

Institutional Framework Impacting East Valley Water Management

BRIEF EVOLUTION OF WATER MANAGEMENT IN ARIZONA

Groundwater levels in the Phoenix-Mesa metropolitan area have been adversely impacted by historic overuse of groundwater. Overuse of groundwater has several negative consequences, to include increasing costs to drill and pump wells. Water quality can also suffer from overuse as naturally salty areas in the aquifer and industrial contaminant plumes underground move over time towards cones of depression in the aquifer. In areas of severe groundwater depletion, the earth's surface may subside, causing fissures that can damage roads, canals, foundations, and other structures. But by far the most severe impact of overuse to a city's economy is an unreliable water supply.

During the mid 1900s, as Arizona cities evolved from an agricultural to an urban economy, policy makers became increasingly concerned about the adequacy of water supplies to support the state's growth. Under federal pressure to preserve its groundwater resources or risk loss of support for the Central Arizona Project, in 1980 water users came together to develop a comprehensive groundwater management plan, known as the Arizona Groundwater Management Act of 1980.

THE ARIZONA GROUNDWATER MANAGEMENT ACT

The Arizona Groundwater Management Act of 1980 (the Code) broadly defines the institutional rules under which entities and persons can use groundwater. The history of the Code and its main provisions are well documented, and for a perusal of these issues the reader is referred elsewhere¹. Each active management area (AMA) has its own goal and management plan to reach this goal, but the management plans further refine what the Code does broadly: determine the manner in which individual entities and persons can make use of groundwater. The development of the East Valley Water Forum's regional groundwater model depends very much on the institutional context provided by the Code. A discussion of the more relevant aspects of the Code follows.

The Code has three primary goals: to control severe overdraft, to provide a means to allocate the state's limited groundwater resources, and to augment Arizona's groundwater through water supply development.

The Arizona Department of Water Resources (ADWR) was created to administer and enforce the Code. Active Management Areas (AMAs), where historic groundwater

¹ Arizona Revised Statutes, Title 45 – Arizona Laws Relating to Water, Third Management Plan for the Phoenix Active Management Area – 2000-2010, Third Management Plan for the Pinal Active Management Area – 2000-2010

overdraft was most severe, were created to apply the highest level of management. The boundaries of the AMAs are defined by groundwater basins rather than by political lines of cities or counties. Membership in the East Valley Water Forum spans both the Phoenix and Pinal AMAs. The goal of the Phoenix AMA is safe-yield by 2025. Safe-yield is a term that means a long-term balance between the amount of groundwater withdrawn in the AMA and the amount of natural and artificial recharge. The management goal of the Pinal AMA is to allow development of non-irrigation uses and to preserve existing agricultural economies in the AMA for as long as feasible, consistent with the necessity to preserve future water supplies for non-irrigation uses.

The Code contains the following key provisions:

- Establishment of a program of groundwater rights and permits.
- A provision prohibiting irrigation of new agricultural lands within AMAs.
- Preparation of a series of five water management plans for each AMA designed to create a comprehensive system of conservation programs and other water management strategies.
- Development of a program requiring developers to demonstrate a 100-year assured water supply for new growth.
- A requirement to meter/measure water pumped from all large wells.
- A program for annual water withdrawal and use reporting. These reports are used by ADWR to ensure water-user compliance with the provisions of the Code and management plans. Penalties can be assessed for non-compliance.

GROUNDWATER RIGHTS

Within the Phoenix and Pinal AMAs, a groundwater authority is required to pump groundwater. There are two categories of wells and groundwater withdrawals; exempts and non-exempt. A well is considered "exempt" if its pump capacity does not exceed 35 gallons per minute. Exempt wells can be used to pump for non-irrigation purposes, such as domestic purposes. Exempt wells must be drilled by a licensed driller, and must be registered with ADWR but are not subject to any other management requirements. Non-exempt wells have a pump capacity greater than 35 gallons per minute. The following types of rights or permits are required to withdraw water from non-exempt wells in the Phoenix and Pinal AMAs.

Irrigation grandfathered rights (IGFR): An IGFR confers the right to irrigate specific parcels of land that were historically irrigated with groundwater between 1975 and 1980. Land without an IGFR may not be irrigated with groundwater. IGFRs are appurtenant to the land, and specify how much groundwater may be used on that land, though the amount may change over time according to conservation goals required by the management plan of the AMA.

Type 1 non-irrigation grandfathered rights: A Type 1 right is derived from land that once had an IGFR, but has since been permanently retired from farming and irrigation. This right is generally appurtenant to the land, and only three acre-feet per acre of groundwater may be pumped each year using a Type 1 right.

Type 2 non-irrigation grandfathered rights: A Type 2 right is derived from the maximum annual historic pumping of groundwater for a non-irrigation use between 1975 and 1980. Non-irrigation uses include golf course and industry use. Type 2 rights are not appurtenant to the land and are frequently leased or sold for use in another location within the same AMA.

Service Area Rights: Service area rights allow cities, towns, private water companies, and irrigation districts to withdraw groundwater to serve customers. Within the East Salt River Valley sub-basin, service area rights are held by the following entities: City of Apache Junction, Arizona Water Company, City of Chandler, Chandler Heights Irrigation District, Diversified Water Utilities Inc., Town of Gilbert, H2O Inc., Johnson Utilities, City of Mesa, Pima Utilities, Queen Creek Irrigation District, Queen Creek Water Company, Roosevelt Water Conservation District, Salt River Project, San Tan Irrigation District, City of Scottsdale, and City of Tempe.

A list of grandfathered groundwater rights, general industrial use permits, exempt wells and associated water withdrawals in the East Salt River Valley Sub-basin is provided in Appendix L.

Withdrawal Permits: Currently there are eight types of withdrawal permits that allow new withdrawals of groundwater for non-irrigation uses within AMAs. Examples of withdrawal permits include hydrologic testing permits, general industrial use permits, dewatering permits, and poor-quality groundwater-withdrawal permits.

Each type of permit or right is subject to certain conditions on the duration, quantity and purpose of the groundwater use. The Code directed ADWR to develop and implement water conservation requirements for agricultural, municipal and industrial water users in five consecutive "Management" periods. The years 2000 through 2010 comprise the Third Management Period.

Groundwater pumped from non-exempt wells in the Phoenix and Pinal AMAs must be reported annually to ADWR and users must pay an annual groundwater withdrawal fee. The fee is used to offset the cost of managing groundwater and to fund the augmentation efforts of the Arizona Water Banking Authority. Withdrawal fees also may be used for conservation assistance, augmentation projects and, after 2006, retirement of irrigated land.

ASSURED WATER SUPPLY REQUIREMENTS

In the Phoenix and Pinal AMAs, subdivided or unsubdivided land cannot be sold or leased without demonstration of an assured supply of water to ADWR. To receive an assured water supply certificate from ADWR in the Phoenix and Pinal AMAs, a developer must demonstrate that water of adequate quantity and quality is legally available to sustain the development for 100 years, the use of water is consistent with the AMA management plan, and that the water provider has the financial capability to build the water delivery infrastructure necessary to serve the development. In the Phoenix AMA, consistency with the AMA management plan essentially requires that new growth is not dependent upon mined groundwater. In the Pinal AMA, however, consistency with the management plan allows for the limited use of mined groundwater in providing adequate supplies. Because most cities desire to facilitate development, many have decided to become “designated” with an assured water supply from ADWR. Once a city has become designated, the developer of lands within that city need only obtain written commitment of service from the water provider to subdivide and sell lands.

The assured water supply requirements have increased renewable water resource use and decreased dependence on groundwater. Municipal water providers in the Phoenix AMA are using CAP allocations earlier than expected and are eager to acquire more CAP and other renewable surface water supplies to comply with assured water supply requirements.² Regional water management techniques have flourished both within and outside Active Management Areas. Prominent examples include the Subregional Operating Group that owns and manages the 91st Avenue Wastewater Treatment Plant, Arizona Municipal Water Users’ Association, WESTCAPS, the operating agreements between the Salt River Project and its member cities, and the Modified Roosevelt New Conservation Space agreements. These regional water management arrangements have been purely voluntary and grassroots in nature, and have flourished where economies of scale and common interest have created an organic incentive to do so. The East Valley Water Forum’s regional groundwater management plan is also a voluntary undertaking, founded on the idea that common economic interest will bind parties in agreement. Although the Code itself is a regulatory tool and does not provide incentives for regional planning per se, the Code does in most cases require the increased use of renewable water supplies, and this, together with the large economies of scale involved in water transport, has created a situation in the AMAs in which regional water management has flourished.

² Speech by Bob McCain, AAI Environmental Summit August 13-15, 2003, “The Arizona Legislature and WMD (Water, Management, Drought): No Shock, No Awe? No Way!”

PUMP AUTHORITIES AND WELL SPACING

The Code provides several groundwater withdrawal authorities, including Irrigation Grandfathered Rights, Type I Irrigation Grandfathered Rights, Type II Irrigation Grandfathered Rights, Service Area Rights, and other permits and authorities. When combined with ADWR's well spacing rules, these authorities define the manner in which each entity in the region may withdraw groundwater.

Well spacing rules are intended to protect both the aquifer and other well owners from excessive draw down and water quality degradation in localized areas. The East Valley is a heavily populated area with innumerable wells that serve domestic, industrial, and agricultural purposes. Due to the need for adequate well spacing to prevent drawdown interference, the need to protect against water quality degradation caused by pumping, and other needs, it is sometimes very difficult for water providers to site a new well. This difficulty creates an incentive for water providers to use wells cooperatively with other providers when beneficial and physically possible. For example, several Valley cities have made arrangements to use Salt River Project wells to deliver water to city customers. Cooperative well arrangements will become increasingly important as cities plan for eventual shortage on the CAP system when reliance on recovered long-term storage credits will increase.

RECHARGE SITES

Recharge of the aquifer is an important regional groundwater management tool, and several recharge facilities are operated cooperatively, including the Granite Reef Underground Storage Project (GRUSP) in the East Valley. However, the development of a recharge facility is extremely time-consuming and expensive, at least in part because the permitting process is very exhaustive and complicated. Because the permitting process is very strict, there are only very few sites within the East Salt River Valley sub-basin that could qualify for large-scale recharge, and this has a large effect on the Forum's ability to develop a regional groundwater management plan.

REGULATIONS PERTAINING TO RECLAIMED WATER

The Arizona Department of Environmental Quality regulates the use of reclaimed water. Regulations apply to wastewater treatment plants that produce reclaimed water and to the sites where reclaimed water is applied or used.

All wastewater treatment facilities providing reclaimed water for reuse are required to have an individual Aquifer Protection Permit (APP). The APP is intended to ensure that the underlying aquifer is protected from contamination that might occur under different water quality classes and forms of reuse, and is necessary for recharge of the aquifer using reclaimed water.

Wastewater treatment plants treat to different quality standards, and the quality of the reclaimed water determines the uses to which the water can be put. Class A reclaimed water is required for reuse applications where there is a relatively high risk of human exposure to potential pathogens in the reclaimed water. For uses where the potential for human exposure is lower, Class B and Class C are acceptable. The Reclaimed Water Quality Standards also include Class A+ and Class B+. Both categories require treatment to produce reclaimed water with a total nitrogen concentration of less than 10 mg/l. Class A+ and Class B+ reclaimed water minimize concerns over nitrate contamination of groundwater beneath sites where the reclaimed water is applied. Class A+ reclaimed water is suitable for irrigation of crops for human consumption.

A list of the wastewater treatment facilities in the East Valley, their treatment capacities, location, and the quality to which they treat reclaimed water is provided in Appendix E.

CENTRAL ARIZONA GROUNDWATER REPLENISHMENT DISTRICT (CAGR)

The Central Arizona Groundwater Replenishment District (CAGR) was created by the Arizona legislature in 1993 under pressure from developers who were concerned about the new assured water supply program requirements to use renewable supplies to meet the demand of new growth.³ CAGR provides a mechanism for landowners and water providers to demonstrate an assured water supply while maintaining reliance on groundwater. CAGR is governed by the CAWCD and is in fact the same legal entity as the CAWCD.

CAGR demonstrates consistency with the management goal of the AMAs in which it operates by agreeing to replenish the groundwater use of its members. CAGR members do not need to purchase, transport, and treat renewable surface water supplies to meet the needs of their customers. Instead, they can rely on groundwater pumping that is replenished by CAGR, either within or outside the area of hydrologic impact. Because pumping groundwater is cheaper than building surface water treatment plants, CAGR, in effect, takes away any incentive for new growth to occur on direct use of renewable surface water supplies.

There are two membership categories: member service areas and member lands. A member service area is the service area of a municipal provider that joins CAGR. A parcel becomes member land when the owner records a covenant binding all successors and assigns of the owner to pay a replenishment tax to CAGR. Paying

³ AMWUA paper, "SB 1425 Central Arizona Groundwater Replenishment District Chapter 200, Laws 1993"

CAGRDR's replenishment tax for excess groundwater use accomplishes the provider's or the landowner's need to demonstrate consistency with the management goal.

Assured water supply rules make it nearly impossible for growth to occur on mined groundwater in the Phoenix AMA, and this provided a strong regulatory incentive for municipal providers to acquire, treat, and deliver CAP water and other renewable surface water sources. CAGRDR membership removes this incentive if the provider has sufficient access to groundwater. In effect, the existence of CAGRDR has allowed large-scale developments in the Phoenix AMA to depend entirely upon groundwater pumping to meet customer demand and to avoid the need to purchase, transport, and treat renewable surface water supplies. CAGRDR membership provides a financial disincentive for direct renewable surface water supply use, and to a lesser degree, also provides a financial disincentive for developing infrastructure to reuse reclaimed water.

Currently, the City of Scottsdale, the Town of Gilbert, the Water Utilities Community Facility District (City of Apache Junction), [Arizona Water Company], and Johnson Utilities are the only CAGRDR member service areas in the East Valley. 189 subdivisions in the East Valley have enrolled as CAGRDR member lands, representing 25,884 homes.⁴

It is projected in the CAGRDR 2004 Plan of Operation that the replenishment obligation for existing CAGRDR members in the East Valley will reach 25,000 acre-feet per year by the year 2025. However, it is projected that the replenishment obligation for the members projected to be added in the next ten years will reach 58,600 acre-feet per year by the year 2025, for a total replenishment obligation of 83,600 acre-feet. It is important to note, however, that the projection of 83,600 acre-feet does not include the replenishment obligation of any members that may join after 2015.⁵

The issue is relevant to East Valley regional groundwater management because replenishment of CAGRDR members' groundwater use need not take place near where the groundwater pumping occurred. Indeed, in the East Valley there is only one existing large-scale recharge facility, GRUSP, and only one other planned in the vicinity of the CAP canal and Queen Creek. Despite the increasing population east of Mesa and Gilbert, membership in the CAGRDR is the mechanism by which developers achieve an assured water supply for their developments, making the area almost entirely groundwater dependent. The impact of this magnitude of groundwater pumping may be felt throughout the entire region and is directly relevant to the Forum's regional groundwater management plan.

⁴ CAGRDR Plan of Operation dated November 8, 2004.

⁵ *ibid*