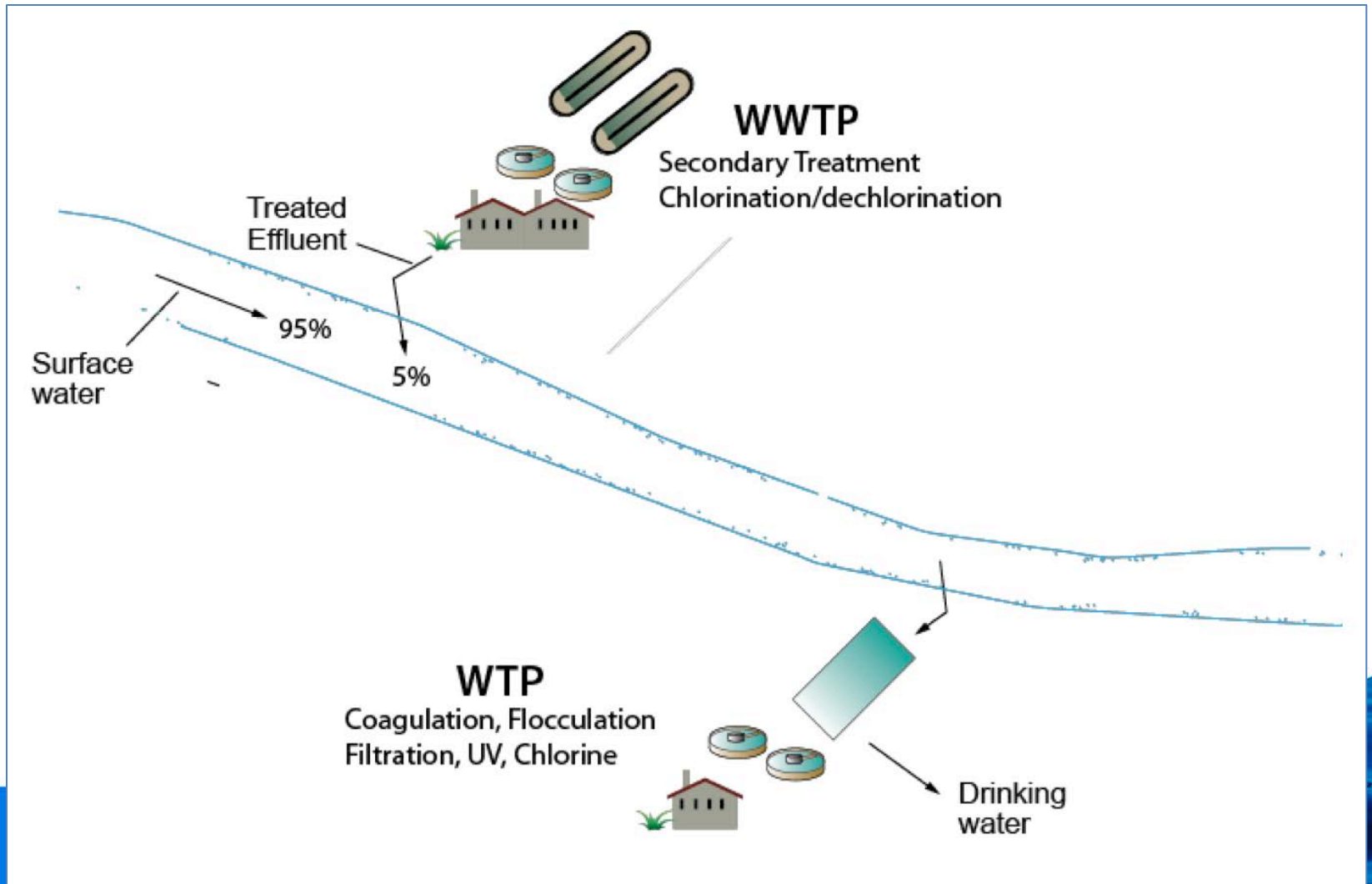


# Potable Reuse in California: Lessons Learned and the Path Forward

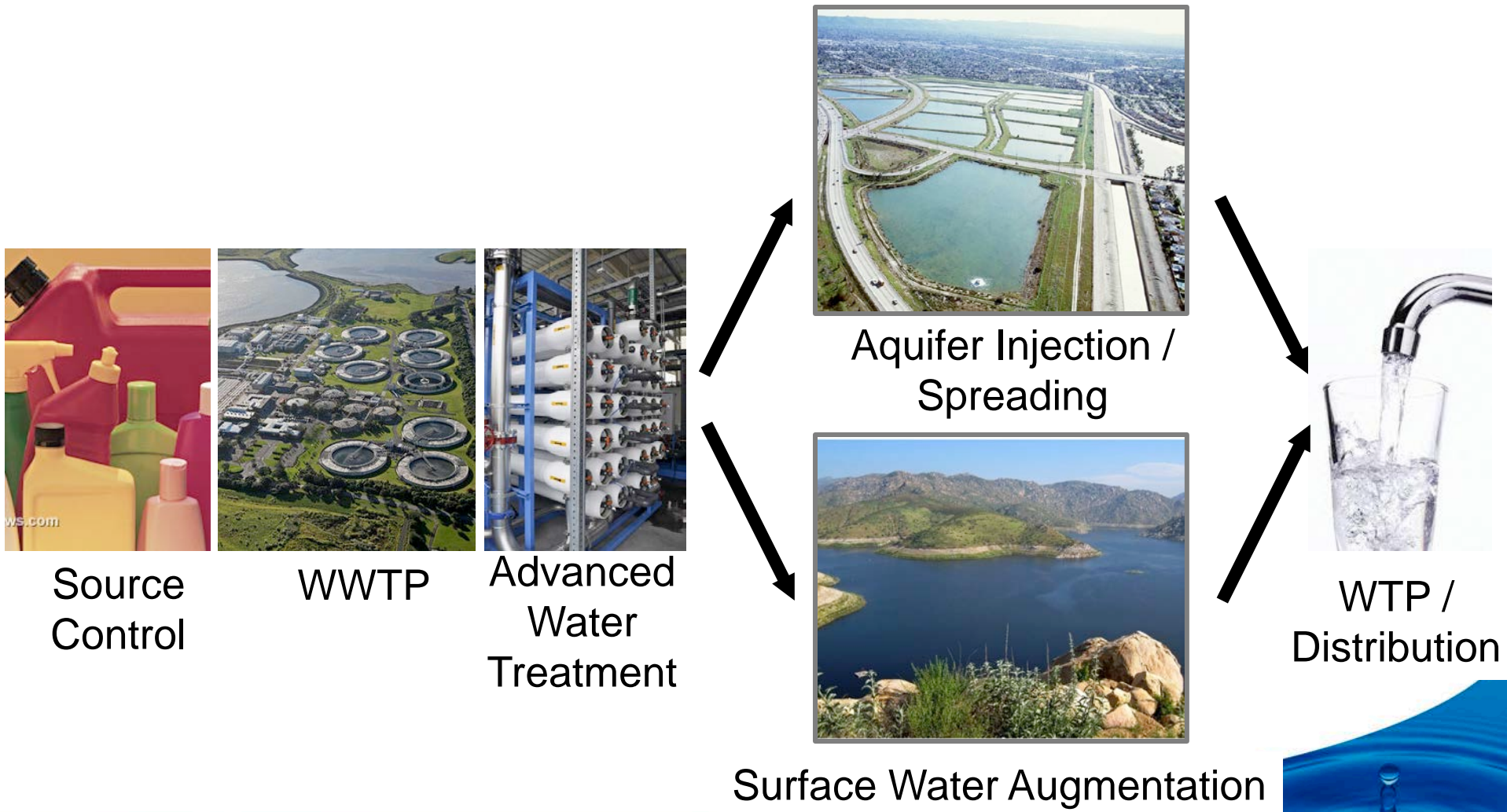
**Shane Trussell, Ph.D., P.E., BCEE**

*Inland Empire WaterReuse  
Cucamonga Valley Water District  
March 10, 2015*

# De *facto* Potable Reuse



# Indirect Potable Reuse (IPR)

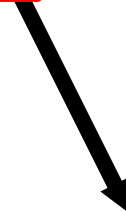


# Direct Potable Reuse (DPR)

Existing surface  
water supply



Raw (or Source)  
Water Augmentation



WTP /  
Distribution



Flange-to-  
flange



Source  
Control



WWTP



Advanced  
Water  
Treatment



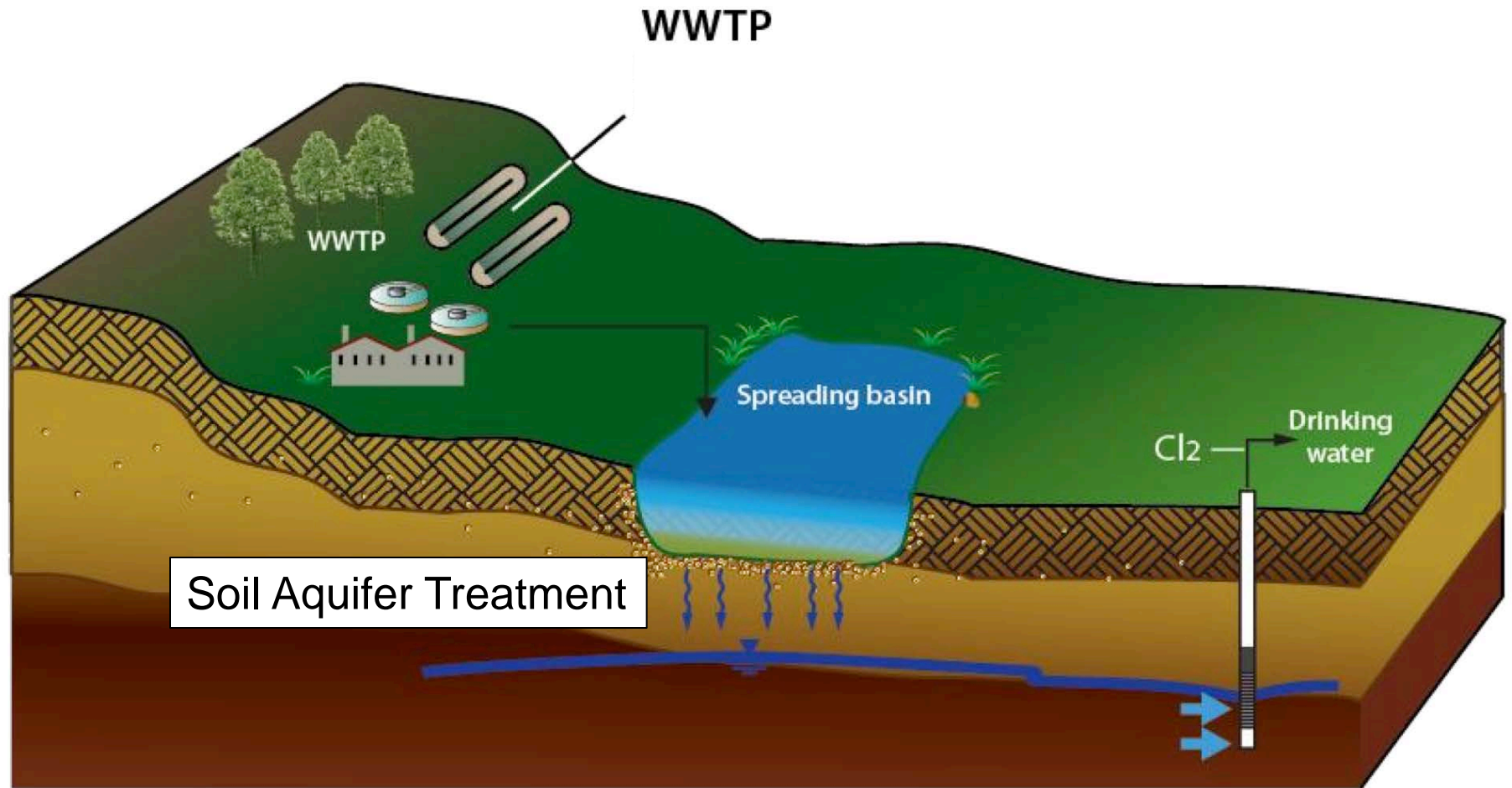


# Current CA Potable Reuse Projects

- All are **IPR projects** doing **groundwater recharge**
- 7 existing projects



# Groundwater Recharge: Surface Spreading



→ Biological Treatment

Granular Media Filtration

Disinfection

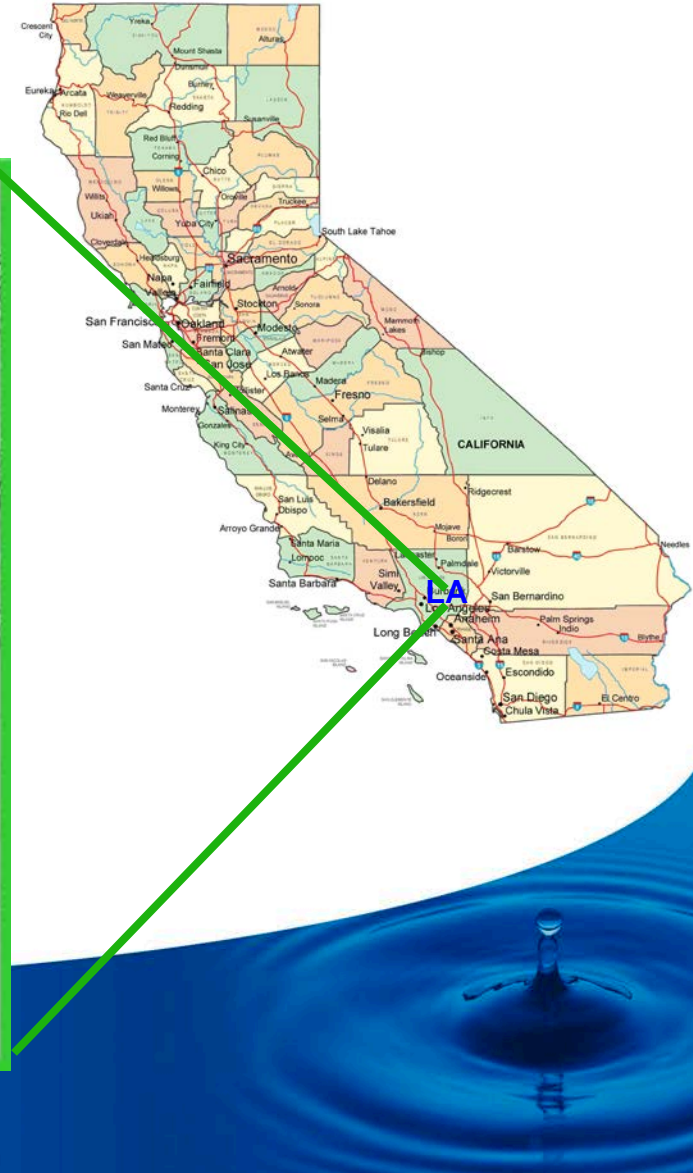
Soil Aquifer Treatment →







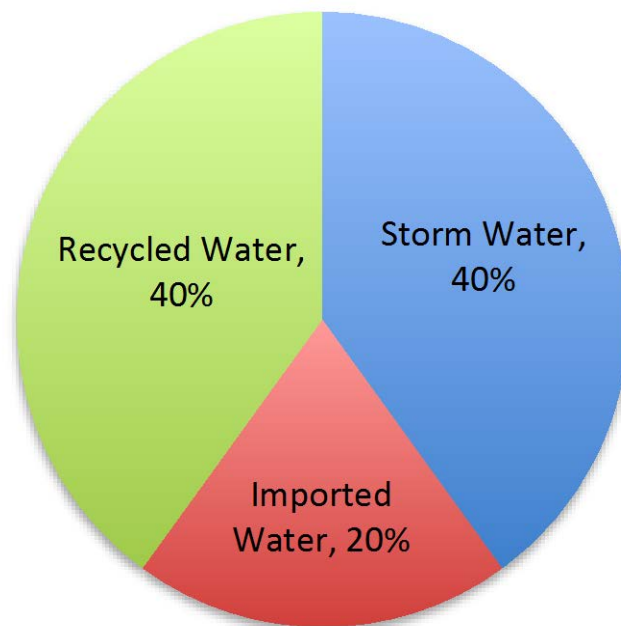
## A map of California is shown, divided into counties. A thick green diagonal line runs from the top left to the bottom right. In the bottom right corner, there is a blue water splash graphic with a droplet hitting the surface, creating ripples. The letters 'LA' are visible in blue near the Los Angeles area.



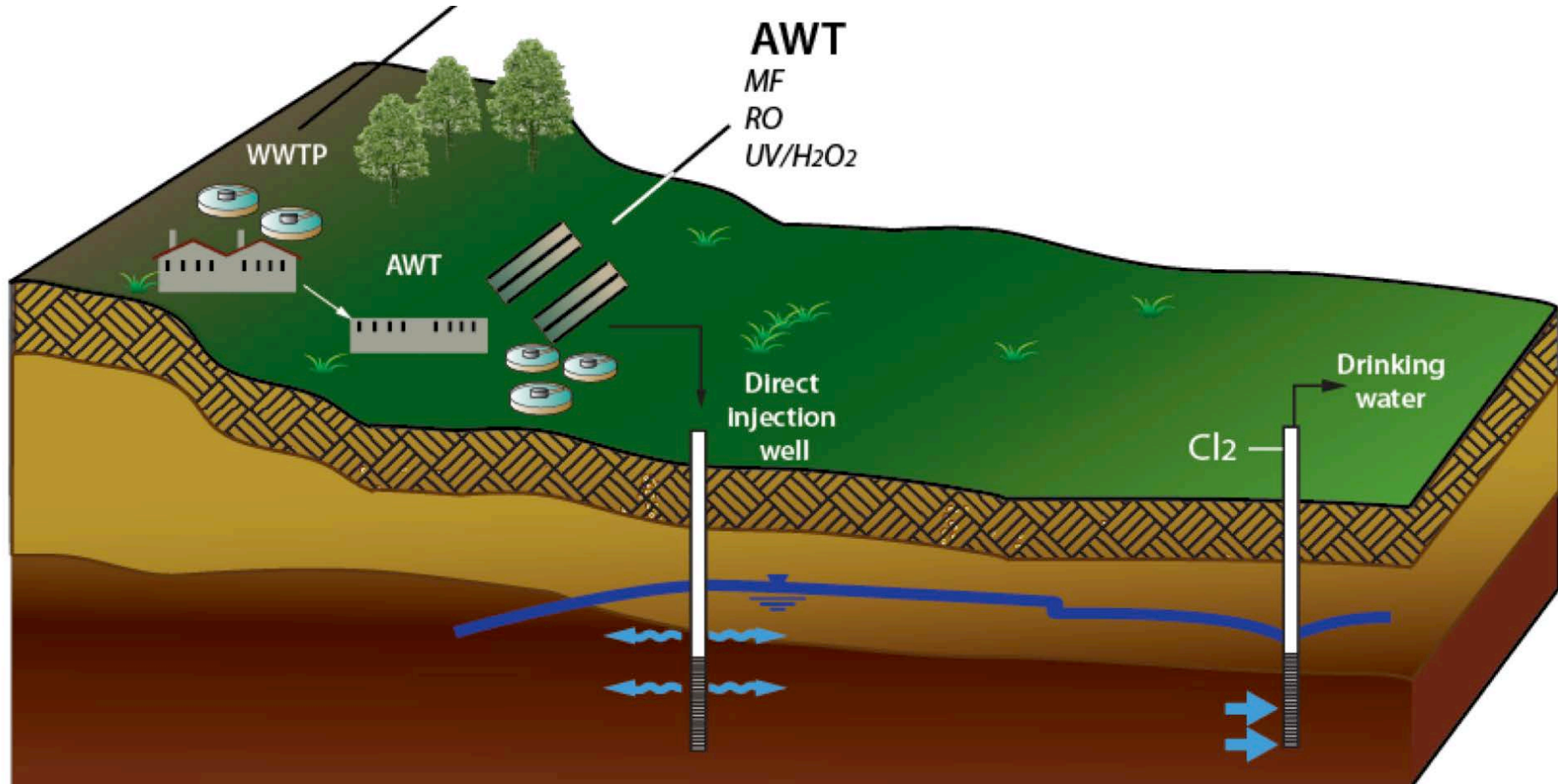


# Montebello Forebay

- Operating since 1962
- Surface spreading
  - 560 acres
  - ~44 MGD
- Extensive testing
  - Epidemiology
  - Trace organics
- Expansion now underway



# Groundwater Recharge: Subsurface Injection



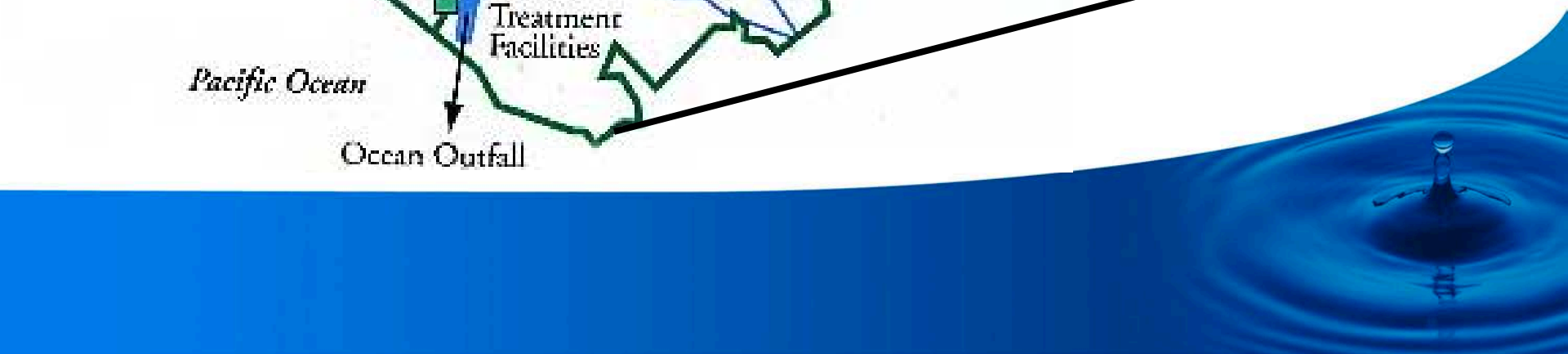




# GROUNDWATER REPLENISHMENT SYSTEM

Ground Water Replenishment  
System

Orange Co., CA





# Orange County GWRS

- Preceded by Water Factory 21 (1978-2005)
- GWRS started operations in 2008
- Presently 70 mgd; undergoing a 30 mgd expansion
- Two recharge projects: direct injection and surface spreading

# Other Groundwater Recharge





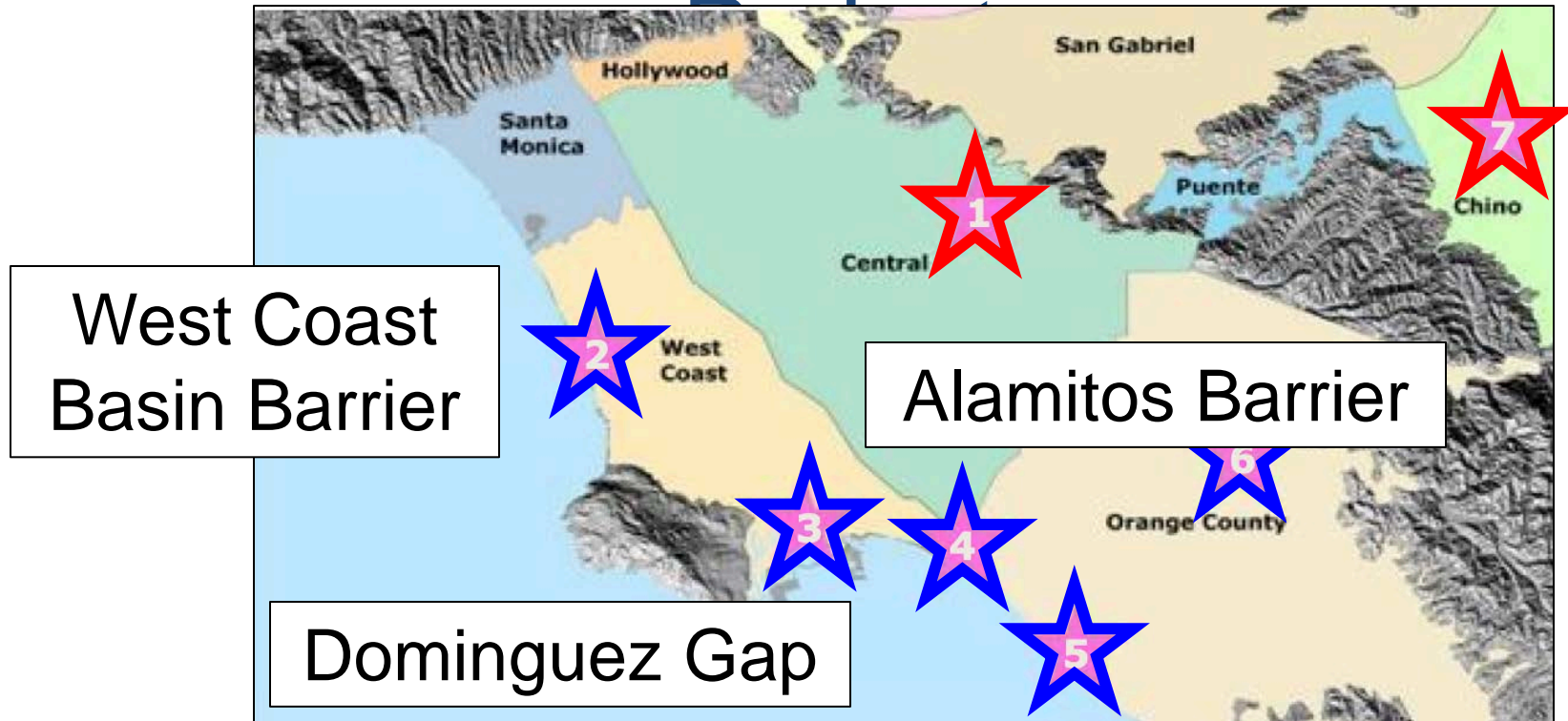
# Other Groundwater Recharge



Chino Basin



# Other Groundwater Recharge



# California IPR Overview

| Facility                         | Technology            | Production (MGD) | Production (AF/year) |
|----------------------------------|-----------------------|------------------|----------------------|
| Montebello Forebay               | Spreading             | 44.6             | 50,000               |
| Groundwater Replenishment System | Spreading / Injection | 100              | 112,000              |
| West Coast Basin Barrier         | Injection             | 22.6             | 25,315               |
| Chino Basin                      | Spreading             | 18.7             | 21,000               |
| Alamitos Barrier                 | Injection             | 8                | 8,970                |
| Dominguez Gap Barrier            | Injection             | 5                | 5,600                |
| <b>Totals</b>                    |                       | <b>~200</b>      | <b>~220,000</b>      |





# Future of Potable Reuse

- Senate Bill 918 was an important milestone
- Established deadlines for regulations
- Requires DDW to inform legislature on feasibility of DPR (end 2016)
- California State Expert Panel
  - Evaluate research and state of science
  - Provide technical guidance on regulations
- WateReuse California/Research Foundation DPR Initiative has raised >\$6M



# Role of environmental buffer in URB

URB



- Contaminant removal
- Dilution / blending
- Storage capacity
- Time to detect & respond to failures



# Role of environmental buffer in URB



- Contaminant removal
- Dilution / blending
- Storage capacity
- Time to detect & respond to failures

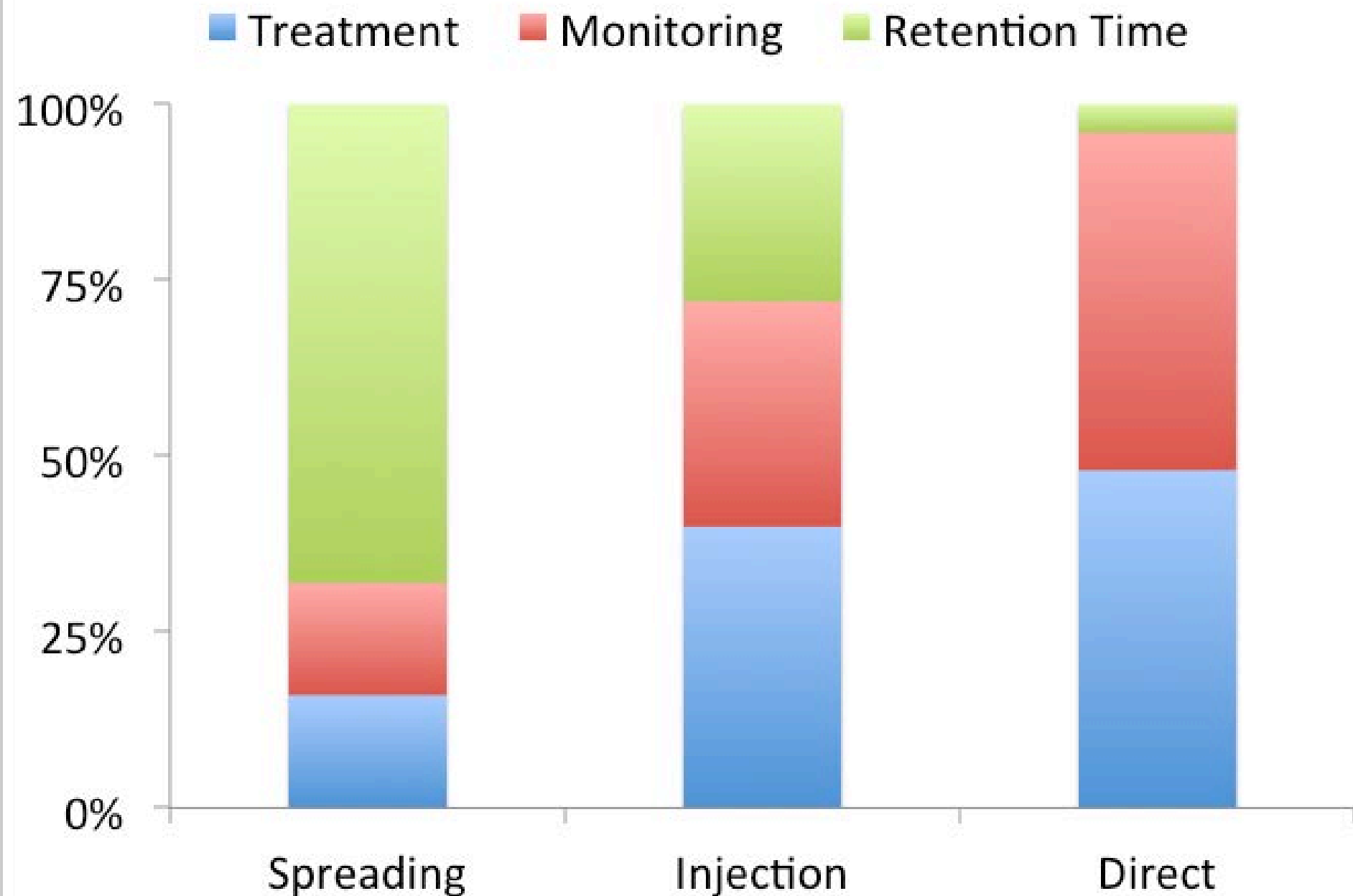
*How do maintain these protections without an  
environmental buffer?*

*What are the key issues?*





# The Transition to DPR from Groundwater



# *WRRF 14-12 Demonstrating Redundancy and Monitoring to Achieve Reliable Potable Reuse*



**1 MGD Demonstration Scale Project for DPR**

# Project Goal

*Leverage industry experience and recent DPR research to demonstrate that we can safely implement potable reuse without an environmental buffer*



# NWRI Expert Panel Meeting



# Conclusions

- Potable reuse can be done safely and has been for the past 50+ years in California
- Multiple solutions must be pursued
  - Non-potable reuse
  - Indirect potable reuse
  - Direct potable reuse
- Need to ensure public health protection
- Public acceptance is critical





# Thank you for your attention

