

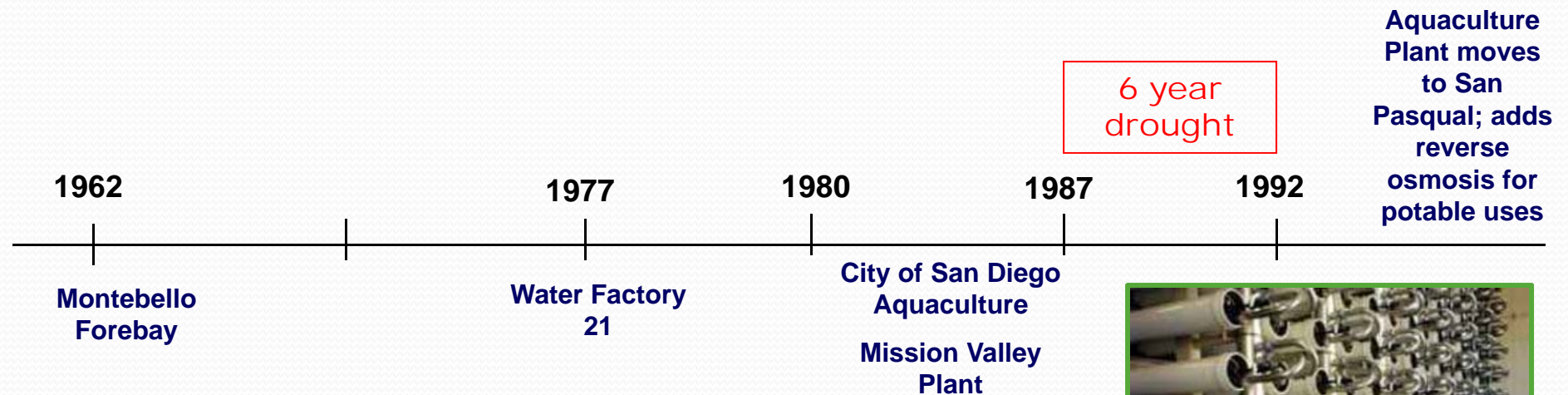
Pending Draft Surface Water Augmentation Regulations



Opportunities
December 4, 2015

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Criteria Builds on Six Decades of Planned Potable Reuse in Southern California



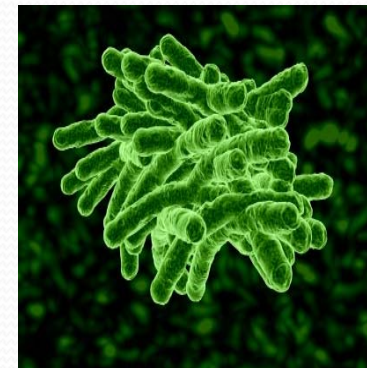
Groundwater Injection v. Surface Water Augmentation

Groundwater	Surface Water
Groundwater does not require further treatment after environmental buffer	Surface water receives further treatment after the environmental buffer
Once contaminated water is injected into groundwater basin, it is hard to monitor and manage	Once contaminated water is delivered to reservoir, it is easy to monitor and can be managed.
Storage in basin is large	Storage in reservoir is relatively small
Basin is not an active control point in treatment process (relies solely on time and dilution criteria)	Reservoir is an active control point in treatment process (Multiple factors are considered)

Indirect Potable Reuse Criteria

Pathogenic Organism Control

- Organism log reduction treatment objective
 - Based on highest organism density observed in raw sewage
 - 10^{-4} annual risk of infection
- 12-log enteric virus
- 10-log *Giardia*
- 10-log *Cryptosporidium*
 - (10 log = 99.99999999% reduction)



Other Proposed Regulatory Criteria

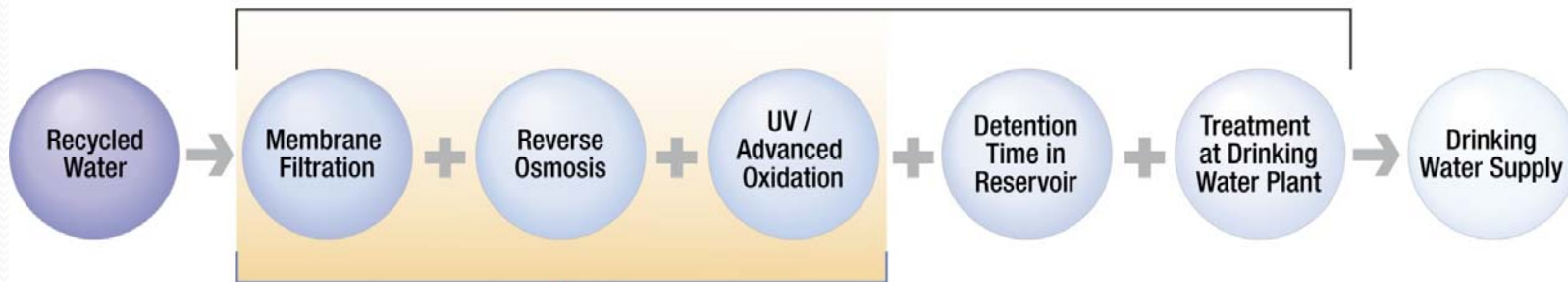
- Industrial pretreatment and pollutant source control program
- Agency control over reservoir
- Financial, managerial, and technical capability
- Monitoring:
 - Treatment performance
 - Priority Toxic Pollutants
 - Chemicals having notification levels
 - Others contaminants if required in permit
 - Environmental buffer (source water)



Treatment Train



Multi-Barrier Water Purification Steps

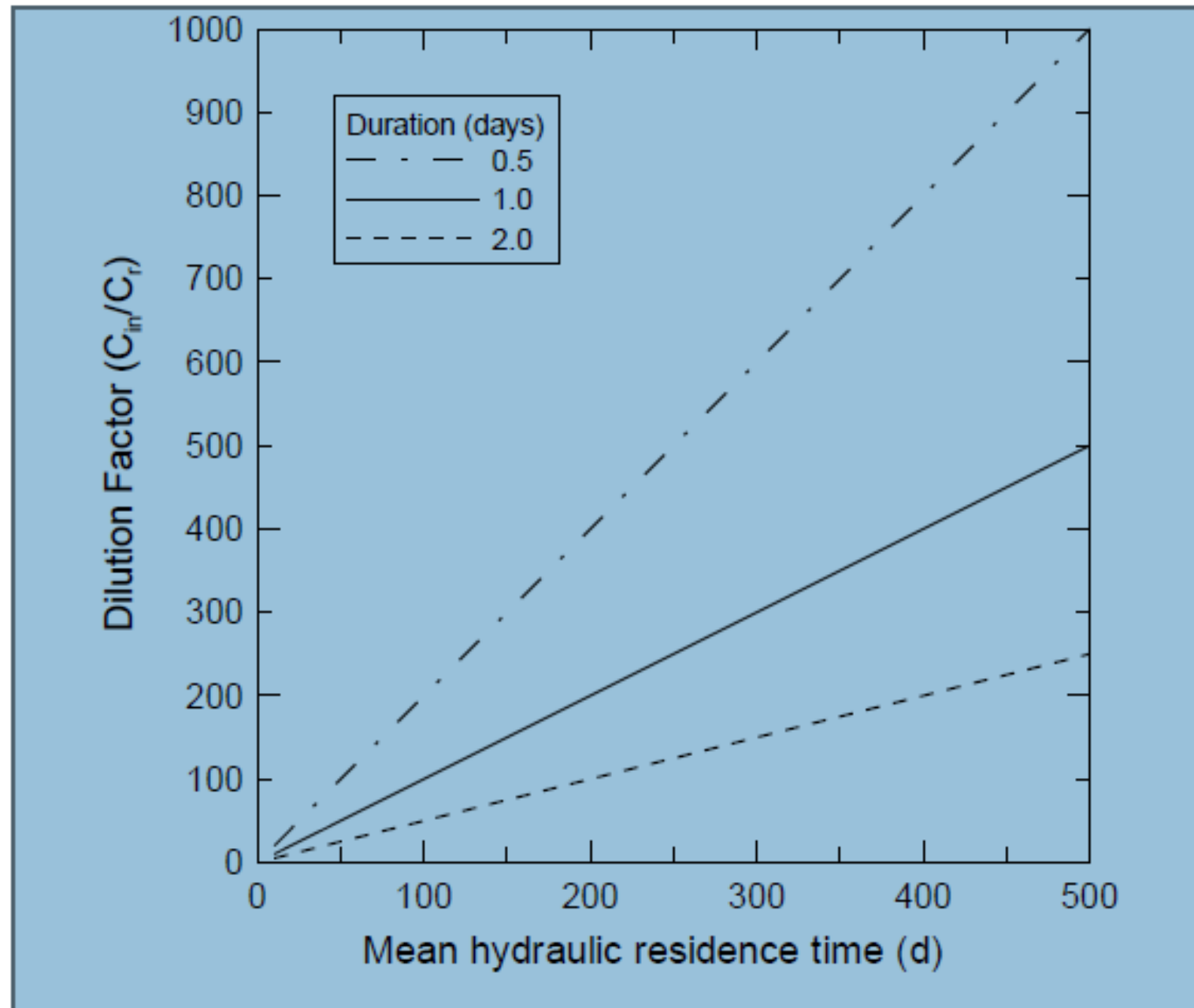


Water Purification Process

State Approach: Reservoir as an Environmental Buffer

- Benefits
 - Attenuation for inadequately treated water (time and dilution)
 - Water system may draw from the reservoir when the recycled water flow is interrupted
 - Mixing
 - Enhances system reliability
 - Singular focus on potable reuse







Surface Water Augmentation Reservoir Mixing Criteria

- The volume of water withdrawn from the reservoir must contain no more than:
 - (1) one percent recycled wastewater that was delivered to the reservoir during any 24-hour period, or
 - (2) ten percent recycled wastewater that was delivered to the reservoir during any 24-hour period, with treatment to provide an additional 1-log reduction of virus, *Giardiacysts*, and *Cryptosporidiumoocysts*
- Demonstrate mixing using hydrodynamic modeling and tracer studies
- $V/Q_{\text{total out}} > 6$ months, as measured monthly
- Criteria must be met at all times under all operating conditions

Multiple Reservoir Uses and Benefits Not Considered in Criteria



- Water quality management
 - Consistent blending
 - Critical control point for poor water quality
- Capture, attenuation and storage of local storm runoff
- Storage of imported water
- Managing reservoir levels for safety, capture or evaporation
- Recycling backwash water
- Fisheries and habitat

Request for DDW

- Regulation should allow for alternative compliance approach if it provides an equivalent or higher level of public health and environmental protection





Possible factors to consider

- Ability to shut off reservoir and switch to other sources
- Multiple blending sources for dilution
- Specific receiving water hydrodynamics and biological barriers
- Alignment of response time for reservoir management with monitoring of advanced treatment facilities
- Alternative approach assures reliable operation of surface water treatment plant to meet surface water treatment rule
- Wastewater source water quality



Next Steps

- State Board Meeting on December 15, 2015 (tentative)
- Next Expert Panel meeting: February 22-23
- Anticipated release for public comment February or March 2015
- SWA Committee: WateReuse proposal on alternative compliance