Southern California Water Dialogue

Taking Action – Three Approaches to Increasing Water Supply

June 22, 2022

Southern California Water Dialogue Co-chairs

CONNER EVERTS

Executive Director

Southern California Watershed Alliance

DEE ZINKE

Assistant General Manager/Chief External Affairs Officer, External Affairs

The Metropolitan Water District of Southern California

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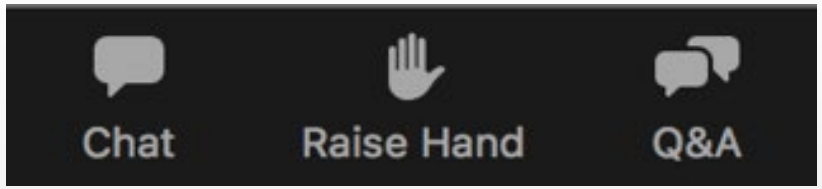

- **Technical Difficulties:** Use chat feature to let us know
- **Asking a Question:** Use Q/A feature, type in question, and click send. Questions addressed after presentation.
- **Poor Connection:** Move closer to your wireless router and turn off other services using bandwidth (e.g. Netflix)
- **Audio Muted:** Attendee audio on mute by default
- **Timetable**: Presentation runs apx 60 minutes followed by Q/A session

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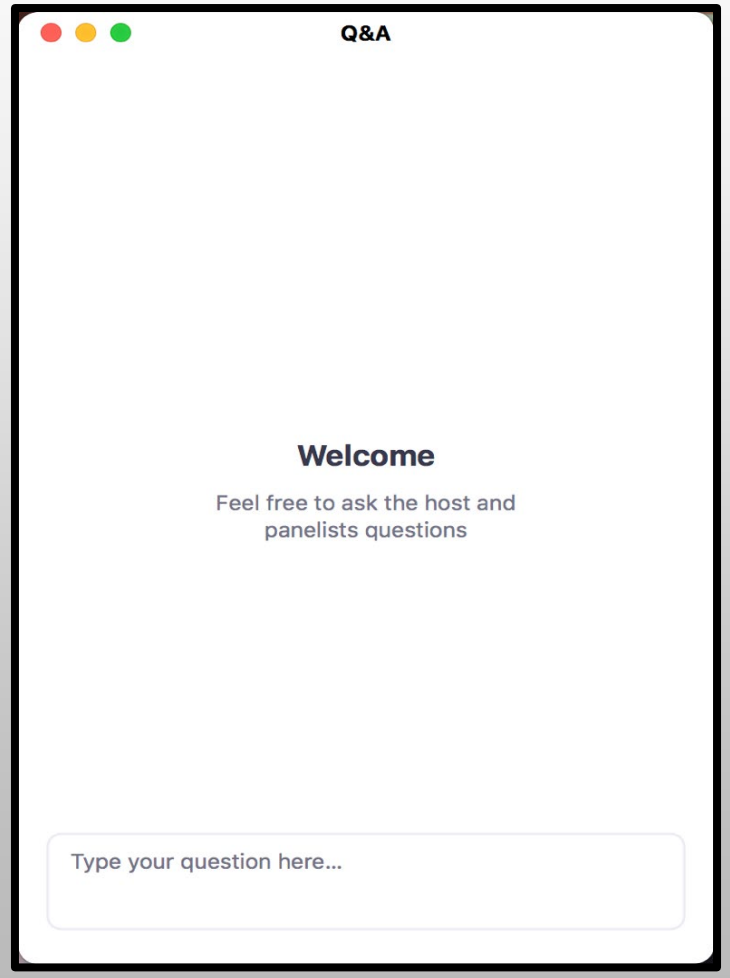

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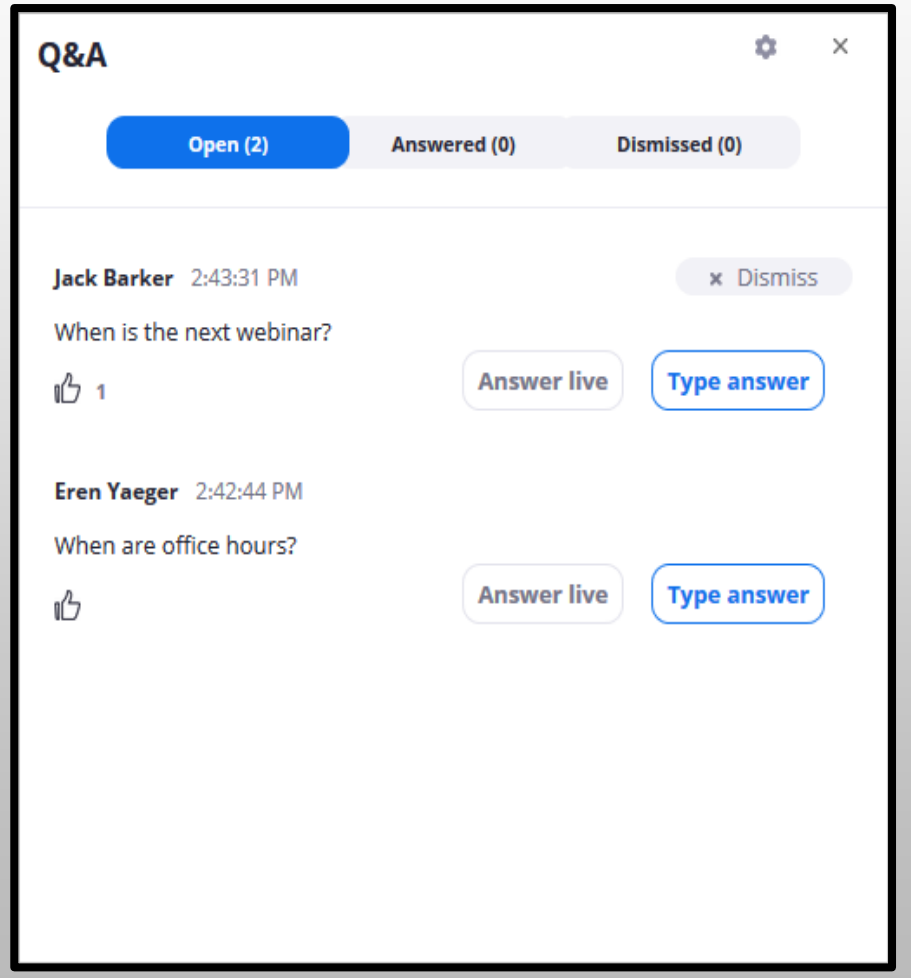

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Agenda

- Announcements and Introduction of Speaker
- Topic overview – by Conner Everts
- Discussion
- Dialogue (Q/A) – Led by Conner Everts
- Concluding remarks

Speakers

Rebecca Abbott, P.E., East County Advanced Water Purification Program, Engineering Manager, Padre Dam Water District

Shivaji Deshmukh, P.E., General Manager, Inland Empire Utilities Agency

Elizabeth Hurst, Chino Basin Program Manager, Inland Empire Utilities Agency

Azita Yazdani, P.E., Founder and CEO, Exergy Systems, Inc.

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Inland Empire Utilities Agency
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Southern California Water Dialogue Meeting

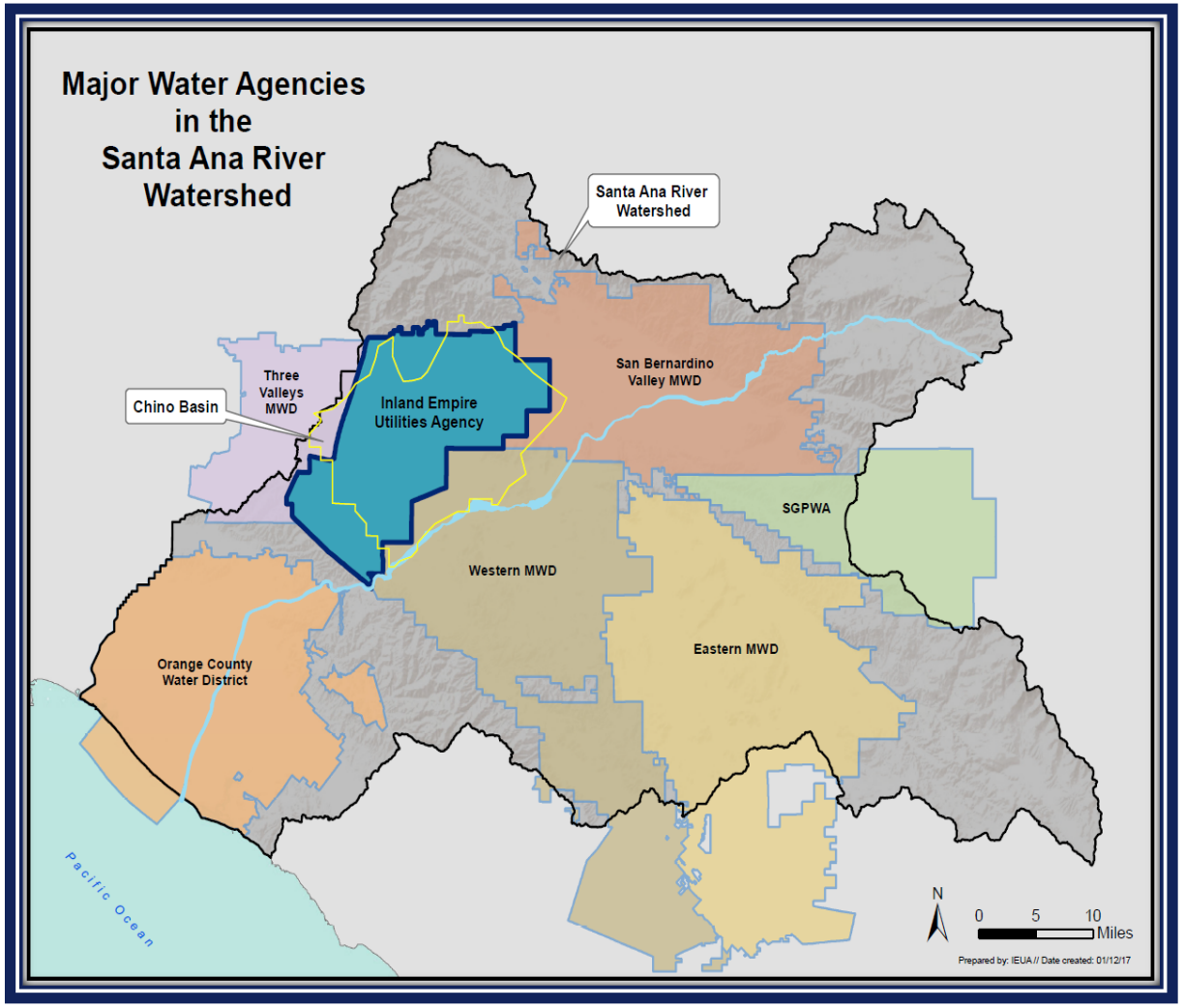
Shivaji Deshmukh, P.E.
IEUA General Manager

Elizabeth Hurst
Chino Basin Program Manager

June 22, 2022

About IEUA…

- Located in the southwestern portion of San Bernardino County
- 875,000 residents in our service area
- 242 – square miles
- Contracting and retail agencies:
  - City of Chino
  - City of Chino Hills
  - Cucamonga Valley Water District
  - City of Fontana
  - City of Montclair
  - City of Ontario
  - City of Upland
  - Fontana Water Company
  - Monte Vista Water District



Water and Wastewater Operations

- Wholesale Imported & Recycled Water
  - —Delivers 32,000 acre-feet (AF) of recycled water
  - —Delivers more than 60,000 AF of imported water
- Wastewater Treatment
  - —Approximately 53 million gallons of water per day (MGD) is received for treatment

FACT: One acre-foot is enough water to provide to three families for an entire year.

IEUA Treatment Facilities

Tours available upon request

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RP-1

City of Ontario

Treatment capacity of 44 million gallons per day of wastewater

RP-2

City of Chino

Will be decommissioned following RP-5 expansion

Carbon Canyon

City of Chino

Treatment capacity of 11.4 million gallons per day of wastewater

RP-4

City of Rancho Cucamonga

Home of the 1 megawatt wind turbine and the Inland Empire Regional Composting Facility

RP-5

City of Chino

Expansion project started Oct. 2020

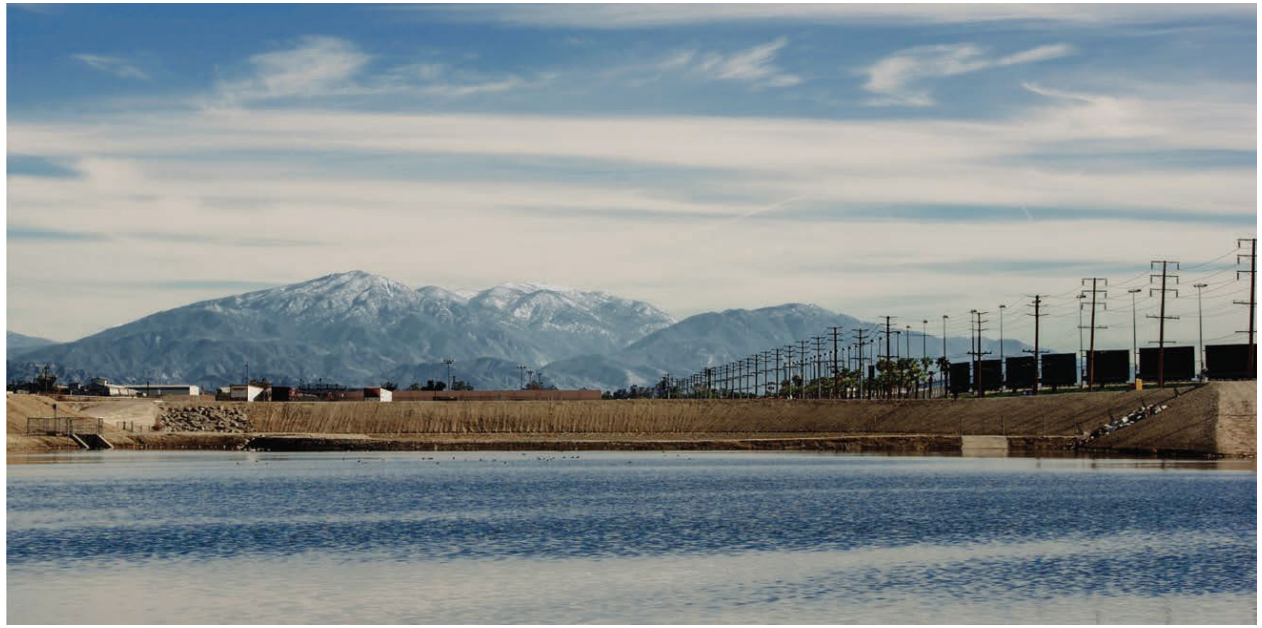
Recycled Water

- Not impacted by climate
- Only new major source of water available to meet southern California's growing water demand
- More than 850 connections
- Recycled water makes up 17 percent of the water supply for the region
- **FY 2020/21:** Average recycled water supply from IEUA's facilities was approximately 50.1 MGD or 56,140 AF

APPROPRIATE USES FOR RECYCLED WATER INCLUDE: Irrigation, landscaping, golf courses, farms, industrial cooling, parks, cemeteries, construction, recreational lakes, groundwater recharge, industrial processing, and median strips.

Groundwater Recharge

- Enhances water supply reliability and improves drinking water quality throughout the greater Chino Basin
- 18 recharge sites
- Captures runoff from storms, imported water from the State Water Project and high-quality recycled water from IEUA's distribution system
- **FY 2020/2021:** IEUA recharged 16,253 AF of recycled water and 4,883 AF of stormwater/local runoff

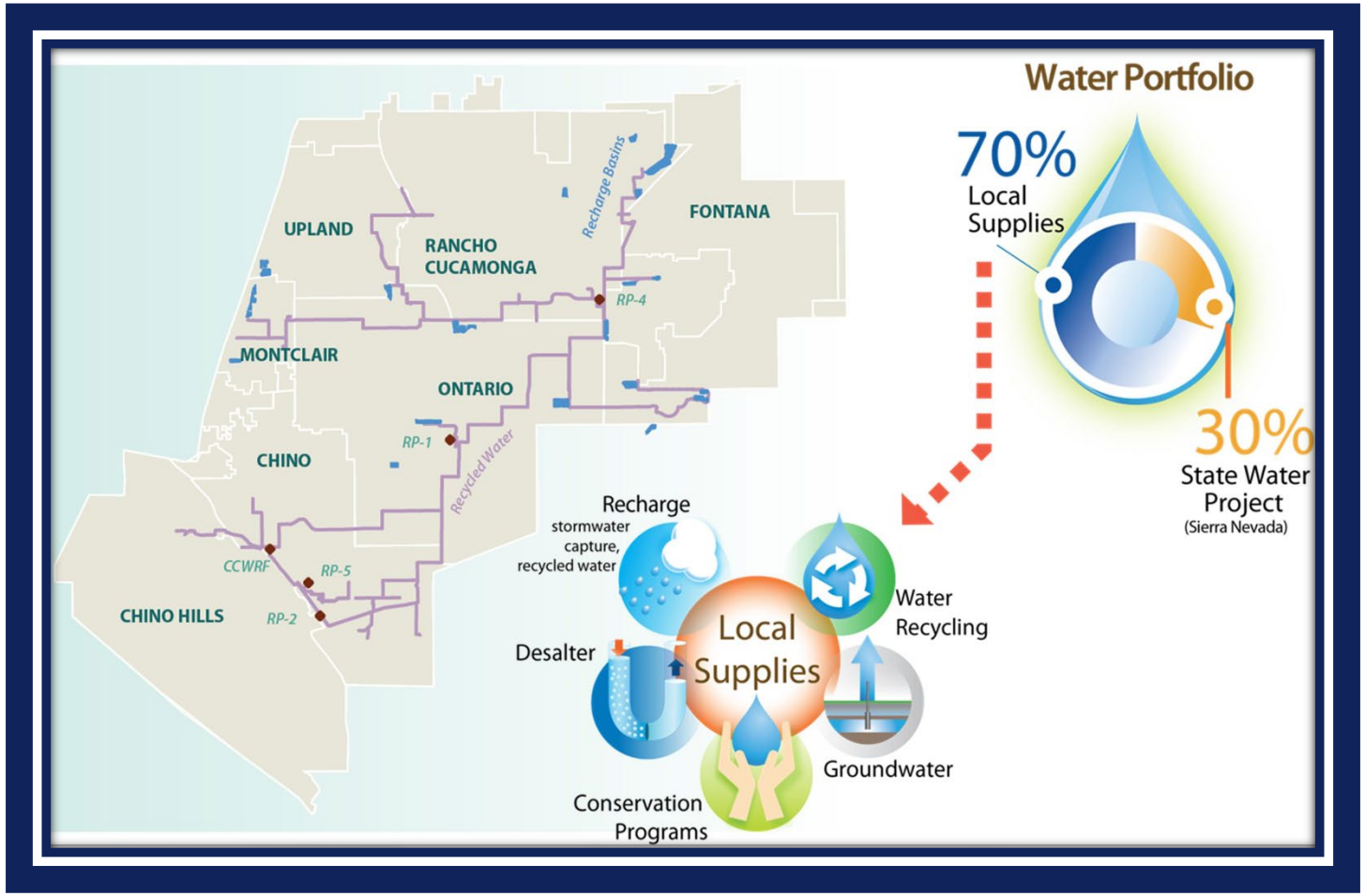


Hickory Basin

Energy Management Plan

- Energy accounts for 25% of non-labor operations and maintenance costs
- Portfolio: MW = Megawatt
  - 5.0 MW Solar
  - 1.0 MW Wind Turbine
  - 4.0 MW Battery Storage
- **FY 2020/2021:** Energy Optimization programs generated 10% of the electricity consumed from renewable energy
- Renewable energy generated in FY 2020/21 would be able to provide electricity to at least 673 homes for one year

Regional Water Portfolio



California Water

- Imported Supplies
- Groundwater
- Stormwater
- Water Transfers
- Desalination
- Water Recycling

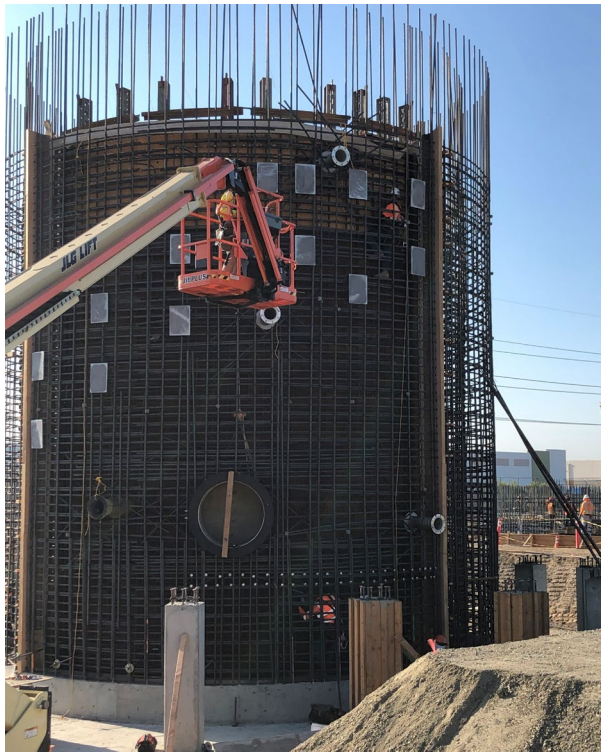
Current Priorities

- Regional Contract
- **RP-5 Expansion Project**
- Meter Equivalent Unit (MEU) Rate
- Customer Relations
- **Chino Basin Program I WSIP**
- Drought Status and Water Supply Awareness

RP-5 Expansion Project

- Goals
  - Address increased flow, projected regional growth, an anticipated increase in capacity needs, and allow for the decommissioning of RP-2
- $330 million construction cost
  - $297 million: Low-interest loans
  - $5.9 million: Sales and use tax exclusion from the California Alternative Energy and Advanced Transportation Financing authority
  - Remainder is pay-go from rates, connection fees and property taxes
- Current Design Capacity: 16.3 MGD
- Project Design Capacity: 22.5 MGD
  - Ultimate buildout to treat average flow of 30 MGD and peak flow of 60 MGD
- Two separate milestones
  - Liquids Treatment Expansion
  - Solids Treatment Facility
- Project Completion: 2025

RP-5 during construction



Team installing stair embeds at the new acid phase digester, which will stand at a final height of approximately 65 feet tall

Chino Basin Program | WSIP

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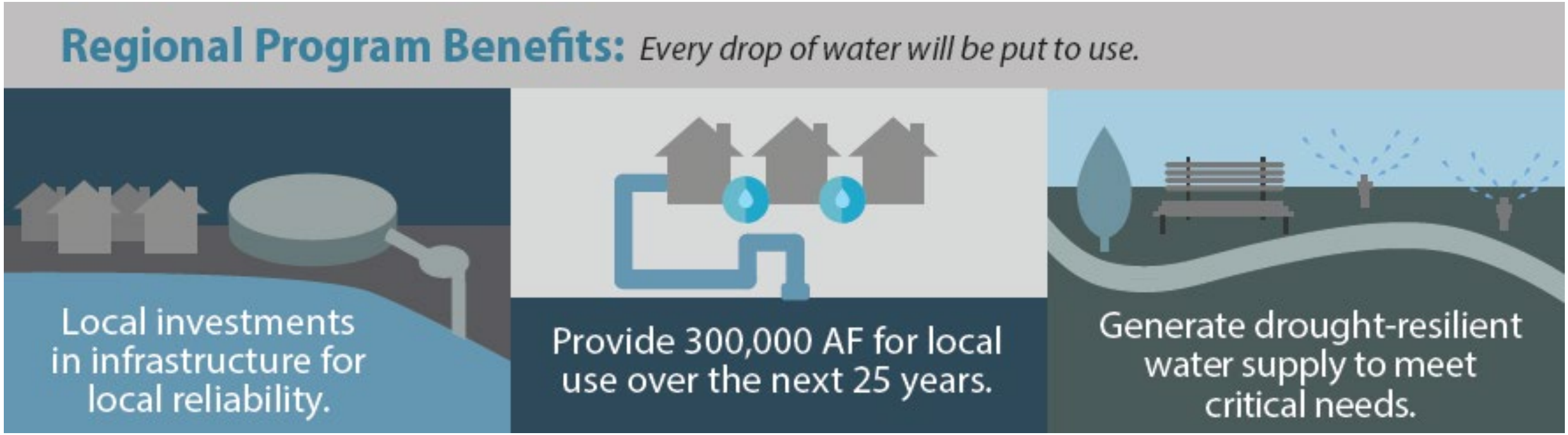
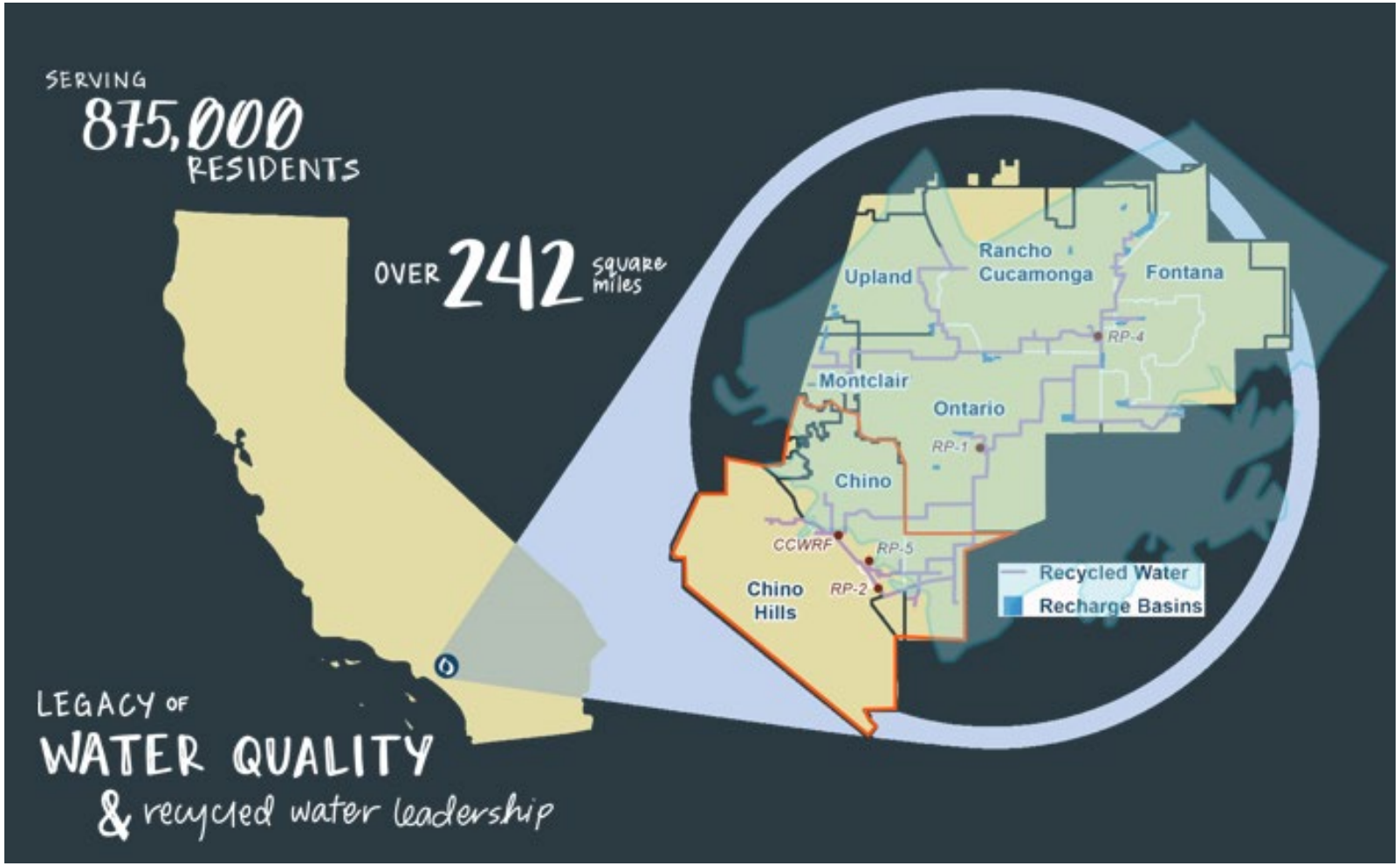
CBP



Background | Local Challenges



Imported water from Metropolitan is 30% of water supplies

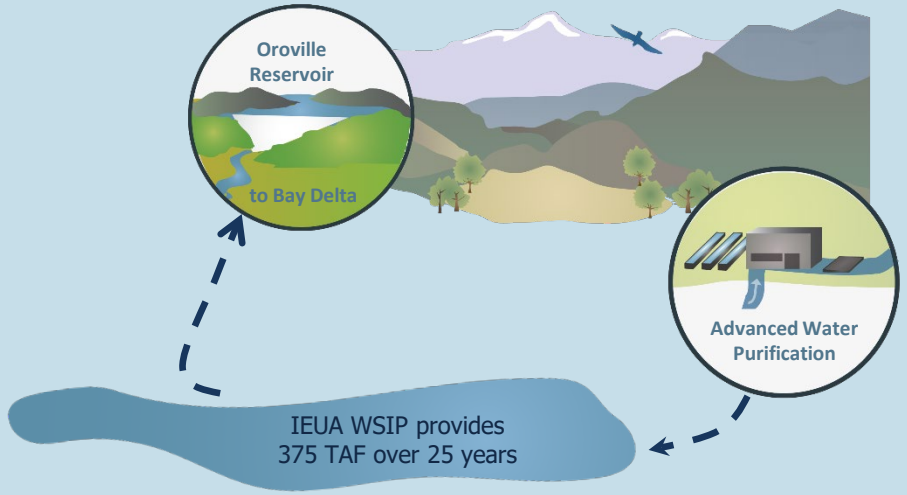
- State Water Project constrained area
- 2022: 5% allocation
- Subject to environmental flow restrictions

Local need for Advanced Water Purification Facilities (AWPF)

- Wastewater permit compliance by 2030
- Meet Basin Plan commitments
- Opportunity to build infrastructure for future Direct Potable Reuse

Background

Water Exchange
supports **local resource development** and provides water to **native ecosystems** where they need it, when they need it



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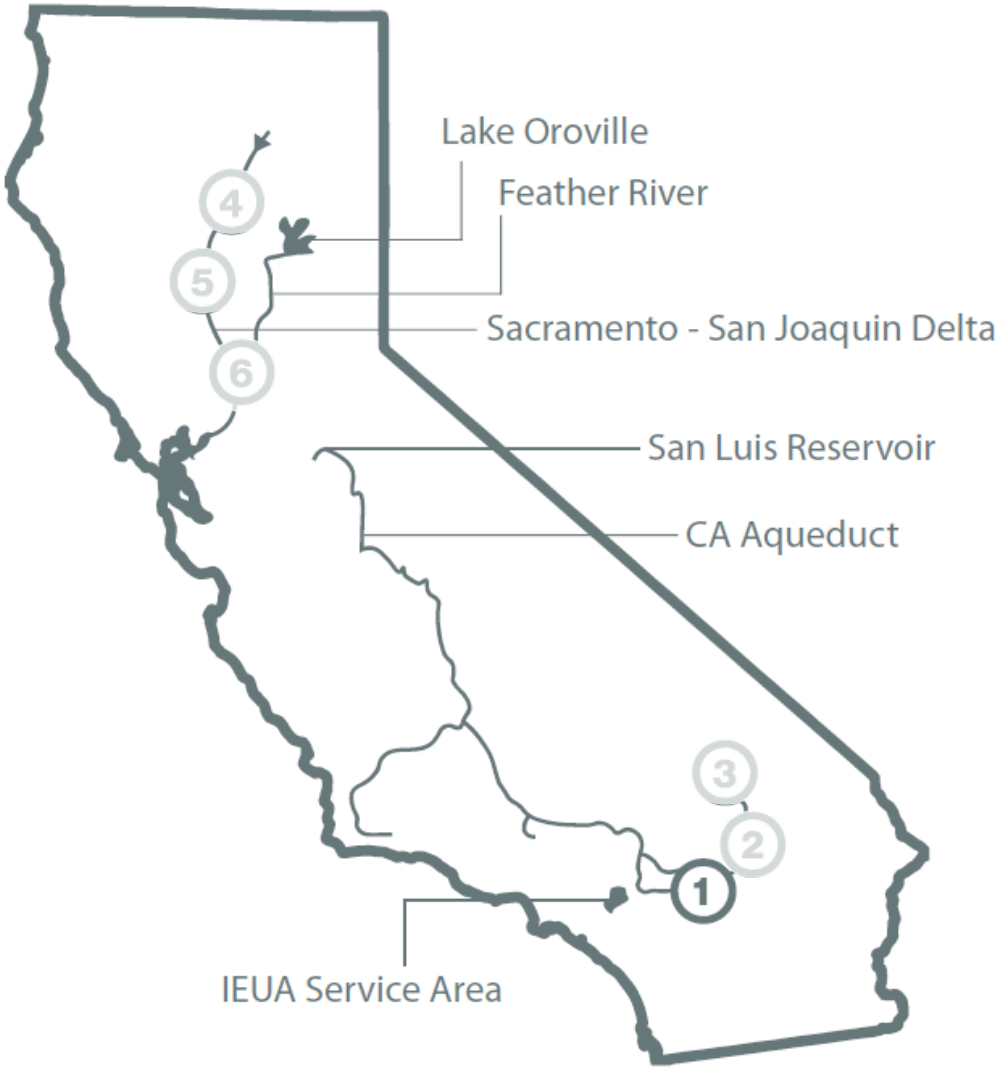
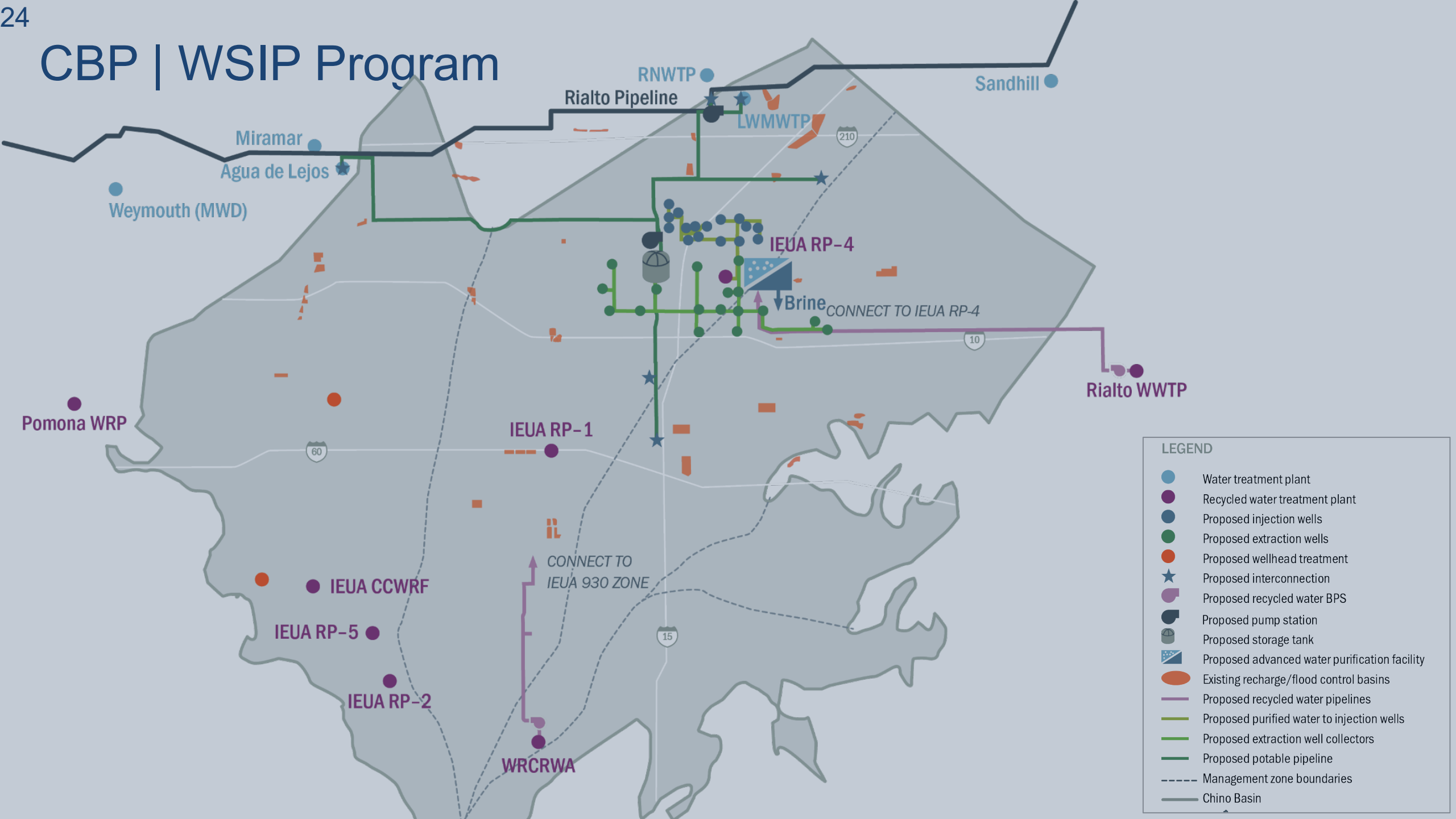
CBP | WSIP Overview

1. Advanced treatment of recycled water supplies
2. Store treated water in the Chino Groundwater Basin
3. Pump groundwater from storage in dry years
4. State releases water from Lake Oroville reservoir
5. Released water flows to the Feather River to improve survival of migrating salmon
6. Water flows downstream through the Bay Delta, to the ocean



CBP | WSIP Program

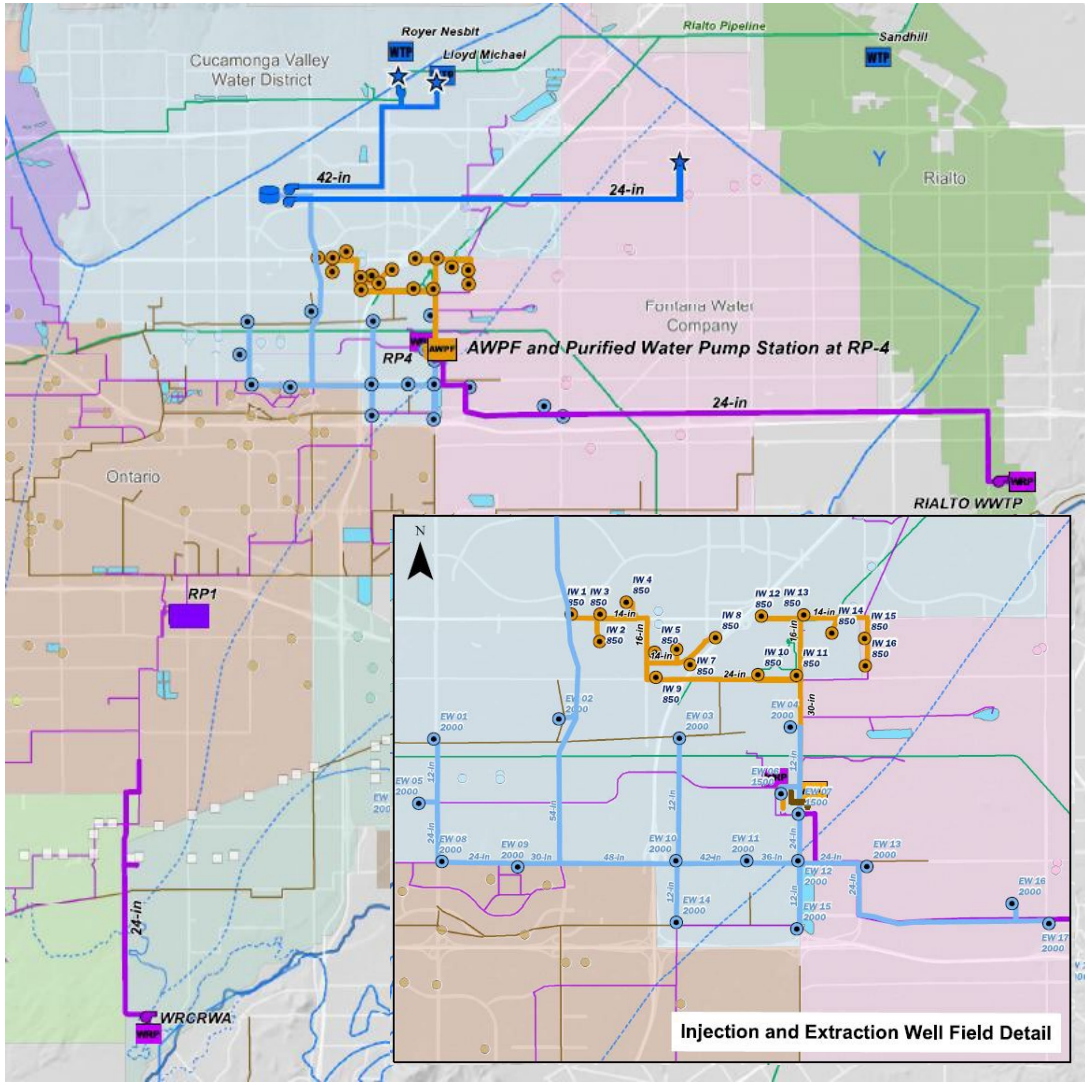


CBP | WSIP Program

Facilities:

- 15,000 AF/year AWPF at RP-4
- Advanced treated recycled water pipeline
- 15,000 AF/year Injection wells
- 6,000 AF/year external water supply sources
- 40,000 AF/year Extraction wells
- Potable water pipelines & Reservoir
- Interconnection to Metropolitan's Rialto Pipeline

Capital Cost: $650 M (2019$)



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Politics & Agreements Overview

IEUA Water & Wastewater Agencies

- Chino
- Chino Hills
- Upland
- Ontario
- CVWD
- FWC
- Fontana
- Montclair
- MVWD

Neighboring Agencies

- Pomona
- Three Valleys MWD
- JCSD
- Rialto
- Western MWD
- WRCRWA

Metropolitan Water District

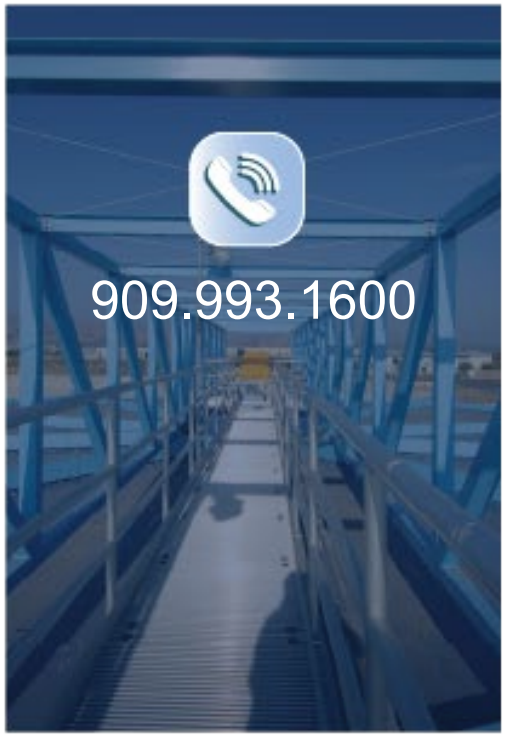
Chino Basin Watermaster

- Ag Pool
- Non Ag Pool
- Appropriative Pool

State of California Departments/Agencies

- Department of Water Resources (& State Water Contractors)
- State Water Resources Control Board
- California Department of Fish & Wildlife
- California Water Commission

- ~10 Agreements with IEUA Agencies + Neighboring Agencies
- Performance requirements with Metropolitan
- 3-4 State Agreements
- CBWM Storage and Recovery Application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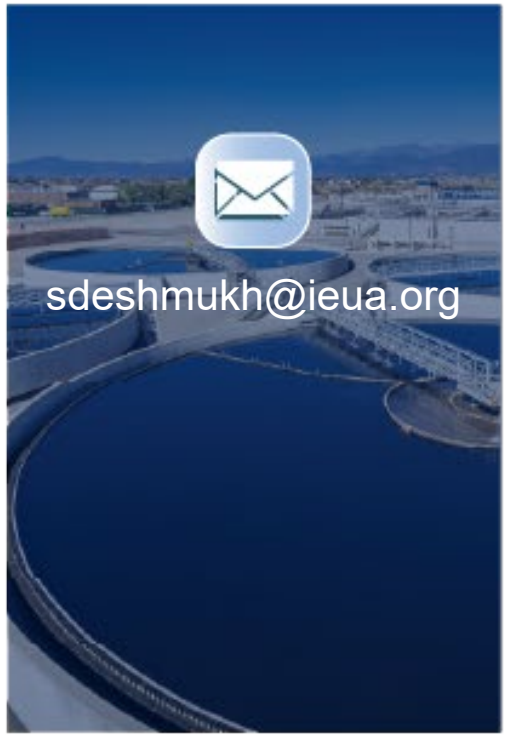
sdeshmukh@ieua.org


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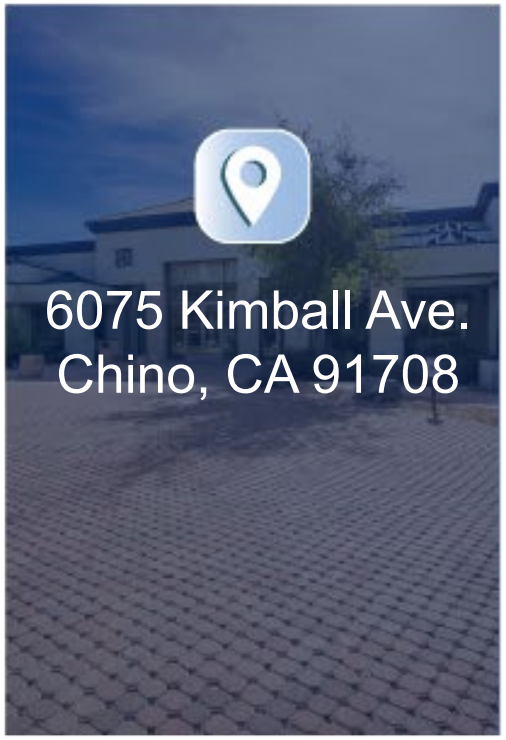
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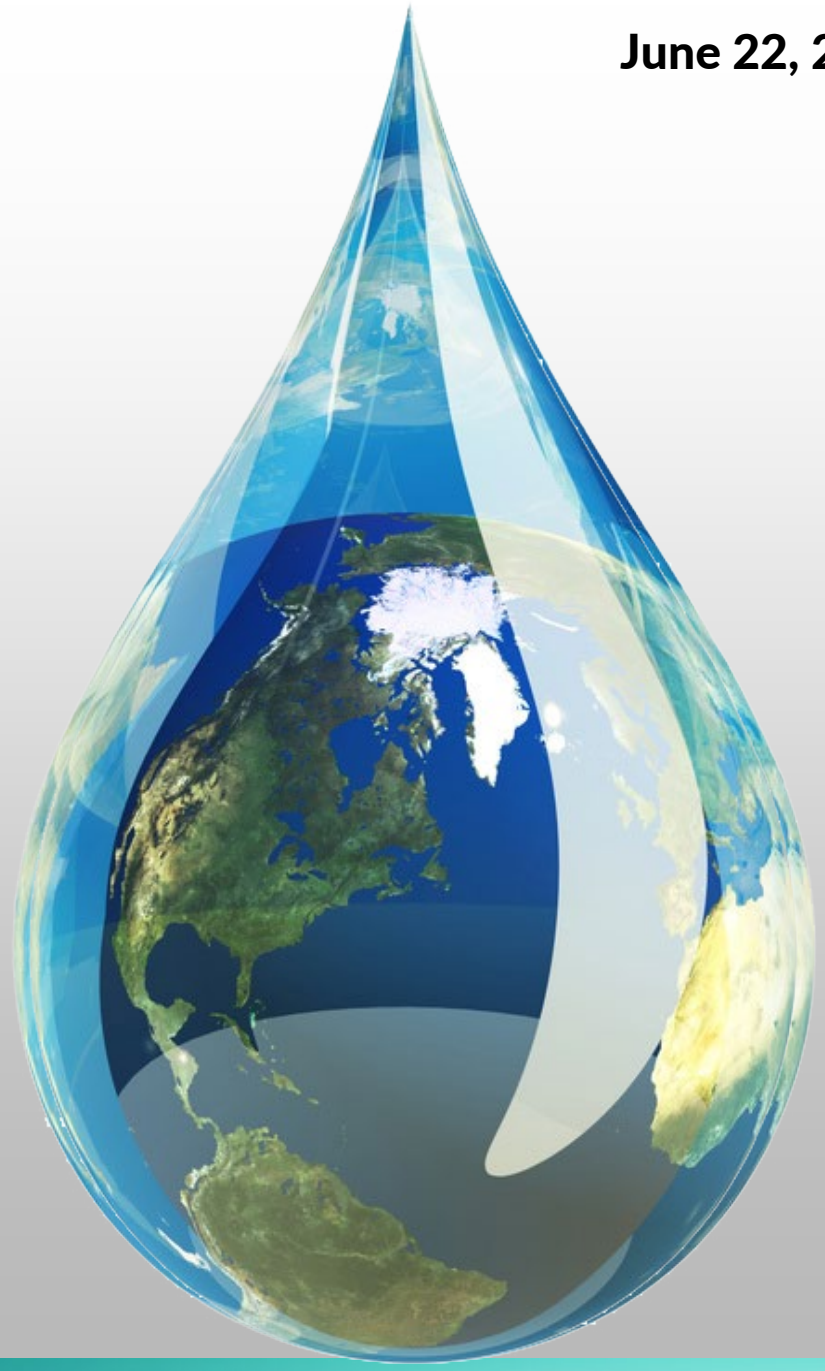
Advanced Technologies for Circular Economy



Distributed/Point of Use Water Purification and Recovery in Water:

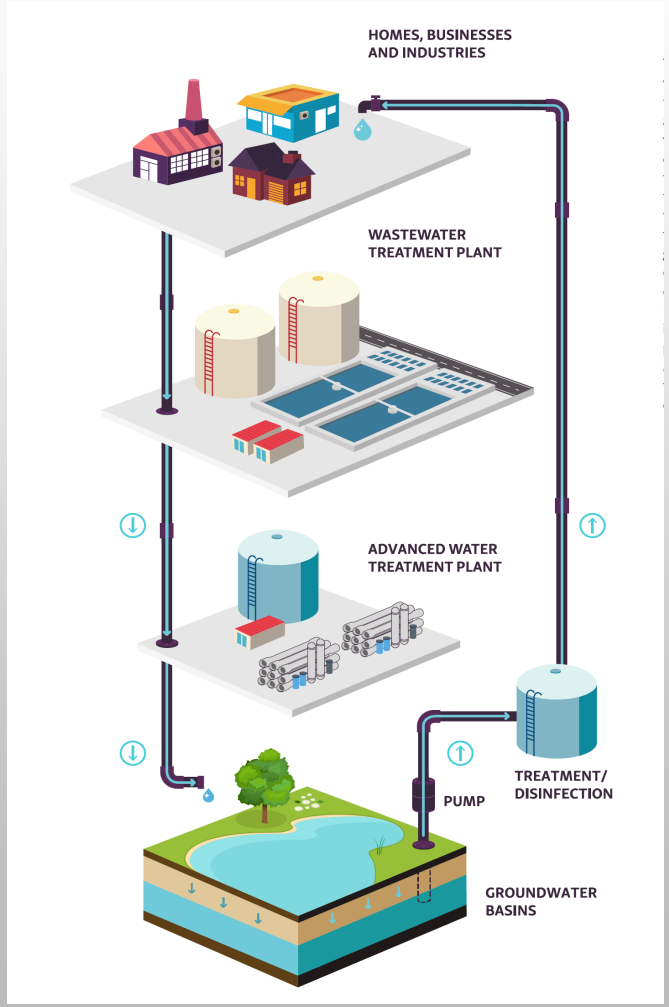
A Discussion of Needs and Technology Solutions

Presented to:
So. Cal Water Dialogue

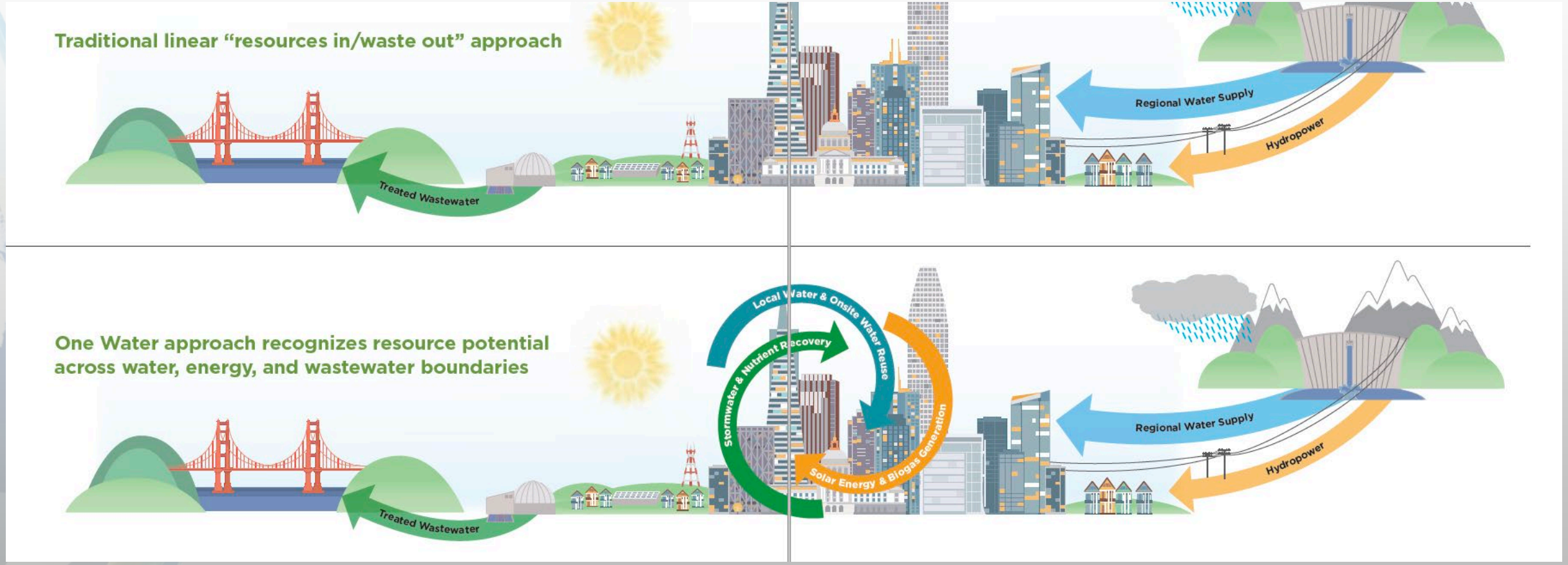
Sustainable Development Awards

Water Does not Flow Uphill: Continuous Use and Waste

- Potable water is not needed or necessary for all things- i.e. toilette flushing and irrigation
- Meeting demands locally/ decentrally is cheaper than delivering water and managing wastes - from miles away
- Localized systems are more technologically adaptive and better address technical needs/inequality



Changing our Water Paradigm from Liner to Circular

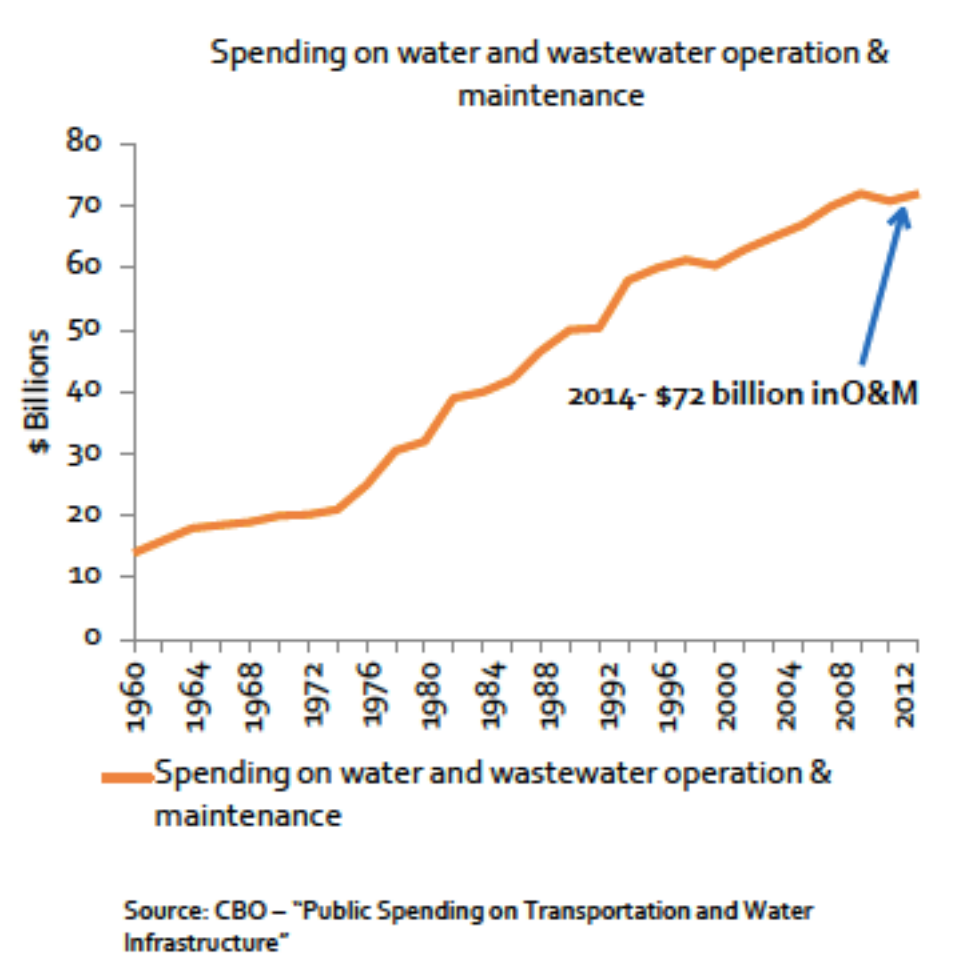


Source: City of San Francisco

Ovewview of Drivers That Demand Change in our Existing Approaches

- ❑ Too Expensive to Manage - Aging water and wastewater infrastructure is breaking the bank across the US & globally
- ❑ Technologically Dated and/or Deficient - Central water and wastewater treatment systems are challenged and cannot address some contaminants and emerging pollutants
- ❑ New Paradigms Requires New Approaches:
  - Why use potable water to flush toilets?
  - Why build central plants when there is not enough water flowing in our sewer systems?

Aging Water Infrastructure with Major Investment Needs



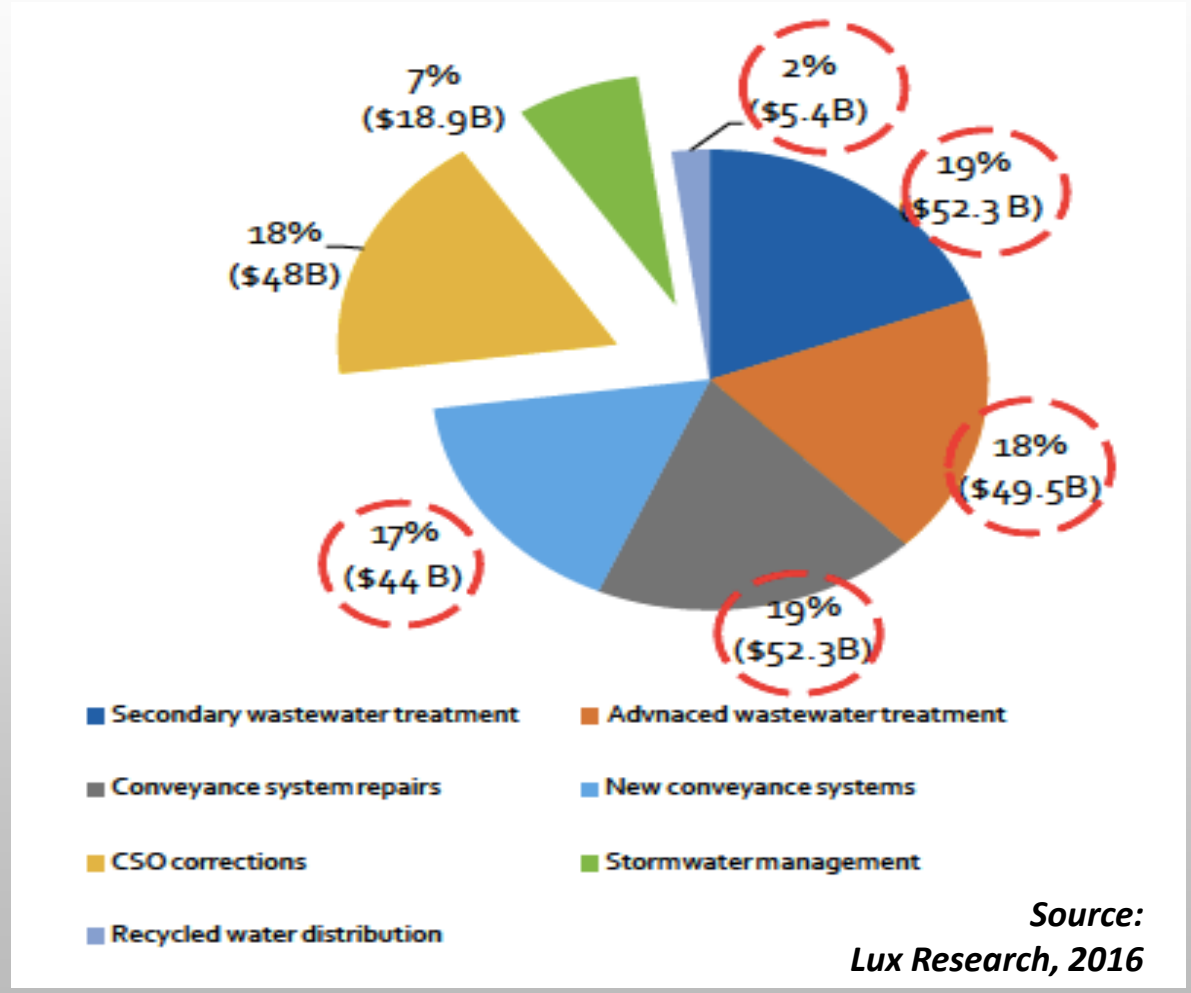
- A majority of O&M spending is in repair and replacing old pipes and mains
- Investments of over $100B is projected
- 60% of drinking water funding are related to pipe infrastructure – *U.S. EPA*

Wastewater Infrastructure Requires $Bs in Capital Investments to Update

U.S. EPA survey - 15,000 plants require $271 billion in capital spending over the next five years (*Source: Lux Research, 2016*):

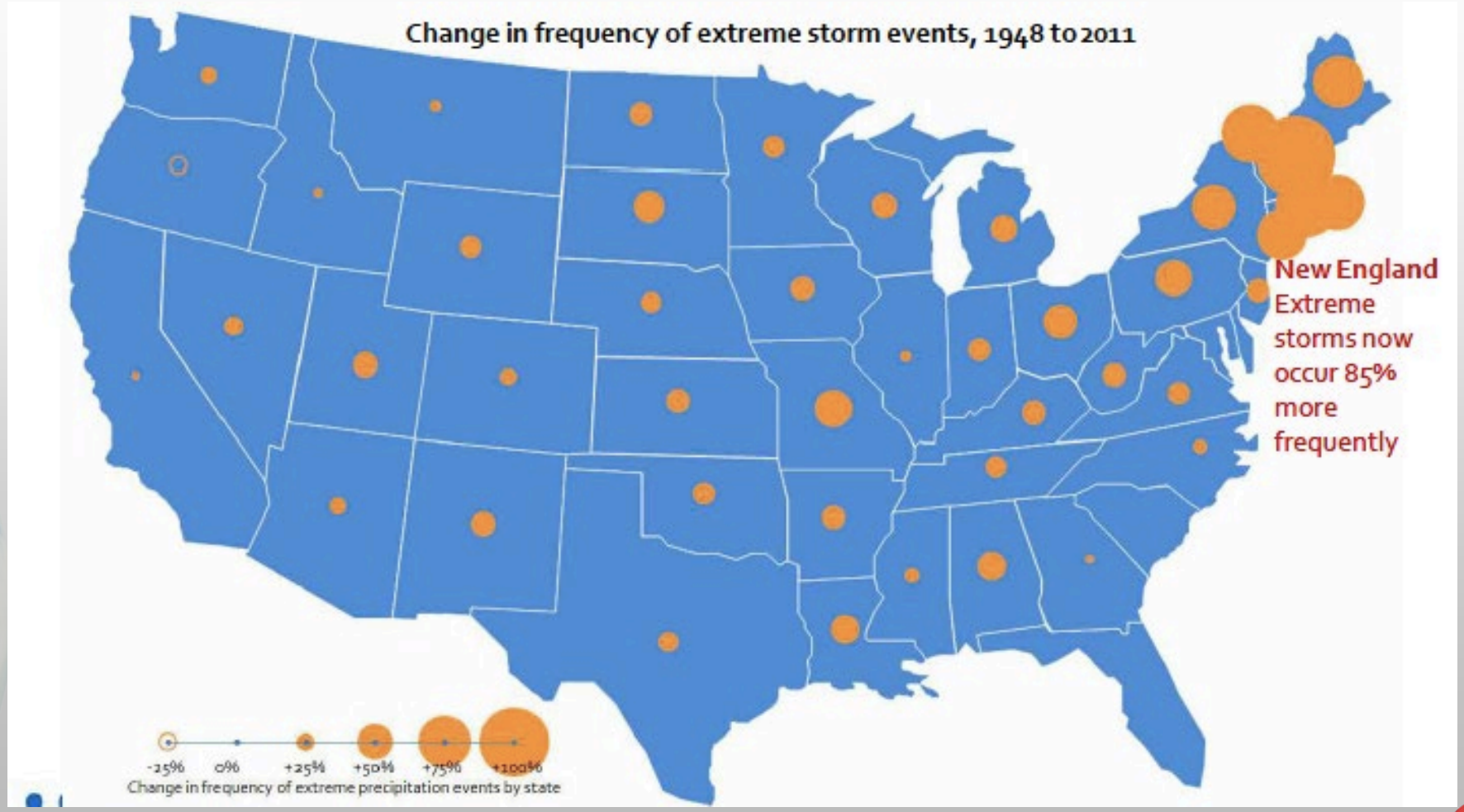
- 75% to modernize wastewater treatment
- 18% allocated to separate overflow from sewer lines
- 7% Plans for Stormwater conveyance

> "Access to centralized treatment systems is widespread, but the condition of many of these systems is also poor, with aging pipes and inadequate capacity" - ASCE

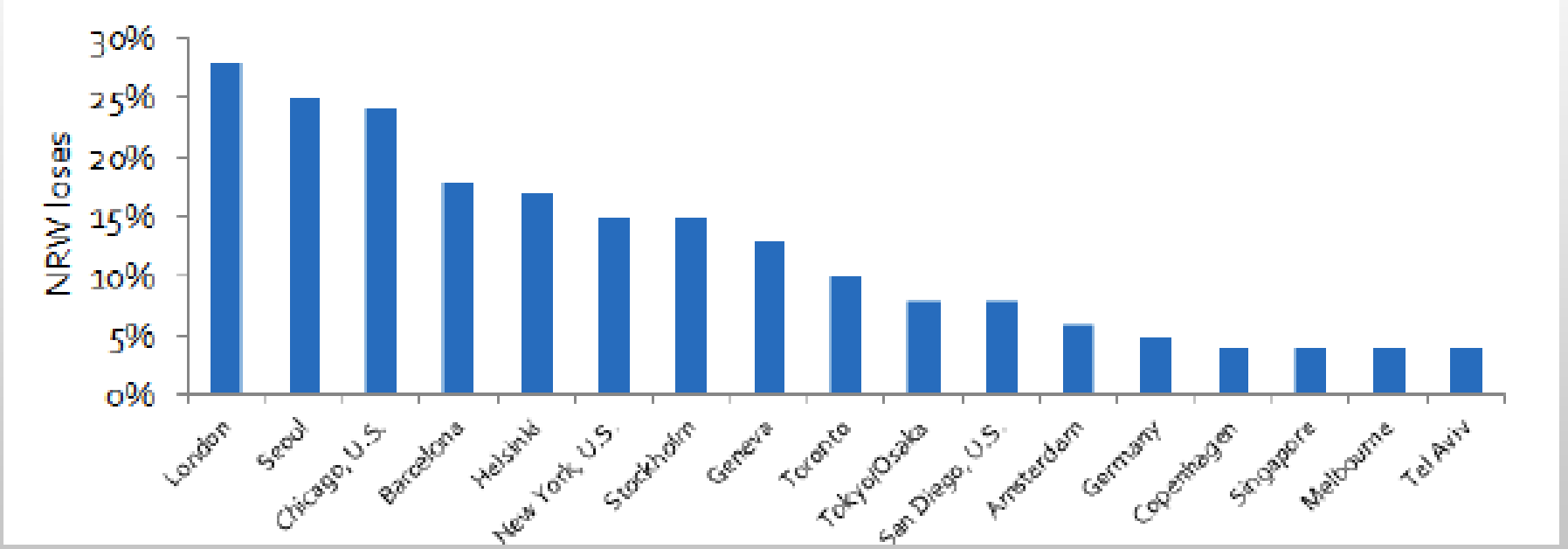


Source: Lux Research, 2016

What is the Right Capacity? Climate and Challenges Populaation Pressures



Pipes in the ground offer no payback: Non Revenue Water loss is as much as 30%



Source: AWE, 2016

Why Invest in Central W/WW Systems When Per Capita Water usage is Decreasing?

CURRENT AND PROJECTED PER CAPITA WATER USE IN THE UNITED STATES

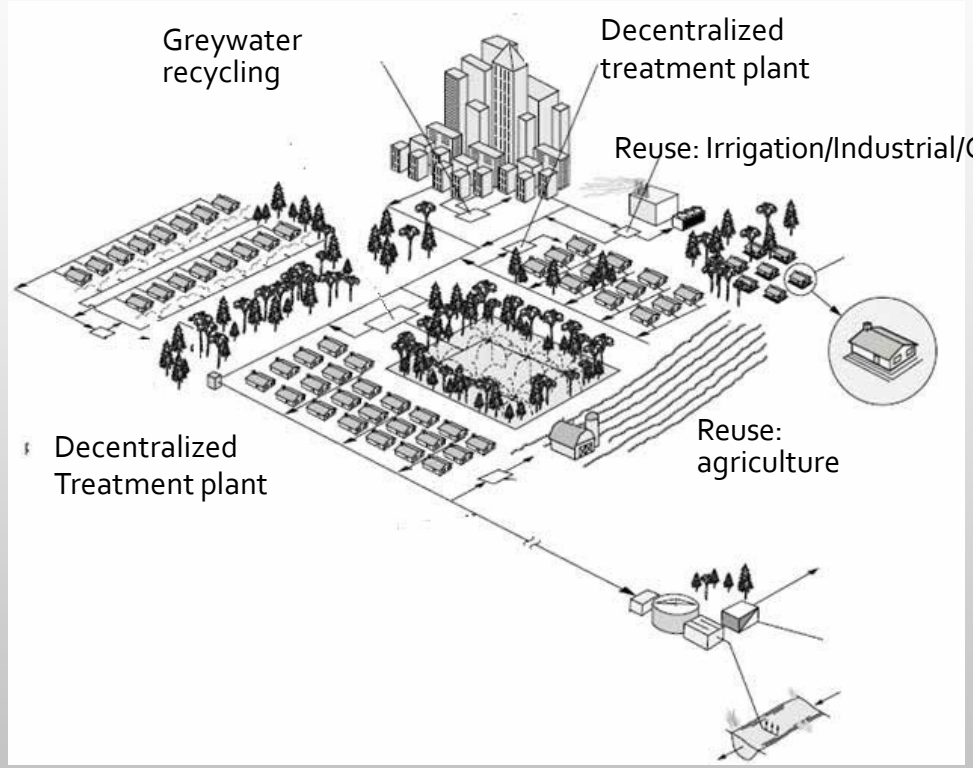
	Flow, gal/capita•d					
	2013		2020		2030	
Use	Range	Typical	Range	Typical	Range	Typical
Domestic						
Indoor use	40 - 80	60	35 - 65	55	30 - 60	45
Outdoor use	16 - 50	35	16 - 50	35	16 - 50	35
Commercial	10 - 75	40	10 - 70	35	10 - 65	30
Public	15 - 25	20	15 - 25	18	15 - 25	15
Loss and waste	15 - 25	20	15 - 25	18	15 - 25	15
Total	96 - 255	175		161		138

84 gal/capita•d in Bay Area to 584 gal/capita•d Northern San Diego

Solution to our Water Dilemma: Distributed/POU Systems

Local and POU systems allow integration of new technologies, continuous adaptability and more effective treatment and recovery:

- Distributed recovery/reuse is more effective by use area
- New technologies and innovations can be more effectively implemented and deployed



Decentralized systems - *"A collection, treatment, and disposal/reuse of wastewater from an individual home, clusters of homes, isolated communities, or institutional facilities, as well as from existing communities, at or near the point of waste generation*

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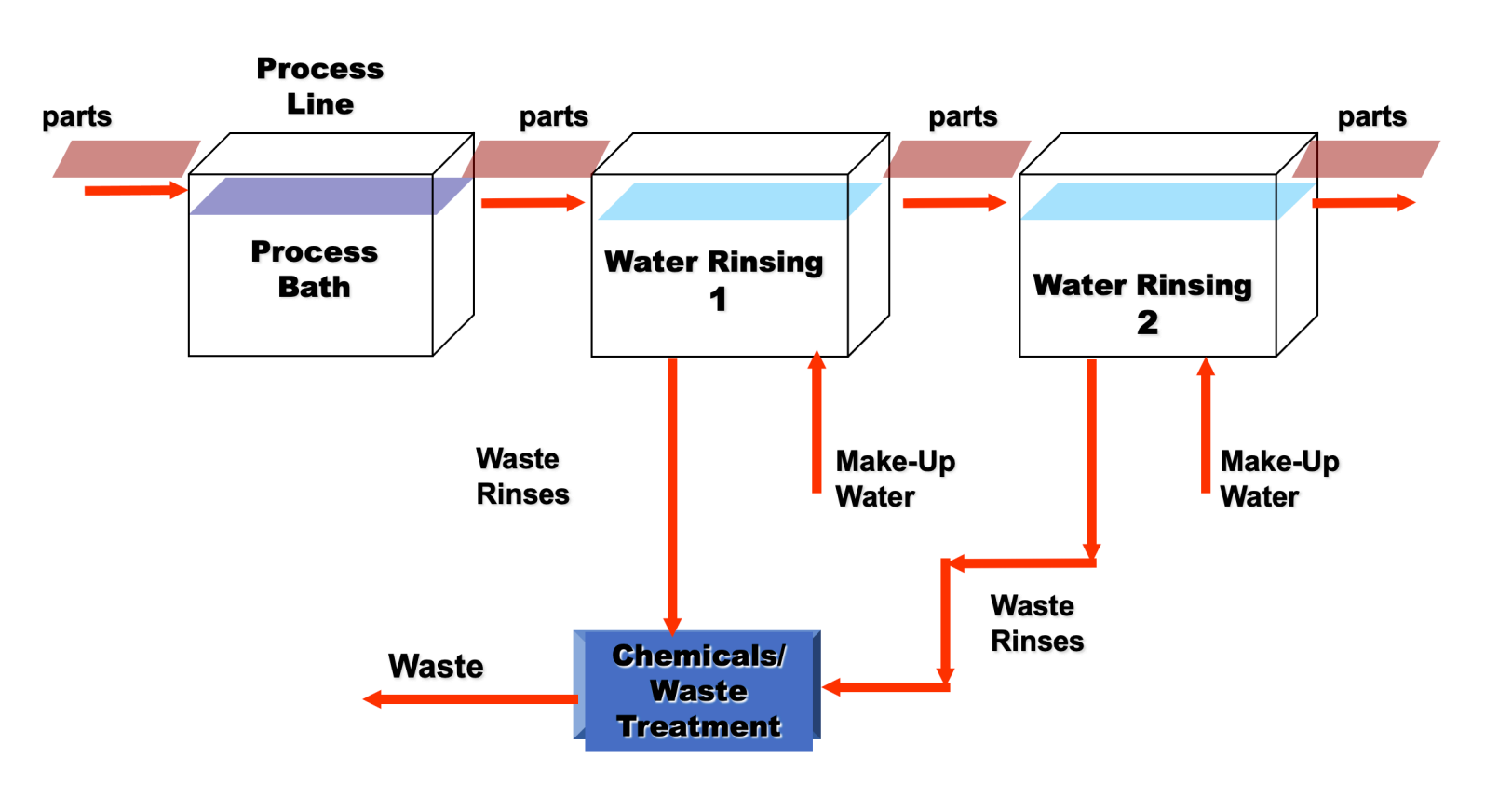
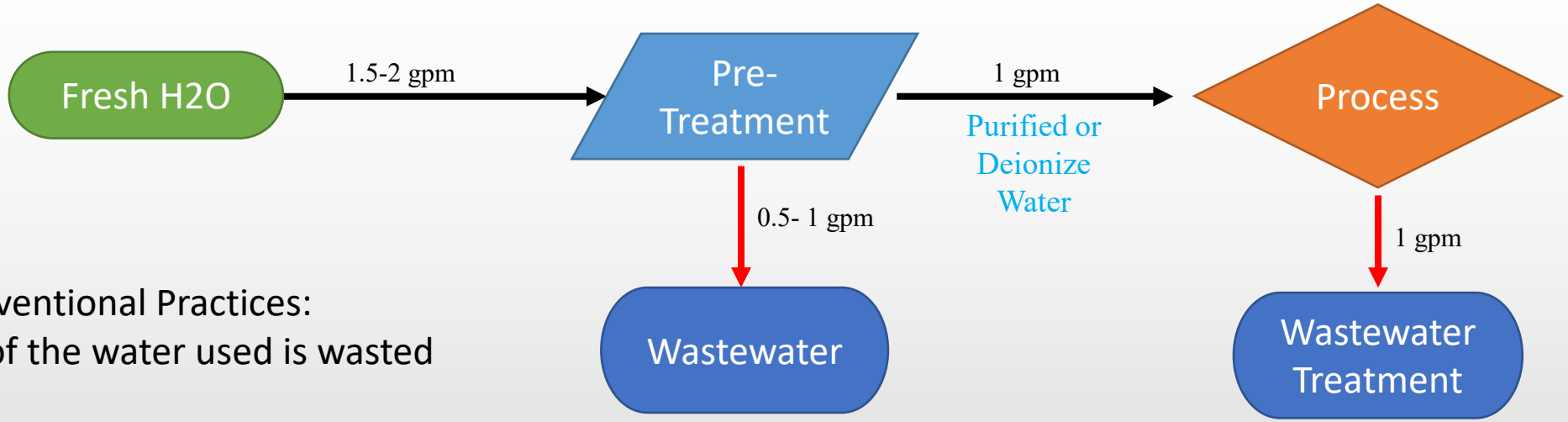
Onsite Industrial Recovery achieves High water Recovery and Saves Water

- Reduces water usage by as much as 90% per application
- Reduces water related costs by up to 70% (In our experience in CII sectors)
- Reduces dependence on fresh supplies and need for central treatment
- Designer Water: Meeting water quality standards by application/site/use; thus making reuse cost effective

Water is used in Many Industrial Processes

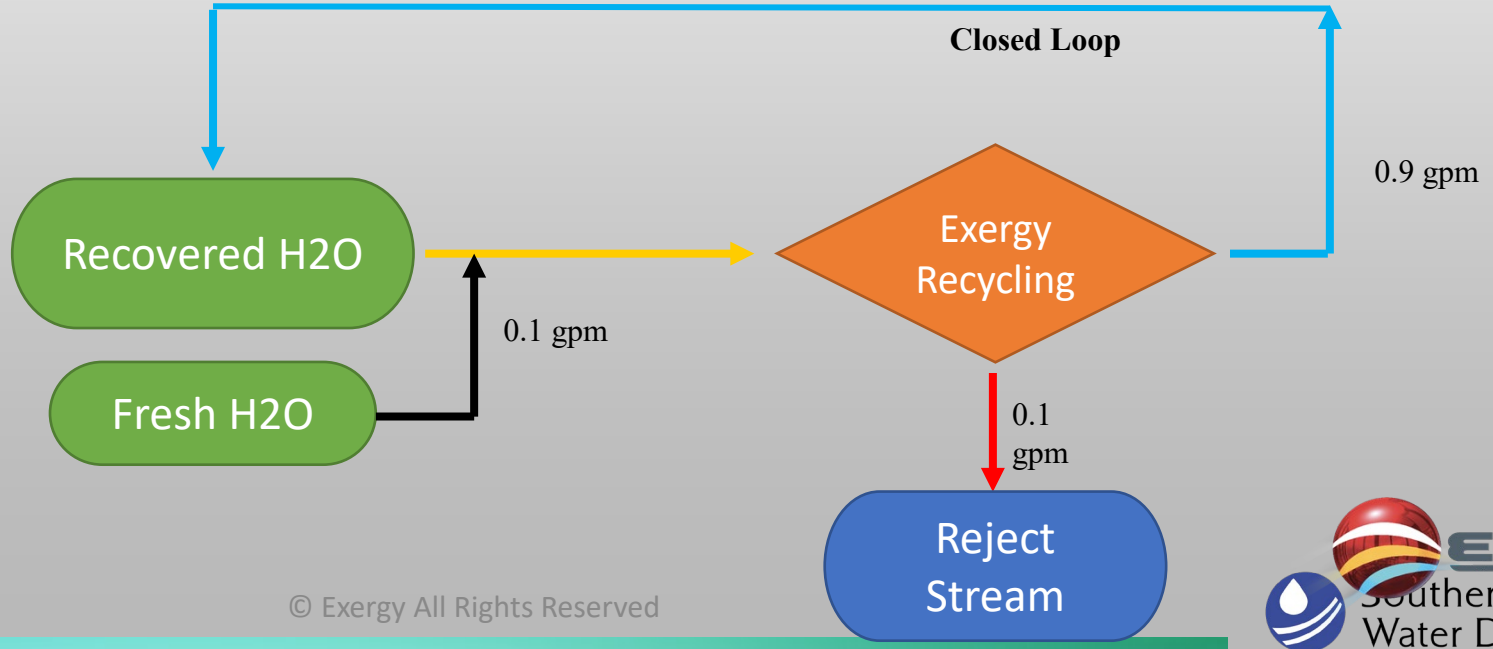


Industrial Operations Waste Water to Make "Pure" Water for Use



Todays Conventional Practices:
150-200% of the water used is wasted

Exergy Approach:
Saves 90%+ of fresh water supply
Reducing total usage to **<10%**



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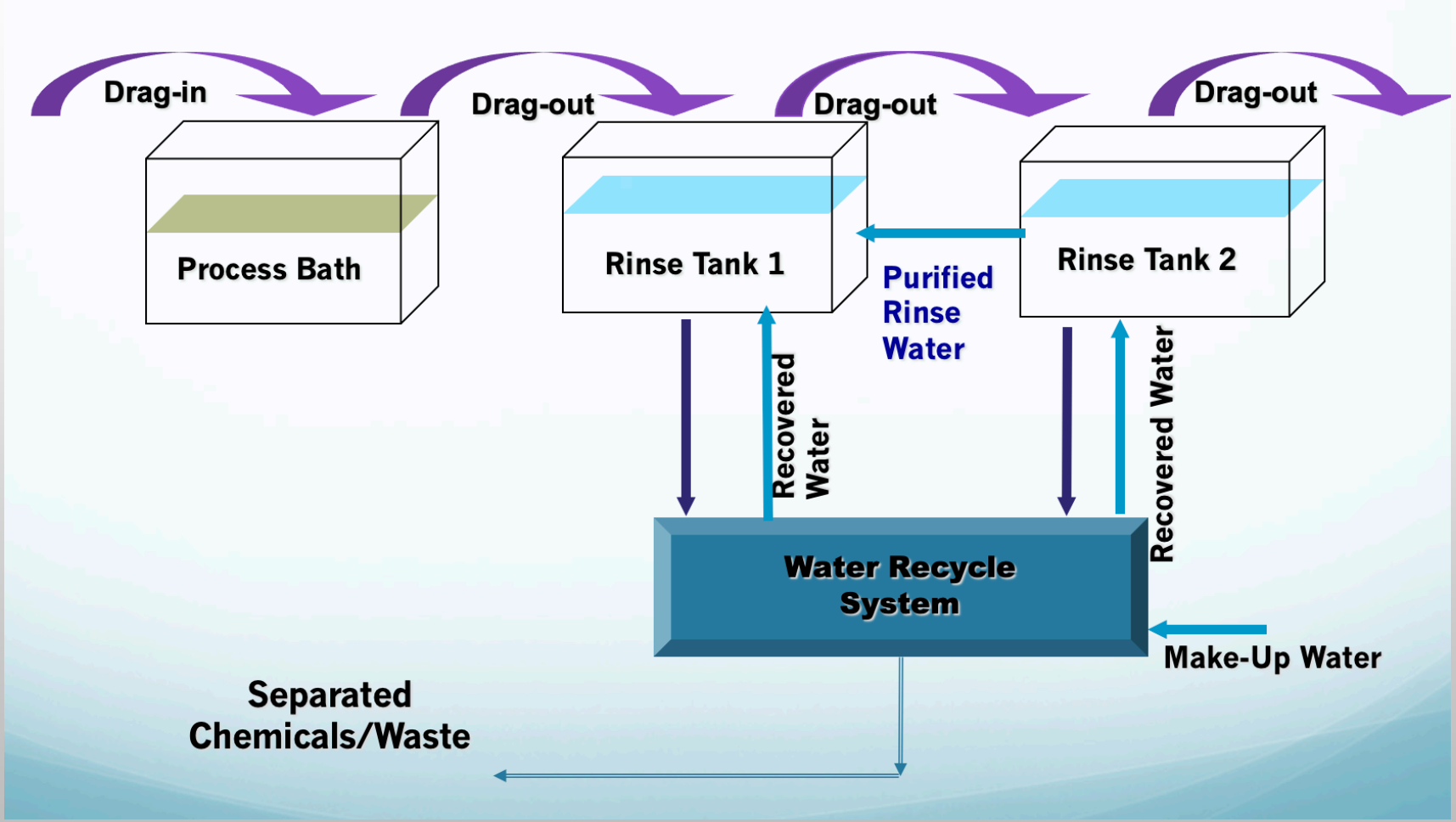
Many Industrial Processes can be Closed loop: Net zero Footprint production



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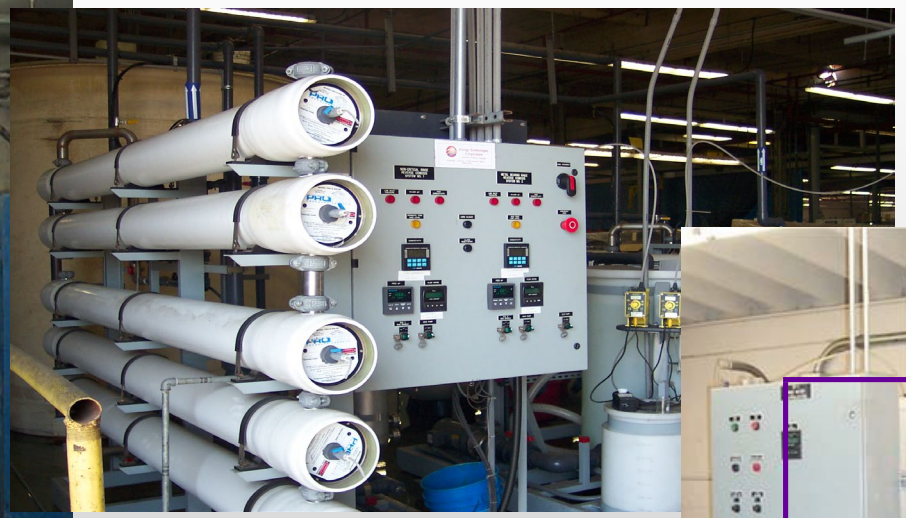
A Water District Case Study for CII Sector: Potential for Onsite Recovery

Sector	Total Annual Water Usage (gals)	Total Potential Water Savings (gals)	Total Potential Water Savings (HCF)	Total Project Cost	Average ROI	$/Gals	$/HCF	Percent Water Use Reduction
Industrial (16 plants	*689,904,010*	*294,801,795*	*394,120*	*$2,675,660*	*1.4*	*0.009*	*$7*	*42.7%*
Commercial (11 sites)	*81,188,851*	*9,770,550*	*13,062*	*$261,110*	*3.8*	*0.027*	*$20*	*12.0%*
Institutional (5 sites)	*6,452,835*	*1,947,275*	*2,603*	*$21,760*	*2.1*	*0.011*	*$8*	*30.2%*
Total	777,545,696	306,519,620	*409,786*	$2,958,530		0.047		39.4%
Average	259,181,899	102,173,207	*136,595*	$986,177	2.4	0.016	$12	39.4%

POU or Decentralized Recycling at Industrial Plants



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Recommendation for Water Agencies

- Water agencies can partner with customers to implement onsite systems and collect revenue from such systems
- Smaller, emerging systems are getting more efficient and enable cost-effective recovery for all types of reuse
- Remote monitoring and IoT allows management of water quality and helps meet standards in decentralized/POU systems
- Water agencies should incentivize and offer programs for reuse opportunities on-site and fund projects

Main Take Aways

- Centralized infrastructure is up for a “big re-think”
- WE ARE SEEING RE-DISTRIBUTED EVERYTHING, i.e. power/solar– Why not in water?
- Technologies can enable a new future in water – availability, quality improvement and enhancement
- Distributed water and wastewater management systems will save utilities and customers money

Azita Yazdani
Contact Information

Azita Yazdani:

ayazdani@exergycorp.com

800-929-1390, ext. 104
Mobile: 949-279-2216

www.exergycorp.com

Question and Answer

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How to Ask a Question

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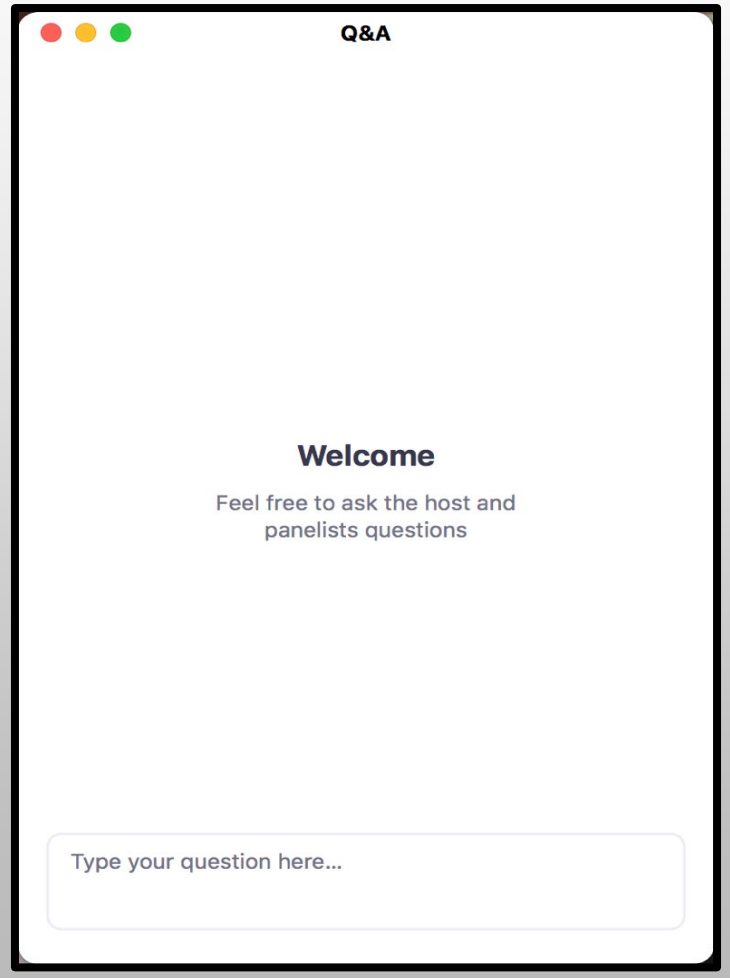
Type in question and then click send



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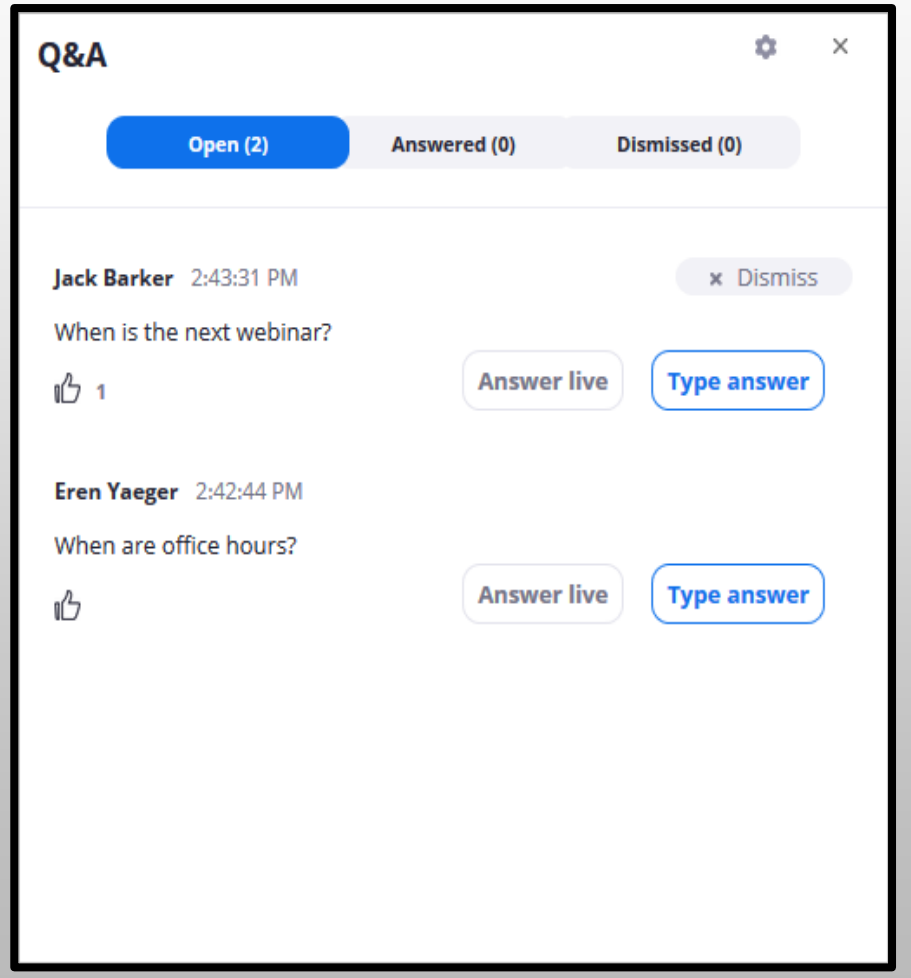

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Next
Southern California Water Dialogue Webinar

Wednesday, July 27, 2022

12:00 – 1:30 pm

Your feedback on today's meeting is important to us. For the next ten minutes, you can use the Zoom Chat feature to send us any comments.

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