Regional Recycled Water
Advanced Purification Center

Regional Recycled Water Advanced Purification Center

Developing a New Source of Water for Southern California

Mickey Chaudhuri | MSSC 2019 Annual Salinity Summit | February 28, 2019

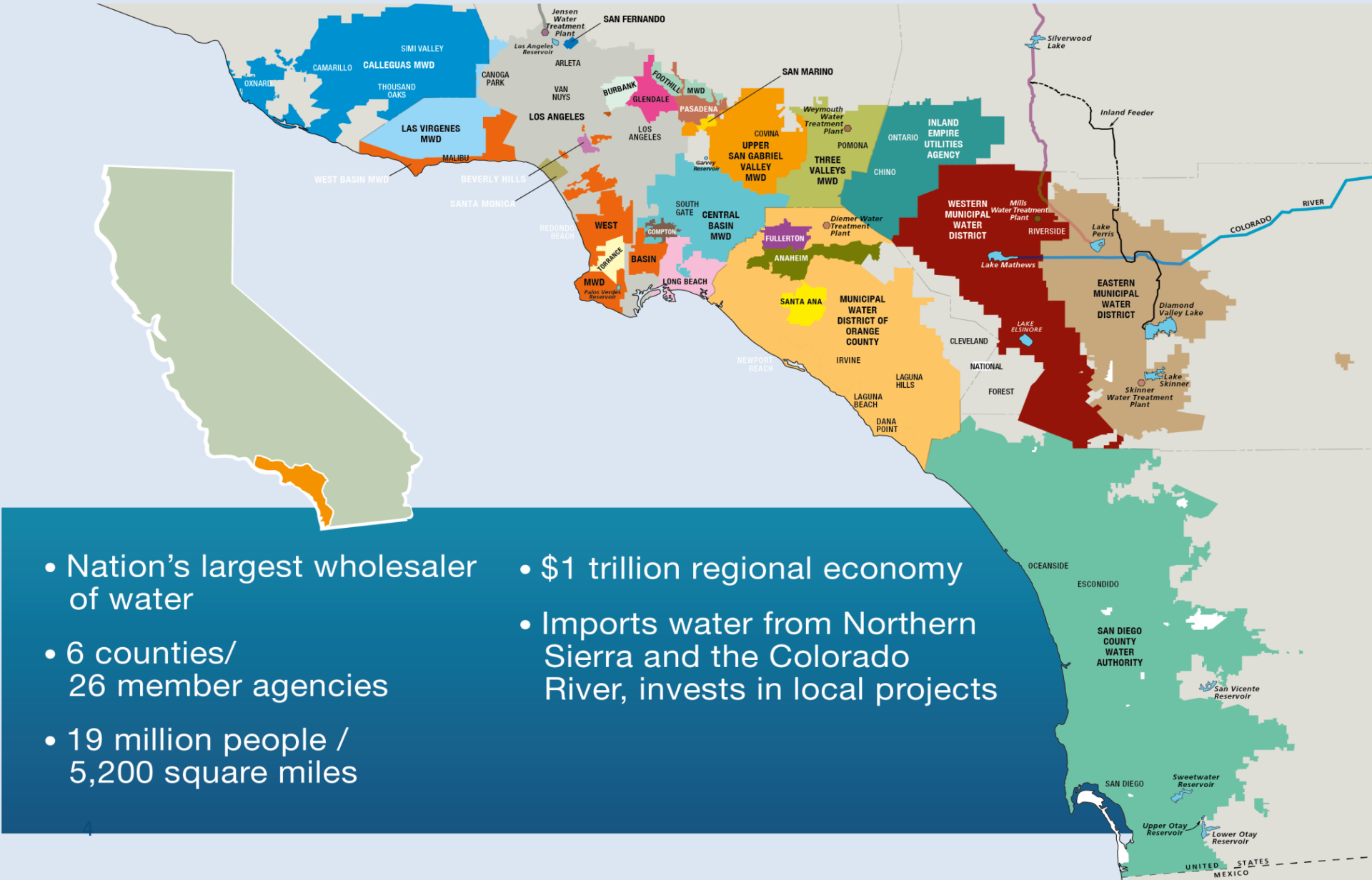
OUTLINE

- Project Need
- MWD-LACSD Partnership
- Program Overview
- Demonstration Project
- Conceptual Planning Studies
- Final Thoughts

Adapting to Changing Conditions

PROJECT NEED

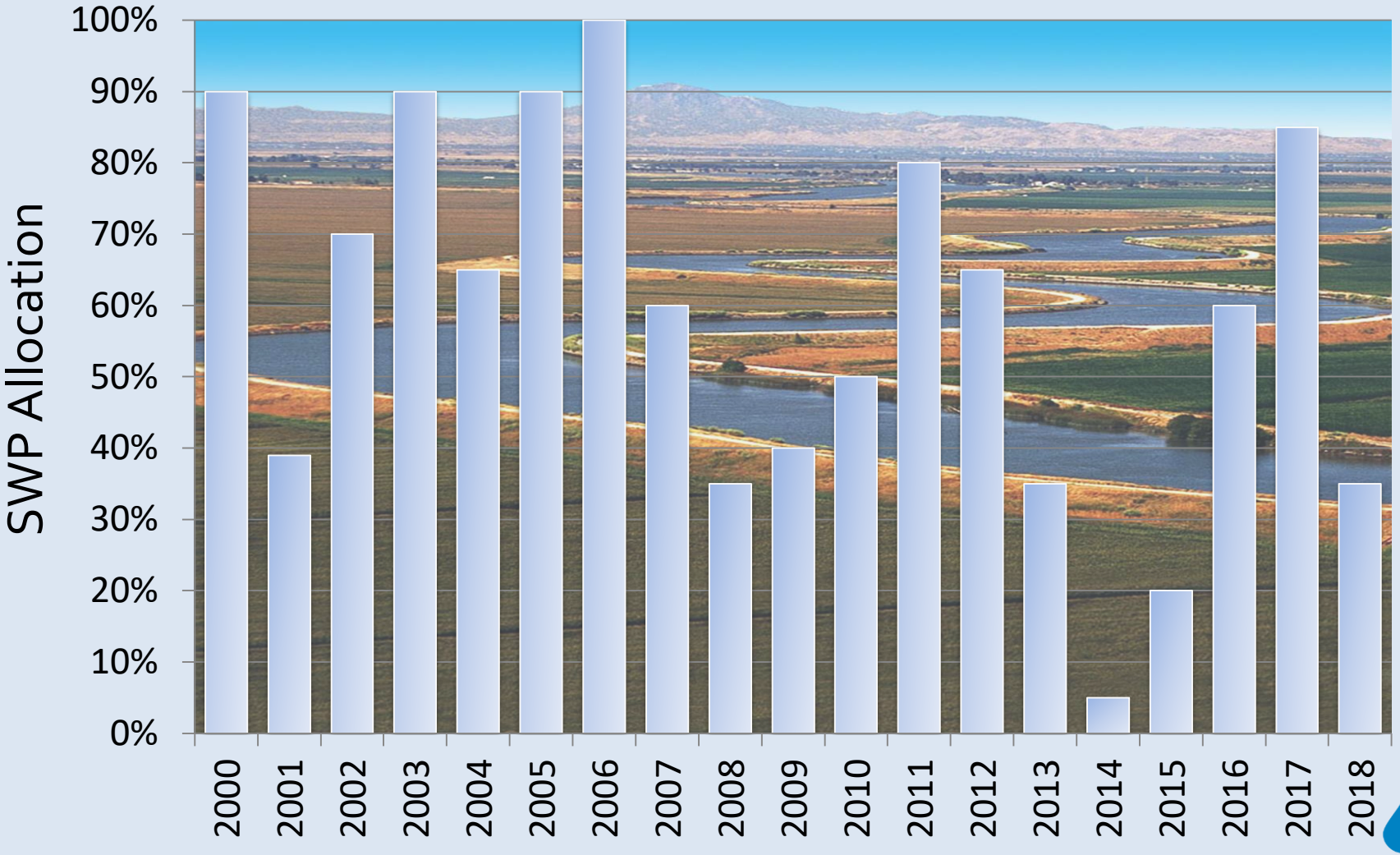
METROPOLITAN OVERVIEW



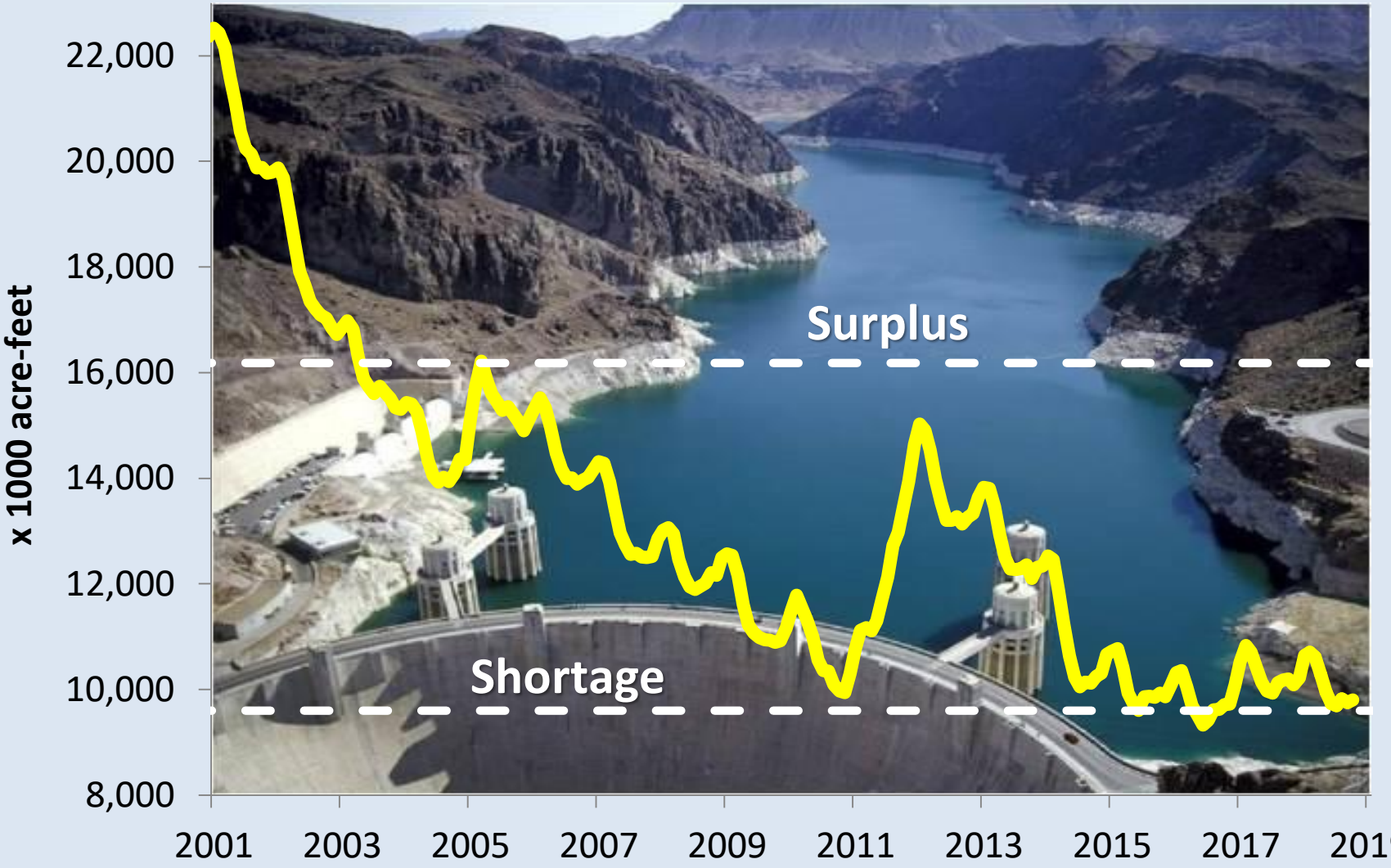
- Nation's largest wholesaler of water
- 6 counties/ 26 member agencies
- 19 million people / 5,200 square miles
- $1 trillion regional economy
- Imports water from Northern Sierra and the Colorado River, invests in local projects

SOURCES OF WATER FOR SOUTHERN CALIFORNIA

INCREASING VARIABILITY IN SWP ALLOCATION

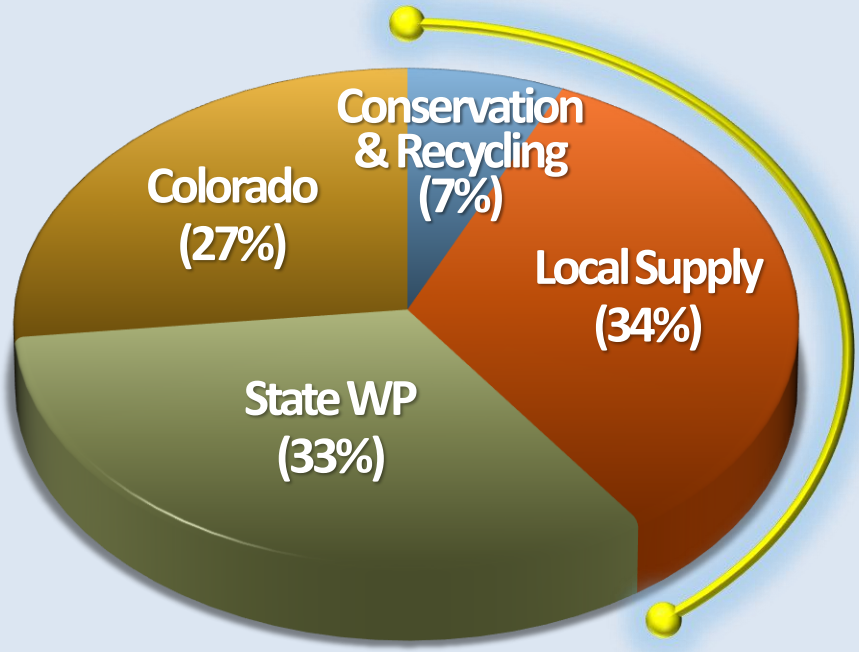


DECLINING LAKE MEAD LEVELS



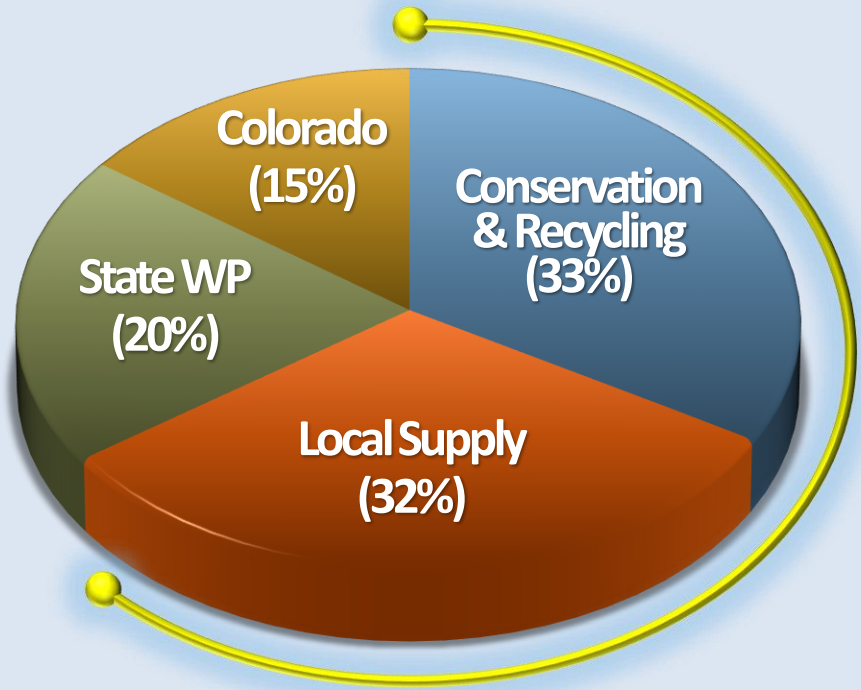
METROPOLITAN WATER SUPPLY STRATEGY

Average Year Water Supply – 1990 vs. 2040



1990 – 41% Local

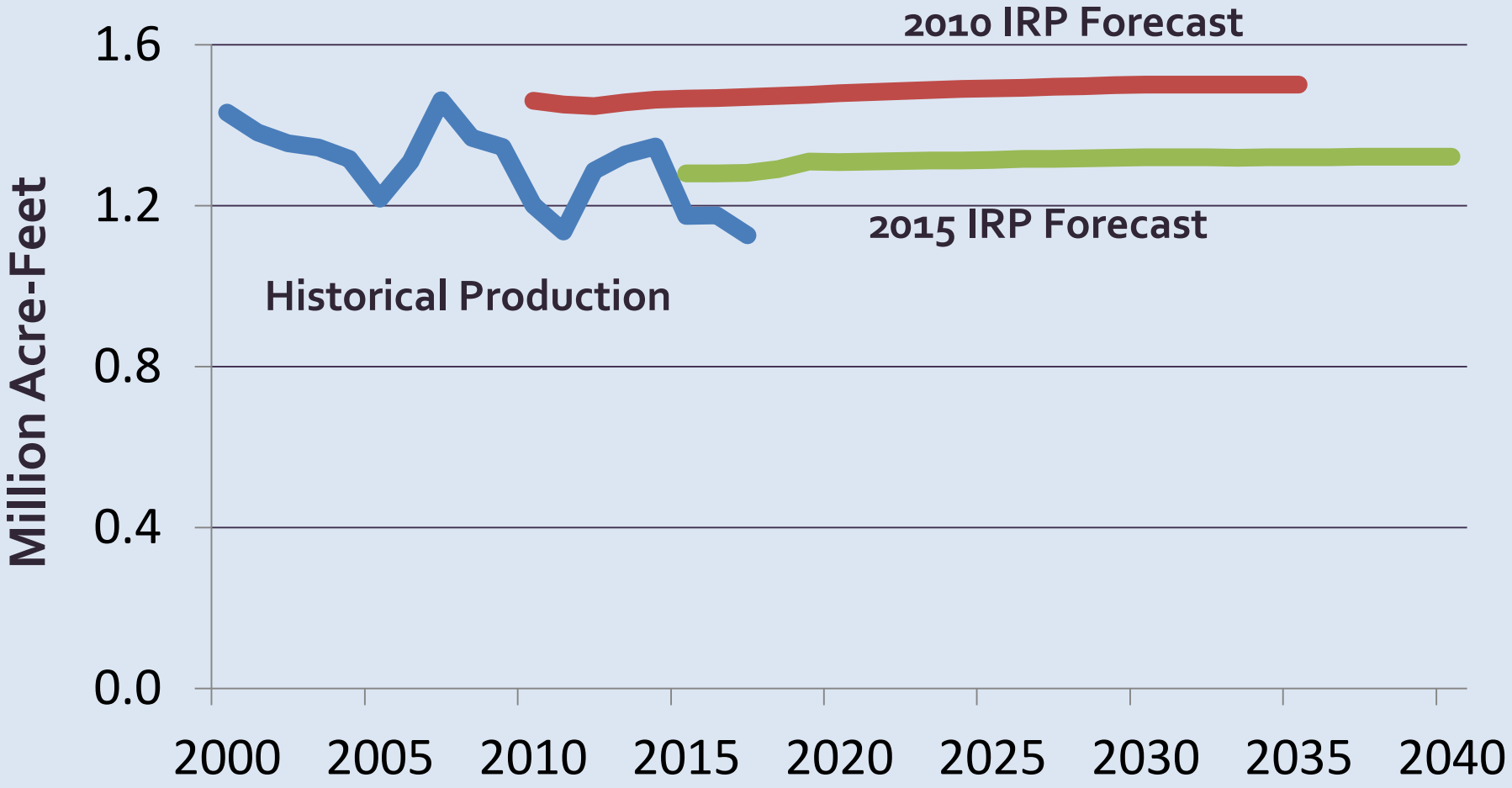
Heavy Dependence on Imported Supply and SWP Diversions



2040 – 65% Local

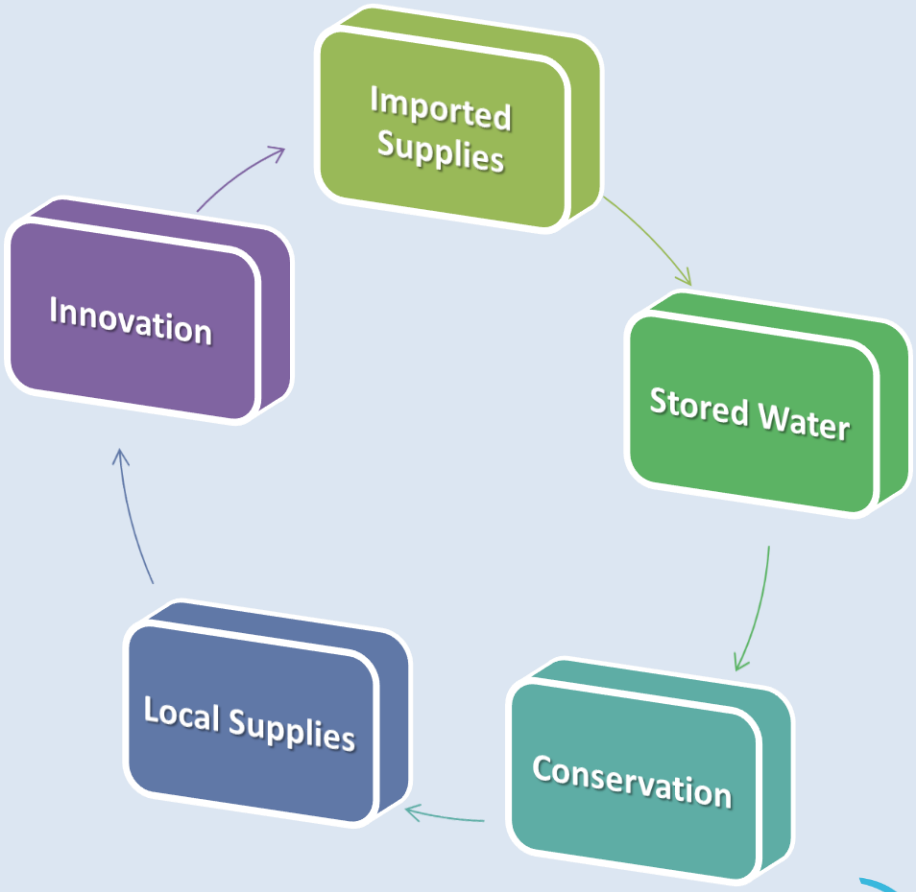
Emphasis on Conservation and Local Supplies

AGENCIES PROJECTED LOWER GROUNDWATER PRODUCTION IN 2015 IRP



NEED FOR RESOURCE DEVELOPMENT

- Recent years of record low snowpack and runoff
- Projected groundwater production has dropped
- Risk of seismic events
- Diverse resource mix important for reliability – "All of the Above" strategy



A Collaboration Between Two Regional Agencies

MWD-LACSD PARTNERSHIP

AGENCY OBJECTIVES

Metropolitan Water District of Southern California

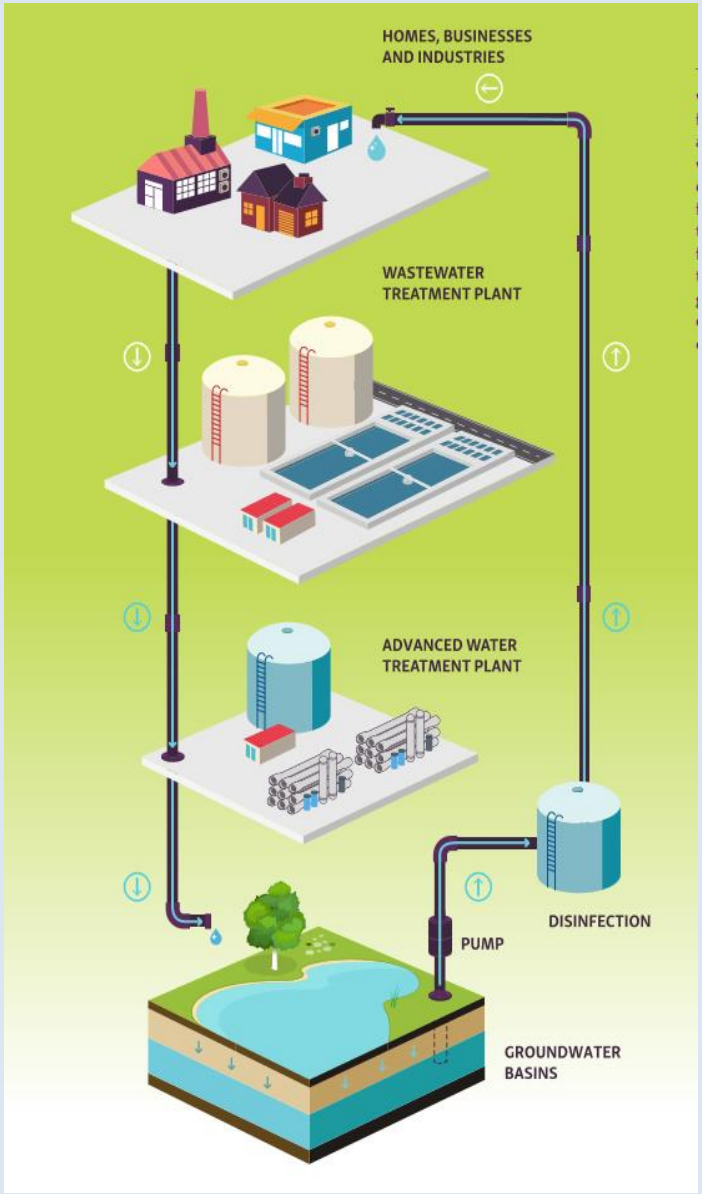
SANITATION DISTRICTS OF LOS ANGELES COUNTY

- Diversify regional supplies
- Improve storage and delivery capabilities
- Provide new source of high quality, drought-resistant water

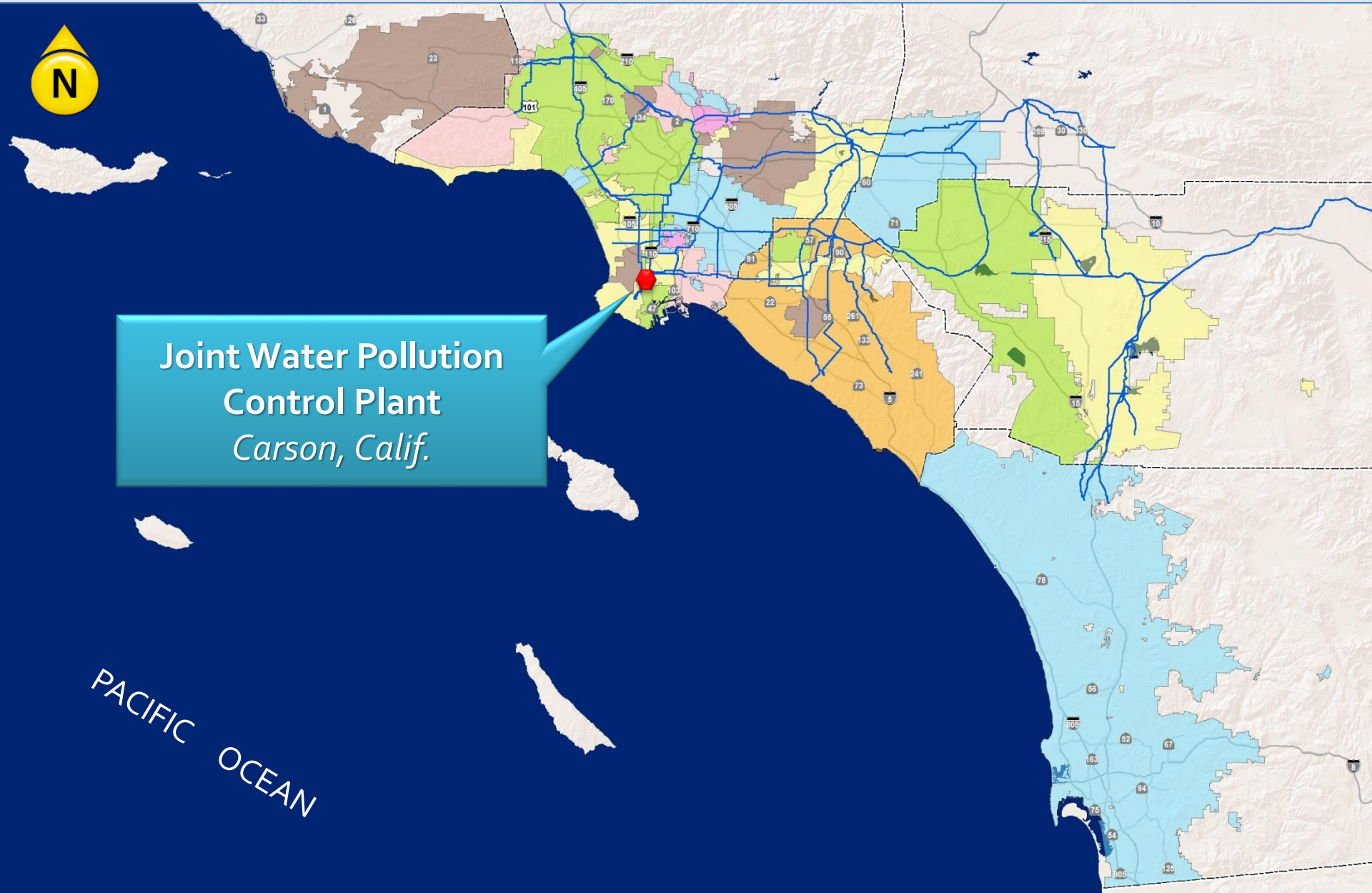
- Increase overall reuse within its system
- Begin beneficial reuse at the Joint Water Pollution Control Plant
- Reduce ocean discharges

REGIONAL RECYCLED WATER PROGRAM

- Collaboration between Metropolitan and Sanitation Districts of LA County
- Development of a new regional water source
  - Up to 150 mgd (168,000 AFY)
  - Deliveries to Metropolitan member agencies
  - Recharge and storage in multiple GW basins
  - Increase in regional storage reserves



NEW REGIONAL SOURCE OF SUPPLY



JOINT WATER POLLUTION CONTROL PLANT

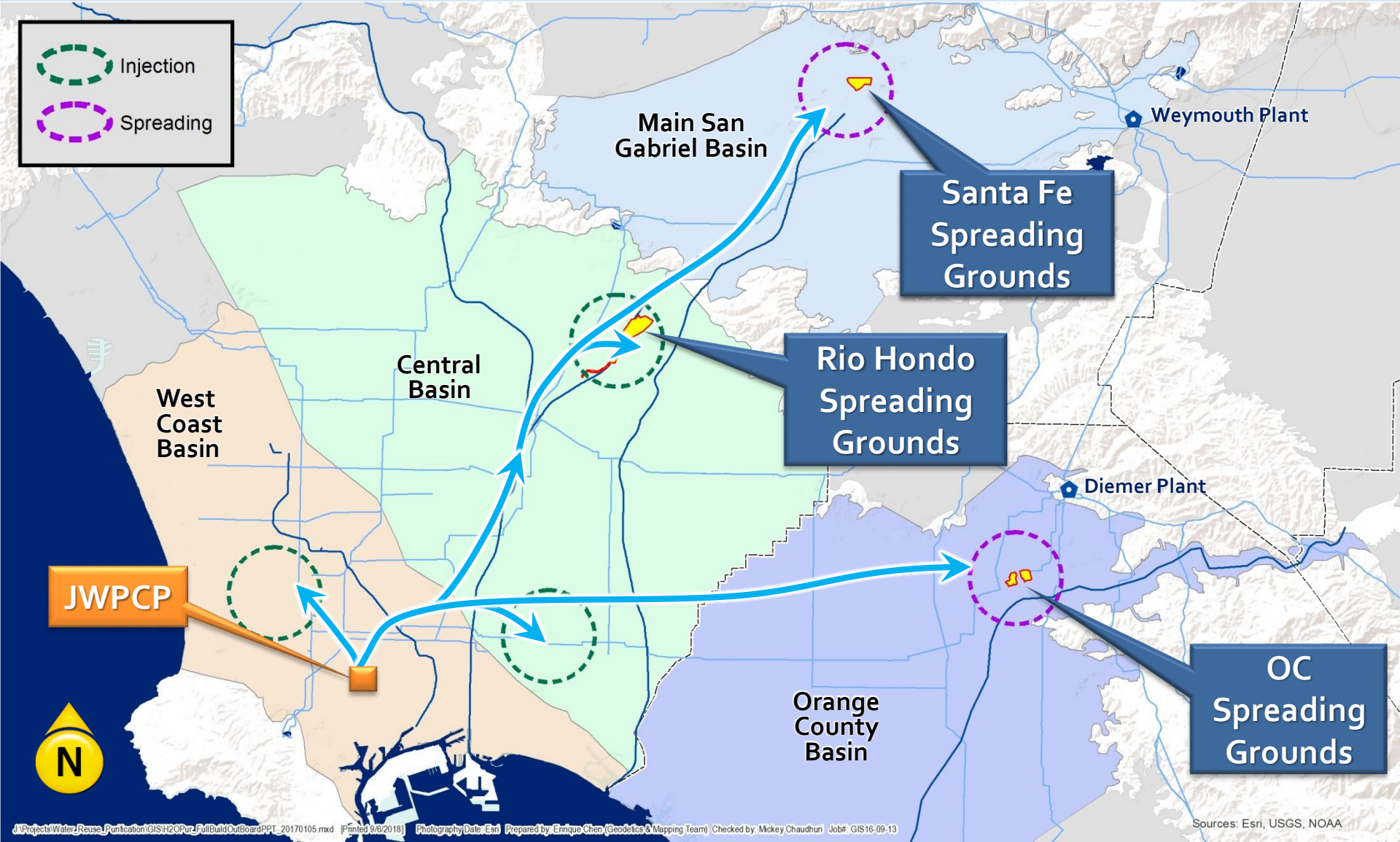
- 2017 average flow of ~260 MGD
- Permitted capacity of 400 MGD
- Primary and secondary treatment
- Currently discharges to the ocean

A New, Drought-Proof Source of Local Supply

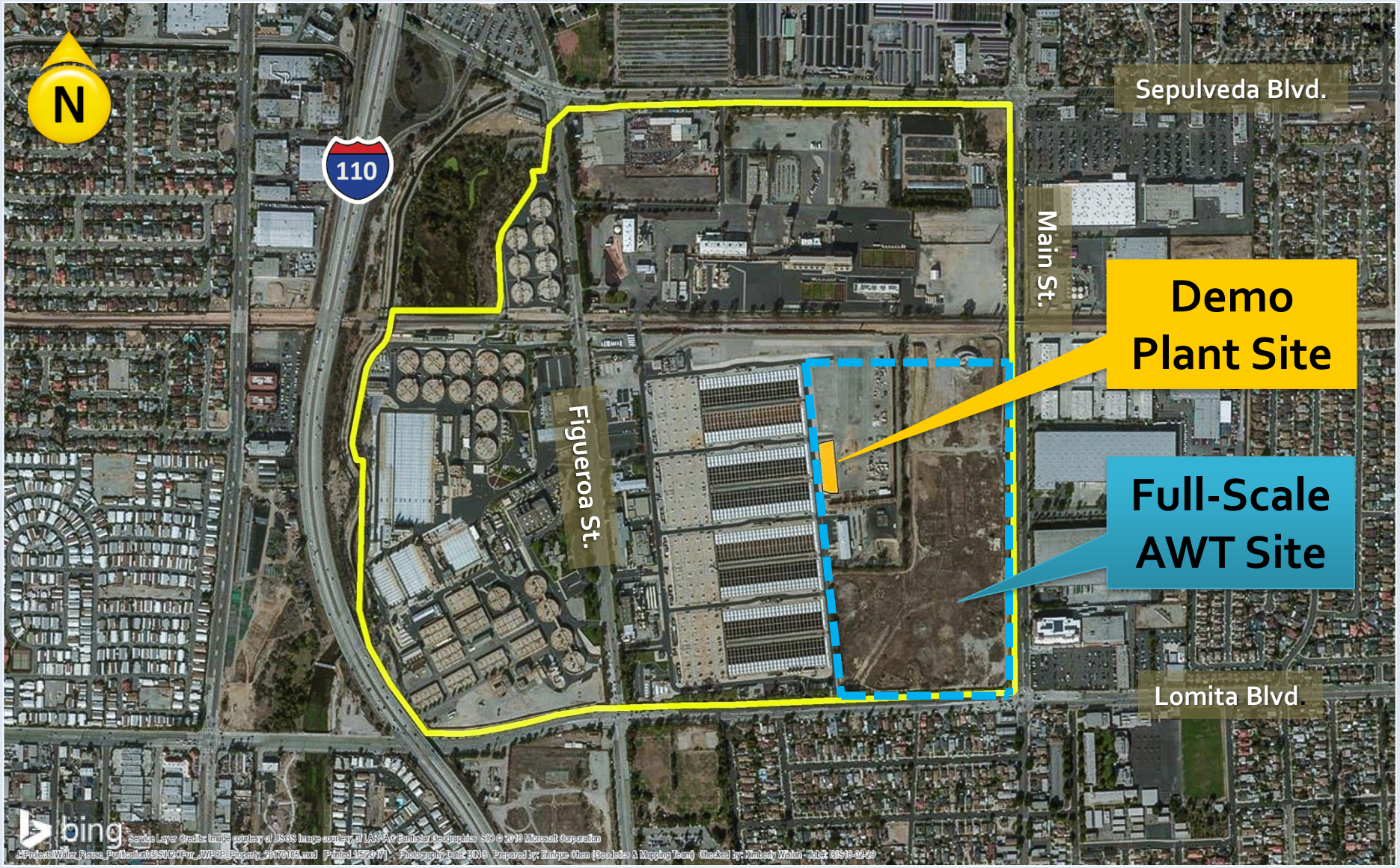
PROGRAM OVERVIEW

POTENTIAL FULL PROGRAM

(up to 150 MGD)



LOCATION OF AWT FACILITIES AT JWPCP



THREE-STEP PLANNING PROCESS

Feasibility Study Report (Complete)

- Can it be done?
- What will it cost?

Conceptual Planning (Nearly Complete)

- How should it be done?
- Can it be phased?

Environmental Permitting (Future)

- What are impacts?

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DEMONSTRATION PROJECT

DEMONSTRATION PLANT OBJECTIVES

- Provide data for regulatory acceptance
- Confirm viability of membrane bioreactor (MBR) process
- Optimize full-scale treatment process design
- Establish cost clarity for treatment
- Confirm operational dependencies/interfaces with LACSD
- Provide vehicle for public outreach and acceptance

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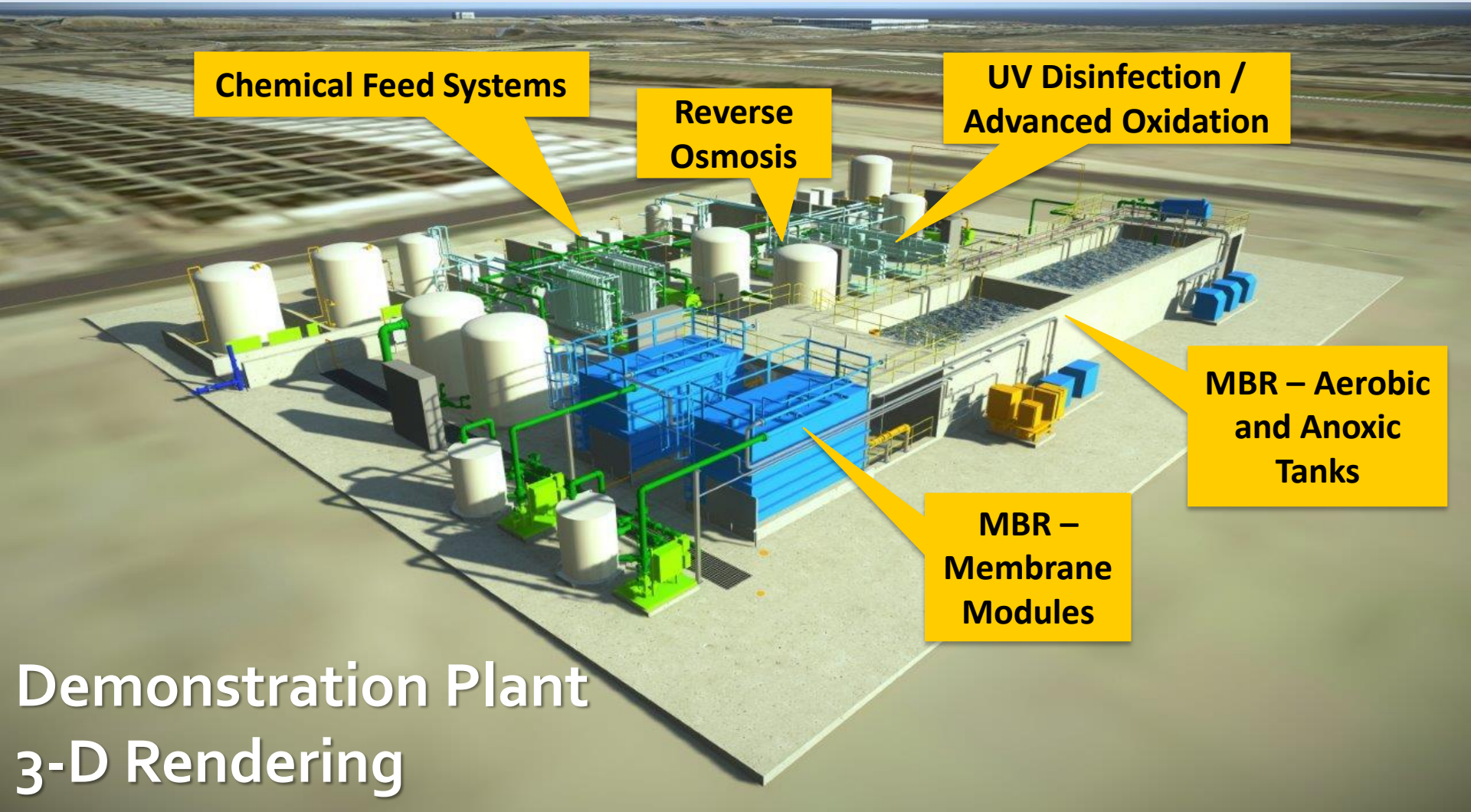
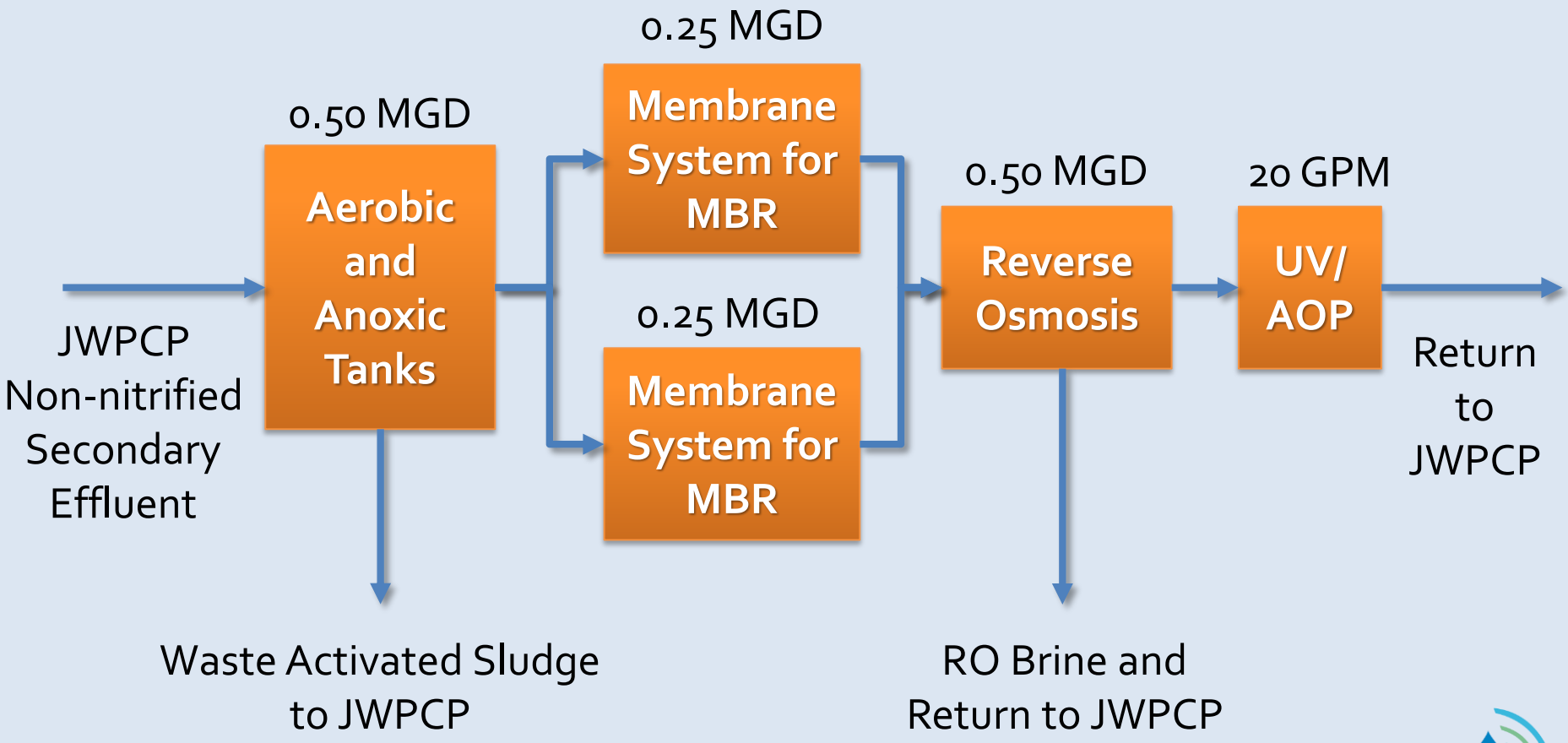


Demonstration Plant 3-D Rendering

DEMONSTRATION PLANT PROCESS TRAIN

(0.5 MGD Capacity)



CONSTRUCTION SITE OVERVIEW

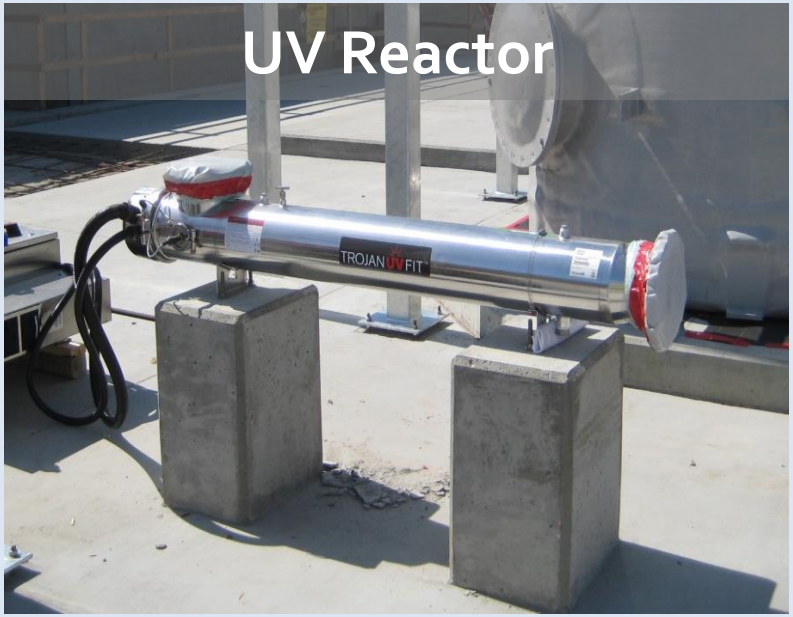
CONSTRUCTION SITE OVERVIEW

PROCESS EQUIPMENT

Membrane Bioreactor

Reverse Osmosis

UV Reactor

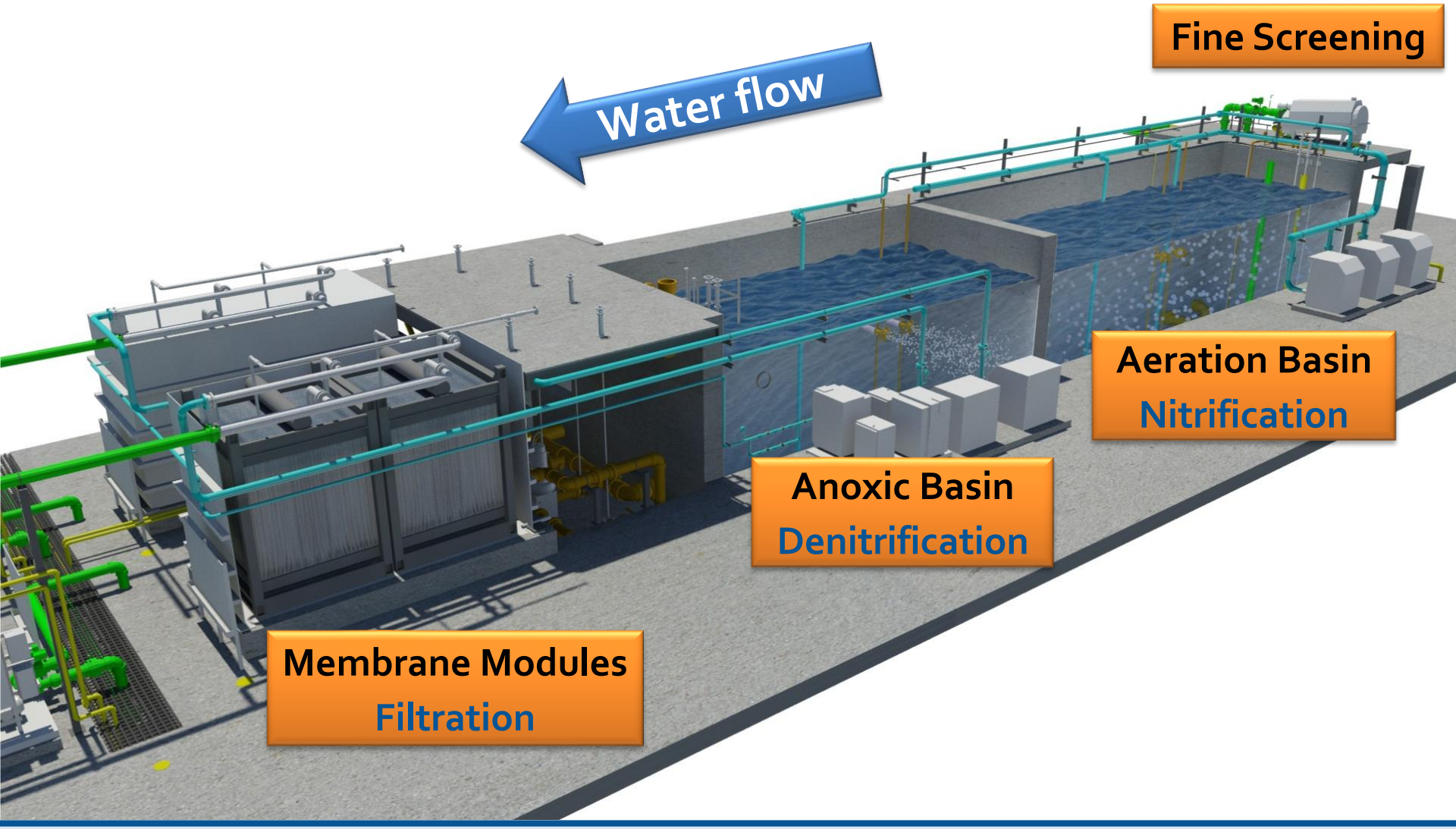


Chemical Storage

MEMBRANE BIOREACTOR FOR WATER REUSE

- Commonly used in non-potable reuse applications
- Limited use in potable reuse projects due to lack of pathogen removal regulatory credit to date
- Growing knowledge base from industry research on pathogen removal through MBR
- Effective technology for treating JWPCP effluent
  - Removes pathogens
  - Manages nitrogen
  - Minimizes RO fouling
  - Removes biodegradable CECs

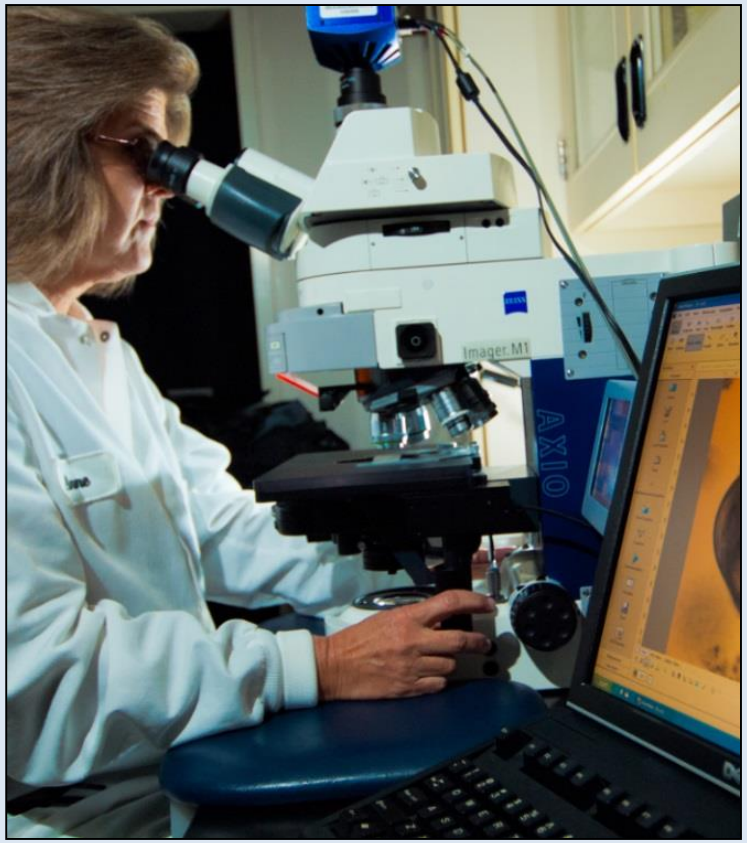
MBR PROCESS AT DEMONSTRATION PLANT



DEMONSTRATION PROJECT

Testing and Monitoring

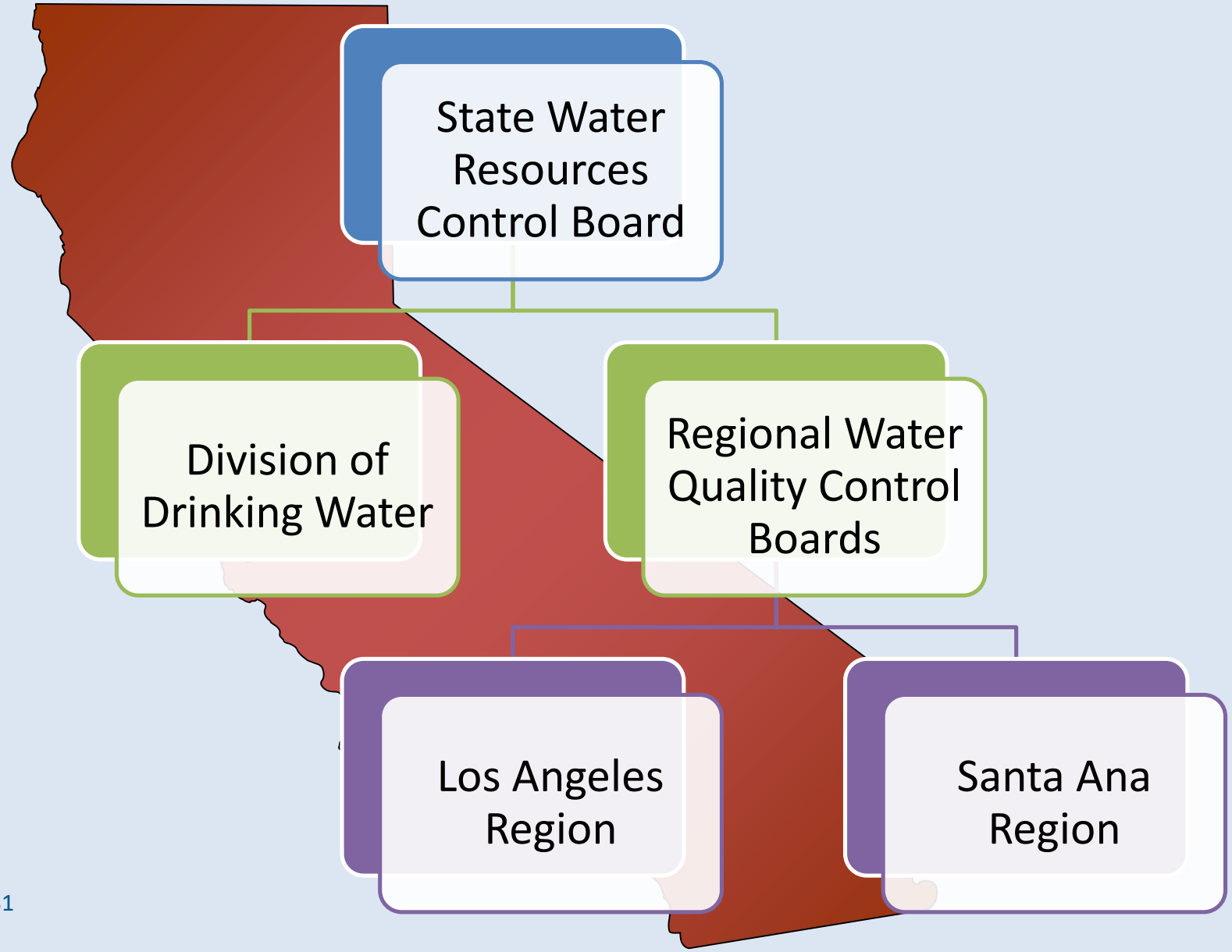
- Primary focus during initial testing period (~15 months) is to demonstrate pathogen removal and achieve regulatory acceptance of MBR
- Water quality from all unit processes will be monitored to ensure treatment goals are met
- LACSD will characterize JWPCP source water and brine/waste streams from the AWT process



DEMONSTRATION TESTING SCHEDULE

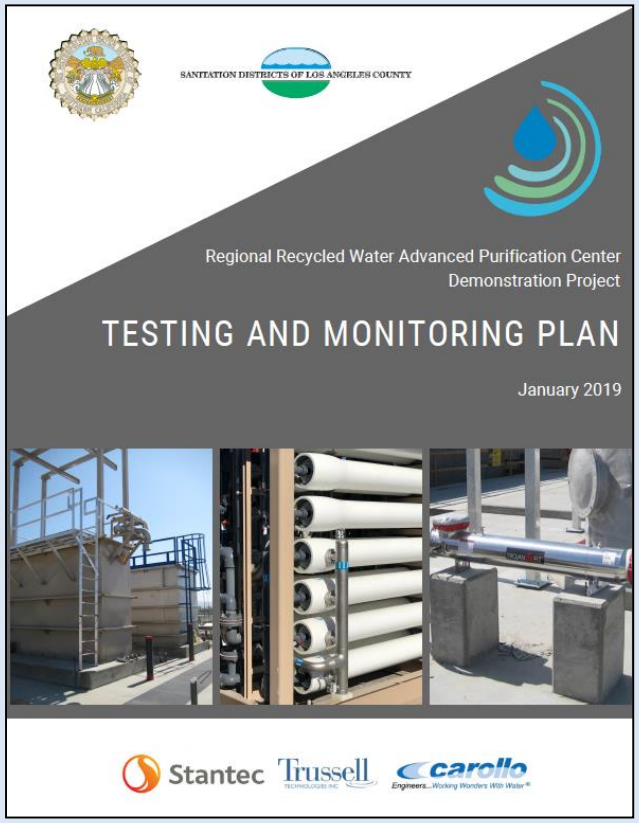
Pre-testing	• Equipment Testing and Process Acclimation (3 months)
Phase 1	• Baseline Performance Testing (4 months)
Phase 2	• Challenge Testing and Evaluation (8 months)

REGULATORY OVERSIGHT



ONGOING REGULATORY COORDINATION

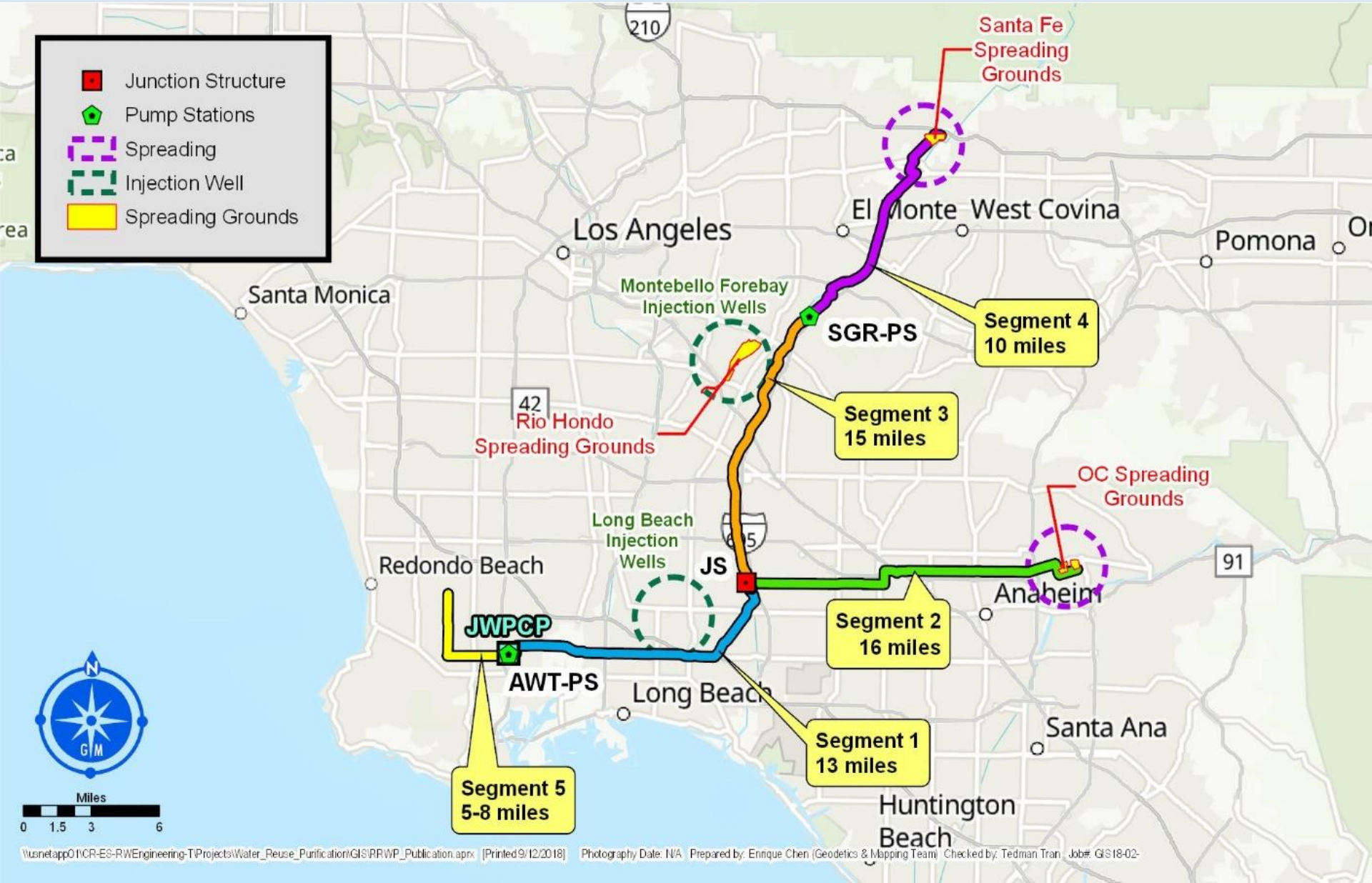
- Continued engagement with regulators since early 2016
- Feedback received on various program elements
  - Potential regional program concept
  - Groundwater basin analyses
  - Demonstration plant process train
  - Demonstration testing strategy
- Independent Scientific Advisory Panel commissioned
- Regulatory approval of testing and monitoring plan received in February 2019



Assessing Full-scale Program Elements

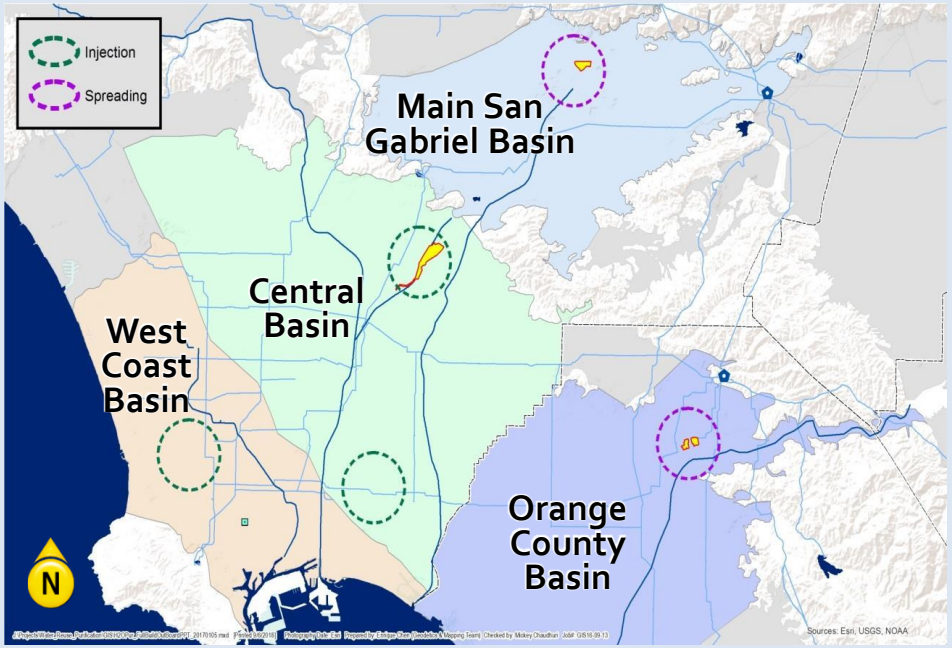
CONCEPTUAL PLANNING STUDIES

PHASING EVALUATIONS



GROUNDWATER BASINS

- Groundwater basin analyses
  - Basin demands
  - Effects of recharge: groundwater levels, water quality, infrastructure impacts, facility needs
  - Operational assessments
- Coordination with groundwater basin partners



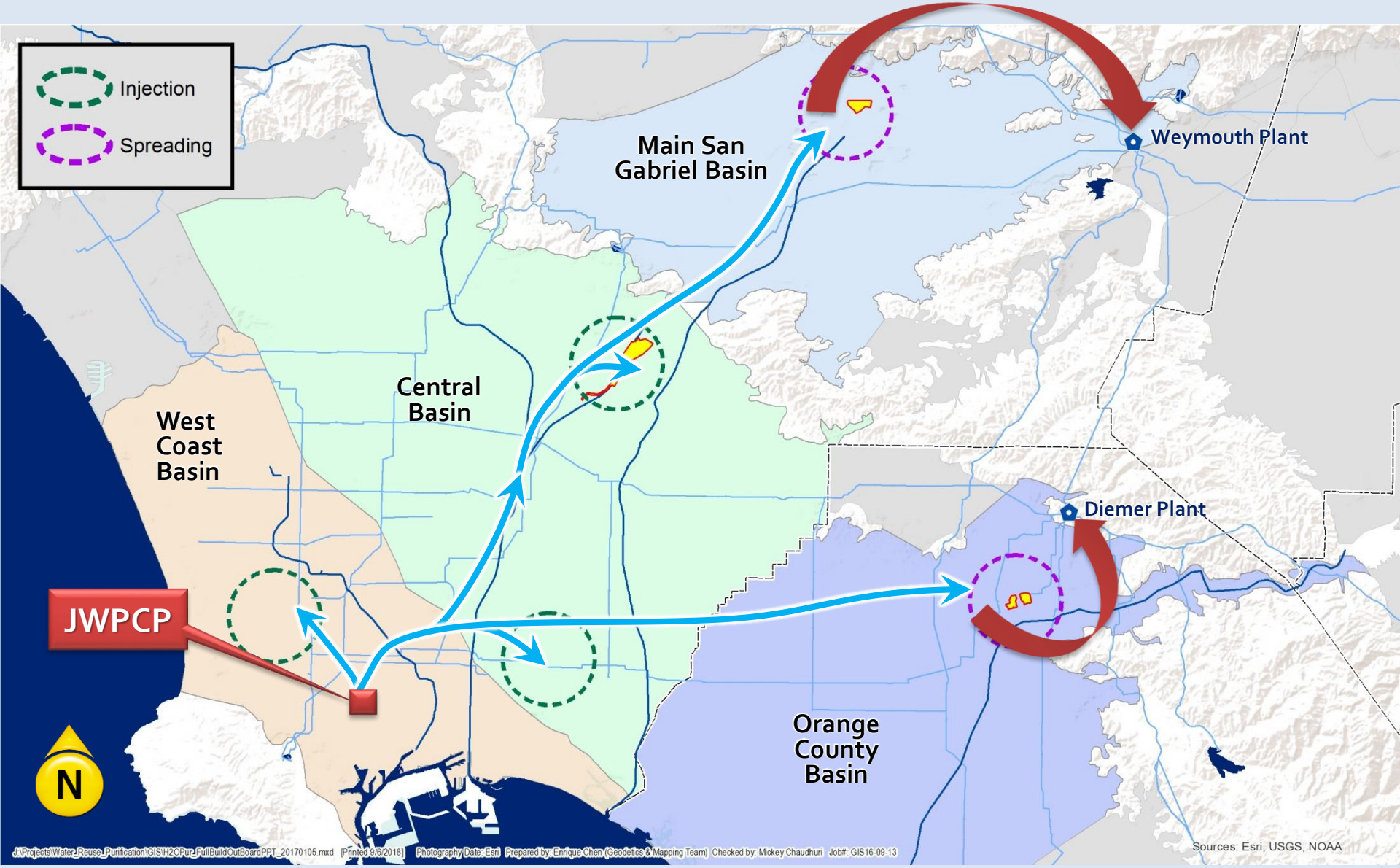
INSTITUTIONAL ARRANGEMENTS AND PARTNERSHIPS

- Ongoing collaboration and agreements with Sanitation Districts on demonstration project and full-scale planning efforts
- Development of institutional arrangements for delivery, storage and extraction of advanced treated water
  - Member agencies
  - Basin managers
  - Flood control agencies
  - Cities
  - Utilities

PUBLIC OUTREACH PLANNING

- Outreach plan
- Meetings with key stakeholders
- Demonstration facility for public outreach and acceptance
  - Exhibits
  - Tours
  - Surveys and feedback

COULD DPR BE A FUTURE OPTION?



ENSURING REGIONAL RELIABILITY

Benefits of the Regional Recycled Water Program

Earthquake

Prepares the Southland for the event of a catastrophic earthquake by increasing local water supplies.

Drought

Produces a drought-proof source of water, readily available rain or shine.

Groundwater

Replenishes groundwater basins, which provide 30% of Southern CA's water supply and have seen levels drop to historic lows in recent years.

Economy

Helps meet needs of region's growing economy and population at a cost comparable to other local water resources.

Wastewater

Uses region's largest untapped source of wastewater, currently sent to the ocean.

METROPOLITAN RECYCLED WATER WEBSITE

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