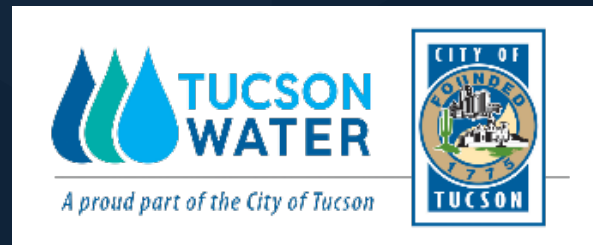


# Tucson Water's PFAS Management

Jeff Biggs, Administrator  
Tucson Water



# Presentation Outline

- Regulatory overview
- TARP – TCE, DX & PFAS
- Potable water system
- Reclaimed water system

## TARP

Tucson International Airport Area  
Groundwater Remediation Project



# Drinking Water Regulations are Evolving Quickly...!

**Federal Health Advisory:**  
PFOA+PFOS < 70 ng/L

**Minnesota –**  
PFOA, PFOS, PFBA, PFBS, and PFHxS at 35, 15, 7,000, 2,000, and 47 ppt, respectively.

**Wisconsin –**  
Groundwater Advisory levels for PFAS under development.

**Michigan MCLs for PFNA (6-ppt); PFOA (8-ppt); PFOS (16-ppt); PFHxS (51-ppt); GenX (370-ppt); PFBS (420-ppt); PFHxA (400,000-ppt) (July '20)**

## Legend

- DW - Enforceable (& more)
- DW - Enforceable Proposed
- DW - Guidance Only
- No DW but GW cleanup std

**Colorado –**  
El Paso County  
PFOA + PFOS ≤ 70 ppt.

**Montana –**  
PFOA + PFOS ≤ 70 ppt.

**Nebraska –**  
PFOA + PFOS ≤ 70 ppt.

**Illinois –**  
Health Advisories  
PFOA < 2 ng/L  
PFHxS < 140 ng/L  
PFBS < 140,000 ng/L  
PFHxA < 560,000 ng/L

**New York – MCLs for PFOA and PFOS at 10 ppt each (Aug 2020)**

**Maine –**  
PFOA + PFOS ≤ 70 ppt.

**Washington –**  
MCLs for PFAS under development.

**Vermont –**  
Enforceable: MCL sum of PFOA, PFOS, PFHxS, PFHpA, and PFNA at 20 ppt.  
Guidance: Sum of PFOA, PFOS, PFHxS, PFHpA, and PFNA at 10 ppt.

**Oregon –**  
PFOA, PFOS, PFNA and PFHpA at 24, 300, 1 and 300 ppt, respectively.

**Massachusetts – “PFAS6” MCL: PFOS+PFOA+PFHxS+PFNA+PFHpA+PFDA < 20ppt (Sep 2020)**

**New Hampshire –**  
MCLs for PFOA, PFOS, PFNA and PFHxS at 12, 15, 11, and 18 ppt, respectively. (July 2020)

**California –**  
Notification Levels:  
PFOA = 5.1 ppt  
PFOS = 6.5 ppt  
Response Levels:  
PFOA = 10 ppt  
PFOS = 40 ppt  
(February 2020)

**Nevada –**  
PFOA, PFOS, and PFBS at 667, 667, and 667,000 ppt, respectively.

**Rhode Island –**  
PFOA + PFOS ≤ 70 ppt.

**New Jersey MCLs for PFNA at 13 ppt, PFOA at 14 ppt, and PFOS at 13 ppt (June 2020)**

**Connecticut –**  
Sum of PFOA, PFOS, PFNA, PFHxS and PFHpA at 70 ppt.

**Delaware –**  
PFOA + PFOS ≤ 70 ppt,  
PFBS ≤ 40 ppt.



**Alaska –**  
Proposed MCL: Sum of PFOA, PFOS, PFNA, PFHpA, and PFHxS at 70 ppt, and PFBS at 400,000 ppt.  
DW Guidance: PFOA + PFOS ≤ 70 ppt.  
GW Cleanup Target: PFOA + PFOS = 400 ppt

**Texas –**  
Groundwater cleanup targets for PFOA, PFOS, PFNA, PFDA, PFHxS, PFHxA, PFHpA, PFBS and PFBA at 290, 560, 290, 370, 93, 93, 560, 34,000 and 71,000 ppt, respectively.

**Pennsylvania –**  
MCL under development  
Guidance: PFOA + PFOS ≤ 70 ppt.

**North Carolina –**  
GenX ≤ 140 ppt.  
(PFOA < 2000 ppt for GW cleanup)

# Tucson Water's Treated Water Quality Operational Targets

Parameter	Value (ppt)
PFOS	7
PFOA	11
PFHxS	7
PFOS + PFOA + PFHxS + PFHpA <sup>(1)</sup>	18
PFHxA	200,000
PFBS	420

(1) When PFOS, PFOA, PFHxS, and PFHpA are present, combined concentrations should not exceed the operational target.

# PFAS History

EPA Provisional Health Advisories:  
PFOA = 400 ng/L  
PFOS = 200 ng/L

Continued monitoring indicates concentrations approaching New EPA HA for PFOA + PFOS (70 ppt)

\*All sample results indicate that water delivered was below the EPA HA

Interim mitigation: Well operations, blending, and GAC changeout  
GAC & IX bench-scale testing (RSSCT)

Long-term mitigation selection/design

\*All sample results indicate that water delivered was below operational target of 18 ng/L

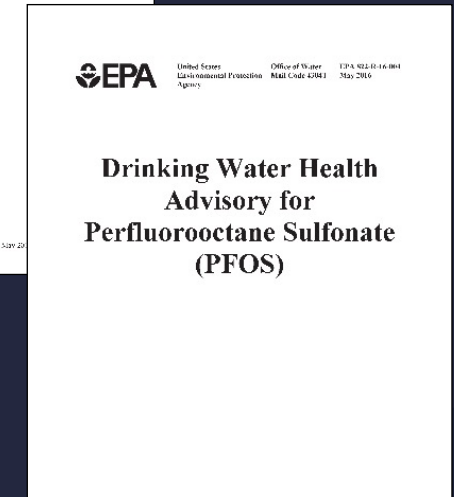
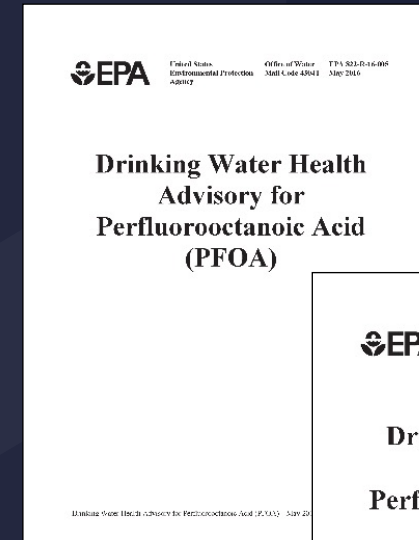


Initial detections of PFOA/PFOS at TARP well below Provisional Health Advisories

Continued monitoring indicates concentrations approaching EPA HA

\*All sample results indicate that water delivered was below the EPA HA

Continued GAC changeouts and capacity expansion construction



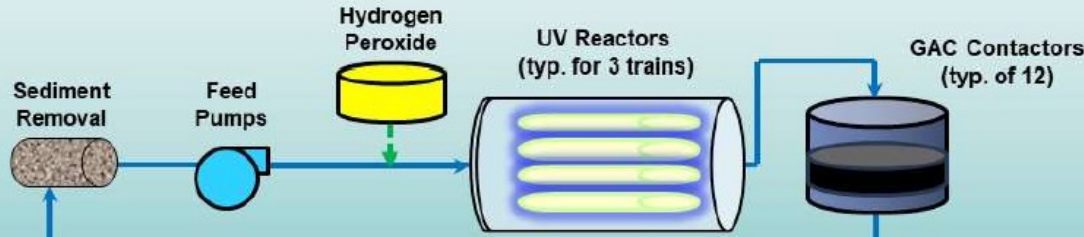
# **TARP Facility Shutdown – June 21, 2021**

# Schematic

## AOP Water Treatment Facility

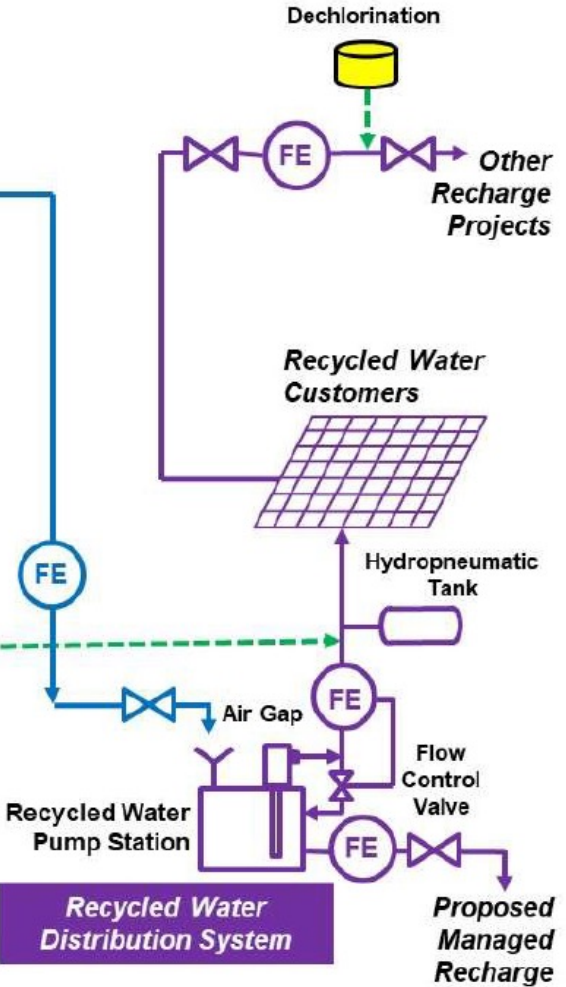
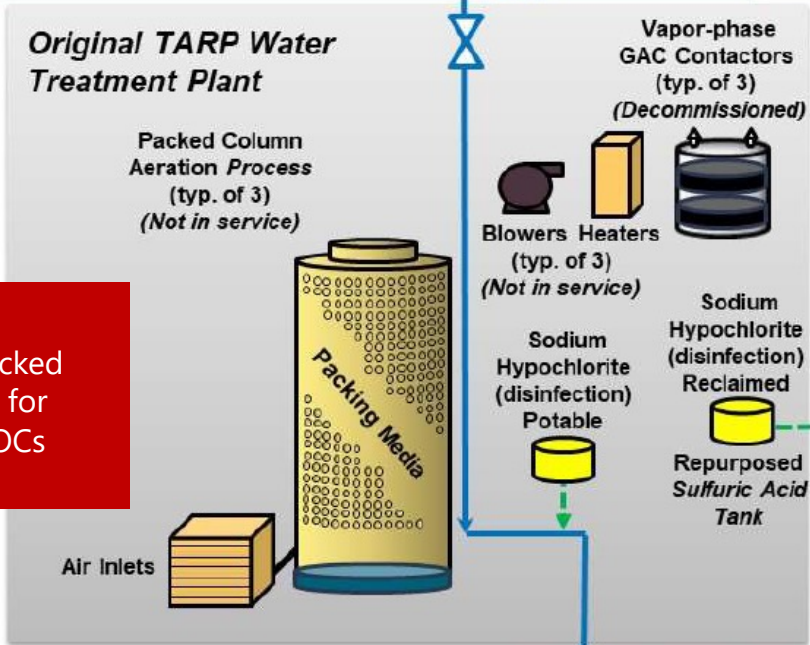
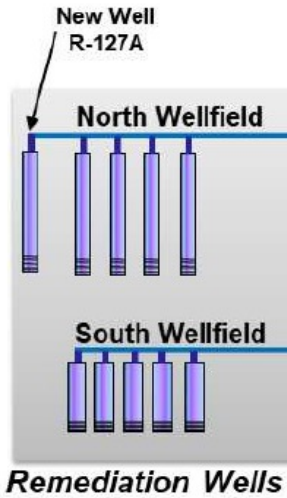
**2014**  
UV-Hydrogen Peroxide  
Advanced Oxidation for 1,4-  
dioxane Operational

**2020-21**  
10<sup>th</sup> Well and AOP WTP  
Expansion Operation  
Constructed



**2021-22**  
Recycled Water System  
and Santa Cruz River  
Treated Water Beneficial  
Uses Advance

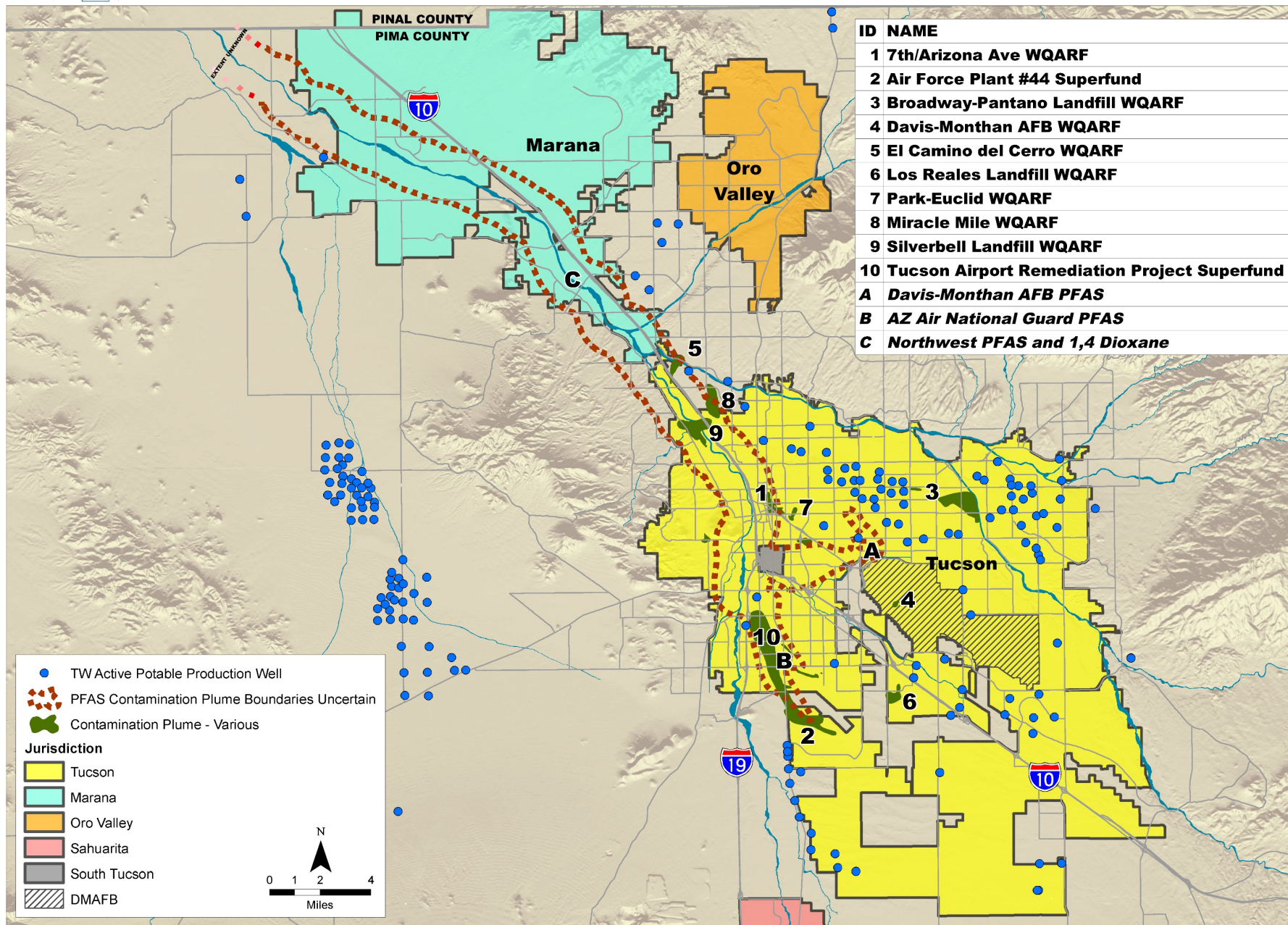
**1994**  
Nine Wells and Packed  
Column Aeration for  
TCE and other VOCs  
Operational



Drinking Water  
Distribution System

Recycled Water  
Distribution System

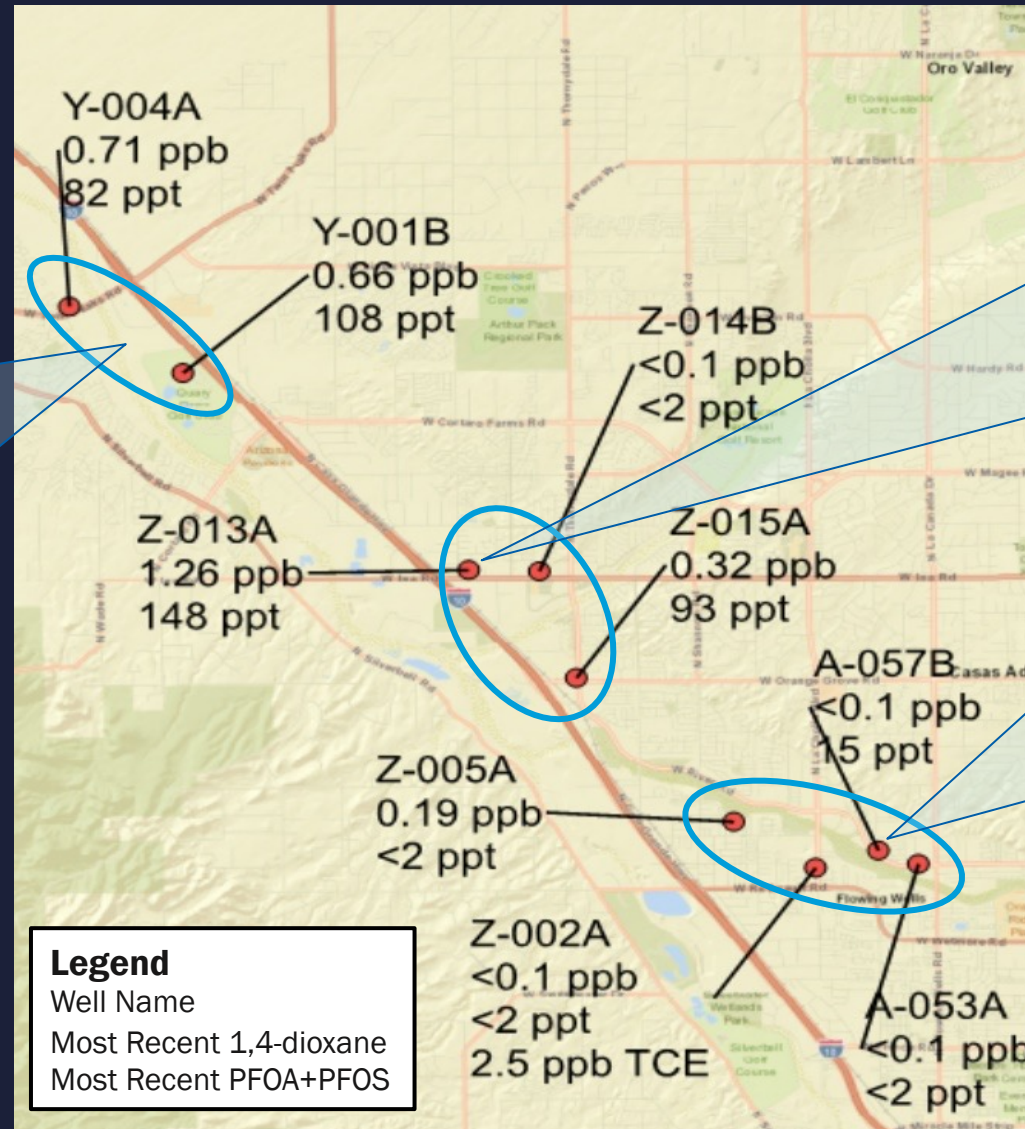
Proposed  
Managed  
Recharge



ID	NAME
1	7th/Arizona Ave WQARF
2	Air Force Plant #44 Superfund
3	Broadway-Pantano Landfill WQARF
4	Davis-Monthan AFB WQARF
5	El Camino del Cerro WQARF
6	Los Reales Landfill WQARF
7	Park-Euclid WQARF
8	Miracle Mile WQARF
9	Silverbell Landfill WQARF
10	Tucson Airport Remediation Project Superfund
A	Davis-Monthan AFB PFAS
B	AZ Air National Guard PFAS
C	Northwest PFAS and 1,4 Dioxane



# Centralized Treatment Evaluated for NW Area Production Wells

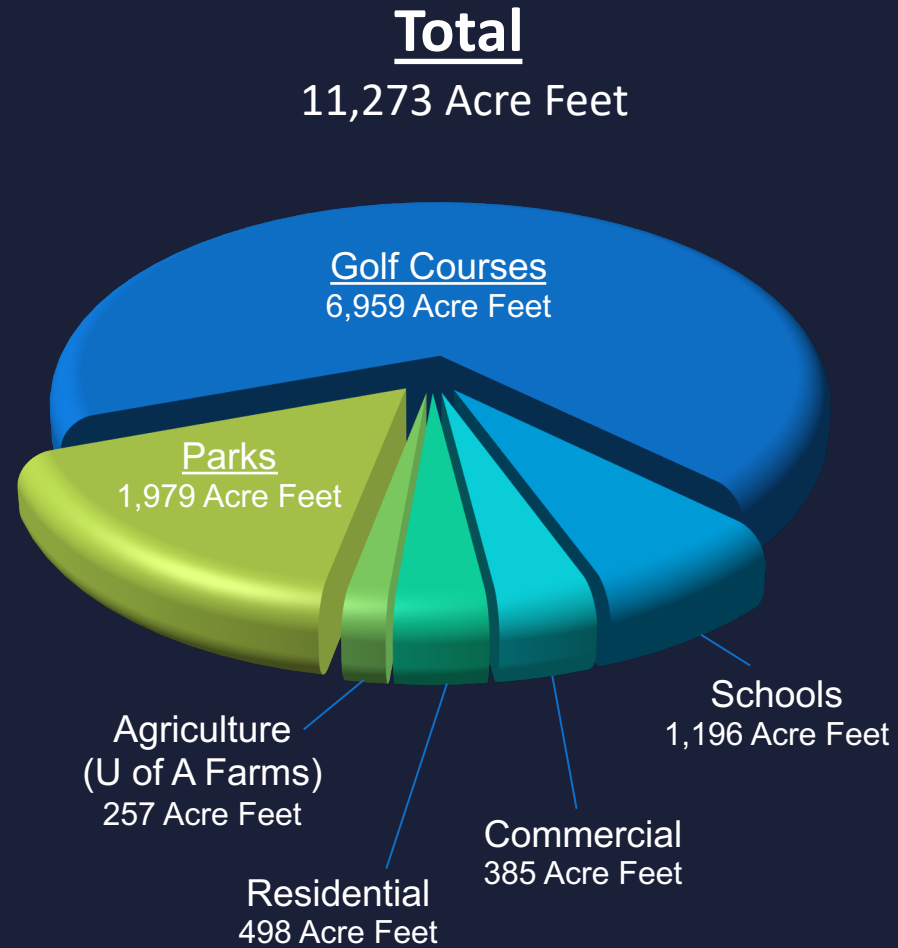


**Northern Cluster**  
Treatment at new centralized site

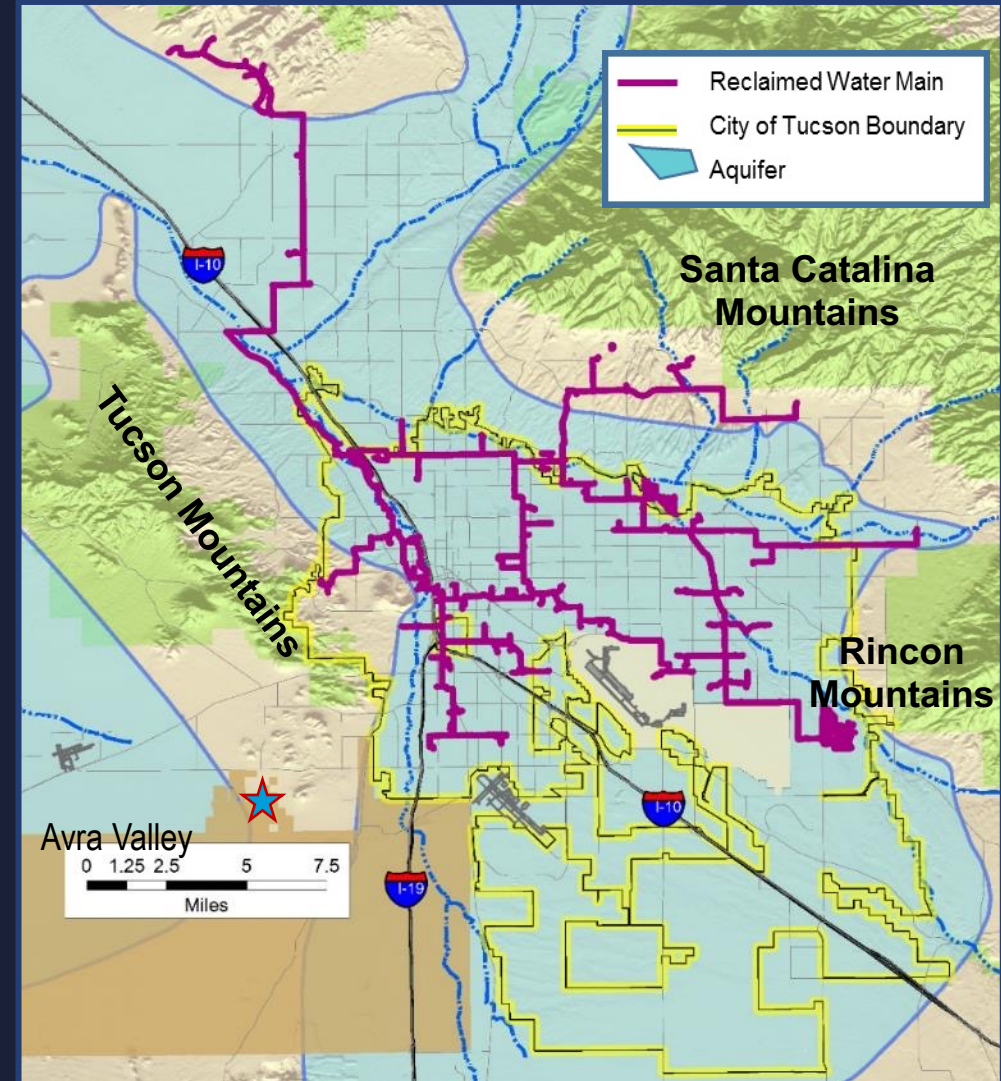
**Central Cluster**  
Treatment at Z-013A

**Southern Cluster**  
Treatment at A-057B

# Reclaimed Water System Profile



## Reclaimed Water System



# Our Reclaimed System Today

- 195 Miles of Pipe
- 1000+ Customers
- 15 Booster Stations
- Over 30 mgd delivery capacity



# Sweetwater Reclamation Facility and Silverbell Landfill PFOA + PFOS Detections

- Optimize operations to reduce PFAS levels
- Maximize deliveries from Pima County Agua Nueva WRF
- Utilize extraction wells for peak demand needs
- Prioritize extraction well selection based on PFAS levels
- Potential Future PFAS Treatment

