

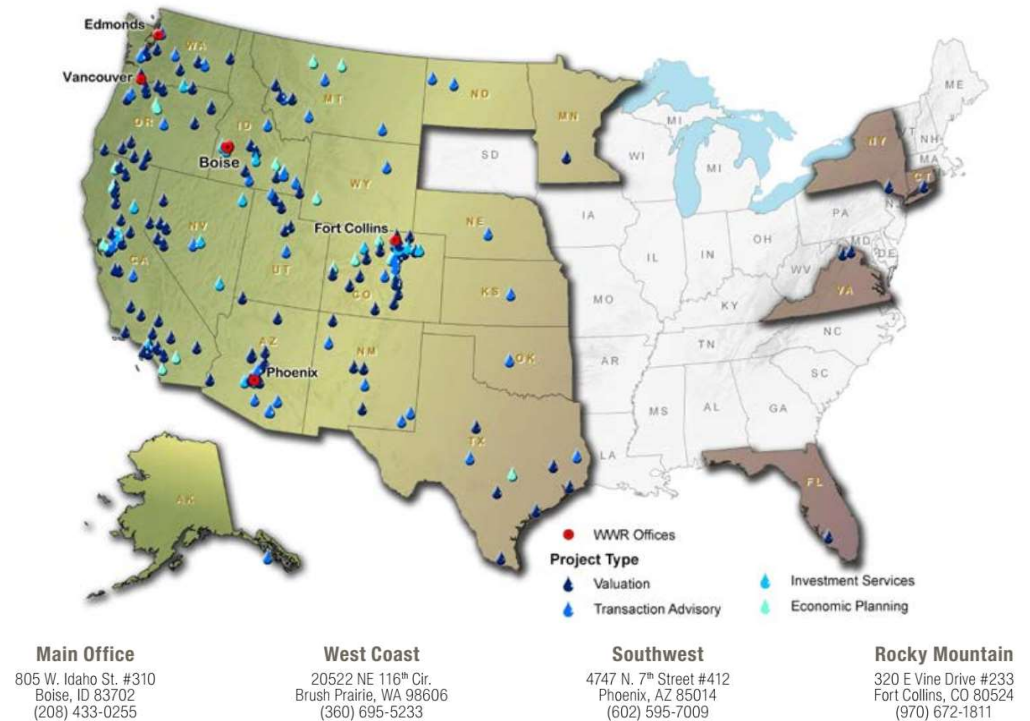
Markets for Reclaimed Water and the Role of Private Investment

July 2019

WestWater Research Overview

- Economic and financial advisory firm specializing in water resources.
- Nationwide practice with offices in four states.
- Professional team of economists and MBAs.
- Expertise in water markets and water resource planning.
- Diverse clients across the public, private, and non-profit sectors.

WestWater Project & Office Locations



Markets for Reclaimed Water

DEFINING THE MARKET

Reclaimed Water Market Transactions

We ARE talking about...

- Transactions of treated wastewater.
- Voluntary transactions.
- Negotiated prices.
- Sales, leases, exchanges.
- Value assigned to the water resource.

We ARE NOT talking about...

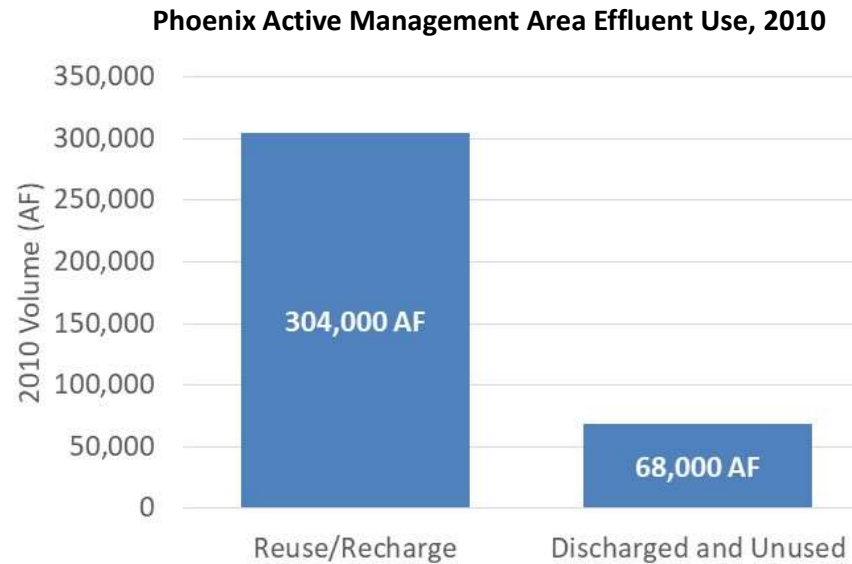
- Non-potable water rates.
- Non-potable water service.
- Prices reflecting the cost of treatment and conveyance infrastructure.
- No value assigned to the water resource.

Markets for Reclaimed Water

ARIZONA

Central Arizona Reclaimed Water Use

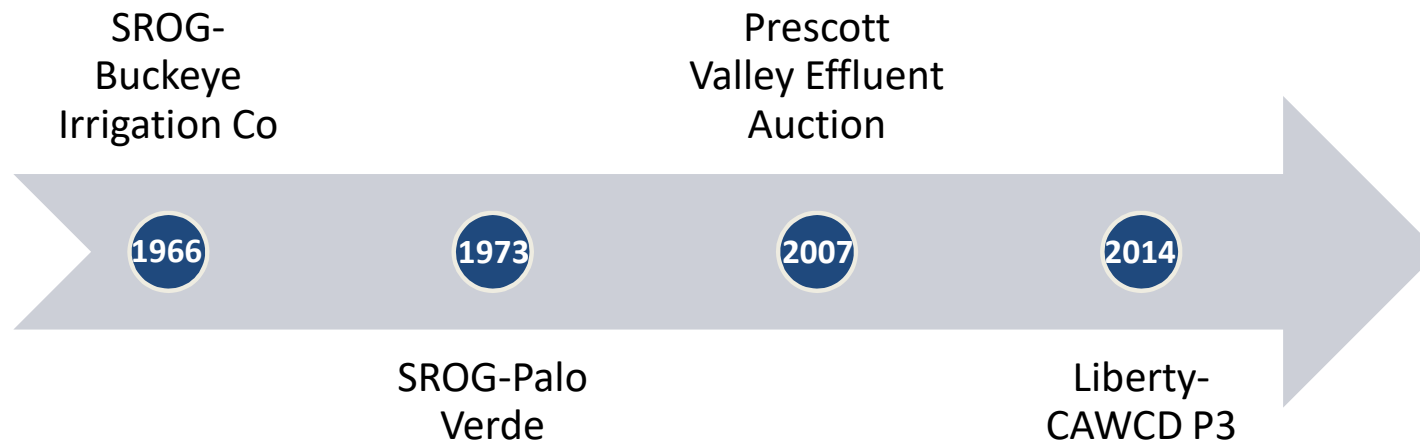
- The Phoenix area reuses or recharges approximately 82% of its effluent.



Source: "Water Reuse in Central Arizona." Decision Center for a Desert City Technical Report. October 2013.

Evolution of Arizona's Reclaimed Water Market

Notable Events



SROG – Palo Verde (1973)

- **Water Use:** Palo Verde is the largest generator in the US (4,030 MW), and only nuclear plant using 100% reclaimed water for cooling.
- **Term:** Thru 2050
- **Annual Volume:** Up to 80,000 AF
- **Up-Front Payment:** \$30M over four years.
- **Annual Payment:** \$144/AF in 2019, changes to a four-tier structure in 2026 ranging from \$198-\$474/AF.

Palo Verde Nuclear Generating Station



80,000 AF per Year

36 Miles

91st Avenue WWTP



Prescott Valley Effluent Auction (2007)

- **Project:** Auction of 2,274 AF (100-year supply) of recharged effluent.
- **Objective:** Raise funds to finance the Town's Big Chino Valley groundwater importation project.
- **Outcome:** Completed sale that could generate up to \$67M for the Town.
 - Price floor guaranteed by a pre-auction bid of \$43 million.
 - Attracted multiple competing buyers.
 - Winning bidder was a New York-based private equity fund.
 - Sales of effluent rights have begun to developers seeking a 100-year Assured Water Supply.
- **Recognition:** Named 2008 "Water Deal of the Year" by *Global Water Intelligence*.



Liberty Aquifer Recharge Facility (2014)

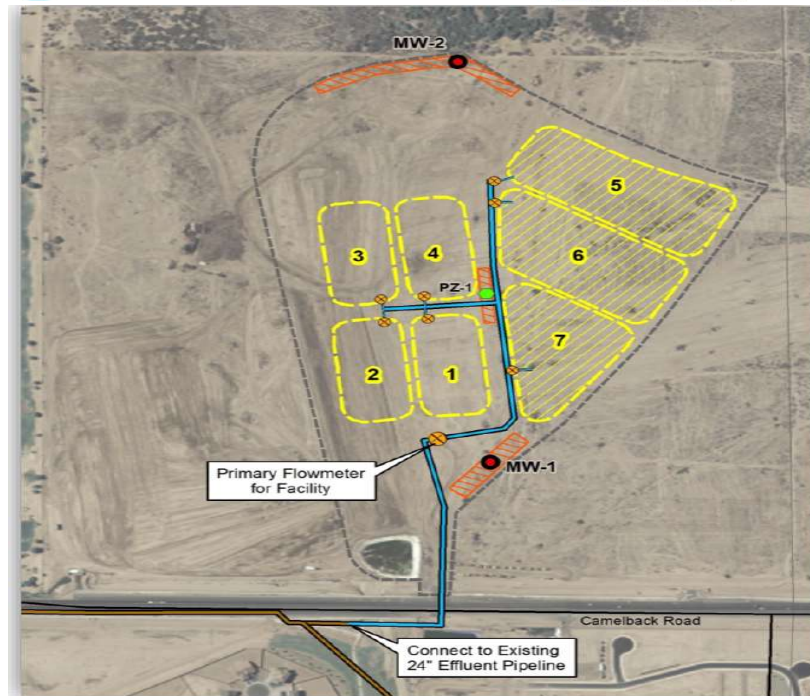
- **Public-Private Partnership** between CAGRD and Liberty Utilities for development of a new reclaimed water recharge facility in Litchfield Park, AZ.
- **CAGRD Contributed \$4.8M** in exchange for a 100-year lease of 2,400 AF, and a right to purchase 2,600 AF per year of recharge credits.
- **Liberty Contributed \$1.2M** and 5,000 AF of reclaimed water.
- **Recognition:** Nominated for 2014 "Water Deal of the Year" by *Global Water Intelligence*.



Liberty Utilities



CAGRD
CENTRAL ARIZONA GROUNDWATER
REPLENISHMENT DISTRICT
A Division of Central Arizona Project



Arizona Reclaimed Water Market Participants

Sellers

- Bisbee.
- Casa Grande.
- Chandler.
- Globe.
- Liberty Water.
- Metro Water.
- Pima County.
- Prescott Valley.
- SROG Cities.
- Superstition Mountains CFD #1.
- Surprise.
- Tolleson.
- Tucson.
- US Bureau of Reclamation.

Buyers

- Buckeye Irrigation Company.
- Central Arizona Groundwater Replenishment District.
- Freeport-McMoRan
- Frito Lay.
- Golf courses.
- Land developers.
- Palo Verde Nuclear Generating Station.
- Private equity funds.
- Reliant Energy.
- Tribes.

Markets for Reclaimed Water

LEGAL/REGULATORY ISSUES

Enabling Regulatory Conditions

	Arizona	California
Key Statutes/Decisions	APS v Long (1989)	Water Code 1210-1212
Ownership	WWTP owner	WWTP owner
Downstream Users	No claim	Protected from injury
Change of Use	No regulatory process	SWRCB change petition
Reclaimed Water Recharge	More straightforward	More complicated

Markets for Reclaimed Water

CALIFORNIA

California Reclaimed Water Use

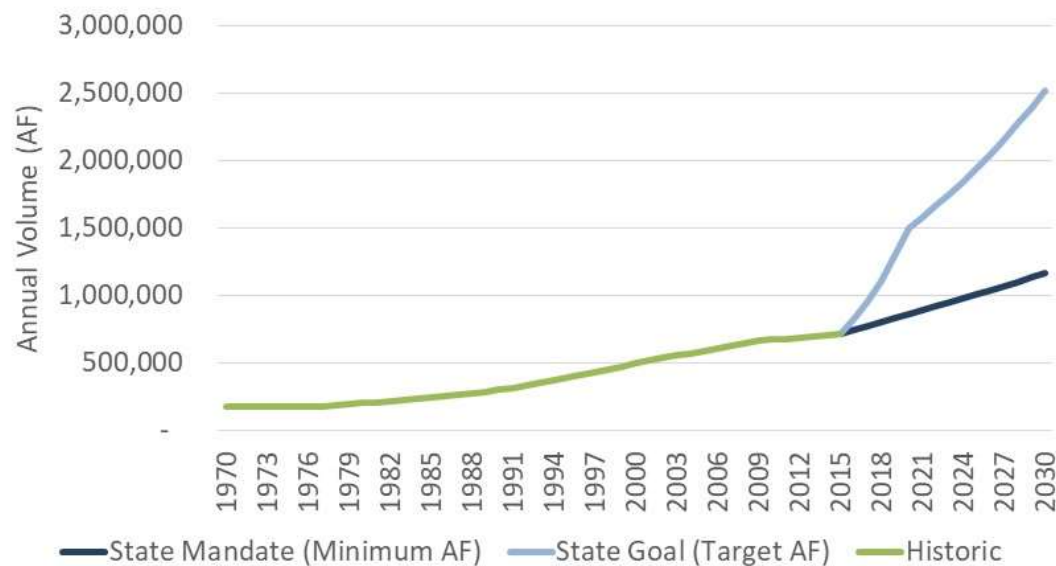
- 1.28 Million acre-feet of reclaimed water discharged to the ocean annually.
- Most ocean discharge occurs in growing and water-short urban areas.



Source: Hawkins, J. "Inventory of Municipal Wastewater Discharges to California Coastal Waters." September 2018.

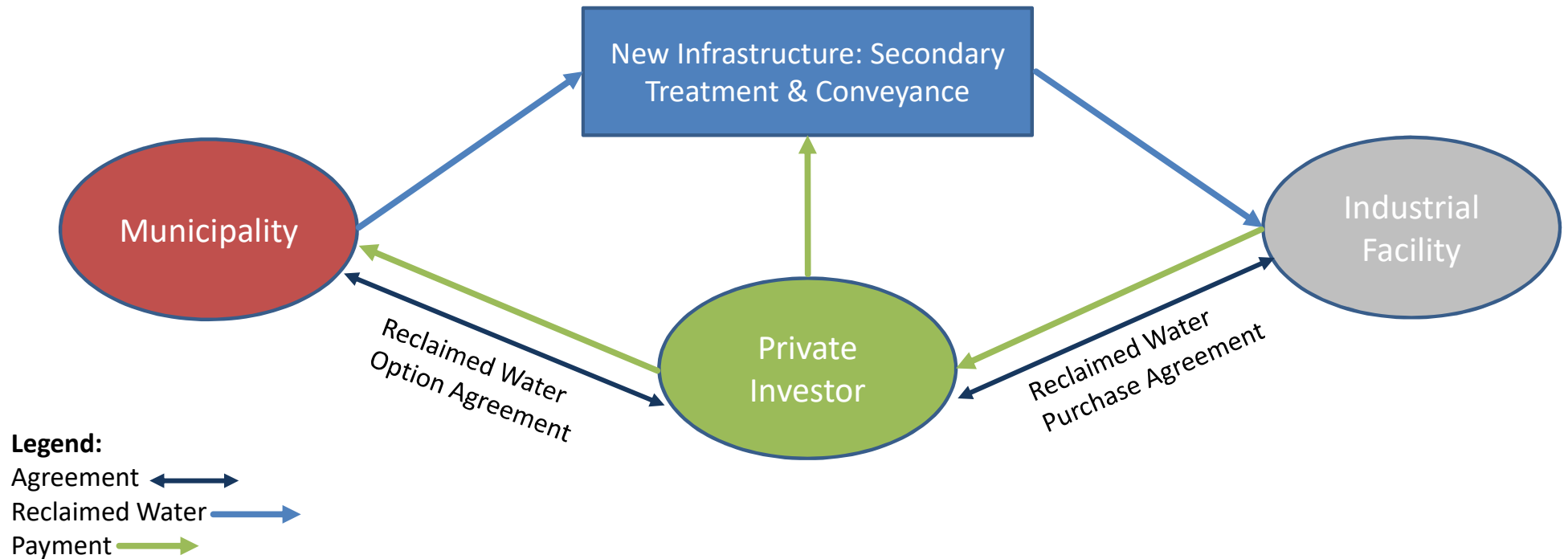
California Reclaimed Water Use

- State of California's recycled water use goal is 2.53 Million AF by 2030.
- Achieving this goal will require significant infrastructure investment (up to \$80B by some estimates).



Source: California Department of Water Resources. "Municipal Recycled Water." California Water Plan, vol 3, ch 12. October 2014.

How Markets Can Help – An Example



Key Elements of a Successful Project

- ✓ Control of reclaimed water supply.
- ✓ High credit quality reclaimed water purchaser(s).
- ✓ Long-term reclaimed water purchase agreement with purchaser(s).
- ✓ Consistent/predictable cash flow.
- ✓ Clarity regarding infrastructure construction, ownership, and O&M responsibilities.
- ✓ Manageable construction risk (cost and timeline).
- ✓ Reasonable and transparent cost of capital.

Key Takeaways

- Market transactions of reclaimed water have enabled Arizona to become a leader in water reuse.
- The private sector and private investment have catalyzed expansion of water reuse in Arizona.
- While California reuses a relatively small portion of its reclaimed water, the State has established aggressive reuse goals.
- Achieving California's water reuse goals will require significant capital, and public/private sector cooperation.

Thank you

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