

Water Reuse Task Force Kickoff Meeting

August 27, 2024



Check-In and Networking
We will begin at 9:00am

Background Information

- TDEC is beginning to gather information and develop resources to support potable and agricultural water reuse.
- To support this effort, TDEC formed a Water Reuse Task Force composed of TDEC staff, consulting engineers, other state agencies, utilities, University staff, and others with related expertise.
- The Task Force held a kickoff meeting in Nashville on August 27-28, 2024.
- The meeting established the group's objectives, enabled connections among participants, and set the stage for progress.
- This slide deck contains the presentations and Task Force input provided during the August 2024 kick-off meeting.
- To engage participants and capture live input throughout the meeting, TDEC used the "Slido" polling platform. The poll results are included throughout this slide deck and have not been edited by TDEC.

Welcome and Meeting Overview

- Welcome to the Water Reuse Task Force kickoff meeting!
- Two-day hybrid event.
- There is space for sharing expertise and asking questions.
- We will stay together as one group throughout.
- You are welcome, but not obligated, to stay for each workgroup-focused session.
- This meeting will be recorded for notetaking purposes.



Big Picture Objective

Develop a regulatory framework to enable potable reuse and agricultural reuse in Tennessee.

- Aim to compile language that may contribute to the potential future rule by summer 2026
- Leverage expertise and work collaboratively

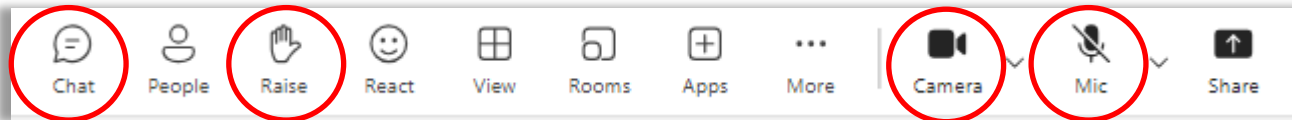


Basic Meeting Ground Rules

- One person speaks at a time.
- No personal or institutional attacks.
- Be concise.
- Express your own views rather than speaking for others.
- Stay on track with the agenda.
- Identify areas of common ground where possible.
- Each person reserves the right to disagree with any proposal and, where appropriate, assumes a responsibility to offer an alternative proposal.
- In the room: Raise your hand or name tent to indicate you'd like to speak.

Virtual Participation Best Practices

- Mute your mic when not speaking.
- Use “raise hand” button to indicate you would like to speak.
- Use the “chat” function to share a comment, information, or question.
- Turn on your camera when speaking if you are willing and able to do so.



Live Polling with Slido

Join at
slido.com
#1036 313



Day 1 – Morning Agenda



- **Check-in & Networking**
- **Welcome and Introductions**
- **Background on Water Reuse and Implementation in Tennessee**
- **BREAK** (10:35 – 10:50am)
- **Task Force and Workgroup Approach**
- **Q&A / Discussion**
- **LUNCH** (11:55 – 12:55pm)

Day 1 – Afternoon Agenda

- **Regulatory Considerations**
(Start at 12:55pm)
- **Building the Regulatory Framework**
- **BREAK** (15 mins)
- **Workgroup 1 Focus Session:
Regulatory Framework**
(2:40 – 4:25pm)
- **Wrap Up** (4:25 – 4:40pm)



Day 2 – Overview

Workgroup Focus Sessions:

- Communications and Outreach
- Source Water Nexus
- Advanced Water Treatment
- Operations



Photo: IDEQ

Day 2 – Agenda

- **Welcome and Meeting Overview** (Start at 8:30am)
- **Workgroup 2 Focus Session: Communications and Outreach**
(8:40 – 10:25am)
- **BREAK** (15 mins)
- **Workgroup 3 Focus Session: Source Water Nexus**
(10:40 – 12:25pm)
- **LUNCH** (30 mins)
- **Workgroup 4 Focus Session: Advanced Water Treatment**
(12:55 – 2:40 pm)
- **BREAK** (15 mins)
- **Workgroup 5 Focus Session: Operations**
(2:55 – 4:40 pm)
- **Wrap Up** (4:40 – 4:55pm)

Meeting Objectives

- Establish baseline understanding of water reuse in Tennessee and the regulatory development process
- Orient people to the Task Force, including its goals and function
- Get to know Task Force members and their areas of expertise
- Orient people to the workgroups, including confirmation of key questions, information needs, and function
- Serve as a forum for TDEC to hear more from stakeholders and subject matter experts
- Serve as a clear launching off point for this collaborative process



**Get to Know the
Water Reuse Task Force**

What is one your favorite songs? (Bonus points if it's water-related!)

0 2 5

- Queen
- Don't go chasing waterfalls
- Say you love me- Fleetwood Mac
- One Piece at a Time - Johnny Cash
- Chattanooga - Alan Jackson
- Beyond the sea, Bobby Darin
- November Air
- The water by Johnny Flynn & Laura Marling
- Don't go Chasing Waterfalls - TLC
- Blue water George Strait
- Black hole sun sound garden
- Blue Eyes Crying in the Rain
- Green river
- Anything Bob Seager
- Pirate looks at 40
- Nearly anything Billy Strings
- Centerfield
- Comfortably numb Pink Floyd
- Copperhead Road
- umbrella- rihanna
- Bridge over Troubled Watwe by Simon & Garfunkel
- Black Muddy River - Grateful Dead
- La Mer
- Anti Hero
- Bohemian Rhapsody- Queen
- Rain is a good thing

Where are you from?

036



What type of organization do you represent?

0 3 6

Academia



17 %

Consultant



14 %

Federal agency



3 %

State agency



56 %

Utility



8 %

Other



3 %

Introductions

Please share:

1. Name
2. Organization
3. Area of expertise
4. Why are you interested and willing to contribute to this effort?
5. Fun fact



Primary Workgroup Affiliation

Color coded name tents indicate primary workgroup participation

Blue: Regulatory Framework

Red: Communications and Outreach

Green: Source Water Nexus

Purple: Advanced Water Treatment

Orange: Operations

Note that you are welcome to join ANY or ALL workgroup meetings outside of your primary workgroup and some switching of primary workgroups may occur.



Break (15 minutes)

Water Reuse 101

THE RIVERS OF TENNESSEE



TENNESSEE HAS OVER 50,000 MILES OF
STREAMS AND OVER 500,000 PUBLICLY
OWNED LAKE ACRES.

Your “Comfort Level” with Potable Water Reuse



- Slido question next—get your phones ready!

What is your comfort level with potable water reuse implementation?

0 3 4

I'm ready to see it in practice.



I'm cautiously optimistic.



I don't know, but curious.



I need to be convinced.



I don't think so.



Water Reuse 101 – Context

- **What do we mean when we say *water reuse*? What are the main types?**
 - Water reuse (also commonly known as water recycling or water reclamation) reclaims water from a variety of sources then treats and reuses it for beneficial purposes
 - Water reuse the is reclamation of and additional fit-for-use treatment of treated municipal wastewater effluent
 - Types include
 - Potable water reuse (direct, indirect, and agricultural)
 - Non-potable reuse (landscape irrigation, maybe industrial)

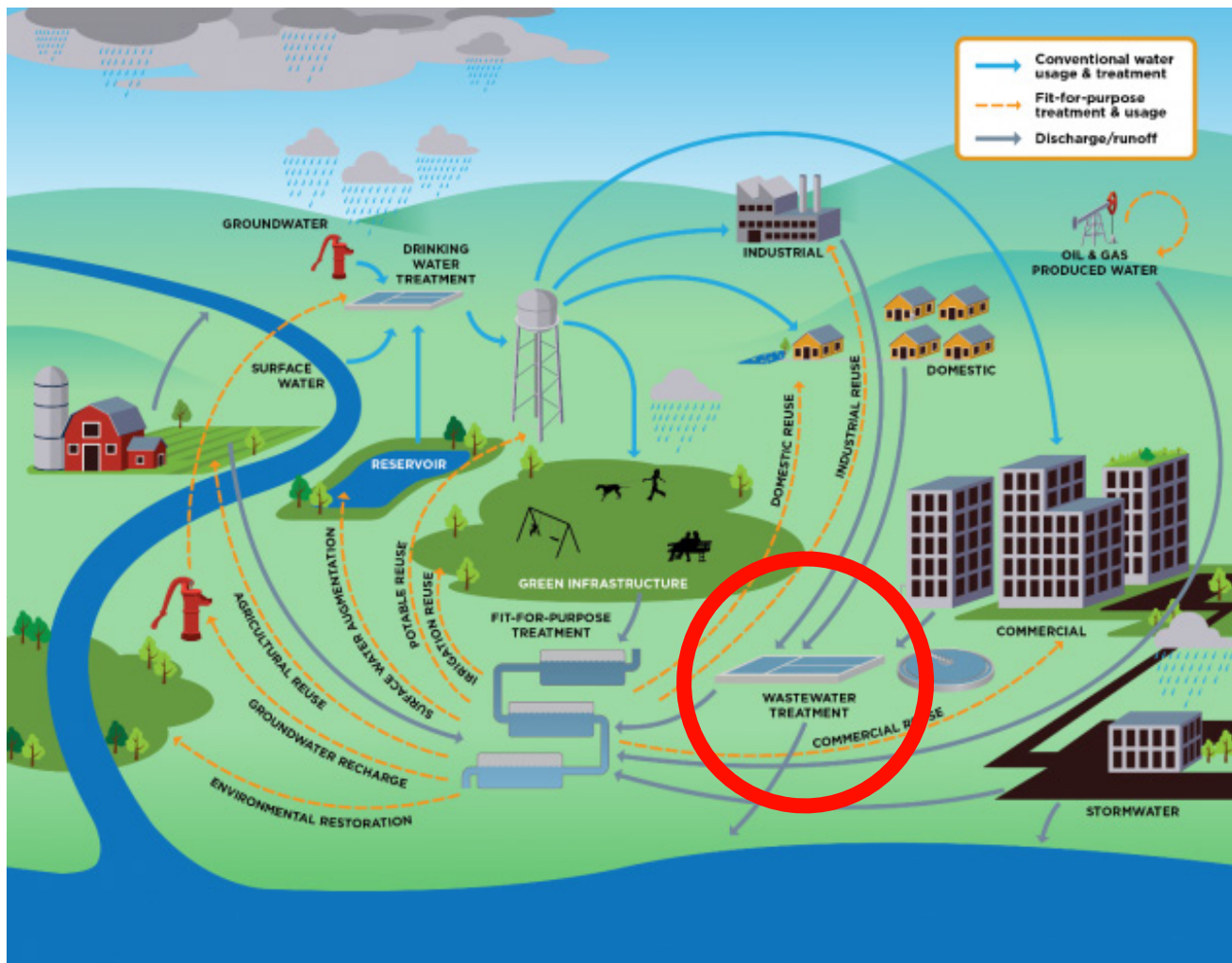


Water Reuse 101 – Context

- Potable water is more commonly referred to as Drinking Water
- Agricultural Reuse treatment
 - Advanced treatment beyond a typical WWTP
 - Limited crop irrigation based on advanced treatment
- Indirect Potable treatment
 - Advanced treatment beyond a typical WWTP
 - Environmental buffer (ground water recharge, saltwater intrusion)
 - Water treatment
- Direct Potable treatment
 - Advanced treatment beyond a typical WWTP
 - Water treatment

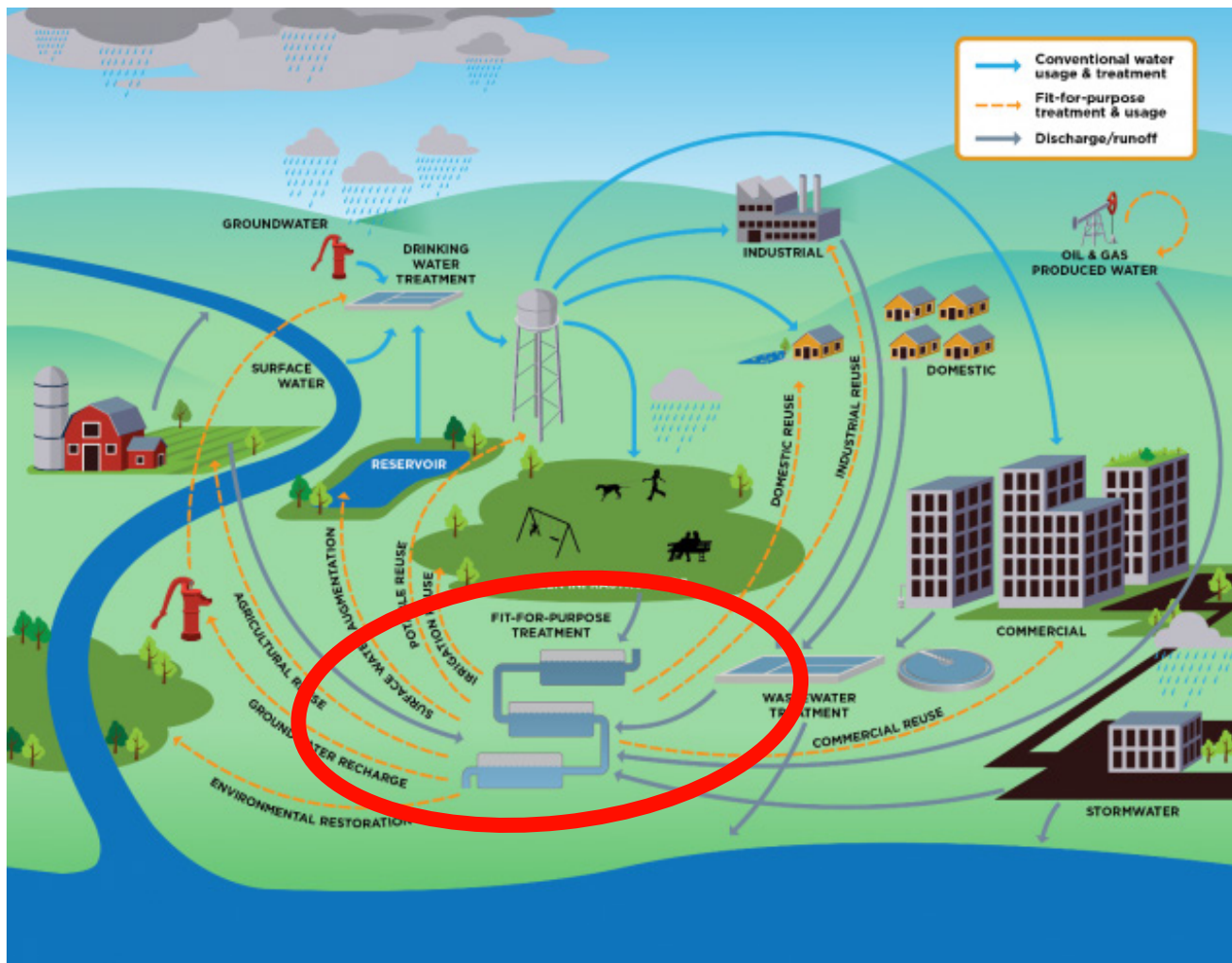


Water Reuse 101 – Wastewater Reuse



<https://www.epa.gov/waterreuse/basic-information-about-water-reuse#basics>

Water Reuse 101 – Wastewater Reuse



<https://www.epa.gov/waterreuse/basic-information-about-water-reuse#basics>

Water Reuse 101

Examples of Reuse Sources and Uses



<https://www.epa.gov/sites/default/files/2021-04/documents/wrap-update-on-collaborative-progress.pdf>

Water Reuse 101 – Why Reuse?

- Reduces the amount of freshwater that needs to be withdrawn from sources like rivers, lakes and aquifers
- Preserves these vital resources for other important uses:
 - Drinking water
 - Supporting aquatic ecosystems



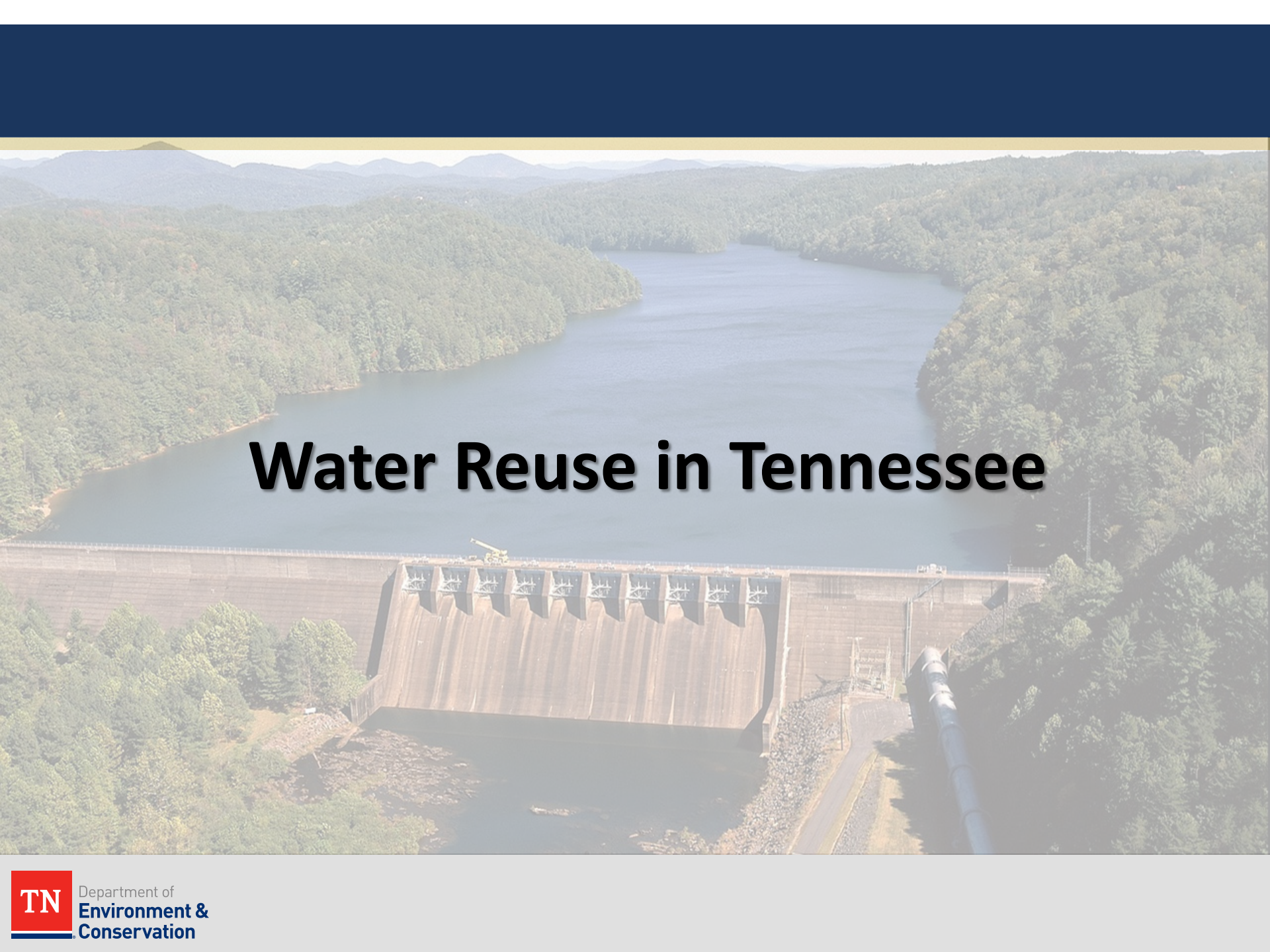
Water Reuse 101 – Why Reuse?

- Reduce nutrients from entering waterways:
 - Reduce nutrients like nitrogen and phosphorus in wastewater plant discharge
 - Reuse can help to reduce the amount of these nutrients that enter streams and rivers preventing harmful algal blooms and protecting aquatic life





Questions?



Water Reuse in Tennessee

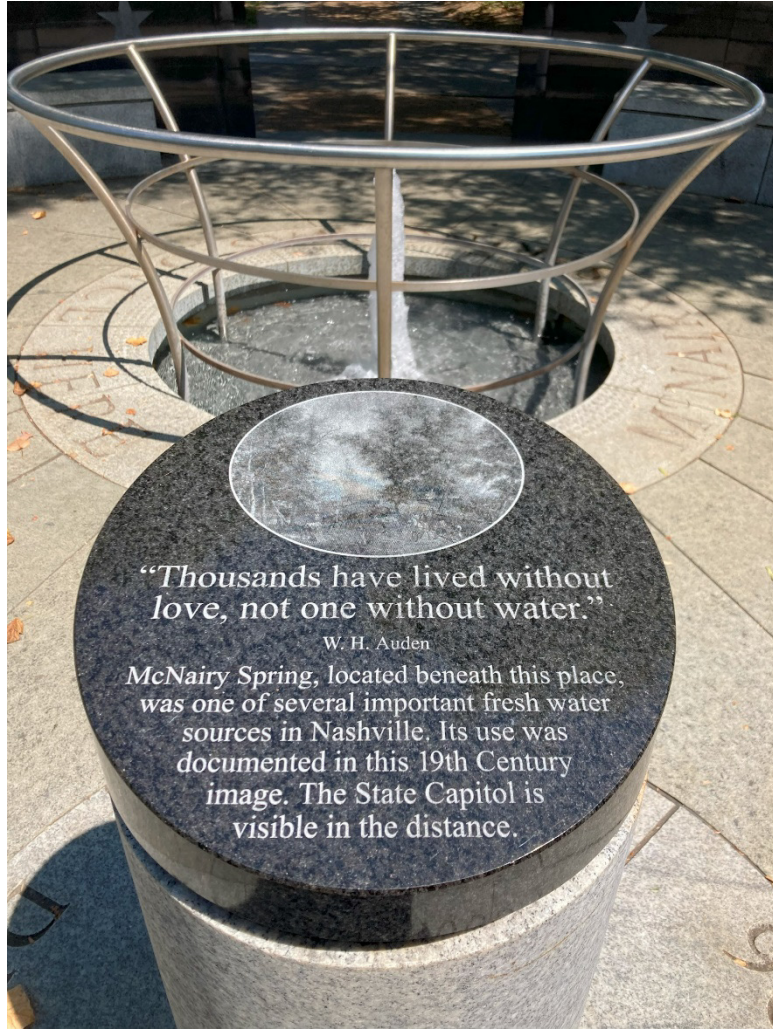
Water Reuse in Tennessee – Why does it matter?

- What are the primary reasons / drivers for pursuing potable reuse and agricultural reuse in Tennessee?
 - **Nutrient-based assimilative capacity** in small and high-quality receiving waters is the primary driving force for municipal reuse.
 - Some communities source their water from low-flow streams, which could also drive interest in reuse as the state is experiencing significant growth.



Photo: City of Tampa

Water Reuse in Tennessee



- What types of reuse are currently allowable and implemented in TN?
 - Non-potable Reuse is under Rule 0400-45-06
 - Primarily for irrigation
 - Industrial – Blue Oval City
 - 8 communities currently permitted
- Expressed interest in reuse within the state
 - Two communities are interested in pursuing potable reuse
 - Minimal interest for agricultural reuse

Water Reuse in Tennessee

- How does reuse fit within broader water quality/quantity challenges in the state?
 - TN H2O plan: *“Tennessee must continue to embrace new and creative technologies, such as water reuse. This must be done with a focused pursuit of identifying unintended consequences while also creating incentives for successful implementation of such practices.*
 - Water resiliency relies on a diverse water profile and can help protect high quality streams



Photo: Indian Head Canoes

Water Reuse in Tennessee – Current Regulations, Implementation, Interest

- T.C.A. § 69-3-108(e) requires applicants for a new or expanded wastewater discharge to surface waters to consider alternatives to discharge, including land application and beneficial reuse of treated wastewater.



Water Reuse in Tennessee – Current Efforts

- Work to date
 - Non-potable regulations effective May 2022
- Internal Water Reuse Team meetings
 - Ongoing for over a year
 - Team
 - April Grippo
 - Angela Jones, PE, CPM
 - Cindy Wheeler, PE
 - Emily Leonard
 - Emma Bartolo
 - Erich Webber
 - Jennifer Tribble
 - Matthew Tipton, EI

Water Reuse in Tennessee – Current Efforts

- Participation in the State Summit on Water Reuse in 2022, 2023, and 2024
- Secured facilitation support
- Planned / executed outreach for Water Reuse Task Force



Pilots





Pre-Meeting Survey and Interview Input

Concerns about Water Reuse in Tennessee

- “My major concerns include the quality of reused potable water and the health effects of emerging pollutants, such as PFAS.”
- “I think a major challenge will be public perception of water reuse—the “yuck” factor.”
- “There are only a handful of states pursuing regulations for potable reuse, and it's a tricky regulation to develop, especially given existing state regulations and institutional practices.”
- “An important consideration will be the impact of these regulations on local governments and small utility systems.”
- “I believe major challenges will include infrastructure costs, proper technology selection, and regulatory oversight.”

Hopes about Water Reuse in Tennessee

- “It is my hope that we can demonstrate the technical and economic feasibility of potable water reuse in TN.”
- “I hope to provide insight into best practices for water reuse as climate and availability pose growing challenges.”
- “I am excited about integrating water and nutrient management with environmental protection.”
- “My hope is that we can utilize existing data from other states to inform approval and operational monitoring.”
- “I hope to foster public acceptance of water reuse through education and science-based learning.”

Importance of Water Reuse in TN



- Slido question next—get your phones ready!

033

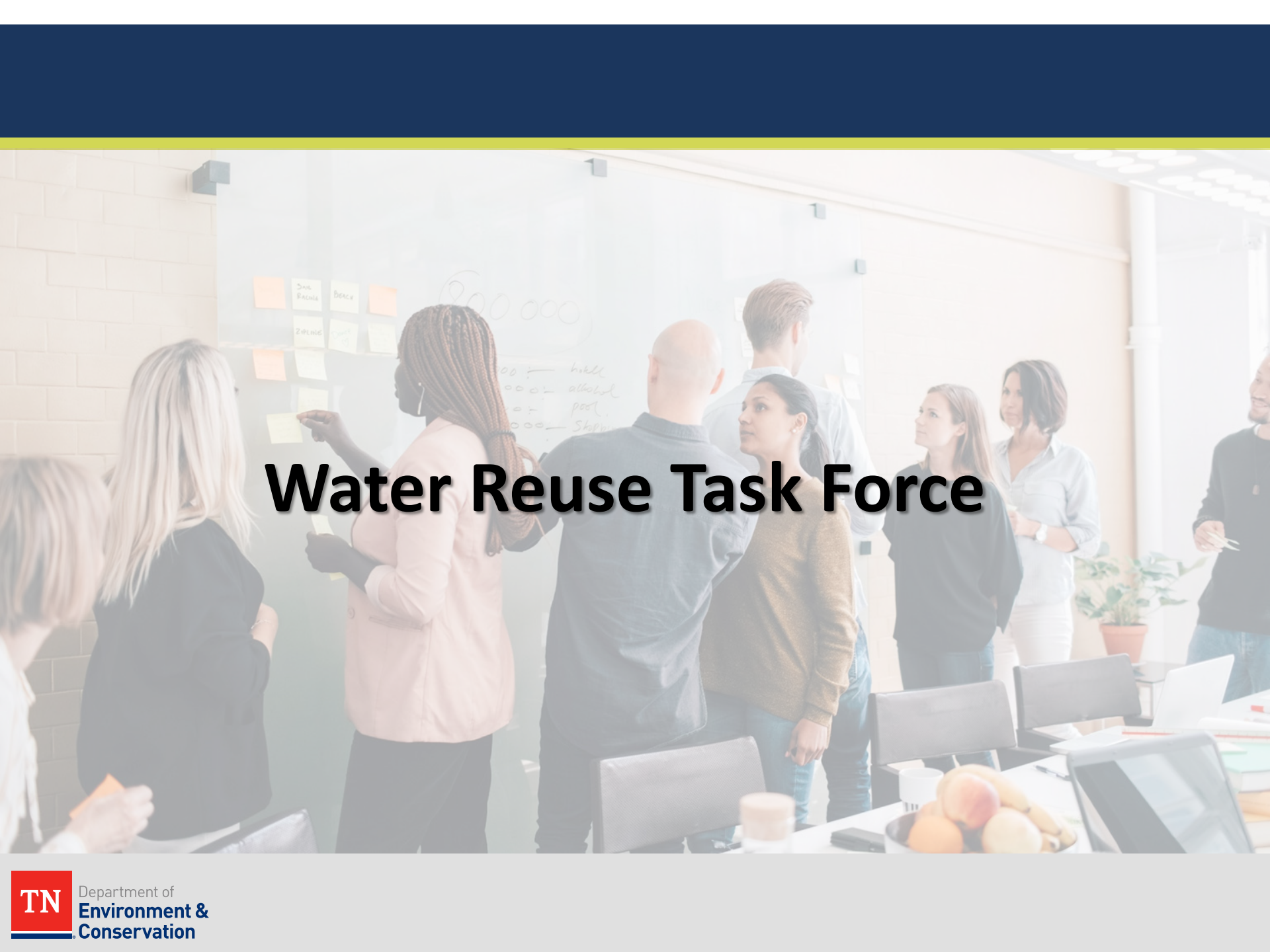




Questions?



Break (15 minutes)



Water Reuse Task Force

Task Force – Approach, Structure and Function

Water Reuse Task Force



Task Force – Approach, Structure and Function

- Facilitation Committee Members
 - A TDEC Facilitation Committee member will lead each workgroup
- Internal TDEC Reuse Team
 - Engineering, Permitting, Policy, Legal, External Affairs
- Workgroups
- Received feedback from interviews related to workgroup function which will continue to be integrated

Task Force – Facilitation Committee Function, Responsibilities & Role

- Facilitation Committee function
 - Chose approach, created initial charter content, participant selection
 - Monitor process and ensure progress
 - Help identify next steps and facilitate adjustments
 - Meet regularly as a team
 - Be active listeners for stakeholders and bring information back to the group
 - Coordinate with internal TDEC Water Reuse Team



Task Force – Workgroup Structure



Task Force – Guiding Charters

- Charters
 - Define purpose and big questions
 - Identify focus areas and expected outputs
 - Envisioned to be “living documents”



Tennessee Water Reuse Task Force Overview and Draft Workgroup Charters

The State of Tennessee is pursuing the development of a regulatory framework to further enable water reuse in the state as an approach to help meet water resource needs and help address surface water quality issues. The regulatory framework is envisioned to include rules for agricultural reuse, indirect potable reuse, and direct potable reuse, as well as necessary revisions to related rules, design criteria, and guidance for reuse best practices in the state.

As the lead agency in this effort, the Tennessee Department of Environment and Conservation (TDEC) has created the “Tennessee Water Reuse Task Force.” The Task Force is designed to engage stakeholders in a collaborative regulatory development process and include the expertise of experienced reuse professionals within Tennessee and beyond.

The Task Force is working towards developing a draft rule for potable reuse, proposed revisions to existing rules, and draft revisions to relevant design criteria, and any associated draft guidance documents by July 2026. To accomplish these objectives, the Task Force has developed five workgroups, including state staff and external partners, to make progress in distinct areas of work.

To identify the objectives of each workgroup and help each workgroup get started, TDEC has created draft “charter” documents that capture information such as: background; goals and objectives; key workgroup outputs; initial guiding questions; and workgroup planning and implementation. The workgroup charters are expected to be “living documents” throughout implementation of the Task Force and its workgroups. Below are links to each of the draft charter documents.

Regulatory Framework Workgroup Charter (draft)	2
Communications and Outreach Workgroup Charter (draft)	10
Source Water Nexus Workgroup Charter (draft)	17
Advanced Water Treatment Workgroup Charter (draft)	25
Operations Workgroup Charter (draft)	32

Task Force – Participation Expectations / Group Function

- Voluntary effort – A big Thank You!
- Attendance is key
- Level of stakeholder engagement
- TDEC will weigh recommendations from workgroups and make decisions
- Fluid and adaptive mindset

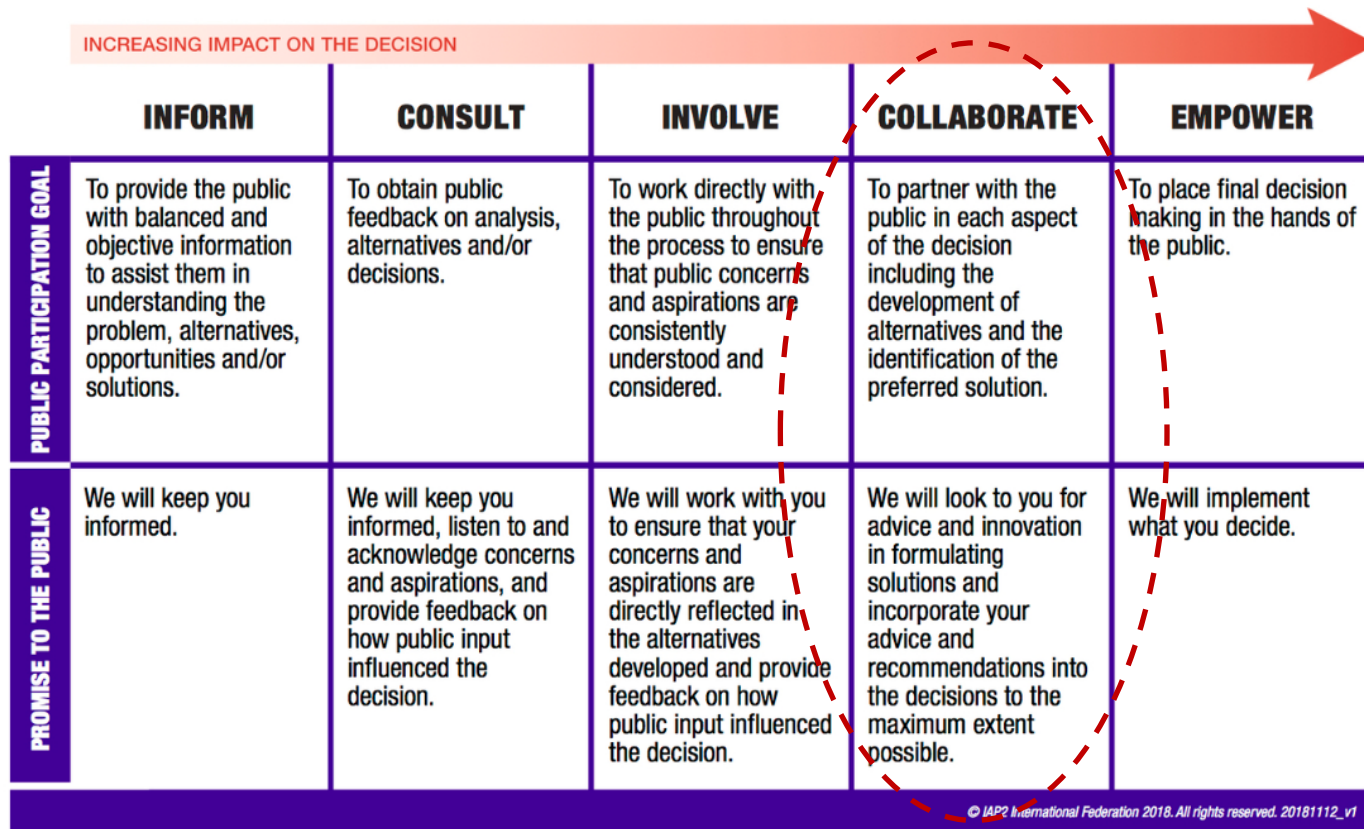


Task Force – Level of Engagement

IAP2 Spectrum of Public Participation



IAP2's Spectrum of Public Participation was designed to assist with the selection of the level of participation that defines the public's role in any public participation process. The Spectrum is used internationally, and it is found in public participation plans around the world.



Task Force – Workgroup Roles & Responsibilities



- Lead responsibilities
 - Help set agendas for workgroup meetings
 - Identify action items and next steps
 - Help track status of action items
 - Coordinate with Facilitation Committee, as needed
- Participant roles
 - Attend and participate in regularly scheduled meetings
 - Respectfully represent interests and concerns of your organization/peer group with respect to water reuse in Tennessee
 - Review materials prepared for workgroup meetings
 - Provide input as requested prior to, during, and/or after workgroup meetings
 - Share expertise and knowledge related to the topic area
 - Identify additional information, research, or expertise as needed

Task Force – Facilitation Committee Roles & Responsibilities

- Facilitator / Facilitation Committee Responsibilities
 - Establish meeting dates/invites
 - Help establish agendas and prepare meeting materials
 - Share agendas and meeting materials
 - Facilitate meetings
 - Ensure every voice is heard
 - Identify areas of agreement/disagreement and coordinate information between workgroups
 - Produce meeting notes and capture action items
 - Ongoing communication with the workgroup



Task Force – Role of the Workgroups



- Anticipated tasks
 - Provide input to TDEC on how to prioritize issues
 - Provide information to the group
 - Suggest guest speakers to inform the group, as needed
 - Help develop draft analyses and suggested language as necessary to inform the workgroup and TDEC
 - Review TDEC documents and provide constructive feedback and suggested edits
- Recurring meetings at multiple levels



Q&A, Discussion, and Input



Lunch (60 minutes)

The background of the slide features a blurred image of a workspace. It includes a silver laptop on the right, a spiral-bound notebook with a calendar page visible in the center, and a tan-colored folder or binder on the left. The text is overlaid on this image.

Regulatory Considerations

(starting at 12:45pm)

Regulatory Considerations

- What does this state process look like?
 - Workgroups gather information
 - Collaboration to bring information together
 - Draft language to potentially include in rules and guidance documents
 - Public Comment
 - Revisions (if necessary)
 - Rule approval by Tennessee Board of Water Quality, Oil & Gas

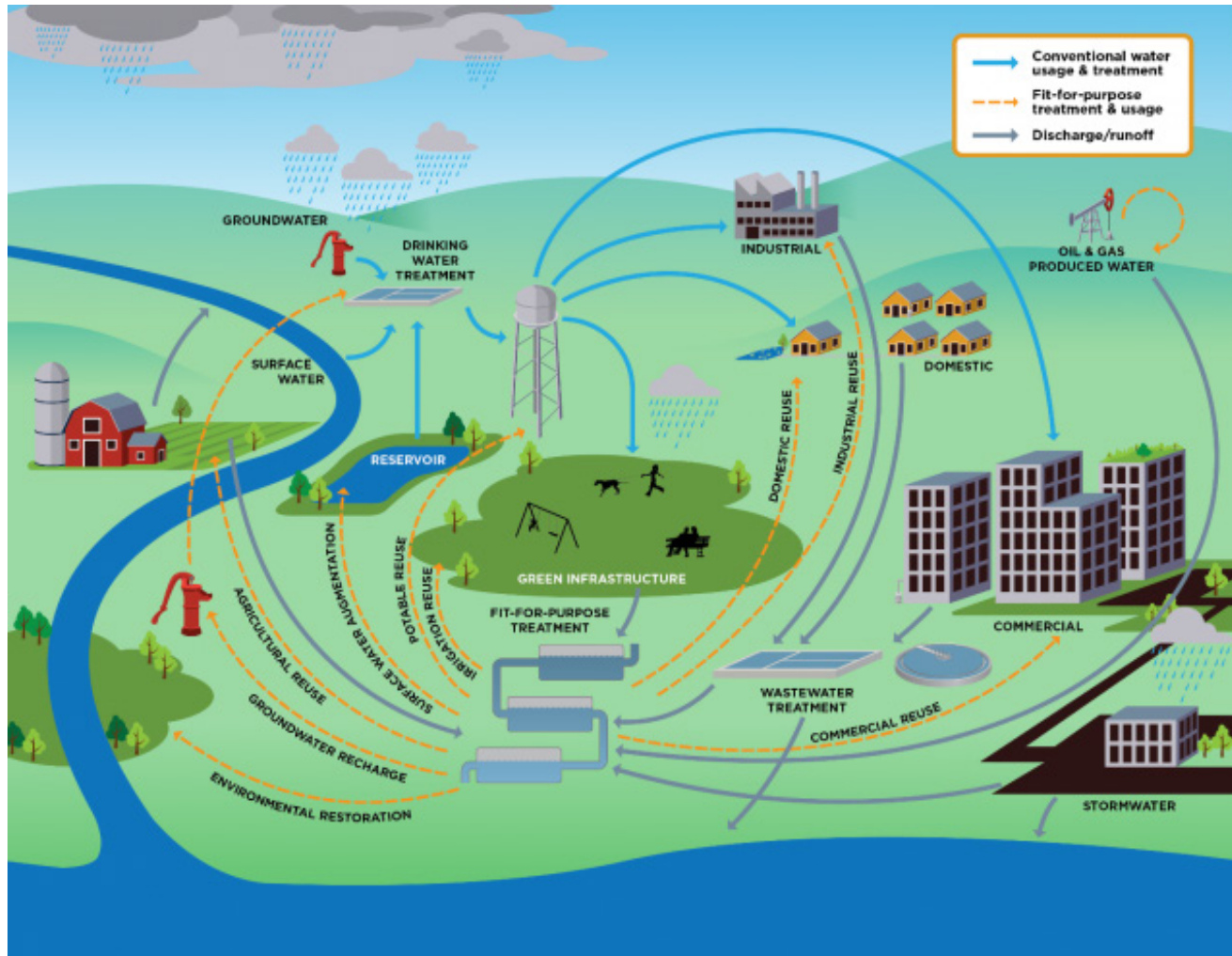


Building the Regulatory Framework

- Pieces of the puzzle
 - It is anticipated the potable reuse rules would live **within drinking water regulation**
 - Enable direct and indirect potable reuse



Building the Regulatory Framework

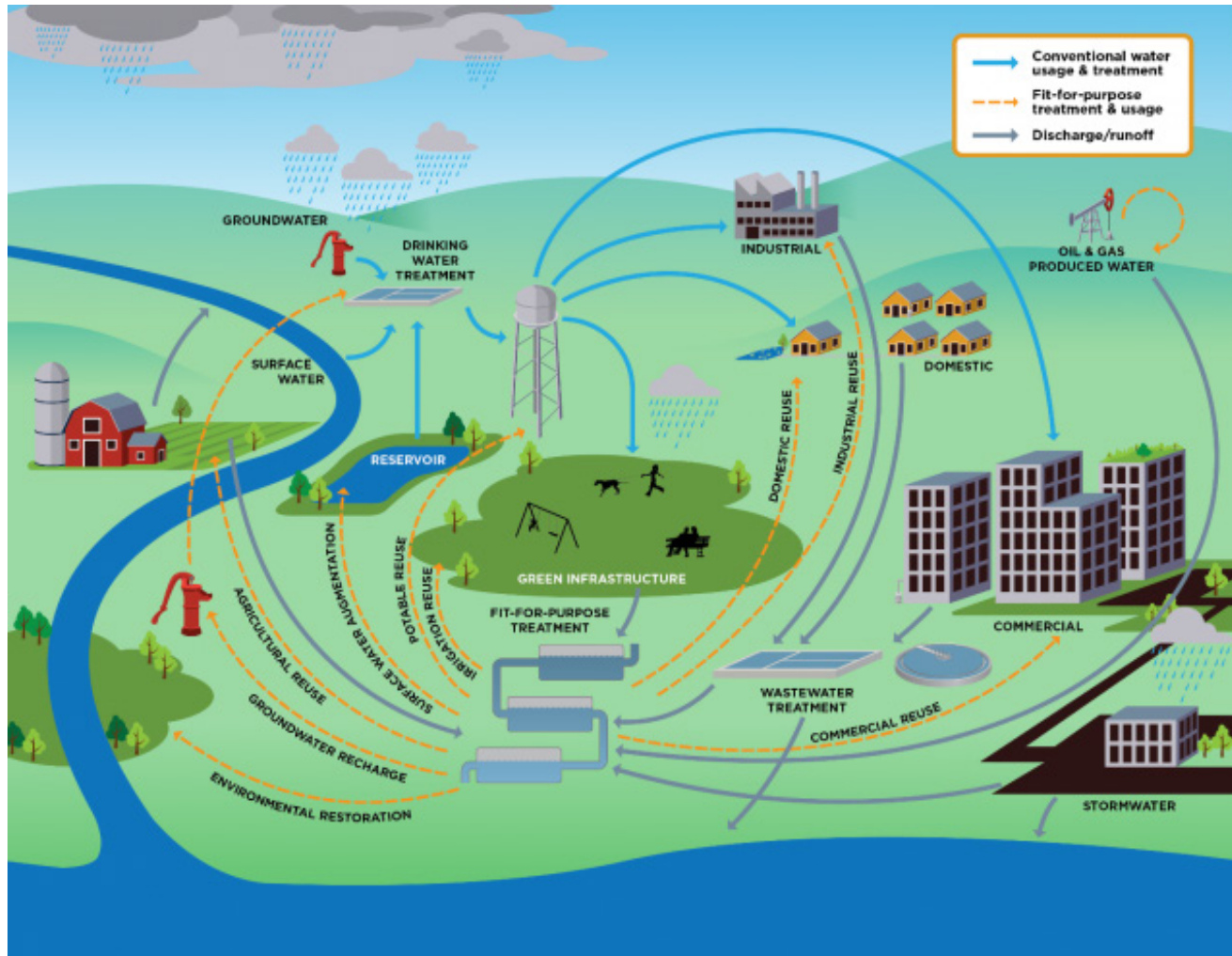


Building the Regulatory Framework

- Pieces of the puzzle
 - Agricultural reuse through modification of non-potable reuse regulation?
 - Weave into workgroup process



Building the Regulatory Framework



Regulatory Considerations – Proposed Rule Changes

0400-40-02

Regulations
for Plans,
Submittal,
and Approval;
Control of
Construction;
Control of
Operation

0400-40-06

State
Operating
Permits

0400-40-16

Public Sewerage
Systems

0400-45-01

Public Water
Systems

0400-49-01

Rules
Governing
Water and
Wastewater
Operator
Certification

0400-45-XX

Proposed
Potable Reuse
Rule

Regulatory Considerations – Proposed Guidance Changes

Sewer

Design Criteria for
Review of Sewage
Works
Construction Plans
and Documents

Water

Community Water
System Design
Criteria

Reuse

Draft guidance for
reuse best
practices not
included in either
Design Criteria

Regulatory Considerations – Challenges

Survey and Interview Input

- "Any water reuse regulation must protect public health while still setting achievable standards given the available technology."
- "It is important to consider the existing regulatory framework and de facto reuse occurring in the state. The water reuse regulations we develop could impact existing/future drinking water treatment systems with respect to source water planning."
- "It will be challenging to customize regulations for TN. We'll need to consider both safety and economics."

Regulatory Considerations – Challenges

Survey and Interview Input

- "TDEC has some ground to make up in terms of knowledge and technical competency related to water reuse."
- "I am concerned about the health effects of emerging pollutants in TN's drinking water. These include micropollutants like PFAS, cyanobacteria toxins, pharmaceuticals, and heavy metals."
- "I believe regulatory oversight will pose a major challenge. For example, the high costs of PFAS monitoring must be considered, particularly for small utilities."

Regulatory Considerations – Leveraging Expertise

- Relevant reuse regulations in other states

- Passed** potable reuse rule

- Colorado
 - California

- Draft** potable reuse rule

- Arizona

- Rule under development**

- Florida
 - New Mexico

Regulation 11 - Direct Potable Reuse

Water Quality

Search or request records

Water quality engagement

Regulations, policies, and guidance

Funding - Grants and Loans

Drinking water consumer info & data

Drinking water resources for water systems

Compliance assurance

Facility design

Facility operator certification

Guidance and forms

Reporting sample results

System (inventory) changes

The division would like to thank all stakeholders one last time for their tremendous effort in the Direct Potable Reuse (DPR) project, resulting in successful rulemaking. The thorough, thoughtful input by stakeholders was key in creating this DPR package of regulations and associated policies.

The final regulations are [published on the secretary of state's website](#) (version dated 1/14/2023, Section 11.14). The drinking water policies associated with DPR are policies [16](#) and [17](#), also available on our current [drinking water policies website](#). Responses to comments received about the policies have been posted to the project folder.

The division would once again like to thank stakeholders for their participation. The division will continue working with specific public water systems regarding direct potable reuse. It will also continue to participate and stay connected with organizations like WaterReuse Colorado regarding potable reuse in across the state of Colorado.

[View DPR Policies 16 & 17](#)

[Regulation 11 - Primary Drinking Water Regulations](#)

Direct Potable Reuse Regulations (SBDDW-23-001)

Background

Water Code section 13561.2 requires the State Water Board to adopt uniform water recycling criteria for direct potable reuse on or before December 31, 2023, if an expert panel has made a finding that the proposed criteria (regulations) would adequately protect public health. For more background information, please see the Initial Statement of Reasons (ISOR) provided below.

Status of Proposal

This rulemaking is complete.



- Regulation 11 - Colorado Primary Drinking Water Regulations – November 14, 2022
- Policy 16 - Direct Potable Reuse
- Policy 17 - Enhanced Source Water Control Program
- “DIRECT POTABLE REUSE” means using a series of processes that produce finished drinking water utilizing a source containing treated wastewater that has not passed through an environmental buffer

Colorado

- The supplier may not commence direct potable reuse without
 - Prior written Department approval of an application for direct potable reuse
 - A technical, managerial, and financial capacity assessment using the criteria found in the New Public Water System Capacity Planning Manual
 - Plans and specifications for construction of new waterworks

Colorado

- The supplier must submit a copy of the public notification of the intent to apply for direct potable reuse along with certification that states that the supplier has fully complied with the notification requirements in 11.14(3)(a)(ii)
- An enhanced source water control plan
- The plan provided with the application must include a copy of any agreement(s) with a wastewater entity to implement the enhanced source water control program
- A direct potable reuse operations plan
- At least one year of monitoring results of the treated wastewater

Colorado – Communications and Public Outreach

- The supplier must develop a written plan for a communications and public outreach program
- The communications and public outreach program must be conducted in a manner that allows for meaningful involvement and fair treatment of Disproportionately Impacted (DI) communities
- The written communications and public outreach plan must include information the supplier intends to distribute that includes at least all of the ... content in language that is understandable to those without a technical background in the subject matter



- Regulation 4190: Outlines the specific requirements for DPR systems in California – August 6, 2024.
- “Direct potable reuse project” or “DPR project” means a project involving the planned introduction of recycled water that meets the requirements of this Article either directly into a public water system or into a raw water supply immediately upstream of a water treatment plant.
- “DPR project water” means municipal wastewater used by a DPR project that has undergone partial or complete treatment as set forth in this Article.
- Direct potable reuse responsible agency (DiPRRA) - public water system responsible for compliance with this Article for a DPR project.

California – General Requirements

- (a) The source water for a DPR project shall be municipal wastewater.
- (b) There shall be no bypass constructed around required treatment processes for municipal wastewater from the DPR project to the distribution system.

California – General Requirements

- (c) A DiPRRA shall enable and facilitate the inspection by the State Board at any time of all facilities, operations, and records used to comply with the requirements in this Article as described in the engineering report including facilities and operations related to:
 - (1) Source(s) and treatment;
 - (2) Wastewater source control
 - (3) Cross-connection control
 - (4) Technical, managerial, and financial capacity demonstration
 - (5) Operations plan, monitoring plan, and water safety plan

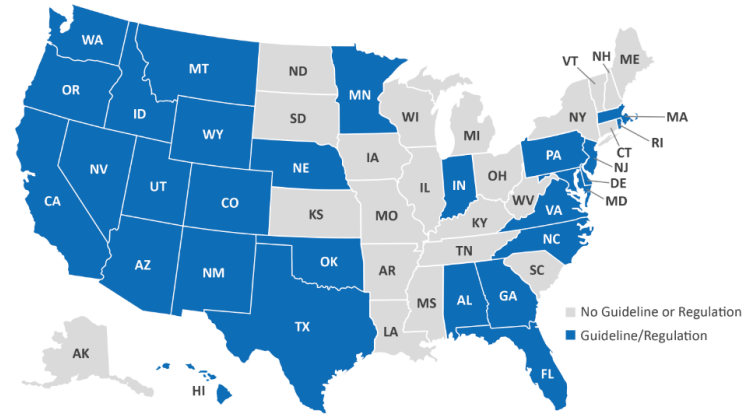
Regulatory Considerations

- Perspectives with potable reuse in other states

Regulatory Considerations – Leveraging Expertise

- Agricultural reuse implementation
 - Currently excluded from Rule 0400-40-06
- State examples of agricultural reuse
 - Hayden, ID
 - Treats ~1.2 M gallons of wastewater daily, recycling as much as 100% of it to irrigate alfalfa and poplar trees on city-owned farmland
 - Driver: Agricultural reuse reduces release of nutrient-rich treated wastewater into sensitive waterways
 - Orange County, FL
 - Irrigates 2,737 acres of citrus / year with recycled water
 - Driver: Eliminate wastewater discharges to surface waters
 - Secondary benefits: Creates reliable water supply; aquifer recharge

States with Water Reuse Regulations or Guidelines for Agriculture



Date created: March 2023

This is a map of states with guidelines or regulations included in the REUSExplorer tool. Some states may permit reuse on a case-by-case basis and did not have enough information to include in the tool.

Regulatory Considerations

- Perspectives with ag reuse regulations in other states

Regulatory Considerations – Leveraging Expertise

[Environmental Topics](#) ▾[Laws & Regulations](#) ▾[Report a Violation](#) ▾[About EPA](#) ▾[Water Reuse](#)[CONTACT US](#)

Regulations and End-Use Specifications Explorer (REUSExplorer)

This tool links to summaries of state water reuse regulations or guidelines and is searchable by source of water and end-use application. Results included in this tool were derived from the regulations, guidance, laws, or policy documents of each state and language from the state documents was preserved to the degree possible. These summaries are not legally binding and do not replace or modify any state or federal laws; please always refer to your state for the latest information. You can search the tool for the following reuse end-use applications: potable, onsite non-potable water reuse, centralized non-potable reuse, consumption by livestock, agriculture, landscaping, environmental restoration, industry, and impoundments. This tool was developed by EPA and partners as part of the Water Reuse Action Plan ([Action 3.1](#)). Content in the tool is current as of February 2024.



REUSExplorer Tool

Select the state, sources of water, and/or reuse application of interest using the available drop-down menus. No selection will display all available results. If no results are available for multiple selections, the search will yield "no results available." The results do not include laws and policies under development.

State or Country**Sources of Water** ⓘ**Reuse Application** ⓘ

See the REUSExplorer [demonstration webinar](#)

TN

Department of
**Environment &
Conservation**



Questions?



Break (15 minutes)



Workgroup 1 Focus: Regulatory Framework

Workgroup 1 Focus: Regulatory Framework

- Map the regulatory components of the state's potable reuse framework
- Technical information will be provided by other workgroups for inclusion in the regulations



Workgroup 1 Focus: Regulatory Framework

- Primary participants

Angela Jones (Lead)	TDEC
Emily Leonard	TDEC
Jessica Murphy	TDEC
Wade Murphy	TDEC
Samantha O'Neil	TDEC
Russel Owens	TDEC
Matthew Tipton	TDEC
Cindy Wheeler	TDEC
Ariel Wessel-Fuss	TDEC
Paul Bizier	Barge Design Solutions
Kati Bell	Brown and Caldwell
Jae Yoon	Old Dominion University
Ross Colona	TN Treasury
Justin Mattingly	U.S. Environmental Protection Agency
Dani Zebelen	Utah Department of Environmental Quality

Workgroup 1 Focus: Regulatory Framework

- Lead responsibilities
 - Help set agendas for workgroup meetings
 - Identify action items and next steps
 - Help track status of action items
 - Coordinate with Facilitation Committee, as needed
- Participant roles
 - Attend and participate in regularly scheduled meetings
 - Respectfully represent interests and concerns of your organization/peer group with respect to water reuse in Tennessee
 - Review materials prepared for workgroup meetings
 - Provide input as requested prior to, during, and/or after workgroup meetings
 - Share expertise and knowledge related to the topic area
 - Identify additional information, research, or expertise as needed



Workgroup 1 Focus: Regulatory Framework

- Objectives:
 - Establish regulatory scope and structure
 - Establish consistent definitions
 - Determine what information needs to be updated in existing design criteria and guidance documents
 - Determine impact on compliance and enforcement
 - Determine impact on NPDES and SOP permits

See charter for more details

Workgroup 1 Focus: Regulatory Framework

Rule Changes/Additions

0400-40-02

Regulations
for Plans,
Submittal,
and Approval;
Control of
Construction;
Control of
Operation

0400-40-06

State
Operating
Permits

0400-40-16

Public Sewerage
Systems

0400-45-01

Public Water
Systems

0400-49-01

Rules
Governing
Water and
Wastewater
Operator
Certification

0400-45-XX

Proposed Reuse
Rule

Workgroup 1 Focus: Regulatory Framework

Guidance Document Updates

Sewer

Design Criteria for
Review of Sewage
Works
Construction Plans
and Documents

Water

Community Water
System Design
Criteria

Reuse

Draft guidance for
reuse best
practices not
included in either
Design Criteria

Workgroup 1 Focus: Regulatory Framework

- Big questions for workgroup to help answer:
 1. What changes to state regulations need to be made and what policies / guidance will be needed to support the potable reuse reg?
 2. What terminology and definitions exist / need to be updated or created?
 3. What information should be shared / reported and to whom for different elements of potable reuse projects?
 4. Where should piloting programs be outlined?

Workgroup 1 Focus: Regulatory Framework

- Big questions for workgroup to help answer:
 5. What design criteria and guidance documents need to be developed or updated?
 6. How will NPDES and SOP permitting be impacted?
 7. What relevant requirements exist for compliance determinations, violations, and responses to violations?
 8. Is an economic impact study necessary to evaluate the potential impacts of potable reuse implementation?
 9. Regulatory authority for agricultural reuse

Workgroup 1 Focus: Regulatory Framework

- Anticipated outputs:
 1. Regulatory structure
 2. Definitions
 3. Redlines of existing regulations
 4. Permitting processes
 5. Suggestions of any needed updates to compliance and enforcement mechanisms
 6. Data storage / sharing policy
 7. Recommendations on potential economic impact study related to potable reuse
 8. Compiled draft language that may contribute to future rules and guidance documents (which will be available for public comment)

Slido – What are We Missing?



- Get your phone ready!
Slido poll up next.

Regulatory Framework: What other big questions / outputs should be considered? What are we missing?

- Required training for reuse
- Unregulated chemicals
- Operations – advanced treatment facilities require the most skilled operators
- Size of system and history of system should be considered prior to potable reuse
- This has huge pretreatment and local limit impacts
- What is jurisdiction divide among TDEC, health and Dept ag
- Will cities be approached differently depending on their source water?
- Effluent quality vs existing surface water quality. What if effluent is higher quality than stream
- Emergency use exceptions
- Monitoring requirements
- The demand for DPR is different from typical demand for water supply growth.
- Add 0400-40-03 and 0400-40-05 to the list of rules for review and consideration
- Where does IPR belong? Should there be two different LRV goals for IPR/DPR? Do they belong in the same or separate rule?
- Reuse via groundwater recharge. Innovative/outside the box systems
- What is the delineation between defacto and indirect potable reuse?
- Where does the legal authority to regulate direct potable reuse originate?
- Cross-connection control considerations
- How many pilots do we need before we get enough data?
- Collaboration of data
- Environmental justice if it is so expensive only affluent communities can do this to produce "better quality water"
- Security
- IPR vs de facto reuse

Workgroup 1 Focus: Regulatory Framework



- **How do we get to our objectives and outcomes?**
 - What expertise and materials do we have already?
 - What synergies or dependencies are there with other workgroups?
 - What do we still need to be successful?
 - What are our priorities and next steps?

Workgroup 1 Focus: Regulatory Framework

- What synergies or dependencies are there with other workgroups?



What do We Have / What do We Need?



- To the “Jamboard”...

What do We Have / What do We Need?

Text copied from a collaborative Jamboard.

- What materials and expertise do we have?
 - What gaps do we have?
Recommendations to fill gaps?
 - WRF QMRA for CA that's been used elsewhere (e.g., AZ)
 - Framework for Potable Reuse
 - EPA risk assessment tool and ATSDR public health assessment
 - WHO document
 - Water Research Foundation materials (e.g., DPR risk tool)
 - Existing regulatory framework in CWA and SDWA. Source water assessments
 - Permitted facilities/operator input and concerns – survey
 - ECHO Enforcement and Compliance History Online
 - REUSExplorer – state regs and guidance
 - EJ screen
 - Purified – Peter Annin (book)
 - EPA state of the science document
 - Compliance history online for NPDES
 - Definitions table
 - Conservation
 - State survey results (e.g., AZ, VA) re: how public perceives potable reuse
 - Projected water demands vs availability?
 - Effluent quality and receiving streams – how many WWTPs are at assimilative capacity?
 - Reasonable potential criteria procedures / risk assessment approaches
 - North Carolina's "have to haves" after ban on potable was lifted

What do We Have / What do We Need?

Text copied from a collaborative Jamboard.

- What do we still need to be successful?
 - Do the work!!
 - Know the mood of the legislature
 - Support from utilities who are on board with this
 - Municipality funding
 - Source water quality
 - Clarification on where authority is derived (SDWA vs CWA)
 - Geological data for groundwater, aquifers, contaminants, etc. Feasibility studies
 - GIS support (no go zones)
 - PFAS concentration levels in TN
 - Support or engagement with environmental and public health advocates
 - Demonstration / drinking reused water
 - Waters across state or county borders
 - Long term commitment to ensure resources and state capacity for implementation
 - Timeframe for success
 - Industrial pretreatment and source control for wastewater system
 - Public and legislator buy-in
 - Kentucky / TN Water Professional materials and stakeholders
 - Health Department – illness outbreak authority
 - Framework to measure success of the reuse program (state and community level)
 - Identify who is liable for unknowns
 - Events and education to reduce the ‘yuck factor’ – proactive measures
 - Communication re: combined systems (EPA reg)
 - Joint use agreements, as needed (important for operators)
 - Conservation nonprofits (e.g., TWRA) for comms and water perspectives

Slido – Where should We Focus Next?



- Get your phone ready!
Slido poll up next.

Regulatory Framework: What focus areas should be prioritized as the workgroup gets started? (Pick your top 4)

Compliance and enforcement considerations



60 %

Definitions and terminology



75 %

Economic impact considerations



25 %

Environmental justice considerations



5 %

Evaluate existing relevant state regulations



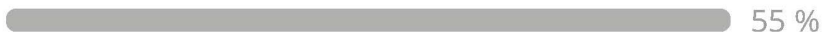
55 %

Identify needed supporting policies and/or guidance



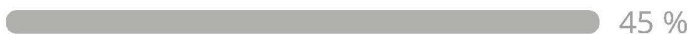
55 %

Permitting processes (including review and approval)



55 %

Written regulation framework for other workgroups to use



45 %

Other

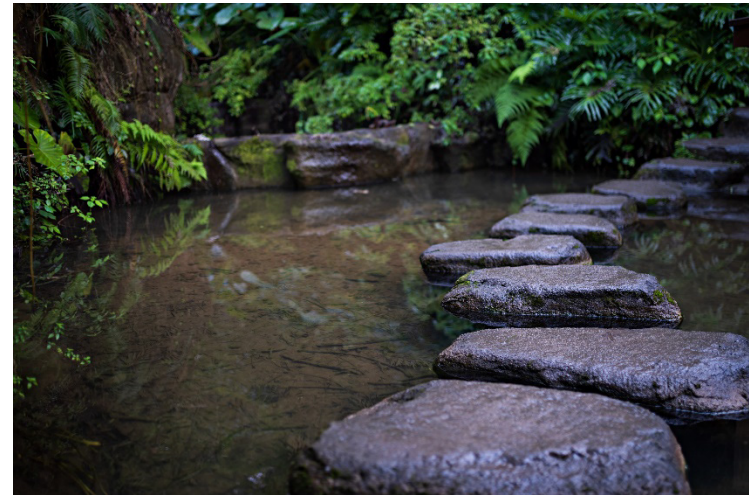


5 %

Workgroup 1 Focus: Regulatory Framework

- **Next steps**

- Review charters
 - Primary workgroup participants share feedback with TDEC lead (Angela Jones)
- Identify next workgroup meeting and get it on the calendar
 - TDEC will send Doodle poll to primary workgroup participants
- TDEC will invite workgroups to SharePoint access to facilitate collaboration
- Workgroup participants share relevant background materials
- *Others?*





Questions and Discussion

Day 1 Wrap-Up

- Summary
- Expectations for Day 2
 - Communications and Outreach
 - Source Water Nexus
 - Advanced Water Treatment
 - Operations

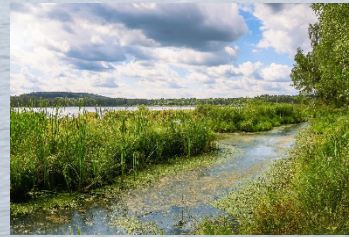
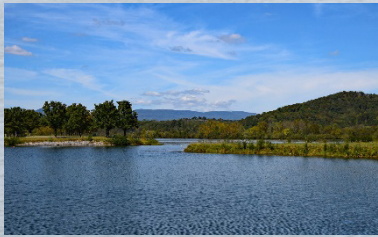


Day 2 Agenda Overview



- **Workgroup 2 Focus Session: Communications and Outreach** (8:40 – 10:25am)
- **BREAK** (15 mins)
- **Workgroup 3 Focus Session: Source Water Nexus** (10:40 – 12:25pm)
- **LUNCH** (30 mins)
- **Workgroup 4 Focus Session: Advanced Water Treatment** (12:55 – 2:40 pm)
- **BREAK** (15 mins)
- **Workgroup 5 Focus Session: Operations** (2:55 – 4:40 pm)
- **Wrap Up** (4:40 – 4:55pm)

Thank you!



Water Reuse Task Force Kickoff Meeting – Day 2

August 28, 2024

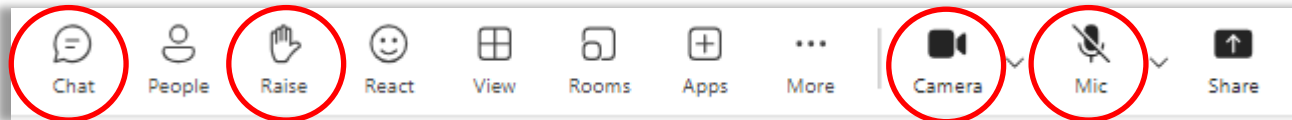
- Help yourself to refreshments.
- Please take your name tent from the front of the room.



We will begin at 8:30

Virtual Participation Best Practices

- Mute your mic when not speaking.
- Use “raise hand” button to indicate you would like to speak.
- Use the “chat” function to share a comment, information, or question.
- Turn on your camera when speaking if you are willing and able to do so.



Welcome and Overview – Ground Rules

- One person speaks at a time.
- No personal, institutional attacks.
- Be concise.
- Express your own views rather than speaking for others.
- Stay on track with the agenda.
- Identify areas of common ground where possible.
- Each person reserves the right to disagree with any proposal and assumes a responsibility to offer an alternative proposal.
- In the room: Raise your hand or name tent to indicate you'd like to speak.

Day 1 Recap

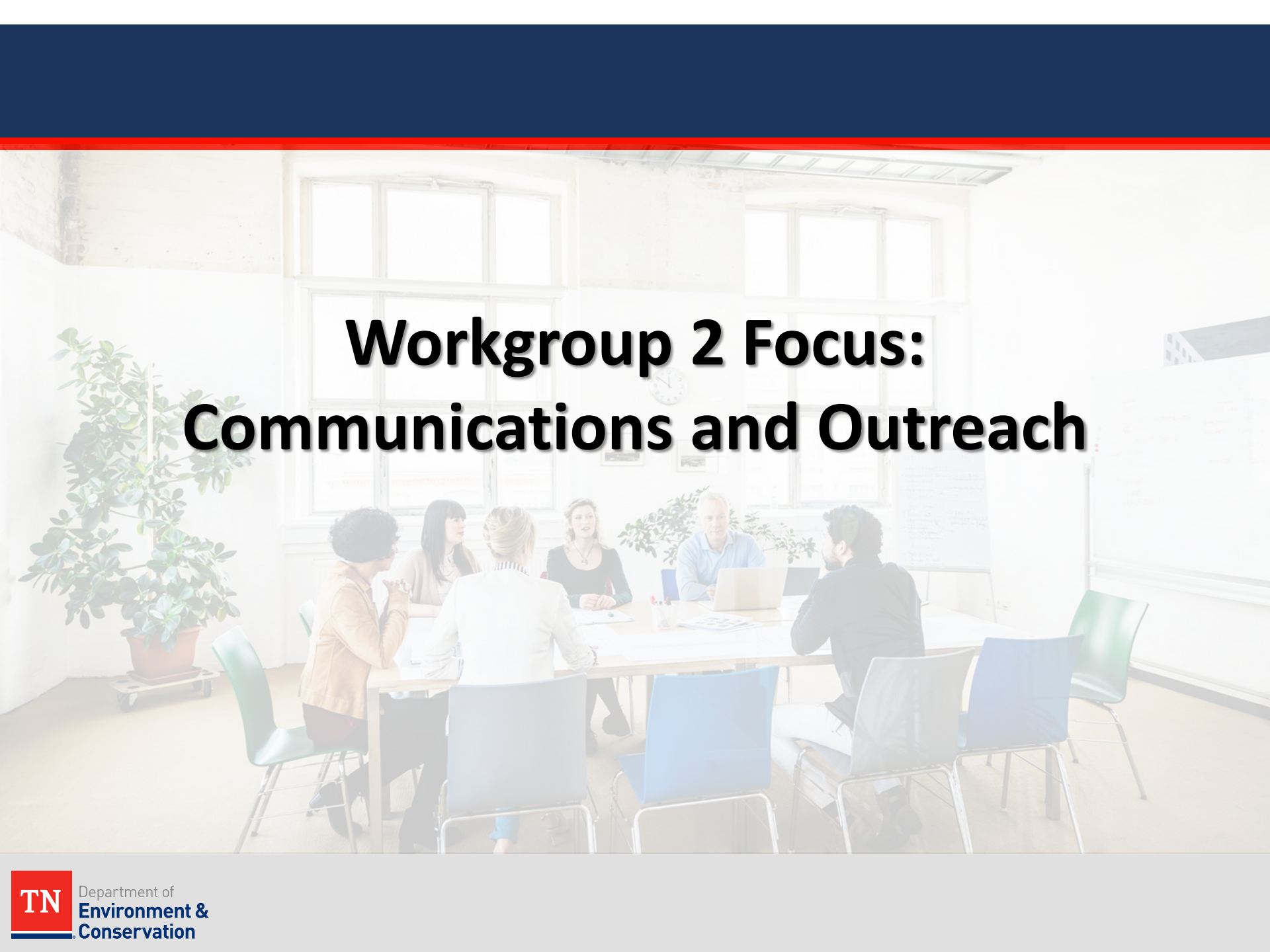
- Background on water reuse and implementation in Tennessee
- Task Force and workgroup approach
- Regulatory considerations
- Workgroup 1 focus: Regulatory Framework
- Refer to charter PDFs for more details throughout the day



Day 2 Agenda



- **Workgroup 2 Focus Session: Communications and Outreach** (8:40 – 10:25am)
- BREAK (15 mins)
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- **Workgroup 5 Focus Session: Operations** (2:55 – 4:40 pm)
- **Wrap Up** (4:40 – 4:55pm)



Workgroup 2 Focus: Communications and Outreach

Workgroup 2 Focus: Communications and Outreach

- Primary participants

Emily Leonard (Lead) **TDEC**

Emma Bartolo TDEC

Megan Ploch TDEC

Anna Sartors TDEC

Matthew Tipton TDEC

Jennifer Tribble TDEC

Cindy Wheeler TDEC

Chuck Yoest TDEC

Darren Gore City of Murfreesboro

Bruce Giles First Utility of Knox County

John Charlson Municipal Technical Advisory Services

Shawn Hawkins University of Tennessee

Workgroup 2 Focus: Communications and Outreach

- The Communications and Outreach Workgroup will:
 - Provide Tennessee with expertise related to water reuse communication outreach and efforts and programs
 - Contribute relevant background materials for reference
 - Share lessons learned from existing potable reuse programs and projects
- Workgroup tasks will focus on the formation of a communications plan and requirements for communities to follow when pursuing potable reuse projects.



Workgroup 2 Focus: Communications and Outreach

- Lead responsibilities
 - Help set agendas for workgroup meetings
 - Identify action items and next steps
 - Help track status of action items
 - Coordinate with Facilitation Committee, as needed
- Participant roles
 - Attend and participate in regularly scheduled meetings
 - Respectfully represent interests and concerns of your organization/peer group with respect to water reuse in Tennessee
 - Review materials prepared for workgroup meetings
 - Provide input as requested prior to, during, and/or after workgroup meetings
 - Share expertise and knowledge related to the topic area
 - Identify additional information, research, or expertise as needed



Workgroup 2 Focus: Communications and Outreach

- Objectives:
 - Develop a clear rationale for why reuse is necessary in Tennessee
 - Consider and identify communication requirements and best practices for utilities proposing water reuse
 - Outline communication requirements and best practices for TDEC
 - Evaluate the need for intergovernmental/memorandum of understanding agreements
 - Identify reuse stakeholders to tailor and execute a communications and outreach strategy
 - Develop a communications and outreach plan
 - Ensure the inclusion of health equity and environmental justice considerations
 - Ensure that the outreach program and requirements are transparent, thorough, and strategic
 - Evaluate the necessity of a statewide economic impact study

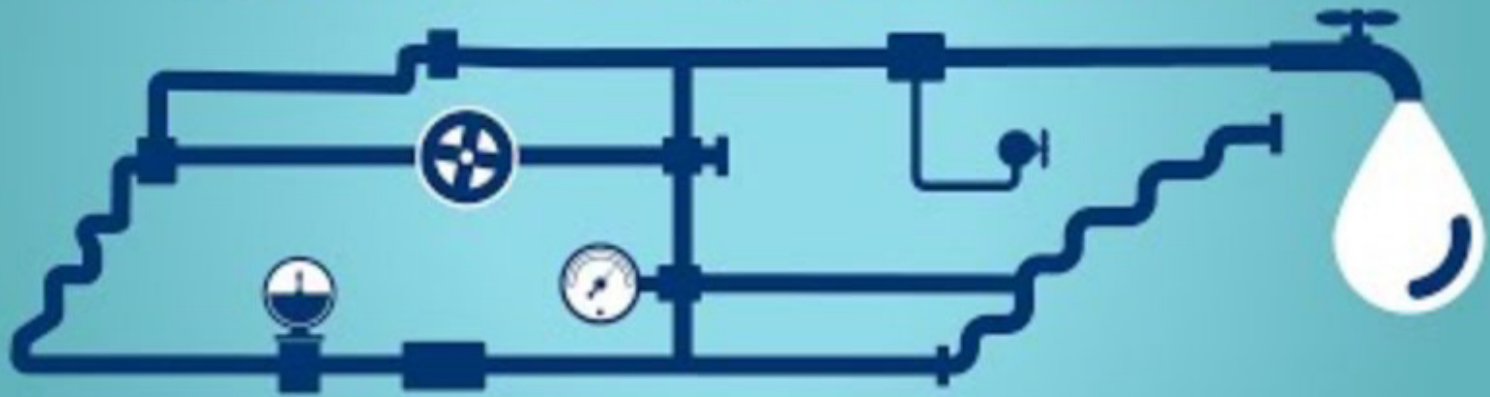
State Revolving Funds

- [Clean Water State Revolving Fund \(CWSRF\)](#)-provides loans for planning, design, and construction phases of wastewater and stormwater systems; provides low-interest, infrastructure loans to cities, counties, utility districts, and stormwater authorities.
- [Drinking Water State Revolving Fund \(DWSRF\)](#) – provides low interest loans for planning, design, and construction phases of public water systems to cities, counties, utility districts, and water authorities for drinking water infrastructure.
- [State Water Infrastructure Grants \(SWIG\)](#)
 - [Asset Management Plan Grant](#) – program addresses the managing infrastructure capital assets for water, wastewater, and stormwater infrastructure.
 - [Lead Service Line Inventory Grant](#) – grant assistance program for communities investigating and addressing lead service line issues; includes direct and indirect technical assistance.
 - [American Rescue Plan](#) – funds allocated toward water, wastewater, and stormwater infrastructure projects. [Investment Plan Video](#).
 - (Timeline TBD) [Emerging Contaminant- Small Disadvantaged Communities \(EC-SDC\)](#)

ARP Investment Plan Video



Water & Wastewater



Infrastructure

Emerging Contaminant-Small Disadvantaged Communities (EC-SDC)

- TDEC applied for **\$39 million** via EPA's Emerging Contaminant-Small Disadvantaged Communities (EC-SDC) grant to address PFAS and other emerging contaminants (ECs) in drinking water supplies. Not yet announced.
- **Eligibility Criteria:** Privately- and publicly-owned community water systems and non-profit non-community water systems that serve small and/or disadvantaged communities.
 - "Small" -communities that have a population of 10,000 or less.
 - A "Disadvantaged" community in TN is defined as having an Ability to Pay Index (ATPI) of 50 or less.

**GRANT MANUAL =
SORTED!**



Eligible Uses and Activities

Activities eligible for EC-SDC funding: In accordance with the statutory eligibilities under Section 1459A of SDWA¹⁰, these actions may include but are not limited to, the following categories for addressing emerging contaminants:

- Scoping and identification
- Testing or sampling for baseline assessment¹¹
- Research and testing
- Planning and design
- Treatment
- Source
- Storage
- Water system restructuring, consolidation, or creation
- Providing households access to drinking water services
- Technical assistance
- Public communication, engagement, and education

PFAS Response in Tennessee

MAGPIES

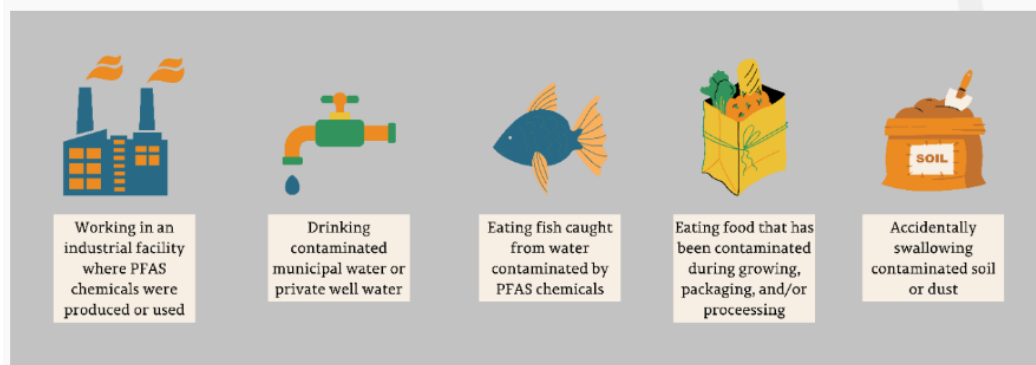
Multi-**A**gency **G**roup for **P**FA**S** **I**nformation and **E**merging contaminant **S**upport

- Representatives from all divisions in TDEC (Lead agency), Department of Ag, Tennessee Department of Health, Tennessee Wildlife Resource Agency, and UT ext.
- This group is working to address PFAS in Tennessee through the coordination of unified response efforts and by raising public awareness of PFAS health risks and exposure pathways.

RESOURCES

- [TDEC PFAS Webpage](#)
- [TDEC PFAS Dashboard](#)
- [UCMR 5 Dashboard](#)
- [PFAS Sampling Demo \(New PSA!\)](#)

How are people exposed to PFAS?



PFAS Exposure Pathways. From left to right: working in an industrial facility where PFAS chemicals were produced or used, drinking contaminated municipal water or private well water, eating fish caught from water contaminated by PFAS chemicals, eating food that has been contaminated during growing, packaging, and/or processing, accidentally swallowing contaminated soil or dust.

Most people are exposed to PFAS primarily through drinking beverages or eating food made with contaminated water or exposure to PFAS in dust or consumer products. Exposure impacts from skin contact and inhalation of water droplets are expected to be minor.

What are PFAS chemicals?



Challenges of PFAS Response – Parallels & Intersections with Water Reuse

“To say that the floodgates are opening is an understatement,” said Emily M. Lamond, an attorney who focuses on environmental litigation at the law firm Cole Schotz.

“Take tobacco, asbestos, MTBE, combine them, and I think we’re still going to see more PFAS-related litigation,” she said, referring to methyl tert-butyl ether, a former harmful gasoline additive that contaminated drinking water. Together, the trio led to claims totaling hundreds of billions of dollars”

([The New York Times](#), May 28, 2024).

The New York Times

Lawyers to Plastics Makers: Prepare for ‘Astronomical’ PFAS Lawsuits

At an industry presentation about dangerous “forever chemicals,” lawyers predicted a wave of lawsuits that could dwarf asbestos litigation, audio from the event revealed.

Listen to this article · 10:19 min [Learn more](#) [Share full article](#) [400](#)



A 3M plant on the Mississippi River. The company has faced legal action over manufacturing the chemicals. E. Jason Wambegans/Chicago Tribune, via Getty Images

‘Forever Chemicals’ Are Found in Some Milk, Including Organic

A Consumer Reports investigation highlights gaps in how the U.S. tests and regulates PFAS in food



PHOTO ILLUSTRATION: CHRIS GRIGGS/CONSUMER REPORTS, GETTY IMAGES

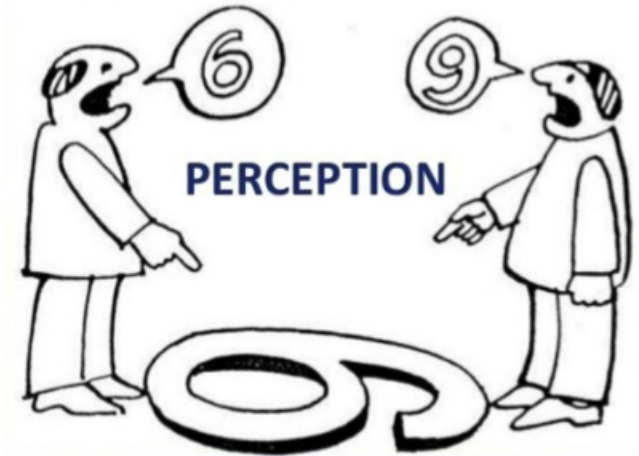
By Lauren Kirchner · Data visualizations by Andy Bergmann
May 2, 2024

“farm contained high levels of PFAS. The source of the pollution was later found to be recycled sewage sludge, which he had been told for many years was a safe fertilizer” ([Consumer Reports](#), May 2, 2024).

Workgroup 2 Focus: Communications and Outreach

- Discussions on challenges to overcome:
 - The “Yuck” Factor: How do we bridge the knowledge gap on water reuse and describe the safety, efficacy, and benefits of water reuse?
 - Environmental Justice: Who benefits from water reuse? How does the state help rural communities and communities with lower socio-economic status and resources benefit?
 - Perception: Perception is reality. Transparency is required to earn trust. What are the best approaches that the state can take to earn the public's trust?

Water Re-WHAT????



Workgroup 2 Focus: Communications and Outreach

- Silver linings:
 - Opportunities to educate and motivate
 - Develop solutions to address the needs of Tennesseans
 - Proactive narrative as opposed to reactive narrative
- **Challenge** – *What should the state call reuse programs or initiatives?*
- Water Reuse Stories/Articles
 - Singapore
 - Namibia
 - California
 - Tampa



Workgroup 2 Focus: Communications and Outreach

- Big questions for workgroup to help answer:
 1. What are the key messages for water reuse in Tennessee?
 2. What strategies and methods should be used to build public acceptance of agricultural and potable reuse?
 3. What should be the required elements of a communications and outreach plan?
 4. What state level education and outreach should TDEC consider?
 5. Who are the key players for reuse messaging (e.g., audiences, champions)?
 6. What constitutes utility compliance and non-compliance with program requirements?



Workgroup 2 Focus: Communications and Outreach

- Anticipated outputs:
 1. Communications and outreach plan
 2. Terminology for use within communications and outreach materials
 3. Key messaging for various audiences
 4. Outreach requirements for communities pursuing water reuse
 5. Reporting requirements for utility outreach
 6. Violations for non-compliance with outreach requirements
 7. Evaluation of public concerns for water reuse

Slido – What are We Missing?



- Get your phone ready!
Slido poll up next.

Communications and Outreach: What other big questions / outputs should be considered? What are we missing?

016

- Should stakeholders be added to this taskforce?
- Please provide lifetime exposure studies showing effects of using purified water
- How to message that purified water may be better quality than current water supply? Do not want to lose confidence in existing sources while messaging reuse.
- Tennessee municipal League
- the 1st question asked early this morning regarding the rationale of doing water reuse in TN has not been clearly answered and agreed upon within this community. until that's done, it's hard to convince the general public.
- Utilize economic and community development and chamber of commerce
- Define boundaries/limits/extent of state promotion or advocacy of reuse
- Partnering with school ag programs
- State is trying to sell dial-up connection for the price of fiber optic cable. How do you justify that?
- Workforce Development
- When is anticipated time Agriculture water reuse is needed in TN?
- There may be a concern of what are we not sampling for in reuse water. Illegal drugs
- Career opportunities e.g. operators
- Scientific sampling size for surveys, targets, and crafting of survey instruments is actually very specialized- who will be involved?
- Poll communities to collecting baseline community assessment information
- Applied research in agriculture
- Education of children
- Looking at state owned land and make it available for reuse water disposal if we are going to support it we need to have skin in the game
- What does TDEC's table showing Pros and Cons look like?
- How can the state provide outreach that will support communities pursuing reuse?
- Not only buy-in from the public but operators and the facilities as well – several campaigns will need to be made
- Is there a potential to do some applied research and outreach?
- Consider outreach through public schools, offer tours to elementary classes
- Language barriers
- Consider who will be local allies in developing and conveying message to establish trust in communities
- Define measurable community outreach

Workgroup 2 Focus: Communications and Outreach

- **How do we get to our objectives and outcomes?**
 - What synergies or working connections are there with other workgroups?
 - What materials and expertise do we have?
 - What do we still need to be successful?
 - What are our next steps and priorities?



Workgroup 2 Focus: Communications and Outreach

- What synergies or dependencies are there with other workgroups?



What do We Have / What do We Need?



- To the “Jamboard”...

What do We Have / What do We Need?

Text copied from a collaborative Jamboard.

- What materials and expertise do we have?
 - TDEC's website – special topics
 - Other state reuse websites
 - Flemming Training Center listserv for operators
 - Existing draft and final potable rules from other states
 - WRF studies
 - MS4 program requirement for stormwater public education and involvement
 - Water reuse projects funded through ARP stream
 - Strong TDEC comms / media team
 - Inspection tools to make operators aware of options (factsheets)
 - AZ survey on public perception
 - FL, Hampton Roads, other water-rich state resources and contacts

What do We Have / What do We Need?

Text copied from a collaborative Jamboard.

- What do we still need to be successful?
 - Involve conservation groups, ag, other partners
 - TDEC reuse website
 - Reuse listservs
 - Early communications with legislators and governor's office
 - Stakeholder list
 - Whitepaper or memo to share with TDEC employees to proactively address questions
 - Talking points
 - In-reach
 - TDEC Office of Communications contacts
 - Set boundary to ensure technologies aren't favored
 - Surveys (public, operators, utilities, communities, local government)
 - Contact industry and energy producers to partner with
 - Contact Chamber of Commerce and NRCS offices within USDA to build awareness
 - Economic Development Council contact
 - Ag producer contacts through extension and field day producer meetings (leverage landscaping industry, recreation field days)

Slido – Where should We Focus Next?



- Get your phone ready!
Slido poll up next.

Communications and Outreach: What focus areas should be prioritized as the workgroup gets started? (Pick your top 4)

Evaluation of public concerns related to water reuse



80 %

Methods of outreach and materials distribution



48 %

Outreach requirements for communities pursuing potable reuse



40 %

Reporting requirements for outreach performed



4 %

Social, health equity, and environmental justice considerations



40 %

State-level communication and outreach



28 %

Tailored, key messaging for different audience types



28 %

Terminology and definitions



96 %

Violations and response to non-compliance



20 %

Other



0 %

Workgroup 2 Focus: Communications and Outreach

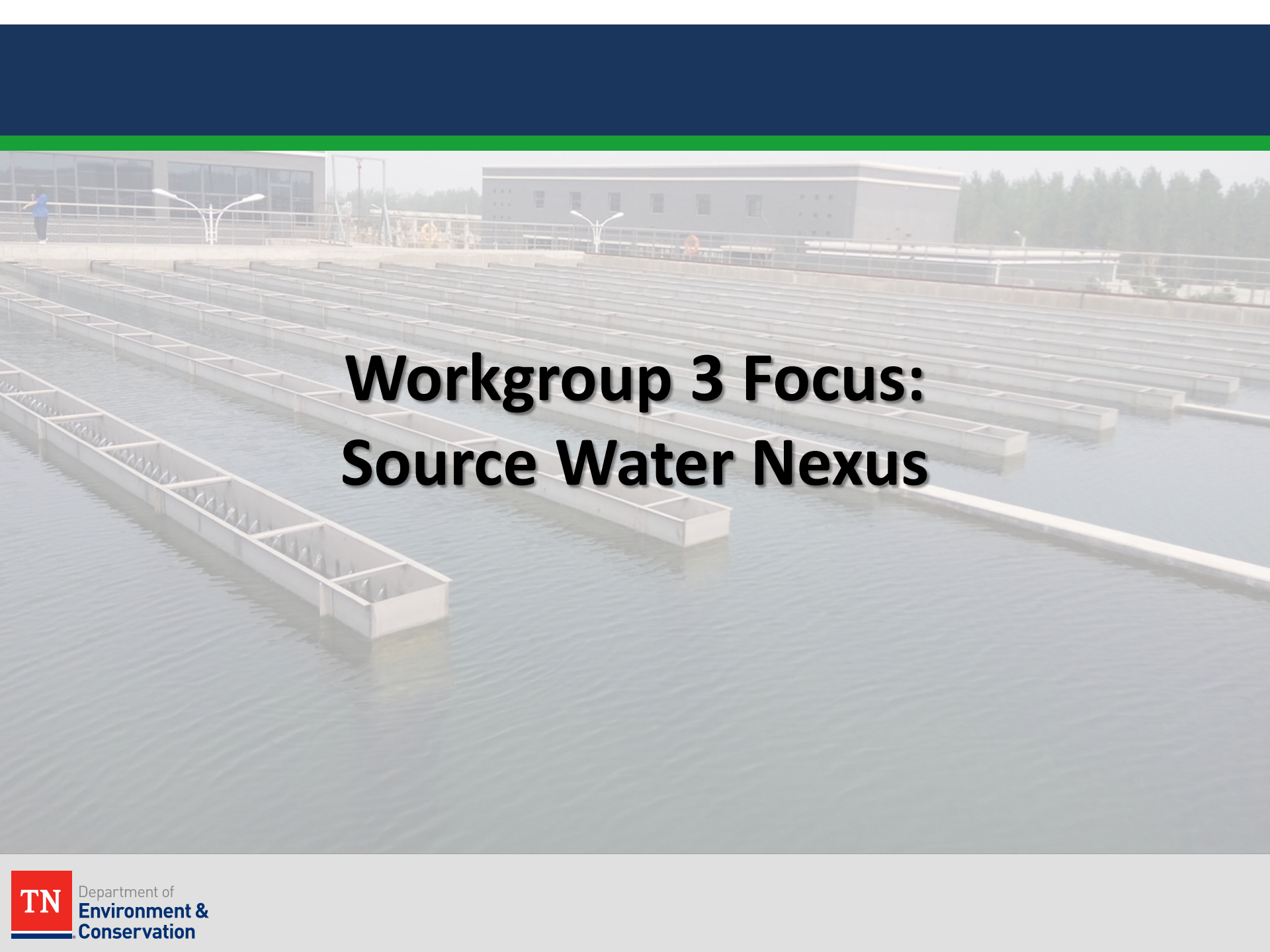
- **Next steps**

- Review charters
 - Primary workgroup participants share feedback with TDEC lead (Emily Leonard)
- Identify next workgroup meeting and get it on the calendar
 - TDEC will send Doodle poll to primary workgroup participants
- TDEC will invite workgroups to SharePoint access to facilitate collaboration
- Workgroup participants share relevant background materials
- *Others?*





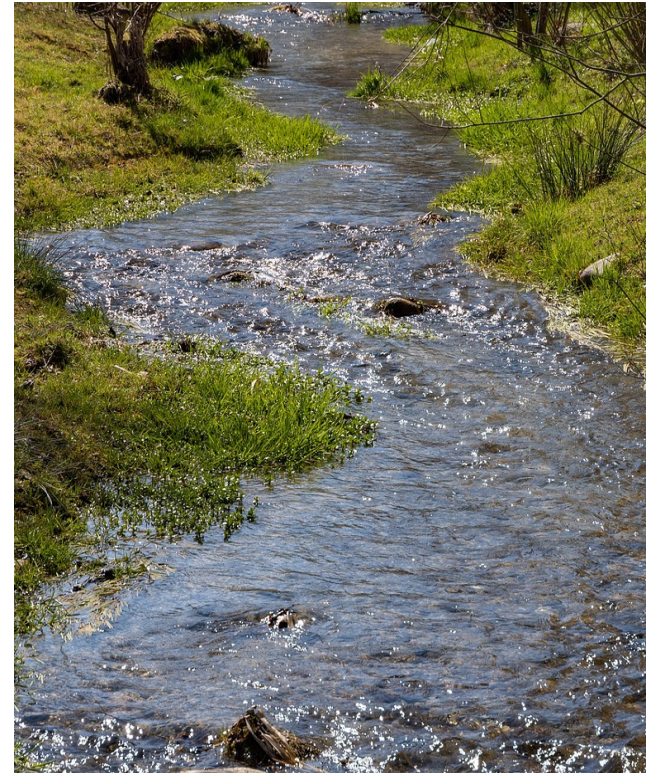
Break (15 minutes)



Workgroup 3 Focus: Source Water Nexus

Workgroup 3 Focus: Source Water Nexus

- The Source Water Nexus Workgroup will:
 - Provide Tennessee with expertise related to wastewater treatment, monitoring, and enhanced source control programs
 - Contribute relevant background materials for reference
 - Share lessons learned from existing potable reuse programs and projects.
- Workgroup tasks will center around the development of requirements for wastewater treatment levels, critical control points, monitoring, and source control programs.



Workgroup 3 Focus: Source Water Nexus

- Primary participants

Matthew Tipton (Lead) TDEC

Vojin Janjic TDEC

Scotty Sorrels TDEC

Berrin Tansel Florida International University

Dewayne Culpepper Tennessee Association of Utility Districts

Amanda Goff Tennessee Department of Health

Tania Datta Tennessee Tech University

Brian Leib University of Tennessee Dept of Biosystems Engineering

- Includes **wastewater treatment** and **enhanced source control**

Workgroup 3 Focus: Source Water Nexus

- Objectives
 - Establish required levels of wastewater treatment
 - Identify treated wastewater characterization requirements
 - Establish requirements for critical control points and monitoring
 - Develop requirements for source control program
 - Develop guidance or policies to support successful implementation of wastewater treatment and source control programs

Workgroup 3 Focus: Source Water Nexus

- Objectives
 - Consider how facilities can ensure they have the technical, managerial, and financial capacity for effective wastewater treatment and source control
 - Establish reporting requirements for wastewater treatment and source control programs
 - Identify what constitutes violations to program requirement and required corrective actions and responses to violations

Workgroup 3 Focus: Source Water Nexus

- Lead responsibilities
 - Help set agendas for workgroup meetings
 - Identify action items and next steps
 - Help track status of action items
 - Coordinate with Facilitation Committee as needed
- Participant roles
 - Attend and participate in regularly scheduled meetings
 - Respectfully represent interests and concerns of your organization/peer group with respect to water reuse in Tennessee
 - Review materials prepared for workgroup meetings
 - Provide input as requested prior to, during, and after workgroup meetings
 - Share expertise and knowledge related to the topic area
 - Identify additional information, research, or expertise as needed



Workgroup 3 Focus: Source Water Nexus – Wastewater treatment

- Big questions for workgroup to help answer:
 1. What is the wastewater treatment requirements to enable its use as a source water for potable reuse?
 2. What monitoring will be required to characterize treated wastewater effluent as a source water for potable reuse?
 3. What critical control points are needed, what monitoring must occur, and what action limits need to be established?
 4. What requirements are needed to ensure adequate communication and coordination between facilities?
 5. What constitutes a violation and what responses to violations are required?

Workgroup 3 Focus: Source Water Nexus – Wastewater treatment

- Big questions for workgroup to help answer:
 6. What are the reporting requirements?
 7. What approaches are recommended for
 - Pathogen removal and crediting approach
 - Source water characterization
 - Monitoring for pathogens and chemical
 8. What components are required for enhanced source control programs (ESCPs) and what contaminants do they need to address?
 9. What legal authority is required to implement an ESCP?

Workgroup 3 Focus: Source Water Nexus – Enhanced Source Control Program

- Big questions for workgroup to help answer:
 10. What assessments and monitoring practices are needed for non-domestic source discharges?
 11. How should a community track non-domestic dischargers and contaminants of concern discharged by facilities?
 12. What outreach and education related to discharges is necessary?
 13. What elements are required for an enforcement response plan?
 14. What records must be generated for ESCPs?
 15. What are the violations and response to violations for ESCPs?

Workgroup 3 Focus: Source Water Nexus

- Anticipated outputs:
 1. Required levels of wastewater treatment
 2. Requirements for
 - Wastewater treatment
 - Treated wastewater characterization
 - Critical control points and monitoring
 - Communication between facilities
 3. Enhanced source control program (ESCP) requirements



Workgroup 3 Focus: Source Water Nexus

- Anticipated outputs:
 4. Guidance / policies for wastewater treatment and ESCPs
 5. Reporting requirements
 6. Violations and response to violations



Slido – What are We Missing?



- Get your phone ready!
Slido poll up next.

Source Water Nexus: What other big questions / outputs should be considered? What are we missing?

014

- Consider capped cost increases for improvements to wastewater utility and for creation of advanced water treatment facility
- Is DPR be allows in small scale...e.g. neighborhood
- Who is responsible for improving the quality of the wastewater to be ready for advanced water treatment? 100% utility, 50% utility 50% industries, 33% utility 33% industry 33% domestic?
- Big difference here between wells and surface water plants as far as approach
- What sampling and analysis standard will be used? Drinking water or wastewater
- Agwater that is treated less than potable would need more investigation to be used.
- Pharmacological, bacterial, piron, virus monitor in context of wastewater source
- Do we want to limit the blend of purified wastewater and traditional drinking water?
- required technology standards
- Be able to answer Why is it enhanced source water shouldn't it all meet the same standard
- Who will the main treatment burden fall to- sewer or water?
- Water for Agriculture that is potable should be ready for use and have less of a YUK factor.
- Establishing contaminant risk criteria
- Wastewater surveillance data
- Distinguish between wastewater treatment, including advanced tratment, water purification facility and drinking water plant.
- Clear terminology and definitions
- Pathogen characterization
- Where and when Safe Drinking Water vs Clean Water rules govern
- Show me the money!
- Minimum set of requirements to even be considered for reuse
- From the outside looking in, federal funding seems to be available mostly for drinking water, is there a way to get more federal funding for wastewater to develop advanced plants
- Water quality levels needed for different types of Ag use
- Establish the different categories and limitations e.g. direct potable, indirect potable with constructed environmental buffer, indirect potable with natural buffer, ag reuse
- Distinguish between indirect and direct potable reuse
- Characterization of raw water
- Money; It always gets back to money.

Workgroup 3 Focus: Source Water Nexus

- **How do we get to our objectives and outcomes?**
 - What synergies or working connections are there with other workgroups?
 - What materials and expertise do we have?
 - What do we still need to be successful?
 - What are our next steps and priorities?



Workgroup 3 Focus: Source Water Nexus

- What synergies or dependencies are there with other workgroups?



What do We Have / What do We Need?



- To the “Jamboard”...

What do We Have / What do We Need?

Text copied from a collaborative Jamboard.

- What materials and expertise do we have?
 - Pretreatment factsheet (EPA)
 - Established operator training program – need to add tailored component
 - NWRI document on enhanced source control
 - WRF studies on enhanced source control
 - Existing state potable regs
 - Influent sampling – ramp up and expand.
 - Leverage health department relationships with utilities

What do We Have / What do We Need?

Text copied from a collaborative Jamboard.

- What do we still need to be successful?
 - Contact from Department of Health labs
 - Understanding of current state of practice for pretreatment in TN
 - Community of practice forums / webinars

Slido – Where should We Focus Next?



- Get your phone ready!
Slido poll up next.

Source Water Nexus: What focus areas should be prioritized as the workgroup gets started? (Pick your top 3)

Communication between wastewater treatment operators, source control program, and non-domestic dischargers



Critical controls points and required monitoring



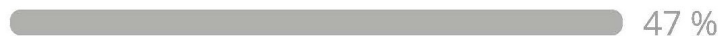
Enhanced source control programs



Reporting requirements



Required levels of wastewater treatment



Violations and required response to violations



Treated wastewater characterization approach



Other



Workgroup 3 Focus: Source Water Nexus

- **Next steps**

- Review charters
 - Primary workgroup participants share feedback with TDEC lead (Matthew Tipton)
- Identify next workgroup meeting and get it on the calendar
 - TDEC will send Doodle poll to primary workgroup participants
- TDEC will invite workgroups to SharePoint access to facilitate collaboration
- Workgroup participants share relevant background materials
- *Others?*





Questions and Discussion



Lunch (until 12:55pm)



Workgroup 4 Focus: Advanced Water Treatment

Workgroup 4 Focus: Advanced Water Treatment

- The Advanced Water Treatment Workgroup will provide Tennessee with expertise related to advanced water treatment, pathogen and chemical reduction, and monitoring and reporting.
- The workgroup will also contribute relevant background materials for reference and share lessons learned from existing potable reuse programs and projects.
- Workgroup tasks will center around advanced water treatment processes and requirements.

Workgroup 4 Focus: Advanced Water Treatment

- Primary participants

Cindy Wheeler (Lead)

TDEC

Matthew Tipton

TDEC

Jo Ann Jackson

Black & Veatch

Chris Lambert

Clarksville Gas & Water

Randall Braker

Duck River Utilities Commission

Kerry Howe

Howe Water Science, LLC

Stephen Opoku-Duah

Lipscomb University

Dong Chen

Purdue University Fort Wayne

Qiang He

University of Tennessee

Shihong Lin

Vanderbilt University

TN Department of Health

Workgroup 4 Focus: Advanced Water Treatment

- Lead responsibilities
 - Help set agendas for workgroup meetings
 - Identify action items and next steps
 - Help track status of action items
 - Coordinate with Facilitation Committee, as needed
- Participant roles
 - Attend and participate in regularly scheduled meetings
 - Respectfully represent interests and concerns of your organization/peer group with respect to water reuse in Tennessee
 - Review materials prepared for workgroup meetings
 - Provide input as requested prior to, during, and/or after workgroup meetings
 - Share expertise and knowledge related to the topic area
 - Identify additional information, research, or expertise as needed



Workgroup 4 Focus: Advanced Water Treatment

Technical Expertise

Pathogen & Chemical Reduction

Monitoring & Reporting Requirements

Treatment Processes

What Technologies are Coming?

Lessons Learned

Share Experience

Share Relatable Materials (forms or outlines)

Best Practices

Pilot Plans

Regulation Guidance

Provide Input for Regulation

Provide the “Must be Included”

Incorporate Creative Options & Flexibility

Slido – Aspects of Advanced Water Treatment



- Get your phone ready!
Slido poll up next.

0 2 2

What do you feel is the most important component of Advanced Water Treatment (AWT)? (Pick your top 2)

Activated carbon



Biological aerated filter (BAF)



Ion exchange



Membrane filtration (UF & RO)



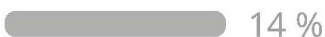
Oxidation



Quality of the source water



Other



Workgroup 4 Focus: Advanced Water Treatment

- Objectives:
 - Establish process control approaches for water quality assurance
 - Establish pathogen and chemical constituent reduction requirements
 - Consider design schemes and treatment technologies for AWT and drinking water treatment facilities based on pathogen reduction credits and chemical constituents
 - Define redundancy, robustness, and resiliency in the context of treatment technologies



Workgroup 4 Focus: Advanced Water Treatment

- Objectives
 - Consider the use of engineered storage buffers in AWTs.
 - Identify requirements for contingency plans
 - Identify what constitutes violations to requirements; what will be the required corrective actions and responses to violations
 - Establish monitoring and reporting requirements for AWTs

The Challenge: Meet objectives while allowing for advancement in technology, changes in EPA regulation, and environmental changes.

Workgroup 4 Focus: Advanced Water Treatment

- Big questions for workgroup to help answer:
 1. What are the benefits/limitations of different technologies and treatment trains for advanced wastewater treatment?
 2. What levels of pathogen reduction and chemical reduction will be required for AWTfFs?
 3. What validation is needed to have confidence in target pathogen log removals?
 4. What principle chemical constituents of concern need to be addressed within AWTfFs?
 5. What considerations and requirements need to be integrated for AWTfF design, process control, and water quality assurance?

Workgroup 4 Focus: Advanced Water Treatment

- Big questions for workgroup to help answer:
 6. What pathogen removal and crediting approach is recommended?
 7. What source water characterization approach and guidance is recommended?
 8. What monitoring approaches for pathogens and chemicals are recommended?
 9. What processes are needed for piloting and permitting?
 10. What contingency plans need to be in place for emergencies?



Workgroup 4 Focus: Advanced Water Treatment

- Big questions for workgroup to help answer:
 11. What constitutes monitoring and reporting requirements and protocols?
 12. What should be required for pilot and verification testing of the AWTF?
 13. What are the violations and response to violations for pathogen and chemical reduction?
 14. What needs to be communicated to the public regarding advanced wastewater treatment?
 15. What are the parameters for use of an environmental buffer.

Workgroup 4 Focus: Advanced Water Treatment

- Anticipated outputs:
 1. Pathogen and chemical reduction and monitoring requirements
 2. Critical control points for chemical reduction
 3. Treatment train design requirements and schematics
 4. Suggested edits to TDEC's existing design criteria
 5. Piloting and verification testing requirements
 6. Action limits, corrective actions for noncompliance, and shutdown procedures
 7. Violations and response to violations for pathogen and chemical reduction
 8. Monitoring protocols
 9. Reporting requirements

Slido – What are We Missing?



- Get your phone ready!
Slido poll up next.

Advanced Water Treatment: What other big questions / outputs should be considered? What are we missing?

- Prior to pilot testing a study should be required that assesses source water, identifies needed barriers to meet treatment goals, and estimates costs
- PPE requirement adjustments for AWTF and/or source water nexus?
- Microfiltration may be a minimum requirement to achieve log removals for protozoans and viruses.
- Third party accreditation of proposed treatment technologies
- second the question of "why not an outcome based approach", why not just use national primary drinking water standard?
- Process sustainability
- Will pilots be required?
- Energy requirements/impacts of treatment approaches
- If AWTF is offline/shutdown, what tests/quality checks will be used to ensure the AWTF is 100% operational and ready to rejoin water train?
- Brine is not necessarily a problem because there is no TDS problem in TN (thus no necessity of RO), brine can be sent back to the WWTP if regulation allows. RO generally enhances public acceptance due to psychology.
- Why not an outcome based approach rather than an inflexible approach?
- Is the environmental laboratory industry ready to support the new monitoring requirements and will the facilities have process control capabilities onsite
- A strategy for addressing not-yet-regulated or unknown chemical hazards.
- Who/what published document will decide what pathogens will be tested/removed?
- AWT effluent characterization and discharge location if discharge is the only feasible alternative of treatment residuals.
- Limits or thresholds on Total Organic Carbon
- Multibarrier approach that considers different removal mechanisms.
- Emerging contaminants
- California is very specific in dictating treatment processes (requires RO) but other states have wanted more flexibility. What is TN's approach?
- Will there be a maximum reuse to source water ratio?
- Is this Adv Treatment workgroup or Source Water Nexus workgroup the lead on determining source water characterization requirements? Is this an area of collaboration between groups?
- Procedures to identify unregulated chemicals of concern for treatment requirements and monitoring in individual projects
- Any remineralization of fluoride additives
- Will AWTF establish minimum quality standards for wastewater or will Source Water Nexus?

Workgroup 4 Focus: Advanced Water Treatment

- **How do we get to our objectives and outcomes?**
 - What synergies or working connections are there with other workgroups?
 - What materials and expertise do we have?
 - What do we still need to be successful?
 - What are our next steps and priorities?



Workgroup 4 Focus: Advanced Water Treatment

- What synergies or dependencies are there with other workgroups?



What do We Have / What do We Need?



- To the “Jamboard”...

What do We Have / What do We Need?

Text copied from a collaborative Jamboard.

- What materials and expertise do we have?
 - TDEC lab accreditations for DW
 - Existing state potable regs
 - Pilots from across the U.S. (contacts, info)

What do We Have / What do We Need?

Text copied from a collaborative Jamboard.

- What do we still need to be successful?
 - Identify who will do testing
 - 1633 testing in state labs
 - Information from TN pilots
 - Folks to help with outreach

Slido – Where should We Focus Next?



- Get your phone ready!
Slido poll up next.

Advanced Water Treatment: What focus areas should be prioritized as the workgroup gets started? (Pick your top 3)

Action limits and corrective actions



Chemical reduction requirements (treatment techniques, crediting, critical control points, monitoring, violations and responses)



Pathogen reduction requirements (treatment techniques, crediting, critical control points, monitoring, violations and responses)



Piloting and verification testing requirements



Monitoring requirements



Reporting requirements



Total organic carbon requirements

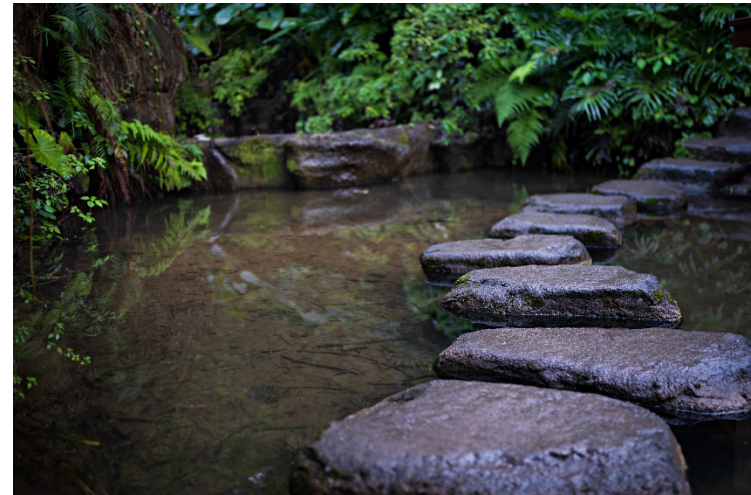


Other



Workgroup 4 Focus: Advanced Water Treatment

- **Next steps**
 - Review charters
 - Primary workgroup participants share feedback with TDEC lead (Cindy Wheeler)
 - Identify next workgroup meeting and get it on the calendar
 - TDEC will send Doodle poll to primary workgroup participants
 - TDEC will invite workgroups to SharePoint access to facilitate collaboration
 - Workgroup participants share relevant background materials
 - *Others?*





Questions and Discussion



Break (15 minutes)

Workgroup 5 Focus: Operations



Photo: Denver Water

Workgroup 5 Focus: Operations

- The Operations Workgroup will:
 - Provide Tennessee with expertise related to water and wastewater operations efforts and programs
 - Contribute relevant background materials for reference
 - Share lessons learned from existing potable reuse programs and projects.
- Workgroup tasks will center around the development of requirements for operations plans and operator training and certification.



Workgroup 5 Focus: Operations

- Objectives:
 - Identify elements of state operations program for potable reuse
 - Develop requirements for operations plans for potable reuse that include measures to control, minimize, and lessen the impact of system failures
 - Identify requirements for operator training and certification programs for potable reuse to ensure proper safeguards and procedures are maintained
 - Create communications plans for exchanges between water and wastewater operators, communication with facilities and regulatory agencies, and prepare public-facing communications

Workgroup 5 Focus: Operations

- Primary Participants

Erich Webber (Lead)	TDEC
Matthew Tipton	TDEC
Jenny Strobel	TDEC
Tim Hill	TDEC
Niki Ensor	City of Kingsport
Chris Lambert	Clarksville Gas and Water
Edwin Deyton	First Utility of Knox County
David Money	Tennessee Association of Utility Districts
Behnaz Molaei	Tennessee State University
Danny Miller	White House Utility District

Workgroup 5 Focus: Operations

- Lead responsibilities
 - Help set agendas for workgroup meetings
 - Identify action items and next steps
 - Help track status of action items
 - Coordinate with Facilitation Committee, as needed
- Participant roles
 - Attend and participate in regularly scheduled meetings
 - Respectfully represent interests and concerns of your organization/peer group with respect to water reuse in Tennessee
 - Review materials prepared for workgroup meetings
 - Provide input as requested prior to, during, and/or after workgroup meetings
 - Share expertise and knowledge related to the topic area
 - Identify additional information, research, or expertise as needed



Workgroup 5 Focus: Operations

- Big questions for workgroup to help answer:
 1. What comprises an operations and maintenance program / plan for potable reuse? When should it be updated?
 - Technical, Managerial, and Financial Capacity
 - Protocols and process control
 - Wastewater characterization
 - Critical control points
 - Process monitoring
 - Alerts and action limits
 - Violations
 2. What operator certification and training considerations must be addressed?
 3. Who should be the recipients of communications related to operations, and what key messages need to be relayed?

Workgroup 5 Focus: Operations



- Anticipated outputs:
 1. Definitions relevant to operations
 2. Operations plan / program components and requirements
 3. Operator certification requirements
 4. Operator workforce development and training resources
 5. Violations and response to violations of operations program
 6. Communications requirements

Slido – What are We Missing?



- Get your phone ready!
Slido poll up next.

Operations: What other big questions / outputs should be considered? What are we missing?

0 1 4

- Additional public impact and treatment complexities.
- Reuse specific CE requirements
- What would exceed the knowledge needed for a level 4 license?
- The only secondary education program oriented to utility operators I know of in TN is at Pellissippi State in Knoxville.
- You can work with existing licensing but require specialized coursework or training
- Perhaps a Grade 5 WTP or WWTP Operator certification... To address additional training and knowledge requirements.
- Does agriculture users of water reuse require training?
- Establishing trigger points for actions- corrective action or shutdown etc.
- TDEC inspector training
- Consider dual licensing – water/wastewater
- TNPOP – will reuse discourage trying to optimize
- Special certification for inspectors
- Operator involvement in operating pilot system provides great experience and training.
- Won't the current licenses with their different levels be sufficient? A new license shouldn't need to be developed.
- Potential modifications or considerations to add to existing CMOM programs
- Certification requirements...WWT4/WT4 or both
- Training opportunities with states that have operating facilities or pilots
- Include operators in pilots and review of reuse design a for feedback and perspective.
- Will recent violations prohibit water reuse?
- What process controls are facilities able to do it real time (without complicated lab analysis)
- Are we considering mandatory training for potable reuse operators?
- Inspections /sanitary surveys
- Allow for new treatment technologies
- Reciprocity with other states on operator certification
- Will there be a reporting requirement similar to the CCR?

Workgroup 5 Focus: Operations

- **How do we get to our objectives and outcomes?**
 - What synergies or dependencies are there with other workgroups?
 - What materials and expertise do we have?
 - What do we still need to be successful?
 - What are our next steps and priorities?



Workgroup 5 Focus: Operations

- What synergies or dependencies are there with other workgroups?



What do We Have / What do We Need?



- To the “Jamboard”...

What do We Have / What do We Need?

Text copied from a collaborative Jamboard.

- What materials and expertise do we have?
 - Groundwork for capacity development plan
 - Expand and advertise apprenticeship programs
 - MTSU and Pellissippi programs – credit for college degrees
 - CA NV operations and Water Research Foundation module
 - Operations manual for treatment equipment

What do We Have / What do We Need?

Text copied from a collaborative Jamboard.

- What do we still need to be successful?
 - Build partnership with universities (or look at TCAT)
 - Staffing!
 - Flexibility in certification and licensing
 - Operator-in-training certification
 - Provisional license (rule change)
 - Operational credit during piloting

Slido – Where should We Focus Next?



- Get your phone ready!
Slido poll up next.

Operations: What focus areas should be prioritized as the workgroup gets started? (Pick your top 3)

Communication between water and wastewater operators, regulatory agencies, and the public



Definitions and terminology relevant to AWTF operations



Operator certification requirements



Operations program and plan requirements



Operator workforce development and training resources



Prediction of future operator staffing demand related to reuse



Violations and responses to violations



Other



Workgroup 5 Focus: Operations

- **Next steps**

- Review charters
 - Primary workgroup participants share feedback with TDEC lead (Erich Webber)
- Identify next workgroup meeting and get it on the calendar
 - TDEC will send Doodle poll to primary workgroup participants
- TDEC will invite workgroups to SharePoint access to facilitate collaboration
- Workgroup participants share relevant background materials
- *Others?*





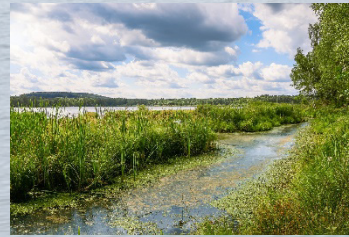
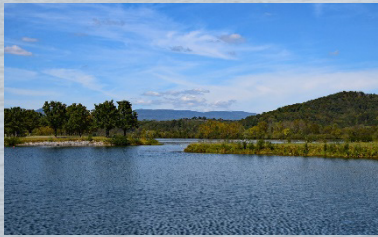
Questions and Discussion

Day 2 Wrap-Up

- Takeaways
- Action items
- Next steps
 - Workgroups meet iteratively
 - Convene as a Task Force again once sufficient progress has been made across workgroups (Spring 2025?)



Thank you!



Tennessee Water Reuse Task Force

Kickoff Meeting



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August 27 – 28, 2024