Arizona Perspectives and Priorities of State and Municipal Reclaimed Water

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City of Goodyear
Arizona

11th Annual Water Reuse Conference
May 27-28, 2015

Just Say "NO" To Purple Pipe

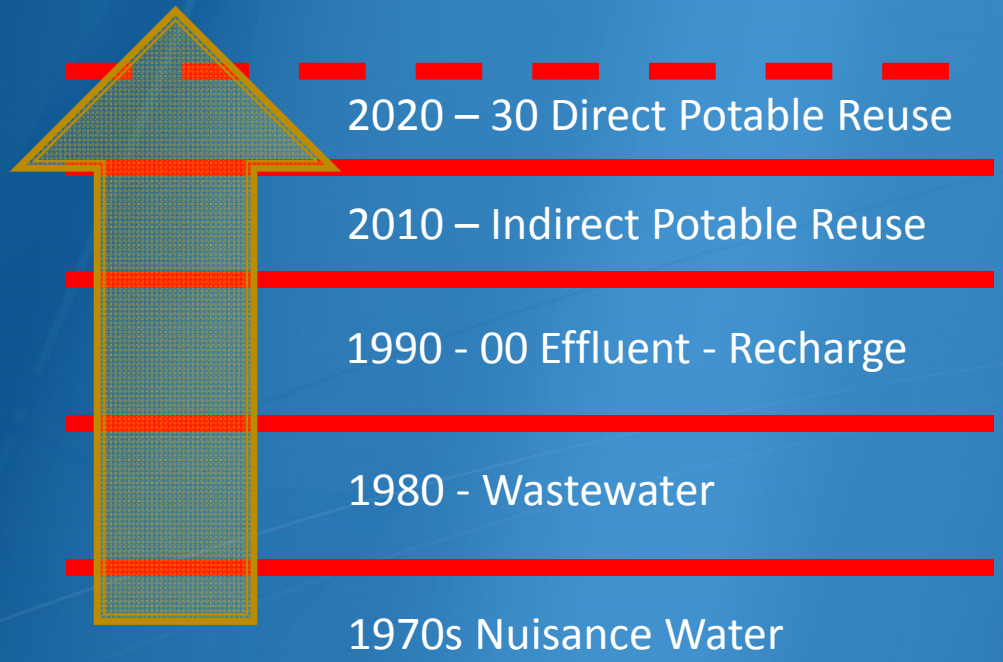
Topics

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

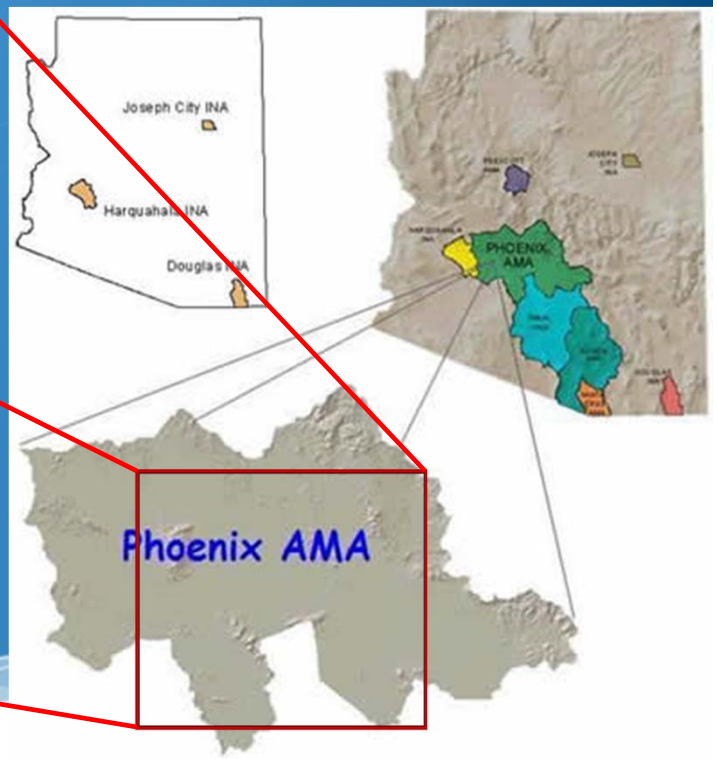
COST OF SERVICES
REVENUES



WATER EFFICIENCY
DROUGHT FIRMING

WATER RESOURCES VALUE

Phoenix Metropolitan Area



Arizona Governing Laws

Underground Water Storage, Savings, and Replenishment Law

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.

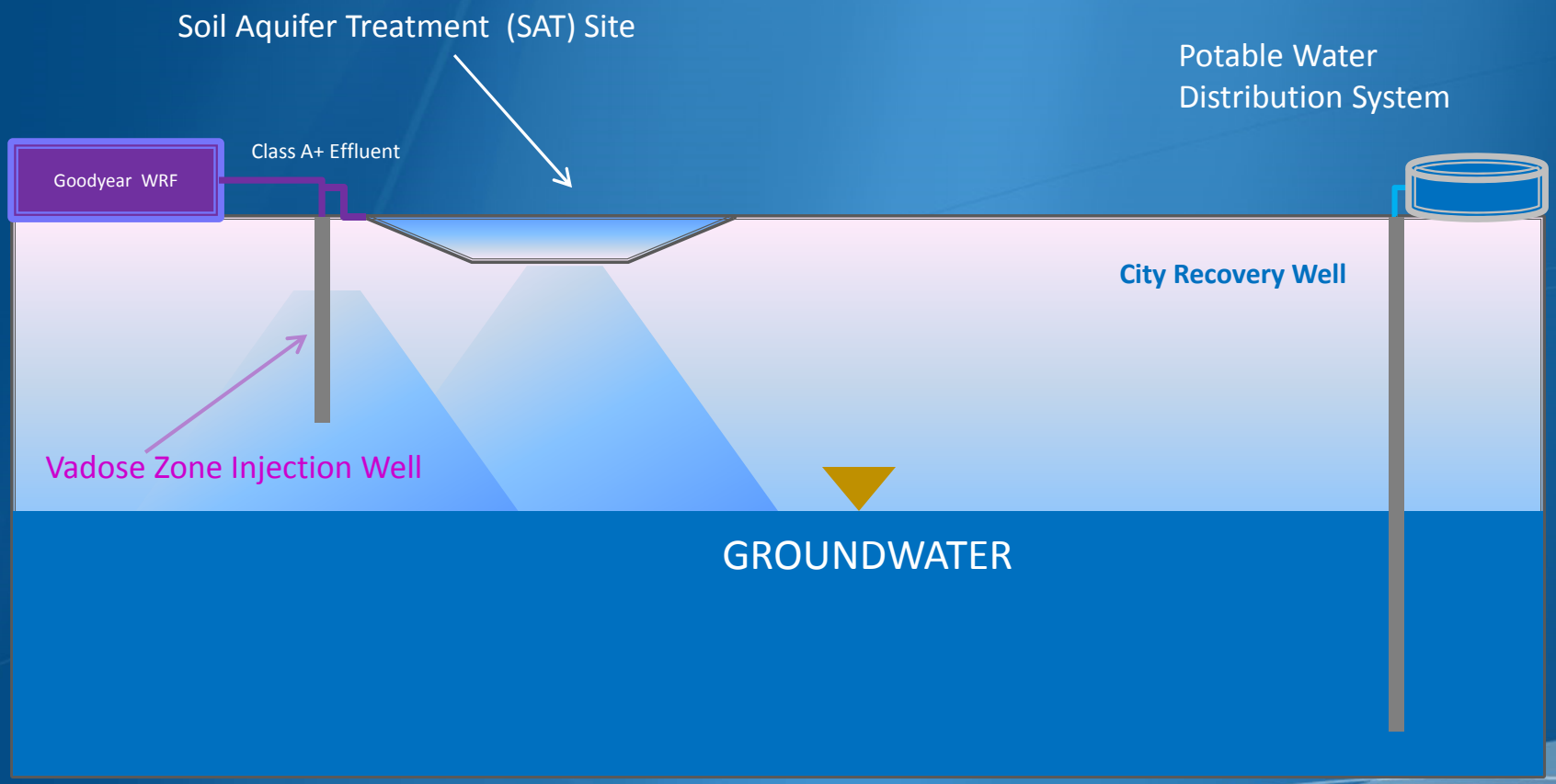
3. This law virtually replaced the need for purple pipe.

Arizona's Groundwater Supply Rules – Phoenix Active Management Area

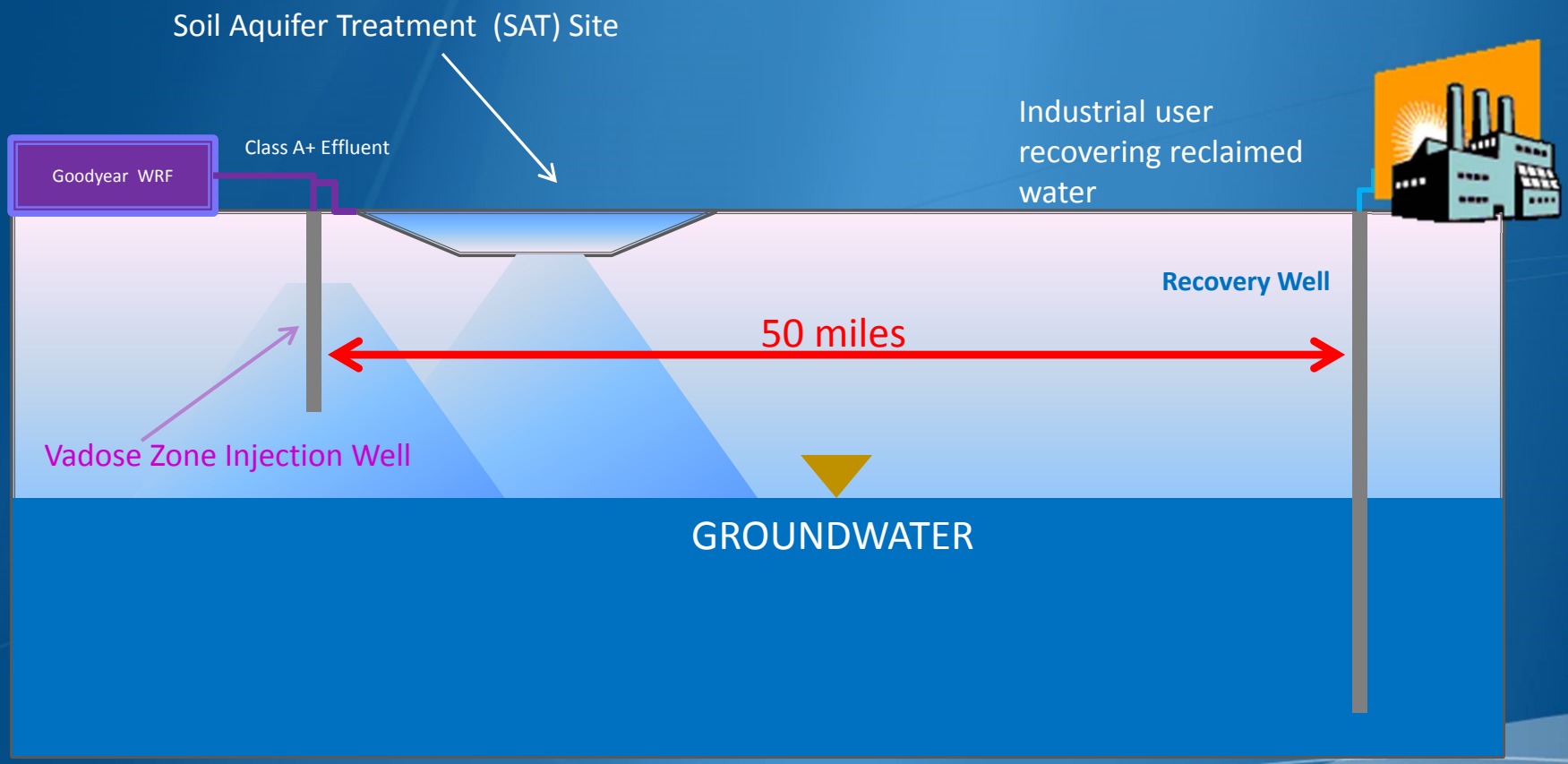
1. All Groundwater pumped within the Phoenix Active Management Area (AMA) must be replenished; gallon for gallon!
2. Replenishment must occur with renewable water supplies which include Colorado River water, Reclaimed, or in-state surface water supplies.

Underground Water Storage, Savings, and Replenishment Law

City of Goodyear Example



Underground Water Storage, Savings, and Replenishment Law



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
    - Agricultural uses
    - Recreational Amenities
    - Electric Generation
    - Industrial uses

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
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

The Daily Courier

home : opinions : columns

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 me
and even outrage at continuing city subsidies for the Antelo
many Letters to the Editor and commenters at dcourier.com
golf course subsidies from the city's general fund (about $2
time has a much larger city subsidy been mentioned - an ov
Antelope Hills.

Antelope Hills, like other purchasers of the city's **effluent** (t
at approximately 11 percent of the price for potable water.
effluent rates other cities charge? Irving Ranch Water Distr
irrigation purposes at 90 percent of the potable rate. In Tuc
percent, depending on the circumstance. In recent studies,
Diego determined that 84 percent and 75 percent, respectiv

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.

How Your Water Rates Subsidize Golf Courses

By ROB DAVIS | April 11, 2010

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.

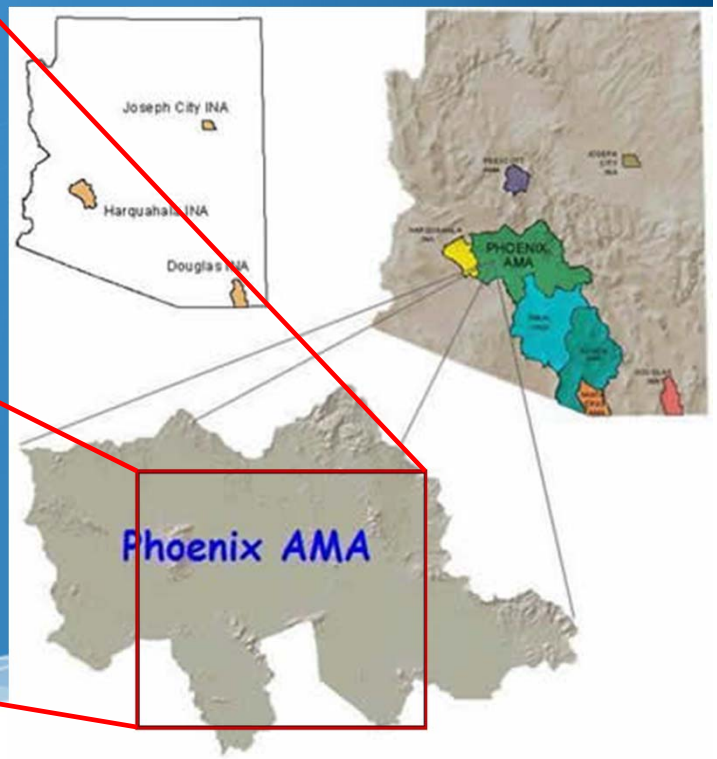
2. Reclaimed water stored underground must be indirectly recovered via recovery well systems and treated to potable standards.

3. Recharge is not suitable for all areas with little or no aquifer storage and one size does not fit all scenarios.

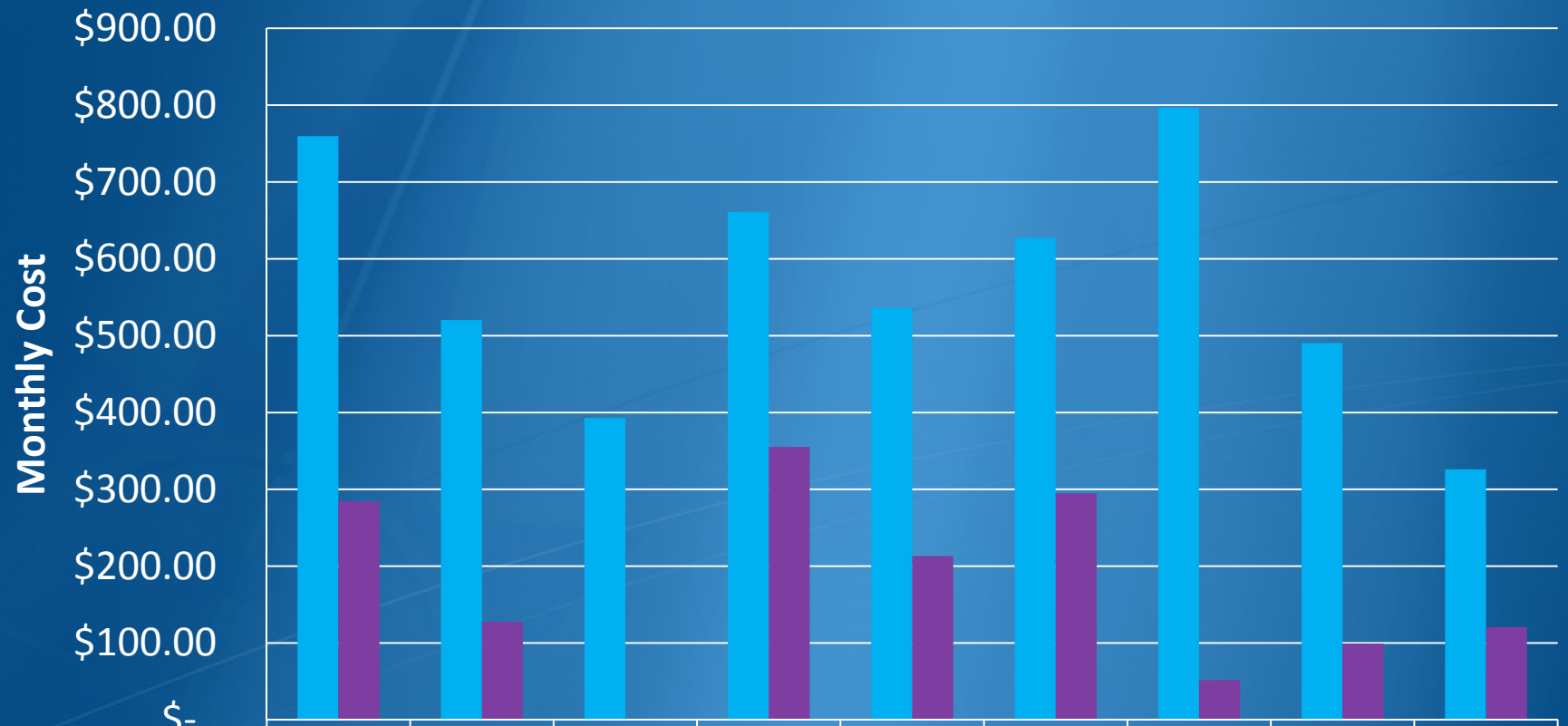
Water Reuse Efficiency and Sustainability

Phoenix Metropolitan Case Study

Phoenix Metropolitan Area



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



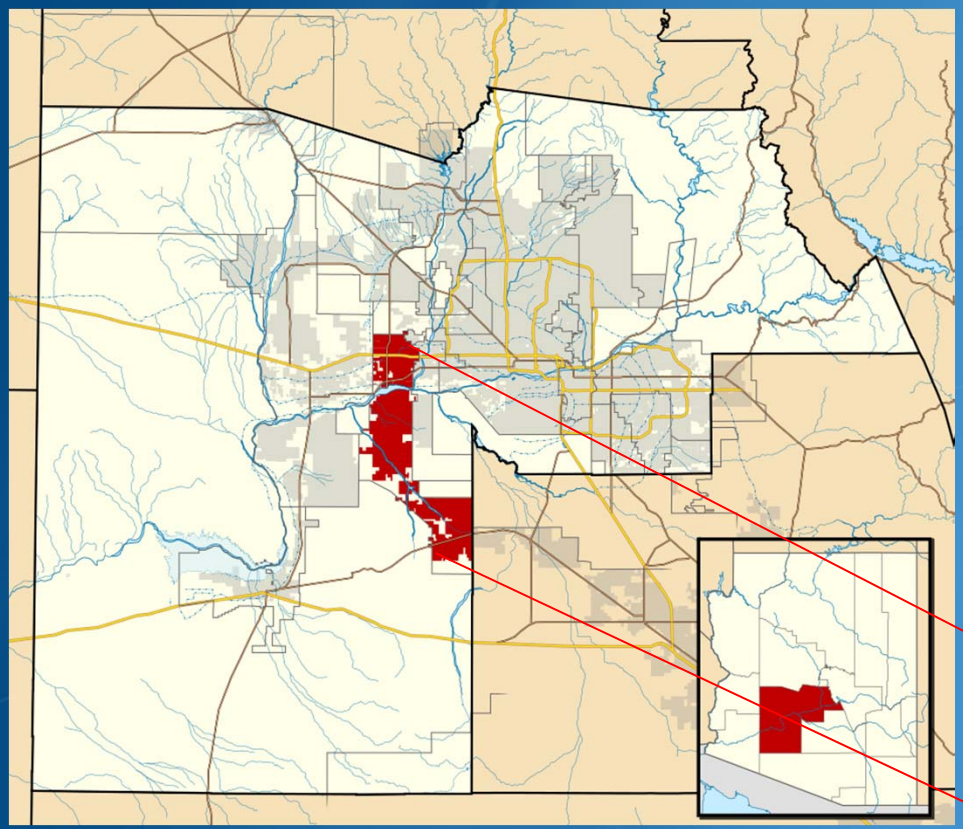
	COG	Liberty*	Avondale	Buckeye	Peoria	Surprise	Phoenix	Glendale	Gilbert
Water Month	$759.61	$520.39	$392.98	$661.12	$536.35	$627.35	$796.69	$490.40	$326.12
Effluent Month	$284.51	$127.63	0	$355.12	$213.35	$294.75	$51.70	$99.28	$120.72

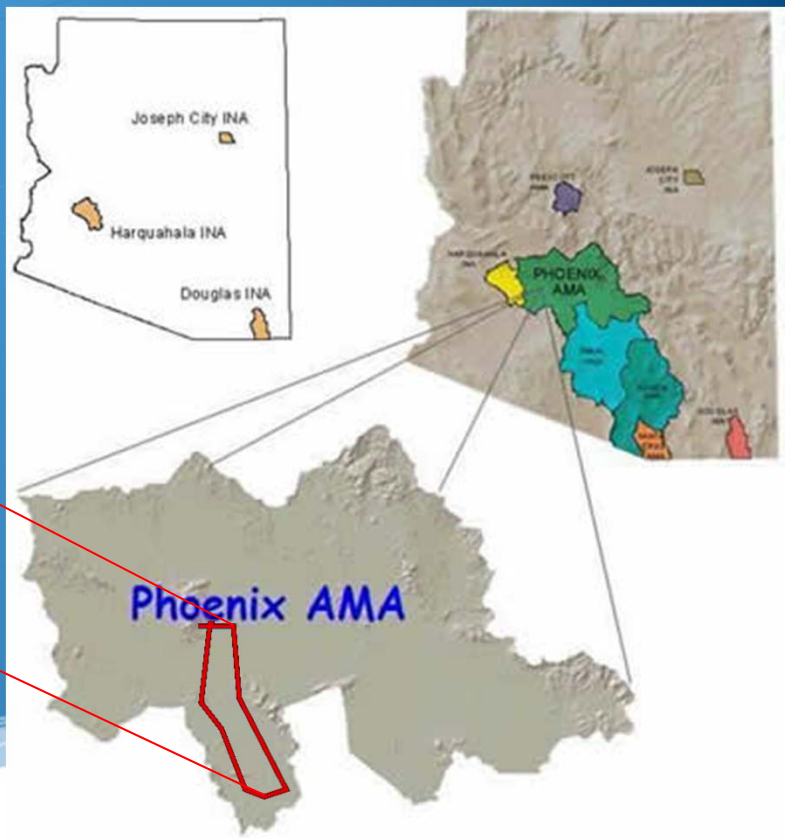
Reclaimed Water Subsidy

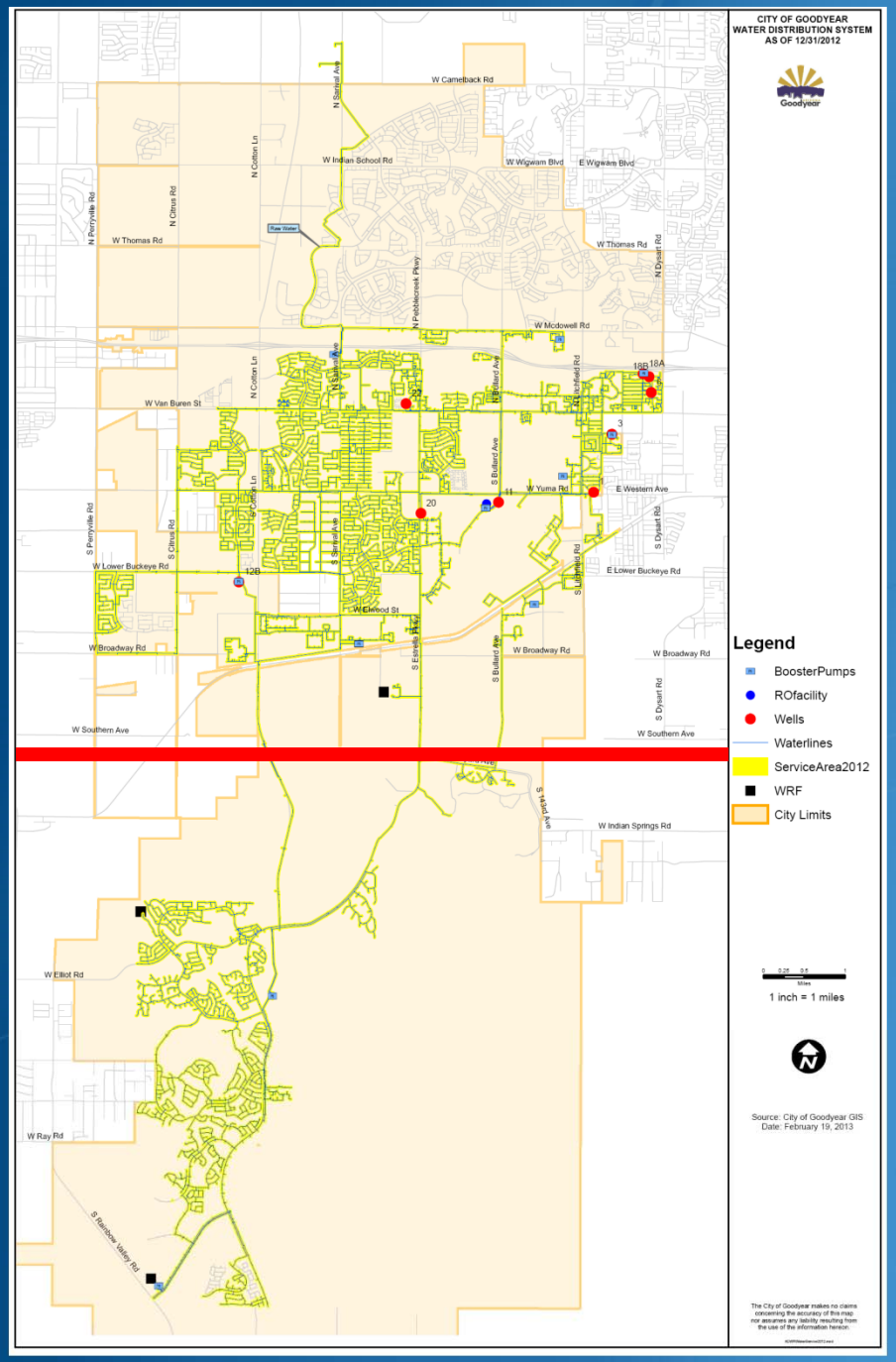
Irrigation 2" meter			
150,000 gal	**Water Month**	**Effluent Month**	**Potential Subsidy**
COG	$ 759.61	$ 284.51	**$ 475.10**
Liberty*	$ 520.39	$ 127.63	**$ 392.75**
Avondale	$ 392.98	$0	**$0**
Buckeye	$ 661.12	$ 355.12	**$ 306.00**
Peoria	$ 536.35	$ 213.35	**$ 323.00**
Surprise	$ 627.35	$ 294.75	**$ 332.60**
Phoenix	$ 796.69	$ 51.70	**$ 744.99**
Glendale	$ 490.40	$ 99.28	**$ 391.12**
Gilbert	$ 326.12	$ 120.72	**$ 205.40**

City of Goodyear – Case Study North vs. south

City of Goodyear







NORTH OF THE GILA RIVER

A. Water infrastructure master planned for build out
B. New growth can develop via normal platting process as infill – pay traditional impact fees
C. Purple pipe not considered in master planning

SOUTH OF THE GILA RIVER

A. Purple pipe deployed for over 20 years
B. Water master planned with reduced potable water infrastructure sizing due to purple pipe
C. Additional southern growth cannot plug into potable water system due to under-sizing
D. New master planned potable infrastructure needs deployment or new satellite services areas
   - ❖ Very expensive due to physical availability and water quality issues

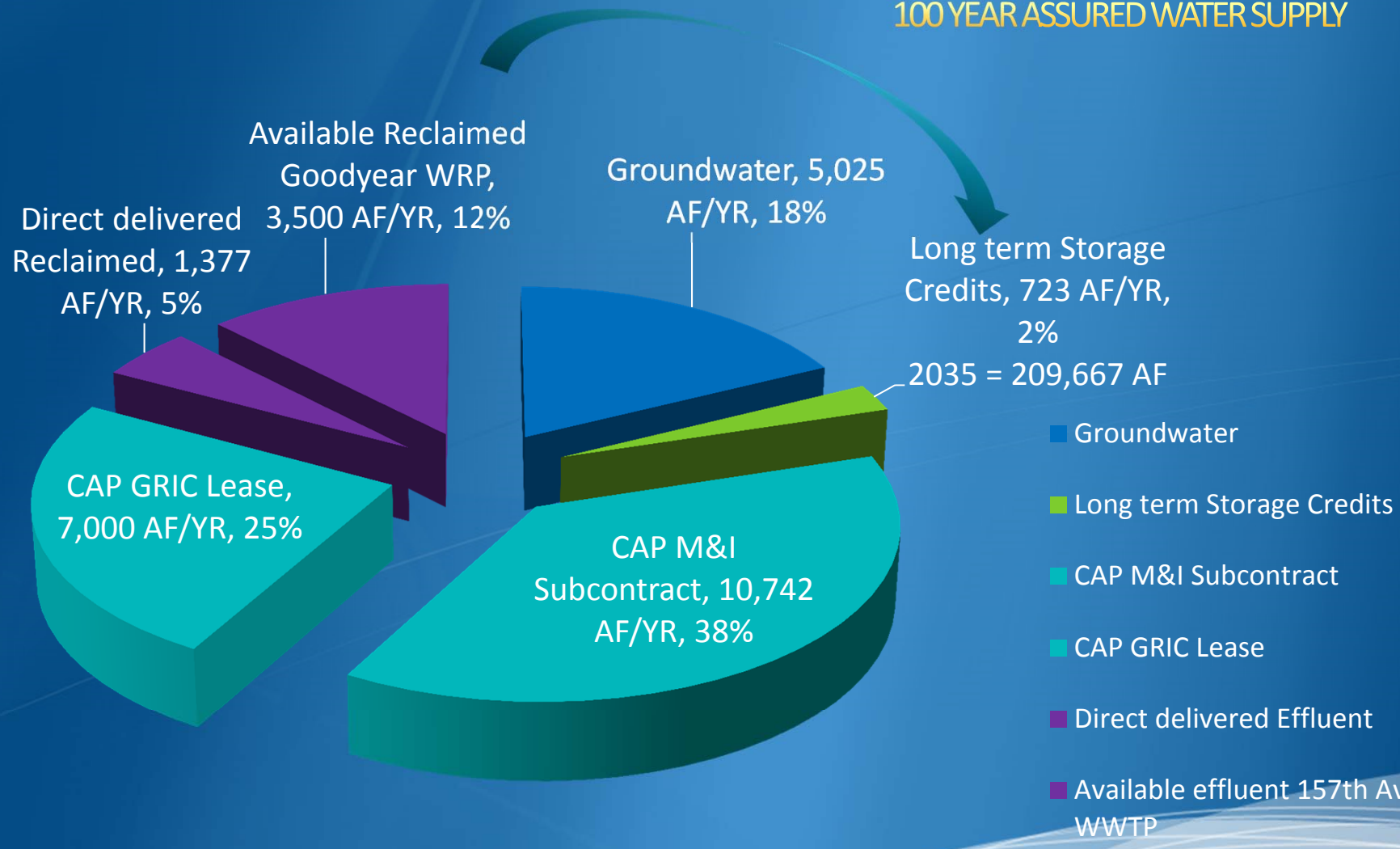
“Drought Proofing” the City

1. The City’s largest water resource component (63%) is its CAP water
   - ✓ CAP water is subject to shortages on the Colorado River

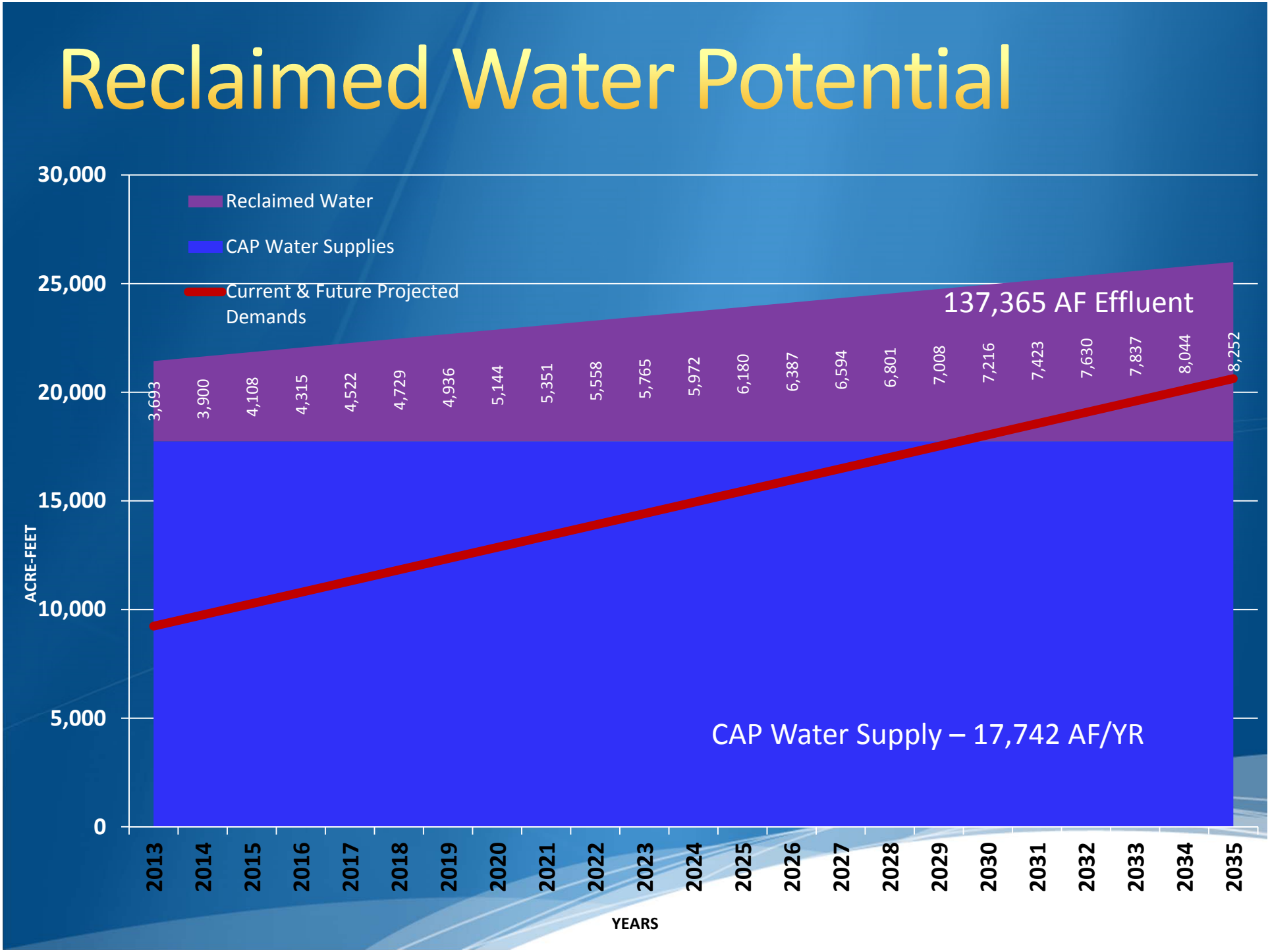
2. In the future beyond 2030 when the City is ordering and using all of its CAP water;
   - ✓ How can the City ensure “its business as usual” from significant shortages affecting its annual CAP water orders for the next 100 years?
   - ❖ Having a robust long term storage credit bank account

Water Resources Portfolio

100 YEAR ASSURED WATER SUPPLY



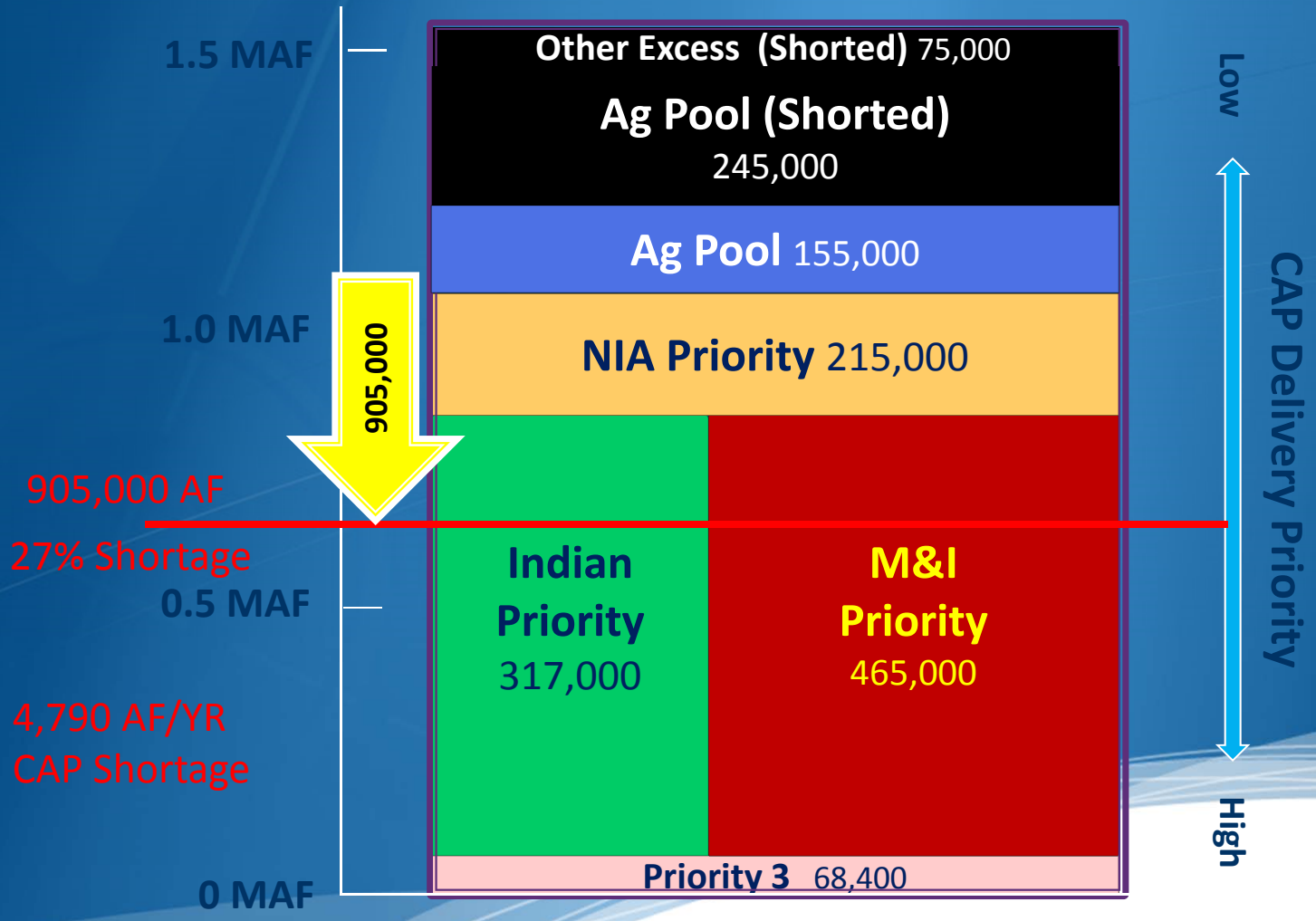
Reclaimed Water Potential



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

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 <u>not</u> 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)
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 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.

Questions &
Discussion?