

The Role of Managed Aquifer Recharge in Meeting the Statutory Requirements of the Central Arizona Groundwater Replenishment District

*16th Biennial Symposium on
Managed Aquifer Recharge*

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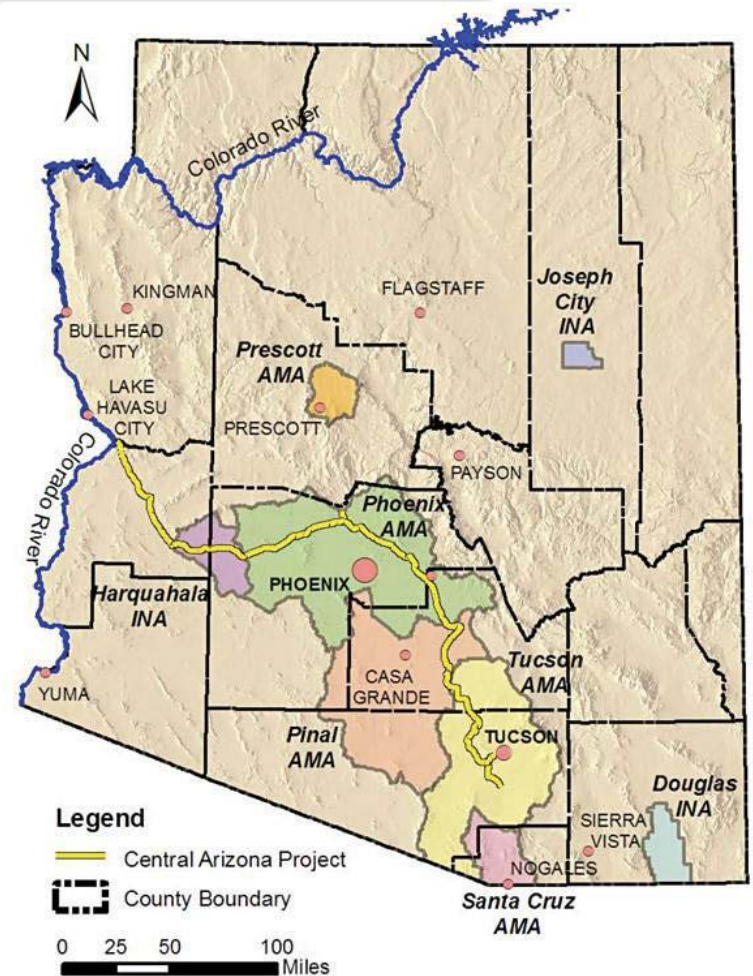
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YOUR WATER. YOUR FUTURE.

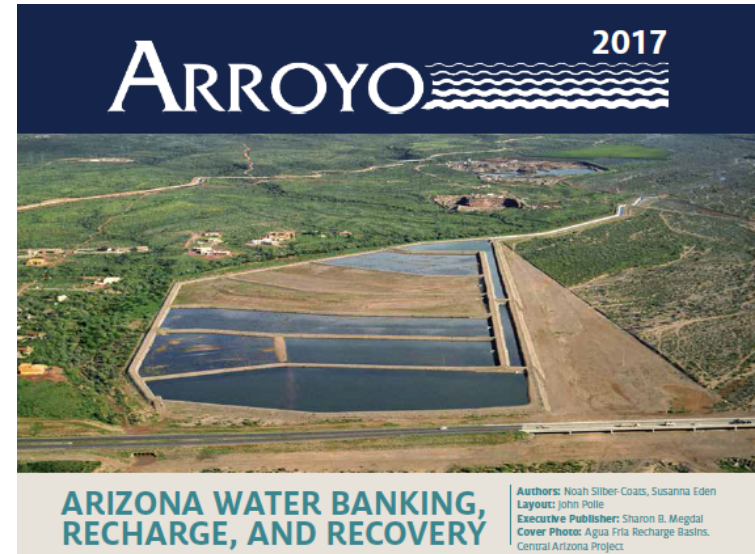
What is the CAGRD?

- The Central Arizona Groundwater Replenishment District (CAGRD) was created by the Legislature in 1993 as a special function of the Central Arizona Water Conservation District (CAP), which operates the Central Arizona Project. The CAGRD is funded solely by its members.
- Arizona law requires CAGRD to replenish “excess” groundwater pumped by its members in the Pinal, Phoenix, and Tucson Active Management Areas (AMAs).



CAGRD's Role in AZ Water Management

- Arizona law requires all new development in the three Central Arizona AMAs to demonstrate a 100-year Assured Water Supply
 - Entities that lack direct access to renewable water supplies but have physical, legal and continual access to groundwater may join CAGRD.
 - CAGRD members pay CAGRD to replenish the aquifer and offset their excess groundwater pumping.
 - CAGRD membership ensures groundwater use is consistent with AMA water management goals.
- Arizona has adopted a robust regulatory framework for aquifer recharge and recovery



Throughout this Arroyo, water banking refers to the storage of water underground in natural aquifers for future use. In Arizona, this underground storage is achieved through recharge projects permitted by the Arizona Department of Water Resources (ADWR) through the Underground Storage, Savings and Replenishment Program. When there is a need to use stored water, it is recovered through wells permitted for recovery also by ADWR. While simple in concept, the actual functioning of water banking, recharge, and recovery in Arizona can be very complicated. The purpose of this Arroyo is to describe, in a clear and straight forward way, how water banking, recharge, and recovery actually work.

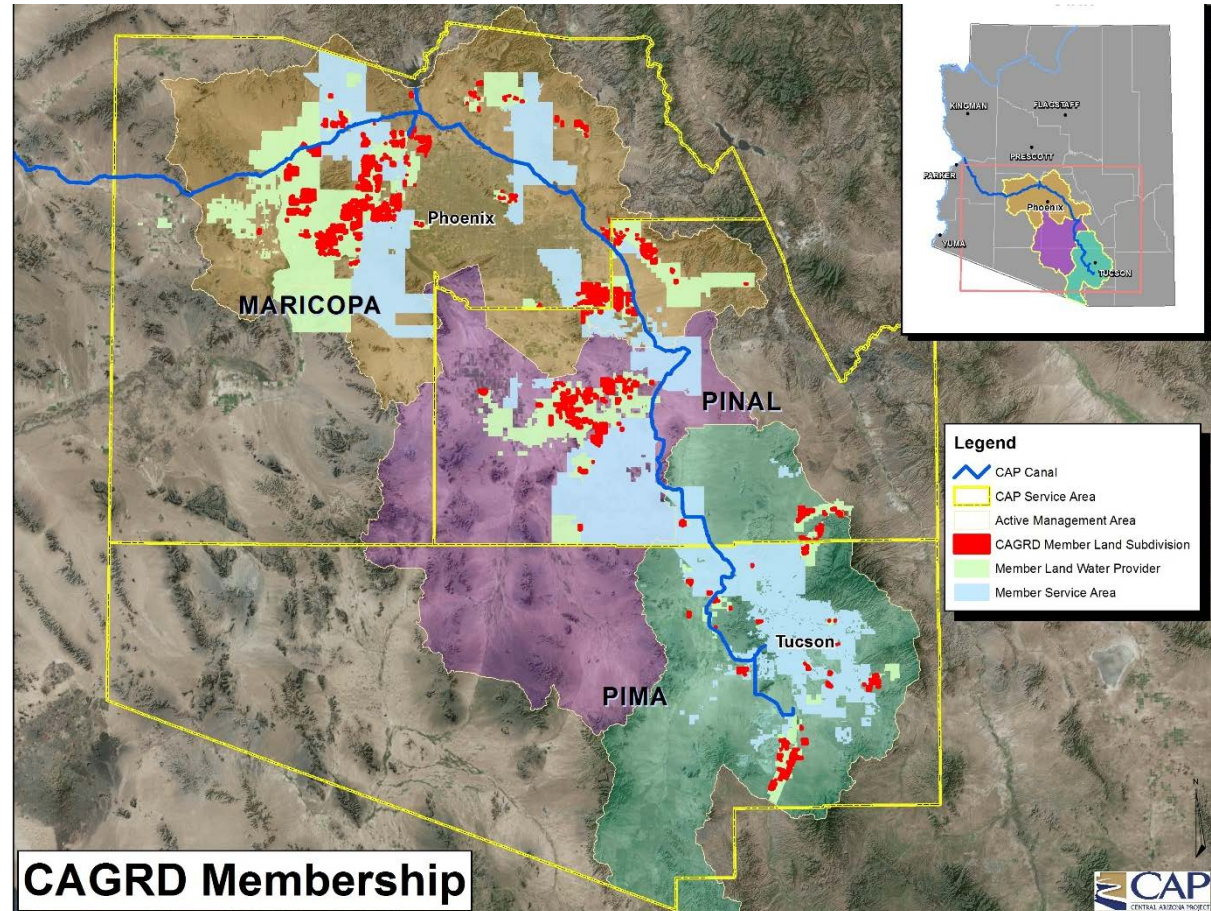
A decade ago, the Arroyo examined the issue of artificial recharge, reviewing the status of legislation, regulation, and recharge projects in Arizona. While covering some of the same background information, this issue has a broader goal—to describe how all the

elements of water banking, recharge, and recovery operate to provide future water security to Arizona's water users. This Arroyo is organized into seven major sections, beginning with this introduction. The second section discusses groundwater management in Arizona and the Groundwater Management Act of 1980, subsequent amendments and legislation. In the third section, the laws related to water banking, recharge, and recovery are examined. The fourth section provides an overview of the ways in which the laws are translated in practice, drawing on both aggregate statistics and specific examples. The fifth section looks at two important entities in water banking, recharge, and recovery efforts—the Central Arizona Groundwater Replenishment District (CAGRD) and the Arizona Water Banking Authority (AWBA). As explained in that section, these two entities serve different purposes and operate according to very different models. The sixth section

CAGRD Membership

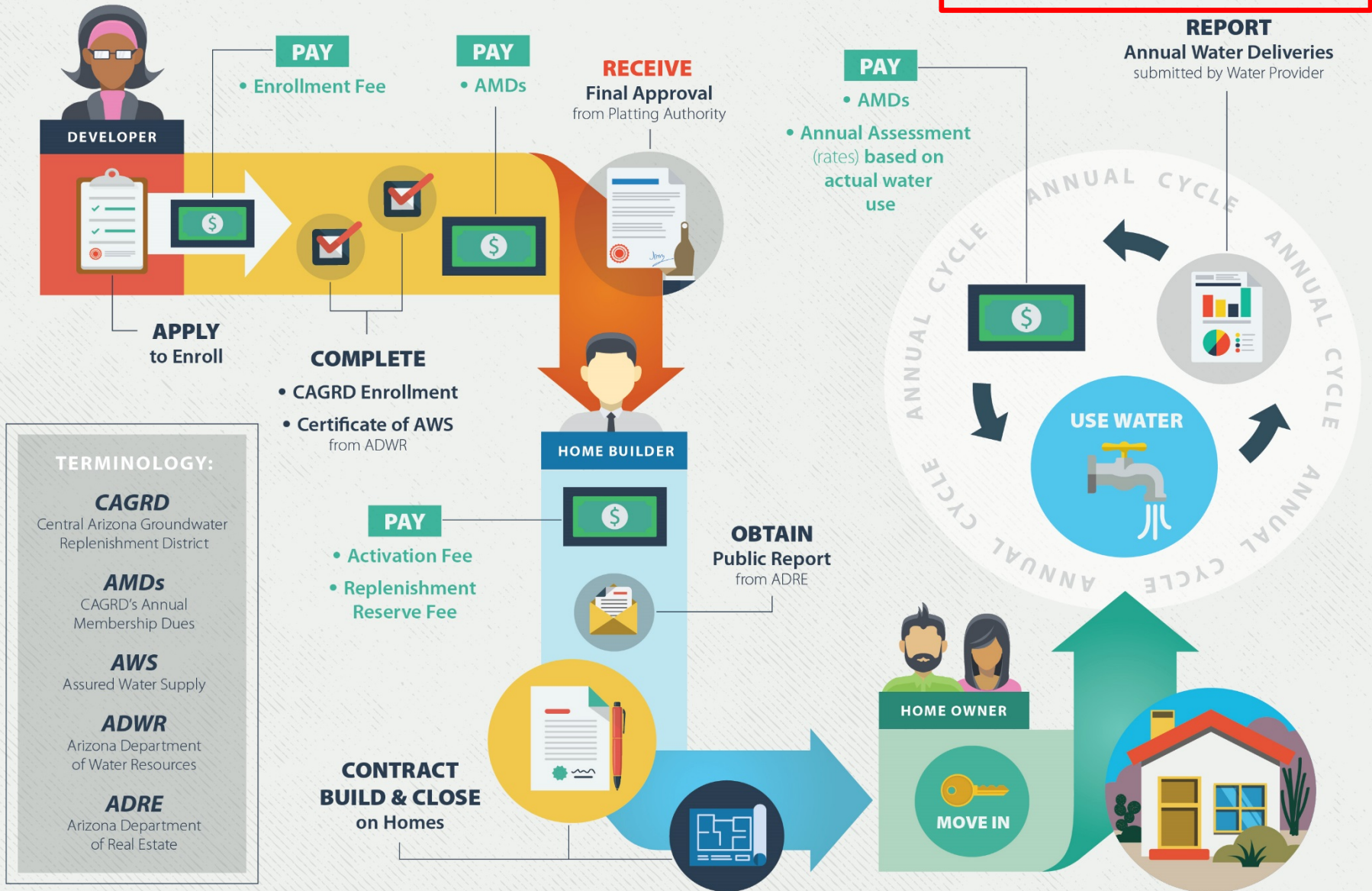
Two types of CAGRD members:

- **Member Service Areas (MSAs):** municipalities and private water companies
- **Member Lands (MLs):** subdivisions and master-planned developments



CAGRD Member Land Development Process

[Link to YouTube Animation](#)



Replenishment

- CAGRDR relies on the statutory recharge framework created by the 1994 Underground Water Storage, Savings, and Replenishment Act
- Replenishment of excess groundwater pumped by CAGRDR members is accomplished through aquifer recharge



Superstition Mountain Recharge Project, located in the East Salt River Valley. Owned and operated by CAP.

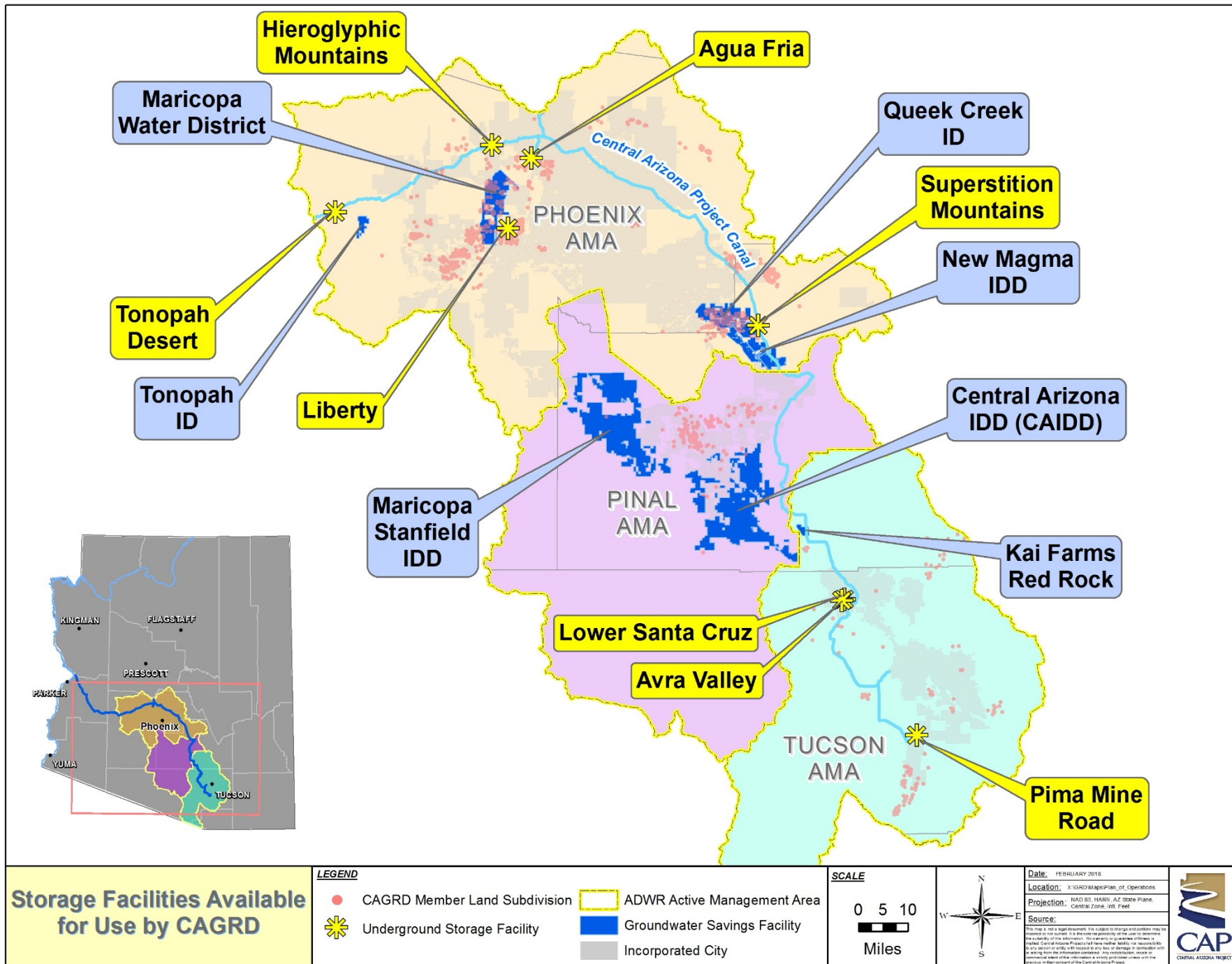
Replenishment Methods

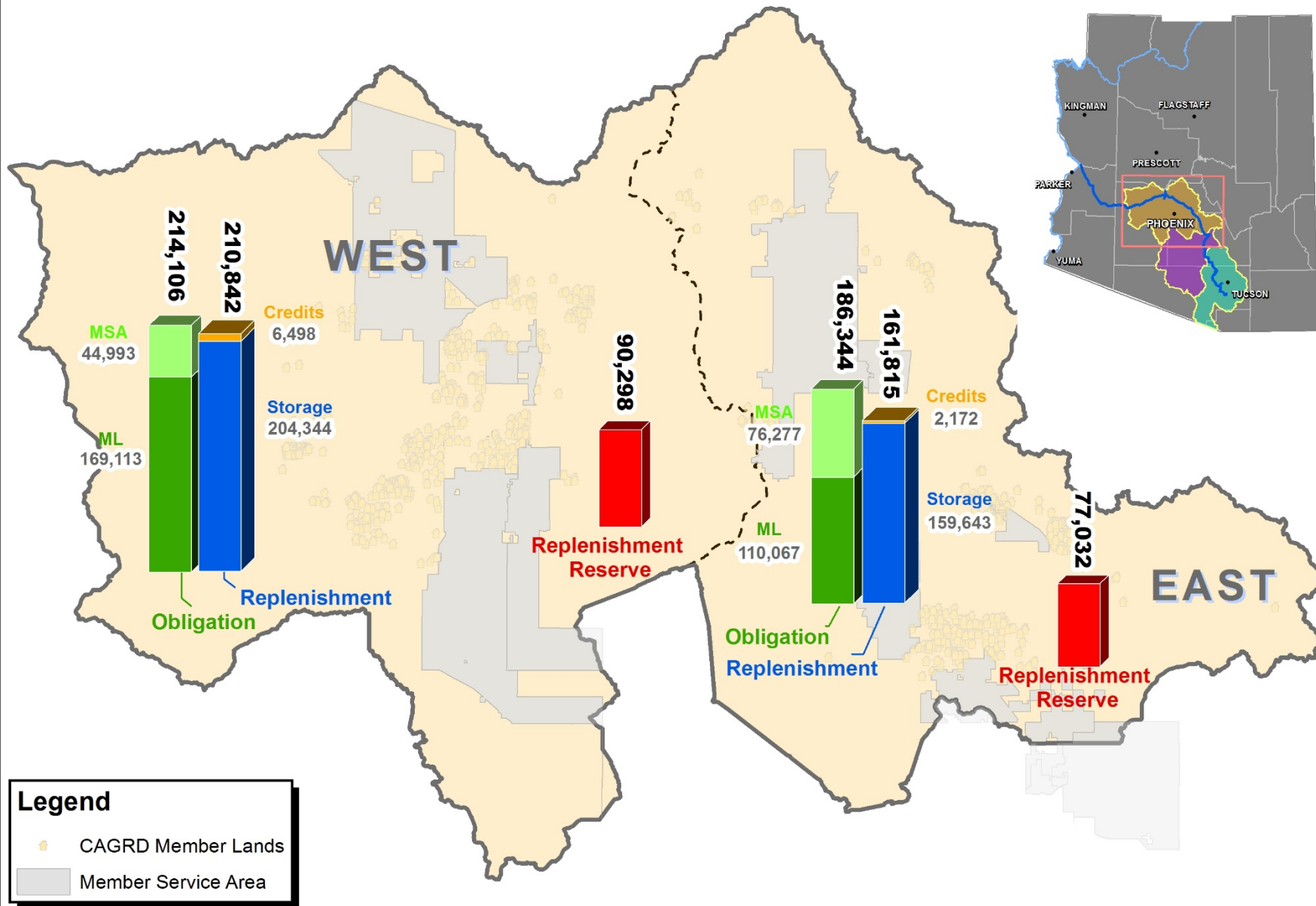
- Mainly recharge water supplies to develop & extinguish long-term storage credits (LTSCs) to replace members' pumping
- CAGRD replenishment methods may include:
 - Direct Recharge at Underground Storage Facilities
 - Managed Recharge at Underground Storage Facilities
 - In-lieu Recharge at Groundwater Savings Facilities
 - LTSC Exchanges
 - Use of purchased LTSCs (extinguishment of credits)

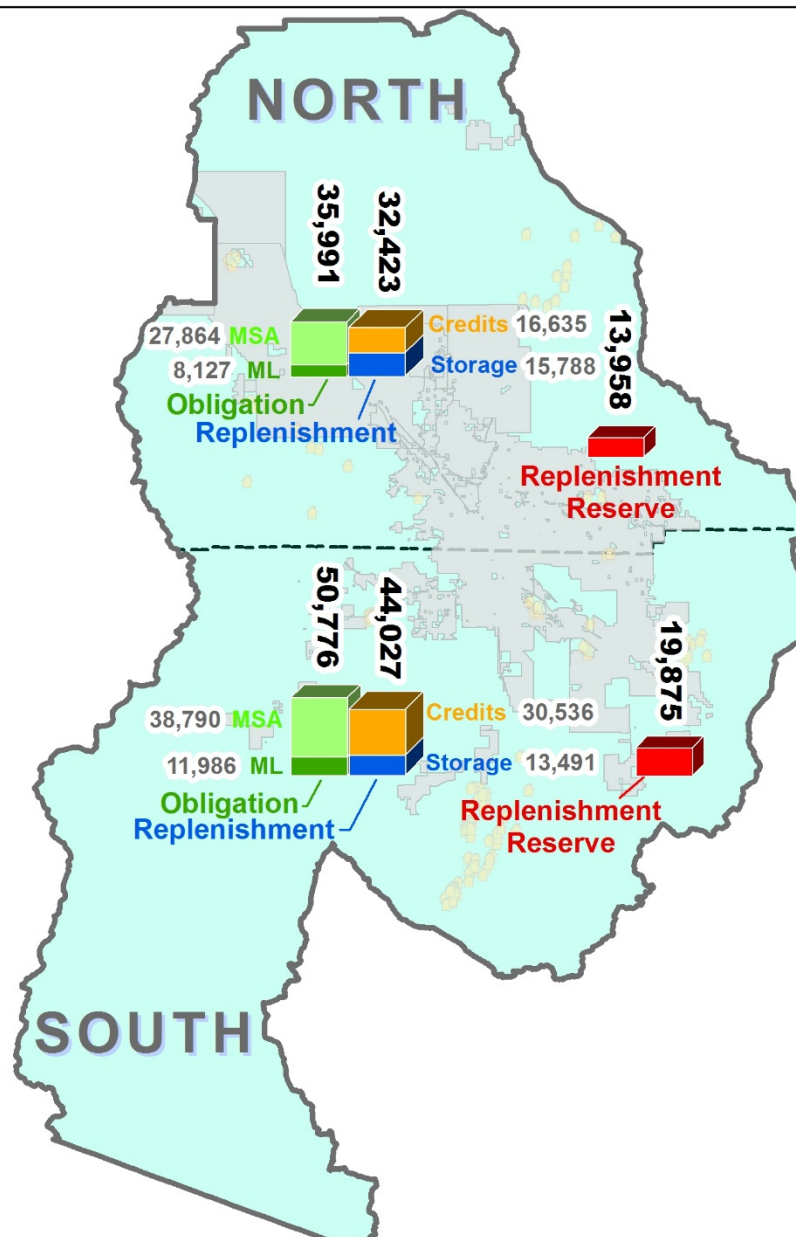


2017 CAGRD Water Supply Portfolio

Supply Class	Annual Volume (Acre-feet/Year, 100 years)	Year Available	Term
CAP Subcontract 1	8,311	At Present	Permanent
CAP Long-term Lease	2,500	2018	100 year lease
CAP Subcontract 2	18,185	2018-2019	Permanent
Long-term Credits	6,770	At Present	100 year (annualized)
Effluent	2,400	2017	100 year lease
Total	38,166		

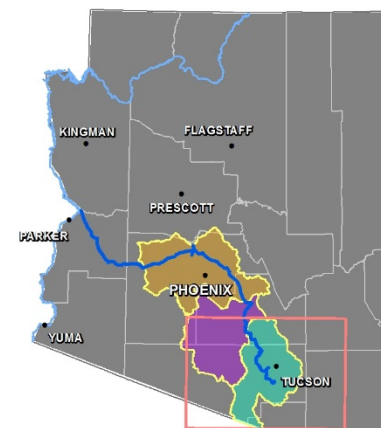






Legend

- CAGRD Member Lands
- Member Service Area

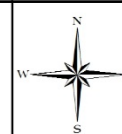


TUCSON AMA

Obligation and Replenishment Activity

1996 through 2016

SCALE

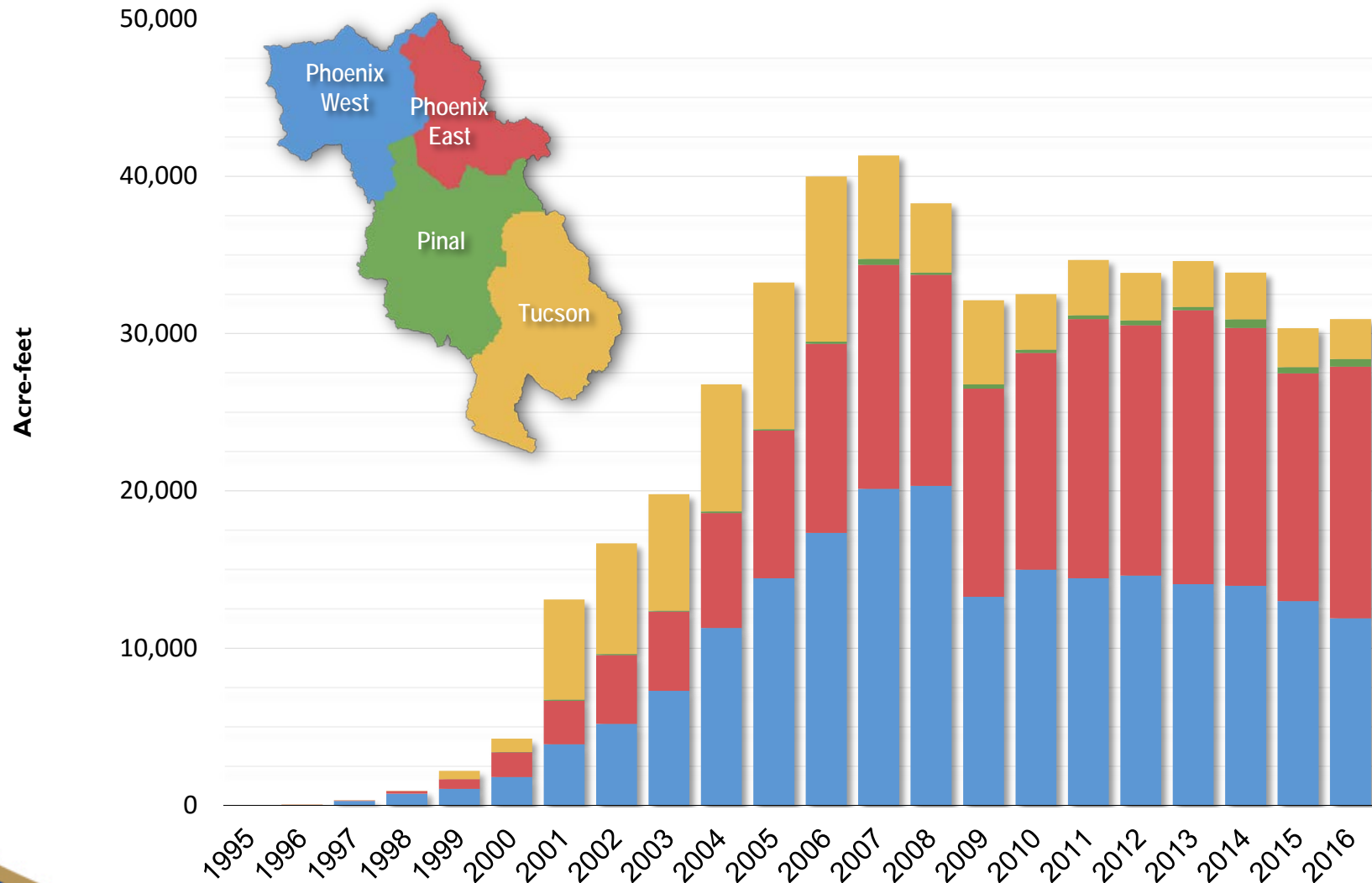


Date: MARCH 2016
 Location: X:\GARD Maps\Plan_of_Operations
 Projection: NAD 83, HARN, AZ State Plane,
 Central Zone, Intl. Feet

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Historic Replenishment Obligation (AF)



2015 CAGRD Plan of Operation

Estimated 100-Year Replenishment Obligation for Current and Future (through 2024) Members (AF)

ACTIVE MANAGEMENT AREA	2015	2020	2025	2030	2034	2114
Phoenix AMA	34,300	37,700	53,300	62,500	68,600	84,200
Pinal AMA	800	1,500	3,500	4,900	5,600	15,500
Tucson AMA	3,300	5,600	9,900	12,000	12,700	13,300
TOTAL	38,400	44,800	66,700	79,400	86,900	113,000

Opportunities

- Replenishment occurs after excess groundwater is pumped and delivered to members
 - No direct delivery by CAGRD
 - 3-year window in which to replenish
 - Ability to seek short term, even unreliable supplies, which reduces competition for supplies among other municipalities/water providers.
- Flexibility with accrual and use of LTSCs
- Partnership opportunities to help members put their supply to use if they cannot
 - CAP Municipal & Industrial subcontract
 - Effluent

Challenges

- Water Supply Acquisition
 - Costs, complexity, and competition
 - Colorado River transfer approvals
- Managing supply portfolio and meeting replenishment obligations during long-term shortages
- Location of Replenishment Versus Pumping
 - Concerns about local areas of aquifer drawdown have generated an interest in re-examining the State's recharge, recovery and replenishment regulations



➤ **It's Complicated!**

Questions?

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CENTRAL ARIZONA PROJECT