

***Which End of the Pipe?
Regulatory Approaches for
Indirect Potable Reuse
Projects***

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Presentation Outline

- **Key Drivers & Implementation Challenges for Indirect Potable Reuse (IPR)**
- **Emerging Regulatory Issues with IPR - Which End of the Pipe?**
- **Regulatory Approaches Adopted by Different States**
- **IPR Case Study - OCWD GWR Project**
- **Conclusion**

Key Drivers for IPR Projects

- **Supplementing Groundwater Withdrawals (Resource & Water Right Benefit)**
- **Limited Ability to Increase Water Supplies**
- **Secure Supply in Drought Years that Increases with Community & Economic Growth**
- **Regional Water Issues**

Challenges to Implement IPR

Project Costs

**Water Rights-
Legal Issues**

**State Regulatory
Issues**

**Public Acceptance
& Stakeholders**

Project Uncertainties

**Treatment
Technology**

**Public Health
& Environment**

**No Established
Federal Standard**

**Limited Past
Project History**

Public Acceptance of IPR - Is My Water Safe?



Emerging Regulatory Issues

- **How will States Promulgate Rules?**
 - **Rulemaking, Guidelines, or Case-by-Case Under Permit**
- **Internal Agency Coordination Issues: Which End of the Pipe?**
- **Unregulated Contaminants?**
- **Technology-based Standards?**

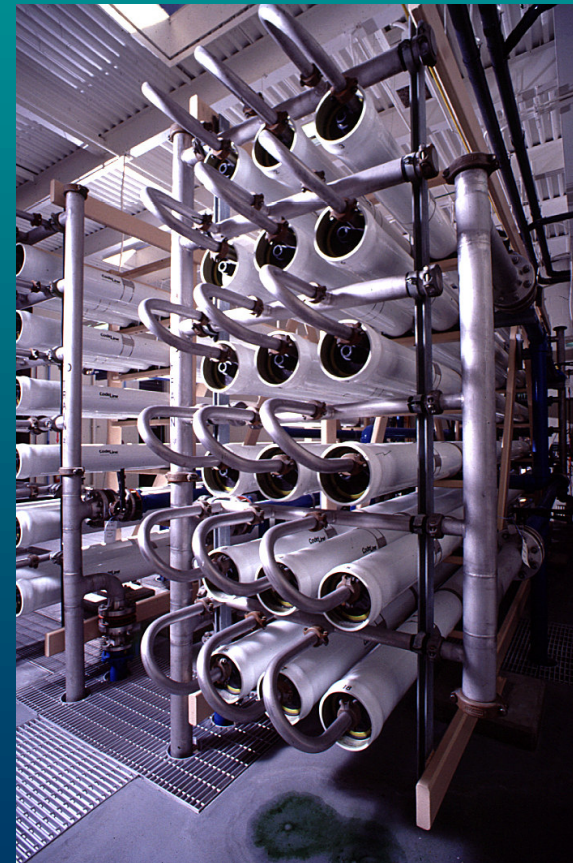
Unregulated Contaminants

- EDCs & PPCPs Not Regulated under the SDWA or CWA
- Concern for Low Molecular Weight Organics
- Std. Laboratory Methods & Ability to Verify Results?



Technology-based Standards?

- MF/UF Removes Suspended Solids, Bacteria & Protozoa
- RO Removes Salinity (TDS), Virus & Dissolved Organics
- RO & AOP (UV & Hydrogen Peroxide) Effective Against EDCs, PPCPs, Trace Organics



Regulatory Approaches to IPR

- **No Federal Regulatory Standard or Established State Standard**
- **Injection to Groundwater Requires SDWA Compliance (Infiltration or SAT?)**
- **States Have Applied Guidelines & Draft Policies to Permits on Case-by-Case**
- **Permit Applications Will Drive the Process**

Case Study No. 1- California

- **General Requirements:**
 - **IPP, Source Water Control, Source Water Assessment, SDWA MCLs**
- **Groundwater Storage & Recovery**
 - **Minimum 6 mos. / 500 ft. for Infiltration; 12 mos. / 2,000 ft. for Injection**
- **Total Nitrogen < 5 mg/l; TOC < 0.5 mg/L**

OCWD Groundwater Replenishment (GWR) Project

Subsurface Injection	DHS Proposed Criteria	OCWD GWR Project
Total Suspended Solids	< 30 mg/L	ND
Filtration	< 2 NTU	0.2 NTU
Disinfection	4 log < 2.2 total per 100 mL	ND
Underground Retention Time	> 12 months	24 months
Horizontal Separation	> 2,000 feet	3,120 feet
Biochemical Oxygen Demand	< 30 mg/L	ND
Total Nitrogen	< 5 mg/L	2.6 mg/L
Total Organic Carbon	< 0.5 mg/L	0.26 mg/L
Drinking Water Standards	< MCLs	< MCLs

Reference: M. Patel, OCWD

GWR Permitting Experiences

- **Significant Benefit Realized from Operation of Water Factory 21 for over 25 years**
 - **WQ Data, GW Modeling, Successful Operation**
- **Extensive Piloting to Demonstrate Membrane Technology (MF-RO) and AOP (UV+Peroxide)**
- **Difficulties:**
 - **Need to Demonstrate Selected UV**

California Regulatory Constraints

- TOC as Indicator for Removal of Trace Organics & Unregulated Contaminants
- Maximum Recycled Water Contribution (RWC) of 50%
- RO Treatment Required for Direct Injection
- Extensive Quarterly Monitoring Required

Case Study No. 2 - New Mexico

- **No Regulatory Standards, Policy Guidelines Are Drafted**
 - Required to Meet SDWA MCLs & NMWQCC Groundwater Standards
- **Groundwater Storage & Recovery**
 - Minimum 6 mos. / 500 ft. for Infiltration; 12 mos. / 2,000 ft. for Injection
- **Unregulated Contaminants? (TOC)**

New Mexico Draft Policy for Aquifer Recharge Using IPR

Recharge Method	Wastewater Quality Parameter	Wastewater Quality Standards	
		30 Day Average	Maximum
Surface	BOD ₅ (mg/L)	10	15
	Turbidity (NTU)	3	5
	Fecal Coliform (Organisms per 100 mL)	5	23
	TRC or UV Transmissivity	Monitor	Monitor
	TOC (mg/L)	N/A	20
Subsurface Injection	BOD ₅ (mg/L)	10	15
	Turbidity (NTU)	3	5
	Fecal Coliform (Organisms per 100 mL)	2.2 during previous seven days	23 in any sample in any 30 day period
	TRC or UV Transmissivity	N/A	5
	TOC (mg/L)	N/A	5

Reference: New Mexico Environment Dept.



Application of Case Studies in Permitting of New IPR Projects

- **Pilot Demonstration of Treatment Required**
 - **Disinfection, Consideration of Multiple Barriers**
 - **Unregulated Contaminant Monitoring**
 - **TOC as Indicator for Trace Organics**
- **Pilot Demonstration Should be Part of Public Outreach Efforts**

Application of Case Studies in Permitting of New IPR Projects

- **Monitoring May be Excessive Where No Past Project History Exists**
 - **Projects in Other States with Successful Operating Histories as Example Projects**
- **Need for Redundancy or Alternative Supply Should be Balanced with Operational Control Strategies**
- **Unregulated Contaminant Monitoring (What's in a Nanogram?)**

Conclusion

- **Limited Availability of Water Resources and the Need to Expand Water Supplies Will Drive IPR**
- **New IPR Projects Will Drive Regulations**
- **Experience with Successful IPR Project Operations within the Region Will Ease the Regulatory Pain**
- **Science & Understanding of Unregulated Contaminants is Growing**

Conclusion

Questions?