

GOING FORWARD: CREATING AN ARIZONA STRATEGIC VISION FOR WATER SUPPLY SUSTAINABILITY

Based on the most recent study conducted by the water community in Arizona, the legislatively formed WRDC, Arizona could be facing a water supply imbalance between projected demands and water supply availability in the next 25 to 50 years of approximately 900,000 acre-feet. In many portions of the State, this short term imbalance can likely be solved with locally available water supplies. However, there is still a need for financing the infrastructure necessary to accomplish this.

The imbalance is projected to increase by an additional 2.3 MAF by the year 2110. The availability of local water supplies to meet these needs will vary based on the intensity of the demands within each region of the State. Local water supplies may not be sufficient to address these needs and more options must be explored and evaluated, including importation and transportation of desalinated seawater. Pursuit of such options will require sustained investment and commitment by Arizona's policy and business leaders. In order to avoid economic disruption, these efforts must begin immediately to ensure that long-term solutions are in place in advance of the need.

Regional Strategies

There is no single strategy that can address projected water supply imbalances across the State. Instead a portfolio of strategies needs to be implemented dependent on the needs of each area of the State. It is very important to recognize the uniqueness of the various regions throughout the State and the varying challenges facing those regions. A more thorough regional overview and evaluation of the water supply needs for each delineated "Planning Area" within Arizona is included in Section 3 of this report. These Planning Areas have been identified based on possible short-term and long-term strategies available to meet the projected water supply imbalances (*see Figure 8*). Additionally, Table 4 highlights the portfolio of strategies that have been identified and the applicability to each of the Planning Areas, as discussed in more detail in Section 3.

Statewide Strategies

In analyzing all the strategies on a regional basis it became clear that there were specific issues that have widespread potential benefit to all Arizonans. Strategic priorities are identified below which ADWR believes will move Arizona forward through its next century. Additionally, action items have been identified for the first 10 years following the submittal of this report including a requirement for the continued review and update of this report every 10 years.



Figure 8. Strategic Vision Planning Areas

Table 4. Planning Area Strategies

Strategy	Applicable Planning Area(s)*	Supply Limitation	Drought Resiliency	Implementation Challenge	Timeline**	Planning Area Key	
						ID	Name
Reclaimed Water Reuse	1, 3, 5, 6, 9, 14, 15, 17, 18, 19, 20 <i>10, 16</i>	Derivative Supply Increases w/Growth	Yes	Low to Moderate Cost Perception of Direct Use	C/EEP to Short	1	Apache
Conservation	ALL Planning Areas	Potential Limited by Existing Programs	Yes	Low	C/EEP to Short	2	Arizona Strip
Weather Modification	3, 5, 9, 16, 17,19	Limited	Limited	High NEPA Limited Local Data	Med	3	Basin & Range AMAs
Watershed/Forest Management	1, 3, 5, 9, 14, 16, 17, 18, 19	Limited	Some	High NEPA	Med	4	Bill Williams
Expanded Monitoring & Reporting of Water Use	ALL Planning Areas	N/A Assists in Managing Existing Supplies	N/A	Moderate Consent of Unregulated Parties Required	Short	5	Central Plateau
Resolution of Indian and Non-Indian Water Rights Claims/Settlement Implementation	1, 3, 4, 9, 10, 12, 13, 14, 16, 17, 18, 19, 22 <i>5, 6</i>	N/A Reduces Supply Uncertainty	Supply Dependent	High Uncertain Federal Funding Consensus among Tribal Parties	Med to Long	6	Cochise
Increased Access to Locally Available Groundwater (Potable & Brackish) & Enhanced Recharge	1, 3, 5, 9, 14, 15, 18, 19 <i>4, 10</i>	Moderate Need Additional Studies to confirm	Yes Short Term Drought	Moderate Securing Supplies & ROW Access	Short to Med	7	Colorado River Mainstem – North
Local Water Supply Study – Groundwater System Analysis/Modeling	1, 2, 4, 6, 9, 10, 11, 14, 15, 17, 20, 22 <i>3, 5,19</i>	N/A Assists in Managing Existing Supplies	Gain Local Knowledge of GW/SW Link	Low - Moderate But Resources and Data Collection Needed	Short to Med	8	Colorado River Mainstem – South
Local Water Supply Management	6,19	N/A	Supply Dependent	High Need Local Support	Med	9	East Plateau
Firming of Low Priority Colorado River Supplies	3, 7, 20	Limited by Available Resources	Yes	Low - Moderate Existing Authority But Resources Limited	C/EEP to Short	10	Gila Bend
Importation – Instate SW or GW	3, 5, 16, 19	Limited by Available Resources	Supply Dependent	Moderate – High Some GW already avail. Public Opposition Likely	Med to Long	11	Hassayampa/Agua Fria
Importation – Desal Exchange	3, 18, 19 <i>5</i>	Limited by Exchange Opportunities and Infrastructure	Exchange Supplies Limited	High Securing Supplies & ROW NEPA	Long	12	Lower Gila
Importation – Desal Direct Use	3, 18, 19 <i>5</i>	Supply Unlimited Economics will drive capacity	Yes	High Securing Supplies & ROW NEPA	Long	13	Lower San Pedro

14 Navajo/Hopi

15 Northwest Basins

16 Roosevelt

17 Upper Gila

18 Upper San Pedro

19 Verde

20 West Basins

21 West Borderlands

22 Western Plateau

Recommended Implementation Schedule:
 C/ EEP = Continuation/Expansion of Existing Programs
 Short = Short-Term (1-5 yrs)
 Med = Medium- Term (5 – 15 yrs)
 Long = Long-Term (> 15 yrs)

* Applicable Planning Area – **BOLD** are areas where strategy is recommended – *Italicized* are areas where strategy could be utilized but not a primary option.

Strategic Priorities

) Resolution of Indian and Non-Indian Water Rights Claims

Arizona has been successful in resolving, either in whole or in part, 13 of 22 Indian water rights claims, providing substantial benefits to both Indian and non-Indian water users. However, the general stream adjudications, which began in the 1970s, remain incomplete. As of July 2013, there are 83,244 claims in the Gila River Adjudication and 14,522 claims in the Little Colorado River Adjudication by both federal and non-federal parties. These legal proceedings involve complicated technical analysis and legal issues that can often be litigated for years. Completion of a general stream adjudication will result in the Superior Court issuing a comprehensive final decree of water rights. Until that process is complete, uncertainty regarding the nature, extent and priority of water rights will make it difficult to identify all the strategies necessary for meeting projected water demands. ADWR believes that options need to be developed by the State to accelerate this process. Creation of a Study Committee to develop options in a short time frame could help provide guidance to ADWR so adequate funding can be identified and obtained to complete the necessary technical work to support completion of this process. Development of options could initially focus on conceptualization of water rights administration in a post-adjudicated Arizona. This will streamline the Court and ADWR's effort to collecting and evaluating only that information what will assist in administering the final water rights decrees.

) Continued Commitment to Conservation and Expand Reuse of Reclaimed Water

Arizona leads the nation in water conservation. However, we cannot be complacent with these successes. Conservation is the foundation of sustainable water management in our arid State. A continued commitment to using all water supplies as efficiently as possible is necessary to stretch our existing water supplies and delay the need to acquire other, more expensive, supplies.

Arizona is also a leader in the reuse of reclaimed water. Reclaimed water is continually produced from residential and industrial water users and is a secure source of water, but Arizona is only taking advantage of a fraction of its potential reuse opportunities. Many non-potable uses are being met by reclaimed water including: landscape irrigation of parks and golf courses; agricultural irrigation; and streamflow augmentation benefitting ecosystems. Reclaimed water is produced consistently throughout the year, with limited seasonal fluctuation. But irrigation demands, which are the most common use for reclaimed water, fluctuate seasonally, with high demands during the summer months and lower demands in the winter. Underground storage of unused reclaimed water during times of excess supplies and recovery of those supplies during higher demand seasons is a way to ensure renewable reclaimed water is available to meet demands. Using reclaimed water limits use of potable water for non-potable purposes and saves potable water for drinking water supplies. However, as demands increase and water supplies become more stretched, the need to explore and invest in direct potable reuse for drinking water supplies will become necessary. Using this supply that is readily available also reduces or delays the need to find alternative, more expensive, water supplies. Addressing legal hurdles and ensuring the public that this is a safe source of water needs to start now to ensure that direct potable reuse of reclaimed water will be available when it is needed.

) Expanded Monitoring and Reporting of Water Use

Monitoring of water use outside of the AMAs and INAs is limited to (1) the Community Water System Reports submitted by municipal water providers and (2) Colorado River accounting reports submitted to Reclamation. Metering and reporting across the State would serve to support and enhance analysis of

current hydrologic conditions. Data collection is a crucial element of the development of groundwater models, which have proven to be invaluable tools throughout the State in developing more thorough understandings of hydrologic systems and evaluating future conditions and potential impacts of new uses and/or alternative water management strategies. Additionally, expanded exploration drilling and testing of wells throughout the State will increase knowledge of local groundwater systems in addition to potentially mitigating local pumping impacts.

) Identifying the Role of In-State Water Transfers

A source of significant controversy across the State, water transfers have been the focus of much debate throughout Arizona's history. So much so that the 1991 Groundwater Transportation Act was adopted prohibiting (with a few exceptions) the transportation of groundwater to the AMAs in order to protect rural Arizona water supplies. However, no such statutory prohibitions exist for the transfer of Colorado River supplies and in-state surface water. The absence of a statutory prohibition on moving these supplies does not mean that transportation is easily achieved. The conflicts that have arisen result from the perception that all transfers will be harmful to local communities and economies. A comprehensive analysis of water transfer is needed in Arizona. Evaluation of long-term versus short-term transfers may actually provide insight into how water transfers can be developed to protect or even benefit local communities. Lessons from other western states that have adopted more market-based water right transfer models may be worthy of review as part of this analysis.

Assuming, upon comprehensive vetting and study, such transfers could be effected in a manner that is satisfactory to at-risk constituencies with respect to local protection and benefit, another issue in this category is the physical transportation of water throughout the state. Typical mechanisms would be through construction of water pipes or canals. The ability to move water throughout Arizona is significantly inhibited by the amount of and dispersal of federal lands. Some land management agencies are amenable to allowing water transmission works to cross their lands while others are not. Because Arizona's highway system has already been constructed, using the rights-of way of existing highways provides an opportunity for colocation of water utility infrastructure and reduces the impact to surrounding lands and ecological resources. However, because of ADOT policy, the ability to utilize these existing corridors is extremely limited. Without this access utilities may have to acquire potentially costly lands and wait for lengthy federal processes to develop much needed infrastructure. Accordingly, in terms of finding some contributing value toward dealing with supply imbalances in the vein of possible mutually desired transfers, finding a compromise to right-of-way access for infrastructure development would assist in hastening the necessary development of water supplies for many communities.

) Supply Importation - Desalination

Importation of water from outside of Arizona will likely be required to allow the State to continue its economic development without water supply limitations. Supplies derived from ocean or sea water desalination can be imported directly into Arizona to meet the water needs of municipal and industrial water users, while at the same time providing aesthetic, recreational and ecological benefits. Alternatively, desalination can be done in partnership with other Colorado River water users in exchange for water from Lake Mead. Potential partners for seawater desalination include higher priority Colorado River entitlement holders in Arizona, the State of California, and the State of Nevada. Additionally, advancing Governor Brewer's initiative to work cooperatively with Mexico through the Arizona Mexico

Commission, developing much need water supplies for both Arizona and Mexico through desalination on the Sea of Cortez could prove most effective. Projects of this magnitude are expensive and energy intensive, although unit capital and operating costs have significantly reduced as technology has improved and are comparable to water rates in other parts of the country. More importantly, because of the need to identify partners and develop agreements, these projects will require a significant investment of time – up to 20 years to bring to fruition. Because of the time it takes to develop these projects, and the more pressing need for water supplies in certain parts of the State, exploration of this strategy should begin immediately.

) Develop Financing Mechanism to Support Water Supply Resiliency

The proverbial elephant in the room is cost. The strategies identified above, both statewide and regional, will require capital investment. For many years, the water community has attempted to develop options for funding water supply acquisition and infrastructure development. These conversations and analyses have largely been conducted in the absence of substantial financial expertise and have achieved limited success. It is time to elevate this conversation and address Arizona's future water supply needs, and only Arizona's community, political, and business leaders are capable of garnering the financial resources and mechanisms necessary to meet these needs. Historically, large water supply projects were funded by the Federal government. These Federal options may no longer be available and, if they are, will likely come at a financial premium to Arizona as the Federal land agencies seek to leverage their missions in exchange for approval and access to project financing. A dialogue is needed, perhaps modeled off the development of the Arizona Commerce Authority, to address Arizona's future water supply needs. Evaluation of the potential role of private capital in funding water treatment and delivery infrastructure will be required as a fundamental element of this planning process.

Some areas of the State need immediate assistance in developing water projects, specifically portions of rural Arizona. Unfortunately, these are areas where limited populations cannot finance the required water infrastructure. The Water Resources Development Revolving Fund was created by the Arizona State Legislature to provide financial backing for these communities, but has not been funded to date. Seed money for this revolving fund will be very important to meet the near-term needs of rural communities and provide long-term water supply security for many Arizonans.

Other areas of the State can develop smaller projects for now and may have sufficient population to financially sustain these smaller-scale water projects. But ultimately, large-scale water projects will need to be developed to meet the needs of Arizona's growing economy. While the water supply needs may not be immediate, addressing the financing of future large-scale water projects needs to begin as soon as possible to ensure Arizona's citizens and industries have secure water supplies into the future.

10-Year Action Plan Outline

- Legislate Strategic Vision update every 10 years (Year 1)
- Begin Discussions on Ocean Desalination (Year 1)
 - Exchange Options
 - California
 - Mexico
 - Direct Options
 - Mexico
- Resolve ADOT Right-of-Way Issues for utilities (Year 1)
- Establish Adjudication Study Committee (Year 1)
- Begin Discussions on Water Development Financing (Year 2)
 - Immediate Needs for Water Resources Development Revolving Fund for rural Arizona
 - Long-Term Needs for Large-Scale water importation projects
- Remove current statutory limitation (*A.R.S. § 45-801.01(22)*) on the ability to receive long-term storage credits for recharging reclaimed water beyond 2024 (Year 2)
- Review Legal and Institutional Barriers to Direct Potable Reuse of Reclaimed water – develop and implement plan for resolution (Year 3)
- Review and implementation of Adjudication Study Committee Findings (Year 3)
- Develop and Begin Implementation of Direct Potable Reuse of Reclaimed Water Public Perception Campaign (Year 4)
- Begin discussions with New Mexico on an interstate cooperative program for watershed management/weather modification in the Upper Gila watershed (Year 4)
- Resolve Remaining Indian Settlements (Year 1 - 10)
- Resolve General stream Adjudication (Year 5 - 10)