

1.1 INTRODUCTION

In January 2011, the Arizona Department of Water Resources (ADWR) published the *Water Demand and Supply Assessment 1985-2025, Prescott Active Management Area (Assessment)*, a compilation and study of historical water demand and supply characteristics for the Prescott Active Management Area (PRAMA) for the years 1985-2006. In addition, the Assessment calculated seven water supply and demand projection scenarios through the year 2025. ADWR conducted the Assessment as required by the *1980 Groundwater Management Code (Code)* in preparation for promulgation of the *Fourth Management Plan for Prescott Active Management Area*. The provisions of this Fourth Management Plan (4MP) will be in effect from the date of its adoption through 2020. A Fifth Management Plan (5MP) will be developed to cover the period from 2020 through 2025.

Management plans are one mechanism available to ADWR to achieve the management goal of each AMA. The statutorily established management goal of the PRAMA is to attain safe-yield, on an AMA-wide basis, by the year 2025. Achievement of safe-yield requires that the amount of groundwater pumped from the AMA annually is balanced by an equal or greater amount of water naturally or artificially recharged. Groundwater withdrawals in excess of natural and artificial recharge lead to an overdraft of the groundwater basins in the AMA. The Code identifies management strategies such as implementation of conservation programs by all major water using sectors to reduce total groundwater withdrawals in the AMAs and increasing the use of renewable water supplies in place of groundwater supplies. Management plans also include non-regulatory programs to encourage use of renewable supplies and water management assistance programs. Enforcement provisions and monitoring programs are also included in the management plans. In the concluding chapter to this management plan, the director has also included a description of ADWR's overall water management approach for the AMA. The Assured Water Supply (AWS) Rules, in addition to the management plans, also limit use of groundwater. The Underground Storage and Recovery Program focuses on use of renewable water supplies and is an important vehicle for achievement of the management goals and ADWR's water management objectives.

After publication of the Assessment, ADWR presented a summary of the document at the Groundwater Users Advisory Council (GUAC), a five-member council appointed by the Governor to represent the groundwater users in the area and advise the director of ADWR and the AMA director on matters relating to water management within the AMA. ADWR also received and reviewed comments and proposals from the Yavapai County Water Advisory Committee (WAC) and the Citizens Water Advocacy Group (CWAG) during the development of the 4MP for PRAMA. The statutory management plan process also requires ADWR to conduct formal public hearings after completion of the proposed management plan (A.R.S. § 45-570). In these hearings, ADWR presents information in support of the plan and obtains comments regarding the plan. Before the plan is adopted, the ADWR director must prepare a written response to the written and oral comments submitted as part of the hearings process and may revise the plan in response to this stakeholder input.

1.2 THE ASSURED WATER SUPPLY PROGRAM

The AWS program was created as part of the Code and is designed to preserve groundwater resources and promote long-term water supply planning in the AMAs. This is accomplished by regulations that limit the use of groundwater by new residential and commercial subdivisions. Every person proposing to subdivide land within an AMA must demonstrate the availability of a 100-year AWS.

In 1995, ADWR adopted AWS Rules to implement the AWS program. Under the AWS Rules, developers can demonstrate a 100-year supply by satisfying the criteria described below and either obtaining a Certificate of Assured Water Supply (CAWS) from ADWR or by obtaining a written commitment of service from a water provider for which ADWR has issued a Designation of Assured Water Supply (DAWS).

An AWS demonstration must include proof that the water supply or supplies for the proposed subdivision will meet the following criteria, that they: 1) will be of adequate quality; 2) will be physically, legally, and continuously available for the next 100 years; 3) will be consistent with the management goal for the AMA; 4) will be consistent with the management plan for the AMA; and 5) that the developer or water provider demonstrates the financial capability to construct the necessary water storage, treatment and delivery systems. The Arizona Department of Real Estate will not issue a public report that allows the developer to sell lots without a demonstration of an AWS within an AMA. For more information on the AWS Program, please visit the ADWR website at www.azwater.gov/AzDWR/WaterManagement/AAWS.

ADWR issued a determination in 1999 that PRAMA was no longer in a state of safe yield. As a result, the AWS Rules require use of primarily renewable supplies, such as reclaimed water, for any new DAWS or CAWS issued in the PRAMA. However, the AWS Rules do allow a certain volume of groundwater to be used. These groundwater allowances were envisioned as a mechanism to help municipal providers transition from groundwater to renewable supplies. Therefore, a certain amount of groundwater use by a DAWS or CAWS in the PRAMA is classified as allowable groundwater.

When a DAWS or CAWS is issued, a groundwater allowance account is established. ADWR credits additional allowable groundwater to these accounts based on a number of factors. The AWS Rules allow for a limited volume of groundwater to be pumped based on formulas for each AMA in the AWS Rules. The amounts of water that may be added to the groundwater allowance account are reduced over time to zero in 2025 in the PRAMA. The City of Prescott, through special legislation, has in their DAWS provisions for increased the groundwater allowance for certain subdivisions that had been preliminarily platted but not final platted when the original DAWS for the City of Prescott was issued.

The AWS Rules also allow holders of, or applicants for, a DAWS or CAWS to add to the groundwater allowance by extinguishing (or retiring) grandfathered groundwater rights (irrigation (IGFRs), Type 1 and Type 2 rights) within the same AMA. The calculation of these extinguishment credits is contained in the AWS Rules, and the credits are calculated differently for each AMA. Groundwater use reported pursuant to the provider or subdivision's allowable groundwater volume is considered consistent with the management goal of the AMA.

The AWS requirement is only one important tool to help attain the management goal of the AMA. Because the AWS requirements only apply to new subdivisions (existing uses and other non-subdivision new uses are exempt from the AWS requirement under the Code), additional programs or tools are likely to be required to bring the AMA into safe-yield.

1.3 THE UNDERGROUND STORAGE AND RECOVERY PROGRAM

Prior to the adoption of the Code, more groundwater was pumped from Arizona's aquifers than naturally recharged back into the aquifers. This imbalance resulted in some aquifers becoming significantly depleted. Replacing groundwater use with renewable supplies and recharging water underground reduce this aquifer imbalance. Artificial recharge is a means of storing available renewable water supplies so that

they may be used in the future. Artificial recharge is an increasingly important tool in the management of Arizona's water supplies, particularly in meeting the goals of the Code. Storing water underground to ensure an adequate supply to satisfy current and future needs is both a practical and cost-effective alternative to direct use of renewable supplies.

The Arizona Legislature established the Underground Water Storage and Recovery program in 1986 to allow persons with supplies of renewable water in excess of their demands to store that water underground for recovery at a later time. In 1994, the Legislature enacted the Underground Water Storage, Savings, and Replenishment Act, which further refined the recharge program. Under this program, any person who wishes to store, save, replenish, or recover water through the recharge program must secure permits through ADWR. Depending on the applicant's intent, different types of permits may be required. For more information on the Underground Storage and Recovery Program, please visit the ADWR website at www.azwater.gov/AzDWR/WaterManagement/Recharge.

In many cases, permitted artificial recharge under the Underground Storage and Recovery Program requires a certain percentage of the recharged volume to be made non-recoverable to benefit the aquifer. These required non-recoverable volumes are called *cuts to the aquifer*. The cuts apply to the storage of water for long-term storage credits. They do not apply to water that is stored and recovered annually. In the PRAMA, due to the type of recharge that has occurred and is projected to occur in the future, this particular offset to overdraft is insignificant as compared to the Phoenix, Pinal and Tucson AMAs. During the historic period, there are only two years in which a cut to the aquifer occurred in the PRAMA. In 2003 and 2004, a combined volume of less than 1,000 acre-feet was accounted as a non-recoverable cut to the aquifer.

1.4 GOVERNMENTAL AND INSTITUTIONAL SETTING

Water management activities are carried out by a number of entities within the PRAMA. City, county, and regional government functions include retail water delivery, flood control, wastewater management, water quality management, planning, and zoning. Several user groups, advisory committees, citizen's groups, and other organizations play significant roles in developing legislative and policy guidelines and educational programs relating to water resources use and conservation. The GUAC for each AMA advises the ADWR area director and agency director on issues relating to groundwater management in the AMA.

The Arizona Water Protection Fund (AWPF) was established in 1994 to provide grant monies for implementation of projects to protect or restore the state's riparian areas. The Fund may be used to purchase CAP water or effluent for riparian enhancement. The AWPF Commission, with the ADWR director serving as an ex-officio member, oversees the grants process. AWPF staff is located within ADWR.

At the state level, the Arizona Department of Environmental Quality (ADEQ) develops and enforces water quality regulations. Through recent legislation (amending provisions of the Water Quality Assurance Revolving Fund or WQARF), ADWR and ADEQ jointly participate in specified activities related to protection of groundwater quality and remediation.

The Arizona Corporation Commission (ACC) regulates the activities of private water companies, particularly those related to rate-setting. The Arizona Department of Real Estate works with ADWR to assure availability of water for new subdivisions.

Federal water management activities in the Prescott area include the Bureau of Reclamation's appraisal level study referred to as the Central Yavapai Highlands Water Resources Management Study (CYHWRMS). The final report for the appraisal level study is anticipated to be released in 2013. It is unknown whether a feasibility study will be done in this area. If a water supply alternative is identified in the appraisal study, and the alternative requires some federal infrastructure, the participants may decide to conduct a feasibility study.

Additional federal water management activities include the Environmental Protection Agency's Superfund and National Pollutant Discharge Elimination System permit programs. The United States Geological Survey (USGS) works independently, and in conjunction with ADWR, in the collection and analysis of hydrologic data in support of improving and understanding the hydrologic system of the Upper and Middle Verde River watersheds. The USGS also completed the Northern Arizona Regional Groundwater Flow Model, through cooperation with the Yavapai County WAC. In addition the USGS and ADWR cooperate with Yavapai County in the operation of the Yavapai County flood warning system.

1.5 PRAMA WATER MANAGEMENT ISSUES

The PRAMA is facing many water management challenges as it moves through the fourth and into the fifth management period. These include:

- *Physical Availability of Groundwater within the PRAMA*

The volume of groundwater within the PRAMA considered "physically available" under the AWS Rules is close to being fully allocated to AWS determinations. It is possible that during the fourth or fifth management period full allocation of PRAMA groundwater will be reached. At that time, additional development in PRAMA will need to be based on either: (1) imported water supplies; (2) renewable supplies with sufficient back-up supplies, as needed; or (3) storage and recovery of renewable water from within the area of impact of storage.

- *Consistency with the AMA Goal under the AWS Rules*

The AWS Rules are designed to reduce the volume of groundwater allowance granted to new subdivisions to zero by 2025. Most applicants for CAWS rely on extinguishment credits to cover the difference between the 100 year subdivision demand and the groundwater allowance. However, the volume of extinguishment credits that may be generated within the PRAMA is finite, and the maximum potential volume of extinguishment credits also reduces each year by design under the AWS Rules. If all active groundwater rights in PRAMA had been extinguished in the year 2012, the total volume of extinguishment credits available in the PRAMA would have been about 2,250 acre-feet per year. If the volume of groundwater that is physically available is greater than 2,250 acre-feet per year, then the only other alternative to using extinguishment credits to cover groundwater-based development would be through imported water supplies, renewable water supplies, or the use of long-term or annual storage credits to meet the "consistency with goal" criterion.

- *Financial Capability under the AWS Rules*

Infrastructure for additional underground storage and recovery, and water distribution, including regional wastewater collection systems in the PRAMA has not yet been constructed. Financing for construction is needed. If additional renewable supplies are to be used for new development, applicants will need to demonstrate the financial capability to construct the necessary infrastructure. Applicants would also have to demonstrate the physical, legal, and continuous availability, as well as water quality, of the imported supply.

- *Limitations of the Management Plan Authority*

The regulatory element of the 4MP includes conservation requirements for the municipal, industrial and agricultural water use sectors. Although conservation is an effective means of managing available supplies, it is insufficient by itself to bring the PRAMA to safe-yield. Individual water user choices, city and county ordinances, and regional cooperative water management efforts may result in additional progress toward safe-yield but are outside ADWR's authority to require or enforce, except through determinations of AWS.

The PRAMA is currently in an overdraft situation. Currently, there are no water management provisions, infrastructure, or financing in place to ensure that safe-yield will be achieved by the year 2025, as required by the Code. Surface water is being stored and recovered on an annual basis, but surface water supplies are susceptible to drought and potentially to long-term climate change. In addition, legal and other agreements and contracts provide that some portion of the AMA surface water supply remain in reservoir storage for recreational and other purposes, restricting the use of the full supply even during times of extreme drought. Also, Arizona surface water laws, based on the doctrine of prior appropriation, prevent long-term storage of surface water supplies as downstream water right holders are entitled to any flows in excess of the upstream, senior right holders' direct use. Reclaimed water is being stored for long-term storage credits or used directly for landscape and turf irrigation. The feasibility of water supply augmentation through rainwater harvesting is being studied and may be implemented, but is not in place today. However, a significant number of already platted and recorded lots may develop within the PRAMA on groundwater without any investment in renewable water supplies. Importation of water supplies from outside the PRAMA or other water management techniques to augment the AMA water supply are critical to the PRAMA achieving its safe-yield goal.

1.6 PRAMA 4MP PROGRAMS

The 4MP primarily addresses water conservation, underground storage and recovery, and water management assistance for the years 2010 through 2020. Statutory guidelines provided in A.R.S. §§ 45-567 and 567.01 direct that the following components shall, or may, be included in the 4MP:

- Irrigation water duties or intermediate irrigation water duties for Agricultural users
- Historic cropping program for Agricultural users
- Agricultural Best Management Practices Program
- A Non-Per Capita Conservation Program for Municipal Providers
- A Total GPCD Program for Municipal Providers
- Monitoring and distribution system requirements for Municipal Providers
- Additional conservation requirements for non-irrigation uses

In addition, ADWR has updated the water quality assessment that was included in the 3MP for the 4MP. Throughout the document, there are significant policy statements regarding how ADWR proposes to manage the AMA's water supplies pursuant to the provisions of the Code and the provisions of the 4MP, the AWS Rules, and the Underground Storage and Recovery Program. The regulatory requirements for groundwater users and water distribution systems are printed in italics for easy reference and are located at the ends of Chapters 4, 5, 6, 8 and 9.

1.7 CONCLUSION

The 4MP is designed to outline the region's water management needs and present ADWR's blueprint for working with water users to achieve the PRAMA's water management goals and objectives. Continued commitment will be needed from ADWR and the public to reduce dependence on groundwater and achieve the statutorily established water conservation goals. With the support of the community, ADWR can respond to changing water issues and needs while maintaining technical assistance and regulatory programs that ensure a dependable water supply for Arizona's future.