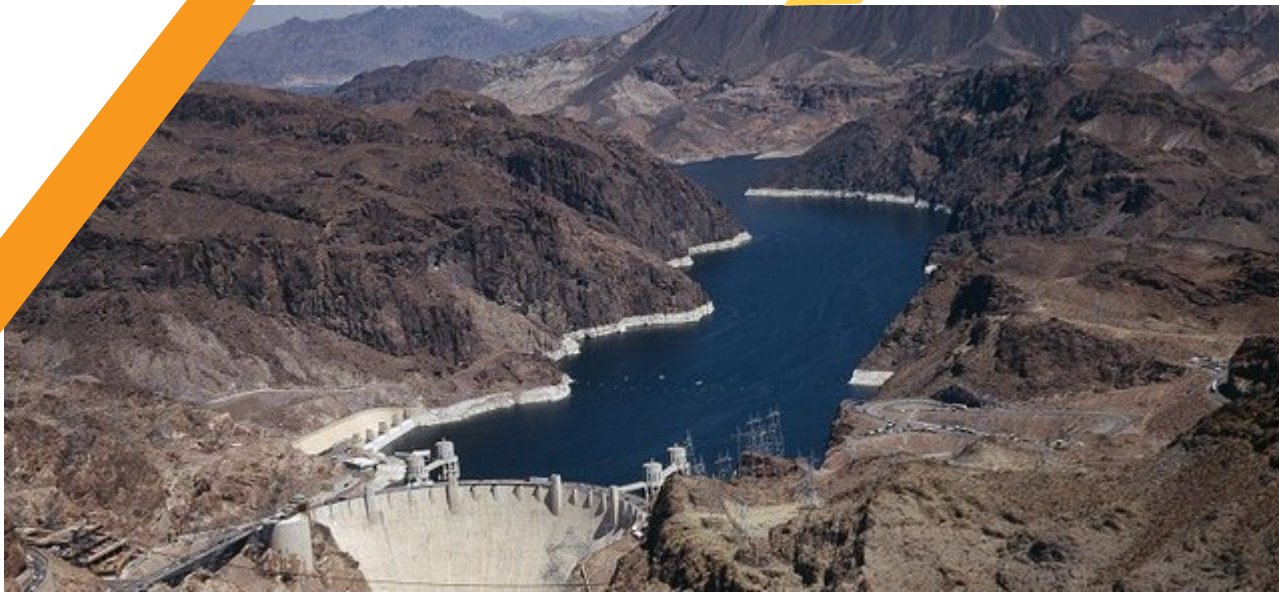


ARIZONA WATER BANKING AUTHORITY

ANNUAL REPORT 2022



Submitted
July 1, 2023



Arizona Water Banking Authority

1110 W. Washington Street, Suite 310
Phoenix, Arizona 85007
Telephone 602-771-8487



July 1, 2023

The Honorable Katie M. Hobbs
Governor, State of Arizona
1700 West Washington Street
Phoenix, Arizona 85007

AUTHORITY MEMBERS
Thomas Buschatzke, Chair
Mark Clark, Vice Chair
Eric Braun, Secretary
Joseph Olsen
Mark Taylor

EX OFFICIO MEMBERS
Honorable Sine Kerr
Honorable Austin Smith

Dear Governor Hobbs:

Enclosed is the Annual Report of the Arizona Water Banking Authority (AWBA). The Annual Report details the AWBA's activities for calendar year 2022 and the progress made on achieving its goals and obligations including commitments made in support of Arizona's plan for implementing the Lower Basin Drought Contingency Plan. The report also includes a Ten-Year Plan that examines the AWBA's ability to meet its statutory responsibilities over the next decade.

A primary objective of the AWBA is to store excess Central Arizona Project (CAP) water underground in central and southern Arizona and to make that water available to municipal and industrial Colorado River water users and certain Arizona Indian Tribes during times of shortage (i.e., firming). In 2022, there was no excess CAP water available to the AWBA for storage as these supplies were used to assist in meeting Arizona's requirement to contribute 512,000 acre-feet to Lake Mead under a Tier 1 condition. In addition, under Tier 1 shortage reductions, the AWBA had its first-ever obligation to firm the Gila River Indian Community (6,429 acre-feet) in 2022. To continue to make progress on its firming goals and objectives, the AWBA purchased 13,273 acre-feet of long-term storage credits, as well as 2,540 acre-feet of Intentionally Created Surplus firming credits under its agreement with the Gila River Indian Community, a component of Arizona's Drought Contingency Plan Implementation Plan. Additionally, the AWBA worked cooperatively with ADWR, CAWCD, and stakeholders on agreements to distribute AWBA long-term storage credits directly to CAP municipal and industrial subcontractors for independent water recovery when impacted during a shortage year.

With a Tier 2a shortage declared in the Lower Basin in 2023 and the likelihood of shortages in the coming years, the AWBA is fully prepared to meet its Indian firming obligations; the AWBA has accrued 162,176 acre-feet for this purpose. Likewise, the AWBA is prepared to distribute credits to CAP municipal and industrial subcontractors should shortages on the Colorado River impact them; the AWBA has accrued over 2.3 million acre-feet of long-term storage credits that can be utilized for this purpose.

I am pleased to submit this report detailing the accomplishments of the AWBA. I am confident the AWBA will navigate through these uncertain times and fully embrace its role in Arizona's water future.

Sincerely,

A handwritten signature in black ink, appearing to read "Tom Buschatzke", with a long horizontal flourish extending to the right.

Thomas Buschatzke
Chair

Enclosure: As stated

cc: The Honorable Warren Petersen, President of the Arizona Senate
The Honorable Ben Toma, Speaker of the Arizona House of Representatives

Arizona Water Banking Authority

Annual Report

2022

Honorable Katie M. Hobbs
Governor of Arizona

Members

Thomas Buschatzke
Chair

Mark Clark
Vice-Chair

Eric Braun
Secretary

Mark Taylor, P.E.*
Member

Joseph Olsen, P.E.
Member

Ex officio

Senator Sine Kerr*
Representative Austin Smith*

* Members appointed in February 2023.

TABLE OF CONTENTS

1	Summary	6
2	AWBA Commission Members – Calendar Year 2022	7
3	2022 Activities	8
3.1	Transitioning From Water Storage to Firming	8
3.1.1	Agency Coordination.....	8
3.1.2	Tribal Firming Obligations.....	8
3.1.3	Agreement to Exchange Long-Term Storage Credits	9
3.2	Recovery Planning.....	9
3.3	Adoption of 2023 Plan of Operation.....	10
4	Revenues and Expenditures	11
5	Credit Development	13
5.1	Long-term Storage Credit Purchases	13
5.1.1	Purchases Pursuant to A.R.S. § 45-841.01	13
5.1.2	Other LTSC Purchases	13
5.1.3	Accounting of LTSCs	13
5.2	ICS Firming Credits	14
6	Credit Distribution or Extinguishment	16
7	Ten-Year Plan	18
7.1	Credit Development.....	18
7.1.1	Water Availability.....	18
7.1.2	Storage Capacity	19
7.1.3	Funding	19
7.1.4	Credit Purchases	20
7.2	Credit Distribution or Extinguishment	21
7.2.1	Timing, Magnitude and Likelihood of Firming.....	22
7.2.2	Tribal Firming for the Gila River Indian Community	24
7.2.3	M&I Firming and Recovery Capacity Required.....	24
7.2.4	Agreement to Exchange LTSCs	27
7.2.5	Interstate Storage and Requests for Intentionally Created Unused Apportionment	27
7.2.6	Estimated Use of AWBA Credits.....	28
APPENDIX		30
<i>APPENDIX A</i>		<i>31</i>

LIST OF TABLES

Table 1. Monies Collected, Made Available, and Expended in 2022 by Source of Funds.....	12
Table 2. Cumulative Monies Collected, Made Available, Expended and Remaining Available through 2022	12
Table 3. Number and Location of LTSCs Purchased in 2022 (acre-feet)	14
Table 4. Cumulative LTSCs Accrued through Storage and Purchased through December 2022 (acre-feet)	14
Table 5. Cumulative ICS Firming Credits Accrued.....	15
Table 6. AWBA Credits Available, Use of Credits in 2023 and Estimated Credits Remaining	17
Table 7. Storage Facilities Available to the AWBA	19
Table 8 AWBA Credits Available through 2023 (acre-feet).....	21
Table 9. Projected Lower Basin Supply Conditions	22
Table 10. Estimated AWBA Firming Volumes through 2027.....	23
Table 11. Firming Proposal for the Gila River Indian Community for Shortage Year 2024 – Tier 1	24
Table 12. Estimated Recovery Capacity Needed by Shortage Tier	25
Table 13. Estimated Recovery Capacity Needed by AMA in Tier 3.....	25
Table 14. CAP’s Available Recovery Capacity by AMA.....	26
Table 15. Uses of AWBA Credits Through 2027	29

ACRONYMS AND ABBREVIATIONS

ADWR	Arizona Department of Water Resources
A.R.S.	Arizona Revised Statutes
AF	Acre-feet
AFY	Acre-feet per year
AMA	Active Management Area
APO	Annual Plan of Operation
AWB Fund	Arizona Water Banking Fund
AWBA	Arizona Water Banking Authority
AWSA	Arizona Water Settlements Act of 2004
CAGRDR	Central Arizona Groundwater Replenishment District
CAP	Central Arizona Project
CAWCD	Central Arizona Water Conservation District
Community	Gila River Indian Community
CRMMS-ESP	Colorado River Mid-term Modeling System in Ensemble Mode
CY	Calendar Year
FY	Fiscal Year
GSF	Groundwater Savings Facility
ICS	Intentionally Created Surplus
ICUA	Intentionally Created Unused Apportionment
ID	Irrigation District
IDD	Irrigation and Drainage District
IGA	Intergovernmental Agreement
Implementation Plan	Arizona's Implementation Plan for the LBDCP
JSAM	Joint Shortage Analysis Model
LBDCP	Lower Basin Drought Contingency Plan
LTSC	Long-term storage credit
M&I	Municipal and industrial
MAF	Million acre-feet
MCWA	Mohave County Water Authority
Nation	Tohono O'odham Nation
NIA	Non-Indian agricultural
Reclamation	U.S. Bureau of Reclamation
RPAG	Recovery Planning Advisory Group
SNWA	Southern Nevada Water Authority
USF	Underground Storage Facility

1 SUMMARY

The operation of the Arizona Water Banking Authority (AWBA) continues to evolve. In its initial phase, the AWBA primarily stored excess Central Arizona Project (CAP) water to create long-term storage credits (LTSCs) to mitigate the effects of future Colorado River shortages on municipal and industrial (M&I) water users, provide groundwater management benefits, assist the State in the settlement of Indian water rights claims, and assist both California and Nevada through interstate banking arrangements. In time, what began as opportunities to beneficially utilize the State's full entitlement of Colorado River water grew in certain cases into obligations the AWBA must fulfill. With reductions in excess CAP water supplies and an increased probability of Colorado River shortages, the AWBA is transitioning to its next phase, focusing on making its credits available to mitigate potential shortages.

The AWBA had no excess CAP water supplies available for storage in 2022. As a result, the AWBA continued to make progress on its firming goals and obligations through the purchase of 1) LTSCs and 2) Intentionally Created Surplus (ICS) firming credits. In 2022, the AWBA purchased 13,273 acre-feet of LTSCs: 10,358 acre-feet in the Phoenix Active Management Area (AMA) and 2,915 acre-feet in the Tucson AMA. Cumulatively, the AWBA has accrued or acquired 4.37 million acre-feet (MAF) of LTSCs. Of this amount, 3.76 MAF are for Arizona uses and 0.61 MAF are interstate credits stored on behalf of the State of Nevada. Additionally, in 2022 the AWBA purchased 2,822 acre-feet of ICS firming credits pursuant to its 2019 agreement with the Gila River Indian Community (Community). Cumulatively, the AWBA has purchased 26,320 acre-feet of ICS firming credits.

Tier 1 shortage reductions in 2022 impacted CAP non-Indian agricultural (NIA) pool supplies. As a result, the AWBA had an obligation to firm 6,429 acre-feet for the Community in 2022. In 2023, Tier 2a shortage reductions again impacted CAP non-Indian agricultural (NIA) pool supplies, resulting in an obligation for the AWBA to firm 14,575 acre-feet for the Community. The United States Bureau of Reclamation's (Reclamation) Colorado River water supply projections for April 2023 (CRMMS-ESP) indicate a Tier 1 shortage is most likely to be declared in the Lower Basin in 2024 (93 percent probability) and in 2025 (43 percent probability). These projections also show that a Tier 0 shortage condition could be in effect in 2026 and 2027 (40 and 33 percent probability, respectively). As a result, the AWBA could have a cumulative firming requirement of approximately 19,473 acre-feet over the next four years.

2 AWBA COMMISSION MEMBERS – CALENDAR YEAR 2022

Thomas Buschatzke – Chair
Director of Arizona Department of Water Resources



Joseph Olsen, P.E.
A person knowledgeable in water resource management



Eric Braun
Representing CAP M&I subcontractors



Alexandra Arboleda - Secretary
Representing CAWCD, designated by CAWCD Board President Terry Goddard



Mark Clark – Vice-Chair
Representing mainstream Colorado River contractors



EX-OFFICIO MEMBERS



Senate President Karen Fann



Representative Gail Griffin

3 2022 ACTIVITIES

The AWBA continued its quarterly meeting schedule in 2022 with meetings held on March 23, June 29, September 13, and December 7.

3.1 TRANSITIONING FROM WATER STORAGE TO FIRMING

Calendar Year (CY) 2022 began with the first-ever Tier 1 shortage declaration by the Secretary of the Interior. As a result, Arizona's Colorado River entitlement was reduced by 512,000 acre-feet. This volume included 320,000 acre-feet in reductions under the 2007 operating guidelines¹ and 192,000 acre-feet in additional contributions to Lake Mead under the Lower Basin Drought Contingency Plan (LBDCP). While these reductions did not impact CAP M&I Priority subcontractors or on-River M&I contractors, they did affect CAP NIA Priority water supplies. As a result, the AWBA had its first-ever Tribal firming obligation in 2022. The Tier 1 shortage reduction also triggered the need to provide additional mitigation resources under Arizona's Implementation Plan for the LBDCP (Implementation Plan). As the likelihood of deeper Colorado River shortages advanced throughout the year, AWBA activities concentrated largely on the steps necessary for meeting its future firming responsibilities.

3.1.1 Agency Coordination

AWBA staff participated in various workshops and stakeholder group meetings during the year to plan and prepare for Tier 2a shortage in 2023. These included coordinated efforts with the Arizona Department of Water Resources (ADWR), the Central Arizona Water Conservation District (CAWCD) and Reclamation to inform stakeholders of the impacts of shortage reductions. Discussions included CAP water supply availability, AWBA firming responsibilities, and how mitigation resources identified under the Implementation Plan would be utilized.

3.1.2 Tribal Firming Obligations

The AWBA is the State's agent for meeting the State's requirements under the Arizona Water Settlements Act of 2004 (AWSA), which became effective and fully enforceable in December 2007. The AWSA required that the Secretary of the Interior develop a Tribal Firming Program to ensure that CAP NIA Priority water supplies made available to Tribes under the AWSA are firmed for a 100-year period (through 2107) to the equivalent of CAP M&I supplies. The AWBA has an obligation under the Tribal Firming Program to firm up to 15,000 acre-feet per year for the Community and up to 8,724 acre-feet per year for future settlements. Although certain future settlements have been identified, these settlements are not yet enforceable. These include settlements for the White Mountain Apache Tribe and the Hualapai Tribe. Therefore, the AWBA's Tribal firming obligation in 2023 is limited to the Community.

The AWBA and the Community executed an Intergovernmental Agreement (IGA) for firming June 16, 2015 (2015 IGA). The 2015 IGA identifies several firming methods that may be used to satisfy a firming obligation during a shortage year. The AWBA entered into subsequent agreements to implement or add

¹ Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations for Lake Powell and Lake Mead.

agreed-upon firming methods including an IGA in 2016 for the development of firming credits² and an IGA in 2019 for the development of ICS firming credits.³

Based on CAWCD's final accounting of 2023 water orders, the AWBA's firming volume is 14,575 acre-feet. To satisfy this firming obligation, the AWBA and the Community elected to utilize the same firming method as in 2021 and extinguish an equal volume of firming credits (see Section 7.2.2).

3.1.3 Agreement to Exchange Long-Term Storage Credits

In addition to meeting its Tribal firming obligations, the AWBA also plays an important role in facilitating wet water mitigation under the Implementation Plan. The AWBA entered into an agreement to exchange LTSCs with Phoenix and Tucson AMA CAP M&I Priority subcontractors that agreed to store water at groundwater savings facilities (GSFs) in the Pinal AMA during Tier 1 and Tier 2a shortages between 2020 and 2022.⁴ Under the agreement, the AWBA will exchange its LTSCs accrued in the Phoenix and Tucson AMAs for an equal volume of LTSCs accrued by the storing entities in the Pinal AMA. This allows storing entities the ability to recover and use the water in the AMA where they are located.

The AWBA agreed to exchange up to 43,225 acre-feet of LTSCs per year (from 45,500 acre-feet of storage less 5 percent cut to the aquifer) for the three-year period. However, since 2020 and 2021 were non-shortage years, the exchange only applied to water stored in 2022. All parties to the exchange delivered supplies for storage in accordance with the agreement. Therefore, the AWBA anticipates exchanging LTSCs for the full volume starting in 2023 (see Section 3.1.3). Pursuant to A.R.S. § 45-2457.01(B), the term of the agreement ends December 31, 2026. Therefore, all exchanges must be completed by this date.

3.2 RECOVERY PLANNING

Recovery Planning activities in 2021 continued to focus on a collaborative effort among the AWBA, CAWCD, ADWR, and the Recovery Planning Advisory Group (RPAG) to update the 2014 Joint Recovery Plan⁵ and improve planning level certainty as the potential for Colorado River shortages approaches. The updated recovery plan⁶ was subsequently released in May 2021 ([2021 Recovery Update](#)). It serves as a companion document to the 2014 Joint Recovery Plan and includes updated hydrologic modeling as well as an analysis of the AWBA's firming responsibilities. It also incorporates key recovery concepts developed through the RPAG and summarizes the procedural steps for recovery implementation.

As the designated recovery agent for the AWBA, CAWCD is responsible for the recovery of water stored by the AWBA, both for intrastate firming and interstate banking with Nevada. During RPAG discussions

² Agreement between the AWBA and the Community for the Development of Firming Credits effective June 30, 2016 through December 31, 2018. Firming credits developed under the agreement remain available until utilized to meet a firming obligation.

³ Intergovernmental Agreement between the AWBA and the Gila River Indian Community for the Development of ICS Firming Credits executed May 20, 2019.

⁴ Arizona's Implementation Plan for the: Agreement to Exchange Long-Term Storage Credits between AWBA and the City of Avondale; City of Chandler; City of Goodyear; City of Peoria; City of Phoenix; City of Scottsdale; City of Tucson; Freeport Minerals Corporation; and EPCOR Water Arizona Inc.

⁵ Recovery of Water Stored by the Arizona Water Banking Authority: A Joint Plan by AWBA, ADWR and CAP, dated April 14, 2014 (2014 Joint Recovery Plan).

⁶ 2021 Update: Recovery of Water Stored by the Arizona Water Banking Authority: A Joint Plan by AWBA, ADWR and CAP, dated May 6, 2021.

in 2021, many CAP M&I subcontractors indicated a preference for utilizing their infrastructure, or that of a partner, to recover AWBA LTSCs for firming, particularly in the near-term. This concept, referred to as Independent Recovery, resulted in a statutory amendment to allow for the distribution of AWBA LTSCs directly to subcontractors for this purpose.⁷ It also stipulates that any LTSCs assigned to a subcontractor by the AWBA cannot be sold; and that the subcontractor is responsible for all recovery costs as well as fees assessed by ADWR for the assignment of the LTSCs. Subcontractors that choose to do Independent Recovery will need to enter into a firming agreement with the AWBA. At the September 13, 2022 AWBA Commission Meeting, the AWBA Standard Template Agreements for Firming CAP M&I Subcontractors were approved. By December 2022, the AWBA had received 27 requests to enter into agreement; 16 agreements had been executed; 11 were still in progress. AWBA staff also sent meeting invitations to CAP M&I subcontractors to present and discuss the two firming methods (Independent Recovery and Direct CAP Delivery). AWBA staff continued monthly coordination with ADWR and CAWCD.

The 2021 Recovery Update also includes a new timeline to provide clarity on recovery implementation for CAP M&I firming. It provides a three-year planning horizon for recovery implementation activities, with action triggers tied to Reclamation's April Five-Year Probability Table and April 24-Month Study projections. The timeline is intended to ensure shortage readiness by highlighting critical decision points and deadlines. Reclamation's 2021 August 24-Month Study indicated a shortage affecting CAP M&I subcontractors within three years, resulting in the need to begin recovery planning consultations. The triggers are described in detail under the Ten-Year Plan section of this report.

3.3 ADOPTION OF 2023 PLAN OF OPERATION

The AWBA 2023 Annual Plan of Operation (APO) was adopted on December 7, 2022. With no excess CAP water supplies available to the AWBA, the 2023 APO focuses on LTSC purchases and developing ICS firming credits to make progress on its CAP M&I and Tribal firming goals. The 2023 APO provides for the development of an estimated 44,780 acre-feet of credits at a total estimated cost of \$14 million.

Credit acquisitions are anticipated to occur in the Phoenix and Tucson AMAs. Potential LTSC purchases total 38,650 acre-feet and are estimated to cost \$12.12 million. Funds include carryover of \$11.14 million in funds reserved by CAWCD for LTSC purchases for CAP M&I Firming under its 2021 and 2022 Water Storage Tax Resolutions. These funds include \$3.3 million in Maricopa County funds and \$7.8 million in Pima County funds. These funds are held by CAWCD and deposited in the AWBA's accounts when LTSC purchase agreements are secured. Total available funds also include an estimated \$978,000 in withdrawal fees collected in the Tucson AMA. Additionally, the AWBA anticipates developing 6,134 acre-feet of ICS firming credits for approximately \$1.83 million using withdrawal fee revenues collected in the Phoenix AMA.

As previously indicated, the Colorado River will operate under a Tier 2a shortage condition in 2023. While this reduction will not impact supplies for CAP M&I subcontractors or on-River M&I contractors, the reductions will result in a Tribal firming requirement of 14,575 acre-feet. The AWBA's APO identifies the use of firming credits for this purpose.

⁷ A.R.S. § 45-2457(B)(7) as amended by Senate Bill 1147.

4 REVENUES AND EXPENDITURES

Arizona Revised Statutes (A.R.S.) § 45-2425 describes the various sources of monies for the Arizona Water Banking (AWB) Fund. The AWB Fund is administered by the AWBA. In 2022, the AWBA obtained its funding from the following sources:

1. Fees for groundwater pumping, known as withdrawal fees, are collected within the Phoenix, Pinal and Tucson AMAs and charged for water banking purposes at \$2.50 per acre-foot in the Phoenix and Tucson AMAs and up to \$2.50 per acre-foot in the Pinal AMA. Withdrawal fees can be used by the AWBA for water management purposes, Tribal firming, and CAP M&I firming. LTSCs accrued with these funds must be used to benefit the AMA in which the monies were collected.

The Arizona Legislature authorized the use of approximately \$1.4 million in the AWB Fund to support both ADWR (\$1.2 million) and the Arizona Navigable Stream Adjudication Commission (\$200,000) for fiscal year 2022.⁸ Any unused monies are subsequently redistributed to the AWBA. Additionally, as a component of the Drought Contingency Plan, fees levied in the Pinal AMA during calendar years 2020 through 2026 will not be made available to the AWBA but will be used instead to support groundwater infrastructure and irrigation efficiency projects in the Pinal AMA.⁹

2. As in previous years, the CAWCD Board resolved to retain the water storage taxes levied and collected for the 2021-2022 tax year and to use the funds for meeting operating, maintenance and replacement, and/or repayment costs of the CAP, which includes water storage by the AWBA. The CAWCD Board also reserved \$7 million in water storage tax revenues to support AWBA purchases of LTSCs for CAP M&I Priority firming. The AWBA had approximately \$8.13 million remaining available from the previous year bringing the total available to \$15.13 million. The AWBA utilized \$3.98 million in 2022 for this purpose leaving approximately \$11.15 for potential purchases in subsequent years. Therefore, the AWBA did not request that the CAWCD Board reserve additional funds under its resolution for fiscal year 2023, adopted in June 2022. LTSCs accrued using water storage tax funds must be used to benefit the county in which the funds were collected.
3. The AWBA did not receive a general fund appropriation in 2022.

Table 1 shows the monies the AWBA collected, monies made available by CAWCD and the monies expended in 2022 by source of funds. **Table 2** shows the total monies received, expended and remaining through December 2022 by source of funds. Remaining funds are committed to activities identified in the APO adopted for the current year. Details of the AWBA's expenditures for acquiring firming water resources are described in Section 5.

⁸ The State Budget for fiscal year (FY) 2023 (adopted on June 22, 2022) no longer authorizes the use of \$1.2 million by ADWR in water banking funds.

⁹ A.R.S. § 45-611(C)(3), § 45-611(C)(5), § 45-613(D) and § 45-615.01

Table 1. Monies Collected, Made Available, and Expended in 2022 by Source of Funds

Source of Funds	Carryover	Collected/Made Available	Expended
General Fund	\$0	\$0	\$0
State Tribal FIRMing Appropriation	\$0	\$0	\$0
Interstate Water Banking¹	\$24,231	\$354	\$0
Water Storage Tax			
Maricopa County	\$0	\$3,107,370	\$3,107,370
Pinal County	\$0	\$0	\$0
Pima County	\$136,496	\$737,986	\$874,482
Subtotal	\$136,496	\$3,845,356	\$3,981,852
Groundwater Withdrawal Fees			
Phoenix AMA	\$226,386	\$885,991	\$718,877
Pinal AMA	\$18,546	\$1,050	\$19,358
Tucson AMA	\$262,701	\$161,943	\$0
Subtotal	\$507,632	\$1,048,984	\$738,235
TOTAL²	\$668,359	\$4,894,694	\$4,720,087

¹ Includes \$314 in interest for 2021 and Lehman Brothers bankruptcy distribution of \$40.

² Totals may not sum due to rounding.

Table 2. Cumulative Monies Collected, Made Available, Expended and Remaining Available through 2022

Source of Funds	Collected/Made Available	Expended	Remaining ¹
General Fund	\$11,100,865	\$11,100,865	\$0
State Tribal FIRMing Appropriation	\$2,578,389	\$2,578,389	\$0
In-Lieu Fund - Mohave County Water Authority Pre-payments	\$5,123,480	\$5,123,480	\$0
Interstate Water Banking - Nevada²	\$112,409,515	\$112,384,930	\$24,585
Shortage Reparations - Nevada	\$8,001,948	\$8,001,948	\$0
Water Storage Tax³			
Maricopa County	\$147,086,691	\$147,086,691	\$0
Pinal County	\$16,585,741	\$16,585,741	\$0
Pima County	\$66,001,209	\$66,001,209	\$0
Subtotal	\$229,673,641	\$229,673,641	\$0
Groundwater Withdrawal Fees			
Phoenix AMA	\$36,314,836	\$35,921,337	\$393,500
Pinal AMA	\$26,079,999	\$26,079,762	\$237
Tucson AMA	\$11,199,536	\$10,774,892	\$424,644
Subtotal	\$73,594,371	\$72,775,991	\$818,381
TOTAL⁴	\$442,482,209	\$441,639,243	\$842,966

¹ Remaining funds include monies committed for the 2022 AOP.

² Pursuant to the Third Amended Agreement, remaining funds are non-reconcilable for interstate purposes. They include accrued interest and recovered Lehman Brothers bankruptcy monies and are subject to legislative authorization prior to use by the AWBA.

³ Monies collected by CAWCD made available to AWBA through direct deposit into the AWB Fund or as an expenditure by CAWCD to offset AWBA delivery and storage costs as part of CAP operation and maintenance costs.

⁴ Totals may not sum due to rounding.

5 CREDIT DEVELOPMENT

The AWBA's APO for 2022 did not include storage of excess CAP water since these supplies were conserved in Lake Mead to assist in meeting Arizona's requirement to contribute 512,000 acre-feet to Lake Mead under a Tier 1 shortage condition. As a result, the AWBA relied on other options to develop credits including the acquisition of LTSCs through purchase agreements and payment of ICS developed in Lake Mead as part of the LBDCP.

5.1 LONG-TERM STORAGE CREDIT PURCHASES

The AWBA purchased LTSCs in the Phoenix and Tucson AMAs totaling 13,273 acre-feet at a cost of \$3.98 million. This amount is less than the target volume of 25,710 acre-feet identified in the AWBA's 2022 APO. While fewer LTSCs were purchased in 2022, unspent funds, including water storage tax funds reserved for this purpose, remain available for AWBA LTSC purchases in subsequent years.

5.1.1 Purchases Pursuant to A.R.S. § 45-841.01

The Tohono O'odham Nation (Nation) must offer the AWBA 10 percent of any LTSCs deemed accruable from water stored at the Mission Mine Complex before ADWR can issue a final volume of LTSCs to the Nation.¹⁰ The price for each LTSC is equal to the AWBA's per acre-foot cost to deliver and store water at a state demonstration project located within 10 miles of the Nation's storage (i.e. Pima Mine Road Recharge Project) at the time of storage. These LTSCs may be used by the AWBA for M&I firming or for water management purposes. However, there is a restriction that they cannot be recovered within five miles of the exterior boundary of the reservation. The Nation has not yet offered LTSCs accrued in 2022 for purchase because the 2022 credits have not been certified yet.

5.1.2 Other LTSC Purchases

The AWBA purchased 13,273 acre-feet of LTSCs from the Ak-Chin Indian Community: 10,358 acre-feet in the Phoenix AMA and 2,915 acre-feet in the Tucson AMA. The LTSCs were purchased for CAP M&I firming purposes using \$3.11 million in Maricopa County water storage tax funds and \$874,482 in Pima County water storage tax funds, respectively.

The AWBA's cumulative LTSC purchases and expenditures are identified in *APPENDIX A*.

5.1.3 Accounting of LTSCs

The AWBA has a statutory requirement¹¹ to account for all LTSCs accrued by the funding sources used to develop the credits. The number and location of LTSCs for 2022, which were limited to purchase acquisitions, are identified in **Table 3**. Cumulative LTSCs accrued through storage or purchased by the AWBA through December 2022 are identified in **Table 4**.

¹⁰ A.R.S. § 45-841.01(F)(3)

¹¹ A.R.S. § 45-2457

Table 3. Number and Location of LTSCs Purchased in 2022 (acre-feet)

Funding Source	Phoenix AMA	Pinal AMA	Tucson AMA	Total
Water Storage Tax	10,358	-	2,915	13,273
Withdrawal Fees	-	-	-	-
General Fund	-	-	-	-
Intrastate TOTAL	10,358	-	2,915	13,273
Interstate - Nevada	-	-	-	-
TOTAL	10,358	-	2,915	13,273

Table 4. Cumulative LTSCs Accrued through Storage and Purchased through December 2022 (acre-feet)

Funding Source	Phoenix AMA	Pinal AMA	Tucson AMA	Total
Water Storage Tax	1,582,453	234,791	512,213	2,329,457
Withdrawal Fees	339,724	434,793	112,769	887,286
General Fund ¹	42,316	306,968	54,546	403,830
Other Intrastate:				
Tribal Firming Appropriation	-	-	28,481	28,481
Shortage Reparation	20,642	60,507	28,340	109,489
GSF Operator Full Cost Share	-	14,125	-	14,125
Intrastate TOTAL	1,985,134	1,051,184	736,349	3,772,668
Interstate - Nevada	60,021	440,241 ²	113,584	613,846
TOTAL³	2,045,156	1,491,425	849,933	4,386,514

¹ Includes 256,174 acre-feet of LTSCs reserved for Mohave County Water Authority in the Pinal AMA pursuant to firming agreements dated February 4, 2005 and December 8, 2010.

² Includes 50,000 acre-feet of LTSCs transferred from CAWCD pursuant to Amended Agreement for Interstate Water Banking.

³ Totals may not sum due to rounding.

5.2 ICS FIRING CREDITS

As part of Arizona's Implementation Plan, the AWBA entered into an IGA with the Community to purchase 50,000 acre-feet of firming ICS created by the Community.¹² Due to a one-time ten percent reduction for system and evaporation losses, the 50,000 acre-feet of firming ICS resulted in 45,000 acre-feet of ICS credits, referred to as ICS firming credits under the IGA. These credits will be used to satisfy AWBA firming obligations to the Community after 2026. The AWBA has paid incrementally for the creation of firming ICS, which started at a rate of \$240 per acre-foot in 2019. The rate schedule has an annual escalator of three percent.

¹² IGA between the AWBA and the Community for the Development of ICS Firming Credits executed May 20, 2019.

In 2022, the AWBA purchased 2,822 acre-feet of firming ICS for \$738,235 which resulted in 2,540 acre-feet of ICS firming credits after the 10 percent deduction. Withdrawal fees were used to purchase the firming ICS, which included \$718,877 collected in the Phoenix AMA and \$19,358 collected in the Pinal AMA.¹³ **Table 5** identifies purchases of firming ICS since 2019 and the resulting ICS firming credits.

Table 5. Cumulative ICS Firming Credits Accrued

Year	Cost / acre-foot	Firming ICS Purchased (acre-feet)	Total Cost	ICS Firming Credits Accrued (acre-feet)
2019	\$240.00	14,660	\$3,518,400	13,194
2020	\$247.20	7,100	\$1,755,120	6,390
2021	\$254.40	4,662	\$1,186,013	4,196
2022	\$261.60	2,822	\$738,235	2,540
TOTAL		29,244	\$7,197,768	26,320

¹¹ Pinal AMA revenues collected in connection with groundwater use fees levied prior to 2020.

6 CREDIT DISTRIBUTION OR EXTINGUISHMENT

The credits developed by the AWBA, including credits developed through non-storage means, are intended to be used for five purposes:

- Firming CAP M&I priority subcontracts;
- Firming post-1968 Colorado River domestic use contracts;
- Firming the State’s obligation under the AWSA, including LTSCs accrued specifically for the State’s obligation to the United States;
- Assisting in fulfilling the water management objectives set forth in Chapter 2 of Title 45, Arizona Revised Statutes; and
- Interstate water banking purposes pursuant to agreements with Nevada.

Credits accrued by the AWBA for firming purposes may be distributed or extinguished under the following circumstances: if a shortage is declared on the Colorado River system and demand exceeds supply, if there is a water shortage as defined under the AWSA, or if there is an operational disruption of the CAP. Since the Tier 1 shortage in 2022 impacted the Community, the AWBA extinguished firming credits for this purpose. No LTSCs were distributed or extinguished in 2022 for water management purposes or the development of intentionally created unused apportionment (ICUA) for interstate banking purposes. Finally, there were no unplanned CAP outages in 2022.

While LTSCs were not distributed in 2022, the need for the AWBA to firm supplies for the following year was confirmed in Reclamation’s [Annual Operating Plan for Colorado River Reservoirs 2023](#), published November 22, 2022. As a result, the AWBA’s firming obligation was incorporated into its APO for 2023 and is also identified in **Table 6** below.

Table 6 identifies the volume of credits accrued or acquired by the AWBA through 2022, the estimated credits used to meet AWBA objectives in 2023 and the balance of credits remaining, not including credits that may be acquired in 2023.

Table 6. AWBA Credits Available, Use of Credits in 2023 and Estimated Credits Remaining

Objective and Location	Credits Available as of December 31, 2022 ¹	Estimated Credits Used in 2023	Estimated Credits Remaining
	Acre-feet		
CAP M&I Firming (4-cent tax)			
Phoenix AMA	1,582,453	0	1,582,453
Pinal AMA	234,791	0	234,791
Tucson AMA	512,213	0	512,213
On-River M&I Firming (general fund)	403,830	0	403,830
Tribal Settlement Obligations:²			
Community - 15,000 AFY	169,281	14,575	154,706
LTSCs	105,390	0	105,390
Firming Credits	37,571	14,575	22,996
ICS Firming Credits	26,320	0	26,320
White Mountain Apache Tribe - 3,750 AFY	0	0	0
Hualapai - 557.5 AFY	0	0	0
Future Settlements – 4,416.5 AF	0	0	0
Federal Assistance (<i>Southern Arizona Water Rights Settlement Act</i>)	34,102	0	34,102
Groundwater Management³ (Withdrawal Fees)	776,265	0	776,265
Phoenix AMA	251,411	0	251,411
Pinal AMA	417,706	0	417,670
Tucson AMA	107,148	0	107,148
Shortage Reparations⁴	109,489	0	109,489
Phoenix AMA	20,642	0	20,642
Pinal AMA	60,507	0	60,507
Tucson AMA	28,340	0	28,340
Pinal Redirect Credits⁵	14,125	0	14,125
Interstate - SNWA	613,846	0	613,846
Phoenix AMA	60,021	0	60,021
Pinal AMA	440,241	0	440,241
Tucson AMA	113,584	0	113,584

¹ Credits accrued or acquired through 2022.² White Mountain Apache Tribe Water Rights Quantification Act enforceability date is December 30, 2027; Hualapai settlement enforceability date is April 15, 2029.³ Withdrawal Fee LTSCs may be used for CAP M&I firming and/or Tribal settlement obligations if needed.⁴ LTSCs accrued pursuant to the Arizona-Nevada Shortage-Sharing Agreement executed in 2007.⁵ Credits accrued from water provided to Pinal AMA GSFs at full cost to the GSF operators.

7 TEN-YEAR PLAN

Pursuant to A.R.S. § 45-2426(B)(6), the AWBA is required to annually prepare a Ten-Year Plan that describes any water banking services and interstate water banking it intends to undertake in addition to storing Colorado River water for its three main purposes: (1) protecting Arizona’s M&I water users against future water shortages on the Colorado River and disruptions of operation of the CAP, (2) fulfilling Arizona’s water management objectives as set forth in the Groundwater Code and (3) making water available to implement the settlement of water rights claims by Indian communities within the state. An analysis of the capacity of the AWBA to complete those activities is also required by statute.

AWBA’s Ten-Year Plan is prepared only for planning purposes and is updated annually based on current information. This Ten-Year Plan analyzes potential activity for the planning period January 1, 2024 through December 31, 2033 to the extent possible and will be utilized in the development of the 2024 APO. The development and the distribution or extinguishment of credits are discussed.

While the Ten-Year Plan is an essential tool for evaluating potential near-term firming obligations or commitments, significant uncertainty looms for Colorado River water supplies. The Bureau of Reclamation is in the process of developing new operating guidelines to replace the 2007 Colorado River Interim Guidelines for Lower Basin Shortages and the Coordinated Operations for Lake Powell and Lake Mead at the end of 2026. These could result in operations that affect water supplies available to the Lower Basin. The AWBA will continue to work collaboratively with CAWCD and stakeholders to ensure it is well prepared to meet its firming responsibilities.

With shortage conditions anticipated in the coming years, this Ten-Year Plan focuses on AWBA credit distribution for firming purposes and for the creation of ICUA associated with interstate water banking. It assumes there will be no surplus conditions during the planning period and that there will be no excess CAP water even if normal supply conditions were to resume. Should conditions change dramatically on the Colorado River, this assumption will be revised in the future Ten-Year Plans.

7.1 CREDIT DEVELOPMENT

The ability to develop LTSCs is dependent on the availability of water, storage capacity and funding. When planning to store water, the AWBA must consider the availability of each as they are interdependent. The availability of one, or lack thereof, will ultimately affect the others. Similarly, when purchasing LTSCs or other water supplies, the AWBA is also dependent on the availability of supplies and funding with consideration also given to location and market rates.

7.1.1 Water Availability

Due to anticipated future hydrologic conditions, the AWBA does not expect to have excess CAP water available during the next 10 years. Consequently, this Ten-Year Plan does not assume a certain volume of supplies that could potentially be stored during this time period. While the AWBA could store CAP water that is turned back during the year, the availability of this water cannot be known in advance and is therefore not a consideration in the Ten-Year Plan. Likewise, the AWBA could store water on behalf of others using supplies made available by those entities, such as Nevada’s unused Colorado River entitlement. However, since that storage would not impact the use of excess CAP supplies, it is also not a consideration in this Ten-Year Plan.

7.1.2 Storage Capacity

Table 7 shows the permitted storage capacity for all recharge projects where the AWBA holds a permit to store water. Those facilities have a cumulative permitted storage capacity of more than 1.3 MAF per year. Actual storage capacity volumes available to the AWBA in any given year will depend on storage by other entities. If excess CAP water becomes available to the AWBA or CAP water is turned back during a year, the AWBA should have sufficient storage capacity available.

Table 7. Storage Facilities Available to the AWBA

AMA	GSF/USF	Facility Name	Facility Permitted Storage Volume (AFY)	Facility Permit Expiration Date
Phoenix	GSF	Maricopa Water District	40,000	6/19/2025
Phoenix	GSF	New Magma Irrigation and Drainage District	80,000	renewal pending
Phoenix	GSF	Queen Creek Irrigation District GSF	22,000	renewal pending
Phoenix	GSF	Roosevelt Water Conservation District	85,000	2/1/2031
Phoenix	GSF	Salt River Valley Water Users' Association	117,000	11/4/2024
Phoenix	GSF	Tonopah Irrigation District	17,059	3/6/2028
Phoenix	USF	Agua Fria Recharge Project Managed	24,000	12/22/2040
Phoenix	USF	Aqua Fria Recharge Project Constructed	24,000	12/22/2040
Phoenix	USF	Granite Reef Underground Storage Project	93,000	3/13/2032
Phoenix	USF	Hieroglyphic Mountains Recharge Project	35,000	10/31/2042
Phoenix	USF	Superstition Mountains Recharge Project	56,500	1/15/2028
Phoenix	USF	Tonopah Desert Recharge Project	87,500	9/1/2025
Pinal	GSF	Central Arizona Irrigation and Drainage District	110,000	10/10/2023
Pinal	GSF	Hohokam Irrigation and Drainage District	82,000	renewal pending
Pinal	GSF	Maricopa-Stanfield Irrigation and Drainage District	168,114	9/22/2025
Tucson	GSF	BKW Farms - Main	14,324	3/2/2026
Tucson	GSF	Cortaro Marana Irrigation District	20,000	10/7/2024
Tucson	GSF	Kai Farms (Red Rock)	11,401	2/5/2026
Tucson	USF	Avra Valley Recharge Project	11,000	1/29/2039
Tucson	USF	Central Avra Valley Storage and Recovery Project	75,000	7/7/2035
Tucson	USF	Lower Santa Cruz Replenishment Project	50,000	1/4/2036
Tucson	USF	Pima Mine Road Full Scale	30,000	2/2/2041
Tucson	USF	Southern Avra Valley Storage and Recovery Project	115,000	12/24/2034
TOTAL			1,367,898	

7.1.3 Funding

As indicated previously in Section 4, funding for water storage that benefits Arizona comes from three sources: water storage taxes (i.e., 4-cent water storage tax), groundwater withdrawal fees and general fund appropriations. The availability of revenues from each source varies annually. Additionally, there are restrictions on how each funding source can be used. Funding for interstate banking is received at the time of storage.

Water Storage Taxes

CAWCD has the authority to levy the water storage tax through 2035. The tax may be levied at a rate of up to 4-cent per \$100 of assessed property value through tax year 2029 and up to 3-cent for the remainder of the term. LTSCs accrued with these funds will be used to firm CAP M&I supplies during shortages.

This Ten-Year Plan assumes CAWCD will continue to retain the water storage tax revenues but continue to offset AWBA water delivery and storage costs as part of O&M if water becomes available. In accordance with the 2019 IGA between the AWBA, ADWR and CAWCD, the AWBA must request funds from CAWCD annually for all planned LTSC purchases for the following year. The AWBA did not request water storage tax funds for calendar year 2024 since the AWBA will likely have unspent funds available from 2023, as well as \$11.15 million in carryover funds from 2021 and 2022. If necessary, additional funds could be requested during the year.

Groundwater Withdrawal Fees

This Plan assumes an estimated \$2.4 million in withdrawal fees is collected annually with approximately \$2 million collected in the Phoenix AMA and approximately \$400,000 collected in the Tucson AMA. Withdrawal fee revenues vary from year to year. As previously noted, withdrawal fees will not be levied for AWBA purposes in the Pinal AMA through 2026. The AWBA can utilize withdrawal fees to further the water management objectives of the AMAs, including firming for CAP M&I subcontracts and implementing Tribal water rights settlements when legislative appropriations are not available. When distributed or extinguished, these credits can only be used for the benefit of the AMA in which the monies were collected.

General Fund Appropriations

Pursuant to A.R.S. § 45-2423(B)(10), the AWBA can submit a request for a General Fund appropriation each year. While the AWBA may request General Fund appropriations during this planning period, receipt of an appropriation cannot be assured.

Funding for Interstate Storage

Pursuant to the Third Amended and Restated Agreement for Interstate Water Banking among the AWBA, Southern Nevada Water Authority (SNWA) and the Colorado River Commission of Nevada (Third Amended Agreement), the AWBA collects all charges for administrative services and for delivery and storage of water. No interstate water banking is expected to occur during the term of this Ten-Year Plan. If any interstate banking does occur, related costs will be incorporated into the APO.

7.1.4 Credit Purchases

Through 2023, the AWBA will have accrued or acquired an estimated 4.46 MAF of credits, including anticipated ICS firming credits. **Table 8** below identifies all available credits by firming responsibilities and objectives, including LTSCs and non-storage firming credits developed pursuant to the AWBA's agreements with the Community.

Table 8 AWBA Credits Available through 2023 (acre-feet)

Objective	Phoenix AMA	Pinal AMA	Tucson AMA	TOTAL
M&I Firming	1,582,453	234,791	512,213	2,329,457
On-River Firming	42,316	306,968	54,546	403,830
Tribal Firming	151,376	25,375	34,102	210,853
Water Management	251,411	417,706	108,475	777,592
Shortage Reparation	20,642	60,507	28,340	109,489
Other	-	14,125	-	14,125
Interstate	60,021	440,241	113,584	613,846
TOTAL	2,108,219	1,499,713	851,260	4,459,192

While the AWBA has a significant number of firming credits, hydrologic modeling has shown the AWBA will likely need significantly more water to firm supplies during shortages. Since excess CAP supplies are not anticipated to be available during the next ten years, this Ten-Year Plan assumes the AWBA will continue to develop credits through alternative means. The AWBA has funding available for this purpose in the near term. However, due to the uncertainties related to the availability of LTSCs, competitive interests, and future market prices, the amount of LTSCs that can be purchased during the planning period cannot be known in advance. The decision to purchase LTSCs will continue to be determined annually as part of the AWBA’s APO.

In addition to purchasing LTSCs, the AWBA will continue to fund the development of the remaining 11,210 acre-feet of the 45,000 total acre-feet of ICS firming credits identified under its agreement with the Community. Assuming the AWBA has \$2 million in withdrawal fees available each year from the Phoenix AMA, all ICS firming credits will be purchased by 2026.

7.2 CREDIT DISTRIBUTION OR EXTINGUISHMENT

The Ten-Year Plan is an important tool for providing advance notice of potential near-term firming obligations and developing future policies. Water Bank firming occurs when Colorado River water supplies are insufficient to meet demand for CAP users and on-River fourth priority users for which the AWBA has firming responsibilities. Factors affecting AWBA firming obligations include Colorado River system hydrologic conditions, the supply available to Arizona, and Colorado River demands within Arizona. The AWBA estimates firming volumes based on Reclamation’s 5-Year Probabilistic Projections. Previously, Reclamation generated the 5-Year Probabilistic Projections using the Colorado River Simulation System, which produced model results beyond the 5-year period. The AWBA historically extended these projections to encompass the AWBA’s full ten-year planning period. However, in February 2022, Reclamation switched to generating 5-Year Probabilistic Projections using the Colorado River Mid-term Modeling System in Ensemble Mode (CRMMS-ESP), which does not provide results beyond the 5-year period and thus the forecast projections could not be extended through 2033. Current firming projections are determined based on an analysis of supply and demand using the Joint Shortage Analysis Model (JSAM), a model developed jointly by CAWCD and ADWR to estimate Colorado River demands within Arizona’s priority system and evaluate the timing, frequency and magnitude of shortages that may result in AWBA firming.

7.2.1 Timing, Magnitude and Likelihood of Firming

Reclamation’s April Five-Year Probabilistic Projections are used to determine the most likely operating tier each year, and the JSAM model is used to estimate the corresponding AWBA firming volume. As identified in **Table 9**, the April 2023 forecast developed based on CRMMS-ESP projected a Tier 1 shortage as the most likely operating condition in 2024. In 2025, the likelihood of a Normal or Tier 1 operating condition is equal, however, there is also a 13 percent probability of a Tier 2 shortage, resulting in a greater probability of any shortage. As a result, operations under a Tier 1 shortage condition are selected for 2025. The Normal Year operating condition is projected as most likely in 2026 and 2027.

Table 9. Projected Lower Basin Supply Conditions

Operational Tier	Tier Reductions (AF)	Reclamation’s Five-Year Table - Shortage Probability ¹			
		2024	2025	2026	2027 ²
Surplus Condition (≥1,145)		0%	0%	0%	7%
Normal Year (<1145 and >1075)		7%	43%	53%	43%
Normal (<1145 and >1090)		0%	0%	13%	10%
Tier Zero (≤1090 and >1075)	192,000	7%	37%	40%	33%
Any Shortage (≤1075)		93%	57%	47%	50%
Tier 1 Shortage (≥1050 and ≤1075)	512,000	93%	43%	27%	33%
Tier 2 Shortage (≥1025 and <1050)		0%	13%	20%	10%
Tier 2a (>1045 and <1050)	592,000	0%	10%	3%	7%
Tier 2b (≥1025 and ≤1045)	640,000	0%	3%	16%	3%
Tier 3 Shortage (<1025)	720,000	0%	0%	0%	7%

¹ Shortage probabilities from Reclamation’s projections of future Colorado River system conditions, April 2023 CRMMS-ESP. These projections do not represent the full range of future possibilities that could occur with different modeling assumptions.

² For modeling purposes, simulated years beyond 2026 assume a continuation of the 2007 Interim Guidelines, the 2019 Colorado River Basin Drought Contingency Plans, and Minute 323, including the Binational Water Scarcity Contingency Plan. With the exception of certain provisions related to ICS recovery and Upper Basin demand management, operations under these agreements are in effect through 2026. Reclamation is beginning a process in 2023 to develop operations for post-2026, and the modeling assumptions described here are subject to change for the analysis to be used in that process.

Table 10 identifies firming requirements for Tribal contractors (CAP NIA priority supplies), CAP M&I subcontractors and on-River M&I contractors for the period from 2024 through 2027. The most probable firming volumes are highlighted, corresponding to the most probable operational tier each year. Estimated AWBA firming volumes are derived from JSAM. Limited data (2023-2027) regarding Reclamation’s projected Lower Basin supply conditions prevent the AWBA from showing shortage probabilities for the remainder of the planning period (2028-2033). Information concerning the remaining years will be updated if the data become available. Estimated recovery capacity for M&I subcontractors, however, is shown for the ten-year period for every operational tier in **Table 12**.

Table 10. Estimated AWBA Firming Volumes through 2027

	Tribal Firming (acre-feet)			
Operational Tier	2024	2025	2026	2027
Normal Year (Tier 0)	0	0	0	0
Tier 1 Shortage	9,447	10,026	10,163	10,485
Tier 2a Shortage	14,900	14,712	14,669	14,566
Tier 2b Shortage	14,017	13,840	13,799	13,703
Tier 3 Shortage	12,669	12,510	12,473	12,386
Most Probable Firming Volumes	9,447	10,026	0	0

	M&I Firming (acre-feet)			
Operational Tier	2024	2025	2026	2027
Normal Year (Tier 0)	0	0	0	0
Tier 1 Shortage	0	0	0	0
Tier 2a Shortage	4,048	11,806	13,639	17,965
Tier 2b Shortage	39,837	47,595	49,428	53,754
Tier 3 Shortage	94,403	102,161	103,994	108,320
Most Probable Firming Volumes	0	0	0	0

	On-River Firming (acre-feet)			
Operational Tier	2024	2025	2026	2027
Normal Year (Tier 0)	0	0	0	0
Tier 1 Shortage	0	0	0	0
Tier 2a Shortage	0	0	0	0
Tier 2b Shortage	0	0	0	0
Tier 3 Shortage	0	0	0	0
Most Probable Firming Volumes	0	0	0	0

	Total AWBA Firming (acre-feet)			
Operational Tier	2024	2025	2026	2027
Normal Year (Tier 0)	0	0	0	0
Tier 1 Shortage	9,447	10,026	10,163	10,485
Tier 2a Shortage	18,948	26,518	28,307	32,531
Tier 2b Shortage	53,854	61,435	63,227	67,457
Tier 3 Shortage	107,073	114,671	116,467	120,706
Most Probable Firming Volumes	9,447	10,026	0	0
4-Year Total Volumes	19,473			

7.2.2 Tribal Firming for the Gila River Indian Community

Under the AWSA, the AWBA, as an agent for the State, is obligated to firm up to 15,000 acre-feet per year (through 2107) of CAP NIA Priority water for the Community when supplies are insufficient to meet demand. The AWBA and the Community entered into an IGA on June 16, 2015 to establish an annual process to ensure the State’s obligations to the Community are satisfied when shortages occur. **Table 11** identifies the estimated firming volume for calendar year 2024. This volume will be amended to reflect actual 2024 water orders as needed. It is anticipated that the remaining firming credits will be utilized before LTSCs accrued on-Reservation are used to satisfy AWBA firming obligations through 2026, although this decision is made annually.

Table 11. Firming Proposal for the Gila River Indian Community for Shortage Year 2024 – Tier 1

Year	Firming Credits Developed			Firming Credits Utilized		Remaining Balance (acre-feet)
	Firming Credits Developed (acre-feet)	Cost / acre-foot	Total Cost	Through CY 2023 ¹ (acre-feet)	CY 2024 ² (acre-feet)	
2015	16,000	\$157	\$2,512,000	16,000	-	0
2016	12,000	\$161	\$1,932,000	5,004	6,996	0
2017	7,000	\$164	\$1,148,000	-	2,451	4,549
2018	9,000	\$160	\$1,440,000	-	-	9,000
Total	44,000		\$7,032,000	21,004	9,447	13,549

¹ Based on CAWCD’s final accounting of 2023 water orders. In 2022, the AWBA extinguished 6,429 acre-feet of firming credits. In 2023, the AWBA will extinguish 14,575 acre-feet of firming credits.

² Estimates for 2024 CAP water availability provided by CAWCD, assuming full water orders for NIA contracts issued in 2023.

7.2.3 M&I Firming and Recovery Capacity Required

As discussed in the 2021 Update to the Joint Recovery Plan, the AWBA will initiate firming discussions with CAP M&I subcontractors based on a three-year planning horizon. Recovery implementation triggers for M&I firming are tied to Reclamation’s April Five-Year Probability Table and April 24-Month Study. The first trigger occurs when the April Five-Year Probability Table shows a greater than 15 percent probability of a shortage impacting the M&I Priority pool in the third year. The second trigger occurs when the April 24-Month Study forecasts a shortage impacting the M&I Priority pool in the second year based on the “Min Probable” forecast. The third trigger occurs when the April 24-Month Study forecasts a shortage impacting the M&I Priority pool in the following year based on the “Most Probable” forecast. In addition to these annual triggers to initiate progressive levels of coordination, the M&I firming timeline in the 2021 Update to the Joint Recovery Plan highlights critical decision points, deadlines to finalize firming agreements, and the timing of rate notifications for CAP recovery. While the triggers and planning timeline are linear in nature, actual hydrologic conditions could change the need to either accelerate or maintain the planning process.

The AWBA is responsible for the distribution of credits for firming purposes, consistent with its statutory and contractual responsibilities. However, the AWBA is not authorized to recover stored water and must rely on CAP or other recovery partners. Many CAP M&I subcontractors have indicated a preference for Independent Recovery of AWBA LTSCs using their own infrastructure (with no direct reliance on CAP recovery).

To estimate the portion of AWBA firming volumes that might require recovery well capacity, it is necessary to evaluate how shortage reductions impact individual M&I subcontractors’ annual direct uses. In some cases, the reductions to M&I Priority supplies will only impact the ability of a subcontractor to accrue LTSCs for future use, but in other cases, reductions will impact a subcontractor’s annual direct uses. Shortage impacts to CAP M&I Priority water scheduled for delivery to a treatment plant (or used for annual storage and recovery) is relevant for recovery planning, because these direct use impacts affect the annual volume of recovery capacity required for M&I firming. Understanding the timing of these impacts is particularly important because it requires the use of recovery wells that must be available in the year that the shortage reductions occur.

Table 12 identifies the estimated volume of recovery capacity that may be needed for M&I firming each year for each shortage tier, and **Table 13** identifies the estimated volume of independent and CAP recovery needed in each AMA during a Tier 3 reduction.

Table 12. Estimated Recovery Capacity Needed by Shortage Tier¹

Year	Tier 1 (acre-feet)	Tier 2a (acre-feet)	Tier 2b (acre-feet)	Tier 3 (acre-feet)
2024	0	2,052	10,386	25,487
2025	0	2,397	11,899	27,285
2026	0	4,412	14,034	29,669
2027	0	6,571	16,141	32,153
2028	0	8,255	18,212	34,347
2029	0	10,049	19,683	36,121
2030	0	11,417	21,739	36,255
2031	0	11,865	22,406	37,378
2032	0	12,588	22,729	39,248
2033	0	12,884	23,053	41,743

¹ Estimated recovery well capacity incorporates 2022 feedback from impacted M&I subcontractors.

Table 13. Estimated Recovery Capacity Needed by AMA in Tier 3¹

	Phoenix Independent Recovery (acre-feet)	Phoenix CAP Recovery (acre-feet)	Pinal Independent Recovery (acre-feet)	Tucson Independent Recovery (acre-feet)
2024	3,228	19,878	1,834	547
2025	3,301	21,528	1,875	580
2026	3,437	23,653	1,953	627
2027	3,571	25,879	2,029	673
2028	3,703	27,820	2,104	720
2029	3,832	29,347	2,177	766
2030	3,832	29,451	2,177	796
2031	4,866	29,518	2,177	817
2032	6,388	29,585	2,177	1,097
2033	7,924	30,160	2,177	1,483

¹ Estimated recovery well capacity incorporates 2022 feedback from impacted M&I subcontractors.

As the AWBA’s designated recovery agent, CAWCD has secured several recovery partnership agreements and continues to explore additional partnerships to increase the volume of recovery capacity available. Within the Phoenix AMA, CAP recovery capacity will likely be made available through the “CAP Board Policy Allowing the Use of the Central Arizona Groundwater Replenishment District Long-Term Contract to Satisfy the Arizona Water Banking Authority’s Firming or Interstate Obligations.” During this ten-year period, CAP may be able to create sufficient recovery capacity through the Central Arizona Groundwater Replenishment District (CAGR) policy and/or credit exchange partnerships. However, if additional recovery capacity is needed, direct recovery might be necessary. Direct recovery would require the development of wells and conveyance systems and would increase recovery costs. CAWCD is currently developing two recovery wells at the Tonopah Desert Recharge Project (TDRP). The first phase of this multi-year project will be completed in late 2023. In 2024, CAWCD anticipates awarding a contract for the design of a recovery wellfield and associated treatment facilities, with a target recovery volume of approximately 15,000 acre-feet per year. Additional drilling and sitework will be undertaken in 2025, along with the initiation of the required NEPA review and investigation of potential partnerships.

Table 14 identifies the volume, terms and conditions of existing CAP recovery partnership agreements. The recovery agreements with New Magma Irrigation and Drainage District (IDD), Queen Creek Irrigation District (ID), Central Arizona IDD, and Maricopa Stanfield IDD collectively satisfy the \$5 million commitment made by the CAWCD Board to support groundwater infrastructure development as part of Arizona's DCP implementation.

Table 14. CAP’s Available Recovery Capacity by AMA

Partner	Volume (acre-feet/year)	Agreement Term	Conditions
Phoenix AMA TOTAL	23,676		
CAGR	6,426	Undefined	
New Magma IDD	5,000	2024-2049	
Queen Creek ID	2,250	2024-2049	
Roosevelt Water Conservation District	10,000	2008-2027	
Pinal AMA TOTAL	12,750		
Arizona Water Company	2,500	2025-2050	Priority to interstate recovery
Central Arizona IDD	5,250	2027-2051	
Maricopa-Stanfield IDD	5,000	2027-2051	
Tucson AMA TOTAL	10,000		
Tucson Water	10,000	2020-2050	Interstate recovery only
Grand TOTAL	46,426		

CAWCD has also entered into two agreements specifically intended to secure capacity for the recovery of the AWBA’s interstate credits.¹⁴ These agreements will be used to develop ICUA when SNWA makes a request. In the Pinal AMA, CAWCD has entered into an agreement with Arizona Water Company for up to 2,500 acre-feet of annual recovery capacity. However, this agreement can also be used for other AWBA

¹⁴ SNWA is responsible for paying the recovery costs to develop ICUA and has therefore, under separate agreements, provided CAWCD \$1 million for advancement to both Arizona Water Company and the City of Tucson for this purpose.

recovery needs during a year when interstate recovery is not requested. In the Tucson AMA, CAWCD has entered into an agreement with Tucson Water for the recovery of the AWBA's interstate LTSCs. The agreement with Tucson Water, for up to 10,000 acre-feet of annual recovery capacity (not to exceed 65,000 acre-feet total) can only be used for interstate recovery on behalf of SNWA.

CAWCD staff have developed a draft Standard Form CAWCD Firming Agreement for M&I subcontractors who want to be firming by CAP or want to have their own firming supplies delivered by CAP. This agreement will serve as a water delivery contract for firming water and covers firming water provided by CAWCD (including AWBA credits) or by the CAWCD subcontractor. At the time of the development of this 10-Year Plan, CAWCD Board approval of the CAWCD Firming Agreement is expected in 2023.

7.2.4 Agreement to Exchange LTSCs

In 2019, as a component of Arizona's Implementation Plan for the LBDCP, the AWBA agreed to exchange LTSCs with Arizona parties who agreed to store a portion of their CAP water at GSFs in the Pinal AMA.¹⁵ This exchange allows these entities storing in the Pinal AMA the ability to recover and use the water in the AMA where they are located. The AWBA agreed to exchange its LTSCs for an equal volume of LTSCs accrued by participants. In 2022, participants stored 45,500 acre-feet in the Pinal AMA. Under the agreement, the AWBA can exchange up to 43,225 acre-feet of LTSCs (45,500 acre-feet of storage less 5 percent cut to the aquifer). LTSC exchanges are anticipated to begin in the second half of 2023. All exchanges must be completed by December 31, 2026.

7.2.5 Interstate Storage and Requests for Intentionally Created Unused Apportionment

Pursuant to the interstate storage Third Amended Agreement, there is no obligation to accrue a specified volume of LTSCs on behalf of SNWA. Rather, storage is determined annually through mutual agreement and paid for by SNWA in the year storage occurs. As of 2020, the AWBA had 613,846 acre-feet of LTSCs in a separate interstate subaccount for SNWA. Since decisions to store water for Nevada are made as part of the AWBA's APO, assumptions for interstate storage are not included in this Ten-Year Plan.

The Third Amended Agreement also authorizes Nevada to request development of ICUA, as follows: in the initial year, an amount not exceeding 20,000 acre-feet; the second year, an amount not exceeding 30,000 acre-feet and in all subsequent years, an amount not exceeding 40,000 acre-feet. However, if sufficient recovery capacity exists, SNWA may request the development of additional ICUA to replace reductions in supply during Colorado River shortages up to its annual entitlement of 300,000 acre-feet. This Ten-Year Plan assumes development of 2,500 acre-feet of ICUA on behalf of SNWA beginning in 2026.¹⁶ There are currently recovery agreements on behalf of SNWA for the development of ICUA that provide up to 12,500 acre-feet per year of recovery capacity.¹⁷ Credits accrued prior to the Third Amended Agreement must be recovered by December 31, 2063. Credits accrued after, such as those accrued in 2018, must be recovered within 50 years of the date of storage with the oldest credits recovered first. The agreement terminates when all credits have been recovered.

¹⁵ Lower Basin Drought Contingency Plan ("LBDCP") Implementation Plan: Agreement to Exchange Long-Term Storage Credits between AWBA and the City of Avondale; City of Chandler; City of Goodyear; City of Peoria; City of Phoenix; City of Scottsdale; City of Tucson; Freeport Minerals Corporation; and EPCOR Water Arizona Inc.

¹⁶ The AWBA anticipates receiving in 2023 a recovery request from SNWA for ICUA development. The AWBA also anticipates further recovery conversations with SNWA.

¹⁷ SNWA has also prepaid CAWCD for the recovery of 50,000 acre-feet of LTSCs that were accrued in the Pinal AMA and transferred to the AWBA under the original interstate water banking agreement.

7.2.6 Estimated Use of AWBA Credits

As illustrated in **Table 15** below, the AWBA anticipates utilizing an estimated 19,473 acre-feet of credits to satisfy potential firming obligations for the Gila River Indian Community through 2027, which correspond to 12 percent of the credits available at the beginning of 2024.

Table 15. Uses of AWBA Credits Through 2027

Location and Objective	Credits Available in 2024 (acre-feet)	Estimated Credits Used/Exchanged through 2027 (acre-feet)	Estimated Credits Remaining End of 2027 (acre-feet)
CAP M&I Firming	2,329,457	0	2,329,457
Phoenix AMA	1,582,453	0	1,582,453
Pinal AMA	234,791	0	234,791
Tucson AMA	512,213	0	512,213
On-River M&I Firming	403,830	0	403,830
Tribal Settlement Obligations:	162,176	19,473	142,703
Community - 15,000 AFY	162,176	19,473	142,703
<i>LTSCs</i>	<i>105,390</i>	<i>0</i>	<i>105,390</i>
<i>Firming Credits</i>	<i>22,996</i>	<i>19,473</i>	<i>3,523</i>
<i>ICS Firming Credits</i>	<i>33,790</i>	<i>0</i>	<i>33,790</i>
White Mountain Apache Tribe - 3,750 AFY	0	0	0
Hualapai - 557.5 AFY	0	0	0
Future Settlements - 4416.5 AFY	0	0	0
Federal Assistance (<i>Southern Arizona Water Rights Settlement Act</i>)¹			
<i>\$3 million provided in LTSCs</i>	34,102	0	34,102
Groundwater Management ²	777,591	0	777,591
Phoenix AMA	251,411	(38,475)	212,936
Pinal AMA	417,706	43,225	460,931
Tucson AMA	108,474	(4,750)	103,724
Shortage Reparations	109,489	0	109,489
Phoenix AMA	20,642	0	20,642
Pinal AMA	60,507	0	60,507
Tucson AMA	28,340	0	28,340
Pinal Redirect Credits	14,125	0	14,125
Interstate - SNWA	613,846	5,000	608,846
Phoenix AMA	60,021	0	60,021
Pinal AMA	440,241	5,000	435,241
Tucson AMA	113,584	0	113,584

¹ Credits could be requested by Reclamation during this time period.² Reflects maximum volume of credits that could be exchanged pursuant to LTSC exchange agreement under the Implementation Plan by December 31, 2026.

APPENDIX

APPENDIX A**Annual and Cumulative Long-Term Storage Credit Purchases¹**

Funding Source	2022		Cumulative	
	Funds Expended	Credits Accrued ² (acre-feet)	Funds Expended	Credits Accrued (acre-feet)
4-cent Tax				
Phoenix AMA	\$3,107,370	10,358	\$27,325,567	111,120
Pinal AMA	\$0	-	\$0	-
Tucson AMA	\$874,482	2,915	\$11,168,108	48,712
Withdrawal Fees				
Phoenix AMA	\$0	-	\$834,876	3,600
Pinal AMA	-	-	\$0	-
Tucson AMA	\$0	-	\$1,100,403	5,123
Shortage Repairs				
Phoenix AMA	\$0	-	\$0	-
Pinal AMA	\$0	-	\$0	-
Tucson AMA	\$0	-	\$579,842	3,665
TOTAL	\$3,981,852	13,273	\$41,008,797	172,219

¹ Information on AWBA annual and cumulative LTSCs accrued from water storage at individual facilities can be found on the AWBA's website, waterbank.az.gov

² LTSC purchases in 2022 include 13,273 acre-feet from the Ak-Chin Indian Community.