

# Recycled Water Trends in California – Water Supply, Technology and Regulation



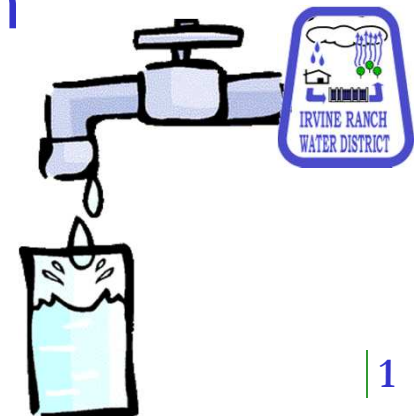
**Presentation to NACWA**

**July 22, 2010**



# Topics for Today's Discussion

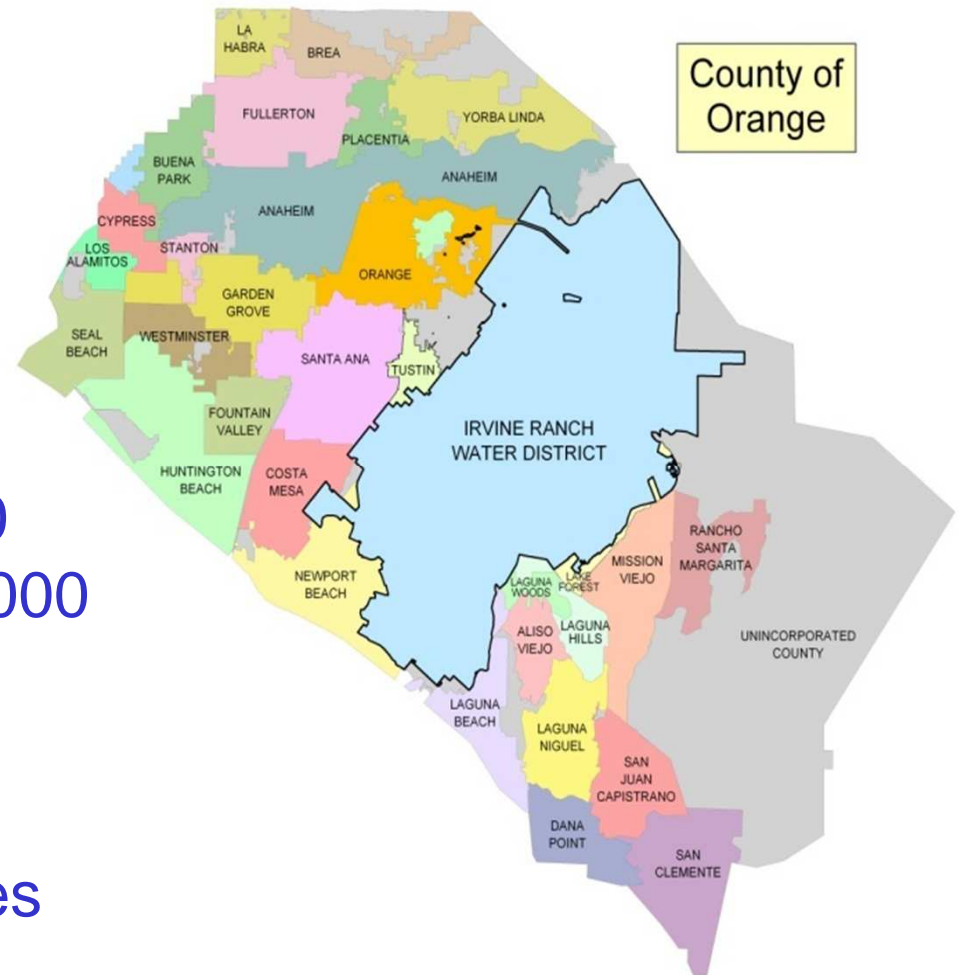
- Background on IRWD
- California's recycled water goals
  - Policy framework and initiatives
  - Potable Reuse Initiative
- Trends in recycled water supply sources and project delivery
  - Satellite treatment and local distribution
  - Graywater
- Conclusions and thoughts





# About Irvine Ranch Water District

- Formed in 1961 by landowners to supply irrigation - population 300
- California Water District providing:
  - Water
  - **Recycled water**
  - **Wastewater**
- Current Customer Base
  - Residential Population 325,000
  - Daytime Population (est.) 500,000
  - Service Connections 93,000
- Size of District
  - 179 square miles/114,500 acres
  - All/part of six cities, unincorporated County





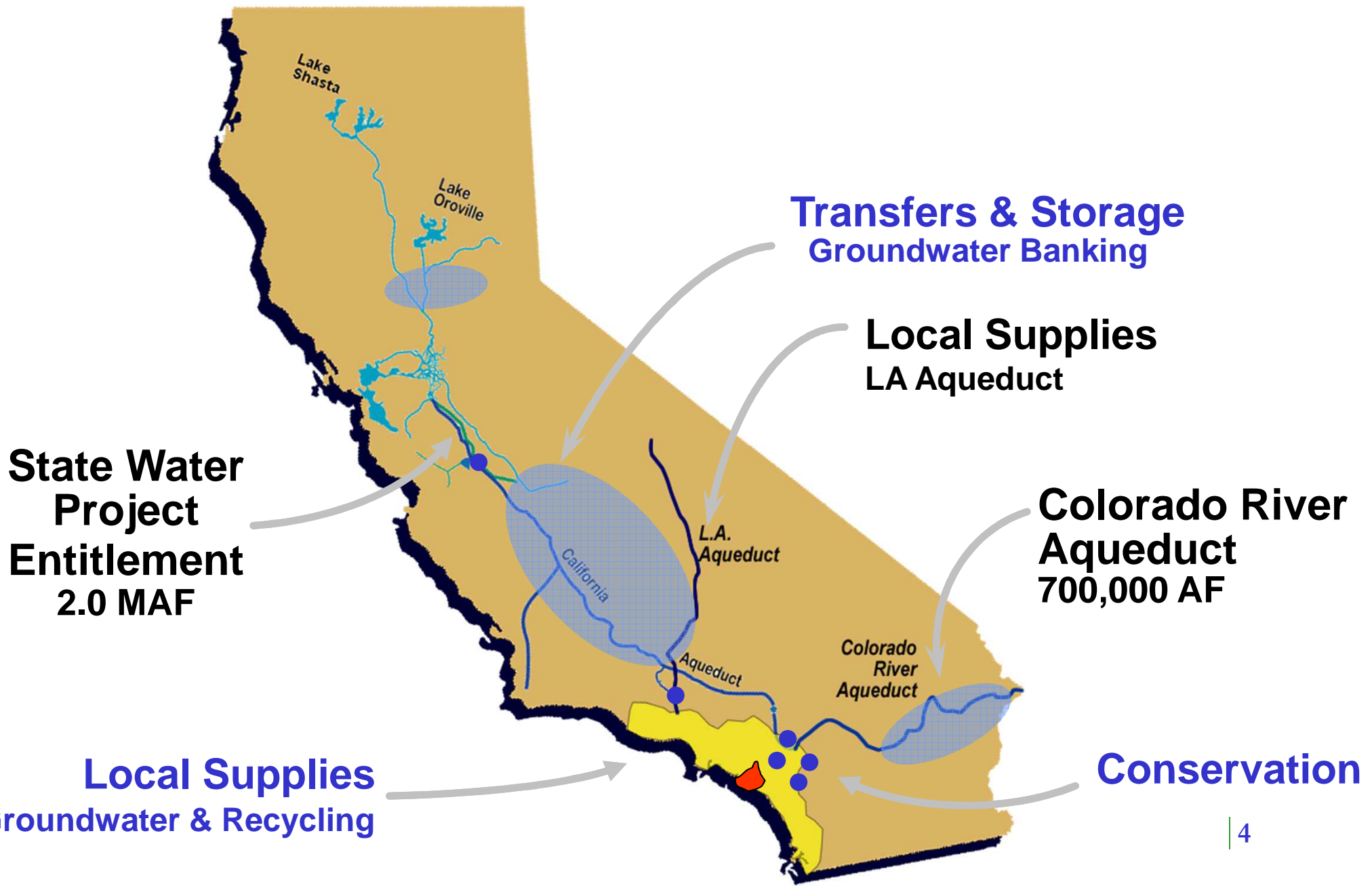
## IRWD's Recycled Water



- One of largest dual distribution systems in U.S. (400+ miles)
  - 3,600 metered connections
- Two wastewater treatment plants:
  - 7.5 and 18 (expanding to 28) MGD
  - Will recycle over 92% of wastewater
- First Unrestricted Use Permit in State
- Rate incentives
- End uses of recycled water:
  - Landscape irrigation / estate yards
  - Agriculture
  - Toilet flushing in office buildings (42)
  - Cooling towers and Industrial
- **Supplies 15,000 af/year (24% of demands)**



# Where Does Southern California Get Water ?

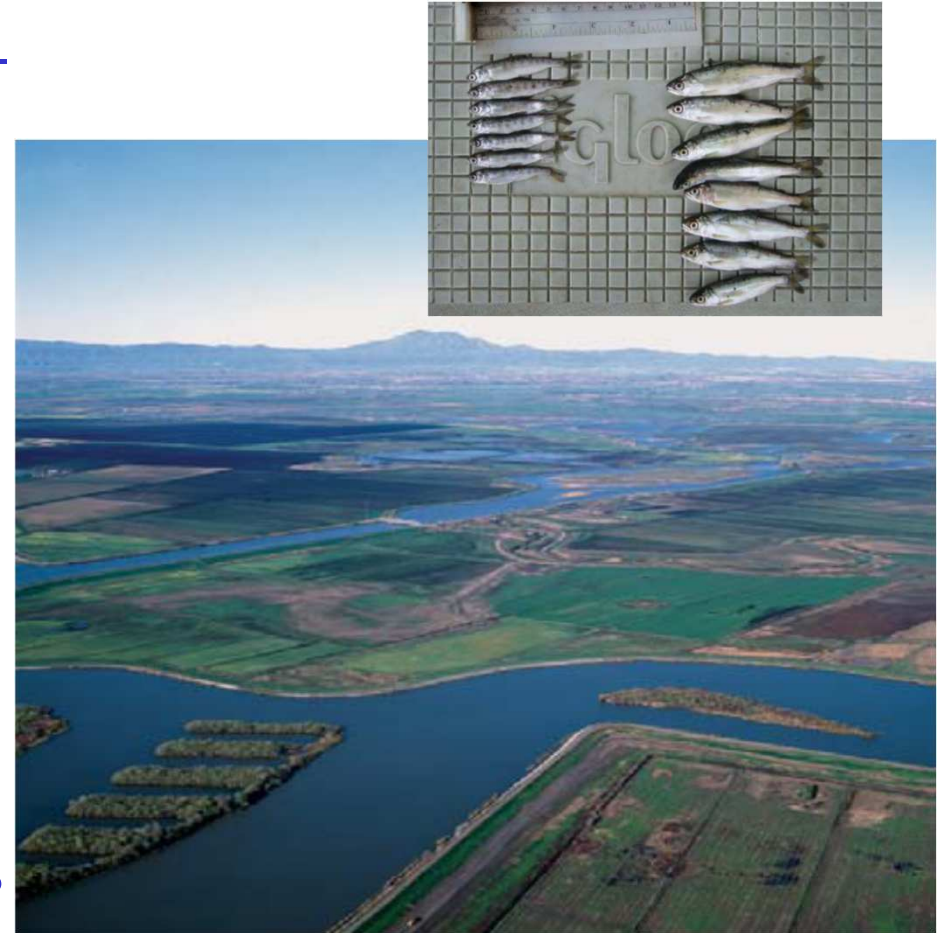






## Crisis Point - San Francisco Bay Delta Estuary

- Key hub for water supply statewide – ***60% of Southern California's Imported water***
- Highly disturbed and altered ecosystem
- Invasive plant and fish species
- Heavy agricultural use and degradation, housing encroachment
- Seismically unstable levee system
- Multiple endangered & listed species (Delta Smelt, Salmon, others)
- Export pumps in vulnerable area with poor water quality
- Court ordered “regulatory” drought



***Unsustainable*** from water supply and environmental perspective



# California Needs Recycled Water - Goals

- Source: 2009 California Water Plan
- Current Statewide Water Use:
  - Urban Water Use = 9 MAF
  - Agricultural Water Use = 34 MAF
  - Total = 43 MAF
- Current Recycled Water Use = 0.65 MAF (7% urban)
- Wastewater Discharge to Ocean = 3.5 MAF
- 2030 Potential Net New Recycled Water Development = 1.2 to 1.6 MAF (10 -15% urban)





# California State Major Policy Initiatives

- 2003 Recycled Water Task Force (AB 331)
  - 40 members representing state, federal, public health, industry, environmental, and academia
  - Published “Water Recycling 2030”
  - 26 recommendations (code, education, funding, regulatory streamlining, signing)
- 2010 Adoption of State Recycled Water Policy
  - Major policy adopted by State Water Resources Control Board
  - “Mandated” 300,000 AF of new recycled water by 2030
  - Key areas and Issues: Salt/Nutrient management plans, streamlined permitting (landscape), groundwater recharge criteria, and established “blue ribbon” CEC expert panel/report







# California State Legislative Initiatives

## 2010 Water Bond

- \$1.2 billion for water recycling
- Likely deferred to 2012

## AB 565 (Pavley)

- Require 50% of all wastewater discharged ocean to be recycled by 2030
- Failed passage, engaged interest in direct and indirect potable reuse



## SB 283 (DeSalunier)

- Required amendment of plumbing code for indoor use of recycled water in condominiums

***Legislature and Administration have strong recycled water policy interests***



# Supply Trend – Direct Potable Reuse

- Why Direct Potable Reuse?
- Indirect Potable Reuse not feasible for applications
  - Incompatibility geology
  - Insufficient surface storage capacity
  - Poor quality diluent
- Large scale “purple pipe” systems
  - Expensive to retrofit in many cases
  - Inadequate customer density
  - Won’t alone achieve the California Water plan 2030 potential increase in water recycling (1.2 to 1.6 MAF)





## Supply Trend – Direct Potable Reuse

- WaterReuse California established goal (August 2009)
  - Assess barriers to Direct Potable Reuse
  - Eliminate barriers as appropriate
- Solicited funding for Workplan development
- Conducted 52 person national expert workshop to identify and address barriers (April 2010)
- Develop Workplan (Summer 2010)
  - Define research/studies
  - Identify potential funding sources (public/private)
  - Schedule, roles
- Workplan Implementation - 2011 and beyond





# Supply Trend – Direct Potable Reuse

- Key Workplan Areas and 22 key findings from workshop
  - *Public Acceptance* - terminology, safety, “natural barrier” or “environmental buffer”
  - *Regulatory* - source control, oversight, performance standards
  - *Treatment* - treatment performance reliability/redundancy
  - *Monitoring* - substitute for environmental buffer: treatment, time, monitoring, reliability, and response
- Legislation: SB 918 (Pavley)- DPH to develop “uniform recycling criteria” for IPR and feasibility for PR.
- National and international attention: effort underway in Florida



# Trends in Recycled Water Supply Sources and Project Delivery

## Satellite Recycling: distributed treatment and localized recycled water systems

- Small, localized “scalping” treatment plants with limited distribution systems
- Recycled water purveyor advantages:
  - Avoid large-scale pumping, storage, transmission and distribution system retrofit costs
  - Package treatment plant cost effectiveness and reliability rapidly increasing
  - System can be strategically located – target high demand users
  - Can be modularly expanded and phased







# Trends in Recycled Water Supply Sources and Project Delivery – Satellite Recycling

## *Example: City of Anaheim Demonstration Project*

- Demonstration project studied: 100,000 GPD (modularly 50,000 GPD phases).
- Membrane Bioreactor and UV to treat to recycled water standards (Title 22).
- Located in civic center parking lot - small footprint completely enclosed with buried finished water tank.
  - Irrigation, toilet flushing, ice rink and other uses at City Hall and in civic center area.
- Total construction costs estimated at \$6.0 MM (2009); first phase \$3.5 MM.

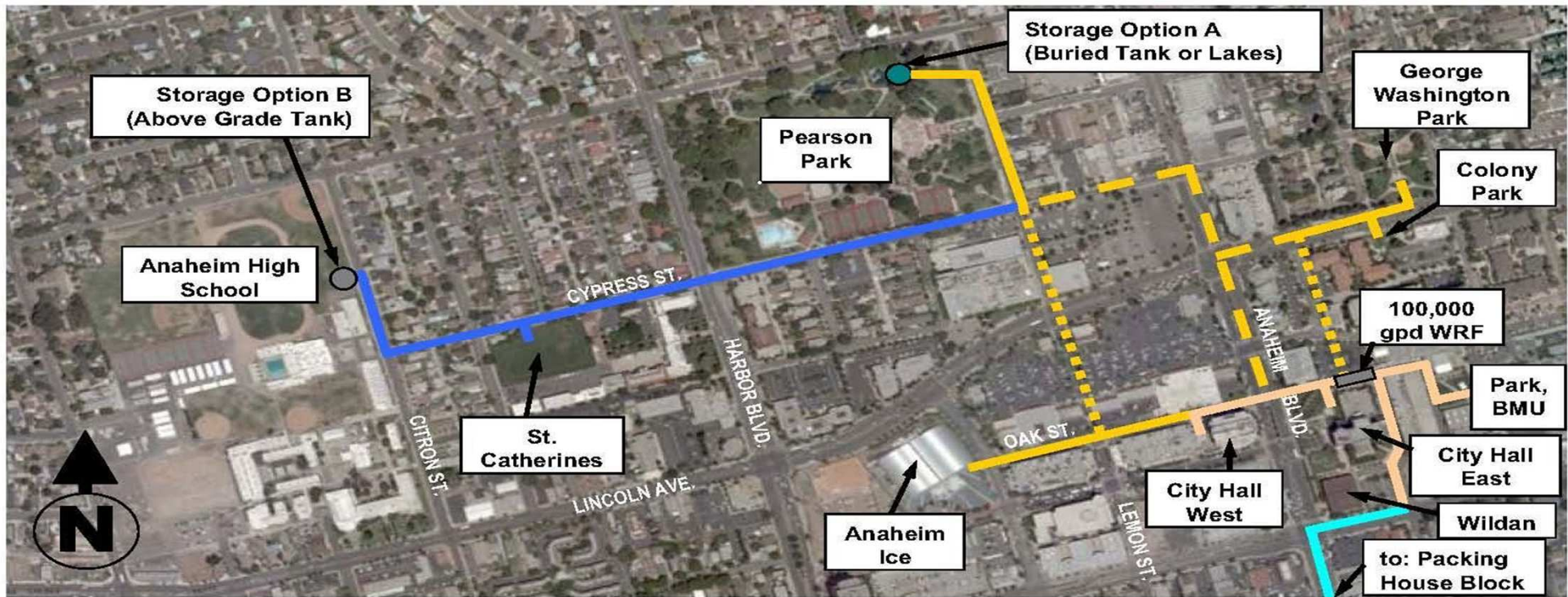




# City of Anaheim Concept Project



## Water Recycling Demonstration Project Overview



### LEGEND

#### PHASES:

- Phase 1 – City Hall East, City Hall West, Park (at future BMU Project)
- Phase 2 – Pearson Park, George Washington Park, Colony Park, Anaheim Ice
- Phase 3 - Anaheim High School, St. Catherine's Military Academy
- Phase 4 – BMU, Wildan, Packing House Block Projects

#### PIPELINE TYPES:

- Backbone Pipe
- Pipeline Alt A
- Pipeline Alt B



# Trends in Recycled Water Supply Sources and Project Delivery – Satellite Recycling

- Wastewater agency disadvantages:
  - Sewage strength is concentrated (BOD, TSS, etc.) impacting regional treatment plant designed operation
  - Collection system function and maintenance (grit, odor control, etc.)
- Policy Considerations
  - “Rights” to wastewater
  - Stranded wastewater treatment and disposal costs





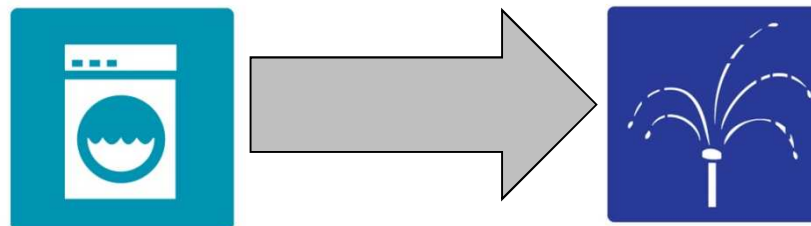


## Trends in Recycled Water Supply Sources and Project Delivery – Graywater Systems

- Significant national and international trend in sustainable community/Low Impact Development (LID):
  - Ultimate “local” reuse system
  - Frequently confused with or assumed to be “recycled” water
  - Water quality, engineering, health and safety standards and regulations underdeveloped and not uniform

***however***

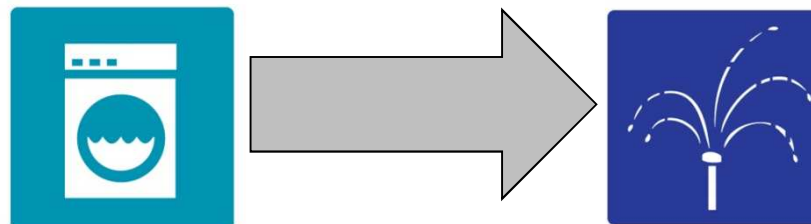
- Provides an additional water supply and type of water reuse where other recycled water projects may be infeasible





## Trends in Recycled Water Supply Sources and Project Delivery – Graywater Systems

- Significant external pressures to address graywater
  - California and other states passing legislation to include in plumbing code
  - Green Building standards
  - Pipe labeling – IAPMO code standards “purple pipe”
- Concerns about impacts to recycled water “brand”
  - Highly treated, safe and regulated product
  - Excellent public acceptance for non-potable use
  - Indirect potable applications gaining support – Groundwater Replenishment System







# Trends in Recycled Water Supply Sources and Project Delivery – Graywater Systems

- **WateReuse Association**
  - Commissioned comprehensive whitepaper and adopted a recycled water industry policy in May 2010
  - Policy implemented in two phases:
    1. Distinguish graywater from recycled water and educate policy makers and public
    2. Accept treated graywater reuse where treatment systems, use standards and regulations protect public health and safety
- **Policy Considerations:**
  - Messy regulatory framework - NPDES polluted discharge? Water supply “rights”? Public Health protection?





# Conclusions and Thoughts

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- Water reuse is a critical part of California's future – supply, ocean discharge reduction, GHG reduction, Low Impact Development
- Legislature, administration, regulators and water industry are making continuous policy and regulatory strides forward
- Public acceptance of recycled water is constantly improving
- Exciting trends in areas such as potable reuse implementation, satellite treatment and local distribution systems, and graywater integration will present challenges and opportunities



# Questions?



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