa and any viruses attached to them.
   - Microfiltration processes are also used in other industries to filter fruit juices and baby food, as well as to sterilize medicines that cannot be heated.

4. **Granular Activated Carbon (GAC):**

   - Next the water flows through carbon granules, which absorb any contaminants that made it through the previous steps.
   - This step also reduces compounds that may produce taste and odor in the water.

5. **UV/Advanced Oxidation:**
   - Ultraviolet light is like very concentrated sunlight. When combined with an oxidant like hydrogen peroxide, a chemical reaction happens that produces very powerful radicals – we refer to that process as "advanced oxidation".
   - The process damages the DNA of microbes or viruses, leaving them unable to replicate. When operated as UV/Advanced Oxidation, this process also destroys trace contaminants still present in the water.

6. Chlorination:
   - This step, after UV, targets virus inactivation.
   - To comply with Safe Drinking Water regulations the water must have a residual disinfectant level for water storage and subsequent consumptive use. This ensures that the water stays free of pathogens all the way to your tap.

The Final Outcome: Clean Drinking Water

- At the end of these six advanced processes, we are left with clean drinking water.
- During the demonstration project, this product water is monitored to make sure it meets or exceeds all drinking water standards – just like we do with the drinking water we deliver to our customers every day.
- Q & A?

The purified water is equivalent to the high-quality water we deliver today.

The purified water produced by the Demonstration will be used for tour tastings and making beverages such as soda, beer and hard seltzer. Any extra purified water will be discharged back into the Water Resource Recovery Facility process.

We are considering the potential role of Direct Potable Reuse as a future water supply strategy, but this water is NOT being sent to the community at this time. This demonstration facility is providing valuable information regarding the role that potable reuse could play in the future, but no decisions to implement (or not implement) this strategy have been made at this time.

  - *Show samples of treated wastewater, purified water, drinking water from the water treatment plant and raw water. Fun addition, keep the labels hidden and have participants guess which water is the water from the water treatment plant, and which is the purified water from the demonstration trailer.*
  - Again, point out that between the drinking water from the current water treatment plant and the purified water there is no difference. **Water should be judged by its quality, not by its history.**

TOUR GUIDE 1 & 2 – GROUPS REASSEMBLED

- We'll rejoin with the other group where the purified water is available for tasting.
  - We invite you to taste the water— it's high-quality water and tastes great!
  - You are welcome to take your tasting cups home with you.

Conclusion

- **The purified water processes can create a new option for maximizing our water supply and creates high-quality, safe water available for human consumption throughout Colorado.**
  - **The more recycled water we use, the less we have to take out of rivers and streams and reduces our dependence on our Colorado River Basin water.**
  - **Until regulations are in place, purified water will not be added into our drinking water distribution system. At this time, although regulations are expected sooner, it's a consideration within our 20-year planning horizon.**

- Thank you for attending today's tour; We are happy to answer any additional questions you may have.
- We will continue conducting tours through the summer and fall, adding additional tour options to our website. Please encourage your contacts to sign up for a free tour today.
- *Hand out informational materials to take home, share website address and social media handles, etc.*

TOUR FAQs

How does the purified water treatment process compare to the water treatment process currently used at the Water Treatment Plants?

Our existing water treatment plants use a traditional water cleaning process that includes four main steps: coagulation/flocculation, sedimentation, filtration and disinfection. The PureWater Colorado Direct Potable Reuse Mobile Demonstration project uses an innovative, 6-step advanced water purification process without reverse osmosis to produce safe, high-quality drinking water. These steps include: ozonation, biofiltration, micro/ultrafiltration, granular activated carbon, ultraviolet light/advanced oxidation, and chlorination resulting in the elimination of pathogens, near-total removal of trace organic constituents and the production of high-quality water that is protective of public health.

The purified water is equivalent to the high-quality water we deliver today.

Are contaminates of emerging concern (CEC) removed?

Yes, CECs are removed in the PureWater process. We tested for 50 CEC groups which comprise 100's of chemicals. After the first ozonation step, we saw approximately 60% reduction in CECs, after the biologically active filtration, we saw an additional 25% reduction (total 85% reduction), and by the end of the granular activated carbon filters we only detected a single chemical above detection limit. This one chemical was atenolol which is a beta blocker. It was detected at 60 ng/L (also known as parts per trillion).

NOTE: CECs include over the counter medications such as acetaminophen, hormones, and prescription medications such as atenolol which is used for blood pressure control.

Where is the purified water produced by the mobile demonstration project going?

The mobile demonstration trailer can produce approximately 300 gallons per hour (5 gallons per minute flow through trailer). Water that is going to be used for consumption will be discharged to totes and held until laboratory analysis has been completed to ensure it meets drinking water criteria. Any water that is not intended to be used for beverage production or tastings will be put back into the water resource recovery process.

How is direct potable reuse regulated?

Currently, neither the Environmental Protection Agency nor the Colorado Department of Public Health and Environment (CDPHE) have direct potable reuse regulations, but they both offer guidelines. Utilities is an active member in the statewide stakeholder group working to support a regulation and CDPHE has committed resources to develop a regulatory framework potentially as early as 2022.

Who else has or is conducting this type of project?

Several communities in Colorado are part of the outreach and research around purified water including Denver Water, Aurora Water and Castle Rock Water.

- While technologies for cleaning wastewater to virtually any level have existed for decades, most of the large water purification projects that use similar technology to what you will see in operation here today have only operated since the late 1990s.
- El Paso Water is pursuing direct potable reuse, and Clearwater, Florida plans to construct a groundwater replenishment project.
- In addition to these projects, many others have been built in the past few years such as Texas' Big Spring and Wichita Falls facilities.
- Along with these efforts, demonstration projects in Altamonte Springs, Florida, and San Diego and Monterey, California, are underscoring that not only can water be purified safely, but an informed public is ready for the next step in water technology.
- Full scale demonstration and pilot projects are being used in places such as Altamont Springs, Florida and San Diego and Monterey, California to inform the public on purified water safety and to hopefully, encourage the acceptance of this next step in the urban water cycle.

Where does Direct Potable Reuse fit in our water supply portfolio?

Colorado Springs Utilities collects surface water from three river basins (Arkansas, Colorado and South Platte) and transports a majority of it from 100 miles away in order to meet the water needs of our community. We currently reuse the water we are legally allowed to through exchanges, our non-potable system, ground water augmentation and water sharing/leases. We anticipate that in our long-term future, purified water will be an additional mechanism for leveraging the supplies we have.

Why is the potable reuse project needed?

Colorado Springs is the largest city in Colorado that is not located on a major water source. Delivering water to our community is one of our biggest challenges and successes. Our planners have always looked ahead – 50 years in advance – to ensure our community has the water it needs when it needs it. Prolonged periods of drought and climate variability require our water supply planners to look at all available water management strategies.

The PureWater Colorado demonstration and purified water technology fits with our commitment to environmental stewardship and reuse of our limited water supplies. What we learn will help us continue to plan for and develop cost-effective, reliable, high-quality water for our customers.

What purpose will it serve?

Purified water is a sustainable water source that is locally controlled and may be a wise way to manage our water resources in the most cost-effective manner.

Purified water technology would provide Colorado Springs Utilities another efficient, cost effective and environmentally responsible means to ensure the continued ability to reuse 100% of our reusable water sources to meet future water demands.

How safe is the water?

Purified water is safe for human consumption. Multiple layers of advanced treatment technology ensure that the purified water created in this treatment demonstration meets all state and federal drinking water regulations. According to studies conducted by the WateReuse Association, purified water is cleaner than bottled water and no adverse human health effects have been documented from the augmentation of drinking water supplies with purified water.

How will it be monitored to ensure safety?

Purified water will be routinely tested, including using real time online sensor technology to confirm acceptable water quality. The results of the testing will be provided to the Colorado Department of Public Health and Environment, the regulatory agency tasked with ensuring safety for human consumption, to document that the purified water complies with or exceeds state and federal drinking water standards.

How much will it cost?

Currently this is a long-term, potential solution, therefore it is impractical to estimate how this solution would impact water rates for our customers. However, treatment technology continues to develop rapidly, increasing efficiency and lowering costs. The economic viability of the treatment technology utilized for purified water will continue to be evaluated against costs for pumping and treating water, especially as regulations become stricter and costs for water go up.

When will it be implemented?

Evaluating the use of purified water is part of our 20-year planning horizon. The potential use of purified water will be monitored over time as the technology becomes more cost effective, regulations change, and the City's water demand grows.

Is uncontrolled growth the reason we need to recycle water?

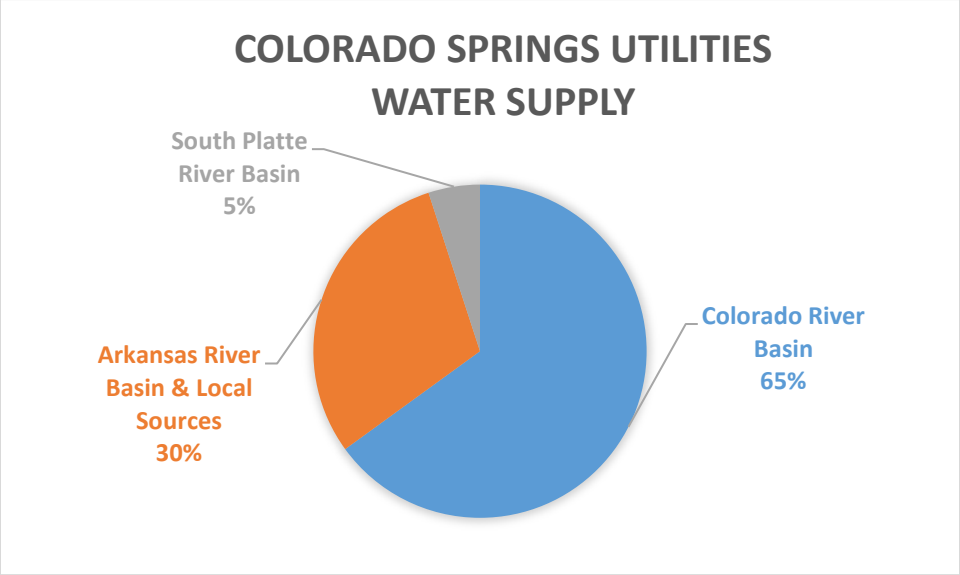
We live in a semi-arid climate and have experienced extended drought across the state for decades. Exploring different ways to be "wise users" of water just makes sense for our community. Reuse is identified in our long-term planning as part of our balanced water portfolio to create a sustainable water future for anticipated growth. We don't regulate growth, but we are obligated to serve the needs of our community.

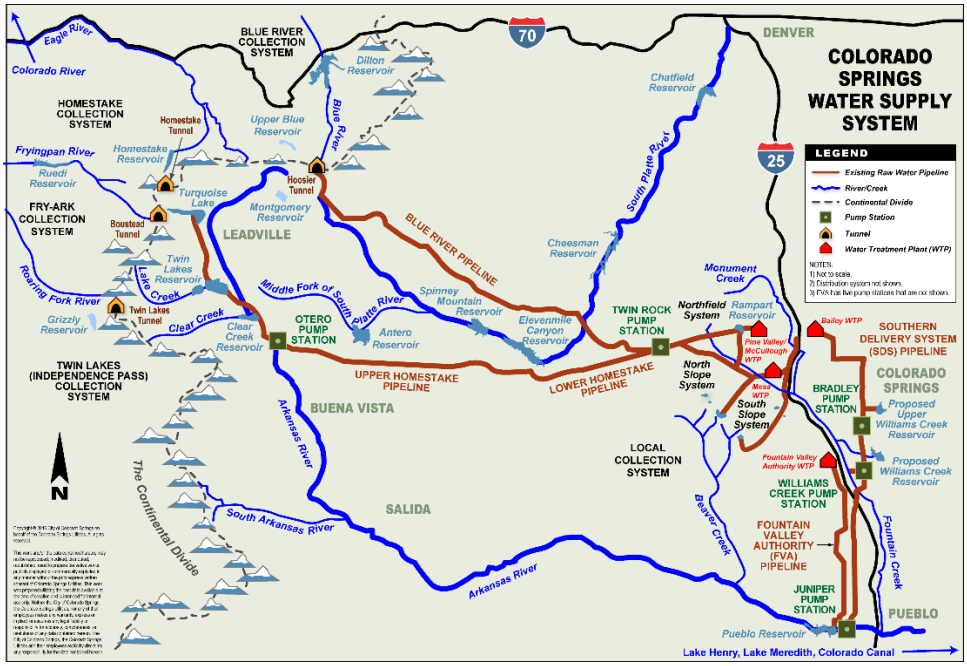
We currently use recycled water in our non-potable system and are exploring different mechanisms for incorporating it into our potable system in the future. Direct Potable Reuse is one example of how it could be incorporated. Direct Potable Reuse is a safe, reliable and sustainable drinking water resource that could help us maximize our reusable supplies.

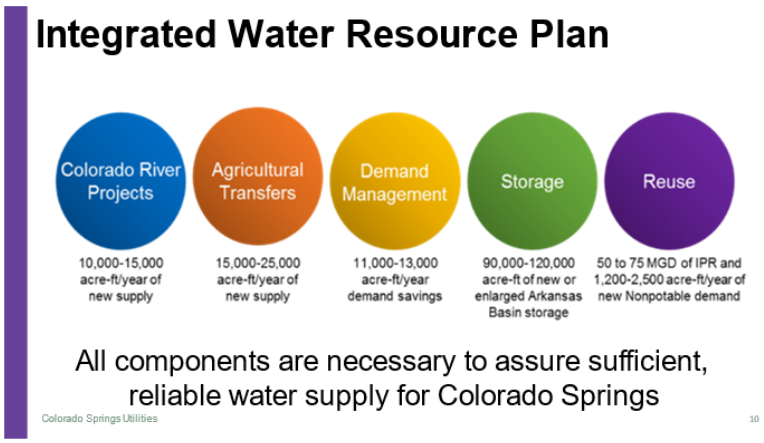
What about Pharmaceuticals?

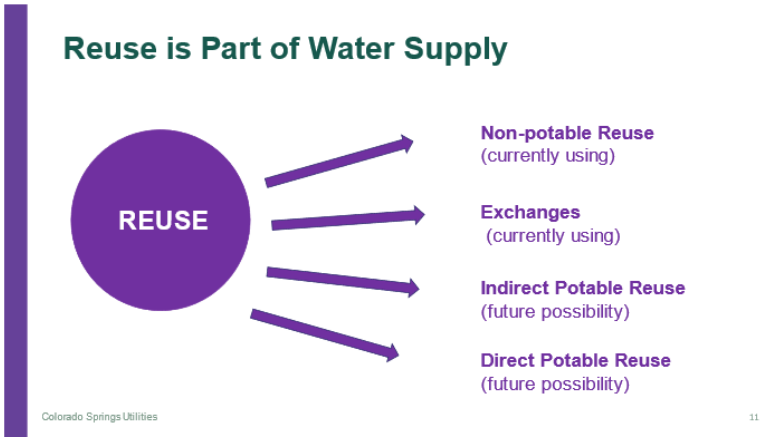
85% of PFAS and pharmaceuticals through ozonation BAF step, then microfilttation and remove the rest.

Visual Aid Posters

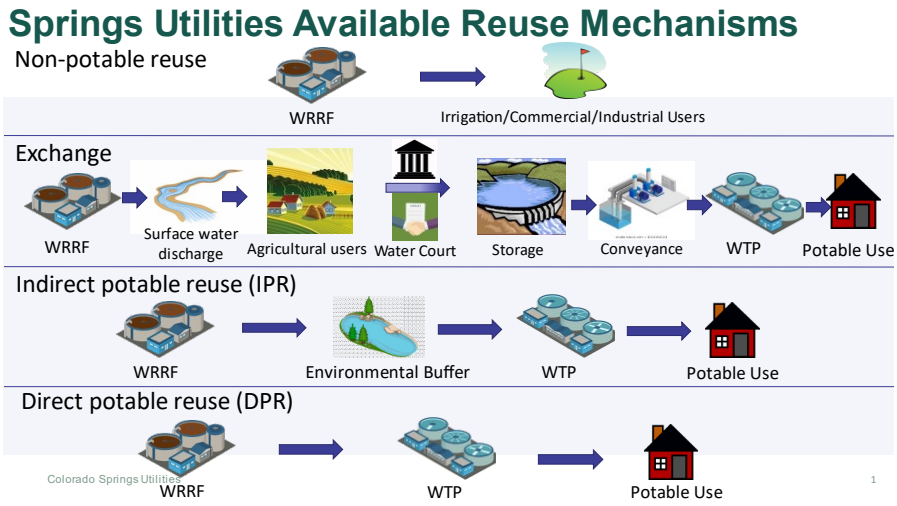




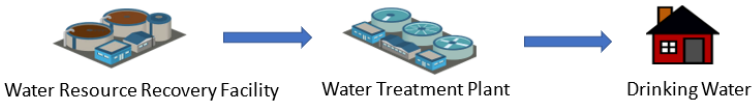




Four methods of Water Reuse



What is Direct Potable Reuse?

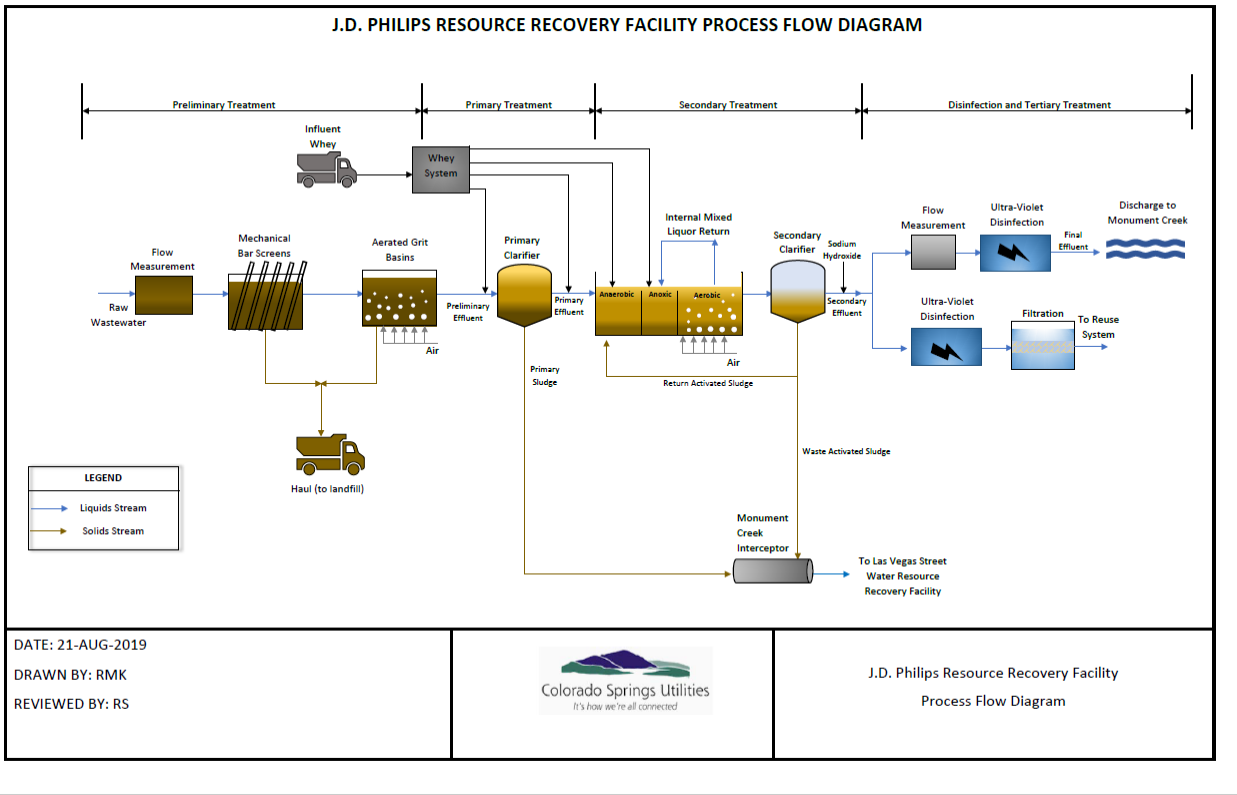


Direct Potable Reuse (DPR): cleaning recycled water to a level that meets or exceeds all drinking water standards.

How Direct Potable Reuse Could Help Our Customers:

- Clean, safe future water source
- Reliable, locally controlled
- Sustainable
- Environmentally friendly
- Cost effective
- Resistant to climate effects

EXTRA POSTERS FOR ADVANCED AUDIENCES:



Attachment G

General Tour Invitation

We invite you on a free tour of the PureWater Colorado Demonstration project.

Colorado Springs Utilities has a long history of planning for our future. The tour of the PureWater Colorado Direct Potable Reuse Mobile Demonstration will showcase one potential option to provide a healthy and viable water future as identified in our Integrated Water Resource Plan. The project is a collaborative effort between Springs Utilities, the Colorado School of Mines, Carollo Engineering, and the Colorado Water Conservation Board.

The PureWater Colorado Demonstration is a mobile unit that shows the advanced purification process behind direct potable reuse: cleaning recycled water to a level that meets or exceeds all drinking water standards. Through use of a multi-barrier purification process, we will demonstrate how to make safe and sustainable drinking water from locally controlled resources.

Select one date and time that fits your schedule. Tours are limited to 24 participants, age 9 years or older, on a first-come-first served basis.

August 5, 2021 (Thursday) from 10:00 am – 11:00 am	**Register Now**
August 10, 2021 (Tuesday) from 1:00 pm – 2:00 pm	**Register Now**
August 14, 2021 (Saturday) from 10:00 am – 11:00 am	**Register Now**
August 18, 2021 (Wednesday) from 11:30 am – 12:30 pm	**Register Now**
August 25, 2021 (Wednesday) from 9:00 am – 10:00 am	**Register Now**
August 31, 2021 (Tuesday) from 5:00 pm – 6:00 pm	**Register Now**
September 14, 2021 (Tuesday) from 12:00 pm – 1:00 pm	**Register Now**
September 18, 2021 (Saturday) from 10:00 am – 11:00 am	**Register Now**
October 13, 2021 (Wednesday) from 12:00 pm – 1:00 pm	**Register Now**
October 23, 2021 (Saturday) from 10:00 am – 11:00 am	**Register Now**

Tour participation: Attendees must be in 4th grade (9 years old) or older. Minimum tour size is 5 with a maximum of 24 participants.

Tour Length: **Expect to spend about an hour with us**. The tour is approximately 40 minutes in length, followed by Q&A and optional tasting of the purified water. We ask that you arrive at least 10 minutes prior for check-in.

Tour Location: Please meet at the JD Phillips Water Resource Recovery Facility at 4205 Mark Dabling Boulevard, Colorado Springs and enter through **Gate G2**. You can find directions here.

Tour Requirements: The tour is conducted out of doors – please dress accordingly. Closed-toe walking shoes are required. Masks are recommended for unvaccinated individuals.

Special Accommodations: The demonstration trailer is not wheelchair accessible. Please contact us for special accommodations.

Questions? Find more information on our website or email us at communityrelations@csu.org. If you wish to be removed from receiving emails from Colorado Springs Utilities, please let us know.

Please forward this invitation to others that may have an interest. Thank you.

We look forward to seeing you,

Colorado Springs Utilities
It's how we're all connected

Attachment H

Tour Survey Responses

Most of Colorado Springs water supply is brought from how many miles away?	How aware are you of the water supply in Colorado Springs?	Colorado Springs Utilities is considering a future option to supplement local water supplies by purifying recycled water with advanced treatment technologies. How knowledgeable are you with purifying recycled water?	Are you familiar with direct potable reuse (DPR)?	Registration Date
				06/17/2021 05:15:28 PM MDT
100 miles		Moderately	Moderately	06/23/2021 01:32:36 PM MDT
100 miles		Moderately	Moderately	06/17/2021 12:18:20 PM MDT
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50 miles		Very knowledgeable	Very knowledgeable	06/17/2021 04:48:52 PM MDT
100 miles		Somewhat	Somewhat	06/17/2021 05:22:33 PM MDT
100 miles		Very knowledgeable	Very knowledgeable	06/17/2021 11:58:12 AM MDT
				07/02/2021 08:51:05 AM MDT
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100 miles		Very knowledgeable	Very knowledgeable	06/19/2021 08:19:04 AM MDT
75 miles		Moderately	Moderately	06/28/2021 05:07:46 PM MDT
100 miles		Not at all	Not at all	06/10/2021 03:02:19 PM MDT
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				06/17/2021 12:45:25 PM MDT
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25 miles		Moderately	Moderately	06/30/2021 08:25:15 AM MDT
50 miles		Somewhat	Somewhat	06/29/2021 10:41:38 AM MDT
75 miles		Very knowledgeable	Very knowledgeable	06/29/2021 11:16:28 AM MDT
				06/29/2021 10:17:41 AM MDT
50 miles		Moderately	Moderately	06/28/2021 03:45:57 PM MDT
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100 miles	Somewhat	Somewhat	Somewhat	07/24/2021 08:29:28 PM MDT
100 miles	Somewhat	Not at all	Somewhat	07/15/2021 03:20:33 PM MDT

Most of Colorado Springs water supply is brought from how many miles away?	How aware are you of the water supply in Colorado Springs?	Colorado Springs Utilities is considering a future option to supplement local water supplies by purifying recycled water with advanced treatment technologies. How knowledgeable are you with purifying recycled water?	Are you familiar with direct potable reuse (DPR)?	Registration Date
100 miles	Very	Very knowledgeable	Very knowledgeable	07/15/2021 01:23:19 PM MDT
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100 miles	Very	Moderately	Moderately	07/29/2021 07:09:05 AM MDT
100 miles	Moderately	Moderately	Moderately	08/05/2021 10:01:13 PM MDT
75 miles	Somewhat	Somewhat	Not at all	08/05/2021 09:56:47 PM MDT
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100 miles	Somewhat	Very knowledgeable	Very knowledgeable	08/13/2021 03:51:21 PM MDT
100 miles	Somewhat	Moderately	Somewhat	08/09/2021 07:46:20 PM MDT
100 miles	Very	Very knowledgeable	Very knowledgeable	08/12/2021 09:18:25 AM MDT
25 miles	Very	Very knowledgeable	Somewhat	07/14/2021 11:12:05 AM MDT
25 miles	Very	Very knowledgeable	Moderately	07/14/2021 11:09:16 AM MDT
25 miles	Somewhat	Somewhat	Not at all	08/13/2021 03:48:12 PM MDT
100 miles	Very	Moderately	Somewhat	08/13/2021 03:50:27 PM MDT
50 miles	Not at all	Not at all	Not at all	08/04/2021 08:05:30 AM MDT
100 miles	Somewhat	Somewhat	Not at all	08/04/2021 08:03:06 AM MDT
100 miles	Somewhat	Somewhat	Somewhat	08/13/2021 06:22:33 PM MDT
50 miles	Somewhat	Somewhat	Somewhat	08/13/2021 06:23:57 PM MDT
50 miles	Somewhat	Not at all	Not at all	07/21/2021 12:10:32 PM MDT
100 miles	Moderately	Moderately	Moderately	07/15/2021 03:15:00 PM MDT
100 miles	Moderately	Somewhat	Somewhat	07/28/2021 08:54:20 AM MDT
100 miles	Not at all	Not at all	Not at all	08/11/2021 11:27:29 AM MDT
75 miles	Somewhat	Not at all	Not at all	07/28/2021 02:35:20 PM MDT
100 miles	Moderately	Moderately	Moderately	07/15/2021 02:45:49 PM MDT
100 miles	Not at all	Not at all	Not at all	08/11/2021 12:58:05 PM MDT
100 miles	Somewhat	Somewhat	Somewhat	07/28/2021 08:58:12 AM MDT
100 miles	Somewhat	Moderately	Moderately	07/15/2021 03:02:31 PM MDT
50 miles	Not at all	Somewhat	Somewhat	07/15/2021 04:12:21 PM MDT
100 miles	Moderately	Very knowledgeable	Very knowledgeable	08/10/2021 08:05:16 PM MDT
50 miles	Somewhat	Not at all	Somewhat	07/21/2021 10:52:54 AM MDT
100 miles	Somewhat	Somewhat	Not at all	07/22/2021 09:36:47 AM MDT
100 miles	Somewhat	Somewhat	Not at all	07/22/2021 09:31:26 AM MDT
50 miles	Somewhat	Not at all	Not at all	08/07/2021 11:32:36 AM MDT
100 miles	Moderately	Moderately	Moderately	07/15/2021 03:03:49 PM MDT
100 miles	Somewhat	Somewhat	Somewhat	07/28/2021 08:57:16 AM MDT
				07/19/2021 01:42:09 PM MDT
100 miles	Somewhat	Not at all	Not at all	08/11/2021 01:04:48 PM MDT
100 miles	Moderately	Not at all	Not at all	08/18/2021 09:36:35 AM MDT
100 miles	Very	Moderately	Somewhat	07/21/2021 08:08:32 AM MDT
50 miles	Not at all	Not at all	Not at all	08/07/2021 11:37:38 AM MDT
100 miles	Very	Very knowledgeable	Very knowledgeable	07/15/2021 02:46:45 PM MDT
75 miles	Somewhat	Not at all	Not at all	08/05/2021 08:07:47 AM MDT
100 miles	Somewhat	Somewhat	Somewhat	07/28/2021 08:59:03 AM MDT
100 miles	Somewhat	Moderately	Moderately	07/15/2021 02:46:15 PM MDT
75 miles	Somewhat	Somewhat	Somewhat	07/16/2021 11:56:29 AM MDT
100 miles	Somewhat	Very knowledgeable	Very knowledgeable	07/15/2021 04:03:02 PM MDT
				08/04/2021 04:55:42 PM MDT
100 miles	Very	Somewhat	Not at all	07/15/2021 01:20:04 PM MDT
100 miles	Moderately	Very knowledgeable	Very knowledgeable	07/28/2021 03:31:56 PM MDT
				08/06/2021 01:41:31 PM MDT
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100 miles	Not at all	Moderately	Very knowledgeable	08/03/2021 10:05:56 PM MDT
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100 miles	Moderately	Somewhat	Somewhat	07/28/2021 07:54:48 AM MDT
100 miles	Very	Very knowledgeable	Very knowledgeable	07/16/2021 09:57:44 AM MDT
75 miles	Moderately	Somewhat	Somewhat	08/08/2021 06:19:03 PM MDT
75 miles	Somewhat	Somewhat	Somewhat	07/16/2021 02:02:00 PM MDT
100 miles	Very	Somewhat	Moderately	07/22/2021 09:30:29 AM MDT
75 miles	Very	Moderately	Moderately	08/05/2021 01:11:48 PM MDT
100 miles	Very	Very knowledgeable	Very knowledgeable	07/27/2021 06:47:39 PM MDT
75 miles	Somewhat	Moderately	Moderately	07/20/2021 05:32:33 PM MDT
100 miles	Moderately	Moderately	Moderately	07/28/2021 09:51:20 AM MDT
				07/15/2021 01:53:38 PM MDT

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				07/19/2021 09:02:56 AM MDT
100 miles	Somewhat	Moderately	Moderately	08/13/2021 06:34:58 AM MDT
100 miles	Somewhat	Moderately	Moderately	08/17/2021 02:25:14 PM MDT
100 miles	Somewhat	Moderately	Moderately	08/17/2021 03:27:14 PM MDT
75 miles	Somewhat	Moderately	Moderately	08/17/2021 02:18:01 PM MDT
100 miles	Moderately	Very knowledgeable	Very knowledgeable	08/17/2021 01:07:35 PM MDT
100 miles	Moderately	Very knowledgeable	Very knowledgeable	08/17/2021 01:04:27 PM MDT
25 miles	Not at all	Somewhat	Somewhat	08/17/2021 02:41:00 PM MDT
100 miles	Somewhat	Moderately	Moderately	08/17/2021 02:00:31 PM MDT
50 miles	Somewhat	Somewhat	Moderately	08/17/2021 02:37:53 PM MDT
25 miles	Moderately	Somewhat	Somewhat	08/04/2021 02:20:08 PM MDT
100 miles	Moderately	Somewhat	Somewhat	07/26/2021 10:15:45 AM MDT
100 miles	Somewhat	Somewhat	Somewhat	07/28/2021 09:00:44 AM MDT
100 miles	Very knowledgeable	Very knowledgeable	Very knowledgeable	08/23/2021 01:20:49 PM MDT
100 miles	Moderately	Not at all	Not at all	08/02/2021 08:11:33 PM MDT
100 miles	Moderately	Very knowledgeable	Moderately	08/19/2021 11:07:25 AM MDT
100 miles	Moderately	Moderately	Moderately	07/21/2021 10:02:21 AM MDT
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100 miles	Moderately	Moderately	Moderately	08/23/2021 07:56:16 PM MDT
100 miles	Somewhat	Somewhat	Somewhat	07/28/2021 08:59:56 AM MDT
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50 miles	Somewhat	Somewhat	Not at all	08/05/2021 07:17:13 AM MDT
100 miles	Moderately	Not at all	Somewhat	07/21/2021 08:57:42 AM MDT
100 miles	Moderately	Somewhat	Moderately	08/16/2021 01:32:21 PM MDT
75 miles	Somewhat	Not at all	Not at all	08/05/2021 07:15:54 AM MDT
100 miles	Very knowledgeable	Very knowledgeable	Very knowledgeable	08/23/2021 04:44:07 PM MDT
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100 miles	Moderately	Moderately	Moderately	08/11/2021 03:07:34 PM MDT
100 miles	Somewhat	Somewhat	Somewhat	07/28/2021 09:24:18 AM MDT
100 miles	Moderately	Somewhat	Not at all	08/20/2021 10:10:42 AM MDT
100 miles	Somewhat	Somewhat	Not at all	08/23/2021 11:33:18 AM MDT
	Somewhat	Not at all	Not at all	08/26/2021 12:22:52 AM MDT
100 miles	Somewhat	Somewhat	Somewhat	07/28/2021 09:22:38 AM MDT
100 miles	Moderately	Moderately	Not at all	08/27/2021 01:08:33 PM MDT
100 miles	Moderately	Not at all	Not at all	08/27/2021 01:40:33 PM MDT
100 miles	Moderately	Not at all	Not at all	08/27/2021 01:39:30 PM MDT
50 miles	Moderately	Not at all	Not at all	08/30/2021 06:15:48 AM MDT
100 miles	Somewhat	Not at all	Not at all	08/19/2021 10:25:42 PM MDT
50 miles	Somewhat	Not at all	Not at all	08/19/2021 10:32:20 PM MDT
100 miles	Very knowledgeable	Somewhat	Somewhat	08/06/2021 08:29:09 AM MDT
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100 miles			Moderately	07/08/2021 10:02:04 AM MDT
100 miles	Somewhat	Somewhat	Somewhat	07/19/2021 09:25:49 AM MDT
75 miles	Somewhat	Somewhat	Somewhat	09/08/2021 10:40:43 AM MDT
25 miles	Moderately	Somewhat	Not at all	07/30/2021 01:41:44 PM MDT
100 miles	Moderately	Somewhat	Not at all	09/01/2021 01:40:26 PM MDT
100 miles	Somewhat	Somewhat	Somewhat	08/02/2021 01:44:25 PM MDT
100 miles	Very knowledgeable	Moderately	Moderately	07/27/2021 07:39:04 PM MDT
75 miles	Somewhat	Not at all	Not at all	08/03/2021 09:58:30 AM MDT
50 miles	Moderately	Somewhat	Not at all	07/15/2021 02:50:43 PM MDT
25 miles	Moderately	Not at all	Not at all	09/13/2021 11:10:14 AM MDT

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75 miles	Somewhat	Somewhat	Somewhat	08/28/2021 07:38:12 AM MDT
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100 miles	Moderately	Moderately	Somewhat	07/30/2021 04:36:33 PM MDT
75 miles	Moderately	Somewhat	Somewhat	09/15/2021 02:19:55 PM MDT
25 miles	Not at all	Somewhat	Not at all	09/28/2021 11:55:48 AM MDT
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100 miles	Not at all	Not at all	Not at all	09/28/2021 05:02:52 PM MDT
50 miles	Not at all	Not at all	Not at all	09/08/2021 02:49:53 PM MDT
100 miles	Somewhat	Not at all	Somewhat	09/28/2021 08:33:14 AM MDT
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100 miles	Moderately	Moderately	Somewhat	09/30/2021 05:16:28 PM MDT
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100 miles	Not at all	Not at all	Not at all	09/28/2021 09:20:42 PM MDT
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100 miles	Somewhat	Somewhat	Not at all	10/07/2021 08:17:24 AM MDT
100 miles	Moderately	Somewhat	Not at all	09/28/2021 10:24:55 PM MDT
50 miles	Moderately	Somewhat	Somewhat	09/29/2021 02:21:55 PM MDT
100 miles	Somewhat	Somewhat	Somewhat	09/30/2021 10:06:51 PM MDT
75 miles	Very knowledgeable	Somewhat	Moderately	10/06/2021 02:35:32 PM MDT
75 miles	Somewhat	Somewhat	Somewhat	10/12/2021 03:09:37 PM MDT
100 miles	Not at all	Not at all	Not at all	08/20/2021 07:52:05 AM MDT
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100 miles	Somewhat	Not at all	Not at all	08/19/2021 06:30:57 PM MDT
				09/15/2021 11:17:46 AM MDT
100 miles	Somewhat	Somewhat	Moderately	09/15/2021 10:45:53 AM MDT
50 miles	Somewhat	Not at all	Not at all	09/15/2021 10:54:06 AM MDT
100 miles	Somewhat	Not at all	Not at all	07/20/2021 02:54:43 PM MDT
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100 miles	Somewhat	Somewhat	Somewhat	08/19/2021 10:30:57 AM MDT
100 miles	Moderately	Not at all	Not at all	08/19/2021 03:15:53 PM MDT
				09/13/2021 05:12:11 PM MDT
75 miles	Not at all	Somewhat	Moderately	08/25/2021 02:33:12 PM MDT
100 miles	Somewhat	Not at all	Not at all	08/03/2021 03:46:01 PM MDT
100 miles	Somewhat	Not at all	Not at all	08/20/2021 01:10:51 PM MDT
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50 miles	Somewhat	Not at all	Not at all	08/19/2021 03:51:41 PM MDT
				09/17/2021 02:59:00 PM MDT
100 miles	Very knowledgeable	Somewhat	Somewhat	08/20/2021 10:37:19 AM MDT
100 miles	Very knowledgeable	Somewhat	Somewhat	07/20/2021 02:59:09 PM MDT
100 miles	Very knowledgeable	Moderately	Somewhat	07/30/2021 12:25:02 PM MDT
100 miles	Somewhat		Not at all	08/23/2021 08:40:59 AM MDT
75 miles	Somewhat	Somewhat	Somewhat	08/23/2021 02:10:41 PM MDT
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100 miles	Somewhat	Not at all	Not at all	10/20/2021 08:33:17 AM MDT
100 miles	Somewhat	Somewhat	Not at all	10/07/2021 08:14:56 AM MDT

Date/Time	Did the presented material provide the information/details you needed to understand the water purification process?	Do you now have a clearer awareness of Colorado Springs Utilities water supply?	Was the presented material easily understandable?	After attending the Direct Potable Reuse Demonstration tour, how knowledgeable are with purifying recycled water now?	We would appreciate any additional tour feedback you may have.
07/27/2021 01:01:56 PM MDT	Yes	Yes	Yes	Moderately	
07/27/2021 12:52:00 PM MDT	Yes	Yes	Yes	Very Knowledgeable	I'm impressed with the forward-thinking staff at Utilities.
08/06/2021 05:04:54 PM MDT	Yes	Yes	Yes	Very Knowledgeable	Fantastic presentation! Everyone was so knowledgeable and answered so many questions. The Mobile Demonstration trailer is great - so very well done! It was great to see it, and to talk with the presenters/experts. Very insightful, and forward thinking! Thank you!
08/06/2021 10:27:48 AM MDT	Yes	Yes	Yes	Moderately	Please, promote approval for use of gray water in El Paso County. Watering landscape with gray water can significantly reduce using first pass potable water for this purpose.
08/06/2021 10:49:29 AM MDT	Yes	Yes	Yes	Very Knowledgeable	This presentation was really great. I am for re-using our water. Your process is very impressive. I still think somehow make the whole process better by: 1. doing a small hydroelectric system with the water would work.. I do have some ideas without pumping the water way up. 2. Purple lines need to be in the planning for Colorado Springs Residential. New housing and building is a perfect start. 3. It would be great the water you clean now to distribute it even more to smaller companies.
08/07/2021 07:31:23 PM MDT	Yes	Yes	Yes	Very Knowledgeable	The staff present were very knowledgeable and were happy to answer all kinds of questions. The event was well organized and went without any problems.
08/07/2021 09:50:28 PM MDT	Moderately	Yes	Yes	Moderately	It provided an interesting overview of the project. Glad to know that Colorado Springs Utilities is looking to the future. Potable water is a major concern in our drought prone State.
08/10/2021 03:47:18 PM MDT		Yes	Yes	Moderately	Birgit and the team did a great job presenting the material and answering questions.
08/11/2021 01:36:59 PM MDT	Yes	Yes	Yes	Moderately	Would have liked to have heard about how the sewage treatment plant operates to currently clean the water.
08/11/2021 02:48:10 PM MDT	Yes	Yes	Yes	Very Knowledgeable	I had a great time. All the directions and information was very clear on where to go, and what was needed at the meeting. The staff was friendly and patient and answered everyone's questions. The information was provided with historic references and was clear and easy to understand.
08/11/2021 03:31:18 PM MDT	Yes	Yes	Yes	Moderately	Our presenters Tara and Shane, did an excellent job of explaining the potable reuse project and why it may become so important in the future as population grows and water diminishes. I was a real skeptic before coming to this demo! They were both very open to our questions and both were knowledgeable. Thank you so much.
08/11/2021 03:49:22 PM MDT	Yes	Yes	Yes	Very Knowledgeable	Since all the cities downstream are already drinking purified river water, which includes our used water, the Direct Potable Reuse is a no-brainer for me. It's ultrapurified because 100% of the source is used water, with the BIG advantage that it can be used over and over. To meet future needs, right now the City should require potable and non-potable water lines in new developments (also xeriscape landscaping) and continue to encourage water conservation in the monthly utility bill newsletter
08/11/2021 04:36:15 PM MDT	Yes	Yes	Yes	Moderately	Should have started 10-15 years ago, when newer technologies when newer emerging and future need was clear, especially after the 03 and 13 droughts. Now you need to speed up to cover for and the inability to develop remaining CR water rights as part of the supply portfolio, as well as other weak links in the water plan and operations.
08/11/2021 05:09:41 PM MDT	Yes	Yes	Yes	Very Knowledgeable	From Lisa Halcomb's warm welcome to a refreshing drink of recycled water the tour was well worth attending. Tara, Sage and Mr. Hoyt did great explaining the process and gave answers to our many questions. My wife Betty and I enjoyed our visit; thanks for inviting us.

Date/Time	Did the presented material provide the information/details you needed to understand the water purification process?	Do you now have a clearer awareness of Colorado Springs Utilities water supply?	Was the presented material easily understandable?	After attending the Direct Potable Reuse Demonstration tour, how knowledgeable are with purifying recycled water now?	We would appreciate any additional tour feedback you may have.
08/11/2021 11:56:32 PM MDT	Yes	Yes	Yes	Moderately	Both presenters were excellent and took their time to answer questions from the group. They were both knowledgeable and approachable.
08/12/2021 08:56:04 AM MDT	Yes	Yes	Yes	Moderately	This was a very informative tour!!! Thank you for providing this for us to understand this process!! It's great stuff!!
08/15/2021 01:48:41 PM MDT	Yes	Yes	Yes	Very Knowledgeable	The demonstration was well presented in a fun and easy to understand manner. I enjoyed learning about water!
08/15/2021 02:09:33 PM MDT	Yes	Yes	Yes	Very Knowledgeable	This was fantastic. I really enjoyed the information on water sources and the policies surrounding reuse. The purple pipe system was new information for me this was a great use of my time and I am encouraging other people to attend a future event
08/15/2021 02:31:05 PM MDT	Yes	Yes	Yes	Moderately	The Presenters did a Great job making the process very understandable!
08/15/2021 10:36:17 AM MDT	Yes	Yes	Yes	Very Knowledgeable	Can't think of anything I would change, it was very well done!
08/15/2021 12:14:44 PM MDT	Yes	Yes	Yes	Somewhat	Birgit was a really good communicator as was Bill. The brand non potable doesnâ€™t sound appealing. I would recommend working on your message strategy.
08/15/2021 12:16:59 PM MDT	Moderately	Yes	Moderately	Moderately	Great info from Birgit and Bill. And a nice presentation.
08/16/2021 01:46:26 PM MDT	Yes	Yes	Yes	Very Knowledgeable	Nicely done presentation. I liked having several presenters and several visuals to explain the process.
08/16/2021 02:33:14 PM MDT	Yes	Yes	Yes	Very Knowledgeable	The presentation tour was well organized and very informative. The technical aspects of the demonstration project were well explained and understandable. I had the opportunity to taste the purified water and it was fantastic, no distinguishable difference from Utilities' current treated water.
08/16/2021 04:29:50 PM MDT	Yes	Yes	Yes	Very Knowledgeable	Great material, especially for public outreach and increasing general understanding and awareness of DPR.
08/16/2021 11:24:20 AM MDT	Yes	Moderately	Yes	Very Knowledgeable	
08/16/2021 11:41:21 AM MDT	Yes	Yes	Yes	Very Knowledgeable	Would like the 50 indicator data collected in the trailer for outside analysis.
08/16/2021 11:50:54 AM MDT	Yes	Yes	Yes	Very Knowledgeable	
08/16/2021 12:16:30 PM MDT	Yes	Yes	Yes	Very Knowledgeable	Staff were very welcoming and passionate about their work and had a good understanding about how DPR may be a benefit to their utility.
08/17/2021 11:12:07 AM MDT	Yes	Yes	Yes	Very Knowledgeable	All of the people attending spoke very favorably about the information presented and how well this tour was organized
08/19/2021 01:06:44 PM MDT	Yes	Yes	Yes	Moderately	Birgit and Sage were awesome presenters and answered all the audience's questions well. it was very informative and easy to understand. I am looking forward to more presentations.
08/19/2021 02:55:09 PM MDT	Yes	Yes	Yes	Moderately	I really enjoyed the tour! Great material! Thank you!
08/19/2021 05:20:59 PM MDT	Yes	Yes	Yes	Very Knowledgeable	
08/19/2021 11:38:01 AM MDT	Yes	Yes	Yes	Very Knowledgeable	Great tour, maybe less people in the trailer at one time.
08/19/2021 12:03:35 PM MDT	Moderately	Moderately	Yes	Somewhat	I struggled with the language used to describe how water is and can be used in Colorado. I didn't struggle because the language was hard to understand; I struggled because it made it seem like the only need for water was by human consumers and only those that could "afford" it.
08/19/2021 12:28:39 PM MDT	Yes	Yes	Yes	Very Knowledgeable	I would of liked to see the trailer actually work. To produce an actual glass of water.
08/19/2021 12:56:31 PM MDT	Yes	Yes	Yes	Moderately	Great presentation. Just the right amount of detailed information (supported by a nice flyer handout) without being too long in length.
08/20/2021 08:29:57 AM MDT	Yes	Yes	Yes	Moderately	A very informative, professional and fun(!) presentation addressing a serious issue facing the community and region at large. Thank you.
08/23/2021 09:42:39 AM MDT	Yes	Yes	Yes	Very Knowledgeable	The trailer looked great, very clean and organized. Our tour was very informative and we learned a lot, thank you so much for putting on the tour.
08/24/2021 07:43:57 AM MDT	Yes	Yes	Yes	Very Knowledgeable	Great tour! The water supply and water reuse overview under the shade structure followed by the trailer tour and the water tasting at the end is a great way to organize the session.
08/26/2021 04:25:54 PM MDT	Yes	Yes	Yes	Very Knowledgeable	

Date/Time	Did the presented material provide the information/details you needed to understand the water purification process?	Do you now have a clearer awareness of Colorado Springs Utilities water supply?	Was the presented material easily understandable?	After attending the Direct Potable Reuse Demonstration tour, how knowledgeable are with purifying recycled water now?	We would appreciate any additional tour feedback you may have.
08/26/2021 10:01:00 AM MDT	Yes	Yes	Yes	Very Knowledgeable	
08/26/2021 10:39:36 AM MDT	Yes	Yes	Yes	Very Knowledgeable	
08/26/2021 12:57:08 PM MDT	Yes	Yes	Yes	Very Knowledgeable	It's good to know that there are lots of people making sure that our water is safe for us and our children to drink.
08/27/2021 11:08:15 AM MDT	Yes	Yes	Yes	Very Knowledgeable	
09/01/2021 05:12:05 PM MDT	Yes	Yes	Yes	Very Knowledgeable	Very well done. Great energy and enthusiasm. Thanks for the swag!
09/01/2021 06:42:21 PM MDT	Yes	Yes	Yes	Moderately	Great work!
09/02/2021 11:16:42 AM MDT	Yes	Yes	Yes	Very Knowledgeable	The presentation was excellent and the concept is one that is past due. Thanks for your efforts to educate the public!
09/03/2021 09:28:58 AM MDT	Yes	Yes	Yes	Very Knowledgeable	There were issues getting in at the gate with the security guard on the intercom not even knowing what DPR was or that a tour was happening. I would recommend making sure security operations is aware in advance to avoid the confusion and frustration if the gate hasnâ€™t been opened yet when people arrive for the tour.
09/11/2021 01:45:40 PM MDT	Yes	Yes	Yes	Very Knowledgeable	Great presentation, very informative!
09/15/2021 01:04:33 PM MDT	Yes	Yes	Yes	Moderately	Thank you so much for the tour. It was great to hear and see our CSU is working on a solution that would improve our water system and reuse the resources that we currently have. Please keep me in the loop to hear more about this moving forward as it is innovative and exciting. The people giving the tour were knowledgeable and friendly. I felt very welcomed. My only other comment is that it would have been more comfortable if masks were required inside the trailer.
09/15/2021 12:01:53 PM MDT	Yes	Yes	Yes	Moderately	Both of the presenters were fantastic and engaging. Good job to both of them.
09/16/2021 10:35:39 AM MDT	Yes	Yes	Moderately	Very Knowledgeable	Thank you for providing this opportunity.
09/28/2021 07:35:22 AM MDT	Yes	Yes	Yes	Very Knowledgeable	That was a great demo. Good job
10/06/2021 08:36:39 PM MDT	Yes	Yes	Yes	Moderately	
10/06/2021 11:52:13 AM MDT	Yes	Yes	Yes	Very Knowledgeable	The tour guides were passionate about the project and you can tell they enjoy working on it.
10/07/2021 09:39:01 AM MDT	Moderately	Yes	Yes	Moderately	I had a lot of fun and learned a lot. I'm not sure if there are ways to view this presentation online or something but that would be cool as well!
10/14/2021 01:13:37 PM MDT	Yes	Yes	Yes	Very Knowledgeable	What a great tour by both presenters!! They both were very knowledgeable and great at explaining things and answering questions. Also, I thought the poster boards that were displayed were really well done and informative. Thanks!!
10/14/2021 02:08:08 PM MDT	Yes	Yes	Yes	Moderately	The team was great. I learned so much, they were very responsive to questions.
10/14/2021 12:23:32 PM MDT	Yes	Yes	Yes	Moderately	Lots of great information! It hasnâ€™t or quite sunk in yet but we both really enjoyed the tour. I am only filling out one survey for the two of us.
10/15/2021 05:39:19 PM MDT	Yes	Yes	Yes	Very Knowledgeable	Thanks for the tour.
10/15/2021 10:23:56 AM MDT	Moderately	Moderately	Yes	Somewhat	
10/20/2021 11:24:57 AM MDT	Yes	Yes	Yes	Very Knowledgeable	Super interesting! Thanks for putting this on and offering public tours. To reach more people with the message, I wonder if this could be adapted into a filmed/virtual presentation?
10/20/2021 12:54:10 PM MDT	Moderately	Yes	Moderately	Very Knowledgeable	Tasting- couldnâ€™t notice it was recycled water. Thanks for letting me know how the process works. Great work!
10/21/2021 05:51:15 PM MDT	Yes	Yes	Moderately	Somewhat	The presenters gave an interesting preview of the water facilities past present and future. And they responded well to several questions throughout the session.
10/22/2021 08:35:33 AM MDT	Yes	Moderately	Yes	Moderately	Please consider ways to entice general public to your the demonstration.

Date/Time	Did the presented material provide the information/details you needed to understand the water purification process?	Do you now have a clearer awareness of Colorado Springs Utilities water supply?	Was the presented material easily understandable?	After attending the Direct Potable Reuse Demonstration tour, how knowledgeable are with purifying recycled water now?	We would appreciate any additional tour feedback you may have.
10/23/2021 04:10:14 PM MDT	Somewhat	Moderately	Yes	Very Knowledgeable	Customize the introductory material to the knowledge level of the group. Our group consists of water professionals so the geberal overview material could be shortened and replaced with more Q&A. The teailir technical information was the right level. Overall, no criticism, your organized and hosted us wonderfully and it was a great way to meet our members again in person! Thank you!
10/23/2021 04:56:00 PM MDT	Yes	Yes	Yes	Moderately	The tour was GREAT!!! I would love to tour a water treatment facility and waste water recovery facility. At some point, you might need some community involvement to get legislation passed to make this process legal here in CO. Would love to help with that. Just imagine what the Colorado River would be like if all the cities taking water from it could use this technology to cut their out takes in half.
10/24/2021 11:17:05 AM MDT	Yes	Yes	Moderately	Moderately	The tour was great! Lots of relevant, easy to understand information. I'd hope that everyone taking the tour leaves feeling comfortable with the idea of adding direct potable reuse to CSU's portfolio! For the trailer portion, I'd recommend the tour leader having a microphone. No one in our group (standing near the back) could hear any of the information presented at the front.
10/25/2021 08:01:58 AM MDT	Yes	Moderately	Somewhat	Somewhat	
10/25/2021 08:10:06 AM MDT	Moderately	Moderately	Yes	Moderately	Only feedback is that I think this would be a great addition to our water infrastructure!
10/25/2021 09:16:59 AM MDT	Yes	Yes	Yes	Moderately	Donene & Kirk did a great job answer questions by the attendees
10/25/2021 11:13:47 AM MDT	Yes	Yes	Yes	Very Knowledgeable	The staff was great, and I am glad that I got to see the unit. When explaining things to the public, I think it is good to give a big picture overview - what are the concerns with using treated wastewater/what are we removing? And what does each treatment step take care of? I think that was explained well, but maybe just more emphasis on those types of questions.
10/25/2021 11:33:44 AM MDT	Yes	Yes	Yes	Very Knowledgeable	Awesome demonstration! Thanks to all that put this on.
10/26/2021 02:22:09 PM MDT	Yes	Moderately	Yes	Very Knowledgeable	Analogies or comparisons to existing tech (ie, bio active is like fish tank filtration, uv is like life straw, ceramic mechanical is like backpacking filter, etc) could help make the tech seem more familiar?
10/26/2021 07:48:47 AM MDT	Yes	Yes	Yes	Moderately	Presenters were very knowledgeable, personable, open to questions and clearly invested in what they do. I'm impressed.
10/26/2021 10:55:05 AM MDT					I have long wanted utilities to embrace the direct potable reuse concept because we treat wastewater to very close to drinking water standards, then pay to withdraw a few miles away and start over with dirtier water than treated effluent. Your presenters were hospitable, informative, positive, and helpful. The finished water tasted refreshing. It was an absolutely delightful end to the work week. If you have a distribution list for updates, I am very interested in following the results
10/26/2021 10:59:52 AM MDT	Yes	Yes	Somewhat	Moderately	I attended a tour session that was being offered to a very technical in-the-industry group, so I'm assuming that was why the material was presented in such a technical manner! But I had been hoping for more public education info such as cost and outlook to implement such a DPR system. I was also curious about the public input survey that CSU did a couple months ago regarding community opinions on implementing such a system. (I was given a biz card and will follow up directly on this question!)
10/26/2021 11:01:35 AM MDT					Thanks again to you and your crew for the DPR demo. tour on Fridayâ€¦really well done!
10/26/2021 11:42:01 AM MDT	Yes	Yes	Yes	Moderately	
10/28/2021 09:18:01 AM MDT	Yes	Yes	Yes	Very Knowledgeable	Donene, Jason and Bill did a great job presenting the water reuse.

Date/Time	Did the presented material provide the information/details you needed to understand the water purification process?	Do you now have a clearer awareness of Colorado Springs Utilities water supply?	Was the presented material easily understandable?	After attending the Direct Potable Reuse Demonstration tour, how knowledgeable are with purifying recycled water now?	We would appreciate any additional tour feedback you may have.
11/04/2021 07:08:17 AM MDT	Yes	Yes	Yes	Very Knowledgeable	
11/05/2021 02:04:31 PM MDT	Yes	Yes	Yes	Very Knowledgeable	
11/05/2021 02:22:19 PM MDT	Moderately	Yes	Yes	Moderately	Exceptionally well done! Especially appreciated the important background information. As a geographer, I also like to help folks understand where they live within the watershed and what lies downstream. But then again, there was a time limit! Six step process in the trailer was interesting and made sense at the time but I abandoned my zoology major at CC after almost failing organic chem so just the topic makes me uneasy. :-) Impresssive nevertheless.
11/05/2021 09:31:54 AM MDT	Yes	Yes	Yes	Very Knowledgeable	
11/05/2021 09:34:51 AM MDT	Yes	Yes	Yes	Very Knowledgeable	
11/05/2021 09:36:47 AM MDT	Yes	Yes	Yes	Very Knowledgeable	Enjoyed the presentation and tour. Thank you very much.
11/05/2021 09:41:24 AM MDT	Yes	Somewhat	Yes	Very Knowledgeable	
11/05/2021 09:42:08 AM MDT	Yes	Yes	Yes	Very Knowledgeable	Staff were very friendly and knowledgeable.
11/05/2021 09:43:53 AM MDT	Yes	Yes	Yes	Very Knowledgeable	
11/05/2021 09:44:22 AM MDT	Yes	Yes	Yes	Very Knowledgeable	Excellent presentation
11/05/2021 09:44:48 AM MDT	Yes	Yes	Yes	Very Knowledgeable	The public outreach aspects of this DRP demo are OUTSTANDING! Swag. Clear graphics. Easy to understand language. Highly applaud your efforts in taking a proactive role on this front!
11/05/2021 09:45:05 AM MDT	Yes	Yes	Yes	Moderately	This was a great tour, and loved seeing what we can do to recycle water! Thank you for all your hard work and time to give us the presentation!!
11/05/2021 09:50:45 AM MDT	Yes	Yes	Yes	Very Knowledgeable	Very well presented! The trailer helped with visually understanding the process.
11/05/2021 10:04:38 AM MDT	Yes	Yes	Yes	Moderately	
11/05/2021 10:07:55 AM MDT	Yes	Yes	Yes	Very Knowledgeable	It was a very thorough tour and I now have a greater appreciation of the new treatment system and feel more confident it will adequately provide and surpass requirements for potable use and meet my palatable expectations as an end user in Colorado Springs. Way to take the lead as the city's growth expands and water supply becomes a critical commodity!
11/05/2021 10:08:53 AM MDT	Yes	Yes	Yes	Moderately	
11/05/2021 10:16:12 AM MDT	Yes	Yes	Yes	Moderately	I enjoyed the presentation and learn a lot but also realized there is more to learn.
11/05/2021 10:19:28 AM MDT	Yes	Yes	Yes	Very Knowledgeable	
11/05/2021 10:22:25 AM MDT	Yes	Yes	Yes	Very Knowledgeable	Loved the demonstration from the team! Look forward to hearing more about DPR in COS!
11/05/2021 10:23:13 AM MDT	Yes	Yes	Yes	Very Knowledgeable	
11/05/2021 10:30:41 AM MDT	Yes	Yes	Yes	Moderately	Good tour exciting possibilities for our future water needs
11/05/2021 10:30:58 AM MDT	Yes	Yes	Yes	Very Knowledgeable	
11/05/2021 10:38:45 AM MDT	Yes	Yes	Yes	Very Knowledgeable	
11/05/2021 10:57:26 AM MDT	Yes	Yes	Yes	Moderately	Given the audience I thought the presentation gave an excellent overview. Sometime I would enjoy getting more in depth information. Thanks for your efforts!!!
11/05/2021 11:11:56 AM MDT	Yes	Yes	Yes	Very Knowledgeable	I really enjoyed the tour and learning about cleaning the water. I am very excited for this program.
11/05/2021 11:20:44 AM MDT	Yes	Yes	Yes	Moderately	

Date/Time	Did the presented material provide the information/details you needed to understand the water purification process?	Do you now have a clearer awareness of Colorado Springs Utilities water supply?	Was the presented material easily understandable?	After attending the Direct Potable Reuse Demonstration tour, how knowledgeable are with purifying recycled water now?	We would appreciate any additional tour feedback you may have.
11/05/2021 11:22:56 AM MDT	Yes	Moderately	Yes	Moderately	Please make this available to specific groups such as high school and colleague students, developers and business/industrial citizen owners by reaching out to them.
11/05/2021 11:24:49 AM MDT	Yes	Yes	Yes	Very Knowledgeable	The tours and activities my students took part in were perfect for their understanding about where our water comes from (a 4th grade standard). The presenters were knowledgeable and did a great job with our kids. Thank you so much!
11/05/2021 11:40:14 AM MDT	Yes	Yes	Yes	Moderately	Very informative and educational. I personally believe this is the future of water for Colorado Springs. There's only so much and if we can reuse the water we have that's all the better. Keep up the good work CSU.
11/05/2021 11:42:19 AM MDT	Yes	Yes	Yes	Moderately	Well done!
11/05/2021 12:10:10 PM MDT	Moderately	Yes	Moderately	Moderately	Sampled the purified waterâ€¦ couldnâ€™t noticed it was the direct potable water.
11/05/2021 12:16:12 PM MDT	Yes	Yes	Yes	Moderately	I really enjoyed the tour. I think it would have been fun to see it in process (I believe there were some technical difficulties this day). Overall, great demonstration!
11/06/2021 09:05:52 AM MDT	Yes	Yes	Yes	Moderately	Everything was presented very clearly and the water tasted fine. However, the â€œyuckâ€ factor still remains in my mind. In the future we may not have a choice about drinking processed potable water. I would suggest that we do more to encourage use of non-potable water for lawns and other projects that donâ€™t require drinking water to preserve our disappearing water sources.
11/07/2021 02:56:58 PM MST	Yes	Yes	Yes	Moderately	It was a very good tour.
11/07/2021 06:31:58 AM MST	Yes	Yes	Yes	Moderately	It was a great tour!!! I enjoyed the fact that everyone was joking about getting sick from drinking the recycled water and had a glass despite the joking. To me, this is a needed technology if the American Southwest is going to stay populated. It could also save the Colorado river from total extinction.
11/07/2021 12:04:58 PM MST	Moderately	Yes	Yes	Moderately	Great Demonstration Tour! Both presenters (inside trailer and outside) gave enough information for a good general understanding, but not so much that it was too detailed for the general consumer. Both presenters were enthusiastic and it was easy to see their passion for this important new technology. I only wish there were a way to get more of the general public to attend this kind of tour. Great job! Thank you for providing it,
11/08/2021 03:36:33 PM MST	Moderately	Yes	Yes	Moderately	This was an informative tour. It might be helpful to have a brief summary of similar pilot or demonstration plants, as well as some of the full-scale facilities that have been doing direct reuse in an emergency (Wichita Falls, TX) or ongoing basis.
11/08/2021 07:50:11 AM MST	Yes	Moderately	Yes	Moderately	Sage did a great job explaining Direct Potable Reuse processes. During the tour, it would be nice to see potable water consumption stats and how they are projected to change in the future and how DPR is projected to aid with potable drinking water consumption.
11/08/2021 07:50:15 AM MST	Yes	Moderately	Yes	Moderately	Sage did a great job explaining Direct Potable Reuse processes. During the tour, it would be nice to see potable water consumption stats and how they are projected to change in the future and how DPR is projected to aid with potable drinking water consumption.
11/08/2021 08:07:13 AM MST	Yes	Yes	Yes	Very Knowledgeable	What a great way to explain why we may need direct potable water here in Co Springs in our future
11/08/2021 08:47:41 AM MST	Yes	Yes	Yes	Very Knowledgeable	
11/08/2021 11:01:17 AM MST	Yes	Yes	Yes	Somewhat	
11/09/2021 02:13:42 PM MST	Yes	Yes	Yes	Moderately	
11/09/2021 04:49:34 PM MST	Yes	Yes	Yes	Moderately	This was a great tour. I really enjoyed it. It is clear that water rights are pretty complicated! I'm glad to know CSU is taking steps to reuse water.
11/09/2021 08:03:28 AM MST	Yes	Yes	Yes	Moderately	The demonstration presentation team did a fantastic job of explaining the process that Utilities went through to get to this point and an equally fabulous job of presenting some very innovative technical processes to folks that do not have the technical background.
11/09/2021 12:05:36 PM MST	Yes	Yes	Yes	Very Knowledgeable	Great job CSU staff - you were very welcoming and presented the material in a clear, understandable way!!!

Initial Data Analysis of Post-Experience Survey
Direct Potable Reuse Tour/Trailer

Prepared for
Colorado Springs Utilities

Prepared by
Sean Williams, PhD (University of Colorado-Colorado Springs)

February 22, 2022

Colorado Springs Utilities (CSU) asked individuals who participated in their direct potable reuse tour/ demonstration to complete a post-experience survey. The survey offered the participants the opportunity to provide "any additional feedback that you may have." CSU collected 128 surveys and 98 of those surveys included a free form response. Those 98 responses included 157 distinct comments, where many of the individual participants remarked on more than one item in the same comment. The unique comments divided into five major categories (comprised of multiple smaller topics):

- Complimenting delivery and presentation of the tour (69%)
- Connecting to the future of Colorado Springs (14%)
- Suggesting tour improvements (9%)
- Requiring evidence (4%)
- Wishing to act (3%).

The discussion below describes the major categories, lists the subtopics that comprise each major category, and provides sample evidence from the responses. However, since most comments appeared just once or twice among all the responses, I would hesitate to place too much emphasis on any single comment's content. Instead, the very general lessons to take away might be that

- The staff who facilitated the tours did a good job
- People acknowledged the importance of DPR for the future
- Some room for improvement existed in delivering the tours
- Many people tasted the samples as evidence of their acceptance
- A few people were inspired by the tours.

Beyond the very general ideas above, the narrative data simply don't support any major conclusions or recommendations.

Complimenting delivery and presentation of the tour (69%)

Most comments (109 of 157 total) focused on praising some aspect of the tour itself, whether that was the presenters, the organization of the tour, or the materials used in the tour such as posters. This category also includes comments that explicitly thank CSU for creating the tour as well as comments indicating that participants learned from the experience. The subtopics and some sample comments appear below.

Subtopic	*Sample Comments*
1. Good explanation/knowledgeable presenters	"Donene, Jason and Bill did a great job presenting the water reuse."
2. Worth attending	"I really enjoyed the information on water sources and the policies surrounding reuse."
3. Answered questions well	"Everyone was so knowledgeable and answered so many questions."
4. Good demonstration	"The technical aspects of the demonstration project were well explained and understandable."
5. Learned new material	"Lots of great information! It hasn't quite sunk in yet."
6. Organized well	"The water supply and water reuse overview under the shade structure followed by the trailer tour and the water tasting at the end is a great way to organize the session."
7. Good materials	"Just the right amount of detailed information (supported by a nice flyer handout) without being too long in length."
8. Thanks	"My wife Betty and I enjoyed our visit; thanks for inviting us."

Connecting to the future of Colorado Springs (14%)

Many comments (22 of 157 total) expressed a connection between DPR and the future of Colorado Springs, and others explicitly indicated that the city should expand and accelerate its DPR program. This category also includes comments connected to the environment and those which expressed optimism and confidence in Colorado Springs Utilities. The subtopics and some sample comments appear below.

Subtopic	*Sample Comments*
1. Expresses confidence in CSU	"It's good to know that there are lots of people making sure that our water is safe for us and our children to drink."
2. Forward thinking	"I'm impressed with the forward-thinking staff at Utilities."
3. DPR is good addition	"I'd hope that everyone taking the tour leaves feeling comfortable with the idea of adding direct potable reuse to CSU's portfolio."
4. Promote grey water	"Please, promote approval for use of gray water in El Paso County. Watering landscape with gray water can significantly reduce using first pass potable water for this purpose."
5. Promote DPR	"Please consider ways to entice the general public to your demonstration."
6. Require conservation	"To meet future needs, right now the City should require potable and non-potable water lines in new developments (also xeriscape landscaping) and continue to encourage water conservation in the monthly utility bill newsletter."

Suggesting tour improvements (8%)

Perhaps the most important information came from participants who suggested improvements to the tour/demonstration experience. Although this was a small group of comments (13 of 157 total), some recommendations were quite specific and could be useful. The subtopics and some sample comments appear below.

Subtopic	*Sample Comments*
1. Adapt to audience level	"Customize the introductory material to the knowledge level of the group."
2. Improve the trailer experience	"I would of liked to see the trailer actually work. To produce an actual glass of water."
3. Improve messaging	"I struggled with the language used to describe how water is and can be used in Colorado. I didn't struggle because the language was hard to understand; I struggled because it made it seem like the only need for water was by human consumers and only those that could 'afford' it."
4. Create an online tour	"I'm not sure if there are ways to view this presentation online or something but that would be cool as well!"
5. Increase information on DPR	"During the tour, it would be nice to see potable water consumption stats and how they are projected to change in the future and how DPR is projected to aid with potable drinking water consumption."

Requiring evidence (4%)

A handful of comments (7 of 157 total) related to seeking evidence for the value and performance of recycled water. These comments focus on participants' desire to have verification, either through their own experience or the expertise of others, that recycled water is desirable. The subtopics and some sample comments appear below.

Subtopic	*Sample Comments*
1. Tasted Sample	"I had the opportunity to taste the purified water and it was fantastic, no distinguishable difference from Utilities' current treated water."
2. Needs external verification	"Would like the 50 indicator data collected in the trailer for outside analysis."
3. Converted skeptic	"I was a real skeptic before coming to this demo! They [the presenters] were both very open to our questions and both were knowledgeable.

Wishing to act (3%)

A few comments (4 of 157 total) expressed that the participant had been moved by the demonstration to pursue future action as CSU moves direct potable reuse ahead in the future. Although it is encouraging to see a few people become inspired to act, given the small number of comments in this category as an overall share of the total comments, we should be careful about assuming that the tour/demonstration had a significant impact on people's views. The subtopics and some sample comments appear below.

Subtopic	*Sample Comments*
1. Would like to learn more	"Sometime I would enjoy getting more in depth information."
2. Offered to help promote DPR	"At some point, you might need some community involvement to get legislation passed to make this process legal here in CO. Would love to help with that."

Future directions for research from the survey might include cross referencing the participants' comments with their responses on other questions in the survey as well as comparing pre- and post-experience data to the narrative comments. Finally, future research might coordinate the findings of this survey to others like it performed in other cities investigating a DPR program to see if the larger data set across multiple locations would generate better conclusions and potential recommendations on how to structure a public outreach campaign for direct potable reuse.