

# Texas Water Reuse


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National Science Foundation  
Energy Positive Water Resource Recovery Workshop

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**Texas Water**   
**Development Board**



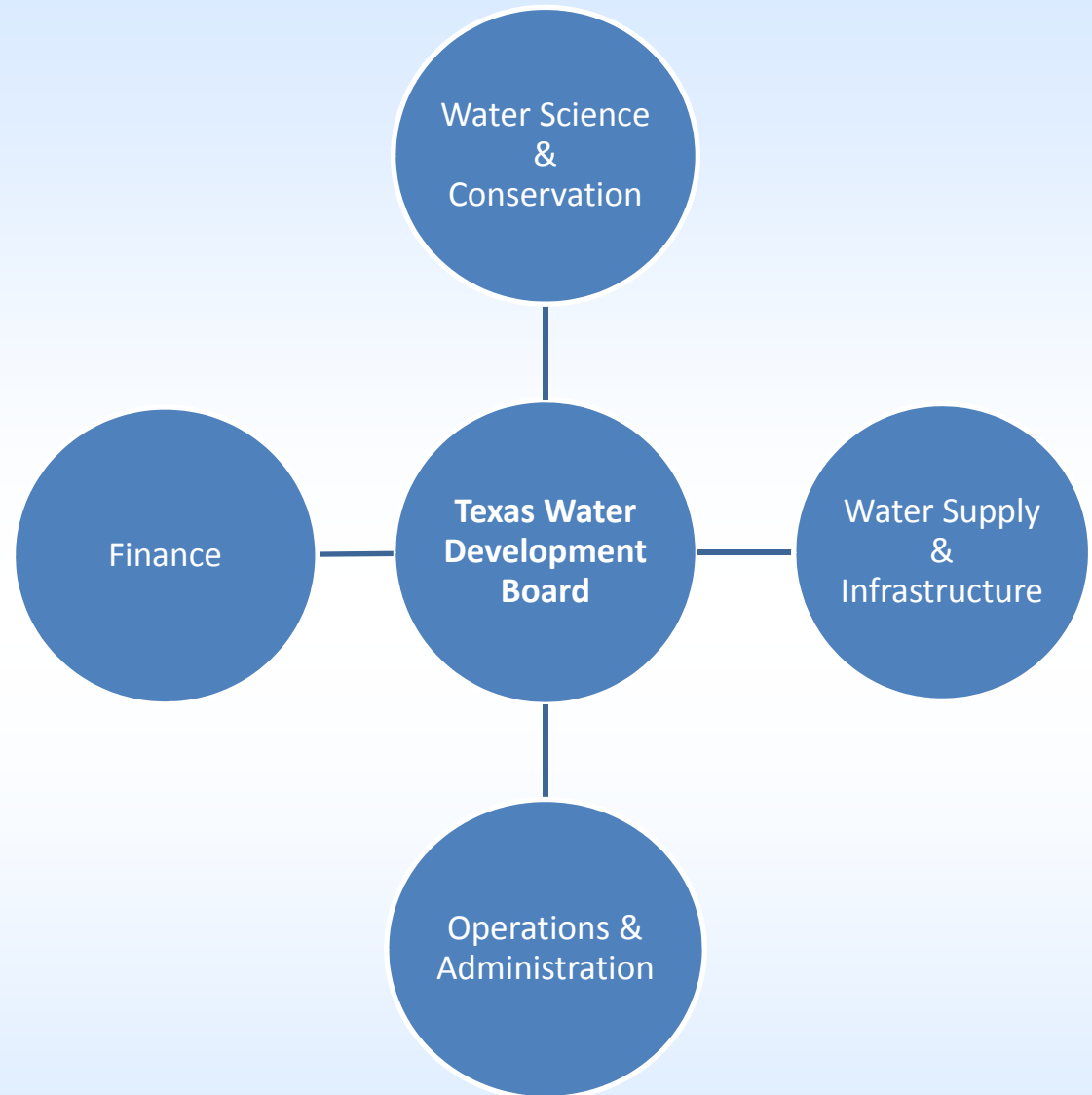
The following presentation is based upon professional research and analysis within the scope of the Texas Water Development Board's statutory responsibilities and priorities but, unless specifically noted, does not necessarily reflect official Board positions or decisions.

# Mission

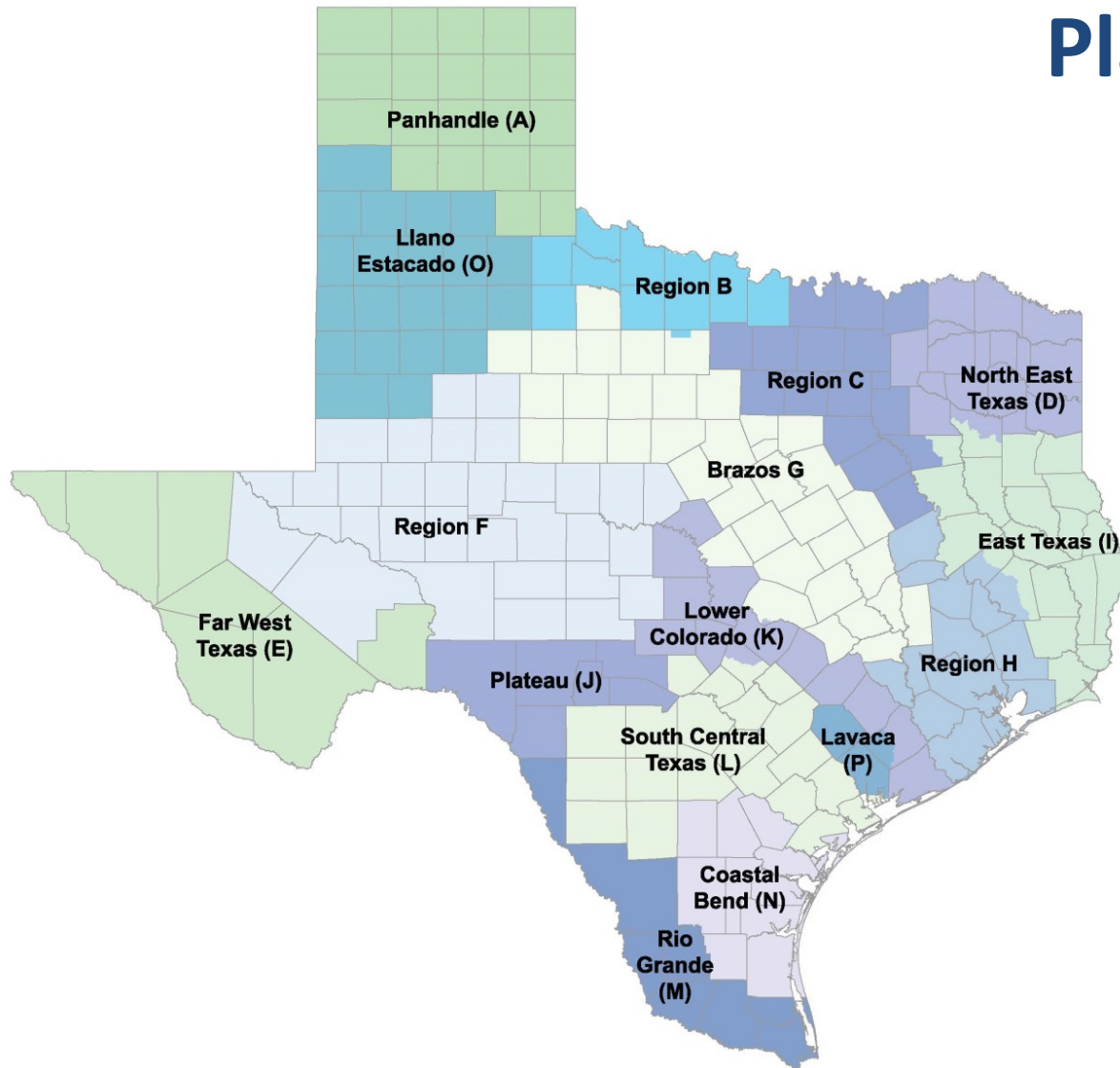
To provide

- Leadership,
- Information,
- Education, and
- Support for planning, financial assistance, and outreach

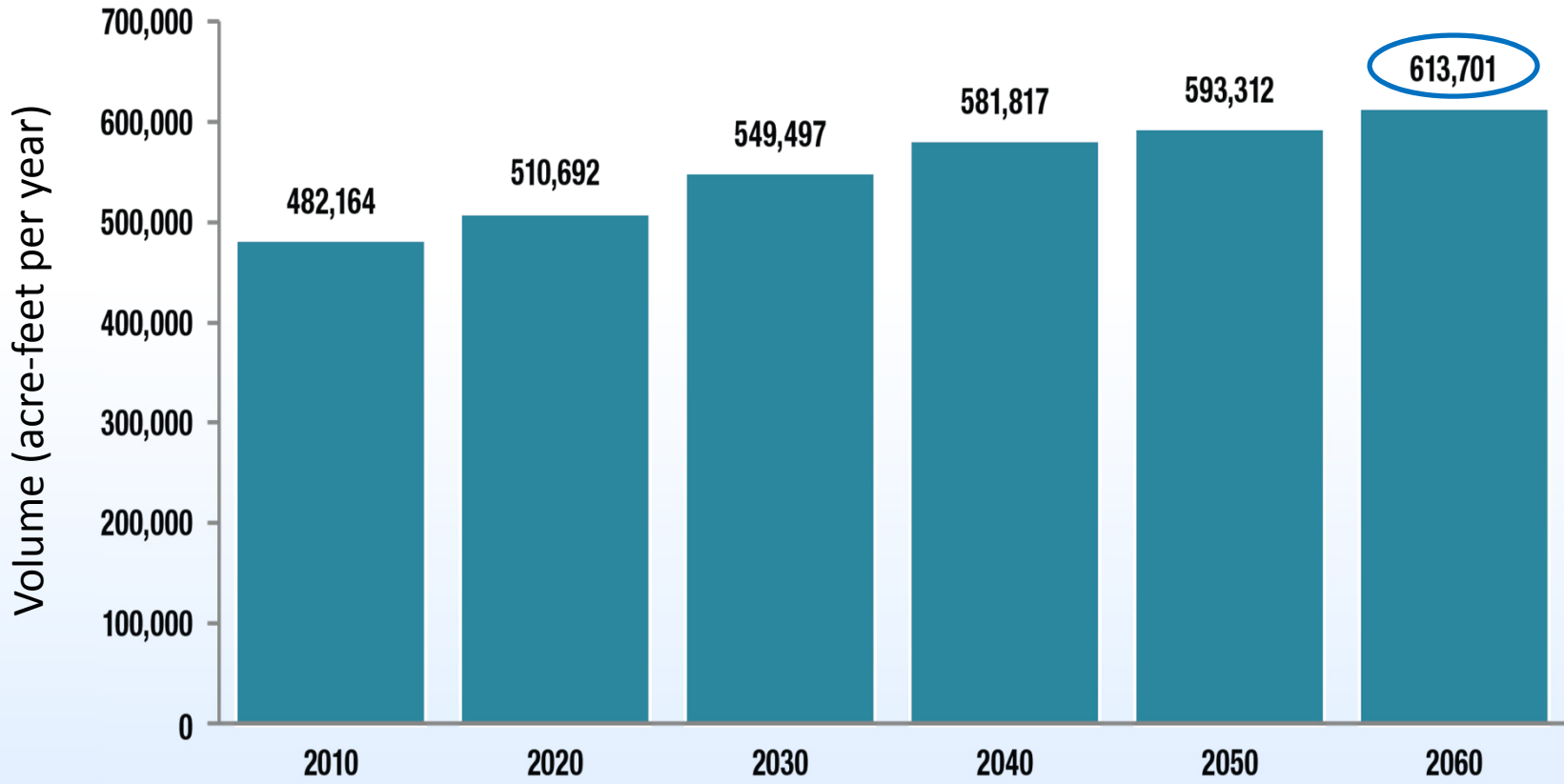
for the conservation and responsible development of water for Texas.



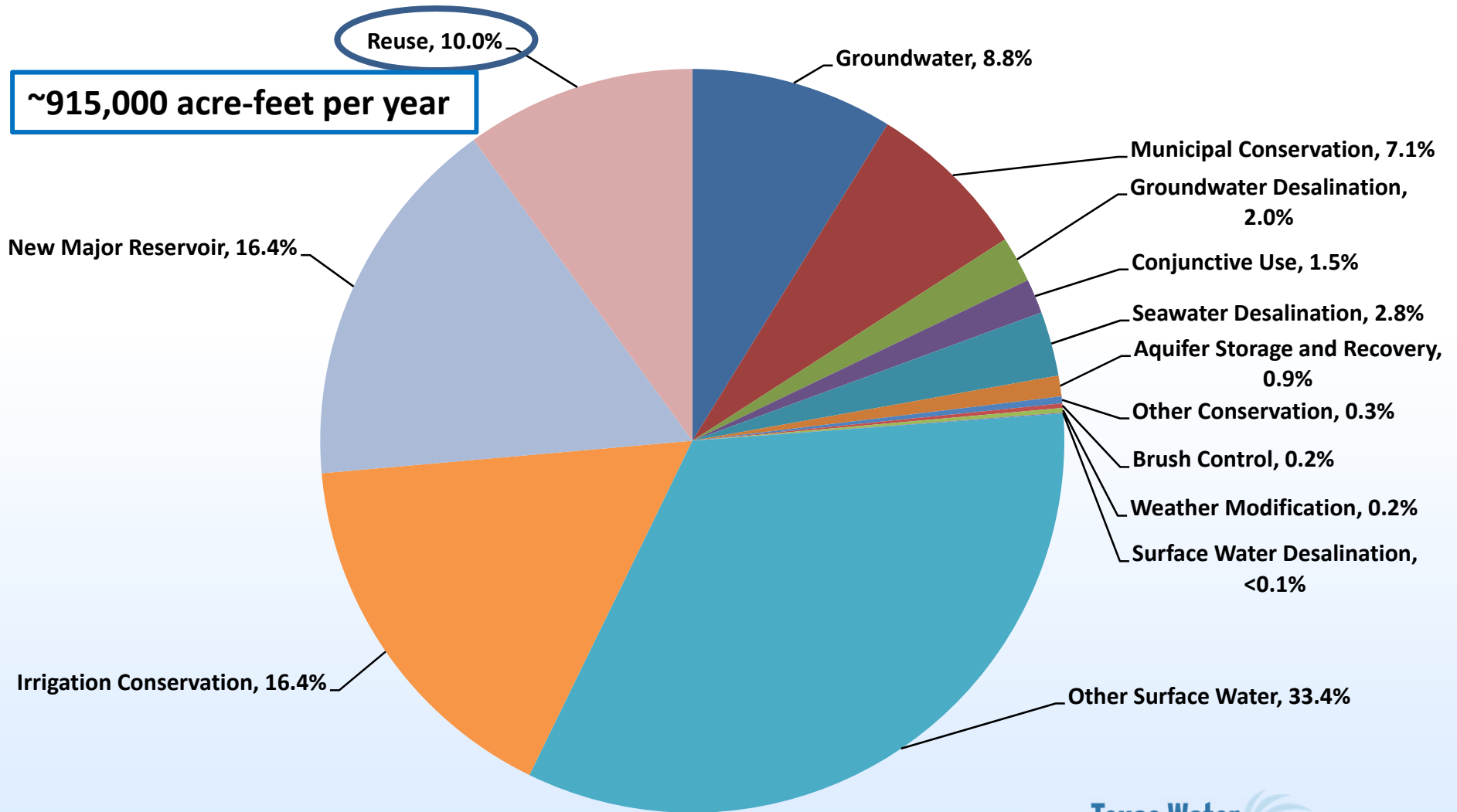
# Regional Water Planning Areas



# Projected Existing Water Supplies by 2060

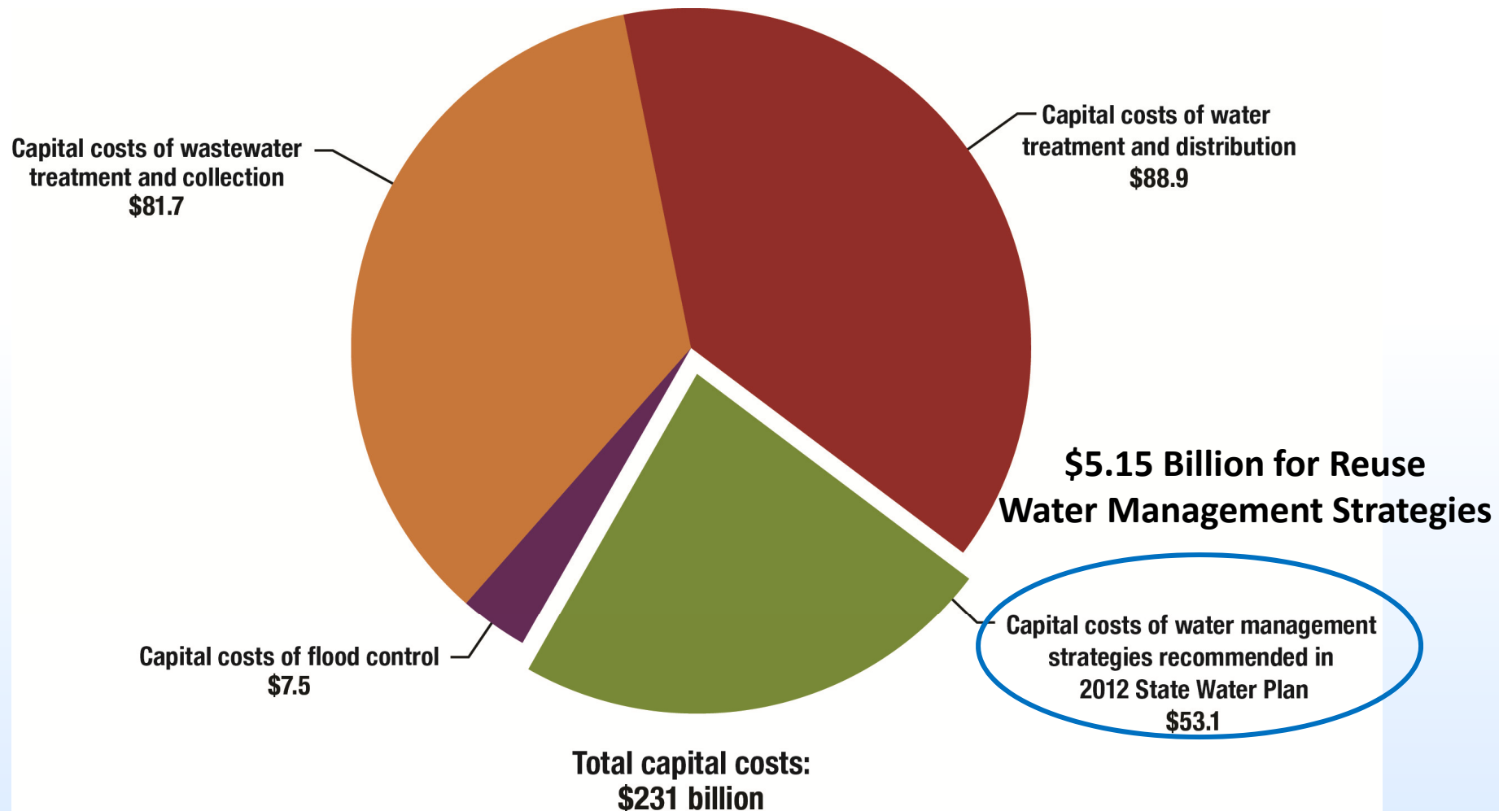


# Recommended Water Management Strategies by 2060



Source: Amended 2012 State Water Plan

# Capital Costs



# Clean Water State Revolving Fund

## Who can apply?

- Political subdivisions
- Federally recognized tribes
- Private entities for newly eligible projects
  - Reduce publically-owned water treatment works capacity through reuse
  - Reduce energy consumption needs for publically-owned treatment works
  - Reuse or recycling wastewater

## Eligible Projects:

- Wastewater infrastructure
- Reuse/conservation/stormwater facilities
- Nonpoint source pollution control



# State-Funded Financial Programs

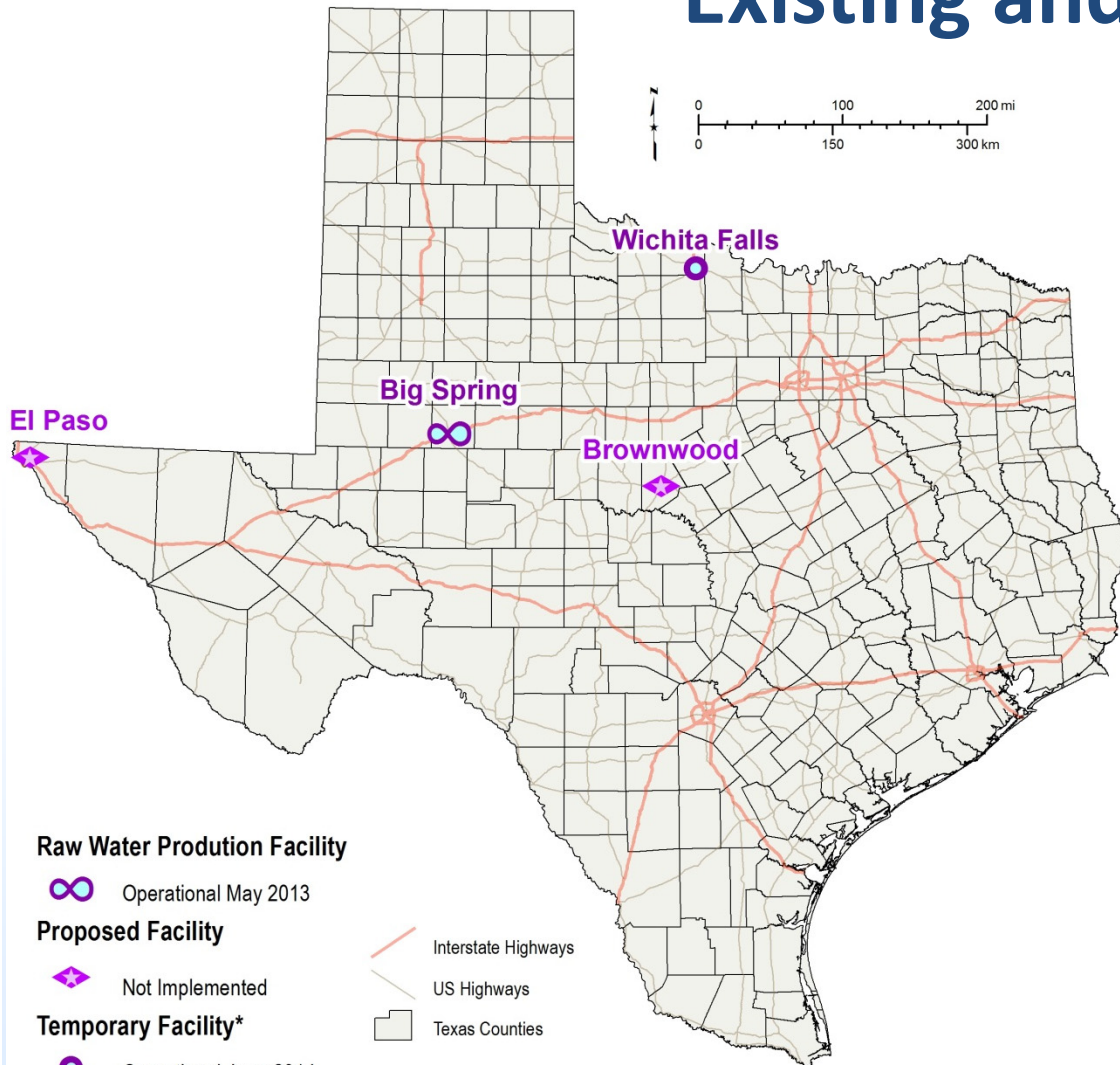
## Programs

- Agricultural Water Conservation
- Economically Distressed Areas Program
- State Participation Program
- Texas Water Development Fund
- State Water Implementation Fund for Texas (SWIFT)

## Project Types

- Sewer treatment plants
- Collection systems
- Lift stations
- System acquisition
- System Rehabilitation
- Non-point source pollution abatement
- Trunk lines
- Reuse projects

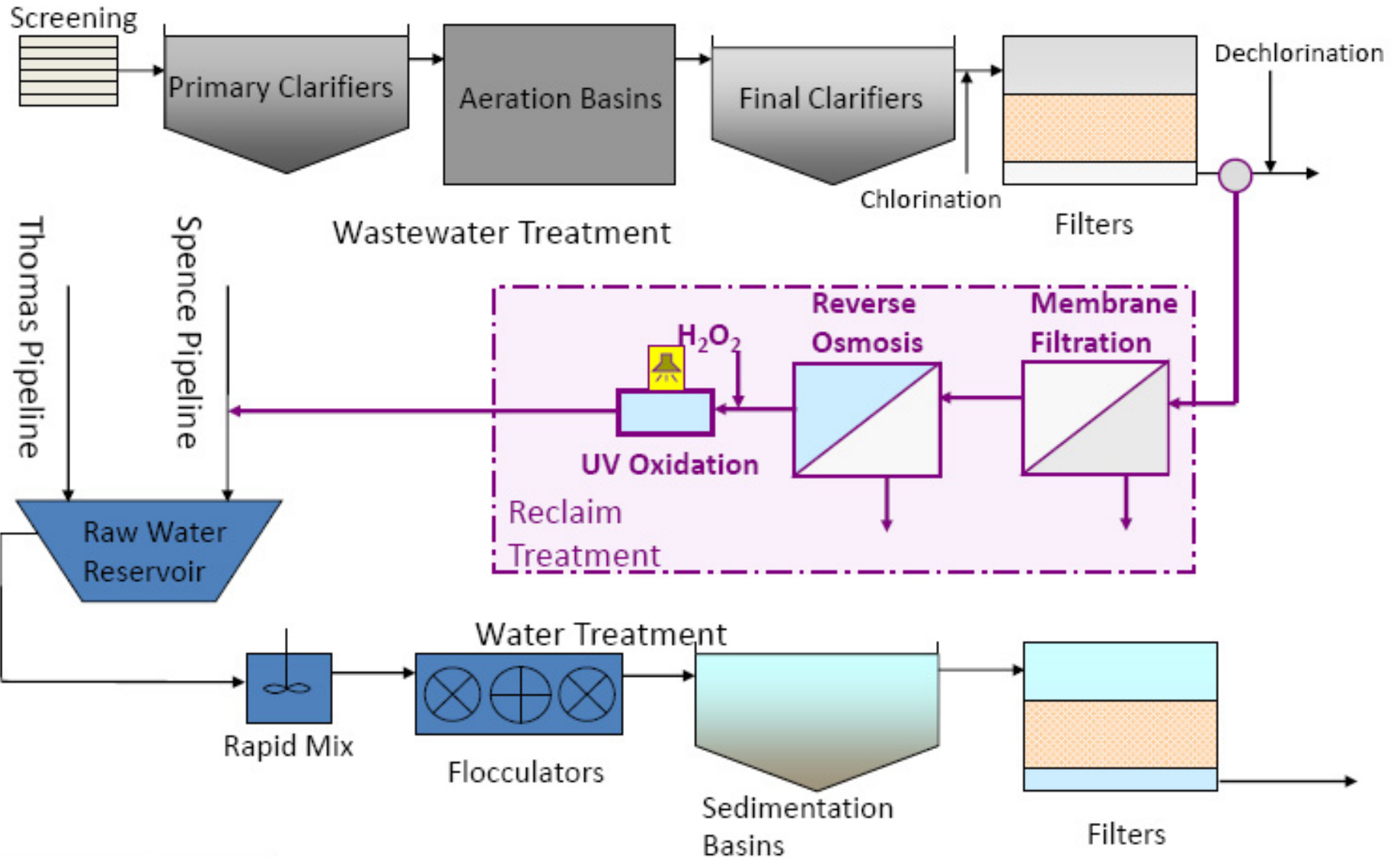
# Direct Potable Water Reuse Existing and Proposed Facilities



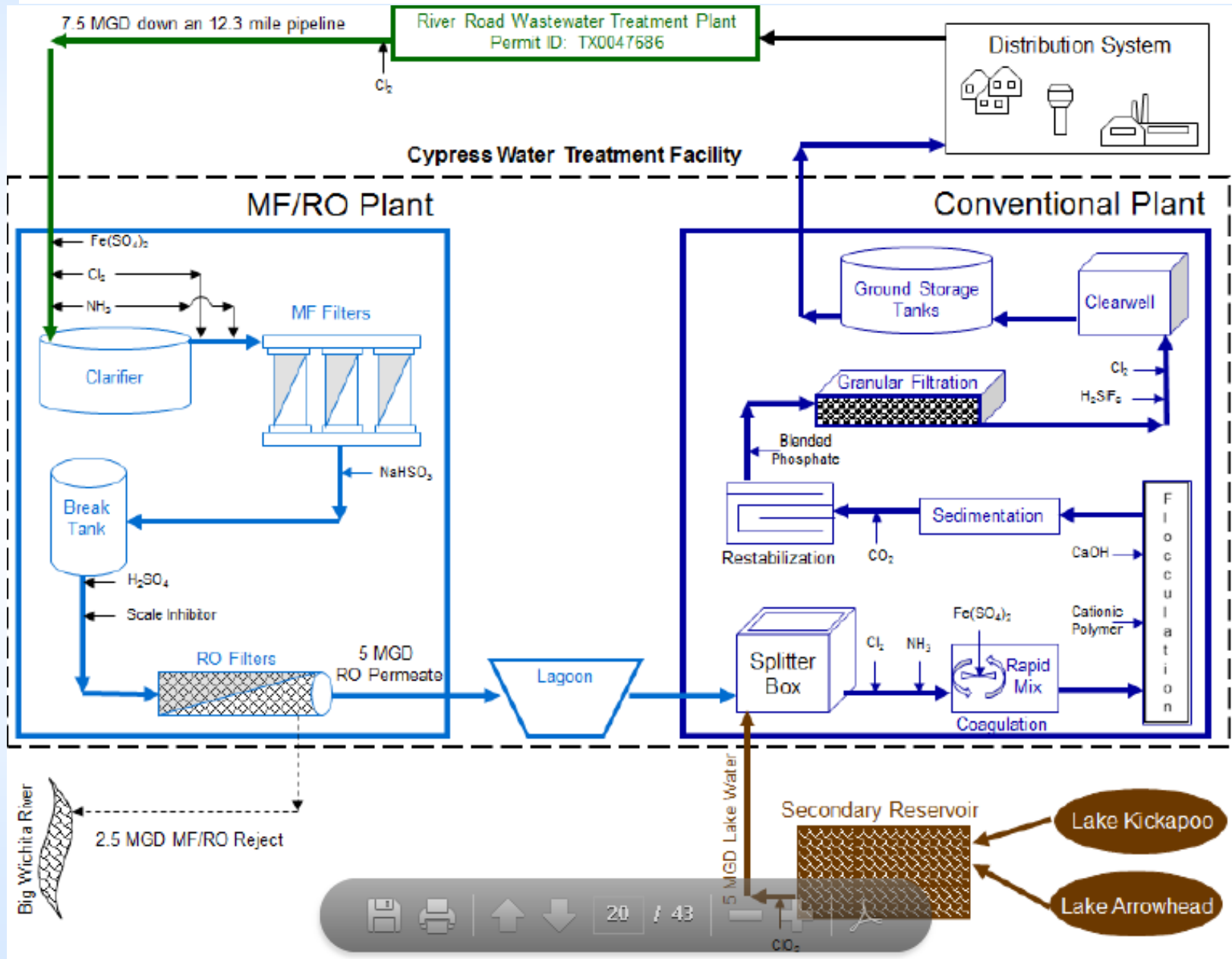
\*Direct Potable Reuse Water Treatment Plant permitted for a period of 6 months

- Raw Water Production Facility
  - Operating since May 2013
- Direct Potable Reuse Project
  - Operating since July 2014 (emergency project)
- Advanced Purified Water Treatment
  - Completed piloting protocol
- Direct potable reuse project
  - Awaiting city council approval

# Raw Water Production Facility in Big Spring, Texas



# Direct Potable Reuse Project in Wichita, Texas



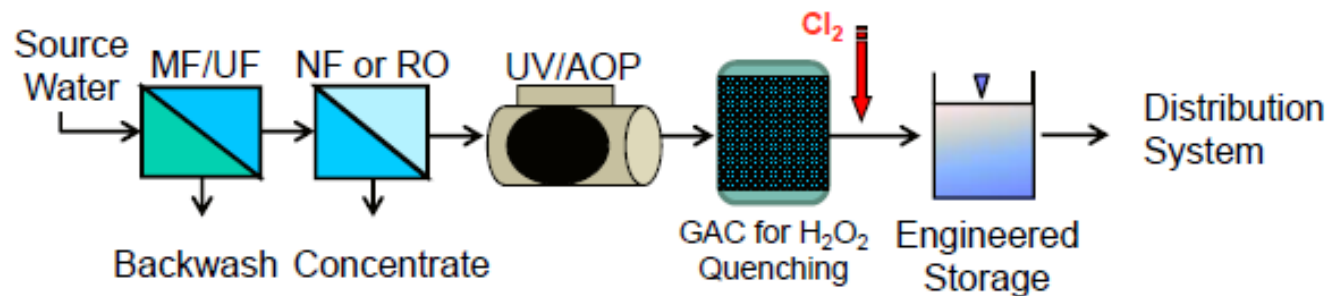
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# Advanced Purified WTP Concept

## Advanced Purified WTP



MF/UF	NF or RO	UV-AOP	GAC	Cl <sub>2</sub>	
●	●	○	●	○	Particulates
○	🕒	●	○	○	TOC
○	🕒	●	○	○	Nutrients
○	●	●	○	○	TDS (Hardness)
○	🕒	●	○	○	TDS (Chloride)
○	🕒	●	●	○	Microconstituents
●	●	●	○	●	Pathogens
🕒	●	●	○	●	Viruses

- Primary removal mechanism; >90% effectiveness
- Additional removal mechanism; >90% effectiveness
- 🕒 75 to 90% effectiveness
- 🕒 50 to 75% effectiveness
- 🕒 25 to 50% effectiveness
- None to <25% effectiveness

# Water Reuse Research

## Evaluating the Potential for Direct Potable Reuse

- Contaminants of Concern
- Water quality performance targets
- Water quality characterization
- Source control
- Treatment technologies
- Environmental buffers
- Quantitative relative risk assessment
- Pilot protocols
- Regulatory summary
- Public awareness and outreach

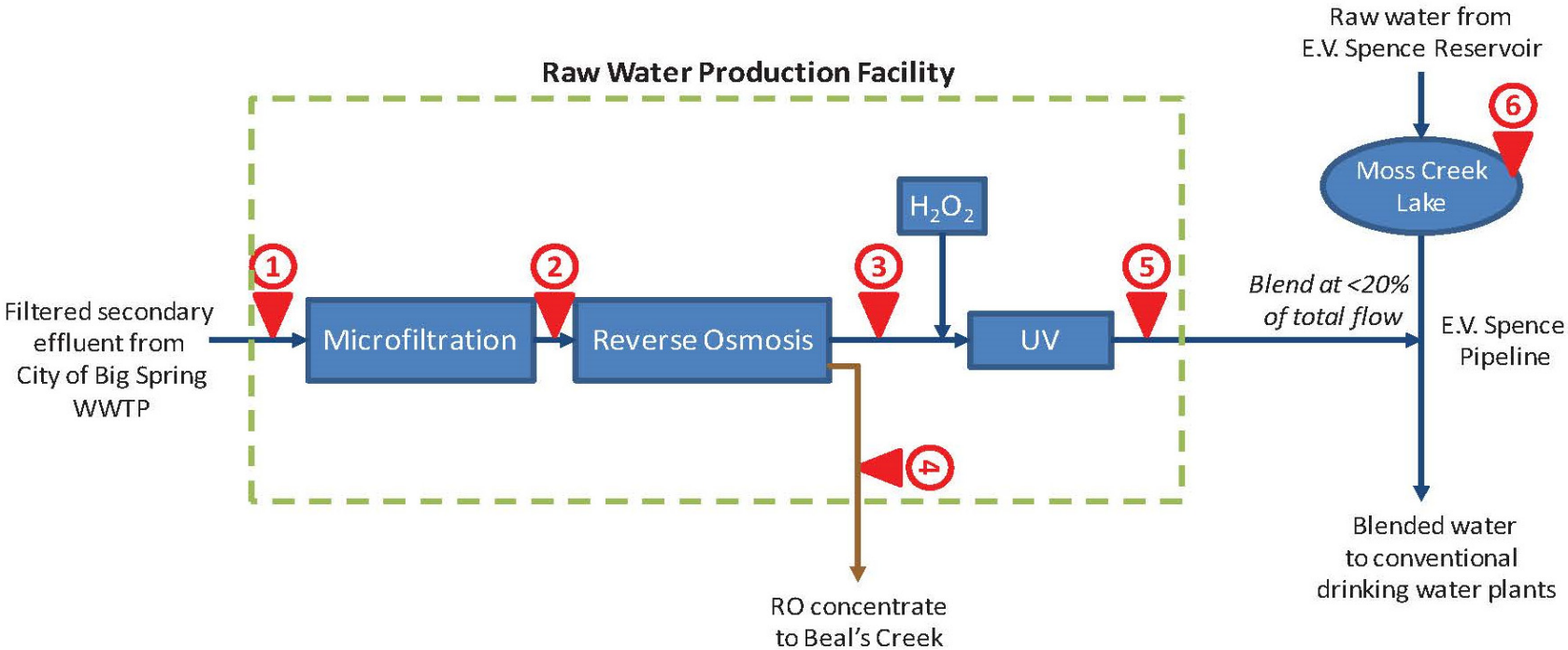


# Testing Water Quality in a Municipal Wastewater Effluent Treated to Drinking Water Standards

- Quarterly sampling
  - Chemicals of Emerging Concern
  - Microbial pathogens
- Develop correlations for surrogates compounds
- Guidance document for monitoring at direct potable reuse facilities



# Sample Locations

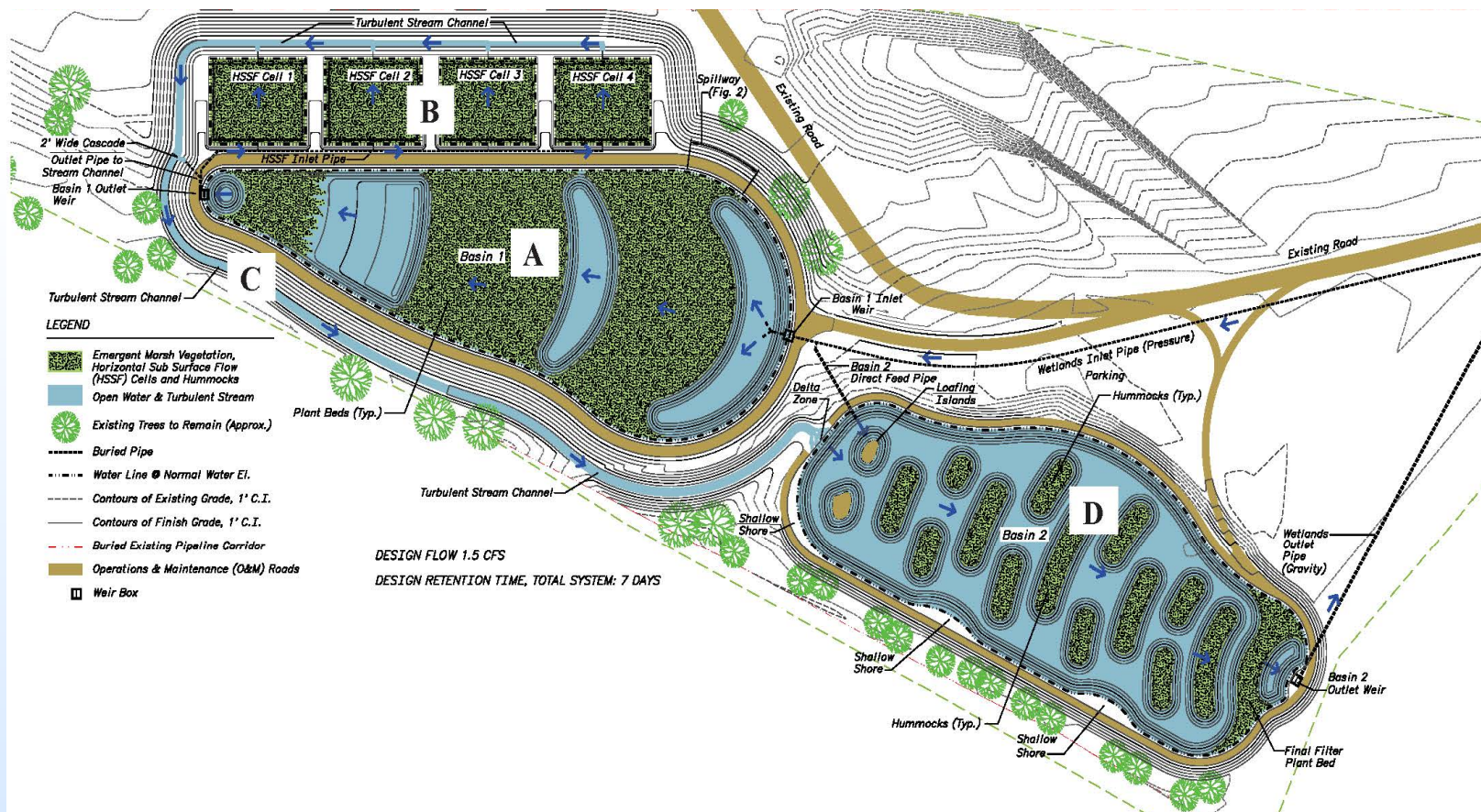


Proposed Sample Location



# Brazos River Wetland

- Engineered wetland constructed in Waco, Texas to evaluate how endocrine disrupting compounds can be reduced from treated wastewater effluent.



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## Innovative Water Technologies

<http://www.twdb.texas.gov/innovativewater/reuse/index.asp>

## Texas Water Development Board

[www.twdb.texas.gov](http://www.twdb.texas.gov)

