# Creating Water Resilience: State Regulations for Water Reuse and Recycling

May 18, 2020
NGA Center for Best Practices

Bevin Buchheister, bbuchheister@nga.org

# *Today's Panelists*

**Greg Fogel**

Policy Director, WateReuse Association

**Brandi Honeycutt**

Environmental Protection Specialist II,
Colorado Dept. of Public Health and Environment

**Liz Lemonds**

Environmental Protection Specialist II, Colorado Dept. of Public Health and Environment

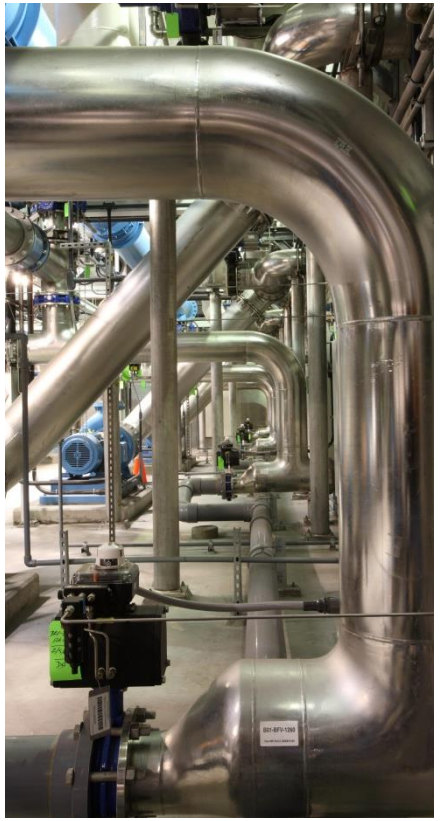
**Micah Vieux**

Business Programs Manager, Loudoun Water

# Water Recycling in the United States

Greg Fogel
Policy Director
WateReuse Association

2020



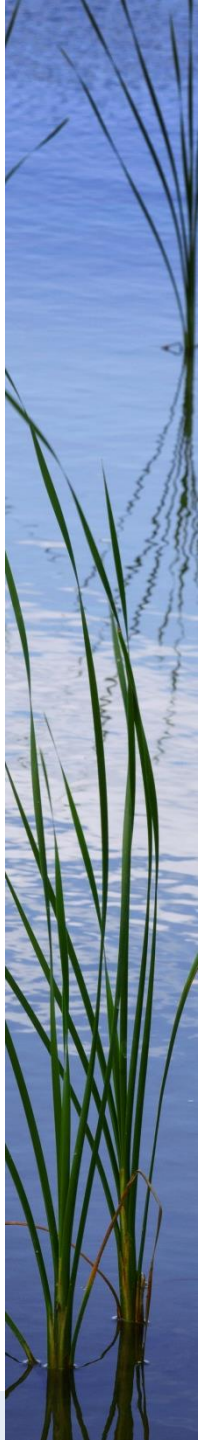
# Water Reuse Paradigm Shift

**Past**

- Supply pumped from ground or surface water; treated to comply with Safe Drinking Water Act
- Collect wastewater, move it quickly downstream, treat it to acceptable standards, and dispose of waste without harming the environment

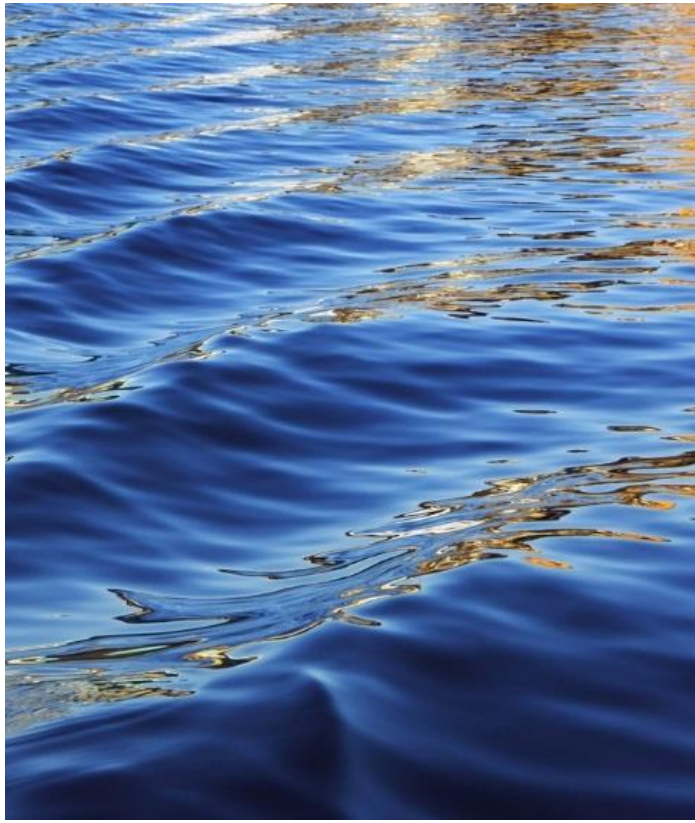
**Trend/Future**

- Manage resources to generate value for the utility and its customers
- "Waste" water and its constituents, such as nutrients, seen as a resource
- Use a holistic "one water" approach to water management



WATEREUSE

# What do we mean when we say reused or recycled water?



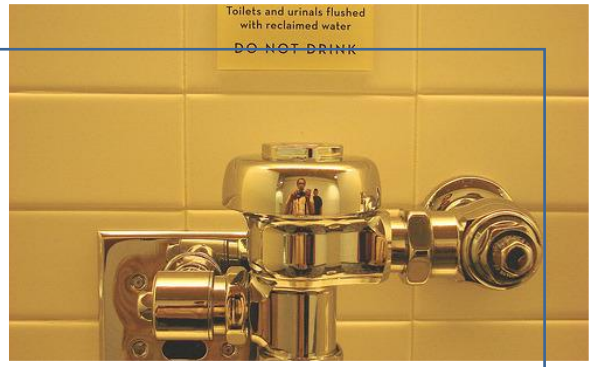
# Fit for Purpose Water Treatment

Potable Supply

Industrial Uses

Watershed/Habitat Restoration

Irrigation




Commercial/Residential Uses

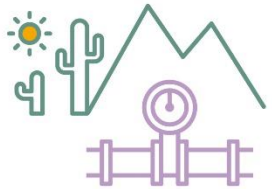
WaterReuse

# Water Reuse in the West and Southwest

## 850,000 Taps

**Served Daily in California**

Orange County annually recycles enough to supply drinking water for **one-third** of its homes and businesses.



Driving

## 20,000 Jobs

**in Nevada's Desert**

A planned 13-mile pipeline will provide **1.3 billion gallons** of recycled water annually to Tahoe Reno Industrial Center, home of Tesla, Switch, and Google...and **20,000 new jobs.**

## $35 Million

**for Ski Slopes in Arizona**

The Snowbowl, a ski resort in Arizona's San Francisco Peaks, uses recycled water for its slopes—sustaining a **$35 million** tourism industry.

## 2,000 Acres

**of Wetlands and Reuse in Texas**

Recycled water replenishes the Upper Trinity River and man-made wetlands—restoring a natural habitat for migratory birds and **supplying drinking water for the Dallas/Ft. Worth area.**

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# Water Reuse in the Pacific Northwest and Midwest

## 6.5 Billion

**Gallons of Recycled Water Used for Idaho Agriculture**

**92% of the recycled water** Idaho produces is used to irrigate crops, a beneficial use that keeps **2000 tons of nitrogen and 500 tons of phosphorus** out of Idaho rivers and streams.

**GM Saves**

## $2 Million

**with Stormwater Reuse**

General Motors captures and reuses stormwater for cooling towers at its Detroit-Hamtramck assembly plant, saving **$2 million a year.**

WATEREUSE

# Water Reuse in the East

**It's Patriotic to Generate**

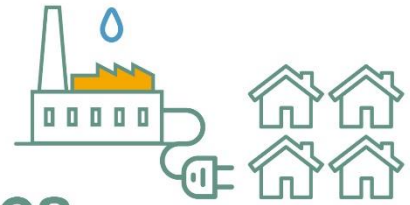
## $4 Million

**in Massachusetts**

But for on-site, decentralized water recycling, Foxboro could not meet water demands for Gillette Stadium, home to the New England Patriots. This NFL team generates **$4 million annually** for the local economy.

**Supporting 70% of Global Internet Traffic through Virginia**

Recycled water cools Loudoun County's "Data Center Alley" which processes more than **two-thirds** of the world's Internet traffic.



## 100,000 Homes

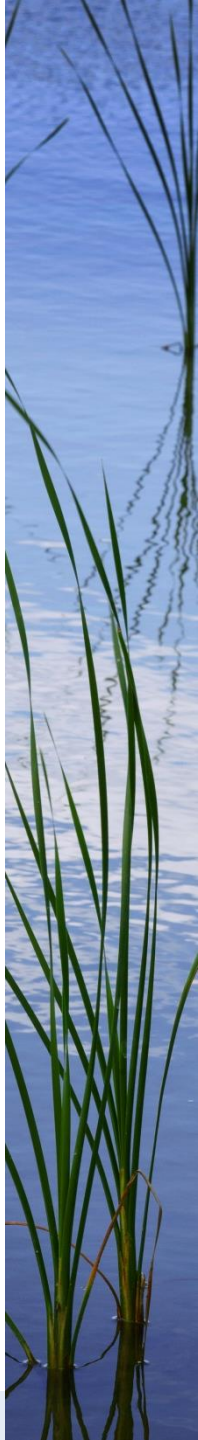
**Powered in Florida**

Tampa Electric uses recycled water to cool a power plant and generate electricity for **100,000 homes.**

## $600 Million

**Hole-In-One in South Carolina**

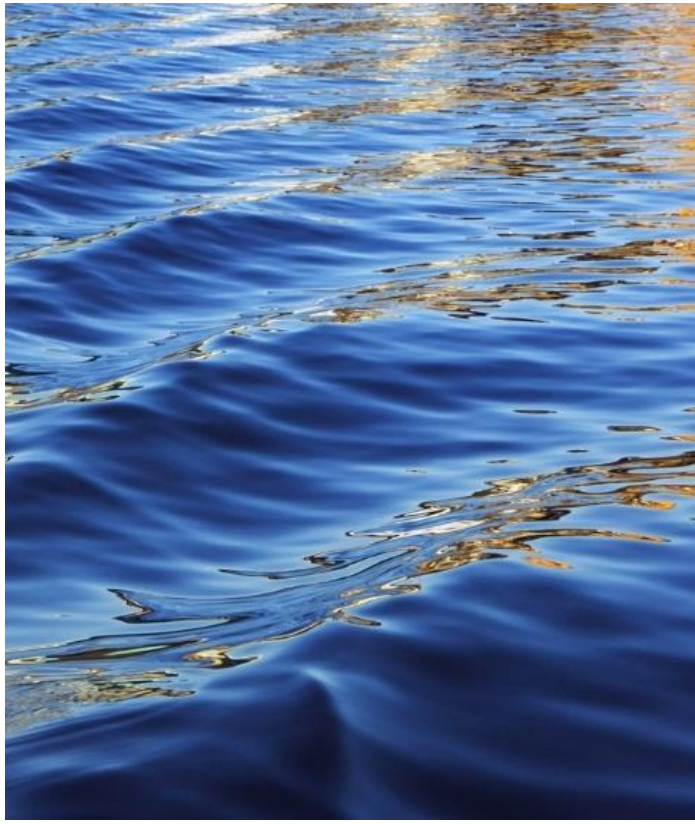
Hilton Head recycles water to irrigate eleven destination golf courses—sustaining **$600 million annually** in recreational tourism.



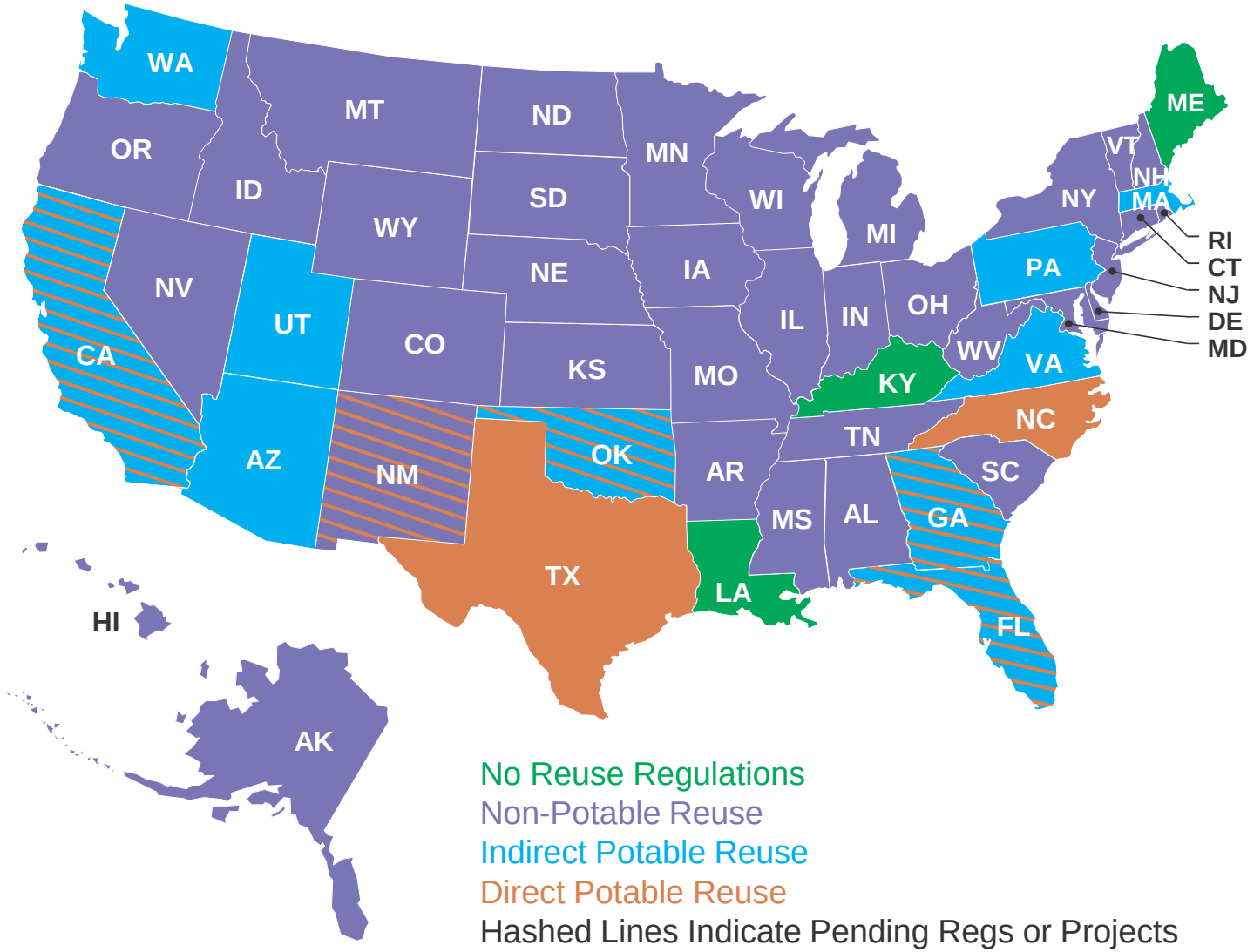
WATEREUSE

Q: Why should states care?

A: Water reuse is regulated at the state level.



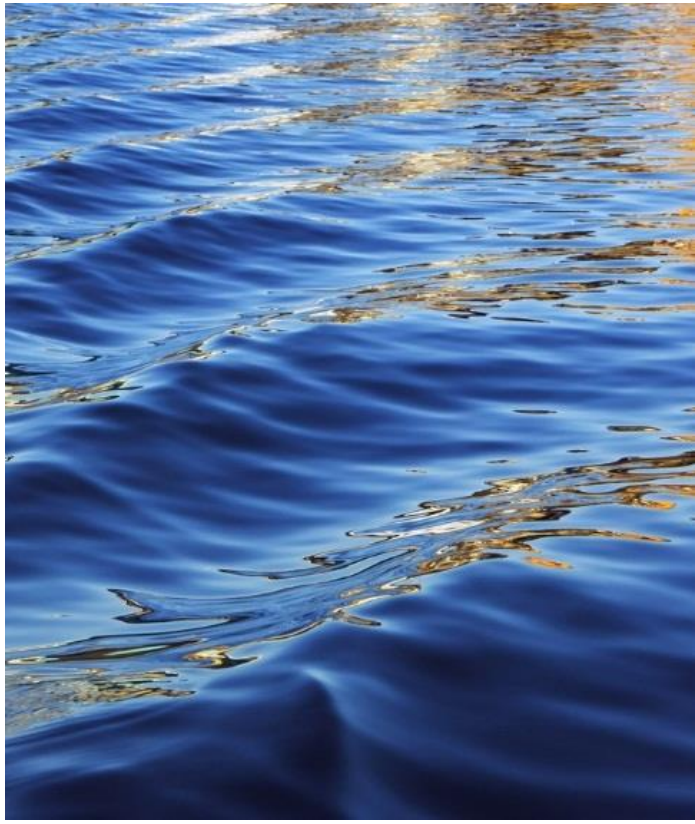
# The State of Reuse Regulations



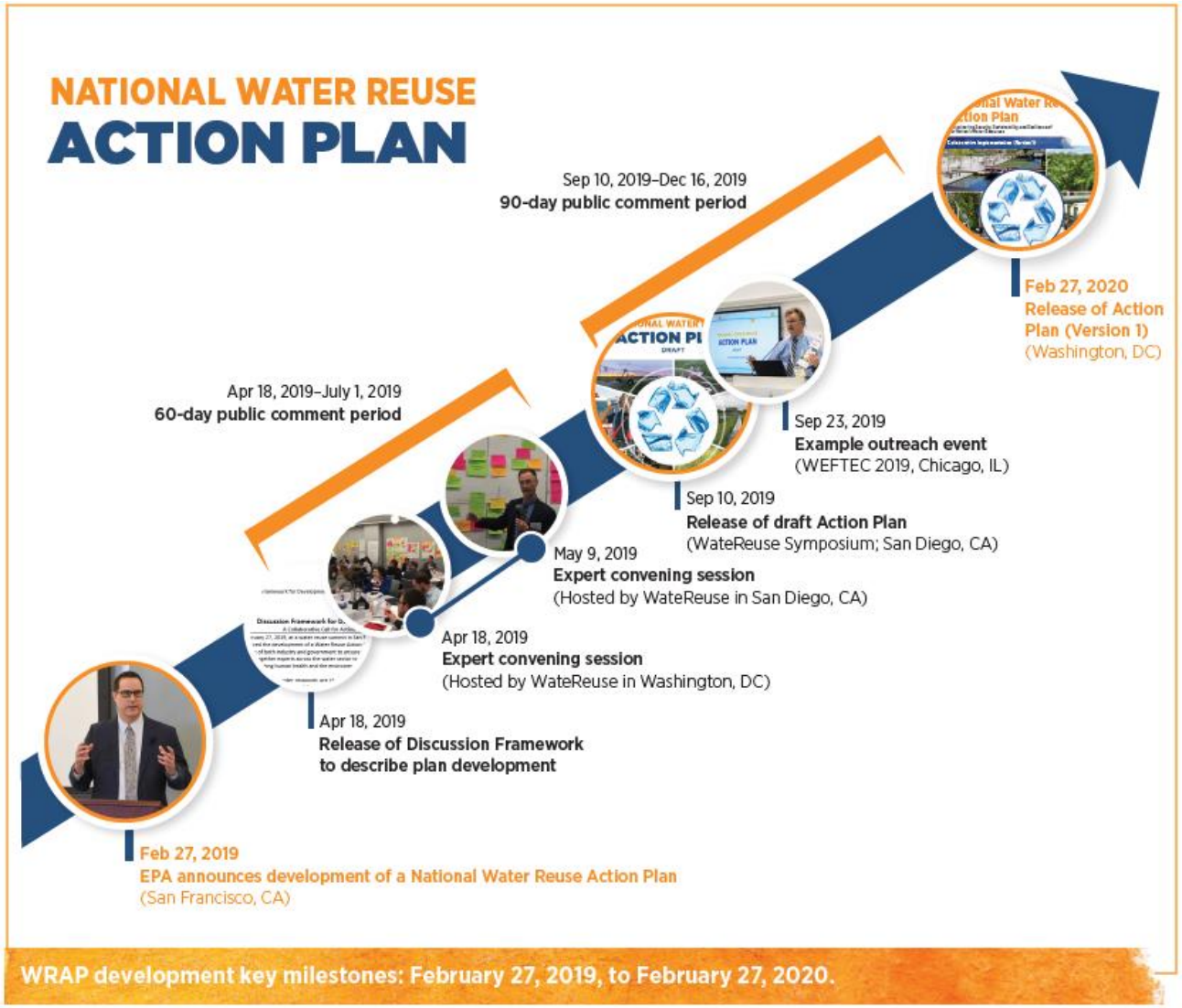

No Reuse Regulations
Non-Potable Reuse
Indirect Potable Reuse
Direct Potable Reuse
Hashed Lines Indicate Pending Regs or Projects

WATEREUSE

# So what *is* happening at the federal level?



# National Water Reuse Action Plan




Source: U.S. EPA

WATEREUSE

# National Water Reuse Action Plan


Source: U.S. EPA

# National Water Reuse Action Plan

## Compile Existing State Policies and Approaches to Water Reuse (Action 2.2.1)

**DESCRIPTION:**
This compilation will build on prior efforts by Western Resource Advocates, Western States Water Council, EPA, WateReuse Association, and others.

**ACTION LEADER(S):**
- EPA—Jeff Lape
- WateReuse—Greg Fogel
- ACWA—Jake Adler
- ASDWA—Wendi Wilkes

**PARTNER(S):**
ASTHO, ECOS, WSWC, GWPC

> "Exploring why resources, policies, and approaches vary (for example, across states or between federal programs), or how differences in seemingly-similar scenarios came to be (for example, what are the scientific bases of different fit for purpose specifications among similar types of reuse?), provide important contexts for end-users."
>
> –ASDWA and ACWA


Source: U.S. EPA

WATEREUSE

# National Water Reuse Action Plan

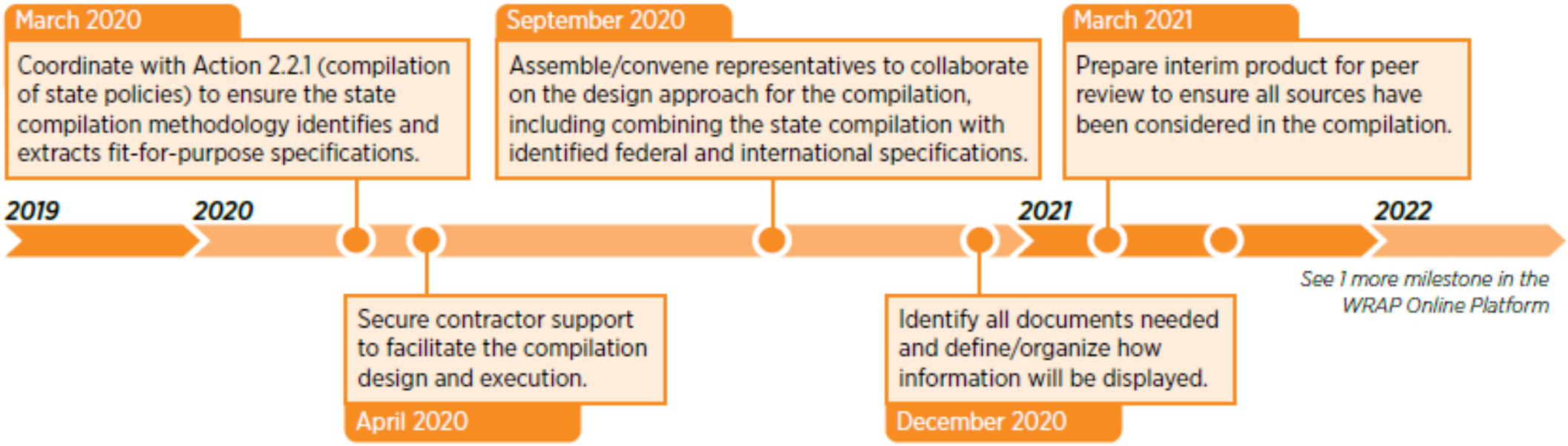
## Compile Existing Fit-for-Purpose Specifications (Action 2.3.1)

**DESCRIPTION:**
Compile existing fit-for-purpose specifications (e.g., chemical and microbial) for different sources of water for potential reuse and end-use applications. The compilation will rely on federal, state, and international sources to inform water reuse best practices and facilitate broader implementation of reuse projects.

**ACTION LEADER(S):**
EPA—Sharon Nappier

**PARTNER(S):**
ACWA, AMWA, ASDWA, WRF, WateReuse

> "States agree that any water reuse aspiration or action must be evaluated with risks to public health, which states and EPA are charged to protect, as the central consideration..."
>
> –ASDWA and ACWA




Source: U.S. EPA

WATEREUSE

# National Water Reuse Action Plan

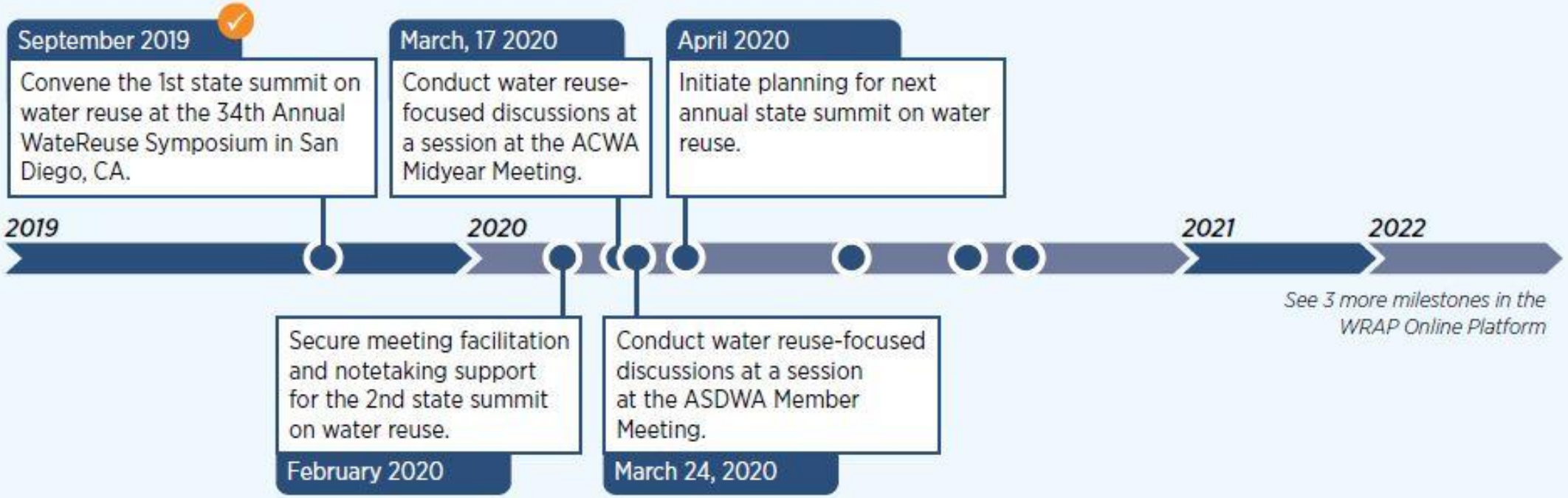
## Enhance State Collaboration on Water Reuse (Action 2.2.2)

**DESCRIPTION:**
Provide forums and opportunities for states to discuss and share information and experiences on programs and approaches for the management of water reuse.

**ACTION LEADER(S):**
- EPA—Jeff Lape
- ACWA—Jake Adler
- ASDWA—Wendi Wilkes

**PARTNER(S):**
ASTHO, ECOS, GWPC, WateReuse

> "Water reuse is an emerging topic in the Northeast and our member states will benefit from the information generated and collected and from the relationships developed among our regional partners and with states across the country that result from implementation."
>
> –New England Interstate Water Pollution Control Commission




WATEREUSE

Source: U.S. EPA

# Questions for Panelists?

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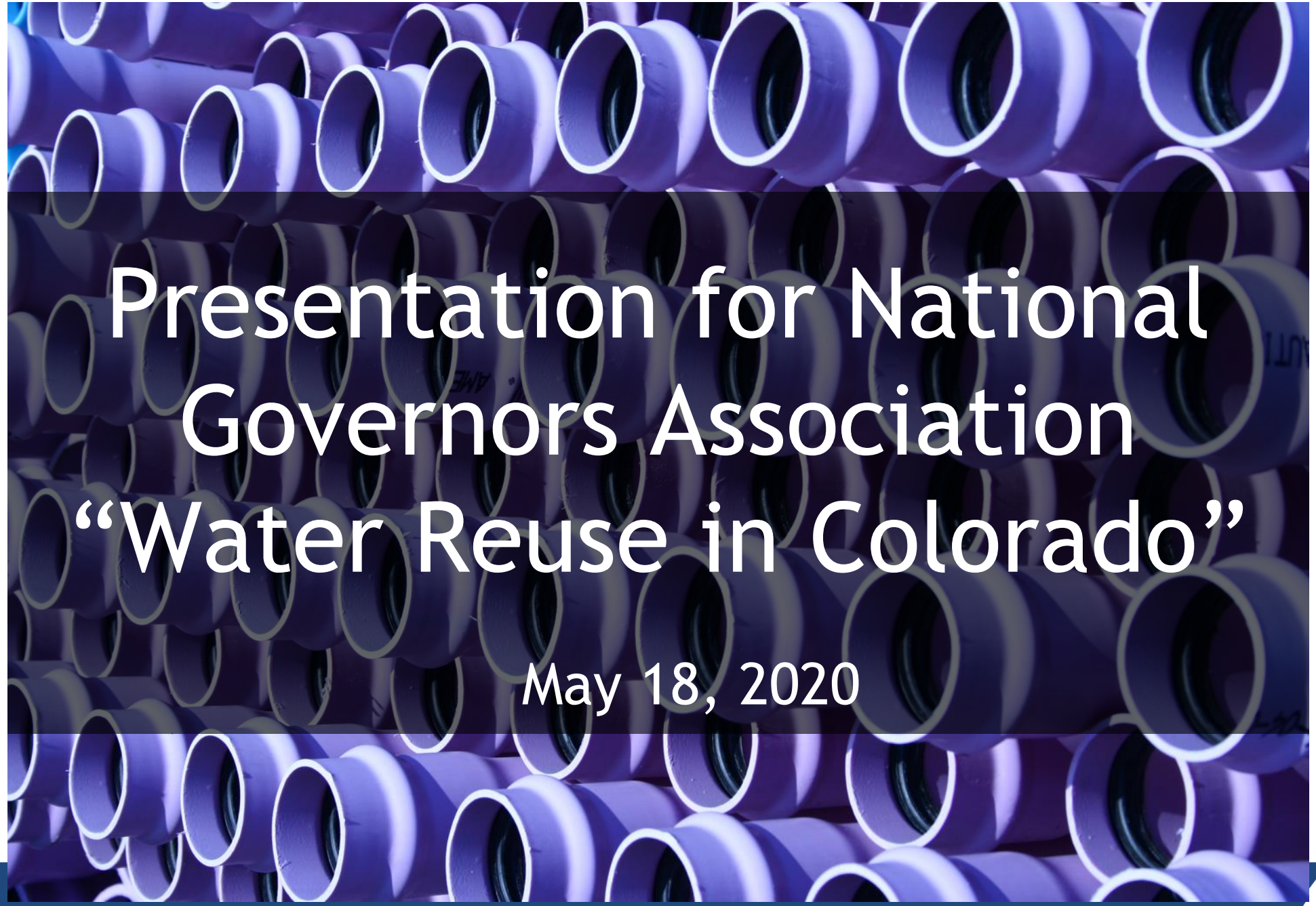


# Presentation for National Governors Association "Water Reuse in Colorado"

May 18, 2020

# Presentation Overview

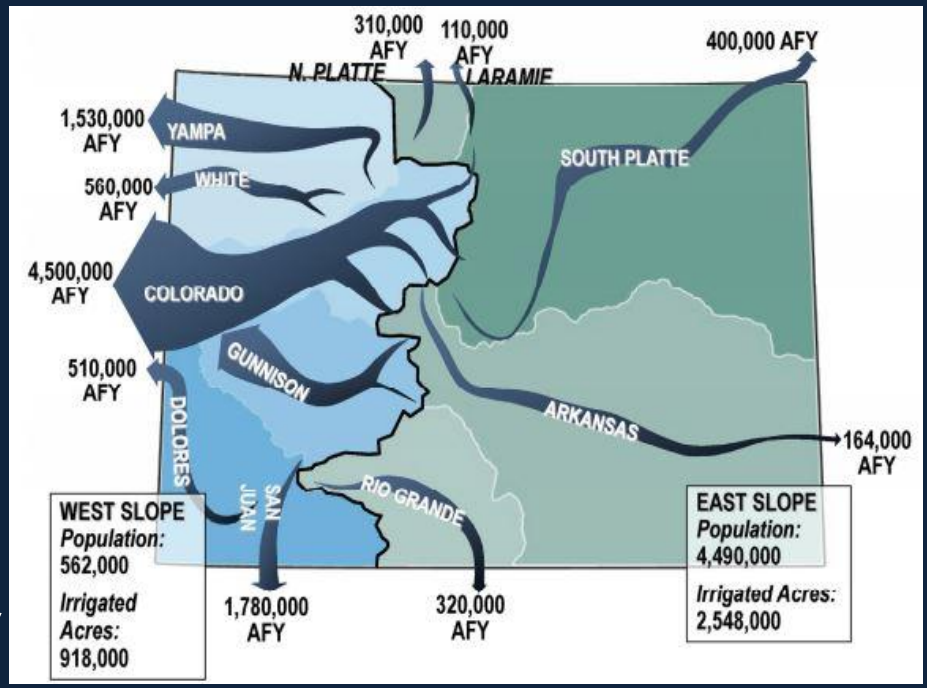
- Colorado drivers for water reuse
- Challenges for making regulations
  - Factors to consider for effective regs
  - Stakeholder process
- Water reuse regs in Colorado
- Direct Potable Reuse

# Colorado Drivers for Water Reuse

- Climate Change/Drought
- Water scarcity/security
- Environment & recreation
- Efficiency and conservation
- Nutrient Criteria - Regulation 85

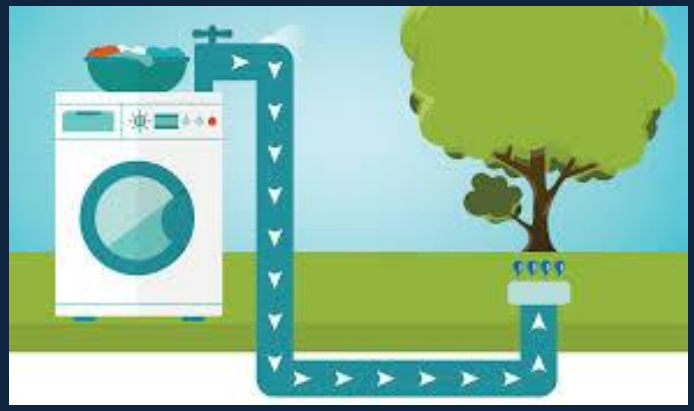
# Colorado Drivers for Water Reuse

- Headwater state — CO River Compact
- CO State Water Plan
- Water rights
- East/West slope
- Transmountain diversions
- Obligated to make the best use of water pumped from the west



# Water Reuse Regulations in Colorado

- Graywater - Regulation 86
  - Showers, baths, bathroom sinks, laundry machines and sinks
  - City/county program



- Reclaimed water - Regulation 84
  - Municipal domestic wastewater

# Overview of Reg 84

- Adopted in 2000
  - 26 treaters, > 500 users/sites
  - 7 types of uses
- 3 categories of reclaimed water
  - Water Quality Standards
    - E. coli
  - Water Treatment
    - Specific filtration requirements

# Reclaimed Water Treatment

## As human exposure increases, water quality increases

**Category 1**

**Category 2**

**Category 3**

**Category 3 Plus**

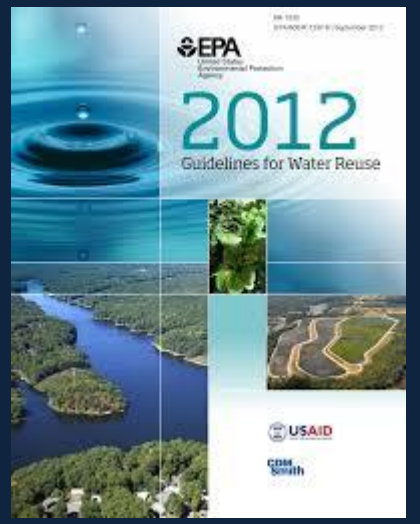
## Water Quality (also BMPs)

# Currently Authorized Uses

- Irrigation
- Commercial
- Industrial
- Fire protection
- Zoo operations
- Agricultural
- Toilet and urinal flushing
- Hemp

# Challenges of Making Regs

- Contention/reaching consensus
  - Balance safety & reuse demand
    - Edible crops
- No federal regulations
  - EPA Guidelines 2012
  - Other states
- Intersection with other regulations
- Process/time
  - Oil and Gas Operations
- Resources



# Factors to Consider for Effective Regulations

- Stakeholders
  - Wastewater
  - Municipal contacts
  - Potential users
  - Concerned & active public
- Enforceability
- Implementability
- Oversight
- Division availability
  - Oil and Gas

# Examples of Stakeholder Input into Regulatory Development

What works!

- Scientific evidence
  - Peer reviewed
  - Accredited association
  - Data
  - CO example
    - Legionella
- User process information
  - Edible crops and hoses
- Sharing draft language
  - Iterations and evolution of language

What does not work

- Arbitrary assumptions
- "Other regs cover this"
- "Other states don't require this"
- "No evidence of risk"
  - Oil and gas example
- Comparing apples to oranges

# Development of Direct Potable Reuse - 2018

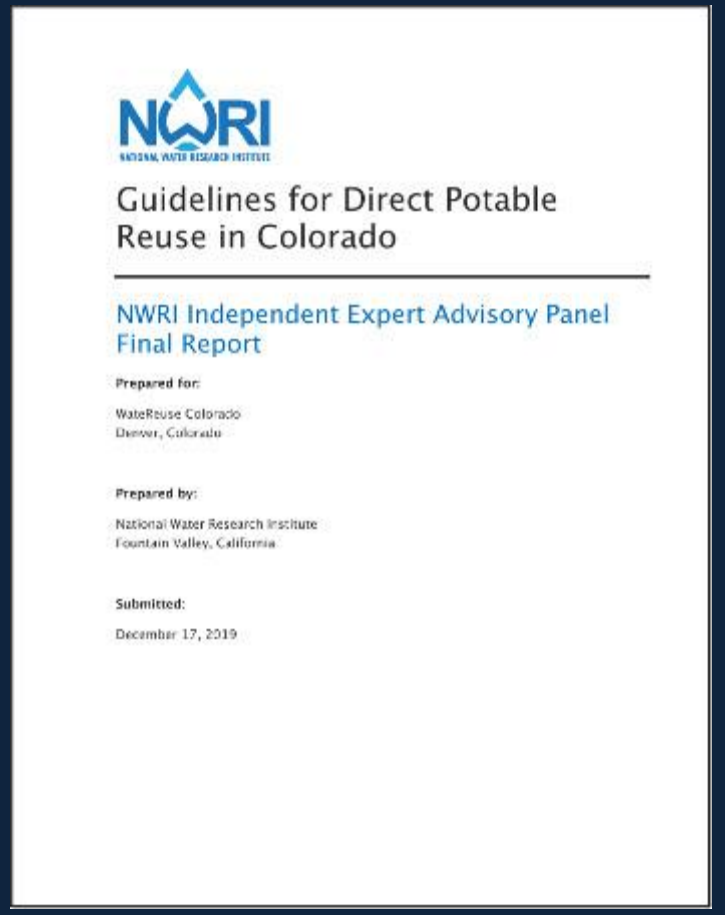
- Framework
  - Regulation, policy & guidance
  - Communication/public outreach planning
- Stakeholders
  - WateReuse Colorado
  - Water Quality Control Division
  - Utilities
  - Engineering consultants

# Development of Direct Potable Reuse - 2018/2019

- Formed Independent Advisory Panel
  - Treatment and monitoring
  - Implementation plans
- National Water Research Institute
  - Guidelines for Direct Potable Reuse in Colorado
- Demonstration

# DPR Next Steps

- Stakeholder process
  - 18 months
  - NWRI report as guidance
- Commission rulemaking process
  - 4 months
  - Formal



NWRI

NATIONAL WATER RESEARCH INSTITUTE

Guidelines for Direct Potable Reuse in Colorado

NWRI Independent Expert Advisory Panel Final Report

**Prepared for:**

WateReuse Colorado
Denver, Colorado

**Prepared by:**

National Water Research Institute
Fountain Valley, California

**Submitted:**

December 17, 2019

# Contact Information

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# National Governors Association

May 18, 2020

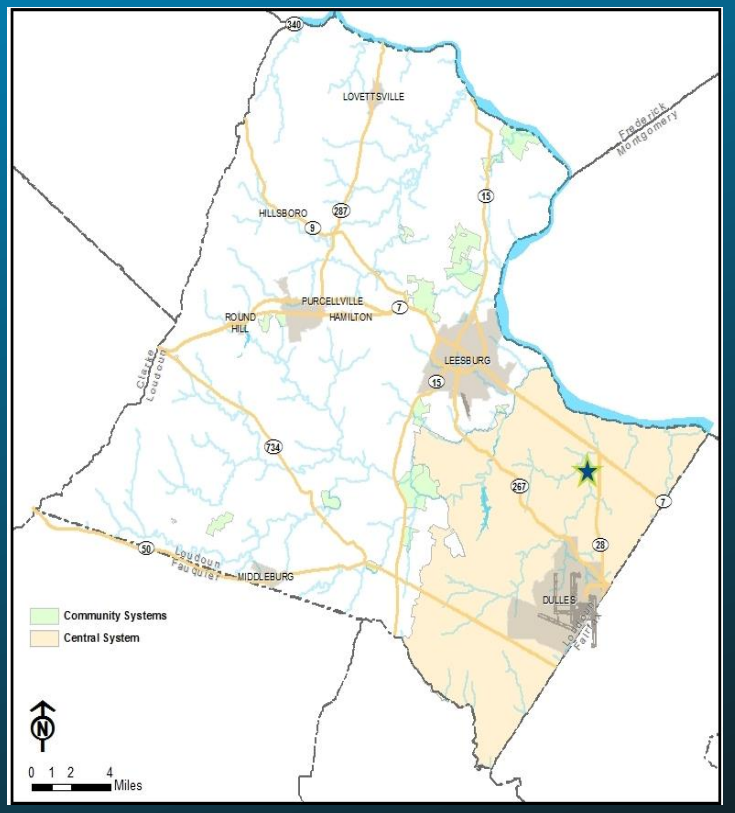
Micah Vieux, M.En.

## LOUDOUN WATER'S RECLAIMED WATER PROGRAM

- Authority formed in 1958

- We are responsible for:
  - Drinking Water
  - Wastewater
  - Reclaimed Water

- 2 Funding Sources (Availability & Rates)
  - Growth pays for growth
  - 3000-6000 ERCs/year
  - 50% of infrastructure <10 years old



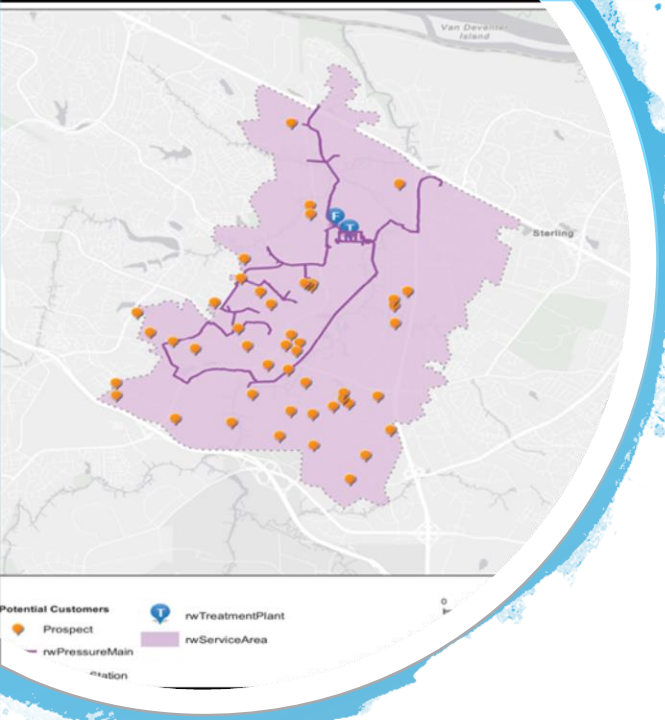

LOUDOUN WATER

# PROGRAM DRIVERS AND HISTORY

NUTRIENT MANAGEMENT

DEMAND MANAGEMENT

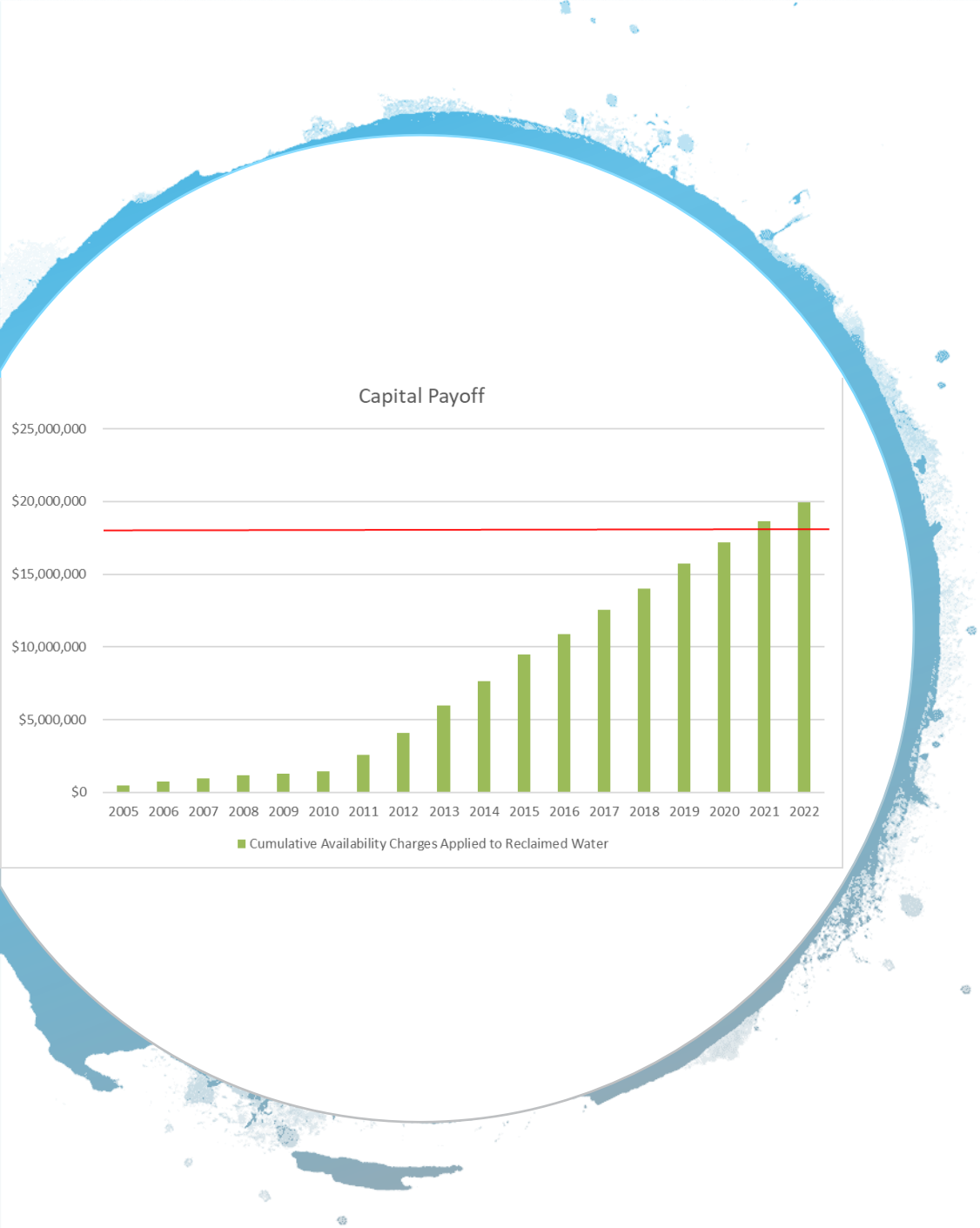
ALTERNATIVE SUPPLY




- **Market/Land Use Analysis**
- **Infrastructure Needs**
- **Financing Considerations**
- **Supporting Policies**
- **Market Strategy**

# PROGRAM MILESTONES

- 2005: Funding Source Established
- 2008: BRWRF/RW Permit
- 2010: *ARRA Funding/Distribution System*
- 2011: First Customer Connections
- 2014: Revenue Covers Expenses
- 2015: Storage Tanks and Pump Station
- 2016: Distribution System Looping
- 2018: Extension by Private Entity
- 2020: Distribution System Study




# INFRASTRUCTURE COST RECOVERY AND CUSTOMER ATTRACTION

- Capital Investment: $20M
- Debt Service: $421/ERC
  - Defer/avoid investments for future W/WW capital projects

## Supporting Policies/Prices

- No Availability Charge
  - 10% for potable back up
- Reimbursement for RW Retrofits
- Rate 1/2 of potable water

## Without Reclaimed Water:

- Water (Cooling Towers): 100,000 gallons x $12.55/gallon = $1,255,000
- Sewer (Cooling Towers): 12,500 gallons x $30.45/gallon = $380,625

TOTAL: $1,635,625

## With Reclaimed Water:

- Water (Cooling Towers): 100,000 gallons x $12.55/gallon x 10%= $125,500
- Sewer (Cooling Towers): 12,500 gallons x $30.45/gallon = $380,625

TOTAL: $506,125

# PAINT THE DEVELOPMENT PICTURE

| Year | Connections | Reserved Cacpacity (MGD) | MDD (MGD) | ADD (MGD) | BRWRF Flow (MGD) | Delivery Capacity (MGD) |
|---|---|---|---|---|---|---|
| 2012 | 2 | 0.1 | 0.2 | 0.1 | 4 | 2 |
| 2015 | 16 | 2.2 | 1.1 | 0.66 | 5 | 7.3 |
| 2019 | 32 | 6.4 | 3.1* | 1.7* | 7.5 | 7.3 |

# PROGRAM GROWTH

# 2019 PERFORMANCE METRICS

## *DEMAND MANAGEMENT*

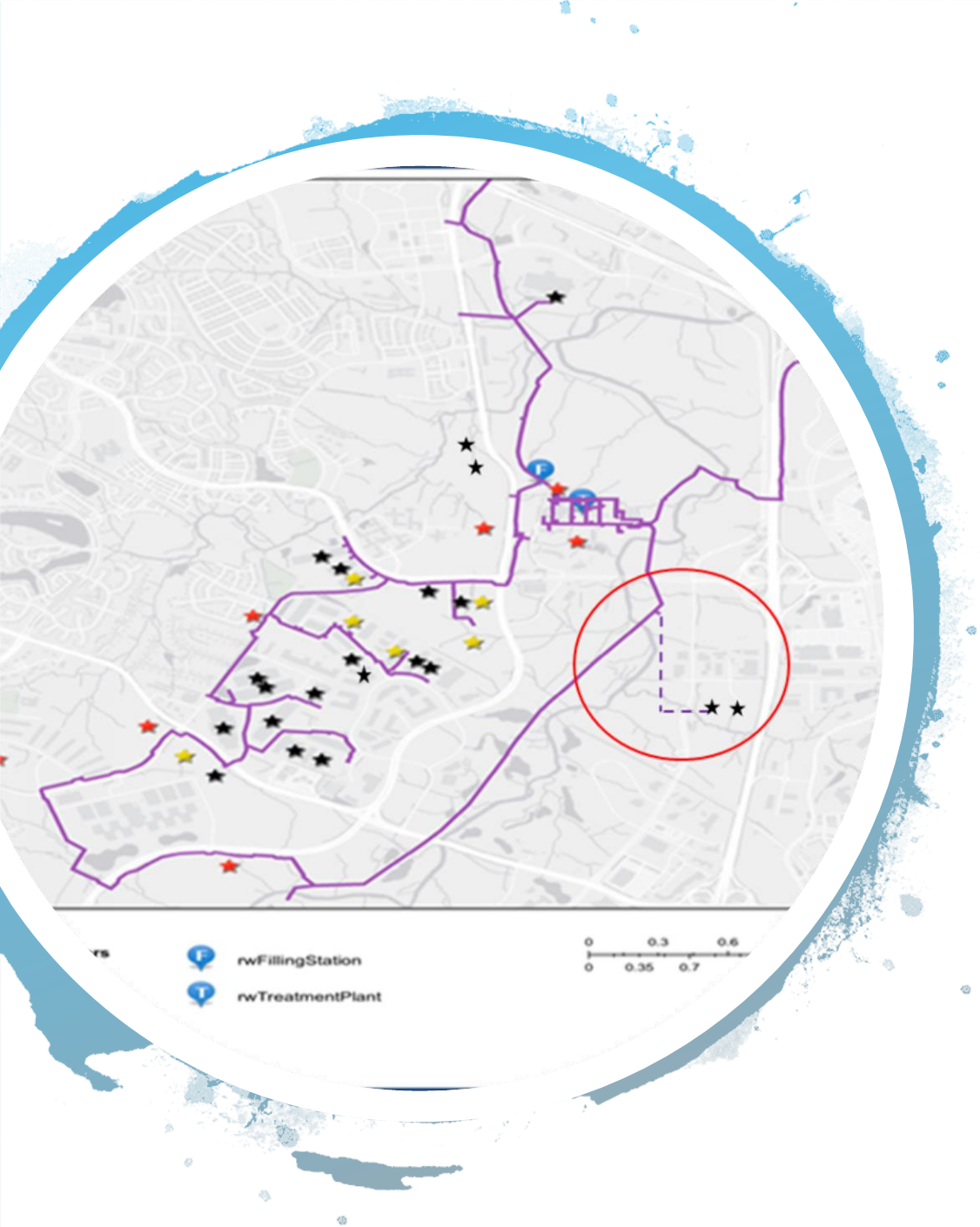
- 620 MG of reclaimed water sold
- 620 MG of potable water conserved

## *NUTRIENT MANAGEMENT*

- Reclaimed water service accounted for 30+% of BRWRF effluent flow

## *ADDITIONAL SUPPLY*

- Reclaimed water comprised 7% of Loudoun Water's water supply portfolio




# Final Thoughts

- **Reforming state regulations**
  - **Comprehensive Regulatory Framework**
    - ***Inclusive of all assets and reuse opportunities***
    - ***Treat to appropriate standard for purpose***
    - ***Potable and non-potable***
    - ***Industrial/Manufacturing***
    - ***Ecological enhancement/restoration***
    - ***Agricultural/Rural Development***
  - **Title and define as Water Recycling**
  - **Reasonable signage requirements**
  - **Clear De Minimus provisions**
  - ***Funding and support***

# Questions for Speakers?

- Use the ‘Q&A’ or ‘Chat’ icons on the control panel at the bottom of your screen to submit your questions

# *Questions for Panelists?*

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