

The Slow Demise of Direct Delivered Reclaimed Water

Arizona Water Reuse Symposium
July 2016

By
Mark Holmes



City of Goodyear, Arizona - Water Resources Division



Topics

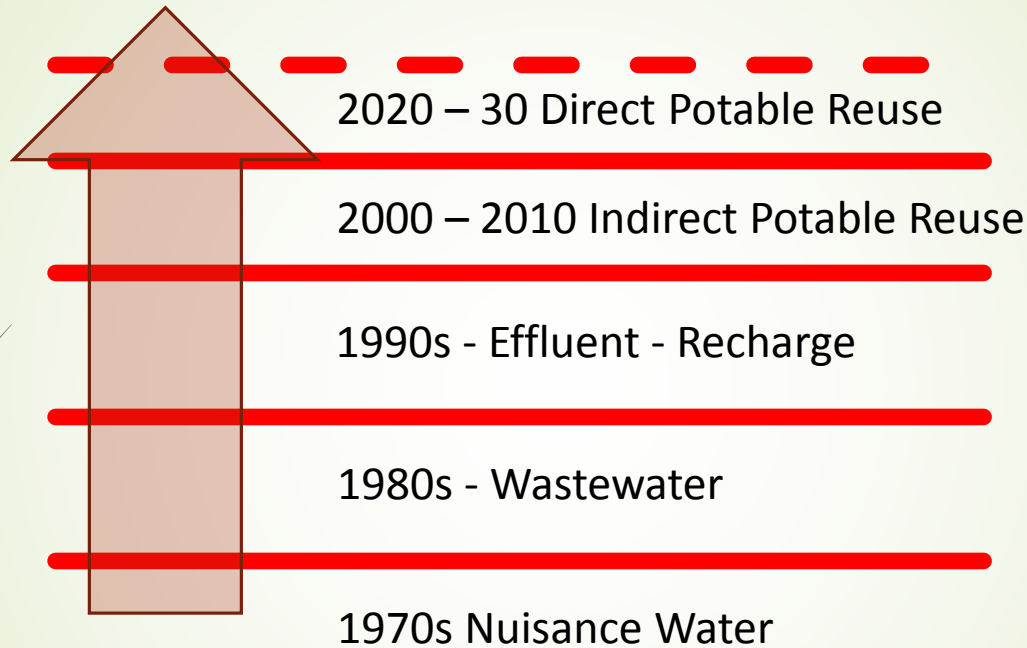
1. Quick overview of Arizona Governing Laws
2. Direct non-potable versus indirect potable reuse (IPR) for reclaimed water
3. Water reuse efficiency and sustainability factors
4. Phoenix Metropolitan and City of Goodyear case studies

Reclaimed = Recycled = Effluent

RECLAIMED WATER VALUE

COST OF SERVICES

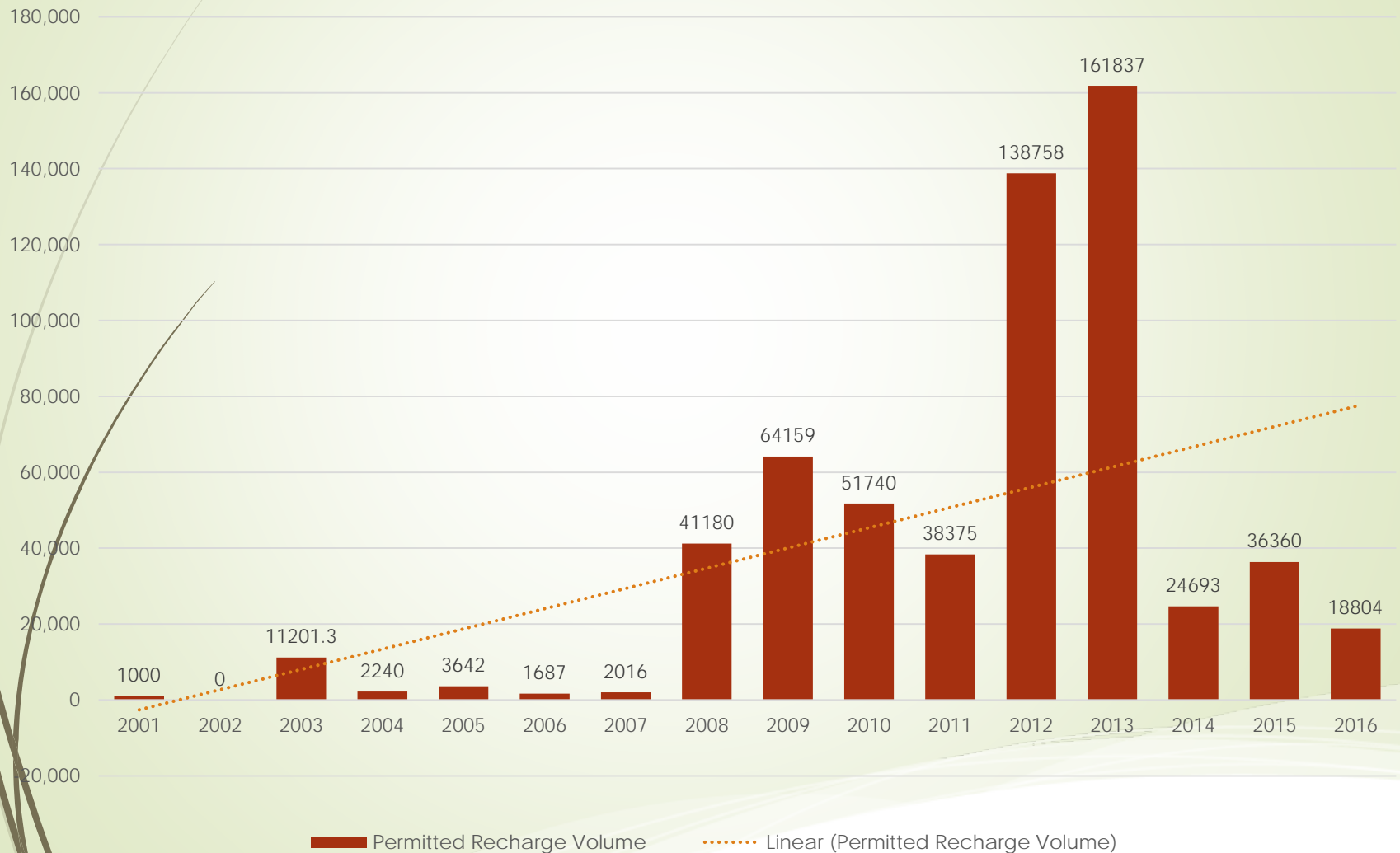
REVENUES



WATER EFFICIENCY
DROUGHT FIRMING

WATER RESOURCES VALUE

New Reclaimed USF Permitted Volume Last 15 Years



Data provided by the Arizona Department of Water Resources

Arizona Governing Laws

1994 – Arizona Revised Statutes §45-801

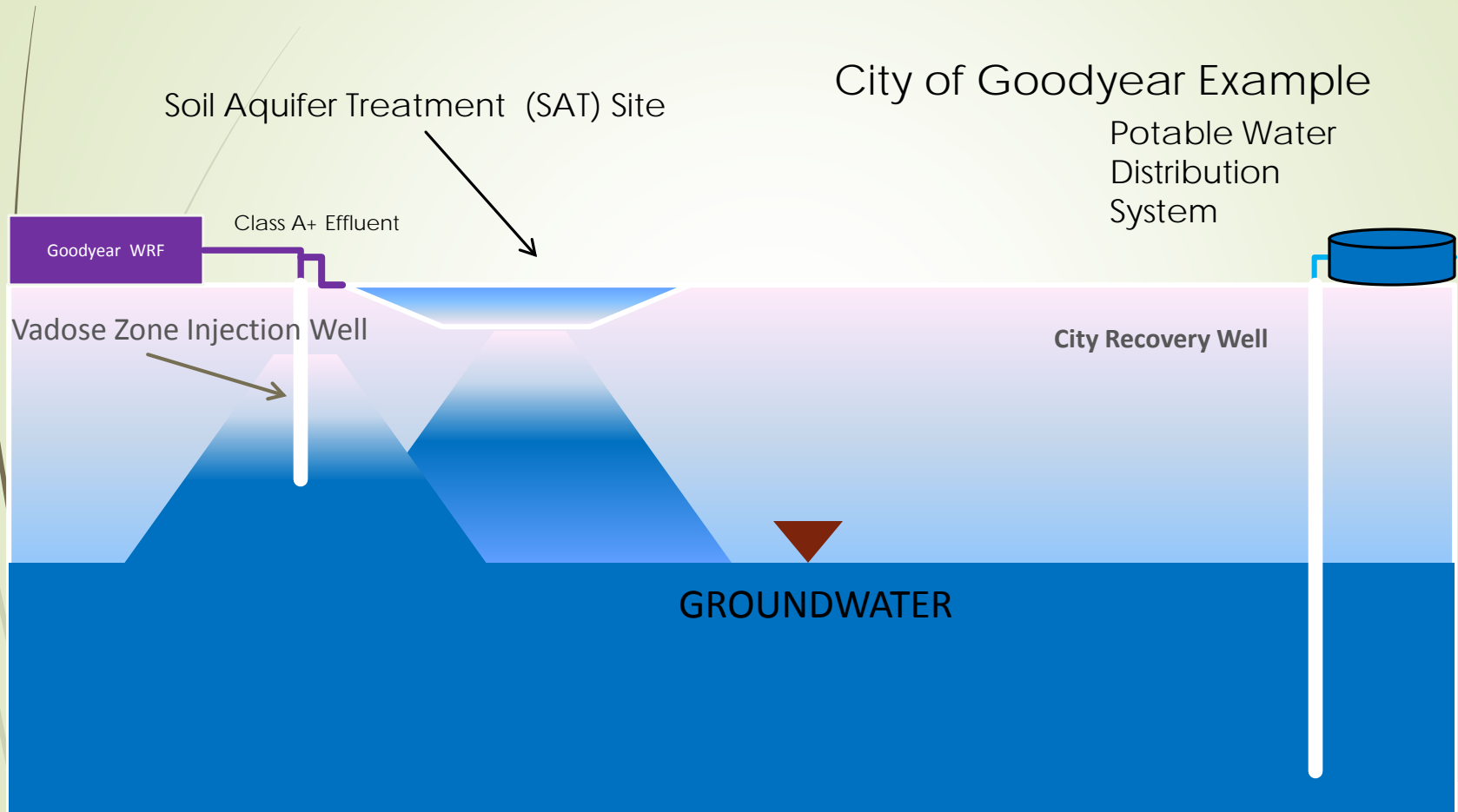
1. Created legal framework and credit system for the recharge, storage, and recovery of renewable water supplies: 1) reclaimed; 2) Colorado River water; or 3) in-state surface water.
2. Ensured that the State of Arizona was using its full entitlement of Colorado River water and storing that water underground for drought protection.

Underground Water Storage, Savings, and Replenishment Law

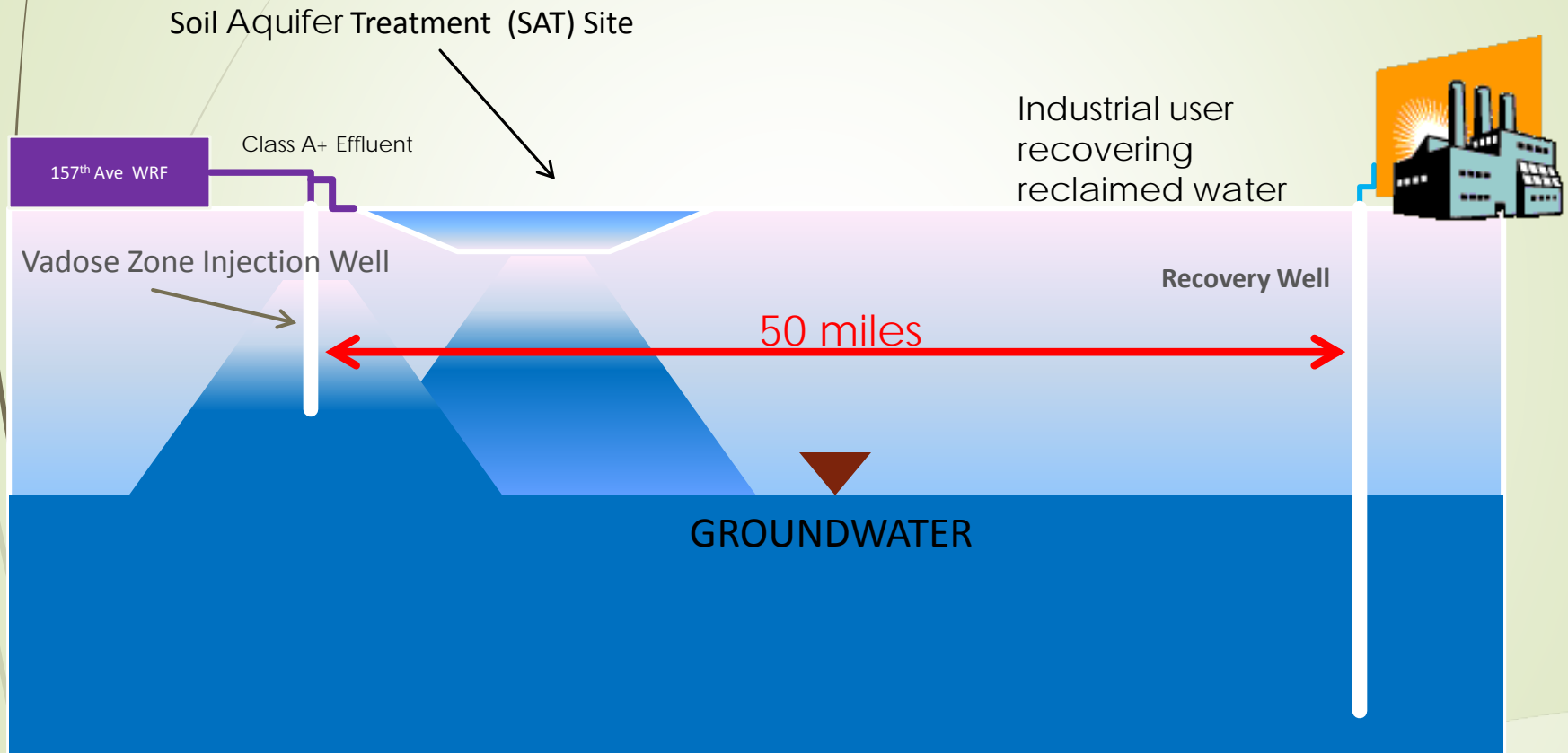
Law was designed to ensure the protection of the general economy and welfare of the State.

- ✓ Efficient and cost-effective management of water supplies
- 1. The aquifer would become the water treatment plant – through the infiltration of reclaimed water at a recharge facility.
- 2. The aquifer would act like the piping between where water is recharged and where water is recovered via groundwater / recovery well.
- 3. This law virtually replaced the need for purple pipe.

Underground Water Storage, Savings, and Replenishment Law



Underground Water Storage, Savings, and Replenishment Law



Direct Non-Potable Deliveries Versus Indirect Potable Reuse (IPR)

Direct Deliveries Versus Indirect Potable Reuse



Direct Deliveries

1. Delivered from the reclamation facilities at a reduced rate for water intensive uses that include:
 - Turf Facilities - Electric Generation
 - Agricultural uses- Industrial uses
 - Recreational Amenities
2. Directly delivered through a secondary infrastructure – “Purple Pipe” in addition to a potable system – significantly *increasing* or in some instances doubling the costs of services



Direct Delivery Challenges

1. May still require a Water Reclamation Plant disposal system(s) in lowest demand months
2. May not have enough reclaimed water within peak demand months
3. May provide only one single reuse
4. Can create master planning challenges



Direct Delivery Challenges

5. Water Quality issues – salinity and total dissolved solids can create challenges for many uses
6. Reduced revenues may not pay for “purple pipe” system cost of services
7. Direct non-potable water sold at a significantly reduced rate
 - a) Is a discounted water supply used as efficiently or sustainably as compared to the more expensive potable water?
8. During future shortages would curtailments affect direct non-potable users based on disposal issues?

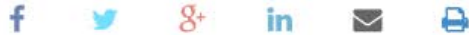


Direct Delivery Challenges

How Your Water Rates Subsidize Golf Courses

THE GIST

San Diego residents are giving a \$10.6 million annual subsidy to the city's reclaimed water sales. That means their bills are higher so local businesses, HOAs, golf courses and even ratepayers in other cities can have lower bills.



April 11, 2010

Direct Delivery Challenges

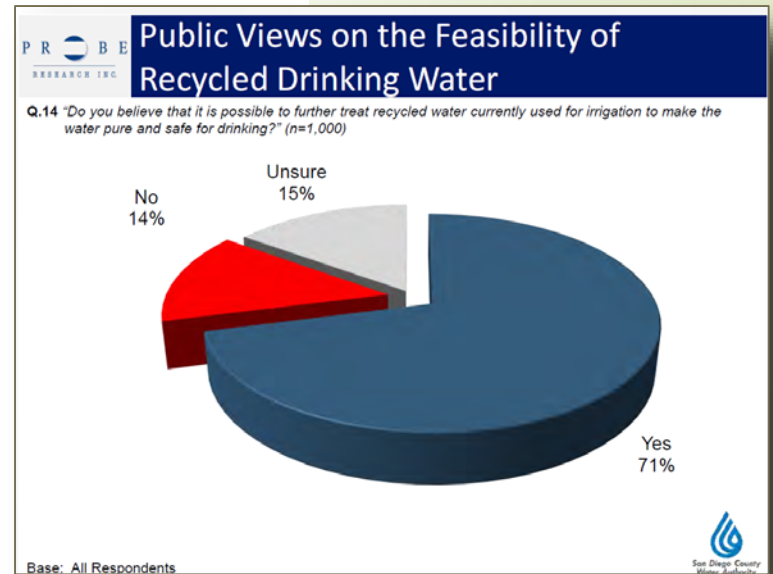
Recycled Wastewater Is Coming Sooner Than You Think

THE GIST

- A \$2.85 billion multi-part project, branded Pure Water, is hoping to use wastewater to start producing 30 million gallons a day of drinkable water within the next six years.
- That's two years sooner and twice as much water as envisioned just months ago.
- East County and North County officials have their own projects in the works.



June 16, 2015



Direct Delivery Challenges

The Daily Courier

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July 09, 2013

6/29/2013 6:01:00 AM

Talk of the Town: Prescott's hidden million-dollar subsidy

By Howard Mechanic

At a [Prescott City Council](#) meeting in May, many council members indicated concern, frustration and even outrage at continuing city subsidies for the Antelope Hills Golf Courses. Since then, many Letters to the Editor and commenters at [dcourier.com](#) have debated the pros and cons of golf course subsidies from the city's general fund (about \$240,000 this year). However, at no time has a much larger city subsidy been mentioned - an over \$1 million hidden city subsidy to Antelope Hills.

Antelope Hills, like other purchasers of the city's **effluent** (treated wastewater), buys **effluent** at approximately 11 percent of the price for potable water. How does this compare to the **effluent** rates other cities charge? Irving Ranch Water District (California) sells **effluent** for irrigation purposes at 90 percent of the potable rate. In Tucson, the price ranges from 73 to 95 percent, depending on the circumstance. In recent studies, consultants for Las Vegas and San Diego determined that 84 percent and 75 percent, respectively, were appropriate rates.

Some cities use pricing to encourage the use of **effluent**. However, Prescott doesn't need to incentivize the use of **effluent** because Prescott can recharge to groundwater all the **effluent** it produces. In exchange, the city can pump an equal amount of potable water for new homes or, preferably, leave the water in the ground and thereby help us reduce our large overdraft.

Direct Delivery Challenges



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The water subsidy for golf courses ‘scandal’

by SOURCE on APRIL 19, 2010 · 2 COMMENTS

in CULTURE, ECONOMY, ENVIRONMENT, SAN DIEGO

by George / [GrokSurf's San Diego](#) / April 17, 2010

[“How your water rates subsidize golf courses”](#) is the headline in a recent *Voice of San Diego* article by Rob Davis that will probably stir up some indignation around town. The article says that “475 businesses, homeowners associations, golf courses and public agencies” get a 78% discount on reclaimed water which is subsidized by regular water users.



Balboa Park Golf Course is not yet using reclaimed water.

Direct Delivery Challenges



Tampa Bay Times



WINNER OF 12 PULITZER PRIZES

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08:03.AM, Tuesday, July 19th, 2016

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Reclaimed water fee roils Clearwater well owners who must pay

By Mike Brassfield, Times Staff Writer
Wednesday, June 17, 2009 8:21pm



My Edition 11

CLEARWATER — The city will run reclaimed water lines into several more neighborhoods starting next month, but home- owners who irrigate with shallow wells are upset that they'll have to pay a monthly reclaimed water fee like their neighbors.

RELATED NEWS/ARCHIVE

Reclaimed water shutdown reminder
4 Days Ago

Tarpon Springs imposes reclaimed water restrictions
1 Month Ago

At tonight's City Council meeting, residential well owners in the Coachman Ridge subdivision will ask to be exempted from the fee, calling it an unfair tax.

The fee is currently \$17 a month but should rise a bit in October. Clearwater residents who have access to reclaimed water must pay this fee whether they hook up to the water lines or not. It's the same elsewhere in Pinellas County.

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Today's top 1

Em

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TODAY'S TO

Citrus High

Indirect Potable Reuse (IPR)

1. Reclaimed water is recharged within the aquifer and stored underground and recovered in the future when needed
 - ✓ May improve the water quality of the aquifer
2. Once recovered, the reclaimed water is delivered via the potable water transmission and/or distribution system
 - ✓ Requires only one infrastructure – “no purple pipe” creating reduced cost of services
3. Potable water sold at potable water rates
 - ✓ Efficiency and conservation built into the rates
4. Percent of water is recovered via sewer collection system and made available for additional reuses
5. Provides better master planning
6. Provides better aquifer management
7. Best water quality to meet all uses
8. Water revenues pay for costs of services
9. Can be curtailed thus all customers are treated fair and consistent



Indirect Potable Reuse Challenges

1. Reclaimed water must be recharged and stored underground within an aquifer
 - a. Requires adequate aquifer conditions, various permits, infrastructure, and recharge systems.
2. Reclaimed water stored underground must be indirectly recovered via recovery well systems and treated to potable standards.
3. Recharge is not suitable for all areas with little or no aquifer storage and one size does not fit all scenarios.



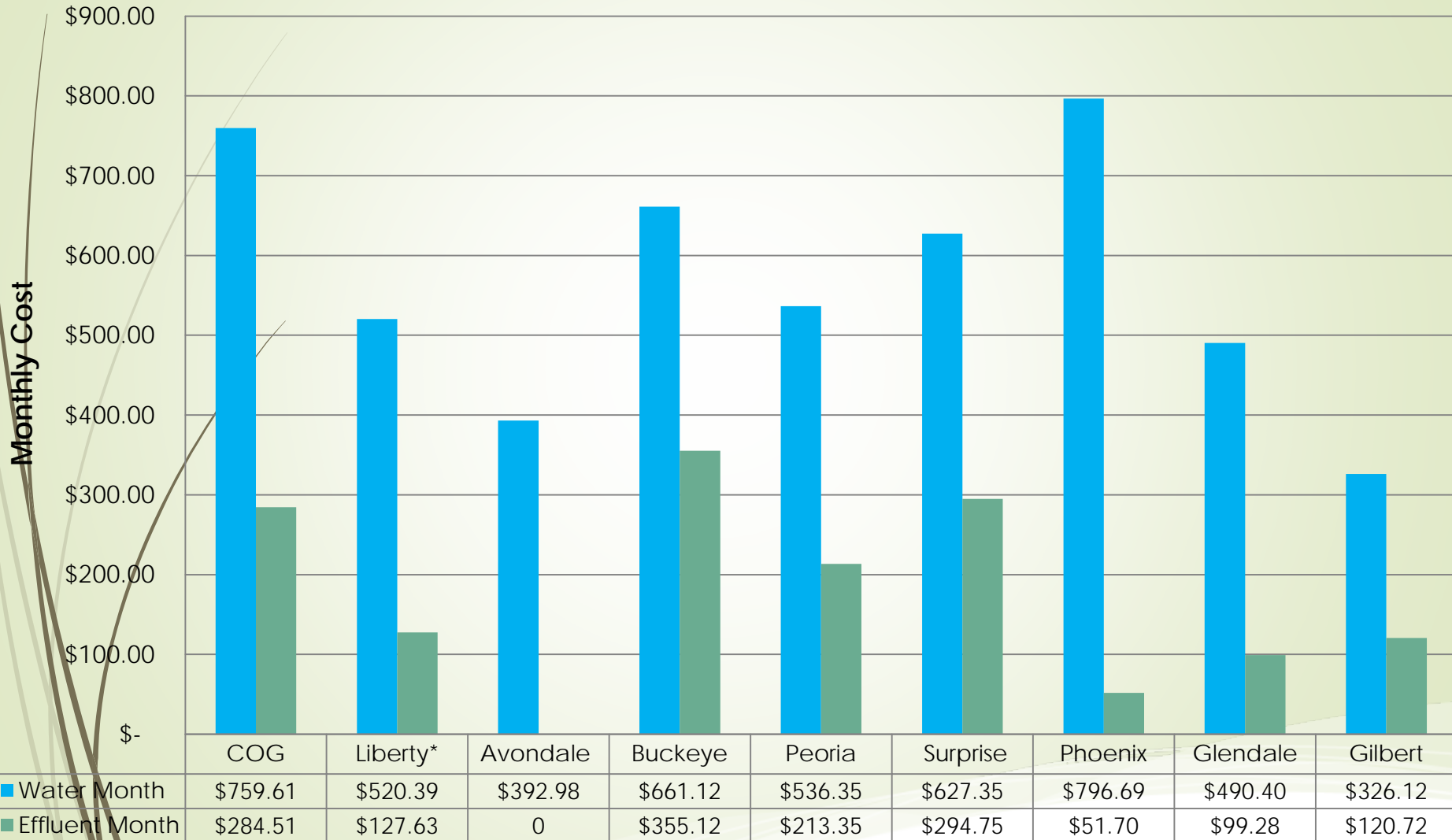
Water Reuse Efficiency and Sustainability

Phoenix Metropolitan Case Study

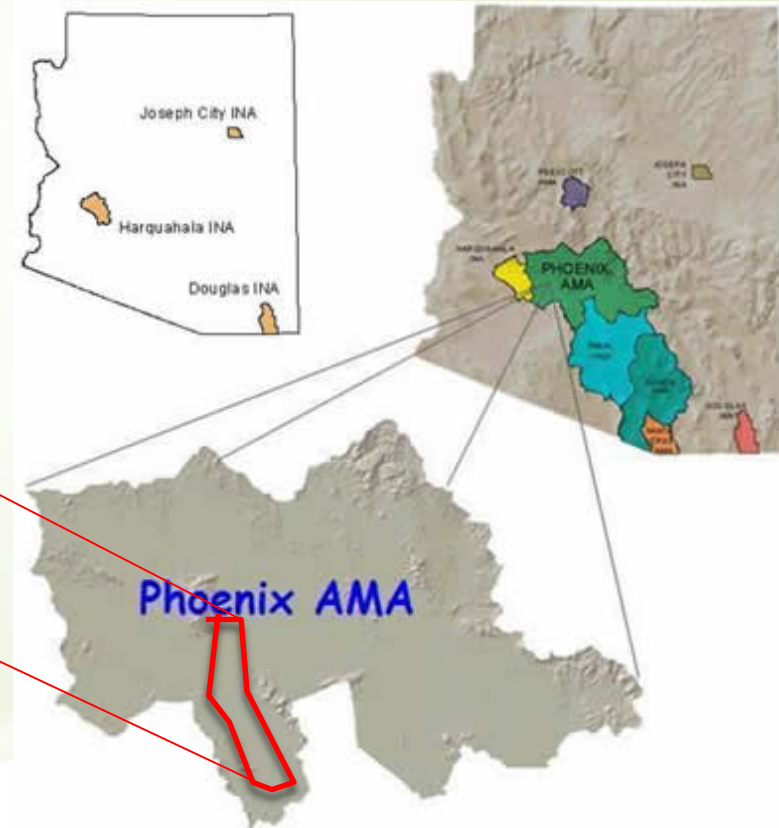
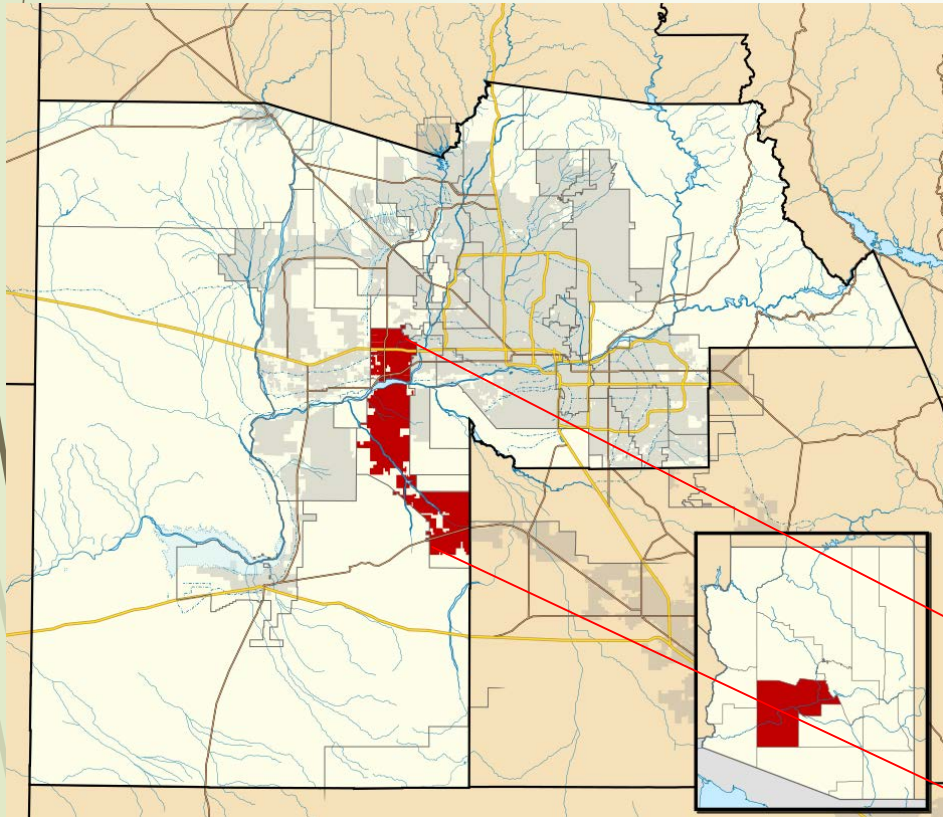
Phoenix Metropolitan Area



Monthly Potable vs. Reclaimed Water Revenues (150,000 gal + 2" meter base)



City of Goodyear

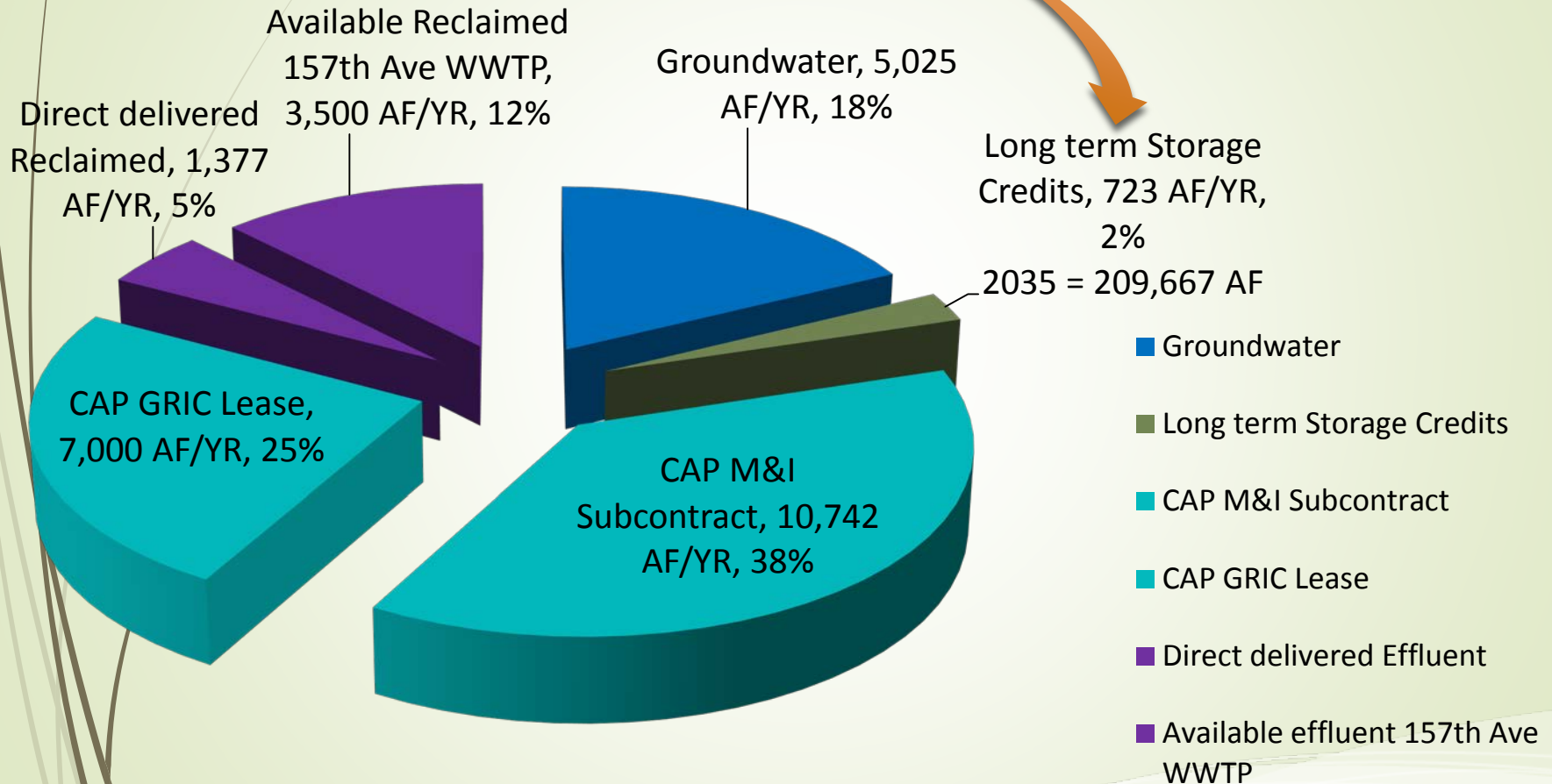


"Drought Proofing" the City

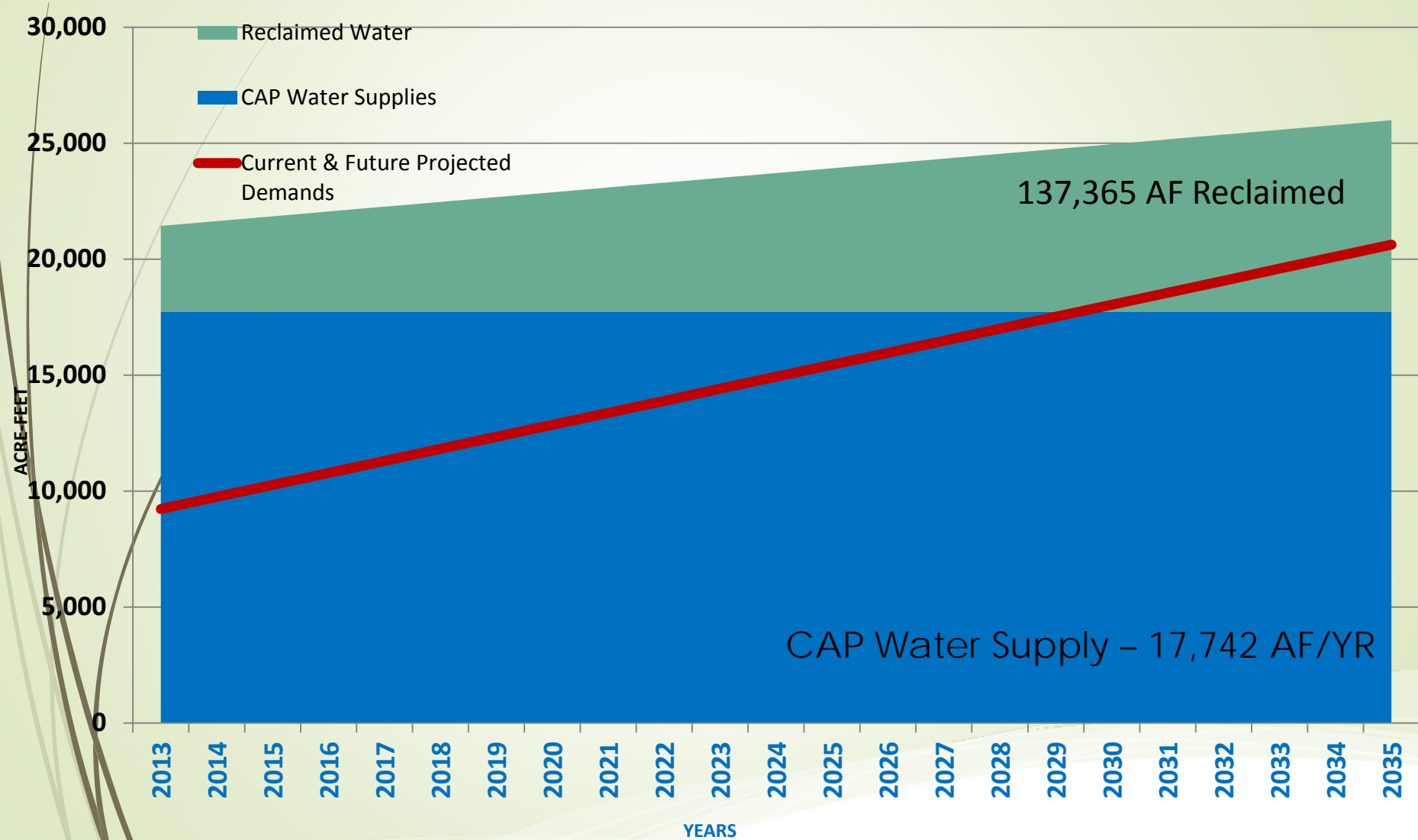
1. The City's largest water resource component (63%) is its CAP water
 - ✓ CAP water is subject to shortages on the Colorado River
2. In the future beyond 2030 when the City is ordering and using all of its CAP water;
 - ✓ How can the City ensure "its business as usual" from significant shortages affecting its annual CAP water orders for the next 100 years?
 - ❖ Having a robust long term storage credit bank account

Water Resources Portfolio

100 YEAR ASSURED WATER SUPPLY



Reclaimed Water Potential

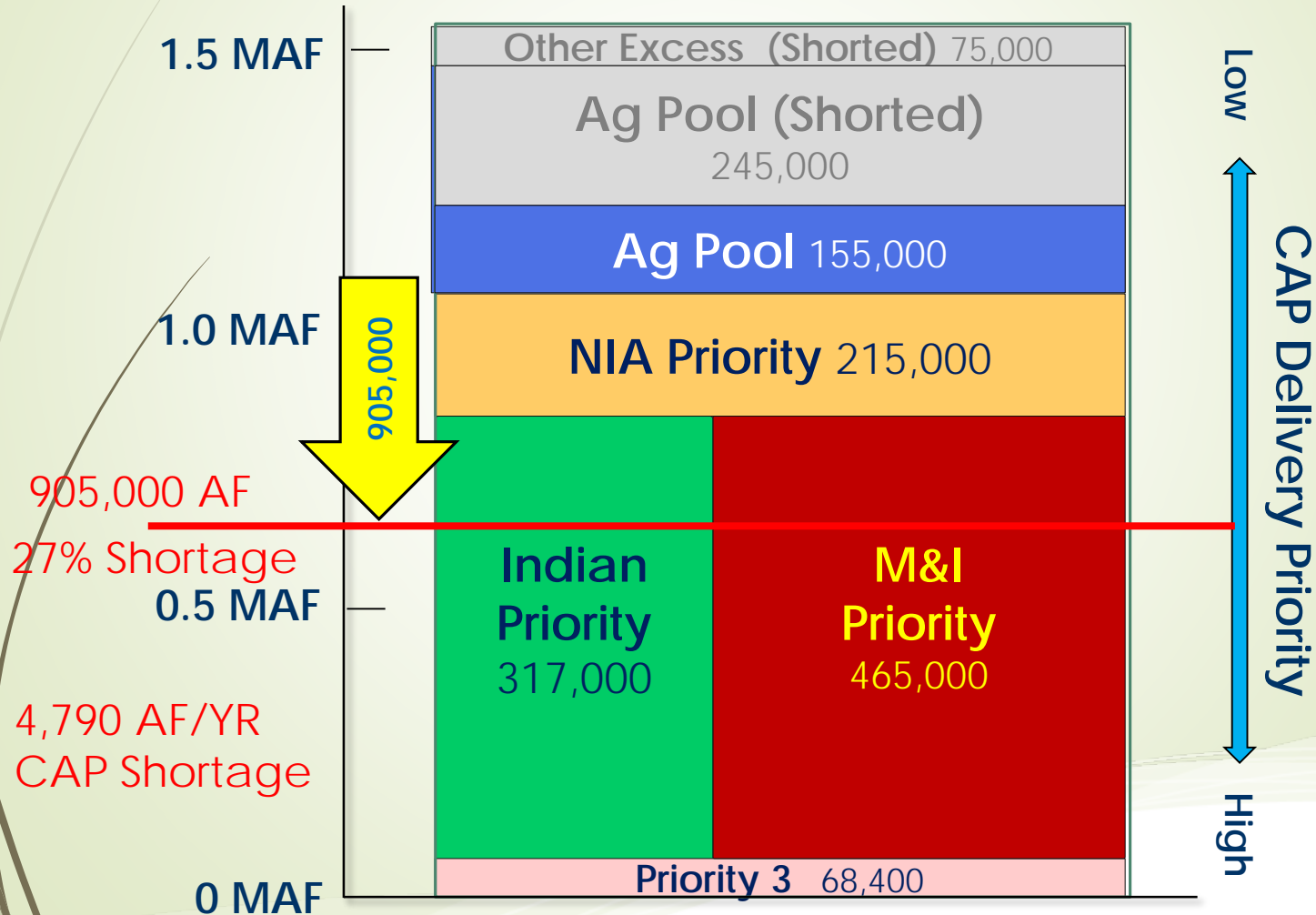


CAP Water Delivery System



CAP SHORTAGE

Scenario



CAP SHORTAGE

Scenario

Shortage of 4,790 AF/YR occurs from 2020 – 2035

Would require a total of 71,850 AF of Reclaimed Water to firm shortage

The City's Long Term Storage Credit Bank Account = 209,667 AF in 2035

The City remains drought proof

This does not include any recovered water via the Arizona Water Banking Authority and CAP – the City controls its destiny.

Policy Considerations

Current Policy

1. Purple Pipe required by all development - Goodyear's Engineering Design Standards and Policies Manual § 5.2.4 – **Currently Suspended**
2. There is no guarantee of reclaimed water availability - Goodyear Code of Ordinances §12-9-1 – **Currently Suspended**

Policy Discussion

1. Purple Pipe is not required - Modify the Engineering Design Standards and Policies Manual
2. The City intends to recharge to the greatest extent possible its reclaimed water supplies - Code of Ordinances
3. The City will recover reclaimed water through Indirect Potable Reuse (IPR) and work towards DPR
4. The City would only directly deliver reclaimed water to an entity or project via a special exception within the Code of Ordinances when it's in the City's best interest.
 - ✓ Need to define the criteria meeting the special exception
 - Reclaimed water use by an industry with need of non-potable water for processing with a return of 80-90% via the sewer collection system

Considerations

- What is the value of reclaimed as a water supply for your organization or the State today or in the future.
- Analyze the best and highest use for reclaimed water; direct versus indirect deliveries?
- How will reclaimed water meet your goals and objectives especially with long-term drought looming?
- One size doesn't fit all; what type of system is best for the organization, region, or state.
- Will the reclaimed system be financially self sustaining? If not, how will it be subsidized and who will subsidize it?

Questions & Discussion?

