

Chapter 5

WATER RIGHTS, SOURCES AND ISSUES

KATHY JACOBS

Arizonans rely on four sources of water to meet their water demands: Colorado River water, other surface water, effluent and groundwater. Arizona's water supplies are physically constrained by climate conditions, but they also are legally constrained through interstate and international compacts, federal decrees and state law. Although surface water rights in Arizona are based on the relatively common "prior appropriation" or "first in time, first in right" system, the groundwater rights within the Active Management Areas (AMAs) are unique. This chapter discusses the legal definitions of the sources of water, the water rights systems and issues associated with those systems. The issues described include institutional limits on sustainability.

SOURCES OF WATER

Colorado River Water

The Colorado River flows through seven states and Mexico prior to discharging into the Gulf of California. Its flows are managed through a series of dams and diversions. Table 5.1 shows the allocation of the waters of the Colorado River between the four Upper Basin states, three Lower Basin states and Mexico. The Upper Basin is allocated by percentages, while the Lower Basin is allocated by volume. Arizona is allocated 2.8 million acre-feet from the Colorado River. Colorado River water used in Arizona is subject to Congressional acts, interstate and international compacts as well as court decrees, collectively known as the Law of the River. The "water master," the decision-making authority for the Lower Colorado, is the Secretary of the Interior, who manages the river through the U.S. Bureau of Reclamation. The Colorado River provides on average about 39 percent of Arizona's water supplies. The Arizona Department of Water Resources (ADWR) is responsible for making recommendations to the Secretary of the

TABLE 5.1
COLORADO RIVER ALLOCATIONS

	Percent of Basin Allocation	Acre-feet per Year
UPPER BASIN STATES		
Wyoming	13	1,043,000
Utah	21	1,713,500
Colorado	47	3,855,375
New Mexico	10	838,125
Arizona	<1	50,000
LOWER BASIN STATES		
Arizona		2,800,000
California		4,400,000
Nevada		300,000
MEXICO		1,500,000

Interior regarding the allocation of Colorado River water to mainstream water users and to customers of the Central Arizona Project (CAP) as well as reviewing proposed transfers of CAP water.

About half of Arizona’s Colorado River allocation is delivered to central Arizona through the CAP. Currently the CAP has 50-year subcontracts with 56 municipal and industrial users, ten Indian communities and ten non-Indian agricultural districts. The conditions under which this water can be used are contained in subcontracts between the Central Arizona Water Conservation District, the Secretary of the Interior and the subcontractor. An important contract provision is the requirement to pay the capital, but not the operations, maintenance or energy, components of the CAP water price, even if the water is not used.

Surface Water

Arizona statutes define surface water as “the waters of all sources, flowing in streams, canyons, ravines or other natural channels, or in definite underground channels, whether perennial or intermittent, flood, waste, or surplus water, and of lakes, ponds and springs on the surface.” In addition, the courts have found that if pumping subsurface water appreciably dimin-

ishes the flow of the surface stream, then that water is deemed to be “subflow,” also a form of surface water. Surface water from lakes, rivers and streams other than the Colorado River is governed by the “doctrine of prior appropriation,” which means that the first person to put water to beneficial and reasonable use, *i.e.*, use without waste, acquires a superior right to later appropriators. Prior to June 12, 1919, a person could acquire a surface water right simply by applying the water to a beneficial use and posting a notice of the appropriation at the point of diversion. On June 12, 1919, the Arizona surface water code was enacted. Now known as the Public Water Code, this law provides that a person must apply for and obtain a permit in order to appropriate surface water. The surface water rights system is administered by the ADWR. Over the last century, storage reservoirs and conveyance systems for surface water have been constructed throughout the state. Major reservoir storage systems are located on the Salt, Verde, Gila and Agua Fria Rivers. In-state surface water systems (Figures 1.1 and 4.2) supply about 19 percent or 1.4 million acre-feet of Arizona’s water.

Effluent

Effluent, or treated municipal wastewater can be treated to a quality that can be used for virtually any purpose, including potable water supply. However, it is most commonly used for agricultural irrigation, turf watering, industrial cooling, maintenance of riparian areas and artificial recharge. Effluent is an expanding source of water that has great value in meeting future water supply needs. It currently serves only two percent or 0.14 million acre-feet of the total water demand in the state. Legally, effluent is neither surface water nor groundwater, but is a third class of water until it is discharged to a riverbed where it becomes surface water or percolates into the groundwater table.

Groundwater

Groundwater means water under the surface of the earth regardless of the geologic structure in which it is standing or moving. Groundwater does not include water flowing in under-

ground streams with ascertainable beds and banks (A.R.S. § 45-101.5). Groundwater supplies on average about 40 percent or 2.9 million acre-feet of the state's water use. Since the 1940s, groundwater has been pumped more rapidly in certain parts of the state than it has been replenished, resulting in a condition called "overdraft" or "groundwater mining." The areas of greatest concern are within the AMAs, though significant conflicts over groundwater use and declines in groundwater levels have developed in rural parts of the state as well. Large amounts of water are stored in Arizona's aquifers, but its use is limited by location, depth and quality. Groundwater use also is affected by concerns that over-pumping will result in subsidence of the ground surface, potentially damaging infrastructure and buildings as well as limiting the water storage capacity of the aquifer. The groundwater rights and permits system was established in the 1980 Groundwater Management Act (GMA) and is administered by ADWR.

THE ARIZONA GROUNDWATER MANAGEMENT ACT

The GMA was adopted on June 12, 1980 in response to multiple pressures on the state's groundwater rights system. The pressures included lawsuits that threatened the water supplies of the mining and municipal water use sectors related to the transportation of groundwater in the Tucson area and a threat by the federal government to halt construction of the long-awaited CAP unless groundwater management issues and concerns about the economic implications of severe overdraft conditions in several parts of the state were addressed.

The GMA has three primary goals. The first is to control the severe overdraft occurring in many parts of the state. The second is to provide a means to allocate the state's limited groundwater resources within AMAs to most effectively meet the changing needs of the state. The third goal is to offset Arizona's use of groundwater through renewable water supply development. To accomplish these goals, the GMA set up a comprehensive management framework and established ADWR to administer its provisions.

Active Management Areas and Irrigation Non-Expansion Areas

The GMA created four initial AMAs, the Phoenix, Tucson, Pinal and Prescott AMAs, with a fifth, the Santa Cruz AMA, established from a portion of the Tucson AMA in 1994 (Figure 1.2). Groundwater overdraft in the AMAs was more severe than in other parts of the state and, therefore, the regulations in these areas are more substantial than elsewhere. The vast majority of the state's population lives in the AMAs. Although the management goals of the AMAs differ, they all focus on reducing the overdraft and/or maintaining groundwater levels.

Three Irrigation Non-Expansion Areas (INAs) were established in rural farming areas where the groundwater overdraft was less severe. The Douglas INA and the Joseph City INA were established as the initial INAs. The Harquahala INA was designated in 1982. The management objective in INAs is the prevention of further declines in groundwater supplies through prohibition of irrigation acreage expansion. General provisions that apply to groundwater management on a statewide basis are discussed in the following sections. Chapter 6 provides a more detailed description of the AMAs.

Statewide Groundwater Management Activities

The ADWR's authorities relative to water management are relatively limited outside of the AMAs. Statewide planning efforts include technical studies of local areas and assistance in projecting future water demands. The most recent statewide water assessment available is the Arizona Water Resources Assessment compiled by ADWR in 1994. There has been no update of this comprehensive statewide water supply database since then, although an effort to compile more recent data currently is underway.

The lack of current information on water supply and demand conditions outside the AMAs limits planning and management activities. A Rural Watershed Initiative, started in 1998, has provided technical assistance to 17 watershed groups to develop regional watershed solutions through locally driven partnerships, complete water resource studies and evaluate management options.

Statewide regulatory programs and requirements managed by ADWR include well drilling, construction, licensing, registration and abandonment, groundwater transportation restrictions, adequate water supply requirements and surface water rights administration. ADWR conducts testing for well drilling licenses and issues Notices of Intent to Drill for any well drilling and construction that occurs in the state. ADWR enforces groundwater transportation restrictions and maintains the provisions of the Water Adequacy Program throughout the state. Unlike the Assured Water Supply Program inside of the AMAs, the Adequacy Program allows new subdivisions to be approved even if the water supplies are found to be inadequate. Chapter 7 contains a more detailed description of the Water Adequacy Program.

Groundwater Rights in AMAs

The GMA established a new groundwater permit system designed to limit expanded use of groundwater and protect the water rights of water users who were in place in 1980, when the law was passed. Most groundwater withdrawals within AMAs are limited in volume on an annual basis and are subject to conservation requirements. There is very limited ability to market these rights. There are four basic requirements that must be met prior to pumping or using groundwater in an AMA:

- Establish the legal right to withdraw the water,
- Obtain a well permit and employ a licensed well driller if a new well is required,
- Unless the well is an “exempt” well or subject to limited other exemptions, withdrawals must be measured and annual groundwater withdrawals reported to ADWR, and
- Specific conservation program requirements and water use limitations apply to particular kinds of water use within the AMAs.

Irrigation Grandfathered Rights. Within AMAs, anyone who owns land that was legally irrigated with groundwater at anytime from January 1, 1975 to January 1, 1980 and has been issued a Certificate of Irrigation Grandfathered Right (IGFR) by ADWR has the right to use

groundwater for irrigation of that land. Irrigation is defined as growing crops for sale or human or animal consumption on two or more acres. The volume of IGFRs is established by the conservation requirements in the adopted management plan for each AMA through a maximum annual groundwater allotment for each farm or specifically identified best management practices.

Type 1 Non-Irrigation Grandfathered Rights. A Type 1 non-irrigation grandfathered right is associated with land permanently retired from farming and converted to a non-irrigation use. This right, like an irrigation grandfathered right may be sold or leased only with the land. Type 1 rights are established based on a maximum of three acre-feet per acre of retired irrigated land and generally are used for industrial purposes such as sand and gravel facilities, golf courses or dairies. They are subject to specific conservation requirements in the industrial chapter of the management plan for each AMA.

Type 2 Non-Irrigation Grandfathered Rights. Groundwater withdrawn pursuant to a Type 2 non-irrigation grandfathered right generally can be used for any non-irrigation purpose. The right is based on the maximum amount of water pumped for a non-irrigation use from a non-exempt well, *i.e.*, a well with a pumping capacity of greater than 35 gallons per minute, in any one year between 1975 and 1980. Type 2 rights can be sold or leased separately from the land and most often are used for industrial purposes. They generally are required to follow the conservation requirements associated with the industrial conservation programs in the management plans for each AMA.

Service Area Rights. Service area rights allow cities, towns, private water companies and irrigation districts to withdraw and transport groundwater to serve their customers. Most persons within an AMA receive water through a municipal water provider pursuant to a service area right. The volume of a service area right is not quantified, but is subject to either a gallons per capita per day conservation limit or alternative conservation requirements based on best management practices.

Groundwater Withdrawal Permits. Groundwater withdrawal permits allow new withdrawals of groundwater for limited nonirrigation uses. Seven types of withdrawal permits cur-

rently are allowed under the GMA. A General Industrial Use Permit, the most commonly used type of permit, allows the withdrawal of groundwater for industrial uses outside the service area of a city, town or private water company. Users of these permits generally are required to participate in the Industrial Conservation Program.

Exempt Wells. With minor exceptions, wells with a pump capacity of 35 gallons per minute or less are legally “exempt” from many of the provisions of the GMA. Water can be withdrawn from exempt wells for any purpose. Non-domestic exempt wells drilled after 1983 are limited to 10 acre-feet per year, but domestic wells can withdraw up to 56 acre-feet per year if they are pumped on a full-time basis.

WATER RIGHTS ISSUES

Groundwater Rights

There are multiple water rights issues within the AMAs, many of which relate to the grandfathered right and permit system in the GMA. The GMA protects pre-1980 pumpage rights and allows for certain kinds of new groundwater withdrawal permits, potentially jeopardizing the ability of the AMAs to meet their management goals. These rights allow the continued mining or over drafting of groundwater.

Water rights issues recently identified in the context of Governor Jane Hull’s Water Management Commission include the amount of allowable groundwater pumping relative to the safe-yield goals, the impact of exempt, domestic wells on existing water rights and the management goals and specific issues related to municipal, agricultural and industrial groundwater rights. Appendix K contains the Executive Summary of the Governor’s Water Management Commission’s findings and recommendations related to this issue.

Surface Water Rights and Adjudications

Adjudications are court proceedings in which the nature, extent and priority of water rights are determined. The majority of the surface water rights in the state have not been formally

quantified at this time, although there are several court decrees in the central part of the state that identify right holders and volumes. For example, the Kent Decree established the relative rights of Salt River Valley landowners to the Salt and Verde Rivers and established which lands had normal flow rights based on priority of use prior to delivery of stored water from Roosevelt Dam. Until water rights are adjudicated, there is no clarity about the size of water rights and whether they are senior or junior to other water rights in the same basin. The two general stream adjudications ongoing in the state, the Gila River Adjudication and the Little Colorado River Adjudication, are discussed further in Chapter 8. The exterior boundaries of these two adjudications include more than half of the state, where most of the Indian reservations and federal land is located. The adjudication courts have been working on Indian and federal non-Indian claims first, and then intend to move to state-law-based water claims. There are nearly 26,500 parties in the Gila River Adjudication and over 3,000 parties in the Lower Colorado River Adjudication. Because of the complexity of the legal and hydrologic issues involved, final resolution of the water rights in these basins is elusive. The adjudication proceedings have been ongoing for several decades, and it is likely that there will be no significant resolution in the near future. This lack of certainty limits management options and makes enforcement of the surface water law more difficult.

The Distinction Between Groundwater and Surface Water

Arizona's courts since statehood have handled surface water and groundwater separately, despite the hydrologic connection between the two sources. This results in a number of legal and institutional issues. Surface water allocations are based on the "first in time, first in right" priority system. Groundwater generally is governed by the reasonable use doctrine that the landowner, without waste, can use water beneath the land for any beneficial purpose. There is no priority system for groundwater, other than the grandfathered groundwater rights system within the AMAs that protects water users that were in place prior to the 1980 adoption of the GMA. Rights to groundwater were relegated to the courts for some time before any action was taken by the state

legislature to regulate or control its use.

Because the water rights system does not acknowledge the hydrologic connection between surface water and groundwater, it generally is not possible to limit groundwater pumping in order to protect surface water rights or riparian habitat. However, the courts have found that if pumping subsurface water appreciably diminishes the flow of the surface stream, then the water is deemed to be subflow and subject to the general adjudication. An Arizona Supreme Court case determined in 2000 that a well is subject to adjudication if it is located either in the saturated floodplain alluvium or outside of the younger alluvium and has a cone of depression that extends into the subflow zone. Factors likely to be considered in individual cases include the elevation, gradient, flow direction and chemical makeup of the water. Key problem areas within the state related to the distinction between groundwater and surface water include the San Pedro River and the Verde River basins.

RIPARIAN PROTECTION

The need to quantify and prioritize the surface water rights in the state as well as to distinguish which water sources meet the legal definition of “groundwater” and which are “surface water” is essential to a workable water management system. Resolving this confusion is of particular concern in the areas where water is pumped from wells in the vicinity of surface water streams. Establishing which wells are pumping groundwater and which are pumping subflow is a necessary step for enforcing the surface water law. This determination generally has not been made. Over-pumping of water from wells has had significant impacts on surface flows in the state and has resulted in the elimination of a large percentage of the natural perennial flow of miles of rivers.

Most of the remaining perennial flows in the state are outside of the AMAs (Figure 9.10), and many support areas of high biodiversity, including endangered species, as well as have significant aesthetic and recreational value. Many top tourist destinations within the state are associated with flowing water. Impacts of pumping on surface water flows are of particular concern

along the Salt, Verde and San Pedro Rivers.

There is a type of surface water right called “instream flow rights” that can be established based on the need for particular flow levels to protect habitat or recreational uses. However, few such rights have been established, and they have recent priority dates, so are generally junior to other rightsholders in a watershed. The only state program that provides funding for riparian protection and restoration, the Arizona Water Protection Fund, has received no appropriations for the last few years. The Arizona Water Protection Fund Commission, which was created by the legislature to preserve and enhance flows in rivers and streams and their associated riparian habitats, continues to be staffed by ADWR, although only a few small restoration and riparian land use management projects are still underway. Projects funded previously were instrumental in preserving riparian habitats throughout the state. The lack of mechanisms to protect the remaining riparian areas is an issue given development pressure and changing climate conditions.