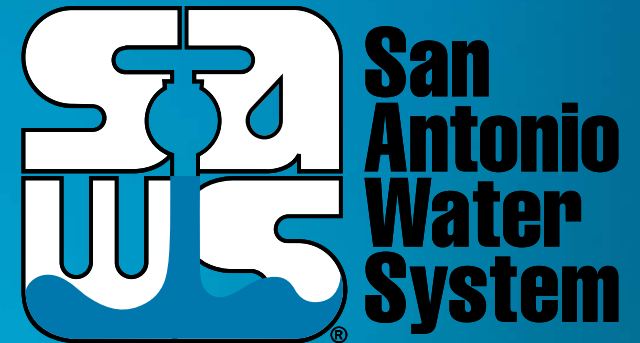


Conservation: Implications for Water Recycling and Reuse

Gregg Eckhardt

Senior Analyst, Production and Treatment Operations

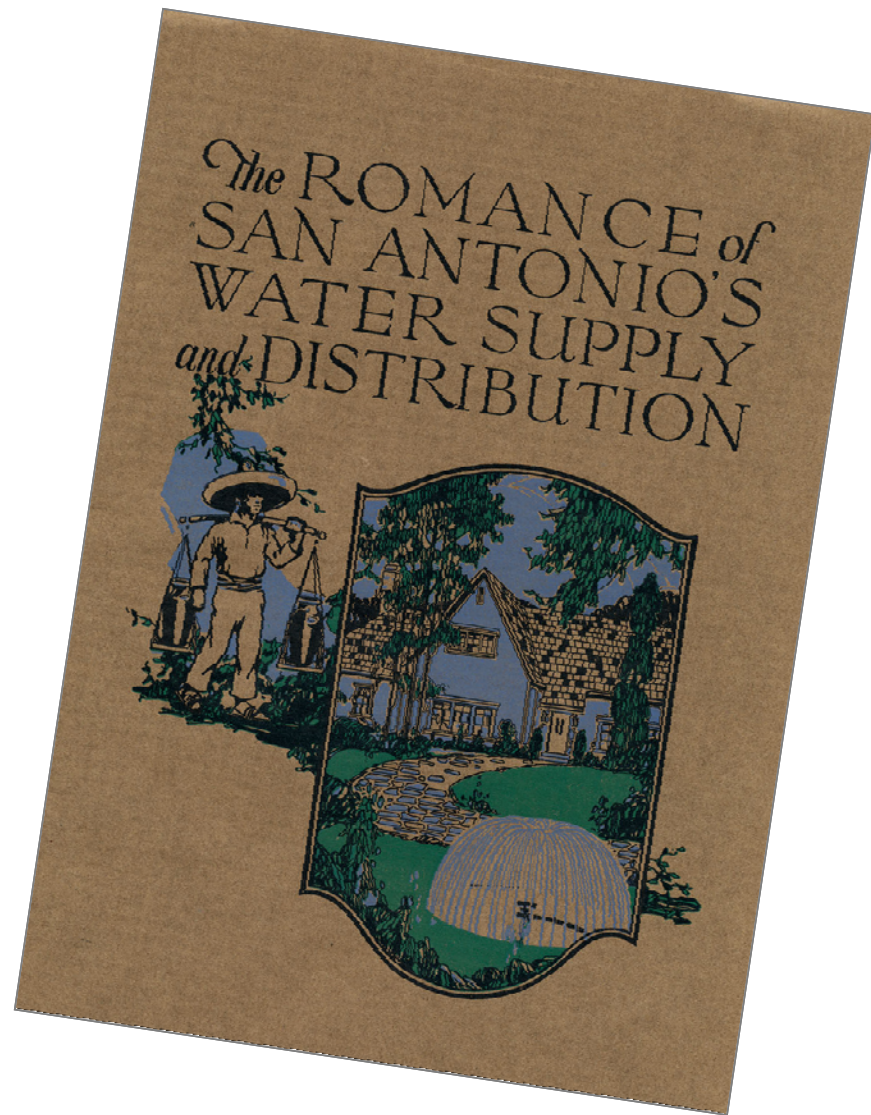


May 11, 2022

MAKING SAN ANTONIO
WATERFUL



Bert McClean,
1924



Nation's Longest History of Reuse

1718:

Acequia system reused wastewaters



1894:

First collection system to sewage farm







1901:

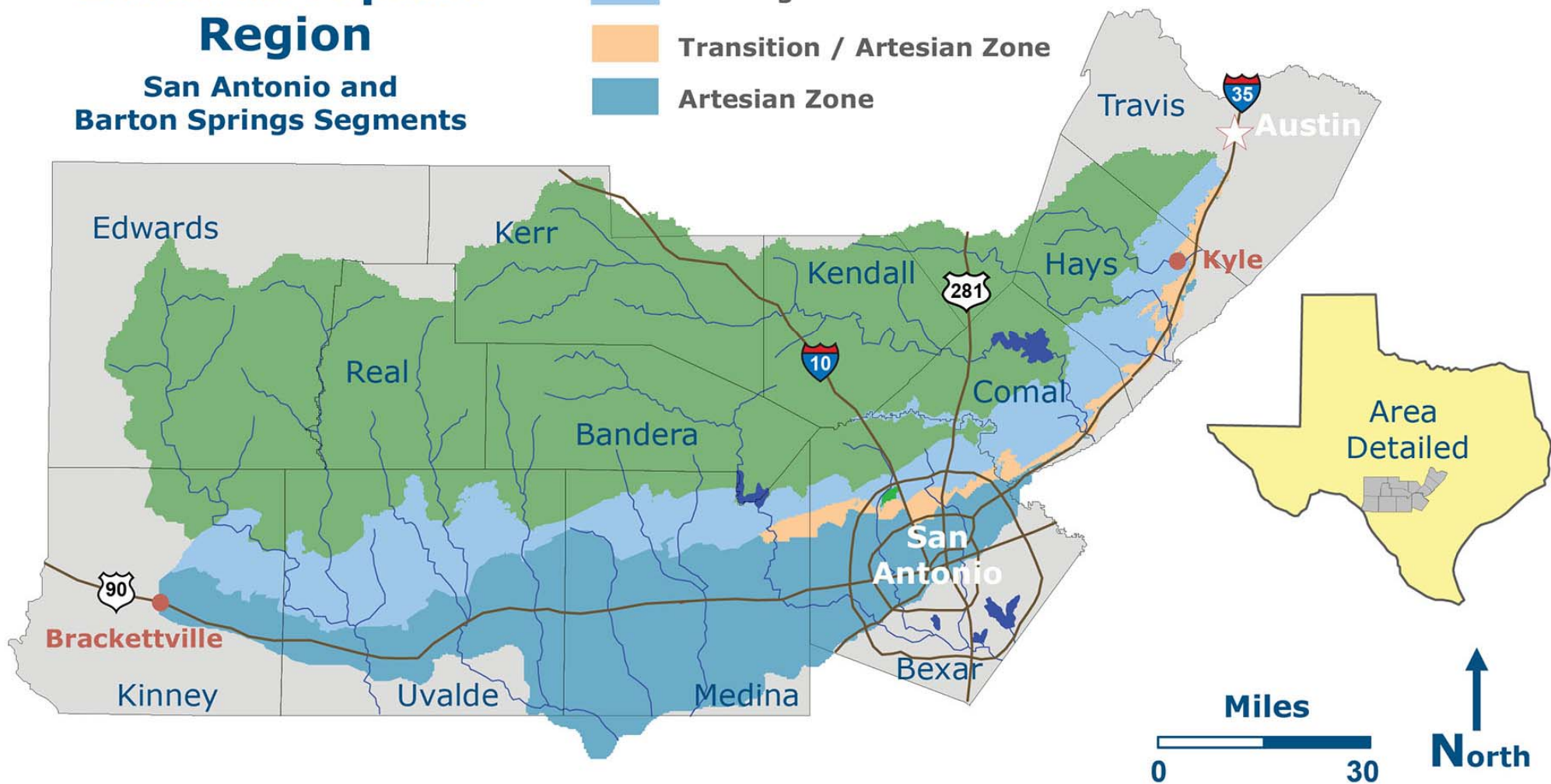
Mitchell Lake part of large irrigation system



The Edwards Aquifer Region

San Antonio and Barton Springs Segments

-  Contributing Zone
-  Recharge Zone
-  Transition / Artesian Zone
-  Artesian Zone







The Blue Hole at San Antonio Springs

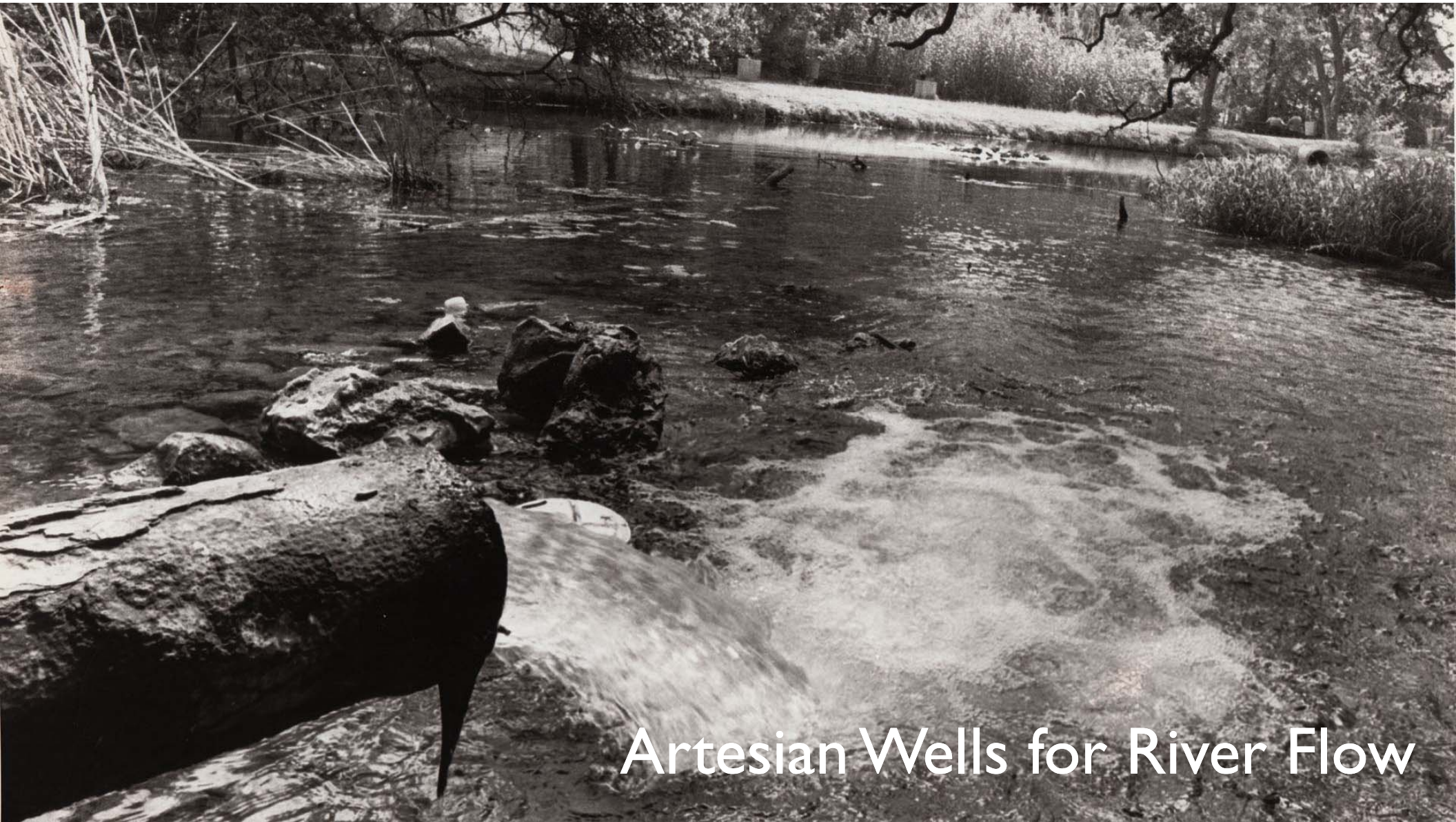


1891 Well at Market Street

"You can drink it in the dark and feel absolutely sure of not experiencing a disagreeable sensation."

- water company ad, 1915





Artesian Wells for River Flow



San Antonio River Walk



Texas Blind Salamander



Fountain Darter

San Antonio Express-News

Serving South Texas since 1865

SATURDAY, August 24, 1996

★ Final Edition 50c

Bunton orders pumping limits

City leaders react angrily, plan to file appeal Monday

By **KEN DILANIAN**
EXPRESS-NEWS STAFF WRITER

Flanked by local leaders at a dramatic City Hall news conference, Mayor Bill Thornton vowed Friday to appeal a federal judge's order that he decried as favoring animals over people.

"Today I think it's time we draw a line in the sand to fight for consideration of humans and human rights," Thornton said. "Quite frankly, the court is jacking us around."

Thornton's sentiments were echoed by a variety of city officials who protested an order by Senior U.S. District Judge Lucius D. Bun-

ton III that may require San Antonians to stop watering their lawns in an effort to save five federally protected species at Comal and San Marcos springs.

After years of warnings, threats and voluntary plans, Bunton finally imposed a legally binding court order in response to allegations from the non-profit Sierra Club that San Antonio's Edwards Aquifer water use is violating the Endangered Species Act.

Governments at all levels have failed to properly preserve the Edwards, Bunton wrote, and that failure is killing species in violation

■ See **THORNTON/8A**



“
Today I think it's time we draw a line in the sand to fight for consideration of humans and human rights. Quite frankly, the court is jacking us around.

— Mayor Bill Thornton

”

“
The Edwards Aquifer region has finally reached the point where the aquifer is unable to provide for the needs of all those who depend upon it during dry years.

— Senior U.S. District Judge Lucius D. Bunton III

”



SAWS chief foresees ban on lawn watering by Oct. 1

By **JERRY NEEDHAM**
EXPRESS-NEWS STAFF WRITER

A federal judge ordered restrictions on pumping from the Edwards Aquifer by the city of San Antonio and other defendants Friday, in an endangered species lawsuit filed by the Sierra Club.

Mayor Bill Thornton and City Council members vowed an appeal.

The order by Senior U.S. District Judge Lucius D. Bunton III does not take effect until Oct. 1. Depending on how much rain falls by then, the San Antonio Water System and other large users of aquifer water could be limited to no



The water debate is about a lot more than blind critters.

Carlos Guerra/1B

more than 1.2 times their winter average pumpage.

Joe Aceves, SAWS president, said that to meet that limit, the city probably would have to ban any outdoor water use by residen-

■ See **FEDERAL/8A**

EDWARDS AQUIFER
AUTHORITY

900

Edwards Aquifer Authority



Conservation

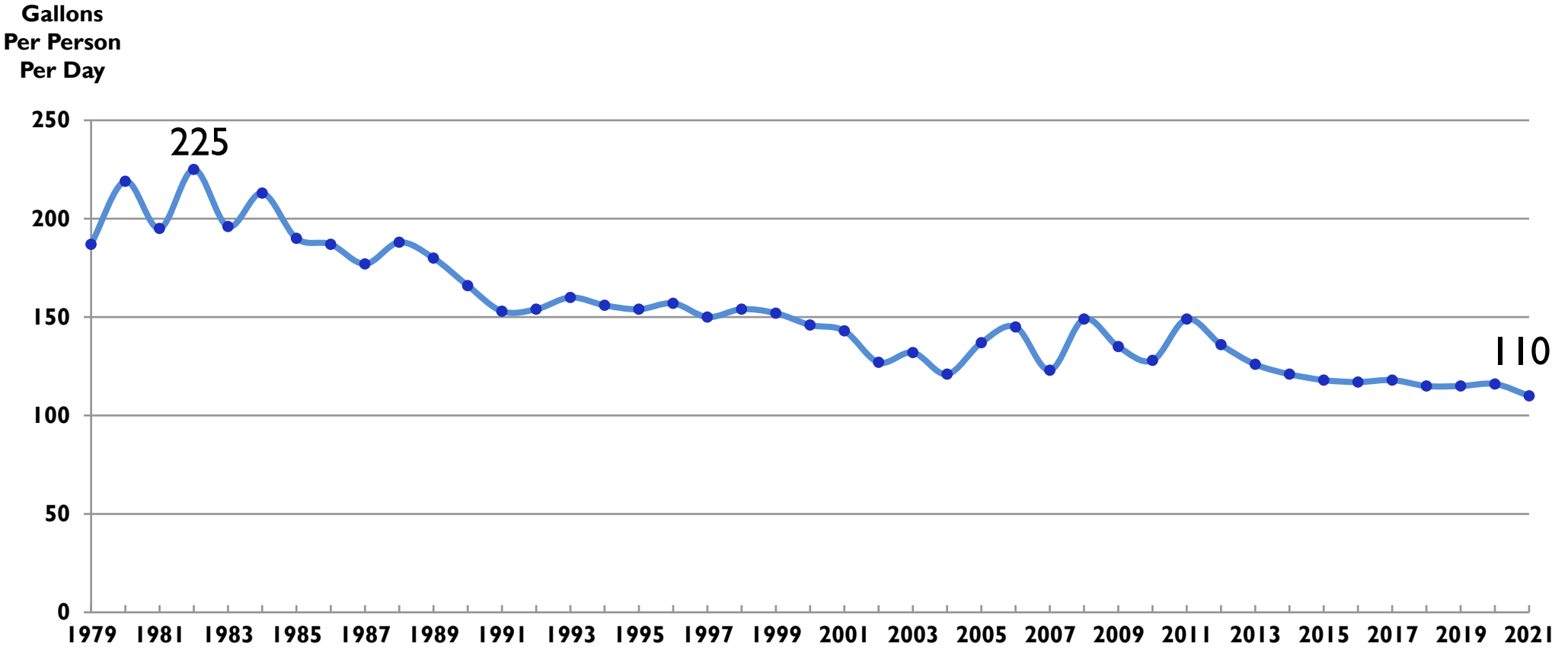


Conservation



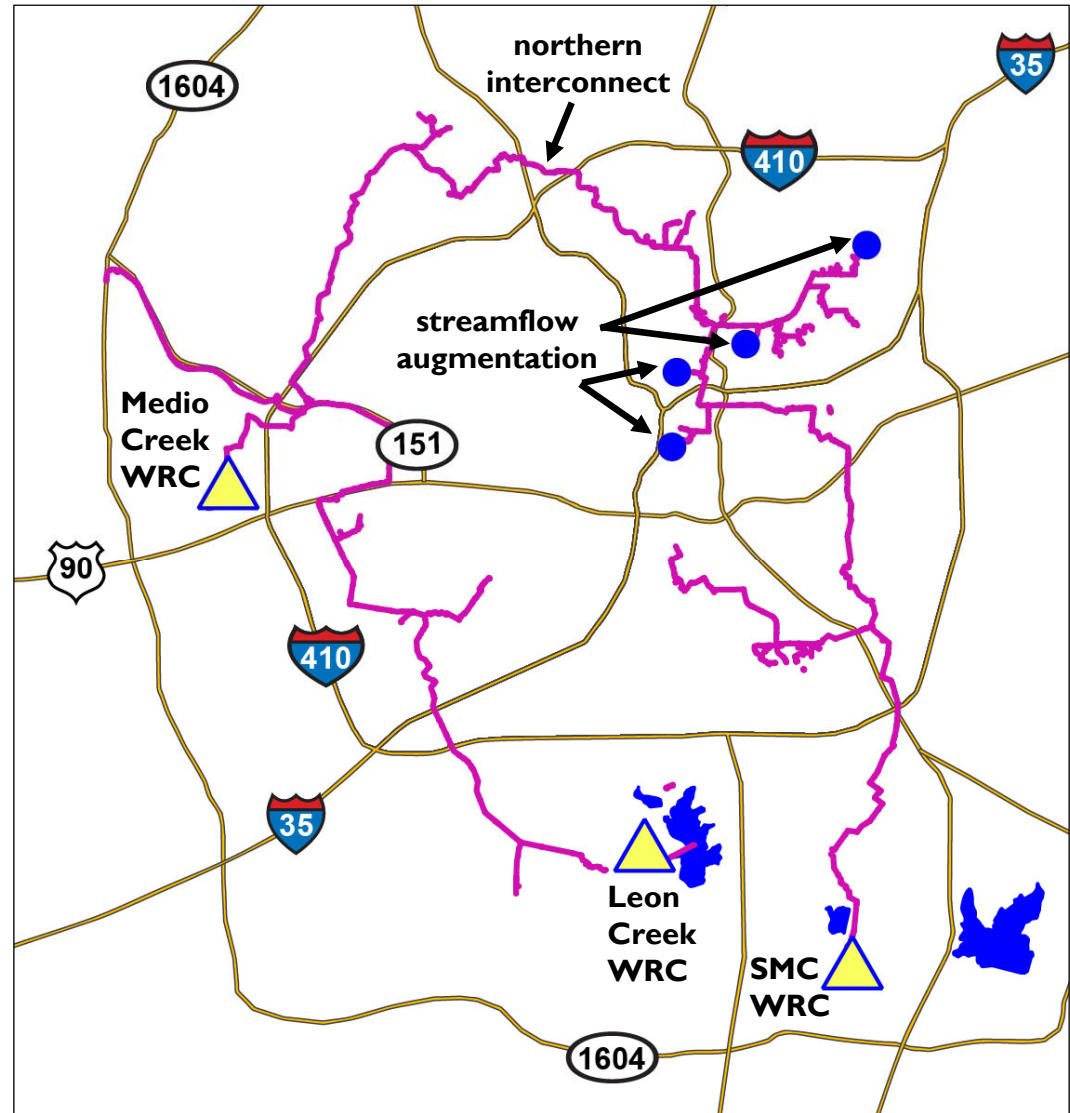
Daily Per Capita Water Use

1979 to 2021



SAWS' Recycled Water System

- About 130 miles of pipeline
- Contributions from three Water Recycling Centers



A large, rectangular sign mounted on a brick wall. The sign is white with a thin black border and contains the text 'Trinity University' in a large, bold, sans-serif font, and 'Founded 1869' in a smaller, regular sans-serif font below it. The brick wall is made of reddish-brown bricks. In front of the wall, there are several bushes with red flowers and some small black lights. The background shows a cloudy sky and bare trees.

Trinity University

Founded 1869

Recycled Water Users





CPS Energy cooling lake

Three Pathways for Recycled Water

Path 1:
Water for
CPS Energy



Path 2:
Water for
Reuse System



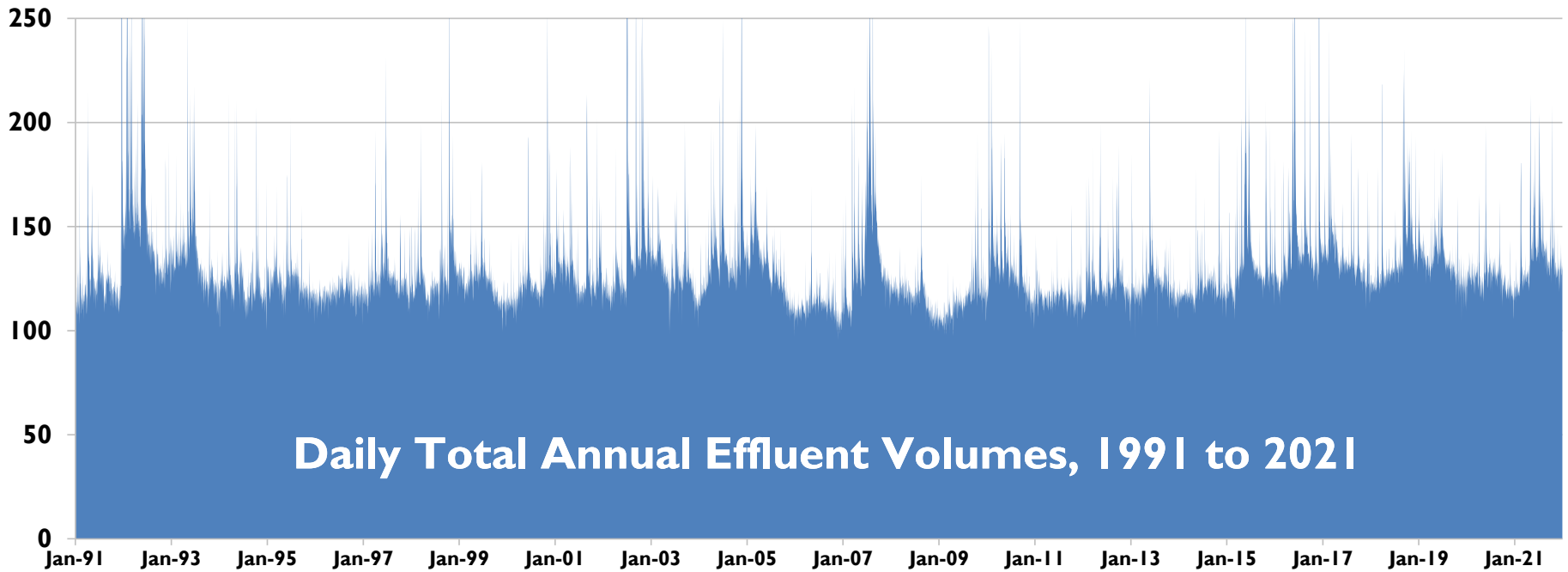
Path 3:
Water for
Instream Benefit



No Growth in Supply

Daily Effluent Volumes, 1991 to 2021

million gallons
per day

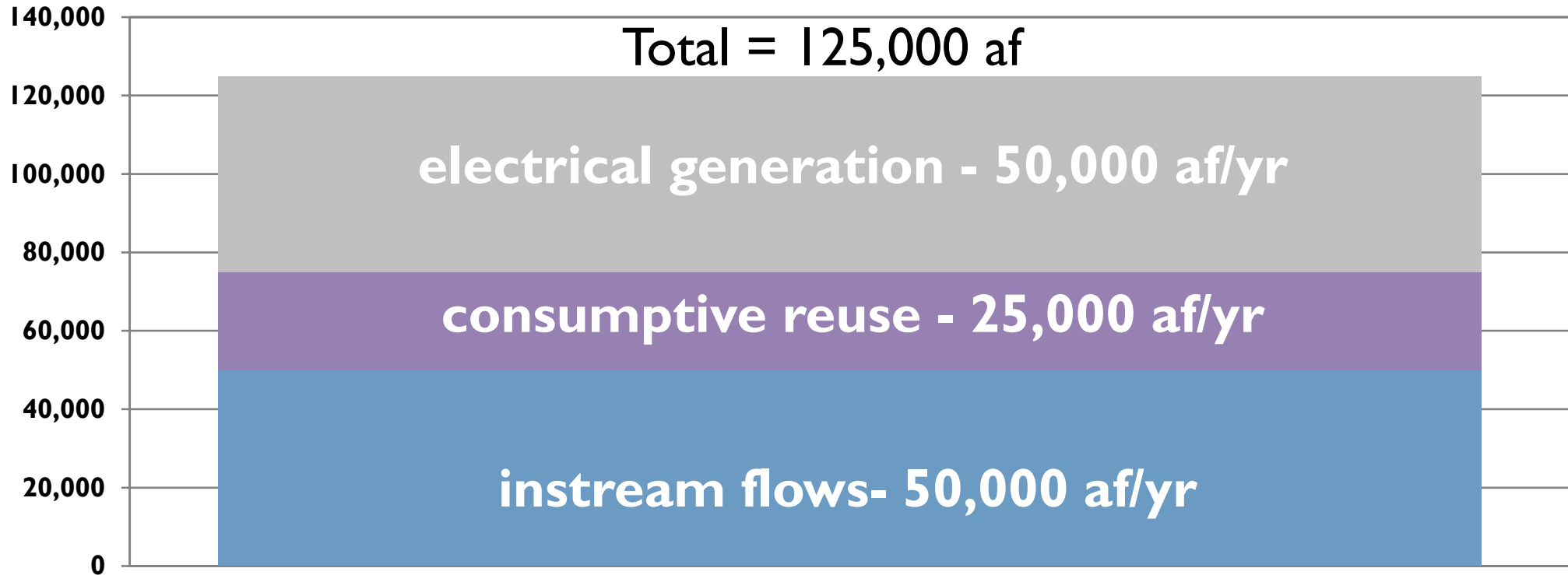


Conservation: Implications for Water Recycling and Reuse



Current Effluent Allocation

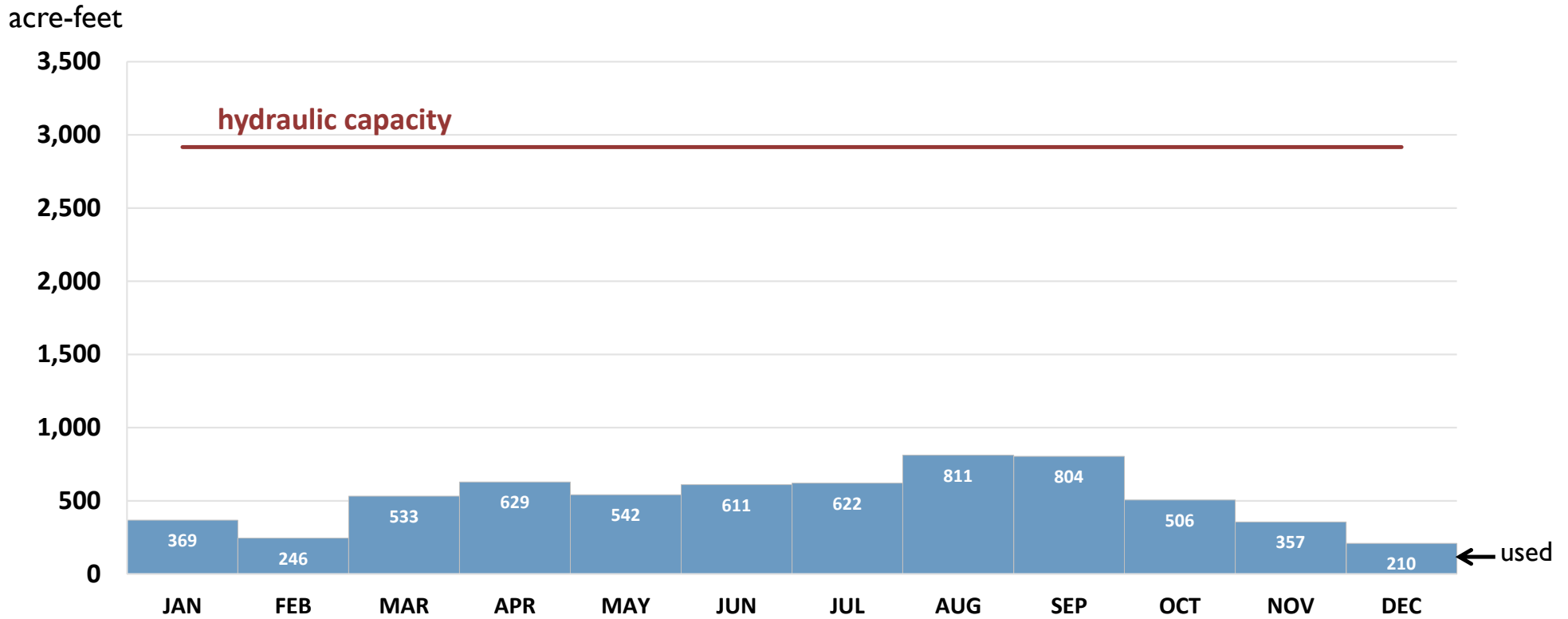
acre-feet



Conservation: Implications for Water Recycling and Reuse



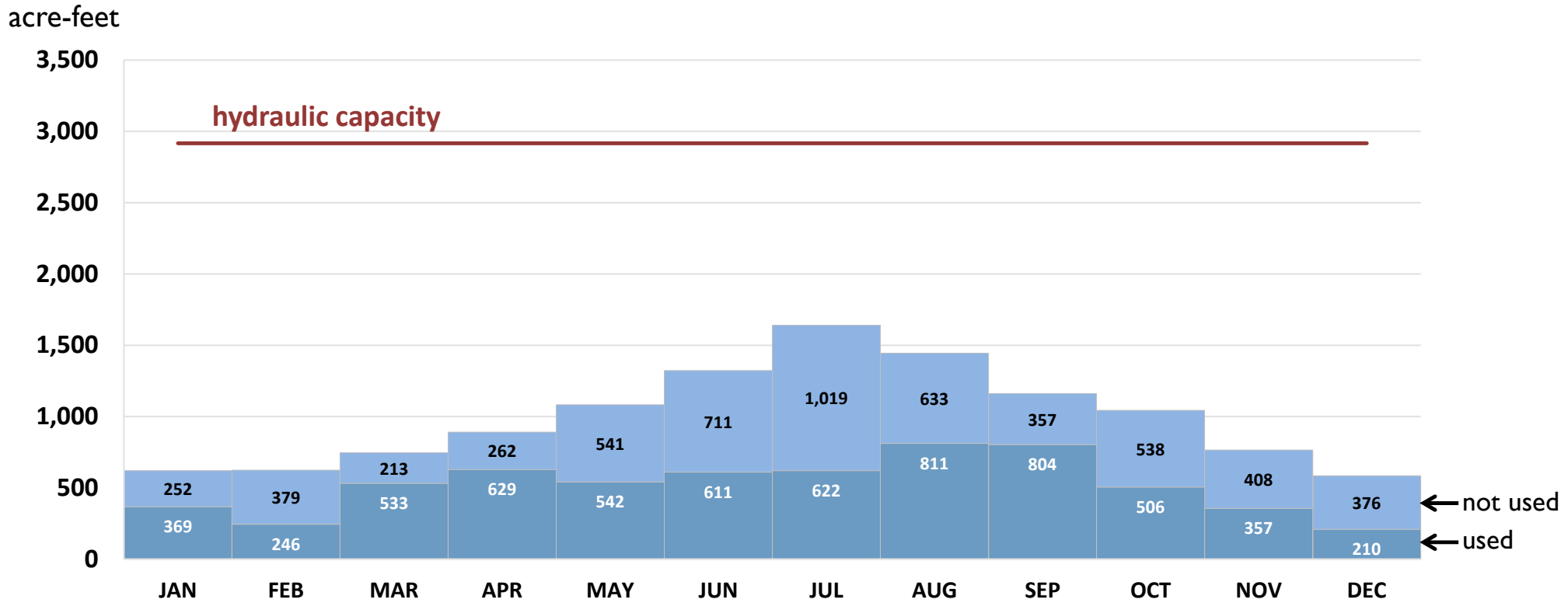
Contractual Consumptive Volumes Used in 2021



Conservation: Implications for Water Recycling and Reuse



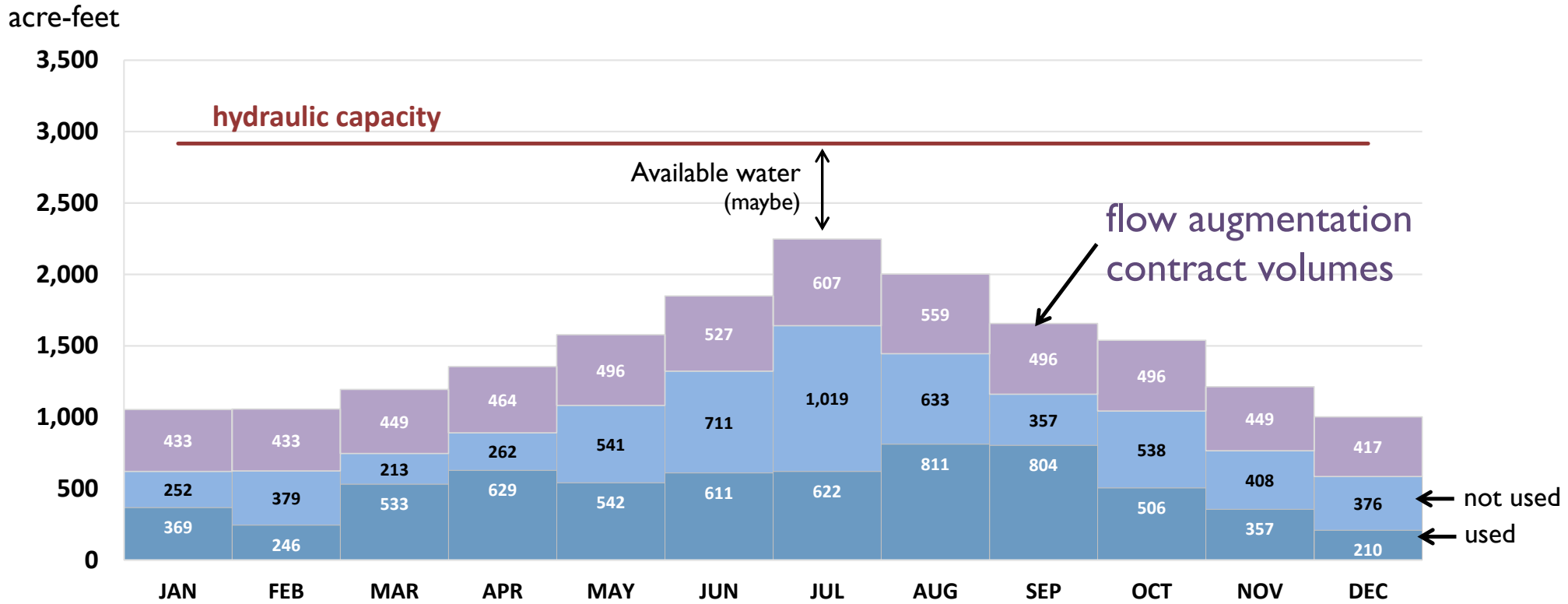
Contractual Consumptive Volumes Used / Not Used in 2021



Conservation: Implications for Water Recycling and Reuse



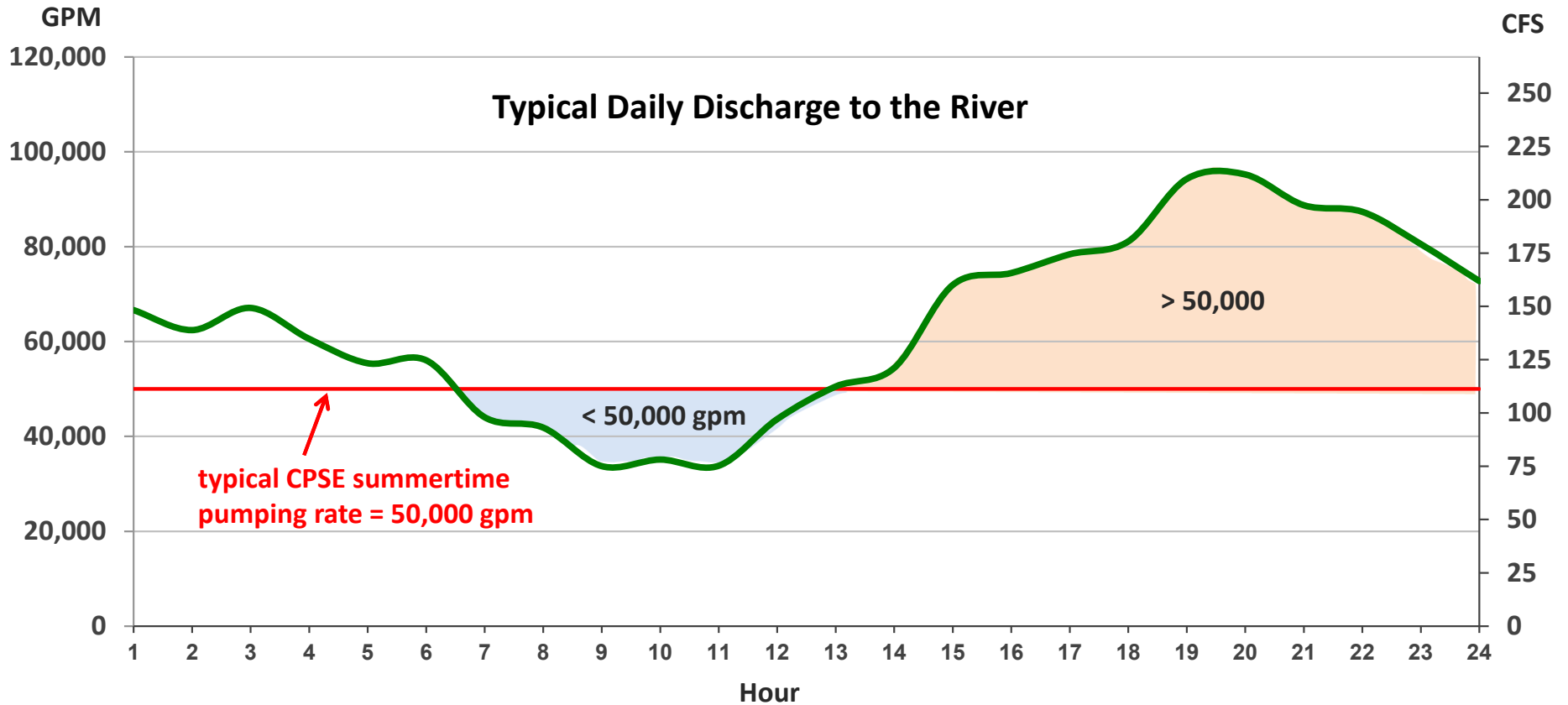
Contractual Consumptive Volumes Used / Not Used in 2021



Conservation: Implications for Water Recycling and Reuse



CPSE Needs and Diurnal Variations in Recycled Water Flow



Conservation: Implications for Water Recycling and Reuse





Conquista Crossing

Legislative Programs

To address flows in San Antonio and Guadalupe River basins:

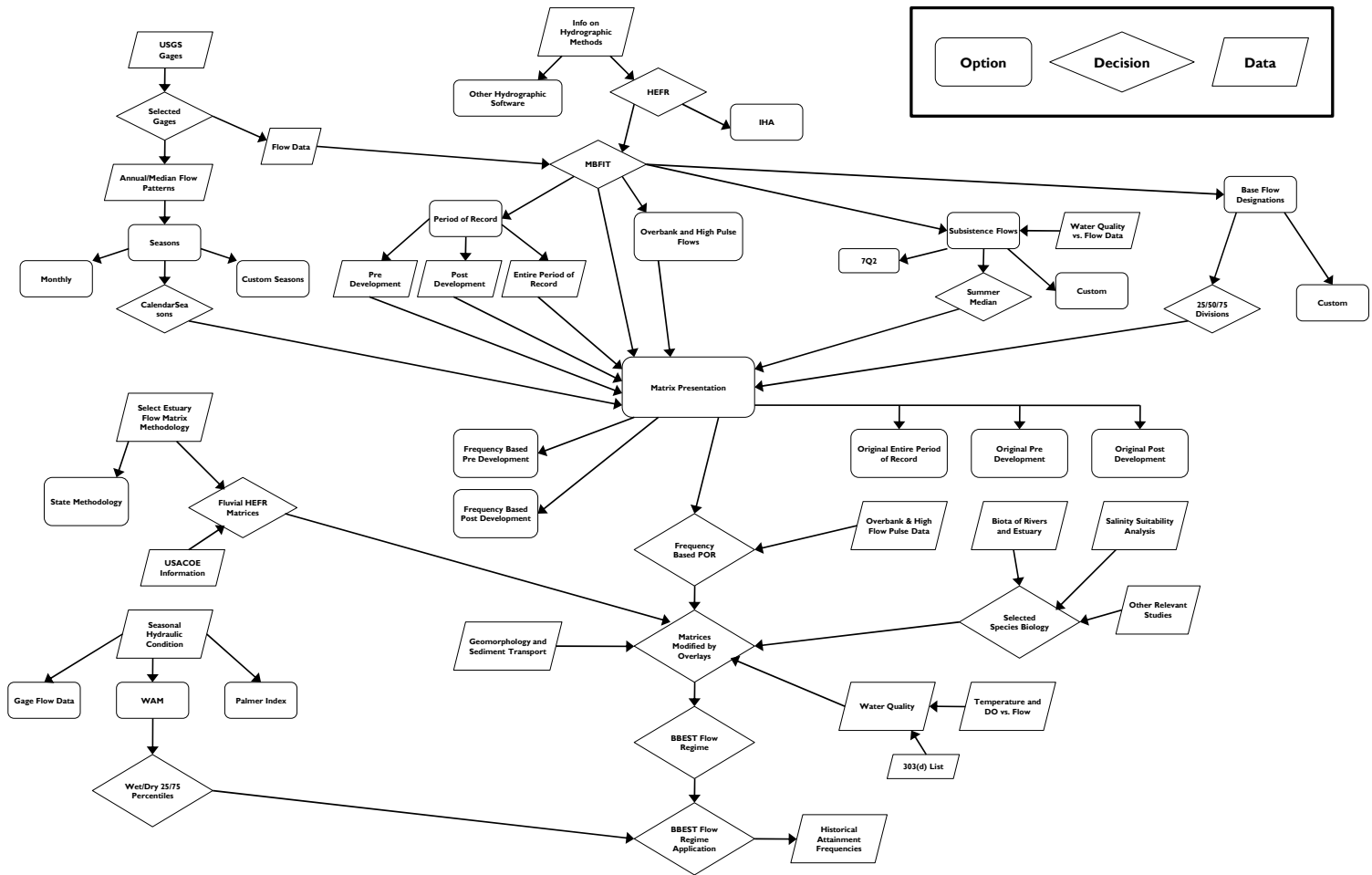
- 2001
 - Senate Bill 2 Texas Instream Flows Program
- 2007
 - Senate Bill 3 Environmental Flows Program



E-Flows Science Team Decision Diagram

End Result:

State adopted Instream Flow Standards for San Antonio River



Conservation: Implications for Water Recycling and Reuse



Senate Bill 3 Stakeholder Recommendations Report

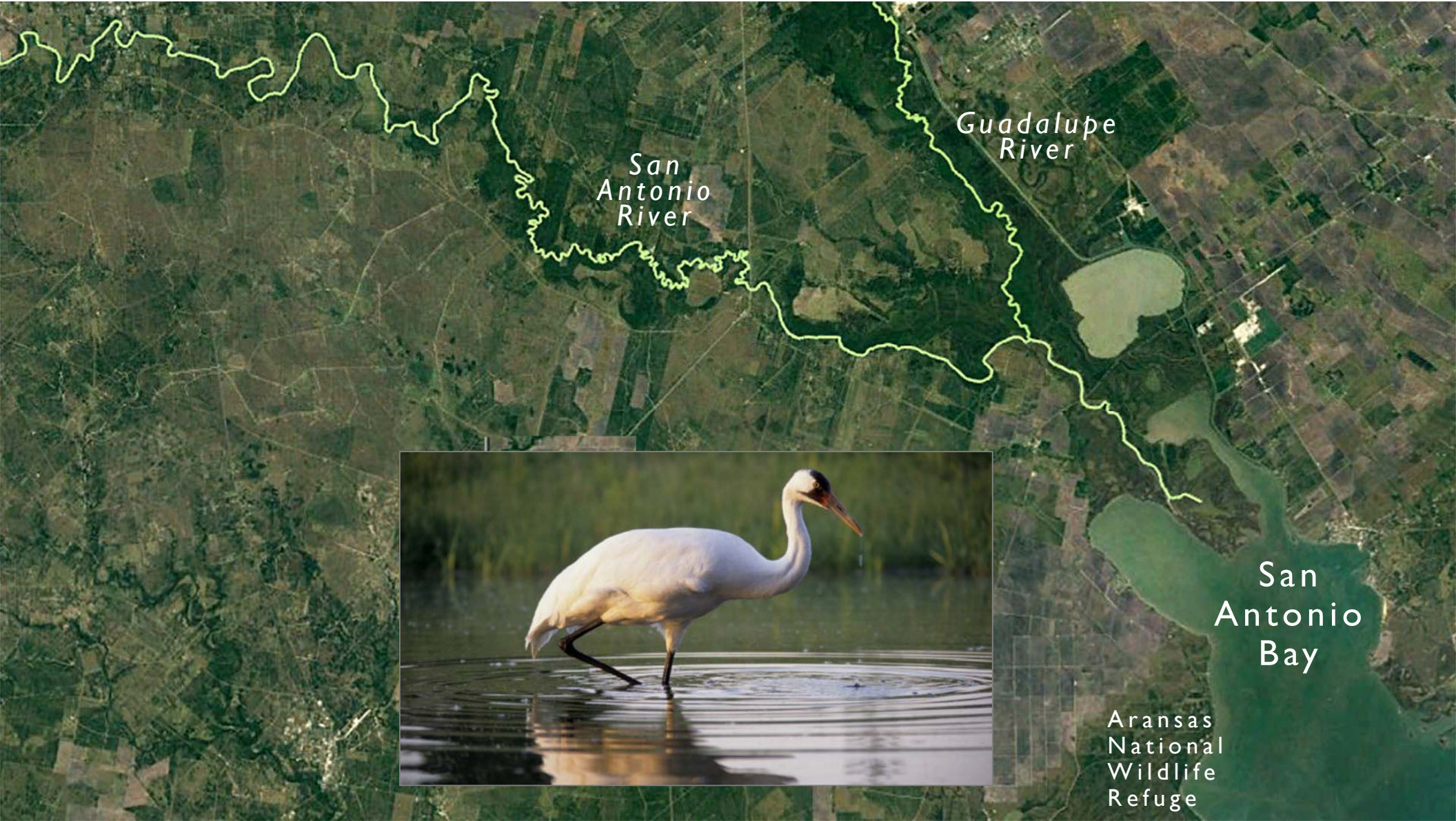
- Outlines *voluntary* strategies to meet instream flow standards
- Dedications of wastewater effluent are a key strategy

Guadalupe, San Antonio, Mission, and Aransas Rivers and Mission, Copano, Aransas, and San Antonio Bays Basin and Bay Area Stakeholders Committee Recommendations Report



Recycled Water to Medina River





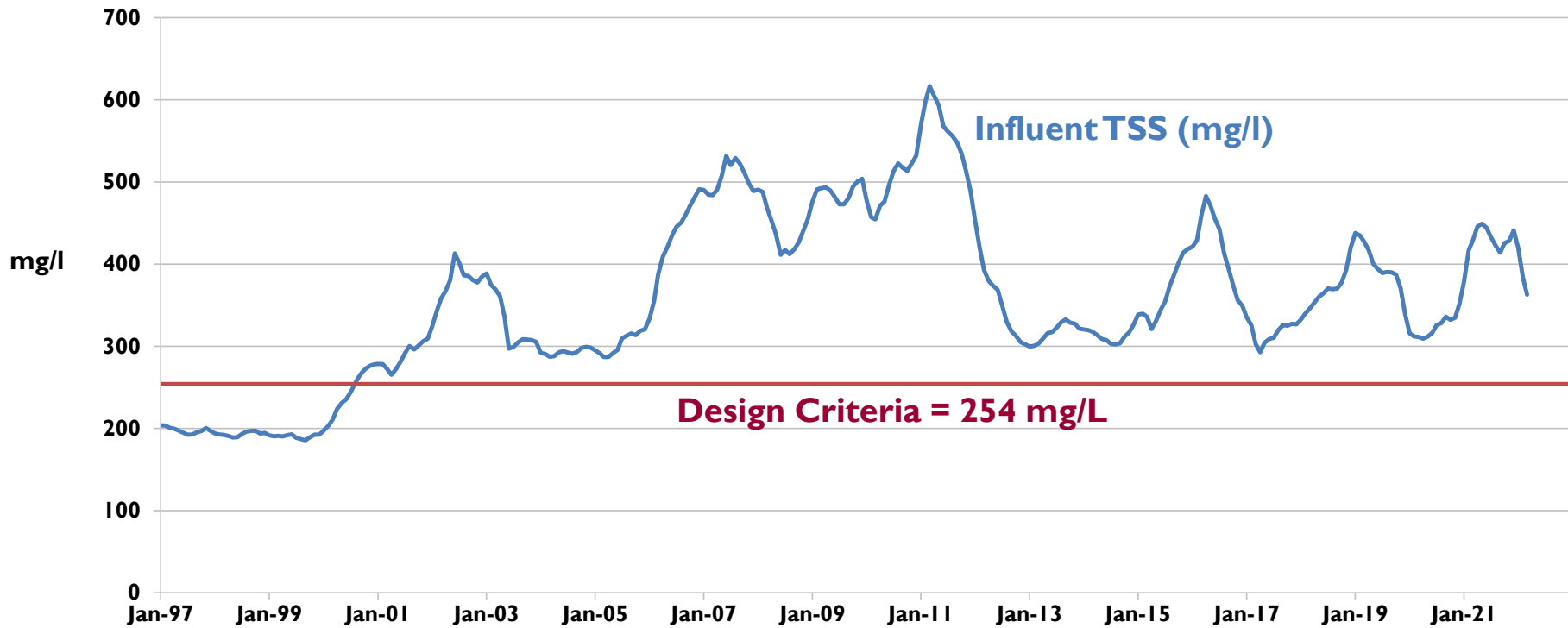
San Antonio River

Guadalupe River

San Antonio Bay

Aransas National Wildlife Refuge

SMC WRC Influent TSS Concentration (12-month rolling average) 1997 to March 2022

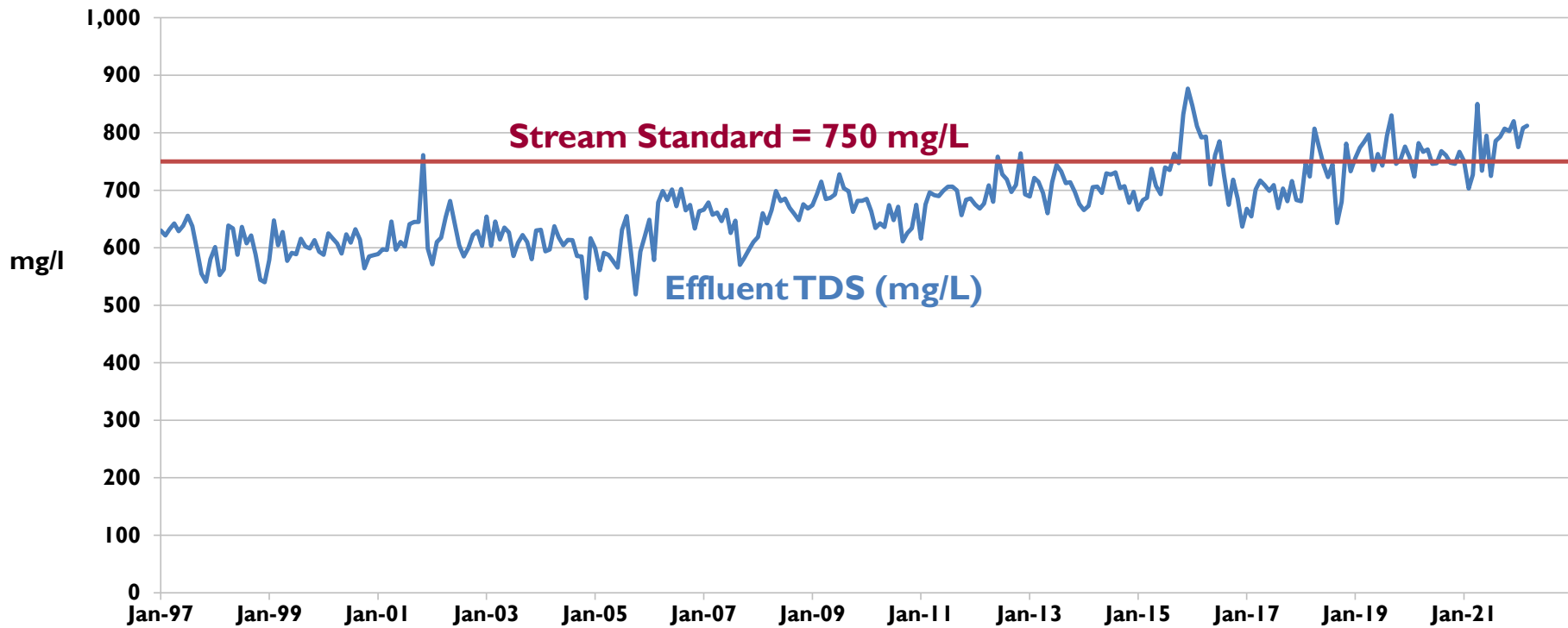


Conservation: Implications for Water Recycling and Reuse



SMC WRC Effluent Total Dissolved Solids

1997 to March 2022



Conservation: Implications for Water Recycling and Reuse



2020 Permit for SMC WRC

- Instead of permit limit, negotiations resulted in a requirement for a Source Identification and Reduction Study

The permittee shall conduct a TDS and chloride source identification and reduction study.

Within 180 days of permit issuance, the permittee shall submit a TDS and chloride source identification and reduction study work plan to the TCEQ Compliance Monitoring Team (MC-224) and cc the Standards Implementation Team (MC 150). The TCEQ may disapprove or modify the work plan within 60 days of receipt, with no response being equivalent to approval. The work plan shall include identification of influent TDS and chloride sources, control options, (e.g. BMPs, pretreatment requirements), effluent sampling at a minimum frequency of once per week, reduction goals, and annual progress reporting. Sampling shall be conducted during periods representative of typical influent TDS and chloride concentrations. The duration of the study shall be 3 years from the date of implementation and annual progress reports shall be submitted by December 31st of each year to the TCEQ Compliance Monitoring Team (MC-224) and cc the Standards Implementation Team (MC 150).

SMC TPDES permit Special Condition 9

TDS Treatment Technologies

- \$ • Precipitative softening
 - Chemical such as sodium bicarbonate and lime are added to remove *some* calcium and magnesium
- \$\$ • Electrocoagulation
 - Applies electrical current that causes coagulation of *some* TDS ions
- \$\$\$ • Membrane softening (nanofiltration and reverse osmosis)
 - Directly removes dissolved ions in cartridge filters
 - Produces very low TDS

ALL are expensive and produce liquid or solid waste streams that require disposal

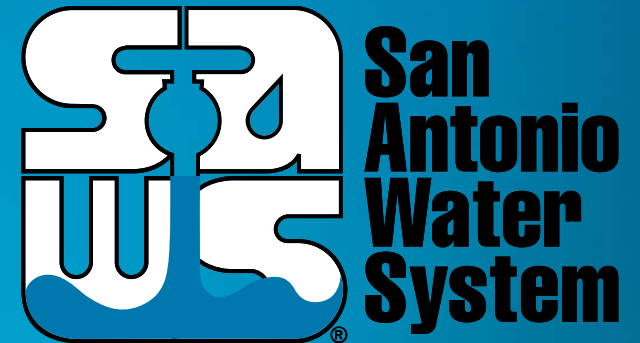
Conservation: Implications for Water Recycling and Reuse



Conservation: Implications for Water Recycling and Reuse

Gregg Eckhardt

Senior Analyst, Production and Treatment Operations



May 11, 2022

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