Colorado’s Approach to DPR Regulatory Development

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WateReuse Colorado DPR Phase 1 Project
Initiated Statewide Reg Development & Outreach

Set a clear framework for potential DPR regulations

Increase public understanding and acceptance

Adapt & use existing planning tools to help utilities assess potable reuse
Collaboration of leading utilities and organizations

State Agencies

Utilities

Consultants & NGOs

Industry Organizations

Colorado Water Conservation Board
State Grant Funding

CDPHE

Denver Water
City of Aurora

Centennial WSD
SMWSA

Town of Castle Rock
PCWRA

Colorado Springs Utilities

Carollo
CH2M
MSK

Katz & Associates
Western Resource Advocates

Water Environment & Reuse Foundation

WateReuse Colorado
WateReuse Association
First Phase Costs and Funding (not incl. NWRI IAP)

- Statewide WSRA, $131,455
- Metro Basin WSRA, $25,000
- South Platte Basin WSRA, $15,000
- Colorado Basin WSRA, $15,000
- North Platte Basin WSRA, $2,500
- WateReuse Colorado, $10,000
- Denver Water, $10,000
- City of Aurora, $7,500
- Centennial WSD, $5,000
- WateReuse Research Fndn, $5,000
- SMWSA, $1,000
- Western Resource Advocates, $4,000
- Town of Castle Rock, $7,500
- PCWRA, $5,000

In-Kind, $59,525

Aurora Water
Denver Water
Colorado Springs Utilities
MSK Consulting
Western Resource Advocates
Centennial WSD
WateReuse Assoc.

In-Kind $59K 20%

Total project cost = $243K (+ $59K in-kind contributions)

Phase 2: NWRI IAP costs ~$160K funded by state grant, in-kind, and direct utility & consultant contributions

Note: PureWater Colorado demonstration funded separately
Colorado’s Three-Tiered Approach

- Regulation
- Policy
- Guidance

Flexibility

Adaptability
Phase 1 Endpoint: **Regulatory Matrix Frames the Regulatory Components and Process**

**Regulatory Matrix**

1. **Regulation**
2. **Policy**
3. **Guidance**

**11 Categories**

**ADVANCING DIRECT POTABLE REUSE TO OPTIMIZE WATER SUPPLIES AND MEET FUTURE DEMANDS**

**EXECUTIVE SUMMARY | SEPTEMBER 2018**

![Image of a mountain lake and snow-capped peaks, possibly indicating a natural water source.]
2018 PureWater Colorado DPR Demonstration Helped Advance Outreach and Reg Development

- Barrier 1: Ozonation
- Barrier 2: Biofiltration
- Barrier 3: Microfiltration
- Barrier 4: Granular Activated Carbon
- Barrier 5: UV/Advanced Oxidation
Communications and Outreach Plan focuses on Target Audiences and How to Motivate Them

**Delivery Strategies**

**Priority Audiences**

- Messaging and Messengers
- State-Wide Communications and Outreach Plan
- Outcome
- Motivation
- Hurdles to Overcome
- Delivery Mechanisms

**Delivery Mechanisms**

- Messaging and Messengers
- State-Wide Communications and Outreach Plan
- Outcome
- Motivation
- Hurdles to Overcome
Key Goals for DPR Regulations

- Comprehensive
- Safe
- Flexible
- Implementable

DPR Regulations
### 11 Critical Categories Identified for DPR Regulation

1. Definitions/Terminology  
2. Source Control  
3. Wastewater Treatment  
4. Pathogen Disinfection/Removal  
5. Chemical Pollutants  
6. Advanced Treatment Processes  
7. Monitoring Requirements  
8. Reporting  
9. Facility operations/ certification programs  
10. Education and outreach  
11. Technical, Managerial and Financial (TMF) capacity

**Workgroup**

**PHASE 1:** Framework completed 2018

**PHASE 2:**

- Advisory Panel: NWRI
- Potential: Late 2019
- Pending funding
Focus Areas for NWRI Independent Advisory Panel in Phase 2

Panelists

- **Panel Chair**: Larry Schimmoller, PE, Jacobs
- Christopher Bellona, PhD, Colorado School of Mines
- Richard Danielson, PhD, BioVir Laboratories
- Eric Dickenson, PhD, Southern Nevada Water Authority
- Ellen McDonald, PhD, PE, Alan Plummer Associates
- Kristina Mena, PhD, MSPH, University of Texas - Houston
Focus Areas for NWRI Independent Advisory Panel in Phase 2

- Definitions and framework for 3 distinct “Types” of DPR
- Terminology
- Enhanced Source Control Optimized for DPR
- Integration of Wastewater Treatment Plant Discharge Permit Compliance with DPR Systems
- Pathogen Disinfection and Removal
- Chemical Removal and Monitoring
- Advanced Treatment Processes
Three “Types” of DPR Defined by the Panel

**TYPE 1**

*Raw Water Blending.* Blending with one or more approved raw source waters prior to treatment of the blended water at a drinking water treatment plant.

**TYPE 2**

*Potable Water Blending.* Blending of advanced purified water downstream of a drinking water treatment plant and prior to distribution by a potable water distribution system, either before or after the disinfection process.

**TYPE 3**

*Potable Water Production.* Advanced purified water into any potable water distribution system directly from an advanced water purification facility.

Requirements will depend on DPR “Type”

*e.g., lower pathogen removal requirements for Type I reclaimed water purification because a drinking water treatment plant will help meet overall pathogen goals.*
Panel’s preliminary recommendation for virus/Crypto/Giardia LRVs is 8/6/5.5 (minimum) based on secondary effluent quality (not raw wastewater).

Secondary effluent must be nitrified, denitrified, and filtered.

Panel recommends a minimum of 3 separate types of pathogen barriers (e.g. physical, chemical, UV).
Panel recommends that regulated and unregulated contaminants be addressed as follows:

**Level 1:** SDWA MCLs and State Requirements, including DBPs. *(REGULATION)*

**Level 2:** Unregulated contaminants of interest for public health specific to potable reuse applications (for example, PFAS, NDMA, 1,4-dioxane). *(POLICY)*

**Level 3:** Unregulated contaminants that are useful to monitor treatment performance for the unit process (for example, sulfamethoxazole, iohexol, and sucralose). *(GUIDANCE)*
Development of DPR Regulations is Underway
Final Rulemaking to Start 2020-2021 Pending CDPHE Funding
Ongoing Outreach from PureWater Colorado

Outreach Events and Scholarships

Materials Available for Future Outreach
Phase 1 deliverables are on WateReuse Colorado’s web page.

WateReuse Colorado News and Current Events

Recent Headlines

WateReuse Colorado Advancing Direct Potable Reuse to Optimize Water Supplies and Meet Future Demands

Documents are available for the WateReuse Colorado (WRCO) project “Advancing Direct Potable Reuse to Optimize Water Supplies and Meet Future Demands.” This project involved many stakeholders including regulators, utility providers, consultants, and advocacy groups with the goal of working towards advancing direct potable reuse (DPR) in Colorado. The project produced several deliverables that address how to tackle the regulatory, public outreach and perception, and technical hurdles that Colorado will face when implementing DPR. Three Technical Memorandums (TM5s) are available in the links below that address each topic, and an executive summary with an overview of the project is included.

- TM1: Regulatory Development
- TM2: Communications and Outreach Plan
- TM3: Treatment Train Planning Tools and Case Studies
- Executive Summary
Phase 1 deliverables are on WateReuse Colorado’s web page.
Should we Act or React?  
Colorado is acting in advance to provide lead time & benefits

- Well-prepared for future DPR projects – in advance of the need
- DPR regulatory development is well underway – utilities will know the rules and costs to move forward with DPR
- Model of success – partnerships and collaboration between utilities, regulators, equipment manufacturers, and consultants
- Regulatory development, outreach, and public confidence are all interlinked
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Questions?

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