

Climate Change and Resiliency Planning at San Antonio Water System

Gregg Eckhardt

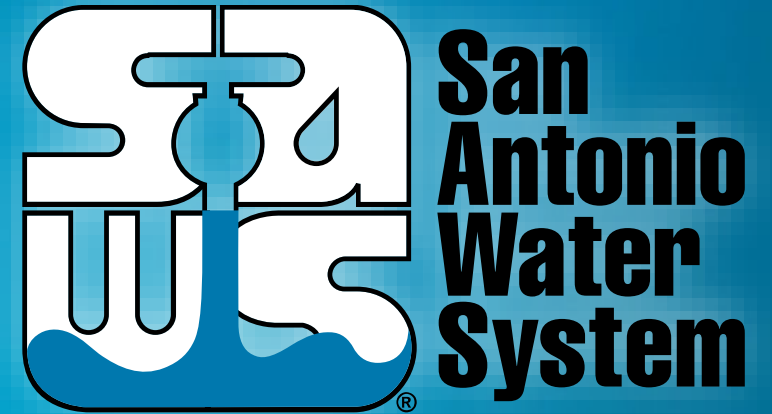
Senior Analyst, Production and Treatment Operations

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February 14, 2024







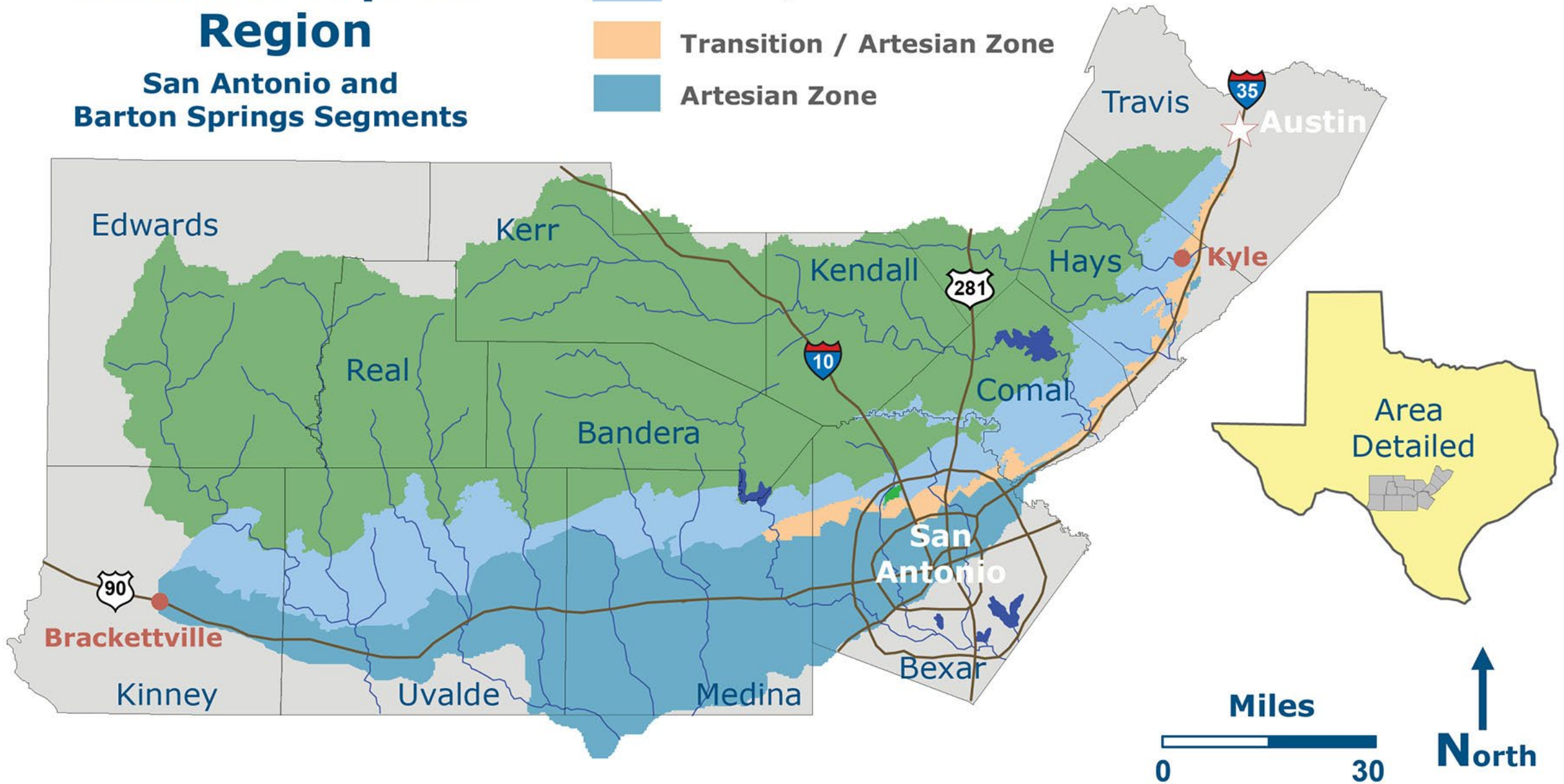
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The Edwards Aquifer Region

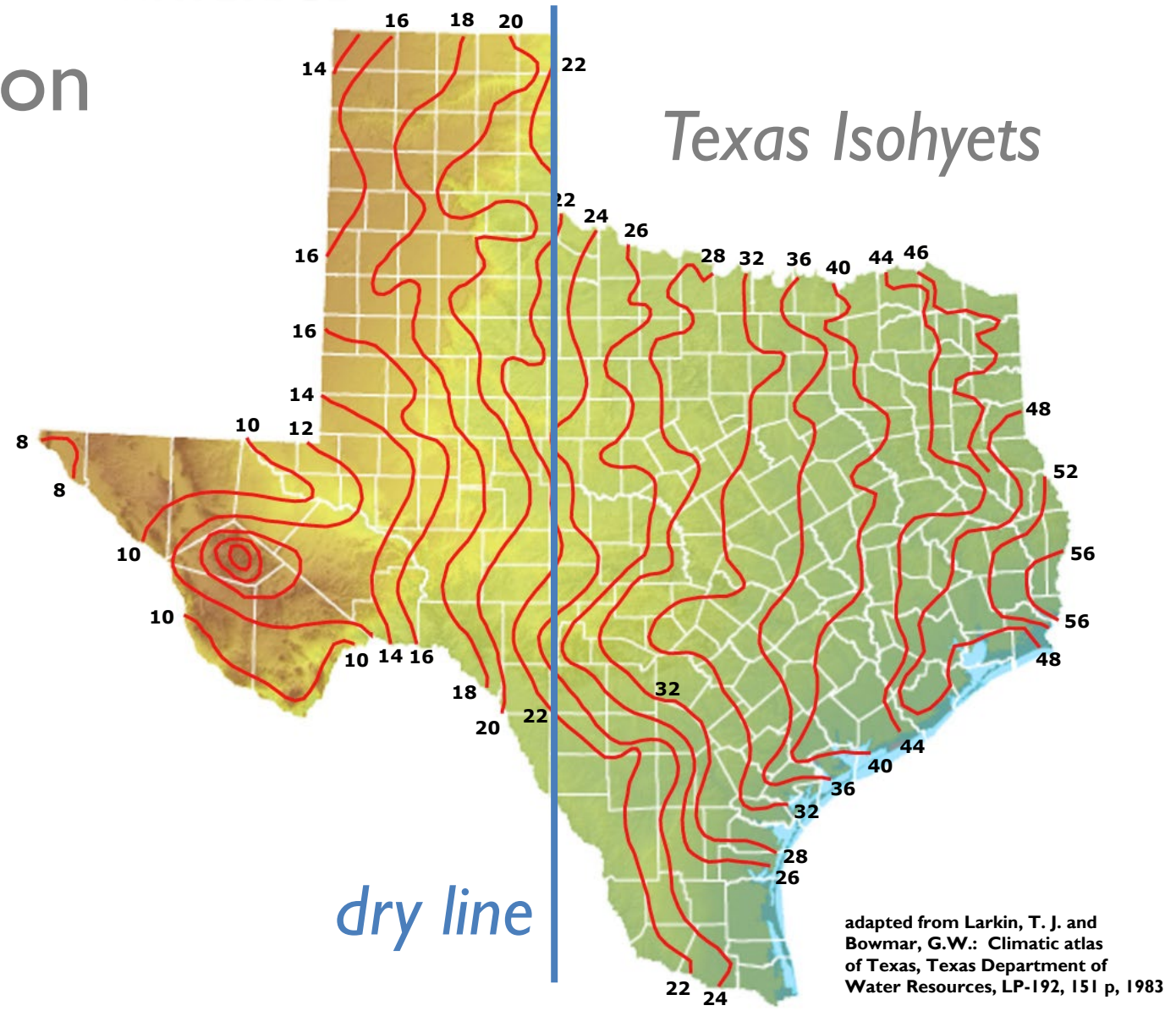
San Antonio and Barton Springs Segments

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



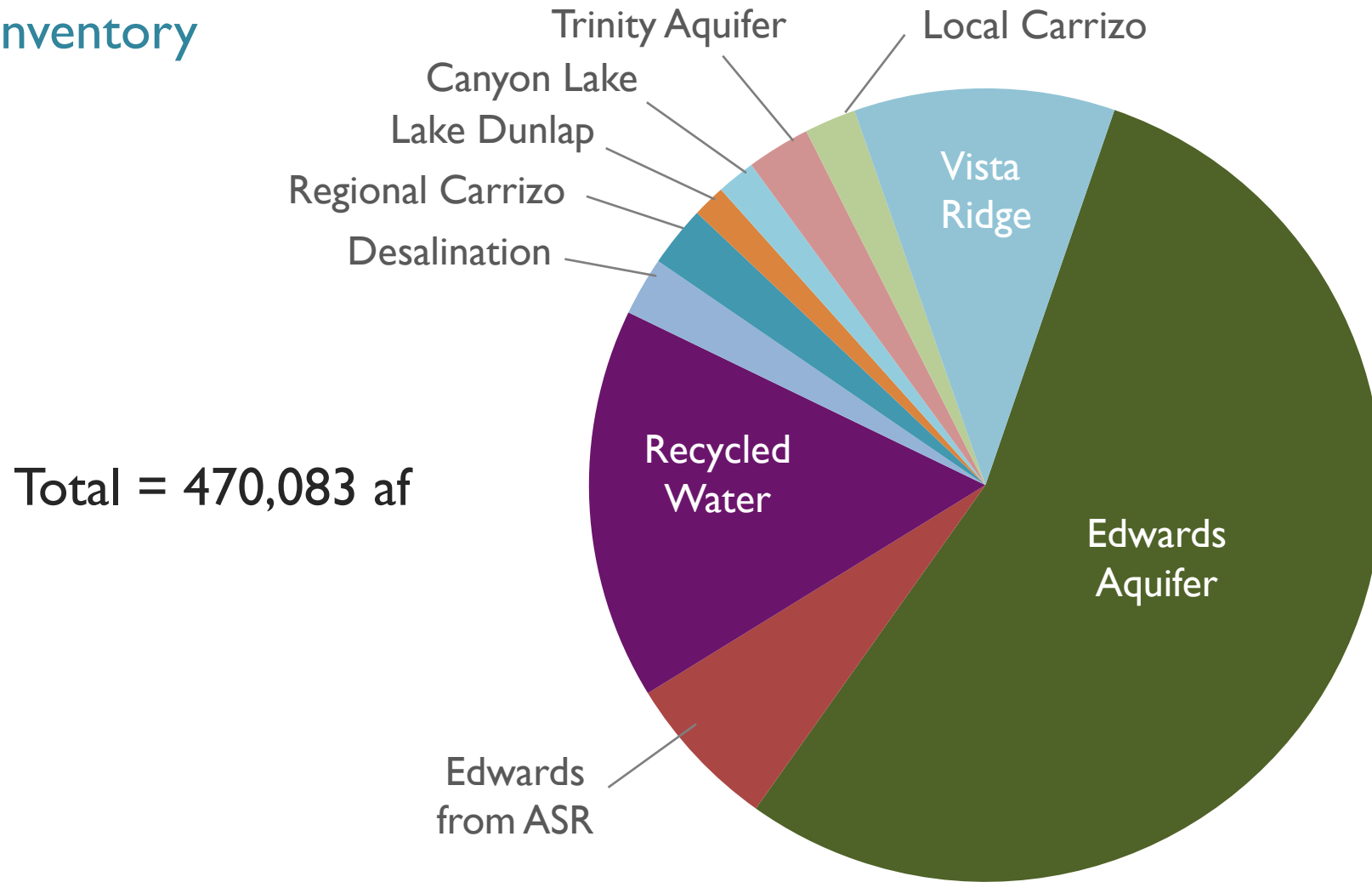
Climate Change Prediction

- Greater variability
- Longer and more frequency droughts
- More severe weather and storms



Supply Diversification

2024 Supply Inventory





Texas Blind Salamander

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**

Water Management Planning



H₂Oaks Center

one site, three sources





plant site

wellhead

Aquifer Storage and Recovery



Carrizo Aquifer Treatment Facility



Desalination Membranes

Unplanned Performance Test



SAWS Treatment Trifecta

Winner: Texas Environmental Excellence Award



Recycled Water



largest direct recycled water system in the United States

Biosolids



mixed with wood waste for compost production

Digester Gas



sold through public-private partnership



DONATE

Winter Storm Uri and Resiliency

- Widespread power outages affected water treatment and distribution facilities
- 1,105 Boiled Water Notices impacted about 14.5 million Texans from February 15-19, 2021
- Texas lawmakers responded swiftly and enacted Senate Bill 3 in June 2021
 - Emergency preparedness planning
 - Weatherization and resiliency

Live Updates: Winter Storms 2021

LIVE UPDATES: WINTER STORMS 2021

Millions In Texas Under Boil-Water Notices Because Of Winter Storm

FEBRUARY 17, 2021 · 10:50 PM ET



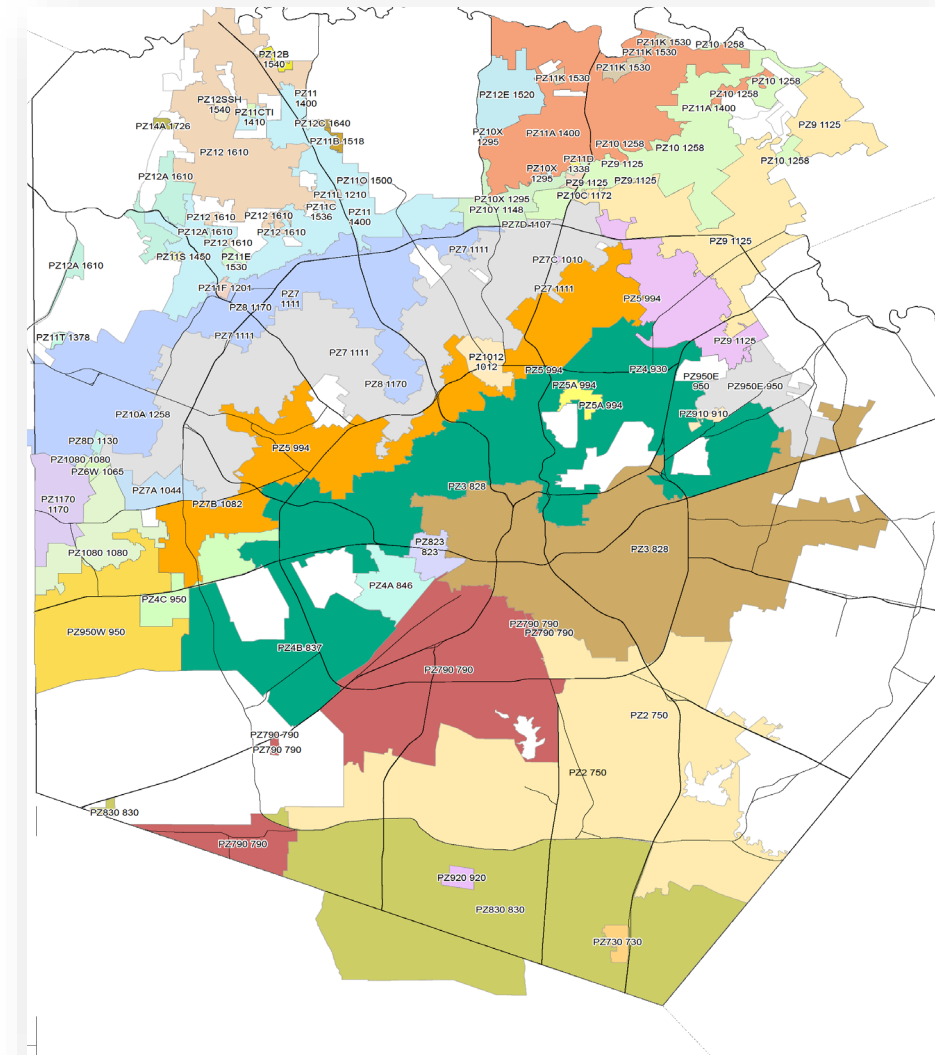
Vanessa Romo



The Texas Commission on Environmental Quality reported on Wednesday that 222 local water systems across the

SAWS Water Distribution Complexities

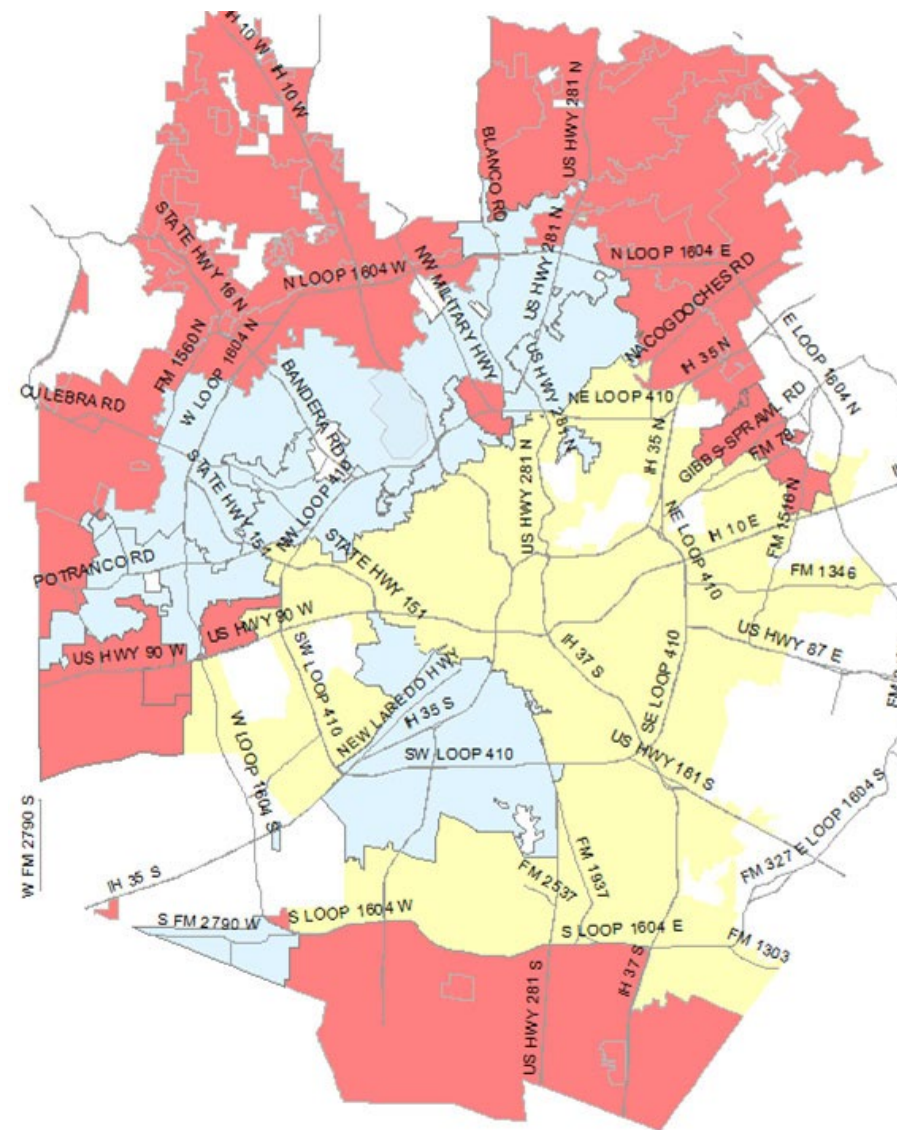
- Over 2 million customers
- 1000 feet in elevation change across 43 pressure zones
- Significant pumping to move water produced to north
- Stand-alone pressure zones



Water Service Impacts of Winter Storm Uri in San Antonio

Daily Outage Map Tuesday Feb. 16

- Red:** low water service
- Yellow:** water service but no pressure
- Blue:** adequate system pressure





Emergency Preparedness Planning

- SAWS submitted an Emergency Preparedness Plan to TCEQ in March 2022 as mandated by state legislation
 - Provides for minimum water pressure of 20 psi after 24-hour power outage
 - Initiated a multi-year resiliency program to install emergency back-up generators at critical water production facilities

SAWS and Back-up Generators at Water Facilities

- SAWS can lose individual water production facilities and supply water from other areas
- SAWS can lose any major water supply and provide water from different sources
- Some SAWS water production facilities have power feed from two separate circuits
- Overall power reliability by sister utility (CPS Energy) has been extremely high



Next Level Back-up Power Planning

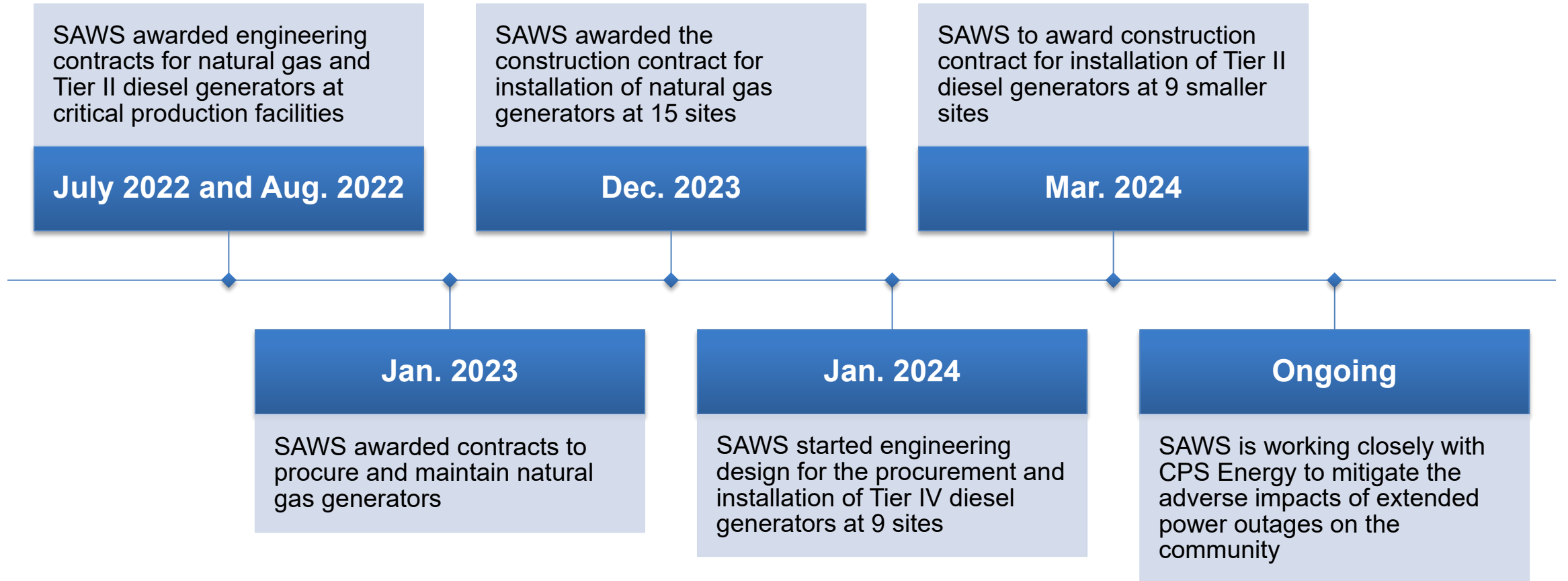
- Diversity in fuel supply with natural gas and diesel generators
- Strategic distributed generation partnership with CPS Energy for approx. 35 MW of natural gas generators
- Aggressive implementation schedule despite long lead time for generators
- Approximate cost approaching \$300M

SAWS, CPS Energy team up for pumping station backup power plan

Effect of SAWS' \$202M plan on water rates unclear; calls for generators at 36 sites



Current Status of Resiliency Program



Weatherization

Insulation and Heat Tracing



Weatherization

Improving Design Long Term

- Move electrical gear into buildings
- Install critical equipment in buildings
- Back-up generators as a design standard at critical facilities



Weatherization

Annual Preventive Maintenance Measures at Treatment Plants

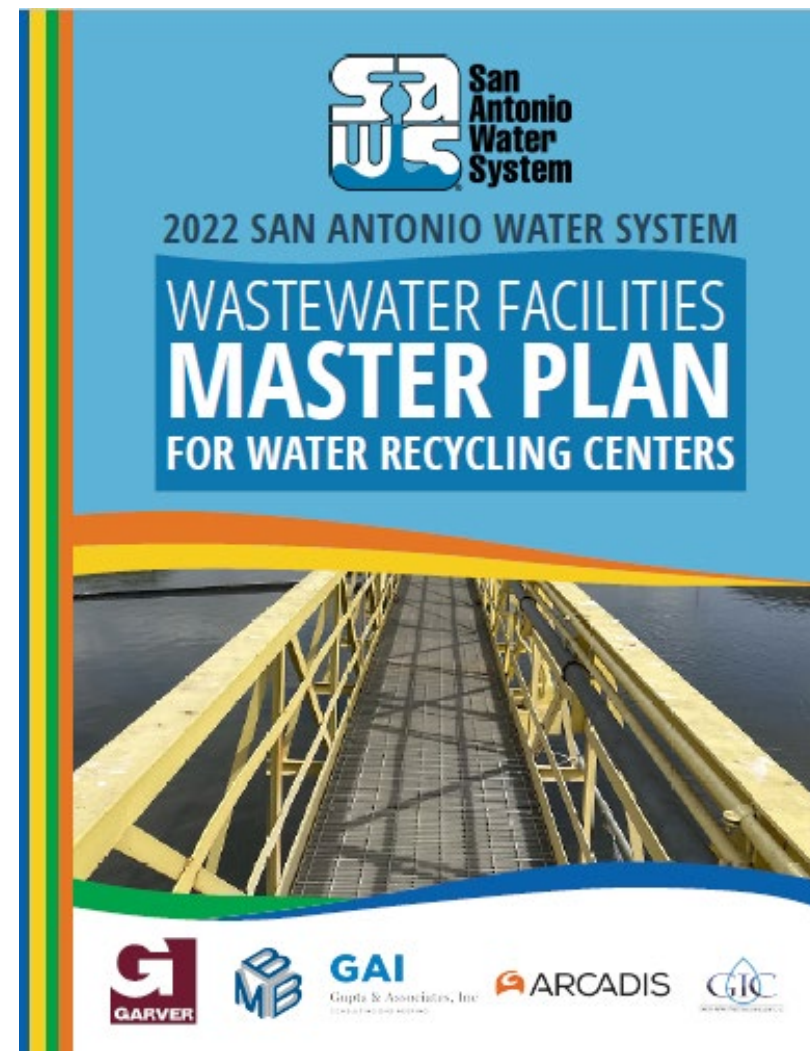


- Protection from north winds
- Use of diesel fueled heaters
- Heat tracing and wrapping small pipes
- Draining larger diameter pipes not in use



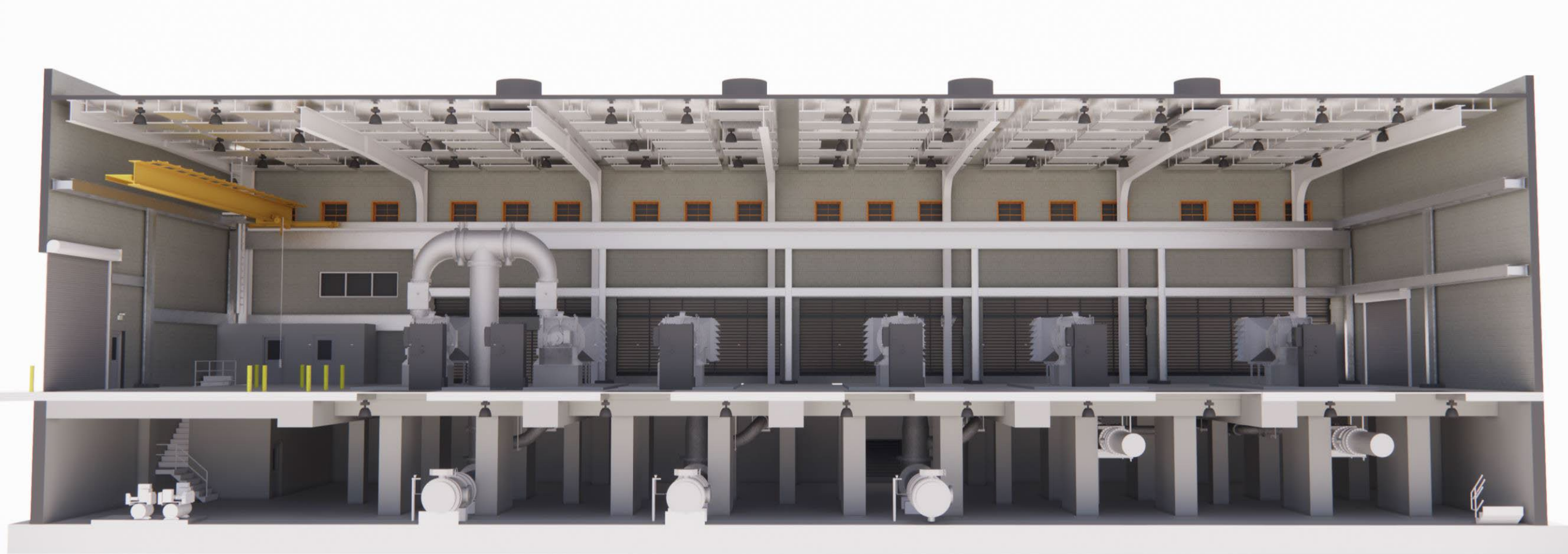
Wastewater Facilities Master Plan

- Completed in 2022
- Over \$1B in projects planned
 - Regulatory
 - Capacity (Growth)
 - Condition (Rehabilitation)
- Top priorities
 - Aeration system upgrades and expansion
 - Biosolids system improvements
 - Peak wet weather flow management
- Long-term planning
 - Phosphorus removal
 - Reductions in biosolids disposal quantities



Wastewater Facilities Master Plan

Aeration System Upgrades and Expansion



Wastewater Facilities Master Plan

Phosphorus Removal



Energy Strategy Master Plan

- Support San Antonio's Climate Action Plan
- Establish Goals
 - 10% reduction in energy intensity over next 5 yrs
- Illustrate SAWWS commitment to reaching energy goals
- Serve as a roadmap for reducing energy consumption, utility expenditures, and carbon footprint



Strategic Energy Management Efforts

- In 2021, SAWS hired a strategic energy management consultant
- Multiple energy conservation measures (ECMs) were established to save energy for SAWS across all core business sectors (production, treatment, and chilled water)
- Example: Leon Creek Water Recycling Center saved over 1.7 million kWh saved in 2023 through aeration control



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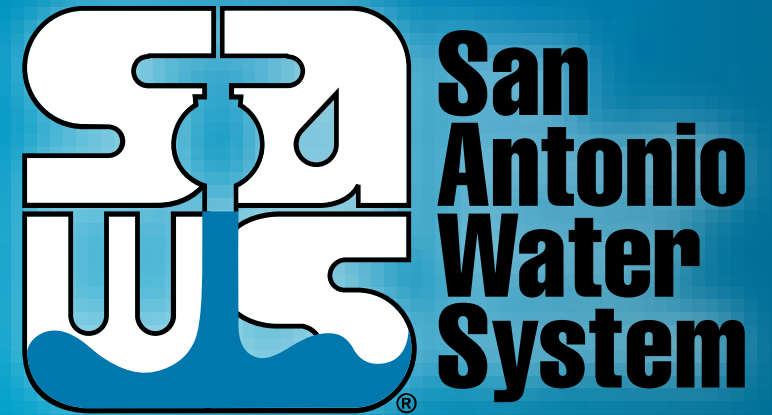
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