Kansas Water Reuse Regulatory Update

76th Annual KU Environmental Engineering Conference

April 15, 2026

Kansas
Department of Health and Environment
Division of Environment

Current Regulatory Climate

KDHE Water Reuse Regulatory Update

- Kansas Currently has no Regulations Specific to Potable Water Reuse
- KDHE Secretary has broad Powers to Protect Public Health
- Wastewater has Anti-Degradation Regulations for NPDES Permits
- KDHE is generally supportive of water reuse for beneficial use
- KS Legislature has passed HB2462 in current session (2026)

KDHE Water Reuse Regulatory Update

How long have humans been recycling their wastewater for beneficially reuse?

Photo courtesy of Orange County GRWS

Lothal, Indus Valley Civilization
India ~2400 BCE

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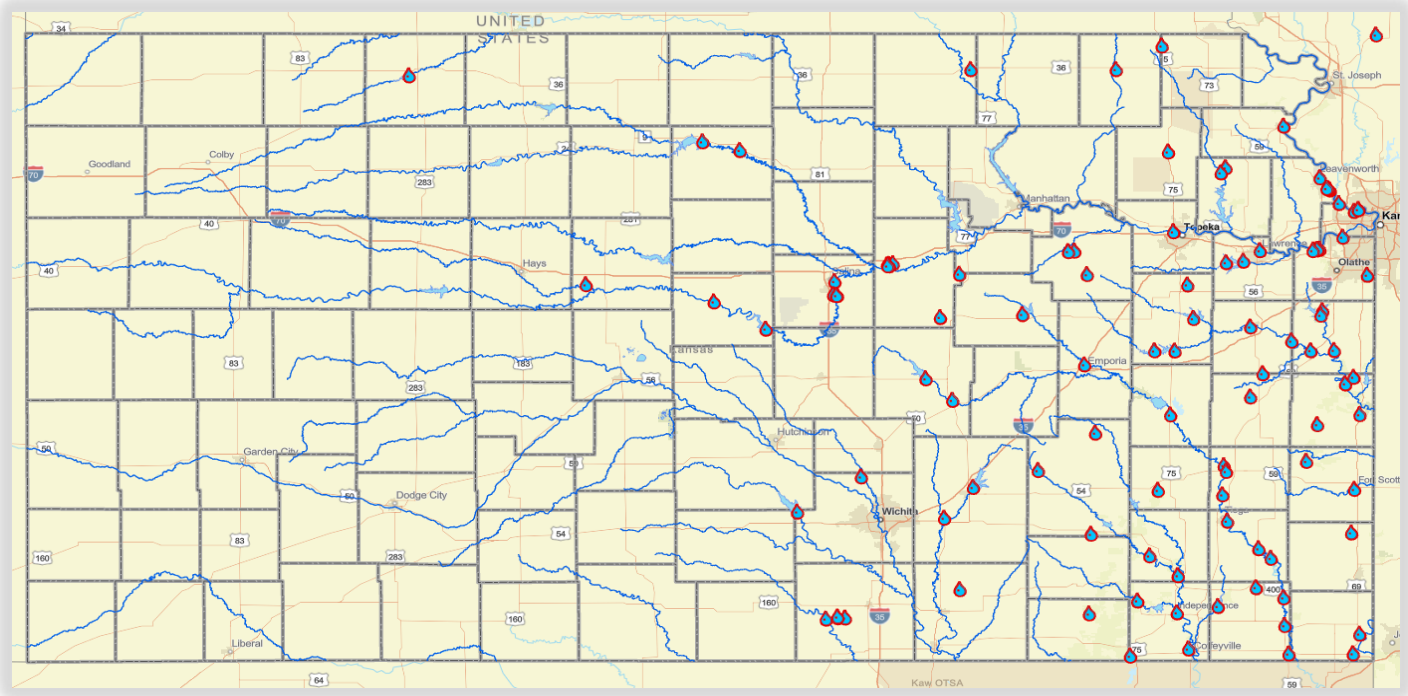
Kansas Historic Indirect Reuse ?

- River Systems – Upstream communities discharge treated wastewater to rivers and streams and downstream community intakes river water and treat it for drinking water



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Current Kansas Reuse?

- Many Kansas communities already use wastewater effluent for beneficially reuse as irrigation water or for both fertilize and irrigation of:

- Parks
- Golf Courses
- Sports Fields
- Agricultural use
- Industrial use

Dodge City Wastewater Irrigation Facility

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Under Article 1.— The SECRETARY OF HEALTH AND ENVIRONMENT, has broad powers to protect public health and permitting of public water supply systems and NPDES permits for discharge of wastewater

- *65-163(a)(1) D - No source of water supply in substitution for or in addition to the source escribed in the application or in any subsequent application for which a public water supply system permit is issued shall be used by a public water supply system, nor shall any change be made in the manner of storage, purification or treatment of the water supply without an additional public water supply system permit obtained in a manner similar to that prescribed by this section from the secretary.*

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2026 Kansas House Bill 2462 -

Requiring the secretary of health and environment to adopt rules and regulations that allow for the direct and indirect potable reuse of treated wastewater **by July 1, 2028**

- *House Conference Committee Report was adopted; Yea: 121 Nay: 3*
- *Senate Conference Committee Report was adopted; Yea: 39 Nay: 0*

- *House Enrolled and presented to Governor on Friday, April 3, 2026*
- *KDHE Expects the Governor to Sign into Law*

Prescriptive Water Reuse Regulations:

Water reuse treatment strategies are generally divided into:

- **Prescriptive** (standardized, technology-based) Specify precise treatment technologies, methods, and disinfection requirements (e.g., "must use microfiltration followed by UV").

- **Non-prescriptive** (performance-based) focus on the quality of the final treated water and the reduction of pathogens, allowing engineers to select the best technology to meet those targets (e.g., "must achieve 12-log virus reduction")

Indirect Potable vs. Direct Potable Reuse

(a)"Indirect potable reuse" means the planned delivery or discharge of treated wastewater to an environmental buffer, such as ground or surface waters, for the development of, or as a supplement to, a drinking water supply.

(b) "Direct potable reuse" means using advanced treatment processes to produce finished drinking water through the utilization of a water source that contains treated wastewater that has not passed through an environmental buffer.

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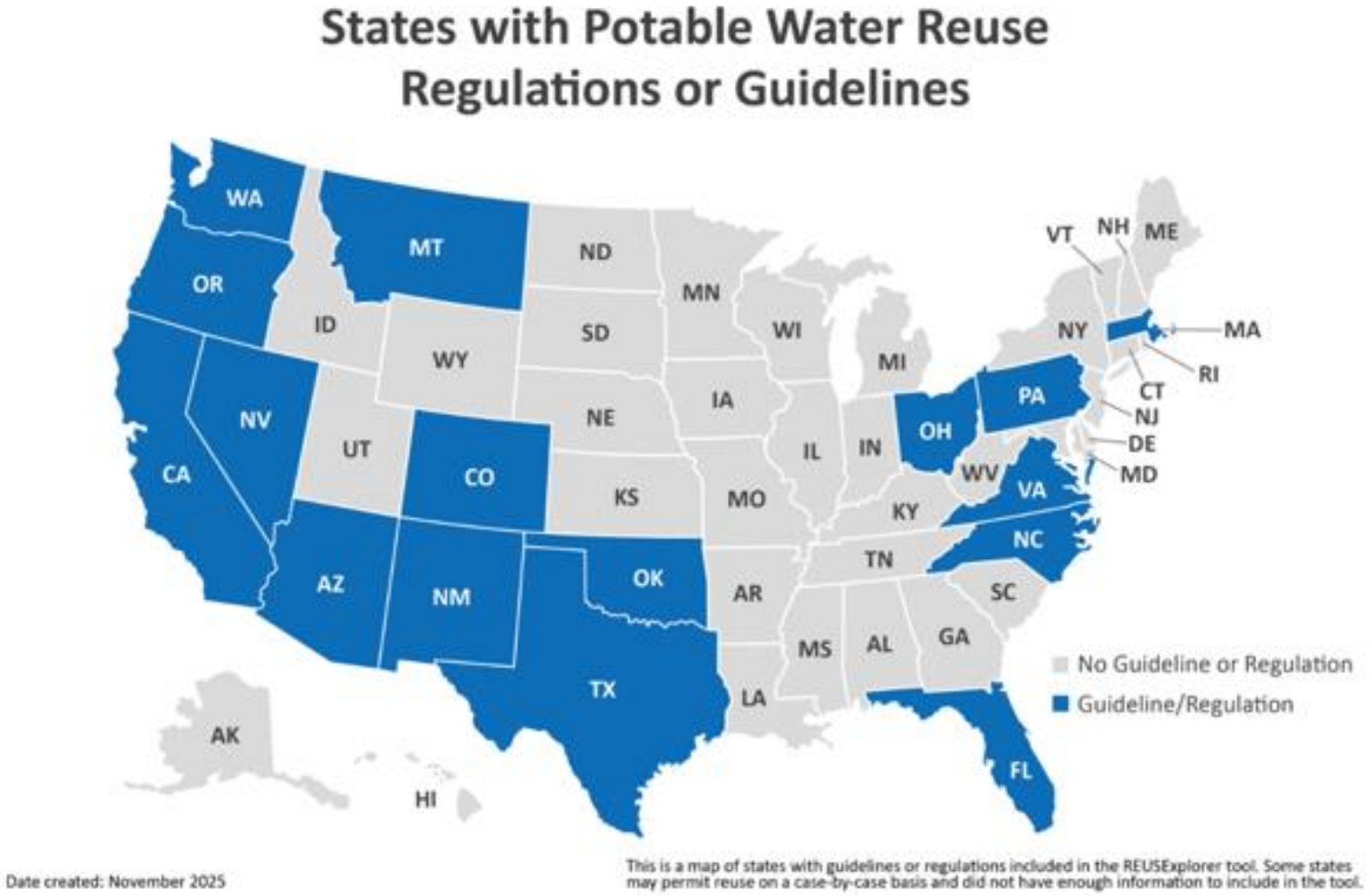

Map Courtesy of EPA

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How KDHE Currently Sees the Process

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Overlap of Regulations

Federal Clean Water Act (CWA)	Federal Safe Drinking Water Act (SDWA)
Protection of the environment	Protection of public health
Minimal focus on downstream receiving water use for drinking water supply	Assumes source water (mostly) without wastewater influence
Key Water Quality Parameters: • BOD • TSS • Bacteria • EPA Priority Pollutants	Key Water Quality Parameters: • TOC • Turbidity • Viruses, Protozoa • MCLs

State Reuse Regulations
Begin with water of wastewater origin and produce potable water meeting & superior to SDWA standards

Slide courtesy of Orange County GRWS

Basic Process Summary

- Public Outreach and Communications
- Feasibility Study
- Wastewater Characterization
- Pilot Study
- Treatment Selection
- Design and Review
- Construction and Startup Testing
- Process Monitoring and Bio-Assays
- Ongoing Research and Treatment Modification

Potable Reuse Communications

- It has been said that the best time to plant a tree was 20-years ago, the second-best time is today.
- The same is true with communicating the with the public about “purified water reuse”
- Language selection is critical (i.e. purified water)
- Systems must get the correct message out first to avoid public misunderstanding

Communication Challenges

- The belief that additional water supply sources are not needed
- Thinking that water supply deficiencies can be solved solely with conservation
- The lack of understanding of potable reuse treatment and “the science”
- Belief that reuse is not safe
- Misunderstanding of other water supplies (treatment costs and limited source quantity)

- **The “Yuck Factor”**

Feasibility Study

Feasibility studies for water reuse projects are essential, multidisciplinary assessments that evaluate the technical, economic, environmental, and social viability of treating wastewater for beneficial use.

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Feasibility Study Components

- **Technical Feasibility:** Evaluation of treatment technology, infrastructure, and water quality requirements for specific end-uses (e.g., filtration, disinfection).
- **Economic Analysis:** Analysis of capital costs (pipelines, plants) and operational costs (energy) against potential revenue, including the evaluation of alternative water sources.
- **Environmental & Social Impacts:** Assessment of environmental benefits, such as reduced discharge into ecosystems, and public perception.
- **Risk Evaluation:** Analysis of risks related to water quality, public health, and regulatory compliance.

Waste Stream Characterization

The first steps in a water reuse project is a systematic process of:

- **Identifying, measuring, and analyzing the physical, chemical, and biological components of the wastewater**
- **So that treatment can be designed to protect public health prior to subsequent beneficial reuse.**
- **This process is essential for designing effective treatment technologies**

Advanced Water Purification (AWP)

- **Multi-barrier treatment approach to target pathogens and harmful chemical contaminants using a combination of:**

- Filtration (Micro or Ultra)
- Reverse osmosis (RO) or
- Ozone (O3) and biologically active carbon filtration
- Advanced oxidation (AOP)
- Combined with continuous online monitoring
- Response plans
- Chlorine / Chloramines for residual disinfection.

Advanced Oxidation Processes (AOPs)

- **Uses hydroxyl radicals (OH) to destroy persistent organic pollutants, pharmaceuticals, and endocrine disruptors.**

Common methods include:

- Ozone (O3)
- O3 / UV
- O3 / H2O2
- UV / H2O2
- UV / O3 / H2O2

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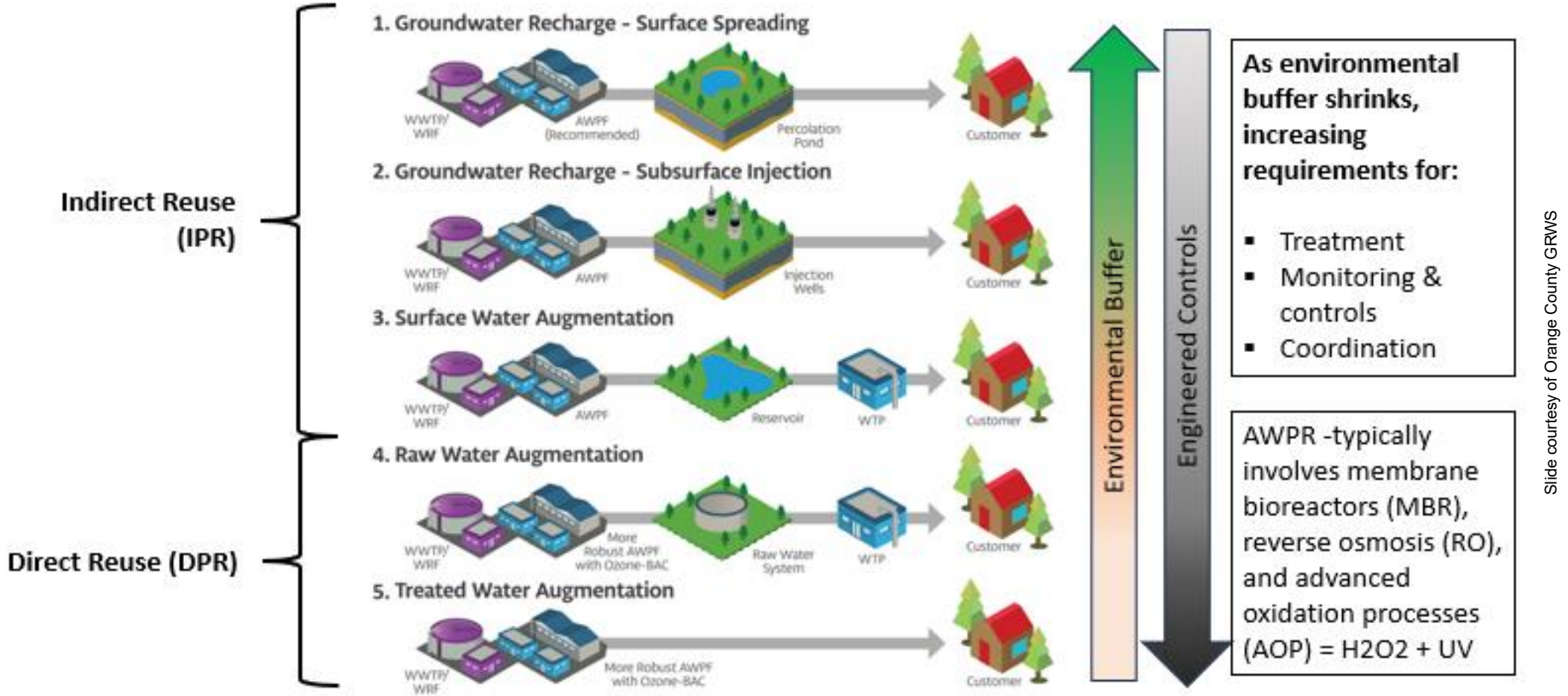
Indirect and Direct Potable Reuse – General Treatment Guide



Slide courtesy of Orange County GRWS

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Process monitoring for AWP and DPR

- Multi-barrier approach utilizing:
- Real-time sensors, surrogates, and high-frequency analytical testing
- Ensure the removal of pathogens and contaminants of emerging concern (CECs).
- Monitoring critical control points (CCPs)
- Turbidity
- Total organic carbon (TOC)
- Electrical conductivity (EC)
- UV transmittance (UVT)

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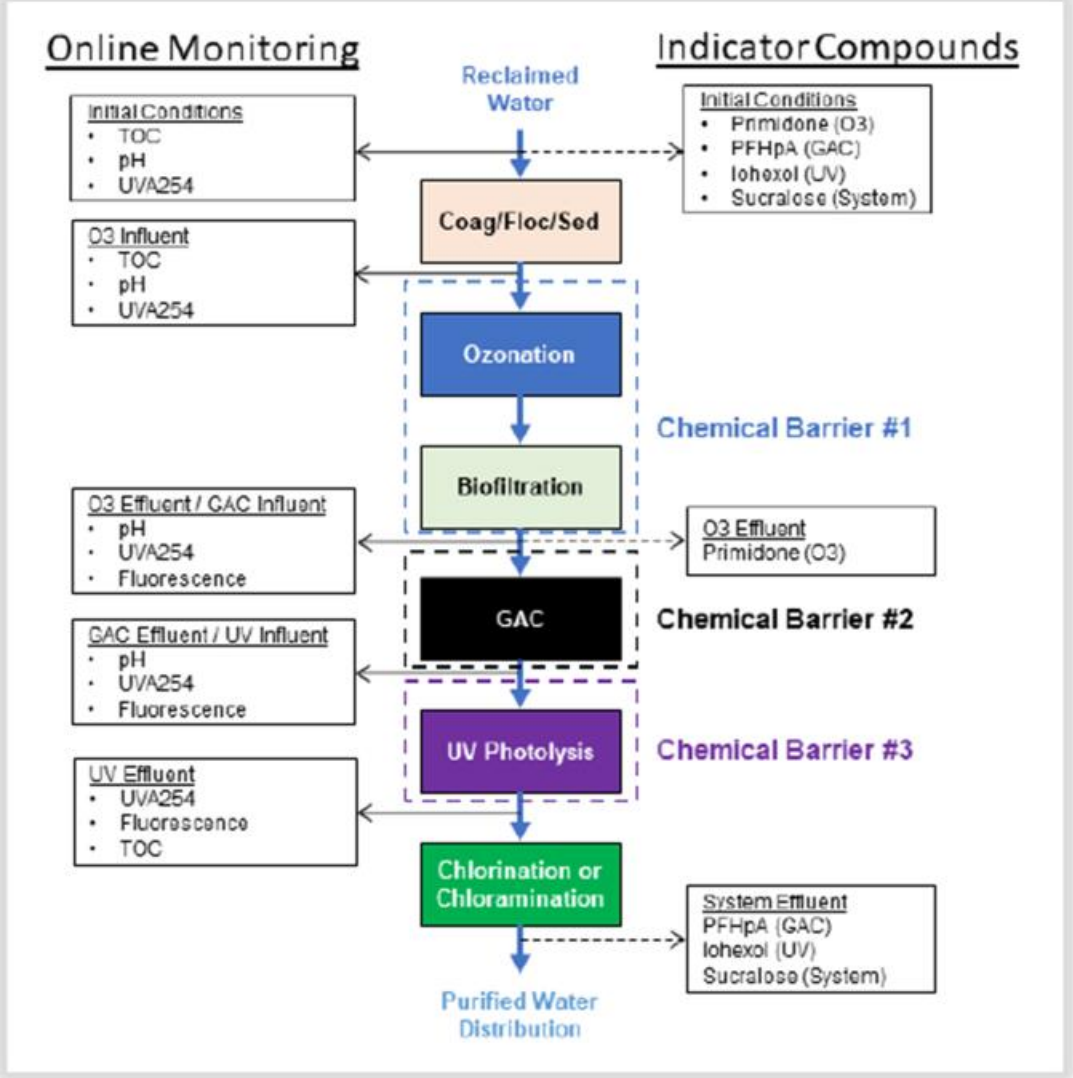
Monitoring of the Chemical

- Hypothetical non-RO DPR system for indicator selection case study.
- Recommended surrogates for online monitoring are shown to the left and recommended indicator compounds for quarterly sampling are shown to the right.



Used Courtesy of State of Colorado – Source: Guidelines for Direct Potable Reuse in Colorado

Biological Assay

- Biological assays (bioassays) screen for unknown contaminants by measuring molecular, cellular, or organism-level effects, rather than just chemical concentration. Ensure the efficacy of treatment processes. Key assays target:

- Nuclear receptors for endocrine disruption (estrogen ER-alpha)
- Androgen (AR) Aryl Hydrocarbon Receptor (AhR) Assays - measures dioxin-like activity, used to evaluate the efficiency of water treatment processes in removing these compounds
- Genotoxicity & Mutagenicity Assays - Specifically detect compounds that can damage DNA or cause mutations

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Sample Groundwater Replenishment System

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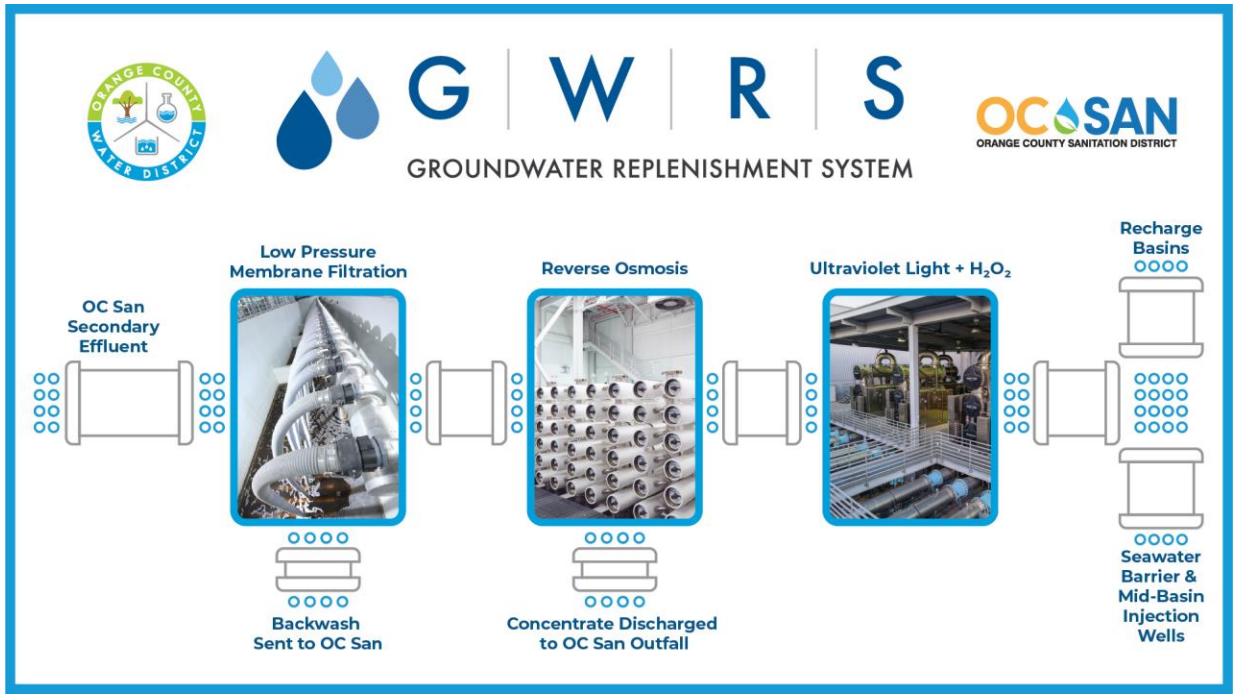
Orange County, CA - Groundwater Replenishment System

GWRS - Produces up to 130 million gallons of purified water everyday from Wastewater



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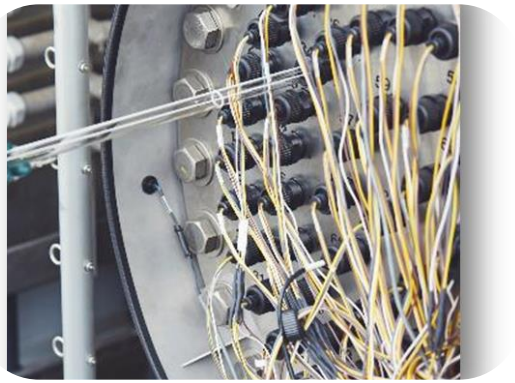
4-Key Lessons from Orange County, CA - GWRS

Early & ongoing public engagement



Know your wastewater composition

Early engagement with regulators & experts

Research is essential to improve water quality

GWRS = Groundwater Replenishment System

Slide courtesy of Orange County GRWS

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Project Must Bring Customers Along…

- Similar projects failed in L.A. & San Diego
- GWRS outreach began over 10 years before startup with focus groups and research.
- What did research tell us?
  - People don't know about their water supply
  - Messages must address health and safety
  - Orange County citizens want reliability, local control and high-quality water
  - Women, mothers, minorities and elderly are key audiences
  - Face-to-face presentations are best
  - "Reverse osmosis" elicits positive trust
  - Word choice matters

Slide courtesy of Orange County GRWS

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