



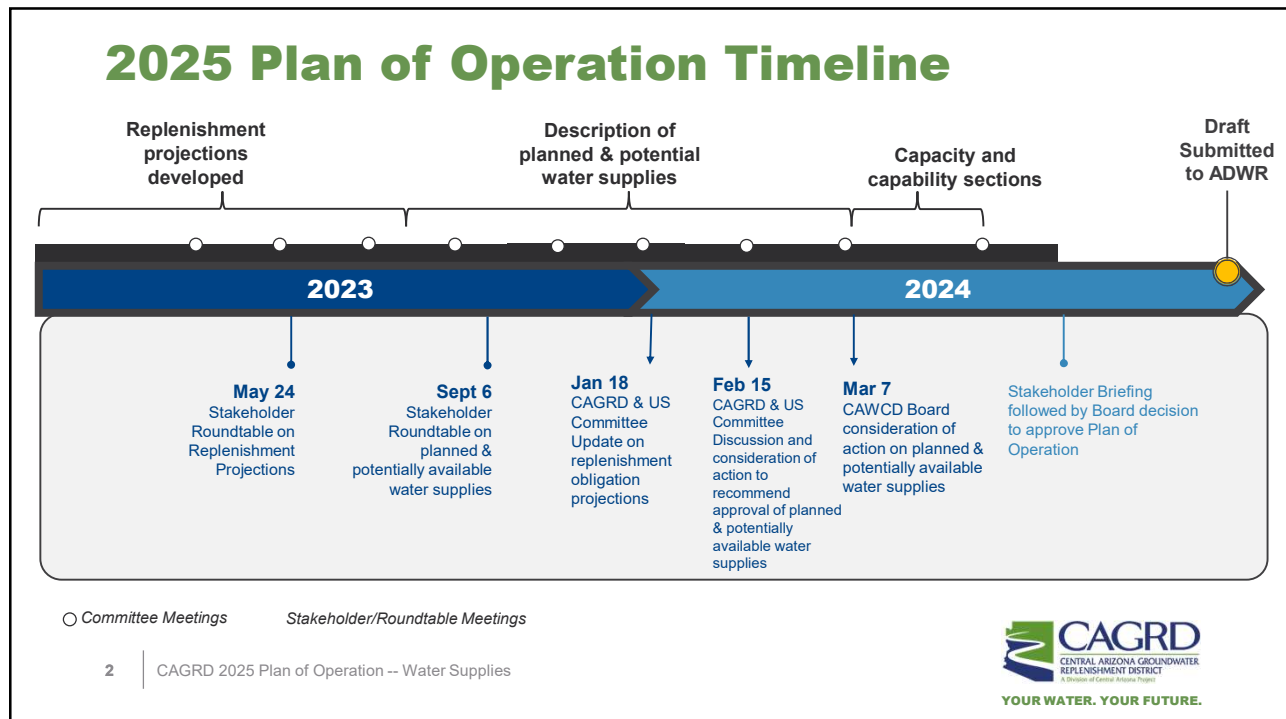
CAGRD
CENTRAL ARIZONA GROUNDWATER
REPLENISHMENT DISTRICT
A Division of Central Arizona Project

Discussion and Consideration of Action to Recommend the Board Approve Planned and Potentially Available Water Supplies for the CAGRD 2025 Plan of Operation

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CAGRD & Underground Storage Committee
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1



2

Statutory Requirements for Water Supply Plan

A.R.S. § 45-576.02.C.2 (c) - CAGRD Water Supply Plan:

A description of the water resources that CAGRD **plans to use** for replenishment purposes during the 20 years following submission of the Plan; and water resources **potentially available** to CAGRD for replenishment purposes during the subsequent 80 years.

3

CAGRD 2025 Plan of Operation - Water Supplies



3

Supplies CAGRD Plans to Use (2025-2044)

4

CAGRD 2025 Plan of Operation Water Supplies Roundtable



4

Supplies CAGRD Plans to Use (2025 – 2044)



5 | CAGRD 2025 Plan of Operation - Water Supplies



5

Supplies CAGRD Plans to Use (2025 – 2044)

Current CAGRD Water Supply Portfolio

Water Supply	Annual Volume (AF/YR)	First Year Availability	Term of Acquisition
CAP M&I	6,426	2006	Permanent contract ¹
CAP Tribal (GRIC Exchange)	15,000	2020	Leased through 2044 ¹
CAP NIA (White Mtn. Apache)	2,500	2027 ²	Annual Lease Volume ³
CAP NIA (Reallocation)	18,185	2022	Permanent contract ³
CAP NIA (GRIC Lease)	18,185	2020	Leased through 2044 ³
Long-Term Storage Credits	14,445 ⁴	2022	100 year
Effluent	2,400	2017	100-year lease
TOTAL	77,141		

¹ Potential reductions under a T2b and/or T3 shortages

² Estimated availability; awaiting final authorization; subject to shortage reduction

³ Subject to shortage reduction under T1 or greater

⁴ Total LTSCs annualized over 100 years; however, a volume greater than the 100-year amount could be used in a year if needed

6 | CAGRD 2025 Plan of Operation - Water Supplies

6

Replenishment Obligation Estimates

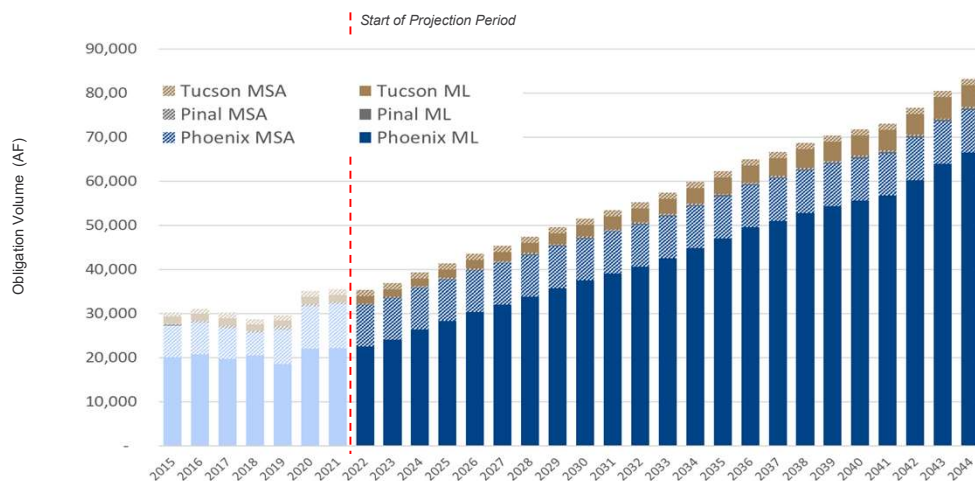
		20-Year Forecast (AF/YR)	100-Year Forecast (AF/YR)
Member Lands	Currently Enrolled	56 KAF	63 KAF
	New Enrollment	15 KAF	13 KAF
Member Service Areas		12 KAF	15 KAF
TOTAL		83 KAF	91 KAF

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7

Obligation by AMA and Member Type



8 | CAGRD 2025 Plan of Operation - Water Supplies

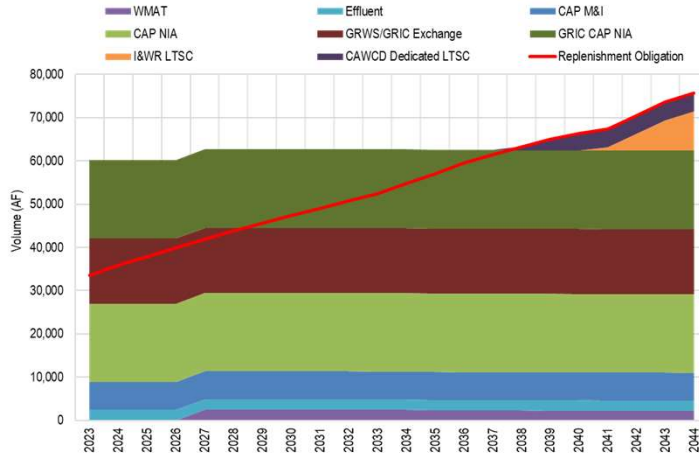


8

Phoenix AMA Current Portfolio

Full Availability of CAP Long-Term Contracts

- Assumes full availability of CAP Long-Term Contracts
- Using the current 2025 Plan of Operation obligation forecast
- Assumes no need for AWBA firming through 2044
- Supplies available beyond annual obligation earn additional LTSCs



9 | CAGRD 2025 Plan of Operation - Water Supplies



9

Portfolio Resiliency Test

- Current portfolio of supplies (>77 KAF/Y) are more than sufficient to meet projected obligation in non-shortage years through the 20-year Plan period
- Because CAGRD's portfolio relies heavily on CAP supplies subject to shortage reductions, CAGRD tested the resiliency of its portfolio by analyzing how a prolonged shortage, consistent with a current Tier 3, would impact CAGRD's ability to meet its projected obligation for existing and current members in the Phoenix AMA through the 20-year forecast period.
- Post-2026 Guidelines could increase shortage reductions, however; at this time, it is unknown what those increased volumes will be and how those will impact CAGRD's portfolio.

10 | CAGRD 2025 Plan of Operation - Water Supplies

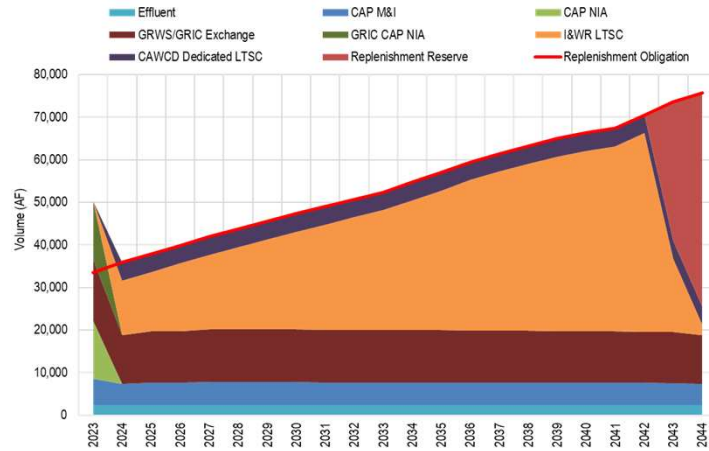


10

Phoenix AMA Current Portfolio

Extended CAP Shortage and No New Supplies Acquired

- Reductions consistent with Tier 3 2024-2044
- No new supplies are acquired after 2023
- CAGRDLTSCs are used annually to meet Replenishment Obligations
- CAWCD dedicated LTSCs are purchased and used to meet a portion of obligation and to meet Replenishment Reserve target
- Replenishment Reserve LTSCs are used beginning in 2043



10

CAGRDL 2025 Plan of Operation - Water Supplies

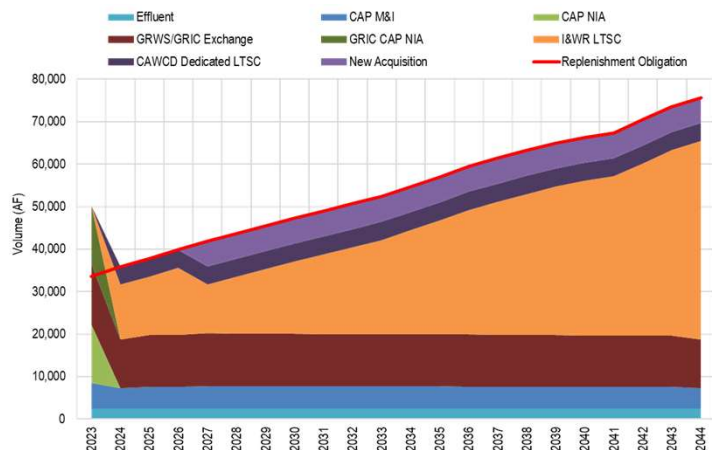


11

Phoenix AMA Current Portfolio

Extended CAP Shortage plus Modest Size Acquisition

- Reductions consistent with Tier 3 2024-2044
- CAWCD dedicated LTSCs are purchased and used to meet a portion of obligation and to meet Replenishment Reserve target
- Modest size supply acquisition: available beginning in 2027 through 2044
- Replenishment Reserve LTSC use pushed out past 2045



11

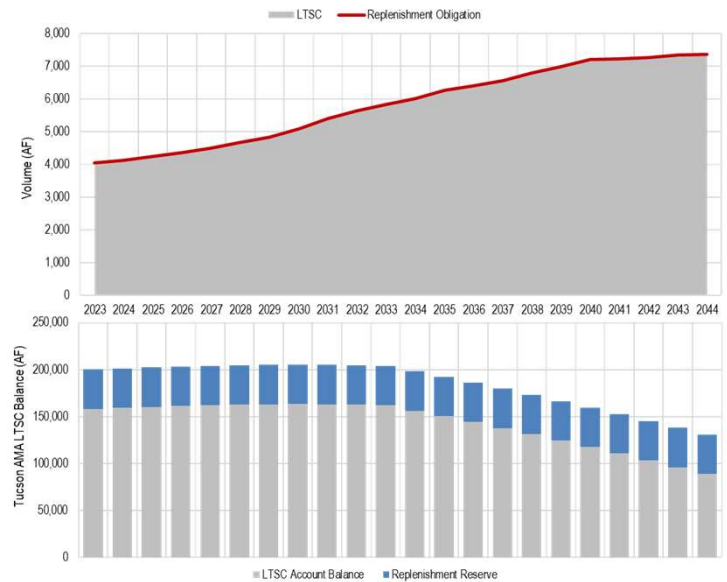
CAGRDL 2025 Plan of Operation - Water Supplies



12

Tucson AMA Supplies and Obligations

- 2022 Tucson AMA LTSC Account Balance: 157,197 AF
- Metropolitan Domestic Water Improvement District LTSC: 250 AF/year through 2041
- City of Tucson LTSC: 5,000 AF/year through 2033
- Replenishment Reserve Balance: 41,929 AF (current balance); RR not relied on through 2044



12 | CAGRD 2025 Plan of Operation - Water Supplies

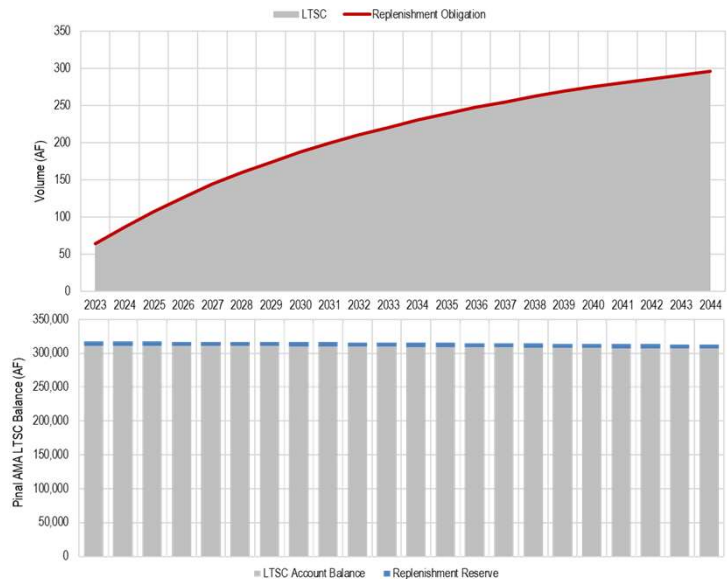
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13

Pinal AMA Supplies and Obligations

- 2022 Pinal AMA CAWCD Dedicated LTSC Balance 311,386 AF
 - Replenishment Obligation met with CAWCD Dedicated LTSC through 2044
- Replenishment Reserve Balance: 6,073 AF (current balance); RR not relied on through 2044



13 | CAGRD 2025 Plan of Operation - Water Supplies

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14

Summary– Supplies CAGRD Plans to Use

- CAGRD's current water supply portfolio is just over 77,000 AF/YR
- With full availability of CAP long-term contracts, current CAGRD supplies are more than sufficient to meet current and new member replenishment projected in the first 20 years
- Under extended reductions consistent with a Tier 3 shortage and no additional supply acquisitions, CAGRD supplies are sufficient to meet projected replenishment obligations in first 20 years but would rely heavily on CAGRD's LTSCs, CAWCD dedicated credits and some Replenishment Reserve credits in the Phoenix AMA
- CAGRD could still meet replenishment obligations under a shortage deeper than a Tier 3 in the Phoenix AMA for some time, but the severity and length of shortage would determine how long CAGRD's Replenishment Reserve would be relied upon

Subsequent 80-Year Potentially Available Supplies (2045-2124)

Statutory Requirements for Water Supply Plan

A.R.S. § 45-576.02.C.2 (c) - CAGRD Water Supply Plan:

A description of the water resources that CAGRD **plans to use** for replenishment purposes during the 20 years following submission of the Plan; and water resources **potentially available** to CAGRD for replenishment purposes during the subsequent 80 years.

17

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17

Potential Supply Evaluation

“With respect to the requirement that CAGRD identify supplies sufficient to meet its obligations for both current and potential members in the 100 years following submission of the Plan, CAGRD is entitled to rely upon not only supplies which are currently likely to be available for acquisition, but also supplies which *potentially* will be available for acquisition in the future.” ***ADWR Decision & Order approving the 2015 Plan of Operation. (August 5, 2015)***

“CAGRD is not required to provide an analysis in the Plan of who might be willing to sell (water supplies)...” ***ADWR Decision & Order approving the 2015 Plan of Operation. (August 5, 2015)***

18

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18

Potential Supply Evaluation Process

WestWater Research is assisting CAGRDR with planning and development activities related to the 2025 Plan of Operation. In particular, WestWater utilized its knowledge of water supplies in Central Arizona to identify and analyze long-term potentially available water resources for inclusion in the Plan. The process of identifying and evaluating the supplies included the following steps:

- **Step 1** – Determine total existing volume within each described supply class (i.e., CAP, Effluent, LTSCs, etc.);
- **Step 2** – Systematically remove those supplies that are clearly known to be unavailable (i.e., committed to a Designation or Certificate of assured water supply, contractually committed to another use, etc.);
- **Step 3** – Apply professional knowledge of planned future uses of supplies and make planning assumptions about reasonable future uses of remaining amounts;
- **Step 4** – Summarize maximum volumes of each supply class that could potentially be available for acquisition in some manner (high estimate of volume potentially available) and reduce that volume by a reasonable percentage or assumption to produce a range of potentially available supply.

Potentially Available Supplies (2045 – 2124)

Supply Category	Supply Location	Potentially Available Low (AF/YR/100 YRS)	Potentially Available High (AF/YR/100 YRS)
Long-Term Storage Credits	Phoenix AMA, Pinal AMA, Tucson AMA	14,196	49,667
Effluent	Phoenix AMA, Pinal AMA, Tucson AMA	43,238	131,024
Central Arizona Project	Phoenix AMA, Pinal AMA, Tucson AMA	144,750	289,499
Colorado River	Arizona Entitlements Excluding CAP Supplies	99,742	199,484
Imported Groundwater	Harquahala, Butler, McMullen Valleys	78,537	157,074
Desalinated Water	In-State, Binational Study	30,000	100,000
New Verde River Supply	Phoenix AMA	0	12,850
Subtotal		410,463	939,598

Summary

- Current portfolio is sufficient to meet 20-year obligations for current and new members even under a prolonged CAP shortage.
- Description of “plans to use” and “potentially available for use” supplies are sufficient to meet statutory Plan of Operation requirements.
- Due to hydrologic uncertainty on the Colorado River, CAGRD plans to continue to acquire new supplies to meet long-term obligations, extend the longevity of LTSCs, and maintain operational and supply source flexibility.
 - Supply categories potentially available to CAGRD include LTSC, effluent/recycled water, CAP, Colorado River, imported groundwater, desalinated water, and/or Verde River water from modified Bartlett Dam
 - Tighter Colorado River availability & increased competition for potentially available supplies
- Volume of new supplies contemplated by CAGRD for acquisition is a small portion of total potentially available water supplies.

Questions

Long-Term Storage Credits (LTSCs)

- Total Current Supply: 135,817 AF/YR**

- LTSC Balance for all Accounts Holders in the Phoenix, Pinal and Tucson AMAs (through 2021)

- High Volume Assumptions:**

- Not owned by CAWCD, CAGRD, AWBA
 - Not pledged to Assured Water Supply
 - Not under contract to be sold

- Low Volume Assumptions:**

- 50% reduction to High
 - Not owned by CAP M&I subcontractors

Potentially Available Supply (2045-2124)

AMA	Low Volume (AF/YR)	High Volume (AF/YR)
Phoenix	7,595	30,798
Pinal	4,429	9,549
Tucson	2,172	9,320
All AMAs	14,196	49,667

Effluent/Recycled Water

- Total Current Supply: 407,748 AF/YR**

- Total annual effluent production including reuse, recharge, and discharge by AMA:
 - Phoenix: 334,686 AF
 - Pinal: 11,479 AF
 - Tucson: 61,583 AF

- High Volume Assumptions:**

- Currently discharged/unused effluent, escalated based on the State's population growth projections for each county

- Low Volume Assumptions:**

- 66% reduction to High

Potentially Available Supply (2045-2124)

AMA	Low Volume (AF/YR)	High Volume (AF/YR)
Phoenix	34,502	104,551
Pinal	1,989	6,026
Tucson	6,805	20,620
All AMAs	43,295	131,197

CAP Supplies

- Potentially available CAP supplies could include:
 - Indian priority CAP supplies not currently utilized as part of a long-term commitment, i.e., supplies currently being used to develop LTSCs, utilized in short-term leases, or enrolled in short-term conservation programs
 - These volumes reduced by 50% to account for increased long-term commitments by 2044
 - Remaining unallocated NIA water (M&I) and other Indian NIA supplies not committed to long-term uses
- Acknowledge uncertainty of future CAP supplies prior to guidelines being developed for post-2026

25 | CAGRD 2025 Plan of Operation - Water Supplies



25

CAP Supplies (continued)

Total Current Entitlements: 1,295,935 AF/YR

- Entitlements total allocated
 - CAP Indian (includes P3) – 429,624 AF
 - M&I – 620,678 AF
 - NIA – 245,633

Potentially available CAP supplies could include:

- Indian priority and CAP NIA supplies as described on previous slide
- Low Volume Assumptions:
 - 50% reduction to High

Potentially Available Supplies (2045-2124)

Priority	Low Volume (AF/YR)	High Volume (AF/YR)
Indian	44,467	88,934
NIA	100,283	200,565
Total	144,750	289,499

26 | CAGRD 2025 Plan of Operation - Water Supplies



26

Colorado River Supplies

- P1-4 average consumptive use during the past 5 years (2018 – 2022) for irrigation* = 997,421 AF
- Potentially available Colorado River Supplies could include:
 - Assuming a 10% to 20% reduction in consumptive use over the next 100 years would produce between 99,742 AF and 199,484 AF that could potentially be available.

* Does not include On-River M&I water

27 | CAGRD 2025 Plan of Operation - Water Supplies



27

Imported Groundwater

- **Total Current Supply: 168,000 AF/YR for 100 years**

- Total **estimated** current supply available from “outside AMA” groundwater basin
- Authorized by Arizona Revised Statute to transport groundwater supplies into the Phoenix, Pinal, and Tucson AMAs

- High Volume Assumptions:

- Subtract Harquahala Valley Water Project volumes sold to Queen Creek and Buckeye

- Low Volume Assumptions:

- 50% reduction to High

Potentially Available Supply (2045-2124)

Source	Total Current Supply (AF/YR)	Low Volume (AF/YR)	High Volume (AF/YR)
Butler	65,000	32,500	65,000
McMullen	38,000	19,000	38,000
Harquahala Valley Water Project	65,000	27,037	54,074
All Sources	168,000	78,537	157,074

28 | CAGRD 2025 Plan of Operation - Water Supplies



28

Desalinated Water

- Timing, quantity, and feasibility of desalination projects are currently unknown.
- Assuming up to 100,000 AF/YR for 100 years could be developed from potential supply sources including in-state brackish water and/or Sea of Cortez¹ Binational desalination efforts.
- The low estimate of 30,000 AF/YR represents a reasonable amount that could potentially be pursued as a future supply for CAGRD.

¹ Binational Study of Water Opportunities in the Sea of Cortez – Minute 323 Executive Summary April 2020

29 | CAGRD 2025 Plan of Operation - Water Supplies

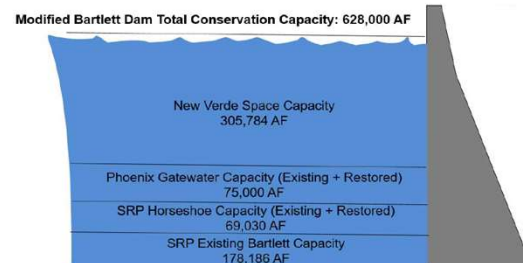


29

New Verde River Supply

- Proposed Bartlett Dam Modification Project would create nearly 328,000 AF of additional storage capacity that could result in a new water supply for Central Arizona.
- CAGRD is a local non-federal cost-share partner on the current Feasibility Study evaluating options for modification of Bartlett Dam.
- Potential for CAGRD allocation of new water supply from Verde River.
- Many CAGRD members also participating who could use new water supply to offset replenishment obligations.
- The local non-federal cost-share partners have established a maximum capacity allocation for participants of 45,000 AF, which translates to a maximum yield allocation of 12,850 AF (using modeled reliability estimates).

Conceptual Modified Bartlett Dam Facility



30 | CAGRD 2025 Plan of Operation - Water Supplies



30