



Recycled Water in 2020: *What are we doing with it?*

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HELIX
Environmental Planning



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General Manager,
Inland Empire Utilities
Agency



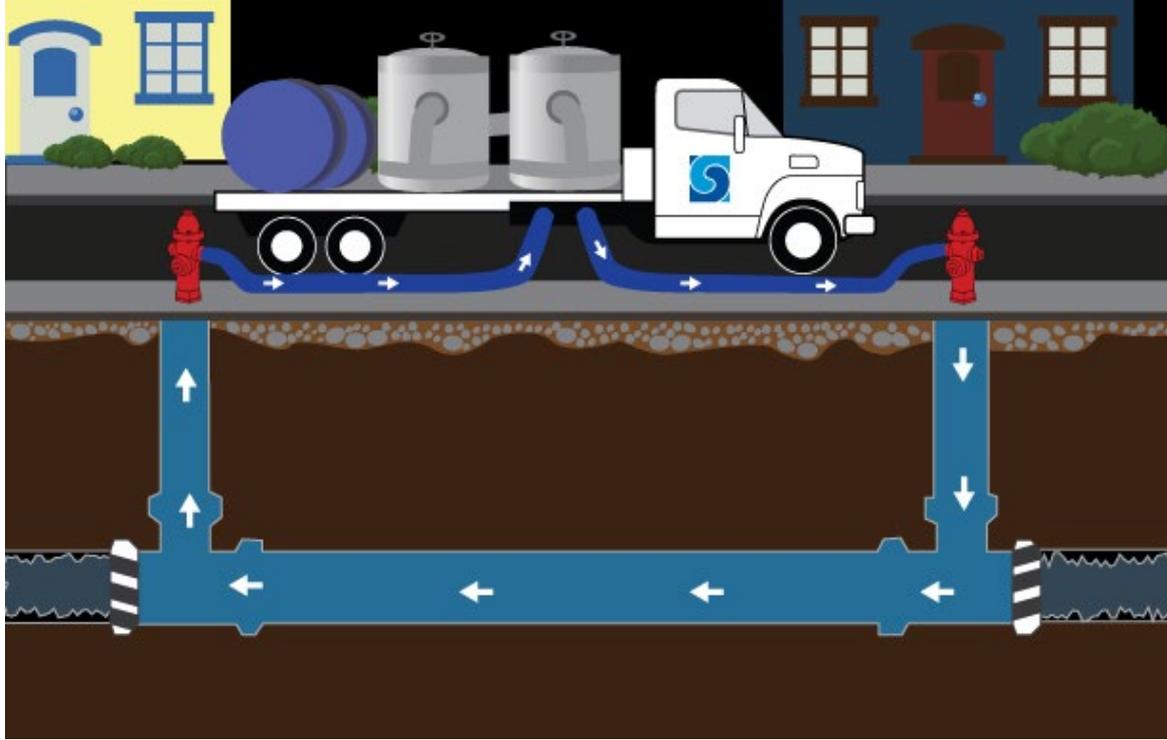
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Moderator



Recycling of Distribution System Flush Water

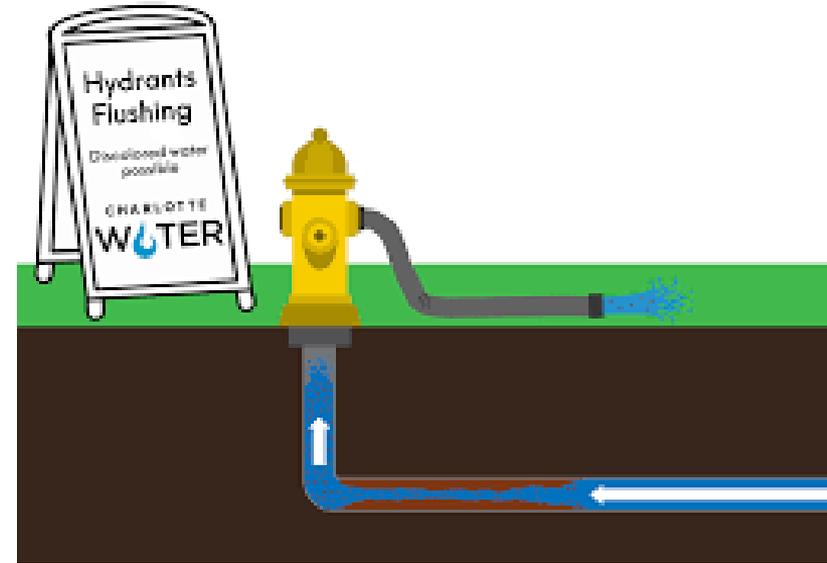


Joe Berg, Director of Water Use Efficiency
Municipal Water District of Orange County

August 14, 2020

What is Distribution System Flushing?

- A process to “Scour and Clean” the inside of water distribution mains by creating high flows
- Achieved by controlling the flow of water through isolated sections of water pipeline at a higher than normal velocity
- The increased water flow provides a scouring affect to remove bio-film and settled out debris such as sand, mineral deposits, and other material that accumulate in the utility’s water pipes



Why is flushing needed?

Improve water quality by:

- 💧 Removing bio-film
- 💧 Eliminating free ammonia and nitrification
- 💧 Improving disinfection residuals



Flushing is endorsed by:



**American Water Works
Association**

Dedicated to the World's Most Important Resource®

Guidelines set by:



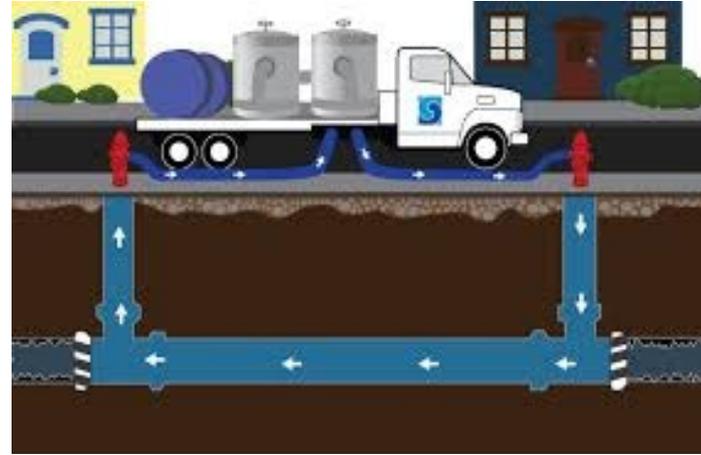
Flushing Methods



Conventional



Uni-Directional



Neutral Output Discharge
Elimination System (NO-DES)



Flush to Reservoir
or Recycled System

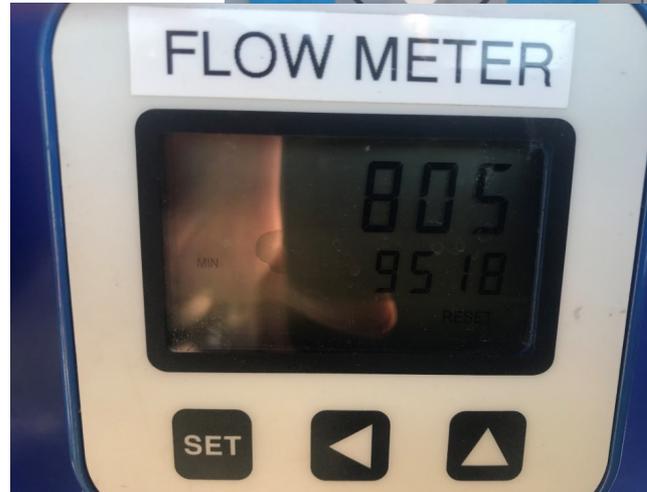


Ice or Foam-Pigging

NO-DES Monitors



- Turbidity
- Flow
- Pressure
- Disinfectant Residual
- Meets AWWA recommended flow rates of 3-5 feet per second

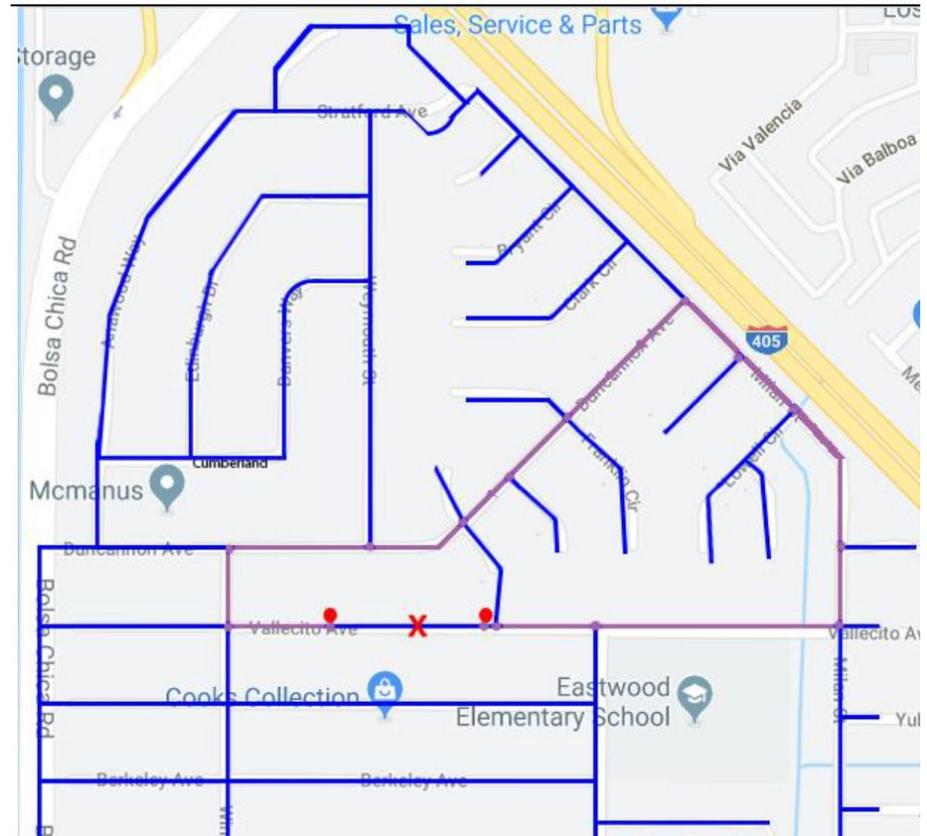
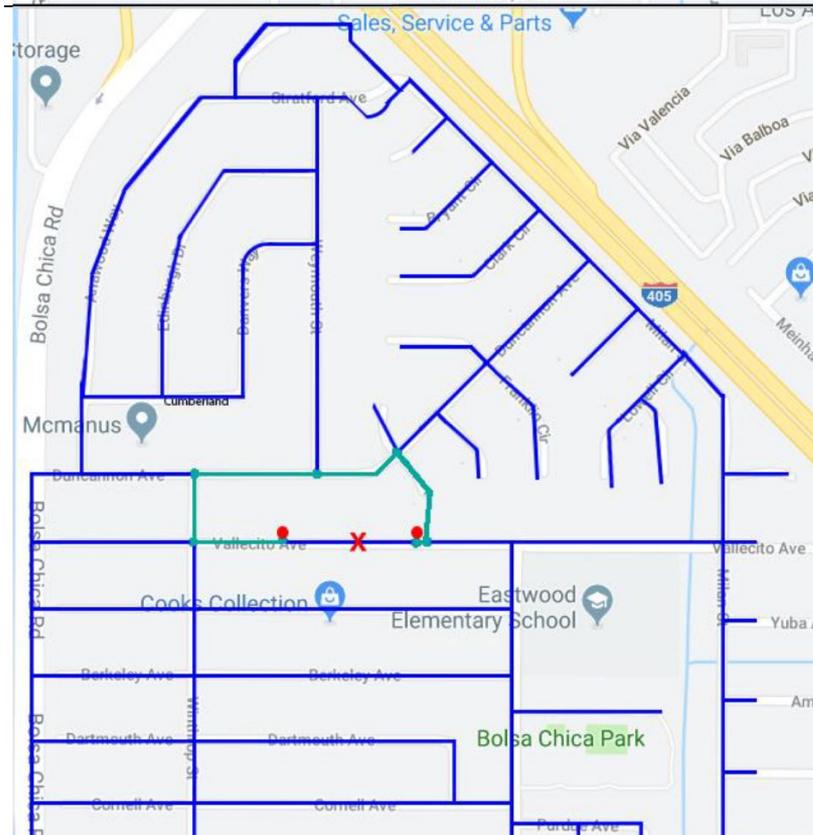




CA 65555



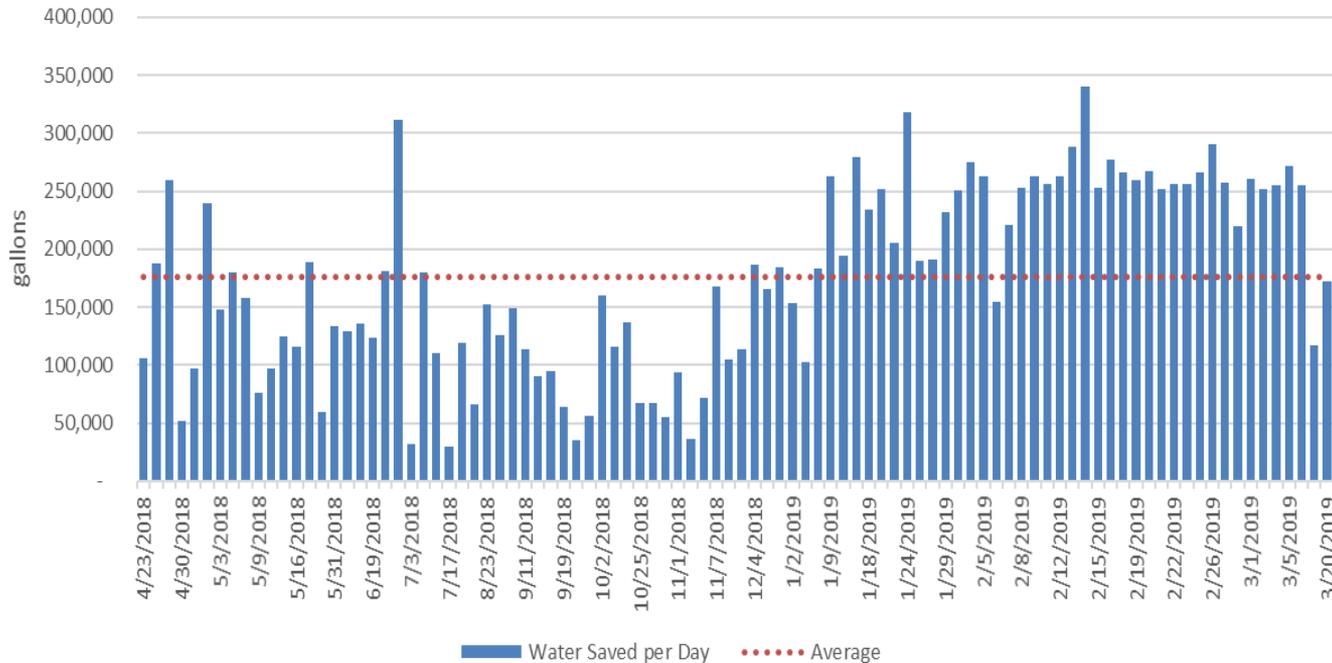
Flush Sequencing



Water Savings from Recycled Flush Water



City of Huntington Beach
Water Saved through No-Des Flushing



- 18 Million Gallons Per Year
- \$66k avoided water purchase per year

Benefits of NO-DES Flushing

- 💧 Water Savings/Recycling
- 💧 Avoids Negative Public Perception
- 💧 Improves Water Quality
- 💧 Energy Savings
- 💧 More Effective than Traditional Methods
- 💧 Eliminates NPDES Compliance

Other Applications

- 💧 Clean and Disinfect New Water Mains
- 💧 Cleaning Mains after Burst Repairs
- 💧 Reservoir Cleaning
- 💧 Fire Flow Testing
- 💧 Fire Line Cleaning

Ongoing Technical Assistance vs. New Shared Services

- 💧 **WSO Technical Assistance**
(Initiated in 2015)
- 💧 Water Balance Compilation
- ~~💧 Water Balance Validation~~ 
- 💧 Component Analysis of Real and Apparent Losses
- ~~💧 Pressure Surveys~~ 
- ~~💧 Leak Detection~~ 
- 💧 Source/Production Meter Accuracy Testing
- 💧 Billing Data Chain Assessment
- 💧 Internal Water Loss Committee Plan

- 💧 **MWDOC Shared Services**
(Initiated FY 2019-20)
- 💧 Water Balance Validation
- 💧 Customer Meter Accuracy Testing
 - 💧 Contract out to McCall's and Westerly
- 💧 Distribution System Pressure Surveys
- 💧 Distribution System Leak Detection
- 💧 Distribution System Flushing
 - 💧 Contract out to NO-DES



Thank you for your attention.
Please **let us know** if you have questions.

Joe Berg

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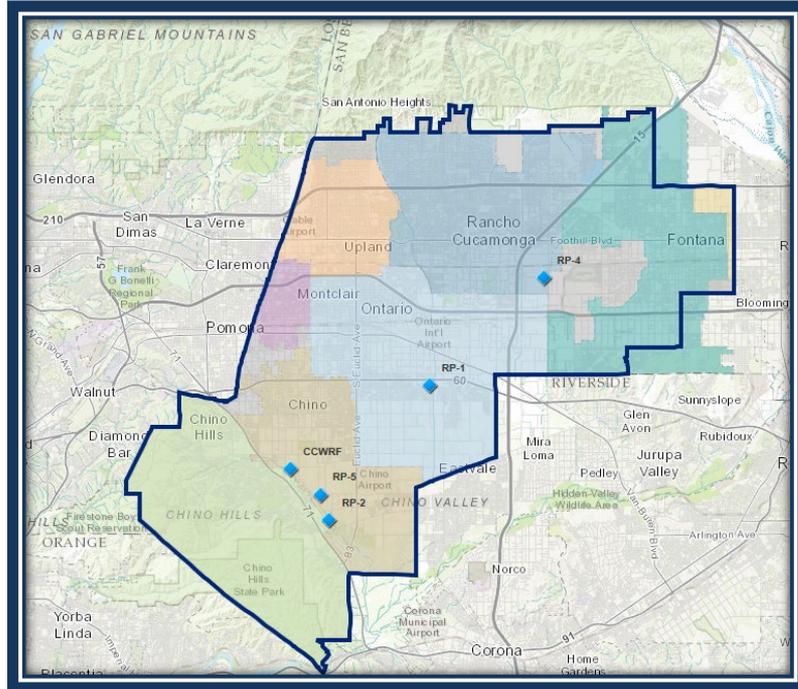
MUNICIPAL WATER DISTRICT OF ORANGE COUNTY

Inland Empire Utilities Agency



2020 Southern California Water Conference

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

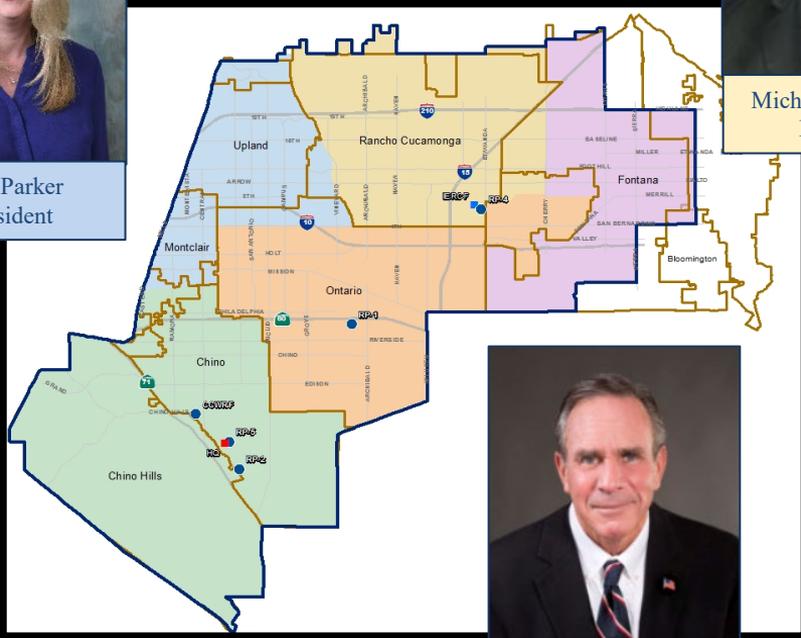
Board of Directors



Kati Parker
President



Michael Camacho
Director



Steven J. Elie
Secretary/Treasurer



Paul Hofer
Director



Jasmin A. Hall
Vice President

Regional Partnerships and Collaborations



Major Programs

Innovation at its best!



Composting
(IERCF)



Wastewater
Treatment



Water
Supply



Renewable
Energy



Recycled
Water
Supply &
Distribution

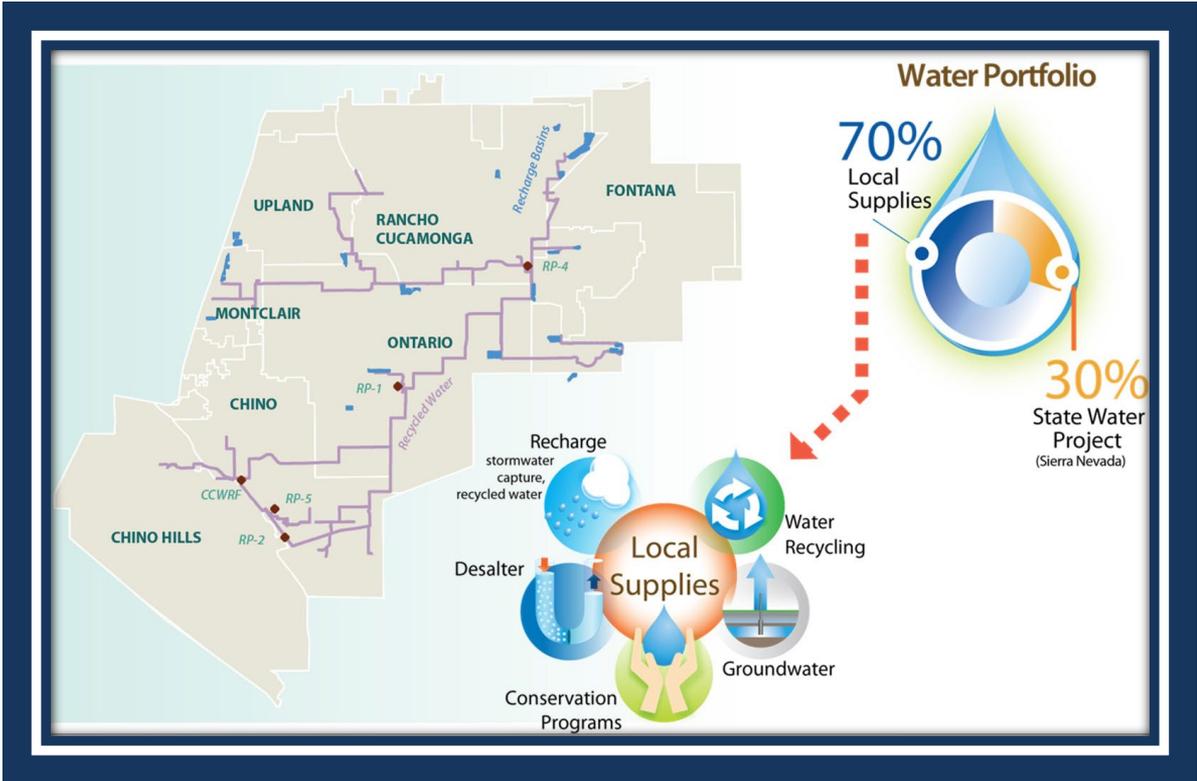


Groundwater
Recharge

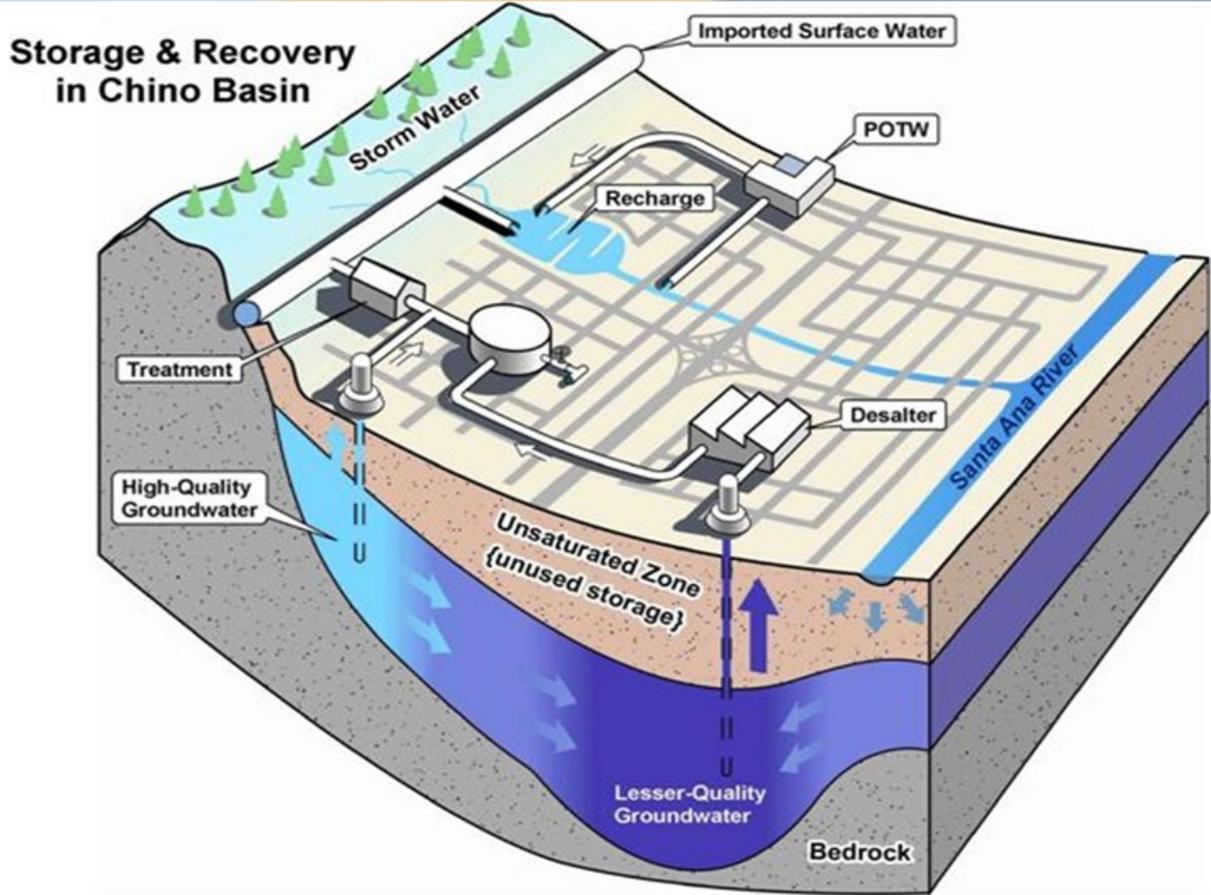


Water-
Use
Efficiency

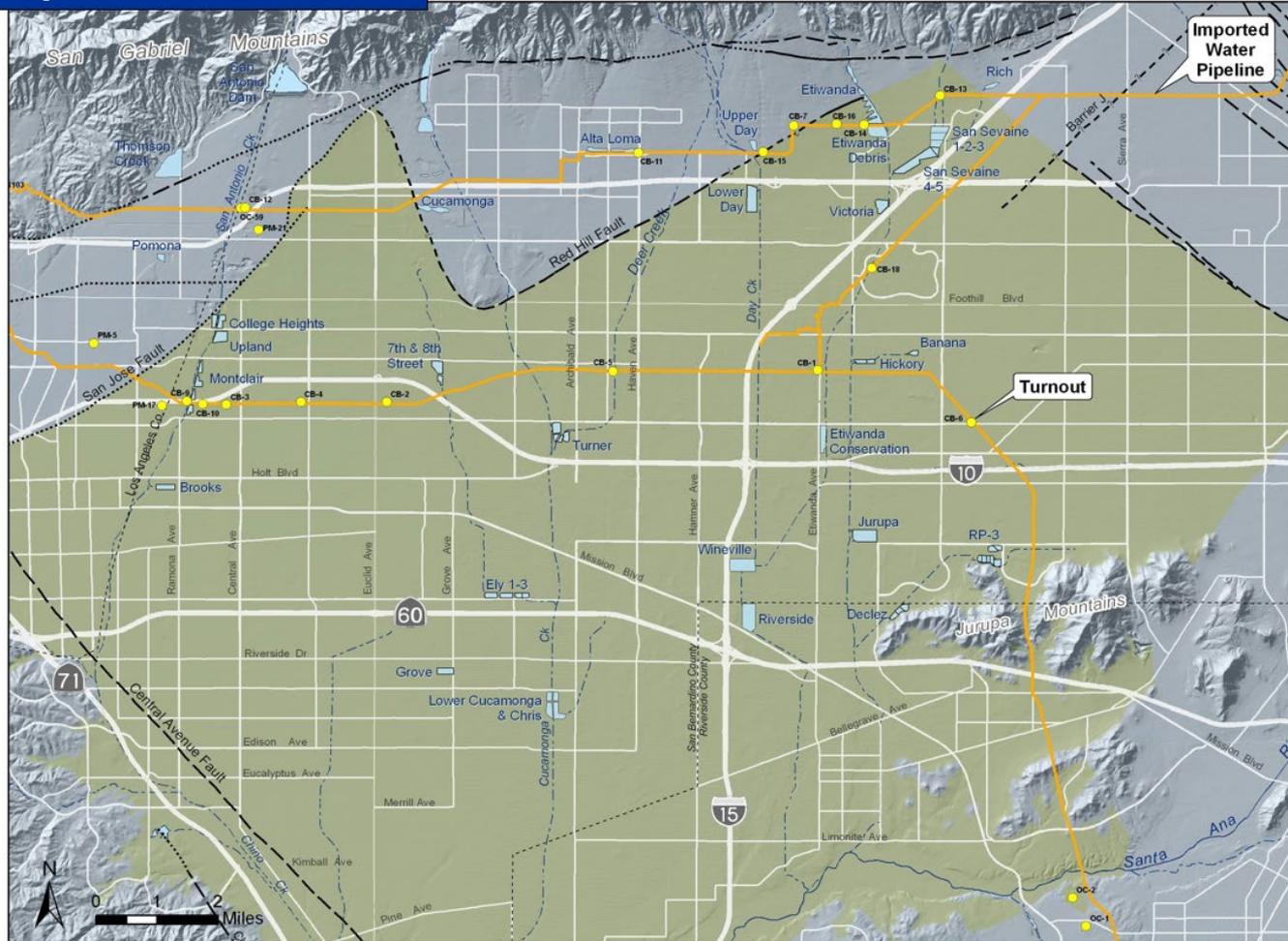
Regional Water Portfolio



Chino Basin ... Integration of Programs



Imported Water Facilities



Figure_2-1_PP.mxd

Chino Basin Water Resources

1950

Population of 80,000

Regional Water Portfolio:

- Chino Basin Groundwater
- Creek Water
- MWD Imported Water

2020

Population of 875,000

Regional Water Portfolio:

- Chino Basin Groundwater
- Creek Water
- MWD Imported Water
- Recycled Water
- Chino Basin Desalter
- Conservation
- Groundwater & Stormwater Recharge

Water & Wastewater Operations

- Wholesale Imported & Recycled Water
 - 32,000 acre-feet of recycled water
 - 60,000 acre-feet of imported water
- Wastewater Treatment
 - 60 million gallons per day
- Highest flow day:
Super Bowl Sunday!
- 5 Treatment Facilities

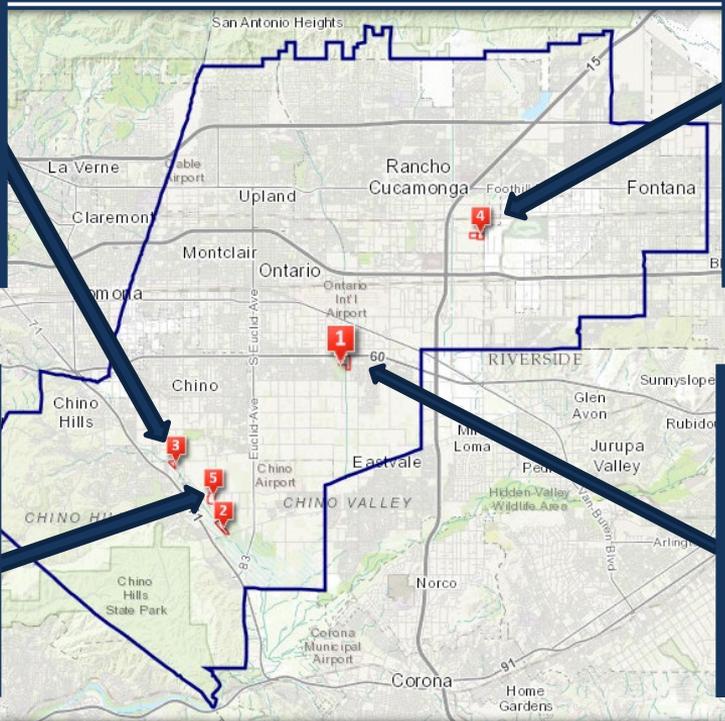


FACT: One acre-foot is enough water to provide to two families of four for an entire year.

Regional Water Recycling Plants



CCWR



RP-4



RP-5



RP-1

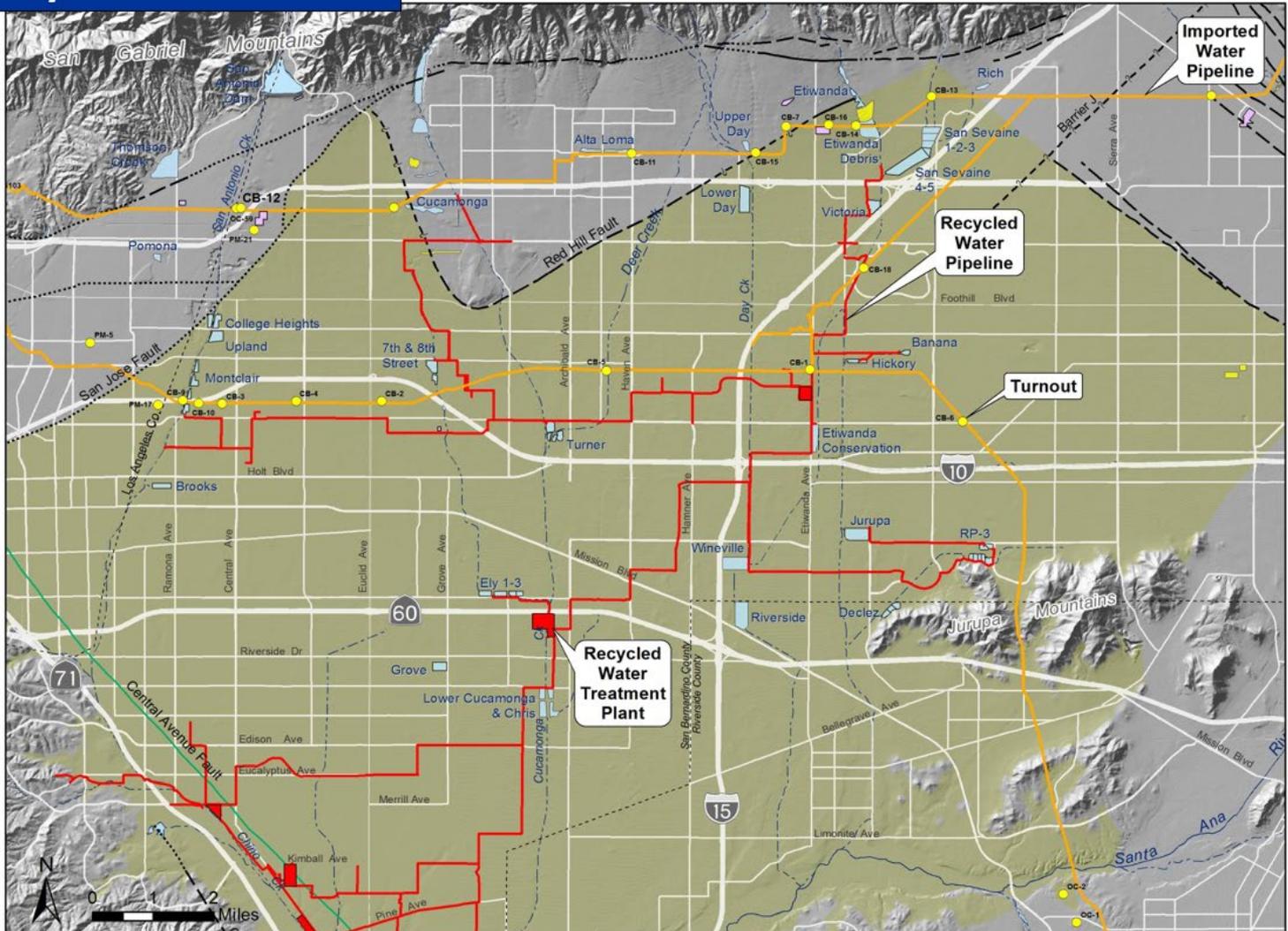
Recycled Water

Not impacted by climate.

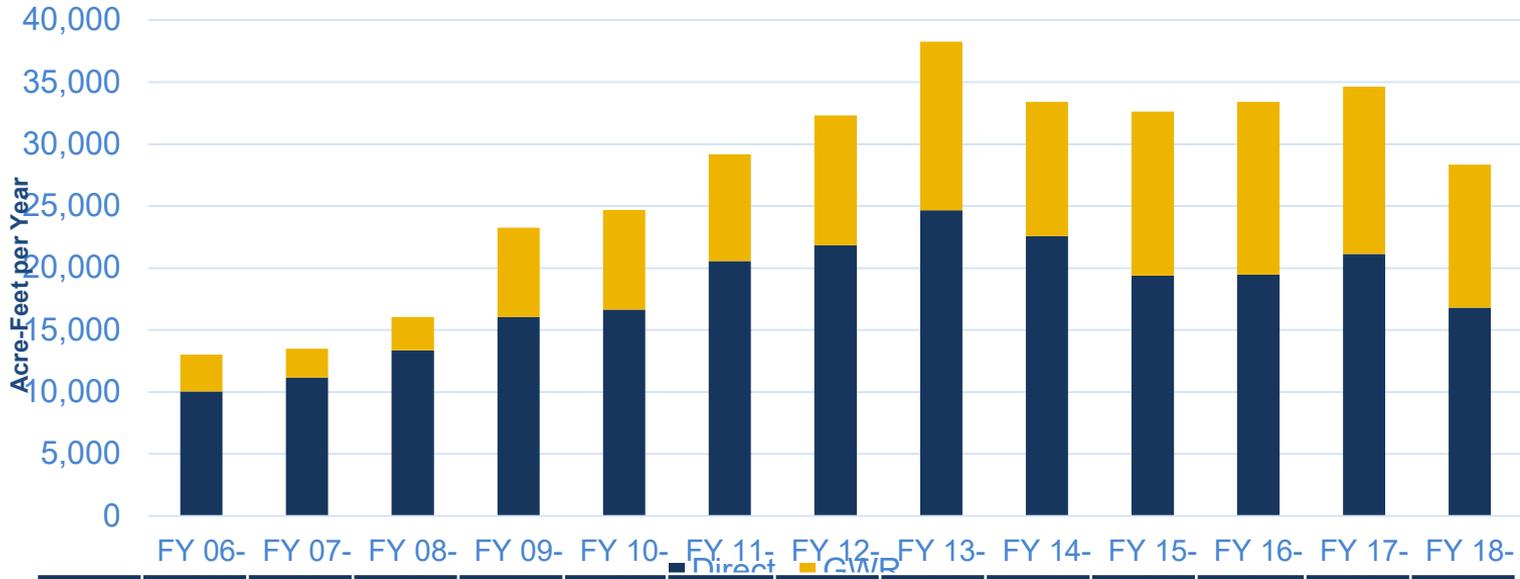
- Highly treated recycled water is the only new major source of water available to meet southern California's growing water demand.
- To date, **IEUA has more than 850 connections** to the recycled water distribution system for irrigation and industrial uses.
- Recycled water makes up roughly **17 percent** of the water supply for the region.
- **SOME OF THE APPROPRIATE USES FOR RECYCLED WATER INCLUDE:** Irrigation, landscaping, golf courses, farms, industrial cooling, parks, cemeteries, construction, recreational lakes, groundwater recharge, industrial processing, median



Recycled Water Facilities



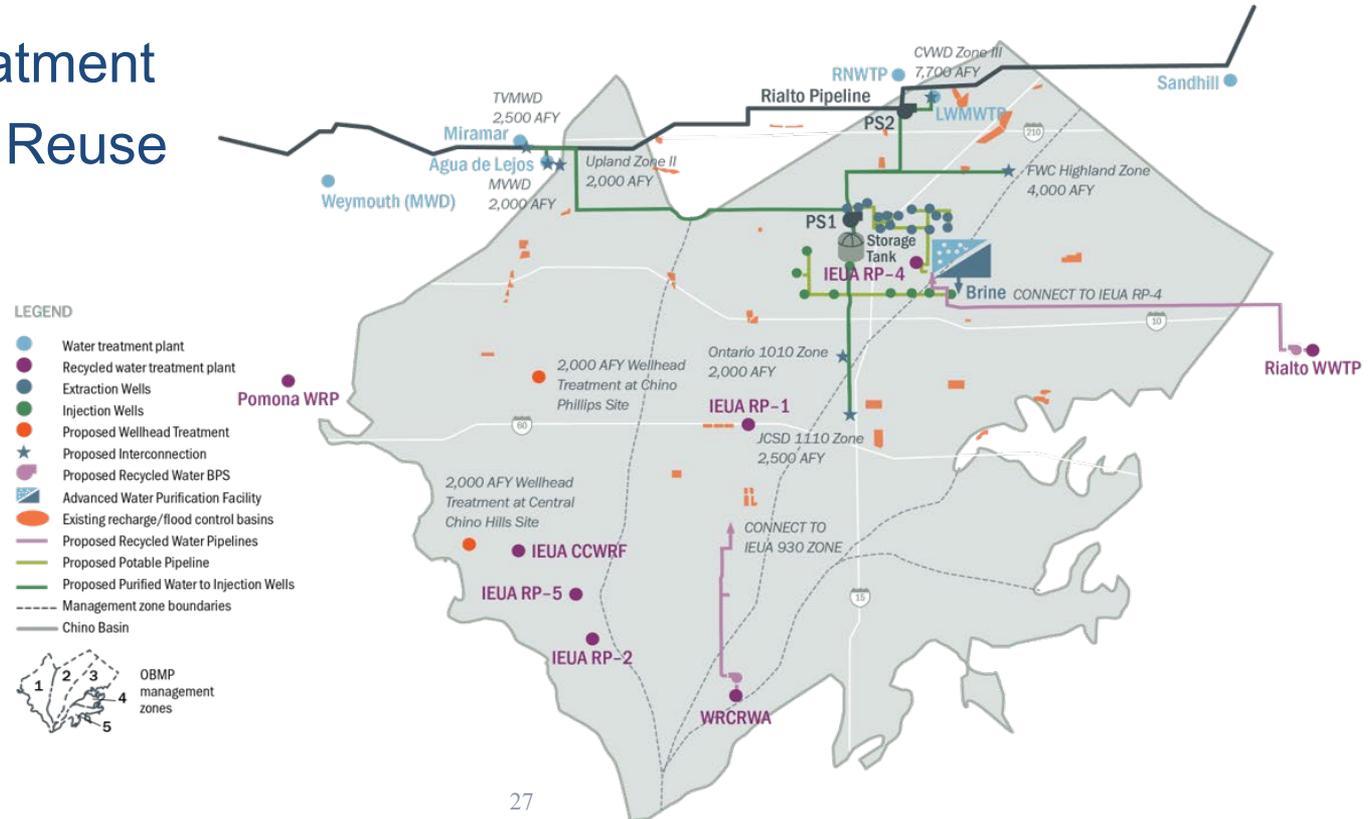
Recycled Water Deliveries



	FY 06-	FY 07-	FY 08-	FY 09-	FY 10-	FY 11-	FY 12-	FY 13-	FY 14-	FY 15-	FY 16-	FY 17-	FY 18-
Direct	10,048	11,153	13,361	16,057	16,656	20,556	21,840	24,659	22,850	19,397	19,477	21,132	16,803
GWR	2,981	2,340	2,684	7,208	8,028	8,634	10,479	13,593	10,840	13,222	13,934	13,510	11,542
Total	13,029	13,493	16,045	23,265	24,684	29,190	32,319	38,252	33,690	32,619	33,411	34,642	28,345

Future of Recycled Water

- Advanced Treatment
- Direct Potable Reuse



Energy Management Plan (EMP)

- Water and energy are inextricably connected
- EMP Goal: **Energy independence** during peak energy price period and **carbon neutral** by 2030
- 80% of peak energy from renewable energy sources
- Energy accounts for 25% of non-labor operation and maintenance costs ... **Highest non-labor cost**
- Portfolio: Solar, Wind Turbine, Co-generation and Food Waste = 9 MW
- Battery storage = 4 MW



Community Outreach and Education

- Campaigns
- Residential Landscape Training Workshops
- Rebate Programs
- Garden in Every School[®]
- National Theatre for Children
- Water is Life Student Art/Poster Contest
- Water Discovery Field Trip Program
- Chino Creek Wetlands & Educational Park
- Earth Day
- Solar Cup



Kick the Habit
don't waste water



WARNING: Failure to reduce water use will impact future generations

KickWaterWaste.com

Contact Us

 – (909) 993-1600

 – info@ieua.org



Visit our website: www.ieua.org



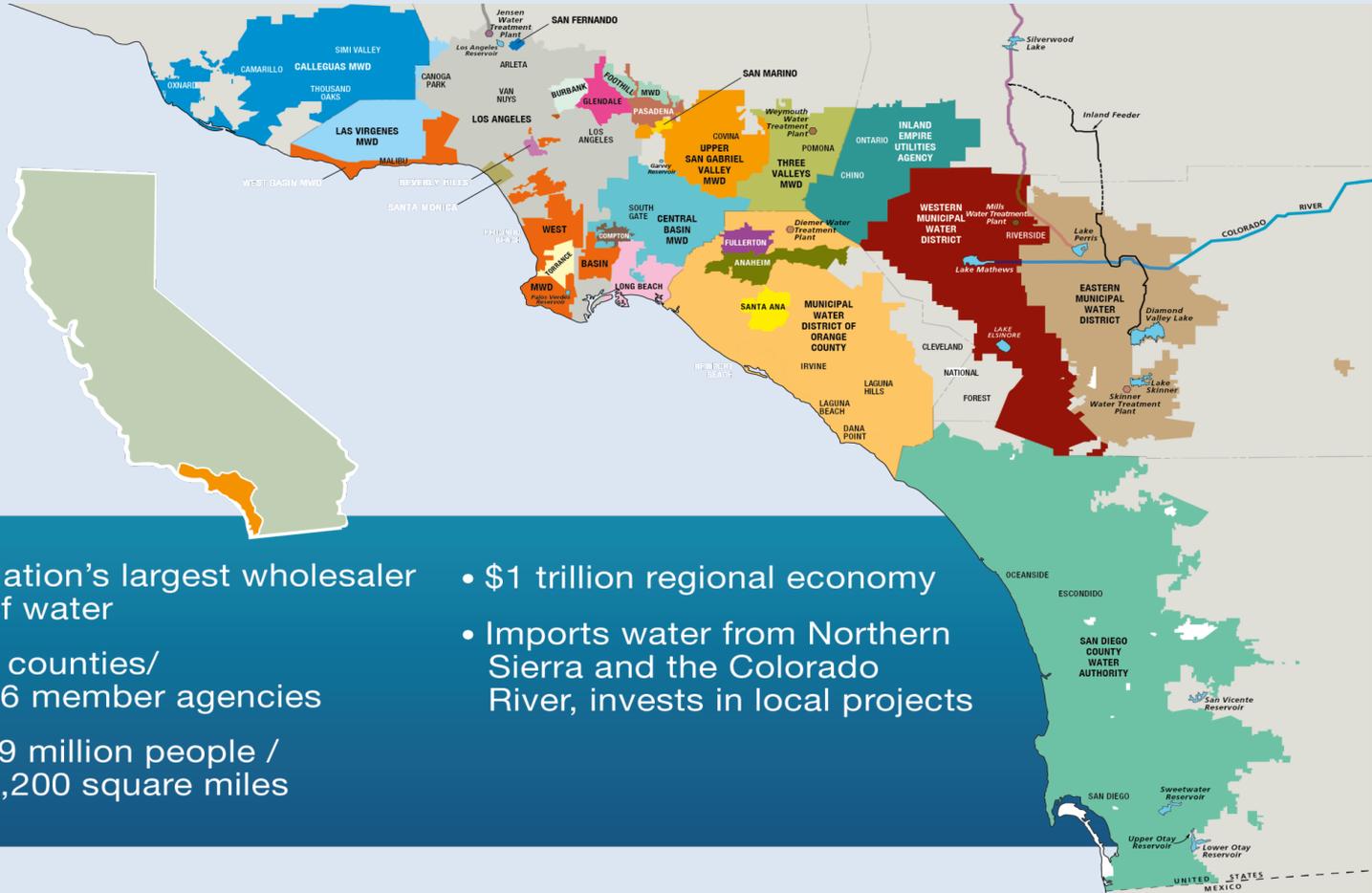
Developing a New Source of Water for Southern California:

Regional Recycled Water Program

Brad Coffey | BIA Southern California Water Conference | August 14, 2020



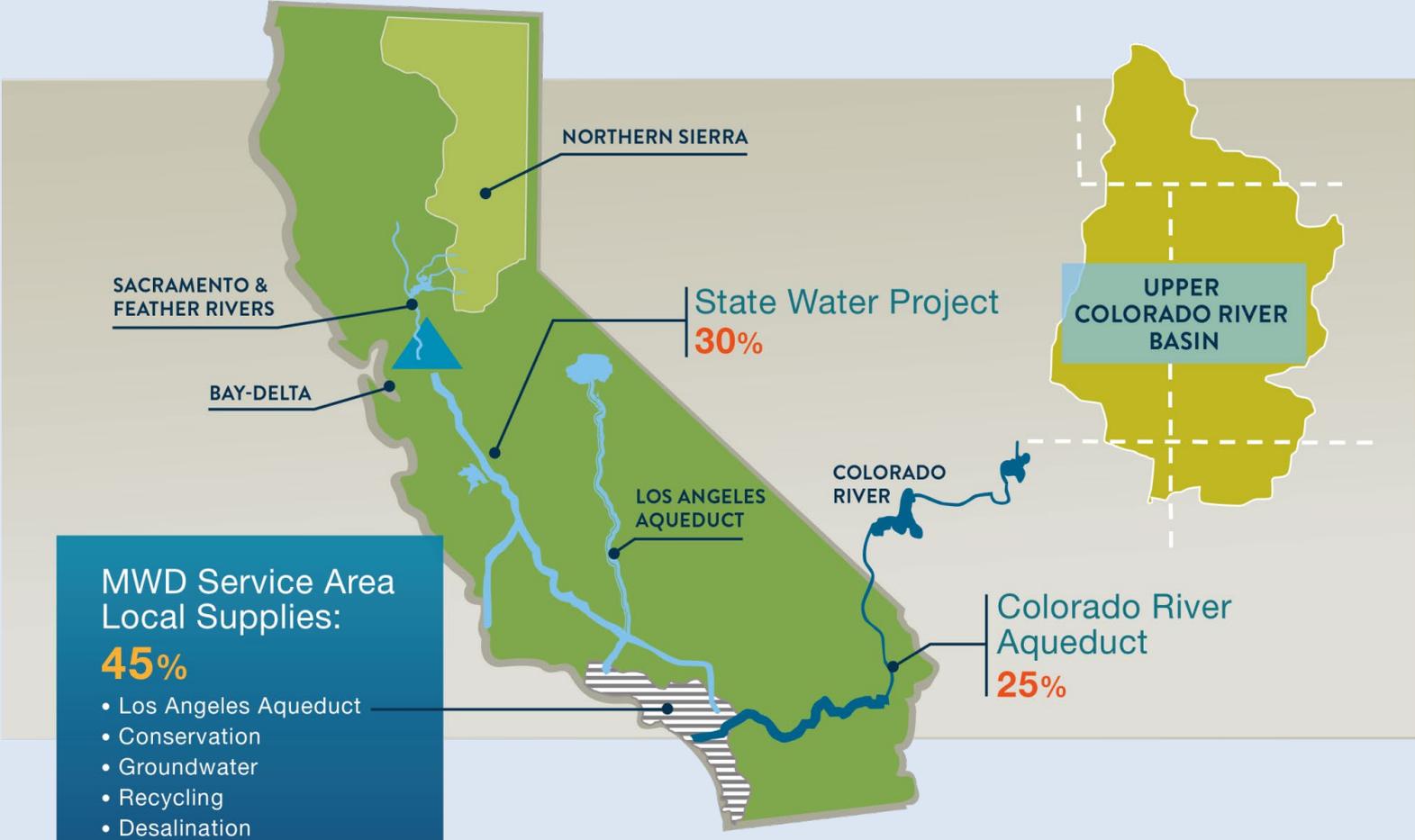
ABOUT METROPOLITAN



- Nation's largest wholesaler of water
- 6 counties/ 26 member agencies
- 19 million people / 5,200 square miles
- \$1 trillion regional economy
- Imports water from Northern Sierra and the Colorado River, invests in local projects



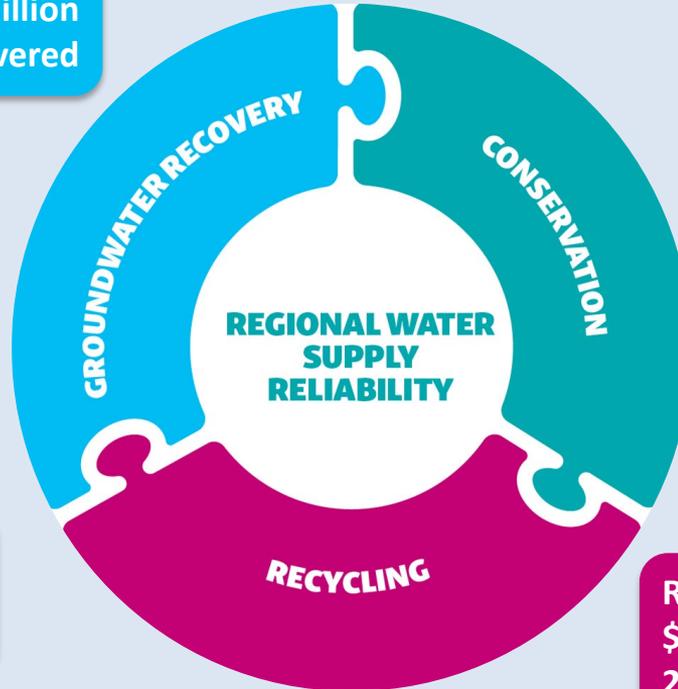
SOURCES OF SUPPLY



METROPOLITAN: A REGIONAL SUCCESS STORY

GROUNDWATER RECOVERY
\$164 million
991,000 acre-feet recovered

CONSERVATION
\$799 million
3,055,000 acre-feet saved



**METROPOLITAN'S
CUMULATIVE INVESTMENT:
\$1.46 BILLION**

RECYCLING
\$497 million
2,895,000 acre-feet produced



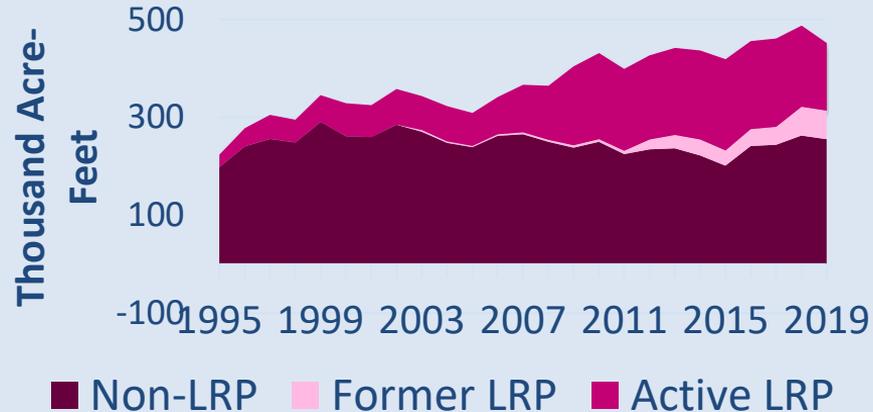
ACHIEVEMENTS IN WATER RECYCLING

FY 18/19
Highlights:

Activity
82 LRP
Projects

Investment
\$22 Million

Produced
138 TAF
(LRP)



ADDITIONAL WATER RECYCLING EFFORTS



Future Supply Actions Funding Program

- Accelerates the development of water recycling projects



Local Resources Program

- Funding for construction of water recycling projects



Facilitation and Leadership

- SCWC Recycled Water Taskforce
- IRWMs



Regional Recycled Water Program



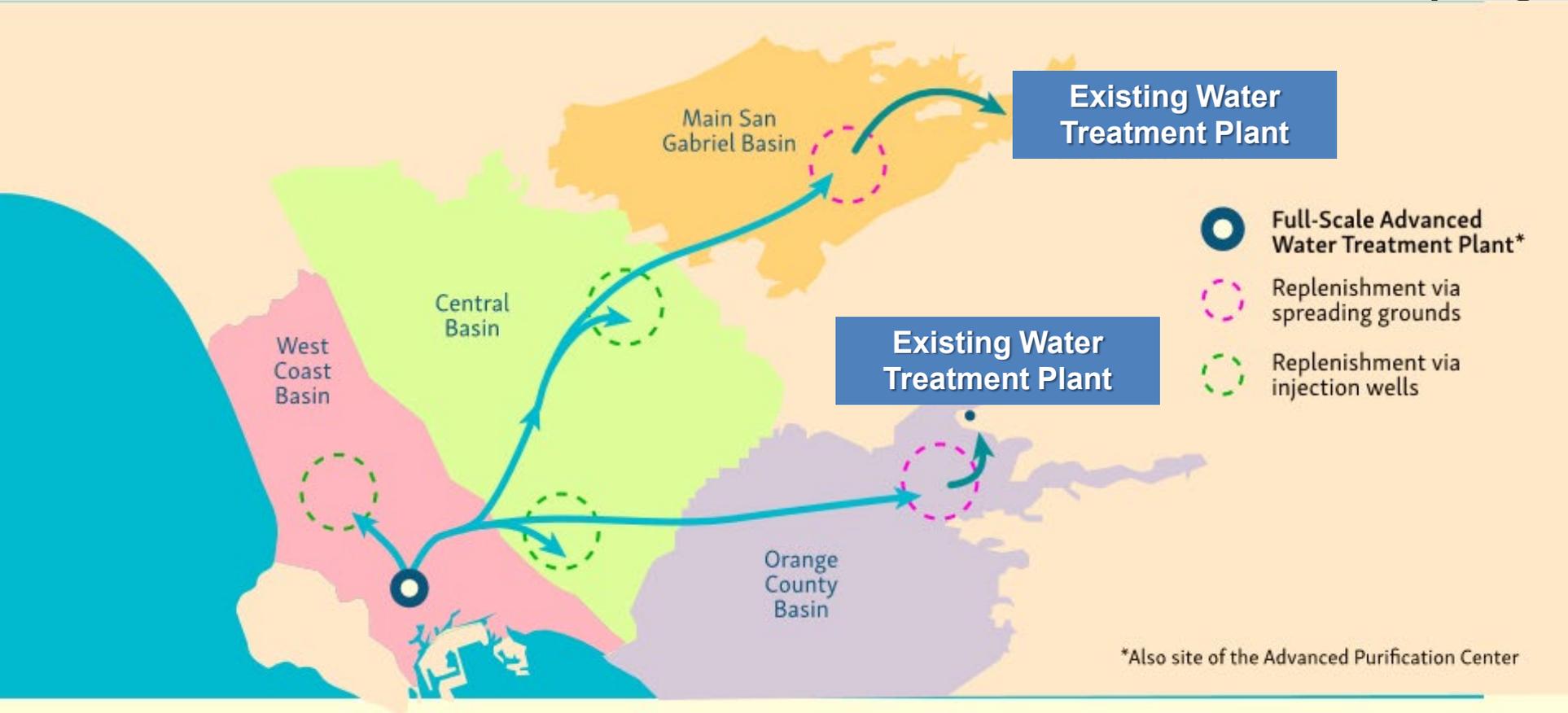
REGIONAL RECYCLED WATER PROGRAM



- 10+ Year Partnership with L.A. County Sanitation Districts
- Advanced Water Purification Center demonstration plant operational in fall 2019

REGIONAL RECYCLED WATER PROGRAM

Innovation in GW & Recycling



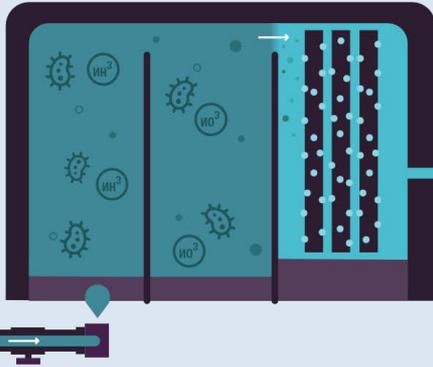
JOINT WATER POLLUTION CONTROL PLANT

- 2017 average flow of ~260 MGD
- Permitted capacity of 400 MGD
- Primary and secondary treatment
- Currently discharges to the ocean

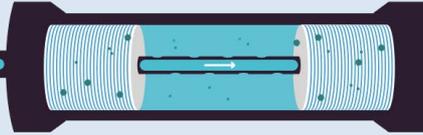


TREATMENT PROCESS

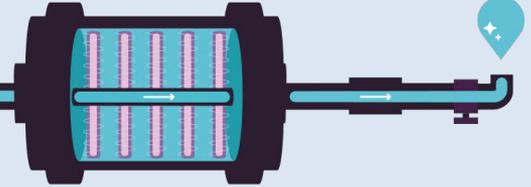
1



2



3



Membrane Bioreactors

Microorganisms remove ammonia and other nitrogen compounds, while membranes filter tiny particles, smaller than 1/100 of a grain of sand.

Reverse Osmosis

Pressurized membranes further remove microscopic materials, such as bacteria, pharmaceuticals and salts, eliminating more than 99% of all impurities

Ultraviolet/Advanced Oxidation Process:

Ultraviolet light and a powerful oxidant destroy any remaining viruses and trace chemical compounds.



DEMONSTRATION PLANT TESTING

- Demonstration Plant construction completed (2019)
- Secondary Effluent Testing (2020-2021)
- Primary Effluent Testing (2021-2022)
- Proposed DPR Testing (2023-2024)
- Science Oversight (ongoing)



Demonstration Plant



Reverse Osmosis

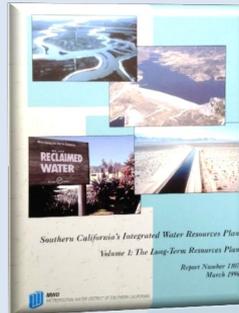


MBR



ON-GOING PLANNING ACTIVITIES

- Planning for the potential next phase
 - Programmatic Environmental Impact Report
 - Future DPR demonstration testing
- Coordinating with other MWD efforts
 - Climate Action Plan
 - 2020 Integrated Resources Plan



COLLABORATION & PUBLIC OUTREACH

LACSD

• 10+
Year
Partners
hip

Program
Partners

- GW basin managers
- Letters of Intent executed

Other
Partners

- SNWA
- LADWP's Project NEXT
- LAFCD

- 85+ Demonstration Plant Tours + 3 Virtual Tours
- Approximately 2,500 visitors
- Member agencies, elected officials, industry groups, students & general public
- Program has been well received – 99% positive reviews



NEXT STEPS



Questions??

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