

# **SYSG - Issue Papers - 2009 Updates Per Priority/Achievability Discussion**

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**\* 2009 UPDATES AND COMMENTS HIGHLIGHTED.**

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## **ISSUE 2: AGRICULTURAL GROUNDWATER RIGHTS**

There are concerns about the impact that grandfathered right holders will have on achievement of the safe-yield goal. Although agricultural interests are expected to withdraw smaller amounts of groundwater over time, they have a right to continue to mine groundwater in perpetuity.

### **BACKGROUND**

Agricultural grandfathered rights to groundwater currently account for 38% of the AMA's groundwater pumping that is not subject to a replenishment obligation (residual groundwater pumping), or approximately 132,500 acre-feet. Due to an anticipated reduction in non-Indian

irrigable acreage, agriculture is expected to be responsible for 28% of the 2025 residual groundwater pumping, or 54,000 acre-feet.

Agricultural groundwater rights are quantified by the conservation requirements in the management plans. Water duties are set based on historic cropping patterns and a maximum efficiency of 85%, but an uncapped "flexibility account" allows for substantial credits to accrue that can be used at any time in the future. Credits accrued in the previous year can also be sold to other farmers in the same irrigation district (those outside of a district can also sell credits to each other). The formula used to establish the water duty for each farm is based on the highest number of acres planted between 1975 and 1980. This formula tends to over-allocate water to most farms. In addition, land that lies fallow (regardless of the reason) continues to accrue credits. The current flexibility account balance for the Tucson AMA is over 800,000 acre-feet.

Since agricultural flex credits can only be used for agricultural purposes, and most farms have more than they can use, most credits are expected to disappear when the farm transitions to urban development. However, concerns remain about the impact of irrigation grandfathered rights and flexibility account credits on the achievement of safe-yield.

## **SOLUTIONS CONSIDERED**

**The following ideas have been considered. Additional ideas may be added to this list.**

- **Agricultural flex credits could be capped so that they provide flexibility to respond to changing conditions without providing an alternative to conservation efforts.**
- **Land that was fallow for a specified number of years could be prevented from accruing flex credits. An impact analysis of this proposal would be needed to avoid sending a "use it or lose it" message.**
- **The ability to transfer flex credits between farmers should not be expanded.**
- **Flex credits should not be transferable to other sectors under any circumstances.**
- **The statutory formula for establishing water allocations for farmers (water duties) could be re-evaluated to encourage on-farm efficiency.**
- **The use of credits could be subject to approval by a board that would evaluate applications by farmers. The review board could make the decisions on whether credits above a certain amount could be used, subject to efficiency demonstrations and conservation efforts by the farmer.**
- **If agricultural groundwater use does not follow expected declining groundwater usage trends, trigger a replenishment requirement or diminish volume of rights.**

## **PRELIMINARY RECOMMENDATIONS**

**An evaluation of capping flex credits to a certain maximum volume that takes into account cropping patterns, weather variability and other factors should be conducted. Also, the possibility of limiting accrual of credits for agricultural lands that are permanently out of production should be considered. The inability to transfer flex credits to other sectors under any circumstances should be continued. In addition, any further**

**recommendations should consider the current activities of the Department and the agricultural community in development of Third Management Plan agricultural conservation programs.**

## **OBSERVATIONS**

It should be noted that agricultural interests made a substantial contribution to the achievement of safe-yield in agreeing that there could never be any new irrigated land in AMAs. This limitation on expansion stands in contrast to the water rights for municipal entities and copper mines. Municipal entities can expand their overall water use so long as they limit their per capita use and use renewable supplies; mine expansion is allowed on the basis of mineral extraction permits.

Regulating accrual of flexibility account credits gives farmers the incentive to use more water to reduce the credit accounts. It is important to avoid unintended consequences in designing alternative regulatory approaches.

There is value in continuing to have agricultural activity in the region other than contributions to the economy and production of goods for consumers. Agricultural land can be fallowed in response to drought conditions, allowing for flexibility to use their water supplies for municipal purposes during shortages. In addition, agricultural land has value as open space.

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## **ISSUE 9: INDUSTRIAL GROUNDWATER RIGHTS**

Industrial water users with grandfathered rights may continue to mine groundwater in perpetuity. This represents an ongoing impact on the ability of the AMA to achieve the safe-yield goal. Industrial interests have grandfathered rights that far exceed the amount of water currently used by industrial rightholders and permits may be obtained for new industrial uses. This represents the potential for an increase in industrial groundwater pumping over time.

### **BACKGROUND**

Industrial water users include turf-related facilities (e.g. golf courses, parks, schools, and cemeteries), sand and gravel facilities, metal mining facilities, large-scale power plants, large-scale cooling facilities, dairies, and other uses not served by service area rights or agricultural grandfathered rights. Industrial grandfathered rights and permits to groundwater currently account for about 58,600 acre-feet (17%) of the AMA's residual pumping. Industrial groundwater use is projected to increase to 70,700 (37%) by 2025. Rights and permits held by industrial users total nearly 195,000 acre-feet. In 1997, the unused portion was more than 136,000 acre-feet. Except for new turf-related facilities subject to the Pima County and City of Tucson renewable supply use ordinances, industrial users may use groundwater up to the volume of their right allotment.

There are several types of industrial rights and permits including Type 2 Mineral Extraction Grandfathered Rights, Type 2 Non-Irrigation Grandfathered Rights, Type 2 Power Generation Grandfathered Rights, Type 1 Grandfathered Rights and Groundwater Withdrawal Permits. Mineral extraction and power generation Type 2 rights can only be used for those purposes while other Type 2 non-irrigation rights may be used for a variety of industrial uses. Groundwater Withdrawal Permits are issued for dewatering, hydrologic testing, poor quality water mitigation, temporary electrical energy generation, drainage improvement, mineral extraction and for general industrial use. With the exception of dewatering, poor quality water

mitigation and drainage improvement permits, these permits are "shall issue" as long as certain provisions specified in the Code are met. Type 2 rights are transferable within the AMA. In 1997 water use by mines and sand and gravel operations accounted for 11% of the AMA water use, electric power used 1% and 3% of the total use was used by Type 2 non-irrigation rightholders.

Irrigation grandfathered rights may be retired to a Type 1 non-irrigation right. Irrigation rights and Type 1 rights are appurtenant to land and may not be transferred as can Type 2 rights. When retired, the volume of the irrigation right is diminished on an acre-foot per acre basis with no more than 3 acre-feet per acre allotted under the Type 1 right. While this retirement diminishes the volume of water that can be withdrawn pursuant to grandfathered rights, it allows an increase in industrial groundwater use, typically for golf courses.

Of the 74,000 acre-feet of Type 1 allotment in the AMA, only 3,000 acre-feet, 1% of the total, was used in 1997. The largest holder is the City of Tucson and municipal pumping by Tucson is subject to replenishment. Groundwater Withdrawal Permit volumes are small, accounting for about 2% of the AMA residual pumping. The number of permit applications may increase in the future as the availability of Type 2 rights to serve industrial uses becomes more limited.

While there is a large volume of unused allotment that could potentially be used, it is unlikely that the full volume would actually be put to use. Type 1 and non-irrigation Type 2 rights may be extinguished for assured water supply credits. This provides a mechanism to permanently extinguish industrial rights. Because industrial rights may continue to use groundwater and new industrial users, such as golf courses constructed on retired farmland, are expected to expand in the future, industrial users represent an ongoing impact on the achievement of safe-yield.

## **SOLUTIONS CONSIDERED**

**The following ideas have been considered. Additional ideas may be added to this list.**

- **Mines and sand and gravel operations should be encouraged to use renewable water supplies to the maximum extent practicable considering economic costs and benefits. Investigate ways to implement a replenishment obligation.**
- **Consider limiting the transfer of Type 2 rights to other facilities (e.g. electric power rights could not be transferred to a new location to start a new use) or lease or sale of Type 2 rights owned by water providers. On transfer of a Type 2 right, require proof that renewable supplies are not available.**
- **Limit Irrigation GFR conversion (retirement) to Type 1 rights (which is a method to establish a new golf course) either during a phase out period or after 2025. This could involve a reduction in the volume allowed under the conversion over time.**
- **Issue new general industrial use and mineral extraction permits only if there is some obligation to replenish or use renewable supplies directly.**
- **Limit use of Type 1 water to the original appurtenant land. Currently, use off the land is allowed subject to certain conditions.**

## **PRELIMINARY RECOMMENDATIONS**

- **Mines and sand and gravel operations are the largest industrial user category in the Tucson AMA and have the potential to use renewable**

**supplies in the extractive process. An investigation of cost effective mechanisms to promote the use of renewable water supplies, such as incentives or a replenishment obligation, needs to be pursued.**

- **Investigate restricting the conversion of Irrigation GFRs to Type 1 rights as a way to constrain the amount of new industrial use in the future. The legal implications and mechanisms of restricting conversion need to be examined. Restrictions could be phased in, such as reducing the conversion volume allowed over time, or could take effect after a specific time such as 2025.**
- **Investigate establishing conditions for the issuance of new general industrial use permits and mineral extraction permits that would require the use of renewable water supplies. This would involve legal and economic feasibility considerations.**

### **OBSERVATIONS**

Unlike municipal entities, industrial pumpage is limited by the volume of the right or permit. However, new permits can be issued for new industrial uses. Renewable supply use is limited by physical, economic and legal barriers. Potential industrial users are scattered and often far removed from conveyance systems making direct delivery a less accessible option than replenishment. Water quality regulations such as wastewater reuse rules or aquifer protection permit rules may provide impediments to using CAP water or effluent although matching water quality with certain industrial users has promise. Water use by Tucson AMA metal mines is almost 70% of the total industrial use and is expected to decline in the future. If use does not decline, phasing in a replenishment requirement could be considered. However, requiring replenishment by metal mining facilities may be difficult to implement given the volatility of world markets and the difficulty of predicting water use trends. Diminishing the volume of the right over time could necessitate compensation to the user and require statutory change. Appropriate compensation to the user in some form may be needed.

The industrial sector currently uses less renewable water supplies than the municipal and agricultural sectors which raises equity issues related to sector contribution to achievement of the safe-yield goal. While replenishment by industrial users might be an alternative, if progress toward safe-yield is not being made, a replenishment requirement by all residual pumpers could be an option.

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### **ISSUE 17: UTILIZATION OF CAP IN THE TUCSON AMA**

The CAP allocations available within the Tucson AMA are not currently fully utilized. Although this is likely to be a short-term rather than a long-term issue, opportunities are being lost to maximize use and storage of CAP water while it is readily available and relatively low in cost. This issue paper focuses on the opportunities to use CAP water that have not been fully exploited, which vary based on the source of the water.

### **BACKGROUND**

In 1999, only 55,256 acre-feet of CAP water were utilized in the Tucson AMA, virtually all of it for recharge. The total amount of CAP water available through existing allocations is 215,333

acre-feet, with the potential to increase to 243,533 AF with the addition of the Southern Arizona Water Rights Settlement Act (SAWRSA) Amendments. In addition, the Arizona Water Banking Authority (AWBA) could bring in as much as 30,000 acre-feet per year of excess CAP water for storage (based on use of all the withdrawal fees collected at a cost of \$60 per acre-foot). The AWBA could potentially store more as a component of the interstate-banking program. Another issue is unused CAP currently allocated to private water companies and other entities. There is concern that certain parties with allocations may not be financially able to maintain their CAP contracts, which could lead to reallocation outside of the Tucson AMA. However, the ADWR reallocation policy gives priority to intra-AMA transfers.

There are numerous reasons why the full CAP allocations are not being utilized. Tucson Water's delivery problems in the early 1990's and a restrictive local ordinance (the 1995 Water Consumer Protection Act) have limited utilization of the City of Tucson's 138,920 AF CAP allocation (which is by far the largest in the AMA). The restrictions in the 1995 Water Consumer Protection Act have precluded direct delivery of CAP water to customers in the past. In response, Tucson Water has re-engineered its CAP water delivery systems to incorporate large-scale recharge activities, and has moved forward with large-scale recharge projects (CAVSARP and Pima Mine Road) that will increase its total utilization of CAP in the very near future. In addition, the City has agreed to store water at a groundwater savings facility at BKW farms. In the near term, the City will be storing enough water to offset about 80% of its current groundwater demand (about 87,000 AF). Other opportunities exist to use the remaining 52,000 AF of the City's allocation.

The other sub-contractors, with a combined CAP allocation of 38,100 AF, have unresolved infrastructure and water treatment issues that limit full use of their respective CAP allocations (see the attached Summary of CAP Allocations, Use Status, and Impediments). Other issues include inadequate allocations to meet current demand for some providers, lack of adequate capacity at recharge facilities, the absence of terminal storage for reliability and policy and regulatory limitations.

Flowing Wells Irrigation District, Green Valley Water Company and Community Water Company are at risk of relinquishing their CAP allocations (7,306 AF), although they would likely be reallocated within the region. The reasons for this include the following: lack of physical access to supplies, ACC limitations on passing the cost of renewable supplies on to customers and getting designations of AWS, and the capital cost of maintaining the subcontracts.

The AWBA has been unable to bank a sizable amount of water in the Tucson AMA, in part because the AWBA does not currently participate actively in development of new recharge projects, and because the current pricing policy for groundwater savings facilities (GSFs) discourages use of this mechanism in the Tucson AMA. There is a substantial disparity between the amount of long-term storage to offset shortages on the Colorado that the AWBA projects the Tucson AMA will need, and the amount that can be stored in existing direct recharge facilities. Until recently, no GSF water has been stored by the AWBA in the Tucson AMA. The current price of \$21 per AF is higher than the groundwater cost for Cortaro Marana Irrigation District, so the District has no financial incentive to store water for the AWBA. The AWBA could store water without recovery to achieve water management goals using the withdrawal fee money, but none of the current recharge facilities are ideally located for such activity.

The Arizona State Land Department (ASLD) has a 14,000 acre-foot allocation associated with certain land holdings that has generally not been utilized. ASLD originally intended to transfer portions of the allocation with land sales and there is an adopted policy on credit sharing that could be more fully utilized (see note D on the attached table). According to ASLD staff, for "Urban Planned Lands" ASLD decides if a CAP allocation will benefit the parcel. For example, a

parcel to be used for open space would not typically receive a CAP allocation. ASLD makes a recommendation to the State Selection Board (Governor, Attorney General, and Treasurer) for a decision. To date, 50 AF have been allocated with one parcel, and a few other sales potentially involving CAP allocations are being reviewed.

The Tohono O'odham Nation has CAP allocations (38,800 AF) that are not contingent on finalization of SAWRSA. The availability of these allocations for long-term lease is uncertain.

Several proposed CAP projects in the Tucson area have involved instream or near-stream recharge. Until mitigation measures such as fish barriers have been constructed to protect upstream endangered species on the Santa Cruz, these projects are unlikely to move forward.

Additional considerations such as supply reliability limit the potential for use of CAP water. The Tucson AMA's position at the end of the CAP canal and the absence of a reliability feature affect the CAP use options available. Municipal direct delivery requires some form of backup supply, but there are other users such as the mines and the Tohono O'odham that are concerned about the number and length of times the canal has already been shut down for maintenance and repair. In addition, CAWCD delivery policy sets agricultural deliveries at a higher priority than recharge, which may affect the total amount of water that can be stored in the Tucson area facilities.

#### SOLUTIONS CONSIDERED

- The State Land Department adopted policy on annual credit sharing for its 14,000 acre-foot allotment could be explored by entities with inadequate allocations.
- The State Land Department could be encouraged to transfer CAP allocations with land sales as originally planned.
- Encourage the AWBA to store more water in the Tucson AMA. The AWBA could be encouraged to store more water if: 1) in-lieu (Groundwater Storage Facility) pricing arrangements were made so that Tucson AMA entities could afford to participate; 2) general fund money was used to increase the funding available, since Tucson does not generate enough property tax money to cover the reliability needs for the region; 3) withdrawal fee money was used to recharge water without recovery for water management benefit; and 4) more Underground Storage Facilities and Groundwater Savings Facilities were developed.
- Provide opportunities for Flowing Wells Irrigation District, Green Valley Water Company and Community Water Company to utilize their CAP allocations.
- Continue to work for public acceptance of direct delivery of treated CAP water.
- Developing CAP delivery reliability for all Tucson AMA users should be a high priority goal for the State of Arizona.

#### PRELIMINARY RECOMMENDATIONS

##### 2009 Update

**CAP water remains somewhat underutilized in the Tucson AMA, but very significant strides have been made since 2000. CAP use rates have more than tripled, recharge capacity exceeds 250 kAF, and the Arizona Water Settlement Act finalized both SAWRSA and the proposed CAP reallocations. The primary remaining challenge relates to the long-term use plans of water providers other than the City of Tucson.**

- **The State Land Department should be encouraged to develop a definitive policy on transferring CAP allocations with land sales.**

**A definitive transfer policy remains elusive, though ASLD has showed some renewed interest in discussing CAP issues in the context of large land planning projects (e.g., Houghton Corridor & Arroyo Grande)**

- **The AWBA should be encouraged to implement a plan to increase its water storage in the Tucson AMA. Such a plan could include: 1) a change in the Groundwater Savings Facility pricing policy so that more Tucson AMA entities could afford to participate (less than \$21 per AF); 2) use of General Fund money (as is proposed in the 2000 budget) to increase the funding available for storing water and for participation in storage project development; 3) withdrawal fee money used to recharge water without recovery for water management benefit, if appropriate locations can be identified; and 4) more active participation by the AWBA in development of storage projects that may require new infrastructure.**

**Since 2000, the AWBA has increased storage in the Tucson AMA. AWBA Commissioners and staff have also been responsive to specific storage allocation preferences voiced by IPAG and the GUAC, including those related to participation in interstate storage. The AWBA clearly acknowledges the problems associated with the area's "Firming Gap" and very recently has shown willingness to evaluate its GSF pricing policy and consider**

- **The ACC should be encouraged to allow pass-through of capital holding costs for CAP and GRD replenishment fees to private water company customers**

#### **Unresolved.**

- **Developing CAP delivery reliability for all Tucson AMA users should be a high priority goal for the State of Arizona.**

**CAP reliability continues to be a concern to local users. The USBR has remained engaged on TASRI planning work, and has consulted with both local users and CAWCD. Obstacles to resolution include differing views on cost allocations and remaining uncertainty about CAP users' plans.**

#### **OBSERVATIONS**

The existing CAP allocations (prior to SAWRSA amendments) to the Tohono O'odham are not currently being fully used and some portion may be available for lease on an annual basis. However, with excess CAP water available, there may be little incentive for year-to-year leases of the Nation's CAP water. See attached table.

**Summary of CAP Allocations, Use, Status, and Impediments<sup>1</sup>**

August 17, 2000

<b>Entity</b>	<b>Date Sub-Contract Signed</b>	<b>Annual Allocation (acre-feet)</b>	<b>Recommended Additional Allocation<sup>2</sup> (acre-feet)</b>	<b>1999 CAP Recharge (acre-feet)</b>	<b>Impediments to CAP Use</b>
<b>Municipal and Industrial Subcontractors<sup>2</sup></b>					
City of Tucson*	2/01/85	138,920	8,206	14,984	E, F
Arizona State Land Department	11/25/86	14,000		0	A, B, D, H, I
Metropolitan Domestic Water Improvement District*	5/08/98	8,858	4,602	4,220	A, B
Flowing Wells Irrigation District	6/19/85	4,354		0	A, B, G
Spanish Trail Water Company*	11/16/90	3,037		12,598	A, B, J
Green Valley Water Company*	6/18/85	1,900		0	A, B, G
Town of Oro Valley*	1/18/97	2,294	3,557	2,000	A, B, C
Midvale Farms	3/08/85	1,500		0	A, B, K
Community Water Company of Green Valley*	5/17/85	1,337	1,521	0	A, B, C, G
Vail Water Company (formerly Del Lago W.C.)	12/27/84	786	1,071	0	A, B
Town of Marana	1/21/85	47		47	A, B, C
Avra Water Cooperative		0	808	0	A, B, C
<b>Subtotal:</b>		<b>177,033</b>	<b>19,765</b>	<b>33,849</b>	
<b>Indian Subcontracts</b>					
Tohono O'odham - San Xavier		27,000		0	Demand is currently limited
Tohono O'odham - Schuk Toak		10,800		0	Planned use is for irrigated Agriculture
Pascua Yaqui		500		0	Demand is currently limited
<b>Subtotal:</b>		<b>38,300</b>		<b>0</b>	
<b>AZ Water Bank</b>				<b>21,395</b>	
<b>CAWCD</b>				<b>12</b>	
<b>Total:</b>		<b>215,333<sup>3</sup></b>		<b>55,256</b>	

- A = No conveyance structure(s) in place for delivery/use
  - B = Water treatment needed for direct potable use
  - C = Insufficient allocation to meet current demand
  - D = Per ASLD policy, CAP allocations must be tied to land development. Interim agreements to use the ASLD allocation are possible.
  - E = Infrastructure/facilities not available for full scale recharge
  - F = Water Consumer Protection Act
  - G = No designation of AWS, no perceived need for using renewable supplies
  - H = Transfer of CAP requires Committee approval (including director of SLD and Governor)
  - I = Interested in credit sharing on annual basis
  - J = Change in Pima County Golf Course ordinance may affect continued interest in groundwater savings credits
  - K = Allocation may be transferred to City of Tucson, which is serving the area
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<sup>1</sup> Agricultural and copper mining water users declined CAP water subcontracts in the Tucson AMA. Non-Indian agricultural CAP water use has been limited to groundwater savings facilities (GSF). All CAP water “use” in the Tucson AMA since 1995 has been storage in groundwater recharge projects.

<sup>2</sup> On December 2, 1999 ADWR recommended to the Secretary of the Interior CAP additional allocations to Tucson AMA municipal providers.

<sup>3</sup> SAWRSA amendments may add 28,200 acre-feet of CAP to the Tohono O’odham allocation.

\* Indicates participation in CAP recharge project.

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## **ISSUE 8: FINANCING WATER INFRASTRUCTURE**

In the Tucson AMA, infrastructure for use of renewable supplies is not in place to meet the potential demand. Obtaining financing for new infrastructure is a major impediment to more complete use of renewable supplies. Projects that would involve multiple jurisdictions and/or private parties are particularly difficult to finance. However, if financing issues can be resolved, several projects with long-term water management benefits to the Tucson AMA could proceed.

### **BACKGROUND**

The Tucson AMA has a number of clearly identified infrastructure needs associated with renewable supplies. There is particular interest in delivering CAP water to the Cañada del Oro (CDO) and Sahuarita-Green Valley. ADWR, the United States Geological Survey, the Bureau of Reclamation and the local water providers have all committed resources to feasibility analyses and other studies. Delivering CAP water to these areas for recharge and/or direct delivery could have considerable benefit to the regional aquifer. There has also been consideration of building additional smaller systems for delivery of renewable supplies to agriculture and mining

Unfortunately, water infrastructure is often very expensive to build, operate and maintain, and the associated financing issues are complex. The expense and financing complexity combine to create a significant obstacle to project implementation. Furthermore, issues such as timing, political acceptability and level of public support also influence financing decisions.

Discussions of infrastructure financing often focus on obtaining funds to build a particular project. However, the repayment issues are often more important. The repayment mechanism (water rates or property taxes) and geographic extent (areas that will benefit from the project)

often determine funding options, so they must be addressed early. In many cases, if the issues of repayment can be resolved, locating funding sources is comparatively straightforward.

With rare exceptions, “free money” in the form of grants is unavailable, and “pay-as-you-go” may end up costing more and taking longer than up-front financing. Therefore most infrastructure is paid for by incurring debt in the form of bonds. Bonds represent pledges of either future property taxes (for general obligation bonds) or future revenues (revenue bonds). Municipal entities (including most special districts) can issue their own bonds. However, for water projects, it may be advantageous for the Arizona Water Infrastructure Finance Authority (WIFA) to act as an intermediary. WIFA can subsidize the interest rate of certain projects by using federal Safe Drinking Water or Clean Water Act revolving funds, and they can provide technical assistance.

For many public infrastructure projects, the area of benefit (and thus repayment) is established with the creation of a special district. Title 48 of the Arizona Revised Statutes provides for numerous types of districts. For projects that fall completely within an existing municipality there are several options, including the versatile Community Facilities District. Over time other special districts with the potential to participate in the development of water infrastructure have been authorized. These include the Active Management Area Water District (i.e. SCVWD), Groundwater Replenishment District (i.e. Phoenix GRD, *not* CAGR), County Water Augmentation Authority (Pinal AMA), and the Multi-County Water Conservation District (i.e. CAWCD/CAGR).

Title 48 does not provide for a special district for water infrastructure that would span multiple jurisdictions and meet all the other project requirements. One possible exception is a Domestic Water Improvement District (DWID), but for the CDO there is a legal question as to whether a newly created DWID could encompass the existing DWID (i.e. Metro Water). Furthermore, even if a DWID-in-DWID is legal, there is an emerging consensus that creation of a new type multi-jurisdictional special district (perhaps modeled after the community facilities district) would be beneficial for financing projects in the Tucson AMA and elsewhere.

Creation of a special district usually requires approval of those within the proposed boundaries. Factors affecting the likelihood of approval include the type of governing board (elected or appointed); the threshold for approval (majority of people or majority of land value); and the method and formula used to calculate repayment obligations. Repayment also raises issues of equity. For instance, repayment through water rates establishes some equity among current users (the more you use the more you pay), but future users gain benefit from a healthier aquifer without having to pay for it. Property tax assessments provide some equity based on ability to pay, but some taxpayers would be subsidizing others.

A multi-way intergovernmental agreement (IGA) is a potential financing mechanism that would not require the creation of a multi-jurisdictional district. In the case of the CDO, each of the municipal partners (Marana, Oro Valley and Metro Water) could create a special assessment district within their boundaries. Bonds would be posted on behalf of all of the entities, and the repayment of the debt would be specified in the terms of the IGAs. While such an arrangement is possible, it is inherently complex, available bonding capacity may be low and interest rates might be high. Furthermore, a multi-way IGA would not be applicable to the Green Valley projects because private interests would be involved.

There are many other examples of “creative financing” for infrastructure, including creation of a non-profit organization, elaborate lease-payback arrangements with private investors, “bridge financing” to meet large future demand, and municipalities issuing bonds on behalf of others. Ultimately however, the issue of repayment is critical. If you can identify a sufficient stream of

money for repayment, and the institutional issues can be resolved, there is usually a way to raise the required capital.

### **SOLUTIONS CONSIDERED**

**The following solutions have been considered. Additional ideas may be added to this list.**

- **Create a new type of special district for multiple jurisdictions, modeled after the Community Facilities District.**
- **Modify the statute of an existing special district to accommodate project needs.**
- **Enter into a multi-party IGA (for CDO project).**
- **Create a new Domestic Water Improvement District that incorporates existing jurisdictions.**

### **PRELIMINARY RECOMMENDATIONS**

- **Write enabling legislation for a new type of special district that would span multiple existing jurisdictions, including multiple counties. The statutory provisions should be flexible enough to accommodate a number of project types and circumstances. The legislation could be modeled after the Community Facilities District (A.R.S. § 48-701) which authorizes both general obligation and revenue bonding capacity, and has explicit ability to receive assistance from the Arizona Water Infrastructure Finance Authority (WIFA).**

### **OBSERVATIONS**

The continued availability of inexpensive groundwater affects the relative feasibility of many projects. The required rise in property taxes or water rates to repay debt could be too high to be politically acceptable. The incentives to use renewable supplies, and the long-term benefits that would accrue, may not be sufficient to overcome the costs of some infrastructure projects.

The timing and feasibility of a number of projects may be affected by proposed water quality standards. The proposed standard for arsenic, for instance, may make the use of CAP water (which is low in arsenic) more cost-effective than treatment at individual groundwater wells (some of which significantly exceed the proposed standard).

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## **ISSUE 16: SUB-AREA MANAGEMENT**

In the Tucson AMA, several limitations have been identified with basin-wide implementation of safe-yield. In the context of safe-yield as currently defined, some portions of the basin may be experiencing ongoing declines while water levels are rising elsewhere. Physical problems that may continue to occur include the following: groundwater quality problems, loss of riparian habitat, subsidence, inadequate water supply, and dropping water levels. An overlay approach that provides for additional management tools in specific regions of an AMA is being explored.

### **BACKGROUND**

The management goal of the Tucson AMA is "safe-yield," defined in the Groundwater Code as a long-term balance between groundwater withdrawals and natural and artificial recharge in an AMA. A.R.S. § 45-561. Achieving a "paper balance" between withdrawals of groundwater and recharge does not ensure that other water management objectives are met. For example, in

Tucson's central wellfield, if groundwater level declines continue, subsidence will be exacerbated, Tucson's ability to prove physical availability of water for AWS purposes will be reduced, pumping and distribution costs will increase, and the riparian habitat in the Tanque Verde area may be damaged. These ongoing declines are permissible so long as they are offset elsewhere in the AMA under the current definition of safe yield.

The concept of sub-area management, (previously referred to as "critical area management") has received substantial attention during the past several years. Water supply and demand conditions vary widely across the AMA, and some portions of the AMA are particularly sensitive to damages associated with dewatering the aquifer. There are very few tools available in the Groundwater Code to address specific sub-areas. The criteria for recovery of stored water outside the area of hydrologic impact in the management plans are the only current regulations designed to address local impacts; it is possible that well-spacing rules (which have not yet been promulgated) could address portions of this problem using current authorities.

### **SOLUTIONS CONSIDERED**

**The following ideas have been considered. Additional ideas may be added to this list.**

- **Change the AMA-wide management goal of safe-yield to a more specific goal, e.g.: "to reduce declining groundwater levels, while achieving, and thereafter maintaining, a long-term balance between AMA-wide withdrawals and recharge" or "sustainable yield" to encourage a recharge surplus rather than a balance between withdrawals and recharge. Sustainable yield, in this context, would include a component to protect surface water flows, not just a groundwater balance.**
- **Require that safe-yield be achieved on a sub-basin, or portion of AMA basis in discrete areas of the AMA.**
- **The "overlay approach", which retains the statutory safe-yield definition for the entire AMA, but would set goals for certain areas, perhaps to maintain or restore water table elevations in riparian areas, prevent or mitigate subsidence in others, or to contain groundwater contamination.**

### **PRELIMINARY RECOMMENDATIONS**

- **The overlay concept should be further developed. It should provide the necessary tools to allow the establishment of sub-areas within AMAs that would have specific restrictions, incentives and management goals. The sub-areas would be established in areas of concern where existing authorities to respond to the problems are generally found to be inadequate. The boundaries or criteria for the sub-area should be established through a public process that results in an amendment of the management plan.**
- **Boundaries could be mapped based on criteria such as: 1)intensity of groundwater pumping; 2) rate of decline; 3) sensitivity to drought or floods; 4)subsidence threat; 5) water quality problems; 6) presence of riparian vegetation or high groundwater levels that could support riparian vegetation; or 7) Indian settlement provisions, etc. The criteria could change over time as the severity of the management problem increases or decreases.**

- **In some cases, the sub-areas may overlap to address multiple issues. The array of management tools that would be available within sub-areas would be specified in the Code, but none of them would be implemented until they were formally adopted in the management plan. Ideas for special tools include either incentives or new restrictions. Incentives could include conservation or augmentation grants or tax credits. New restrictions could include: 1) limitations on conversions of irrigation grandfathered rights; 2) limitations on new exempt wells; 3) higher pump taxes; 4) required replenishment within the sub-area; 5) more stringent conservation requirements; or 6) more stringent recovery well criteria, etc.**

## **OBSERVATIONS**

If there is a change in the AMA-wide goal, additional management tools will be needed to manage water levels and/or protect surface flows. The Santa Cruz AMA already has a management goal that addresses water level management, but the adequacy of the management approach taken in the Santa Cruz AMA would have to be evaluated in the context of the Tucson AMA. Changes in land use and population growth could make this approach very difficult to implement.

The overlay concept has been broadly supported, in part because it can be implemented without major institutional changes. However, equity concerns will be a major impediment unless there is a consensus that the selected approach is fair and reasonable. In order to avoid potential objections, sub-areas should be identified based on sound hydrologic principles. The Department should work with affected jurisdictions to encourage them to participate in the process of designating the sub-area and defining the management options. An economic analysis of costs and benefits to affected parties should be required, and sub-areas should not be created for the sole purpose of regulating an individual user or sector without their consent. If increased pump taxes are involved, there could be a requirement that the taxes be spent within or for the benefit of the sub-area. Regular review of physical conditions and regulatory standards and the opportunity for an appeals process would also be necessary.

## **2009 COMMENTS**

**Using the updated ADWR groundwater model for the TAMA determine which areas of the AMA are currently showing groundwater declines of greater than four feet per year.**

**Identify in which of those areas the problem will continue, worsen or improve. For example:**

**-is the pumping occurring in the service area of an undesignated provider where replenishment is taking place in an area that is not hydrologic ally connected? Does the provider plan to continue pumping for the foreseeable future? Will the over pumping continue?**

**- is the pumping occurring in an area that is planning infrastructure improvements that will improve the situation? Such as in Oro Valley where a direct delivery CAP system is being planned that will eliminate groundwater pumping except to meet peak demands? Will the problem improve?**

**-Are the declining water levels in a service area that plans to develop more land and pump more water? Will the problem worsen?**

- Is groundwater pumping market driven where it may fluctuate with the market? Agricultural and Industrial uses may not be consistent from year to year.

What are best guess projections?

Using data gathered from the exercise above determine true areas of declining groundwater levels.

Determine solutions for those areas. Possible solutions include:

Additional infrastructure for effluent

Additional infrastructure for CAGR D deliveries

Additional recharge sites

Greater efficiencies by existing users

Develop other sources (water harvesting, graywater, stormwater catchments etc...)

Additional infrastructure for CAP or other renewable supply

When reasonable alternatives have been identified a modeler can be tasked with testing recommended scenarios with model runs to help identify the best course(s) of action to take.

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## **ISSUE 12: RECOVERY OF RECHARGE CREDITS**

The recharge and recovery program allows the storage of water in one location and the recovery of credits anywhere within the AMA that meets the recovery criteria. Recovery of stored water does not have to be hydrologically connected in time or place to recharge. Therefore, critical water management problems, such as water level declines, subsidence potential and riparian habitat losses, may be exacerbated. In addition, long term storage credits are being accrued without a clear plan for recovery.

### **BACKGROUND**

The recharge and recovery program was designed to be flexible, to encourage storage and use of renewable supplies. It allows entities that have a legal right to renewable supplies, but lack physical access, to pump groundwater that legally maintains the character of the stored renewable supply. The resulting "paper water" system has created a situation where most of the recharge in the AMA happens in an area down-gradient from most of the pumping and up-gradient of the AMA's northern boundary. Although most of the long-term storage credits that have been earned from recharge to date have not yet been recovered, recovery of the credits is likely to be primarily outside the area of impact of recharge. Because of the concentration of recharge facilities in the northwestern part of the AMA, the best areas for recovery of storage credits are likely to be from within the area of impact of the projects. This is especially true of credits earned at Groundwater Savings Facilities (GSFs) because the existing agricultural production wells can be used as municipal recovery wells. CAWCD will need to develop a policy and pricing strategy for wheeling the recovered water in the CAP canal into the service areas of the storers if this opportunity is to be realized. Agreements between the water storers and the agricultural operators or CAWCD would also be needed to do this.

A related issue is the decline rate criteria for permitting recovery wells. The Second and Third Management Plans limit recovery wells to areas “experiencing a long term average annual rate of decline that is less than four feet per year.” While this has prevented two recovery permit applicants from recovering from a few of their wells, this criterion may not sufficiently limit the amount of allowable water level decline. Sustained declines of up to four feet per year may allow for significant damage in areas with critical water management problems. In addition, providers are allowed to specify which wells are being used as recovery wells in a given year, and wells that exceed the drawdown criteria are likely to continue to be used to pump groundwater from the provider’s AWS “allowable groundwater” account, or groundwater that is replenished by the CAGR. D.

The water level decline rate is established based on average rates of decline, to avoid short-term fluctuations. The time frame for which the average is calculated may vary based on data availability and hydrologic characteristics of the area. Recovery well siting criteria can be changed after recovery permits are issued, especially by adoption of new management plans. There is a need for regulatory certainty so that investments made in infrastructure to utilize or store renewable supplies are not reduced in value by subsequent changes in recovery permit criteria.

Because recovery plans have not been developed by most water storers, it is uncertain how they plan to recover the credits. It is also unclear whether the water that has been stored will be available for recovery because there is no legal mechanism to protect the stored water. This is especially an issue with the credits that are anticipated to be generated by the Arizona Water Banking Authority because there is such a large volume of water proposed for storage and it is uncertain how the credits will be recovered.

## **SOLUTIONS CONSIDERED**

**The following ideas have been considered. Additional ideas may be added to this list.**

- **Encourage all recovery to be from within the area of impact of recharge unless the recharge is done in a particular subarea (“critical area”) or if there are other water management objectives that will be met.**
- **Restrict recovery in particular subareas (“critical areas”).**
- **Change the recovery criteria decline rate to make it more stringent than the current “less than four feet per year” and apply the same restraints to groundwater withdrawals that will be replenished by the CAGR. D.**
- **Require applicants for water storage permits and/or recharge facility permits to submit a recovery plan explaining how and when the credits will be recovered; recovery plan must be revised periodically to keep up to date; may contain contingencies.**
- **Require the AWBA/CAWCD to prepare a recovery plan for drought protection credits prior to storage.**
- **Include in facility permits a condition that stipulates where recovery may (or must) occur.**
- **Increase the cut to the aquifer at GSFs to more than the current five percent unless there is a demonstrated plan to recover the stored water within the area of impact.**

## **PRELIMINARY RECOMMENDATIONS**

- **Using incentives such as reduced cut to the aquifer, encourage all recovery to be from within the area of impact of recharge unless the recharge is done in a particular subarea (“critical area”) or if there are other water management objectives that will be met.**
- **Change the recovery criteria decline rate to make it more stringent than the current “less than four feet per year” and apply the same restraints to groundwater withdrawals that will be replenished by the CAGR. Ensure equity is considered for those who have made major investments in infrastructure.**
- **Require the AWBA/CAWCD to prepare a recovery plan for drought protection credits prior to storage.**
- **Increase the cut to the aquifer at GSFs to more than the current five percent unless there is a demonstrated plan to recover the stored water within the area of impact.**
- **To encourage regulatory certainty, establish a minimum time frame after issuance of a recovery permit (e.g. five years or more) before the decline rate can be used to limit recovery from that well.**

## **OBSERVATIONS**

Any change to the ability of water storers to recover water outside the area of impact will seriously impair entities located far from the CAP canal and could negatively affect the volume of CAP water that is recharged. Likewise, changing the recovery criteria decline rate may be a disincentive for water storage and, as is discussed in the CAGR issue outline, designated providers may stop recharging their own water and rely exclusively on the CAGR for replenishment. Facilities that are designed and constructed with certain recovery criteria in place may become uneconomic if the criteria for recovery change. Finally, requiring recovery plans to be submitted may not produce accurate information since many water storers do not have concrete long term plans for recovery or water production.

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## **ISSUE 3: CENTRAL ARIZONA GROUNDWATER REPLENISHMENT DISTRICT**

The Central Arizona Groundwater Replenishment District (CAGR) was established to replenish excess groundwater used by municipal providers with designations of Assured Water Supply and certificated new subdivisions served by undesignated providers. The CAGR must satisfy its replenishment obligations by recharging in the same AMA as the excess groundwater pumping. This replenishment is not required to be within the area of hydrologic impact of the pumping and may take three full years. The CAGR is required to develop a 20-year plan of operation, but enrollment in the CAGR serves as proof of compliance with the State’s management goals for 100 years. The CAGR is not required to own rights to a long-term water supply.

## **BACKGROUND**

The Assured Water Supply Rules require that all new municipal subdivisions rely primarily on renewable supplies. To accomplish this, water providers can choose to apply for an Assured Water Supply (AWS) designation that allows them to serve new subdivisions within their service areas. If a provider chooses not to seek a designation, developers of new subdivisions are required to obtain a certificate of AWS. One way that providers and developers can prove that

renewable supplies will be used is to join the CAGR. The CAGR recharges renewable water supplies to replace the excess groundwater that is used by member service areas (designated providers) and member lands (certificated subdivisions). Currently in the Tucson AMA, all designated providers and certificated subdivisions have enrolled in the CAGR to comply with the "consistency with the AMA's management goal" provision of the AWS Rules. However, they are also required to comply with the remaining requirements of the AWS Rules, including proof of physical availability.

CAGR member service areas are designated water providers. This means the water providers must either use renewable supplies directly, recharge renewable supplies to offset their groundwater use, or pay the CAGR to replenish most of the groundwater used in their service areas. All of the customers of designated providers must pay for renewable supplies, not just those in new subdivisions. In contrast, subdivisions that become member lands of the CAGR are served by providers that do not have designations. This means that the remaining customers of those undesignated providers continue to mine groundwater, creating an equity issue within the municipal sector.

Because the CAGR is allowed to replenish anywhere within the AMA, there may be no direct hydrologic connection between the groundwater pumpage and the replenishment. Recharge facilities are not available within most municipal service areas and infrastructure does not exist to transport renewable supplies to the outlying portions of the metropolitan areas for replenishment or direct use. This may contribute to physical availability problems over time.

The CAGR may be causing undesirable growth patterns, by allowing new growth outside of areas with direct access to renewable supplies. It may actually be "stealing" potential customers from the designated providers, by providing a low-cost mechanism of meeting the "consistency with the management goal" AWS criteria without developing the infrastructure to deliver renewable supplies. This may result in urban sprawl or satellite communities that have inadequate services.

The drafters of the Code also anticipated that urban growth would occur on land with agricultural water rights, causing early retirement of agriculture. The AWS rules in combination with the CAGR have resulted in there being almost no incentive to develop agricultural land.

Another problem involving the CAGR is that currently, several designated providers are recharging their own renewable supplies for recovery in later years. Recovery can generally occur anywhere within the same AMA as the recharge with the issuance of a recovery well permit. Permitting of recovery wells is governed by criteria defined in the management plan. In the Second Management Plan, the main criterion was that recovery must be from "an area experiencing a long term average annual rate of decline that is less than four feet per year." This criterion can be met by most designated providers. In the Third Management Plan (TMP) more limiting criteria were proposed that would further restrict recovery in areas of water level declines. However, if the recovery criteria are made more stringent in the TMP, designated providers could simply forgo recharging and recovering their own water and rely on the CAGR to replenish the water for them. This would allow them to avoid the recovery criteria.

The final issue is the CAGR's long-term water supply. In the short-term, unused entitlements and surplus Colorado River supplies provide an opportunity to bring additional CAP water supplies into the AMA beyond existing allocations. Each year the Secretary of the Interior evaluates the Colorado River water supply and determines if it is a normal, surplus, or shortage water year. Unused entitlements (either surplus supplies or subcontracted water that is not ordered and used) can be contracted to other users on an annual basis. This is the supply upon which the CAGR currently relies. These unused entitlements are a temporary resource,

because as the Colorado River becomes more heavily utilized, less excess water will be available. Recent projections indicate that shortages on the Colorado River could begin occurring by 2025. Because the CAP has a relatively low priority right to Colorado River water, the CAP's full entitlement may not be available in shortage years. The CAGRDR is not required to show the water supplies it intends to use to meet its long-term obligations beyond the 20 year plan of operation.

## **SOLUTIONS CONSIDERED**

**The following ideas have been considered. Additional ideas may be added to this list.**

- **Require replenishment within the member service areas/lands; possibly include differential pricing.**
- **Require replenishment at a ratio greater than 1:1 unless replenishment is done within the provider's service area or the member land, even if at a greater cost.**
- **Change the AWS Rules' physical availability criterion from 1000' depth to water to match the management plans' recovery criterion (currently less than four feet of average annual water level decline) for new certificates or combine the requirements.**
- **Require the CAGRDR to do long-term supply planning and enact legislation if new mechanisms are needed to show what supplies it plans to use in its long-term plan.**
- **Urge the CAGRDR to investigate alternatives for funding acquisition of long-term water rights, including CAP contracts.**
- **Recommend strengthening the CAGRDR's Plan of Operation requirements to ensure full evaluation of costs and benefits of supply options and assessment of replenishment obligation.**
- **The CAWCD should evaluate a change in the law that protects existing customers from dramatic price increases due to the CAGRDR's need to invest in new supplies and infrastructure to serve new customers. Water supplies in the future are likely to be significantly more expensive than supplies being served to existing customers. A provision for the incremental cost to be paid by the new users should be instituted.**
- **Require all municipal pumping to meet AWS criteria.**
- **Revise the CAGRDR statutes to require recharge in advance, with groundwater pumping by its customers subject to management plan recovery criteria.**
- **Strengthen the hydrologic analysis criteria for CAGRDR members during the initial evaluation of physical availability.**
- **Institute an alert level on groundwater declines for member lands in areas served by undesignated providers. This should trigger a requirement for the responsible provider to develop physical access to renewable supplies, or at least an evaluation of alternatives available.**

## **PRELIMINARY RECOMMENDATIONS**

### **2009 Update**

**Many of the issues surrounding the CAGRDR and the Assured Water Supply Rules that are raised in this paper remain both controversial and relevant.**

- **CAGRD replenishment near wells serving member service areas/lands, or in locations that meet the AMA's management objectives should be encouraged or required. Replenishing at a ratio of greater than 1:1 should be considered if replenishment occurs elsewhere.**

**This issue, which is relevant to non-CAGRD members as well, is widely acknowledged, but unresolved. The CAWCD Board has an objective in its strategic plan which would "... identify areas with potential hydrologic concerns early enough to act accordingly." Pima County's recent amendment to the Water Resources Element of its Comprehensive Plan was intended, in part, to identify related issues during the permitting process.**

- **Recovery of stored credits is subject to recovery criteria in the TMP, while pumpage of groundwater that is subsequently replenished by the CAGRD is not. In order to address this issue, the drawdown criteria in the TMP that are currently applied to recovery of credits should be applied to groundwater pumpage that is replenished by the CAGRD. \***

**This unresolved issue was most recently discussed as part of AMWUA's "Sustainability Policies."**

- **An alert level based on groundwater declines should be instituted for undesignated providers serving member lands. This should trigger actions by the water provider to ensure a long-term renewable supply.**

**Unresolved.**

- **A more rigorous long-term planning and water supply acquisition plan should be required from CAGRD. This plan should identify funding alternatives for acquisition of long-term water rights such as CAP contracts, costs and benefits of supply options, and assessment of the ability to meet the maximum replenishment obligations over time.**

**Based on recommendations of the SYTF & GWMC, statutes were amended to enhance the rigor of the requirements for the CAGRD's Plan of Operation. Those requirements, and the establishment of the Plan of Operation Stakeholder Working Group, were instrumental in the ultimate adoption of the current Plan in 2004. That Plan addresses all of the issues above.**

- **If at some point in the future, new demand causes the CAGRD to invest in new supplies and infrastructure that are significantly more expensive than supplies being served to existing customers, provisions for the incremental cost to be paid by the new users should be instituted through legislation.**

**In recent years, funding mechanisms for the acquisition of new supplies were diversified in a manner that partially addresses this issue. In addition to the "Water Rights and Acquisition Fee" component of the Assessment Rate**

**(\$101/AF), the Enrollment Fee (\$83/HU) and Activation Fee (\$81/HU) are to be used to fund water rights and infrastructure. [\$2/HU of the Enrollment Fee is for conservation]**

## **OBSERVATIONS**

Very serious equity issues result from creating a requirement to replenish within a provider's service area when it is distant from the CAP canal. Such a requirement is also likely to increase the cost of maintaining an assured water supply. Solutions to this problem may involve construction of infrastructure, but it is unlikely that sufficient infrastructure can be built in the short term to bring renewable supplies to all developing areas of the AMA. Phasing in the requirements to match infrastructure development may be an option. If this is not done, it is unclear who will be responsible if a provider located far from the canal begins to experience physical availability problems. In the case of built-out subdivisions, using the trigger point of declining water levels to require use of renewable supplies may be a good compromise.

In implementing the recommendations, issues that should be addressed include implications of the CAGRDR acquiring long-term CAP contracts: 1) potential for competition between the CAGRDR and municipal entities who are looking for increased renewable supplies, and 2) costs associated with the contracts for future capacity being passed on to current members of the CAGRDR. If all municipal entities are required to use renewable supplies, there will be more competition for water.

Requiring the CAGRDR to replenish within its member service areas/lands would certainly require extensive changes to the existing statutes, especially relating to replenishment assessments. It may be better to encourage replenishment in certain areas rather than require it as there may be times when it would be more advantageous for the CAGRDR to replenish outside the member's boundaries.

There are concerns about equity within the municipal sector, in particular the fact that designated providers shoulder a disproportionate amount of the costs of the Assured Water Supply Program. Evaluation of water supply options and changes in CAGRDR statutes or policies should carefully weigh relative impacts on designated versus undesignated providers. Changing the AWS rules will result in some equity issues.

- Alternatively, the AWS Rules' physical availability criteria should be changed for designated providers who are pumping groundwater that is replenished by the CAGRDR. Instead of a maximum depth to water over 100 years of 1000 feet, for such providers it should be four feet per year times 100 years, or 400 feet lower than current average water levels. CAGRDR member service areas that continue to depend on groundwater for their physical availability would lose their designation if the average decline rate in their wellfields exceeds 4 feet per year. In the case of member lands, if the rate of groundwater level decline exceeds 4 feet per year in the wells serving the development at the time of initial application for subdivision AWS, certificates would not be issued.

## **ISSUE13: REGIONAL AND COMMUNITY EFFORTS**

Land use planning and water policy are not well integrated in the Tucson AMA. Inadequate coordination of water resource management, land use planning and economic development activities has resulted in difficulties in developing regional distribution and storage facilities for CAP and effluent and lost opportunities to conserve water. These are impediments to reaching safe-yield and other water management goals.

### **BACKGROUND**

A major factor in the ability to reach safe-yield is inter-jurisdictional cooperation, particularly related to long-term infrastructure development, use of renewable supplies and consistent local water policies within the AMA. The Tucson AMA has access to enough renewable supplies to be at safe-yield today if problems associated with CAP use, effluent and recharge had not arisen. Local water-related decisions have often been made on the basis of rhetoric rather than informed knowledge. The community needs to be better educated about groundwater and renewable supply issues. Even in the context of a major focus on water issues, the public lacks access to credible and reliable information, and is not aware of the consequences of delaying utilization of renewable supplies.

There is currently inadequate commitment to regional problem-solving, although recent developments in the resolution of effluent issues are encouraging. Jurisdictions have had difficulty working together to identify and support solutions. Various jurisdictions and water providers have different approaches to water service, conservation-related ordinances, hookup fees, etc. Increased cooperation is necessary to communicate and implement the community's vision about appropriate water uses and needs for the future. In general, these objectives can be accomplished within the Tucson AMA without substantial changes in state legislation.

### **SOLUTIONS CONSIDERED**

**The following ideas have been considered are under consideration.**

**Additional ideas may be added to this list.**

- **Encourage economic development entities to assess the impact of potential new employers on water supply activities before targeting a company for the Tucson AMA.**
- **Create a joint committee of water providers and land use jurisdictions to work on a set of consistent conservation oriented ordinances and water-related land use policies that would be proposed for adoption, possibly including model use standards, conversion to low flow devices or water audits required on sale of buildings, etc.**
- **Ensure that water related issues are considered in the Sonoran Desert Protection Plan and that the water use implications of solutions related to wildlife habitat, riparian corridors and ranching are fully evaluated.**
- **Establish a regional water district to address financing, consensus building, conservation, education, water supply and environmental needs across the entire AMA (similar to SCVWD) (this option would require legislation).**
- **Create a regional forum for regional problem-solving.**
- **Identify statutory changes needed to provide primacy to local jurisdictions in certain specified areas that are consistent with the AMA's management goals, if the local ordinance is more restrictive than state law.**

- **Building on existing outreach efforts, coordinate a large-scale long-term community education program.**
- **Develop a long-term water supply and demand plan for the entire region, based on a shared community vision of the future and cooperative efforts among interested parties.**

#### **PRELIMINARY RECOMMENDATIONS**

- **Regional coordination should be encouraged.**
- **A joint committee of water providers and land use jurisdictions should be formed to work on a consistent, comprehensive set of conservation oriented ordinances and water-related land use policies. ADWR should facilitate these efforts. These could include model standards and ordinances, requirements for conversion to low flow devices or water audits required on sale of buildings, limitations on exempt wells in riparian areas, conditions of new service, limitations on turf facilities, etc.**
- **ADWR should coordinate with the State Department of Commerce and local economic development entities to encourage evaluation of water demand by prospective new employers and encourage new industries to go to locations where renewable supplies are available.**
- **Building on existing outreach efforts, coordinate a large-scale long-term community education program (as discussed also in the Conservation Issue Paper on Shifting Focus to End Users).**

#### **OBSERVATIONS**

Currently, jurisdictions and water providers have the ability to resolve many of the water-related problems in the Tucson AMA. However, lack of motivation to overcome obstacles and engage in problem-solving approaches is an ongoing issue.

### **ISSUE 1: ADWR'S COMPLIANCE AND ENFORCEMENT APPROACH**

ADWR's statewide compliance and enforcement activities are not always timely, and the program could be more effective if the Department took a more pro-active approach. More timely audits, audit reports, and stipulation development would help avoid protracted compliance cases. Conservation opportunities are lost while cases remain unresolved.

#### **BACKGROUND**

Due to lack of staff resources and a number of high priority projects, ADWR's compliance program has not received sufficient attention in recent years. There are several violations in the turf and municipal sectors in the Tucson AMA that have not had a timely response.

A more proactive, assistance-based program could achieve more water savings and result in fewer violations. If a shift in focus of the municipal program towards the "end users" is achieved, a partnership approach between the providers and the Department could be developed that may be more effective than the current regulatory approach. Education should be a bigger component of the compliance program. ADWR staff resources currently used for compliance purposes could be better utilized in an assistance mode.

## **SOLUTIONS CONSIDERED**

The following ideas have been considered. Additional ideas may be added to this list.

- **An early warning system that puts users who are in danger of a violation on notice and triggers an assistance program could be initiated. Providers would have to notify ADWR of the potential problem or provide interim water use data in advance of the required annual report.**
- **More staff could be allocated to the compliance program to allow more timely assistance and compliance activities.**
- **Develop a compliance related education program, more programs that are developed in advance to assist with compliance problems.**
- **Highlight success stories, awards programs, and technology transfer from successful programs.**
- **A required timeline for ADWR compliance responses should be developed.**
- **The ability for the State to fine flagrant high water users on municipal systems should be established.**
- **The pay scale for ADWR employees should be increased to improve staff retention and productivity levels.**
- **An incentive for early self-reporting of violations should be developed, including reduced fines and penalties.**

## **PRELIMINARY RECOMMENDATIONS**

Increase the effectiveness of the compliance program within the ADWR using the following mechanisms:

- **Evaluate staffing levels and priorities to improve efficiency and timeliness in AMAs and legal division.**
- **Improve pay scale for professional staff to increase staff retention.**
- **Adopt enforceable response timelines for all standard compliance cases, and track and report cases that exceed these timeframes.**
- **Return the compliance fund to ADWR, rather than putting the money in the general fund, to provide additional funding for the program.**
- **Develop an early self-reporting incentive.**

## **OBSERVATIONS**

It is unlikely that the Department would know before a water user does whether that user is headed for a violation. The Department does not receive water use information until the end of March of the year following a calendar water use year, since that is the date that the annual water use reports are due. In contrast, a properly managed facility or municipal provider should be reviewing monthly water use data to catch changes in water use trends as they are developing and take steps to prevent violations.

### **2009 UPDATE**

- **The Department posts its Compliance and Enforcement Manual, as well as past year status reports, on its website.**

## **ISSUE 5: CONSERVATION INCENTIVES TO USE RENEWABLE SUPPLIES**

Substantial concern exists over the failure to use renewable water supplies in the Tucson AMA. There may be opportunities to build incentives to use renewable supplies into the conservation programs in the management plans or the compliance program. A program that needs evaluation is the possibility of generating recharge credits in advance of a potential violation that could be used to offset a potential penalty. This would provide an incentive for some providers to store CAP water that they might not otherwise have brought into the AMA.

### **BACKGROUND**

The reasons that various entities are currently unable to use the CAP and effluent supplies that are available are not related to state statutes or the management plans. There are multiple reasons why renewable supplies are not fully utilized. They include: economic disincentives (renewable supplies are generally more costly); lack of distribution systems; water quality concerns; lack of access to supplies; technical problems; environmental regulations such as the Endangered Species Act; ACC limitations on private water companies; and political problems.

During the development of the Third Management Plan, a number of ideas were generated regarding ways to incorporate additional incentives for the use of renewable supplies into the Plan. The idea that received the most attention was a pro-active compliance program that would allow recharge of credits up-front to offset future violations. The concept is to encourage water supplies that are available now, but which would not otherwise be brought into the AMA, to be stored for future use. When the credits are used to offset a violation, the credits used to offset the violation amount would be in excess of 1:1.

A key consideration is encouraging private water companies that currently have an allocation of CAP water to keep it. In order to pass through costs of maintaining the allocation, ACC staff has insisted on seeing that it is "used and useful." Whatever incentive approach is developed should address this issue.

### **SOLUTIONS CONSIDERED**

**The following ideas have been considered. Additional ideas may be added to this list.**

- **Include in the management plan a provision to store renewable supplies through annual storage and recovery or long-term storage credits prior to a compliance action to offset the excess groundwater used above the GPCD or allotment. Volume stored would have to exceed the amount of the usage that is above the conservation limit. Volumes could vary depending on whether storage was in the area where the groundwater was withdrawn.**
- **Extend or amend the legislation that currently ends in 2000 that allows conservation overages to be offset with long-term storage credits.**

### **PRELIMINARY RECOMMENDATIONS**

- **Through a statutory change, establish a provision to store renewable supplies through annual storage and recovery or long-term storage credits prior to a water use year to offset any possible groundwater use above the GPCD or allotment. No compliance action would be taken if sufficient credits were stored to offset a potential violation. The ratio of credits required to offset overuse should be greater than 1:1, and could**

vary depending on whether storage was in the area where the groundwater was withdrawn, or whether credits were stored in an area that met other management objectives. Credits stored through this program would be extinguished if the credits weren't used within a specific time frame. Specific criteria would have to be applied to ensure that entities were not simply "buying their way into compliance" by storing renewable supplies with no attention to efficiency. A primary concern is avoiding use of this program to build long-term water using features that cannot be sustained once excess CAP water is no longer available. Entities that are not currently designated have to offset all of their current groundwater pumpage with recharge before they can earn long-term credits. This issue will need to be addressed within this proposal in order to ensure that private water companies (who are a key target of this proposed incentive program) can qualify to participate.

### **OBSERVATIONS**

This proposal is essentially an insurance policy; the incentive to participate is to avoid conservation compliance problems for those regulated under the GPCD program. It could be used to provide a safety margin for problems meeting the GPCD target that might arise from hot, dry weather or changing water use trends within a service area. It should probably not be viewed as a permanent way to offset the water use of a new non-residential use such as a golf course or industry.

Current legislation allows conservation overages through 2000 to be offset with long-term storage credits. Extension of this program on a 1:1 basis may provide incentives to use renewable supplies, but possibly not provide incentives to conserve water.

It is currently possible to stipulate with ADWR that non-recoverable water will be stored. However, there is no current incentive to do this. It is used only in the context of a compliance action. Private water companies probably need a specific proactive program that they can sign up for in advance to convince the ACC of the value of the program to their customers.

### **2009 UPDATE**

**The Department has in the past, in certain cases, through Stipulation and Consent Order, been willing to consider extinguishment of existing recharge credits in order to partially mitigate certain Code, Rule, or Management Plan violations. However, there remains no provision for allowing accrual of recharge credits that would be used specifically for future violations, as described in the preliminary recommendations section above.**

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### **ISSUE 10: INDUSTRY STANDARDS**

The efficiency of appliances and water-using fixtures affects the ability of the community and the state to reach its water management goals. Clear, effective "Industry Standards" need to be established for all water using technologies to ensure efficient water usage.

### **BACKGROUND**

Many water-using products are not evaluated for water use efficiency or effectiveness over time. There is a need to review and revise current industry standards to focus on long-term conservation objectives. Additional regulatory standards may be required to limit the use of inefficient technologies and practices.

In some cases, low water-using appliances and fixtures are not achieving the water use rate that is advertised. For example, some low water use toilets are not achieving the savings that were expected over time. Some brands have design flaws, including the need for multiple flushes, and in some cases it is difficult to find replacement parts.

A second problem is that even if people have state of the art appliances, they are buying more water using appliances than they previously did. Examples of such trends include multiple-head showers, jacuzzi tubs, misting systems, and high bleed-off swamp coolers. Many of these products are sold as luxury items to people who clearly can afford higher water bills. However, if they had access to better up-front information regarding water use and efficiency of these devices they might be less apt to purchase them.

## **SOLUTIONS CONSIDERED**

**The following ideas have been considered . Additional ideas may be added to this list.**

- **Establish a statewide action group to evaluate manufacturers' performance standards for water using appliances, performance over time, availability of replacement parts, and emerging technologies in order to make recommendations for revisions or improvement. Since some standards are federal, a cooperative approach with other states or federal agencies may be required.**
- **Identify current testing protocols, additional testing needs and funding source(s) to test and research water using fixtures and appliances over time.**
- **Develop an education program to encourage consumers to make wise choices relative to water-using appliances, and to encourage decision-makers to implement appropriate standards.**
- **Evaluate tradeoffs between energy and water use, perhaps with other state and federal interests.**
- **Evaluate conflicts between various state and/or federal regulations that result in higher water use or discourage conservation.**
- **Establish a state tax credit for purchase of approved devices that save water, similar to the program in Oregon.**

## **PRELIMINARY RECOMMENDATIONS**

- **Establish a statewide action group to evaluate manufacturers' performance standards for water using appliances, including performance over time, availability of replacement parts, and efficiency of emerging technologies in order to make recommendations for revisions or improvement. Since some standards are federal, a cooperative approach with other states or federal agencies will be required. The action group could evaluate testing protocols, identify testing needs and funding sources, evaluate tradeoffs between energy and water use, and evaluate**

**regulatory conflicts that result in higher water use or discourage conservation.**

- **Develop an education program to encourage consumers to make wise choices relative to water-using appliances, and to encourage decision-makers to implement appropriate standards.**
- **Establish a state tax credit for purchase and/or installation of approved devices that save water, similar to the program in Oregon.**
- **Implementation of these recommendations could be facilitated by ADWR in the role of regional/statewide conservation coordinator, if ADWR's role in conservation activities is expanded.**

## **OBSERVATIONS**

Additional regulation of water using fixtures may not be popular, in part due to resistance to regulation in general and problems with existing standards. Incentives may be more readily accepted. Concerns have been expressed regarding the impacts of the existing plumbing codes at both the State and Federal level (e.g. problems resulting from poorly designed plumbing fixtures).

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## **ISSUE 11: RECHARGE SITING**

Most recharge facilities in the AMA have been sited based on proximity to the CAP canal and cost rather than where the recharge will be most beneficial. Recharge facilities are frequently not located in areas where the water is needed. Also, additional infrastructure has not yet been constructed to allow parts of the AMA other than those adjacent to the canal to receive CAP water. In addition, some entities believe that the Department's interpretation of A.R.S. § 45-815.01 (Facilities not qualifying as storage facilities) precludes projects designed to have significant benefits other than recharge (multiple benefit projects), such as recreation and riparian habitat. The Department discourages recharge projects that are not designed and constructed primarily to store water underground, and are in fact recreational amenities such as lakes.

## **BACKGROUND**

There are no statutory siting requirements for recharge facilities except that the facility must not cause unreasonable harm to land or other water users. The Second Management Plan contains siting criteria that require a facility either to "contribute to groundwater supplies which are currently being used or could be used in the future..." or contribute to a remediation program for a contaminant plume or poor groundwater quality area. The Third Management Plan contains similar siting criteria. Therefore, the Department is limited in its ability to direct the siting of recharge facilities to promote water management concerns.

To date, facilities have primarily been constructed in areas close to the CAP canal and where the land is already owned or is readily available. Recharge facilities in the outlying, rapidly growing portions of the metropolitan area have not been built because the necessary infrastructure has been cost prohibitive. Moreover, ADWR is not authorized to consider local or subarea water management issues when reviewing recharge applications. Therefore, ADWR cannot presently create incentives for recharge in critical areas.

The recharge statutes and policies developed by ADWR specifically address projects that do not qualify as recharge facilities. These statutes and policies may limit the ability of a facility to satisfy multiple objectives, such as recharge and riparian habitat restoration or recreation.

Some entities perceive ADWR's policies as a general prohibition on multiple benefit recharge projects. In fact, the Department's position is based on a desire to avoid recharge projects that are used to evade Lakes Bill provisions, and is not intended to limit multiple benefit projects. A.R.S. 45-815.01 indicates that bodies of water do not qualify for USF permits unless they have been designed, constructed or altered so that water storage is a principal purpose of the body of water. In addition, Arizona law generally prohibits artificial "bodies of water" constructed for landscape, scenic or recreational purposes, unless the body of water is "unsealed and an integral part of an underground storage facility." A.R.S. 45-132(B)(6). The Department will not issue a permit for a facility if the facility appears to be designed to evade the prohibition on recreational lakes. In general, the design and operation of the facility needs to minimize evaporation and transpiration, because if storage is a primary purpose, efficiency is important.

Currently, the recharge program requires applicants for an Underground Storage Facility (a direct recharge facility) to show hydrologic feasibility, usually through a hydrologic model. If the water that is stored is likely to leave the AMA, the project does not meet the statutory criteria for hydrologic feasibility. These considerations are not part of the review of applications for Groundwater Savings Facilities (in-lieu, or indirect recharge facilities). Groundwater Savings permits cannot be withheld because the stored water could migrate across an AMA boundary.

### **SOLUTIONS CONSIDERED**

**The following ideas have been considered. Additional ideas may be added to this list.**

- **Incentives to recharge in critical areas (see Sub-Area Management Issue Paper).**
- **Change the recharge statutes to require consideration of where existing pumping is occurring so that the stored water will be beneficially used.**
- **Develop clearer policies including consideration of multiple benefit projects.**
- **Create a siting criterion for Groundwater Savings Facilities, similar to that used for Underground Storage Facilities, that requires an evaluation of whether the stored water will leave the AMA. Permits for Groundwater Savings Facilities should be denied if the stored water will not be available for future use within the AMA where it was stored.**
- **Through a management plan amendment or statutory authorization, allow ADWR to develop incentives for recharge in locations that would accomplish water management objectives even if the critical area management concept does not move forward.**

### **PRELIMINARY RECOMMENDATIONS**

- **Incentives should be developed to recharge in critical areas (with planned recovery outside of a critical area). Incentives could include: a reduction in the cut to the aquifer, a reduction in permitting fees for the facility, or grants to aid in feasibility assessment or construction of the facility.**
- **Through a management plan amendment or statutory authorization, allow ADWR to develop incentives for recharge in locations that would accomplish water management objectives even if the critical area management concept does not move forward.**
- **Create a siting criterion for Groundwater Savings Facilities, similar to that used for Underground Storage Facilities, that requires an evaluation of whether the stored water will leave the AMA. Permits for Groundwater**

**Savings Facilities should be denied if the stored water will not be available for future use within the AMA where it was stored.**

- **Develop clearer ADWR policies including consideration of multiple benefit projects.**

#### **OBSERVATIONS**

The existing management plan siting criterion that requires the stored water at Groundwater Savings Facilities and Underground Storage Facilities add to supplies that are being used or could be used in the future can be satisfied by future pumping by entities other than the storer. This means that the groundwater that has been saved at a Groundwater Savings Facility may not be available to those who paid for the credits to be accrued.

Incentives to recharge in one location also act as disincentives to store water elsewhere. There may be unintended consequences from a water quality or other policy perspective.

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#### **ISSUE 4: CLIMATE VARIABILITY IN THE CONTEXT OF SAFE-YIELD**

Current methods used to project future water demand and supply do not adequately take climate factors into account. Failure to incorporate the full range of potential climate variability as well as long-term trends in climate change may result in negative economic impacts that could have been avoided. The possibility of longer term or more severe drought occurring in Arizona has not been adequately planned for.

#### **BACKGROUND**

Since the Groundwater Management Act was signed into law in 1980, knowledge gained from climate and hydrologic science has grown substantially. For example, we now know much more about El Niño and La Niña processes and how these processes affect the Southwest. As a result, winter temperature and precipitation forecasts during El Niño and La Niña years have improved substantially, and can now be issued with a fairly high level of confidence six months or more in advance. Likewise, research into past climates has increased our knowledge of the range of conditions that have existed in this area and has allowed us to identify the extremes that the area has experienced. Based on such research, we have evidence of conditions such as deep droughts that have affected the entire Colorado River watershed, including the Salt, Verde, and Gila River tributaries. At the same time the science of climate modeling continues to improve. Considerable work is currently underway to develop regional models that more accurately reflect processes, such as our Southwest Monsoon, that are not well depicted in the global or continental-scale models. The outputs of such models are beginning to provide plausible future temperature and precipitation scenarios for time periods of up to 100 years. Given these emerging trends, including a wider range of climate information in planning and management will become ever more important.

Recent climate research indicates that the Southwest may be heading for a drought cycle that could be more severe than any experienced in recent decades. At the same time, historical records and results from modeling changes in the global climate conditions indicate that there is a fair chance of increased precipitation and flooding in the Southwest over the longer term (up to 100 years).

It is clear that both demand for water and water supplies are related to weather conditions in ways that are predictable and may affect the success of management programs. There is a

need to incorporate the latest available information in both planning and regulatory programs, and to increase the planning horizon beyond 2025.

## **SOLUTIONS CONSIDERED**

The following ideas have been considered. Additional ideas may be added to this list.

- **Incorporate a range of alternative climate scenarios in ADWR hydrologic models. These scenarios, derived from paleo and historical climate information as well as from carefully selected general circulation model (GCM) results, should reflect unusually wet and dry periods, as well as "average" conditions.**
- **Ensure that hydrologists associated with ADWR and with water providers are trained in the interpretation and use of climate information and forecasts as well as ways of accessing data that are useful to water managers, such as planning for infrastructure development.**
- **Evaluate the impacts of climate variability and change on implementation of ADWR programs such as assured water supply, groundwater recharge and recovery needs, transferability of water rights, rules governing transportation of water, and the function of the Arizona Water Bank.**
- **Require the ACC to take drought planning and flood control impacts into account in rate analysis cases.**
- **Require development of a long-term, multi-agency drought contingency plan that explicitly reflects changes in climatic conditions over time scales ranging from seasonal to multi-decadal, and beyond.**
- **Incorporate the effects of weather in implementation and assessment of the effectiveness of conservation programs.**

## **PRELIMINARY RECOMMENDATIONS**

- **The state should develop a drought plan that identifies appropriate responses to varying levels of drought, including contingencies to respond to more severe drought than has been experienced in recent decades (use the New Mexico drought plan as a starting point).**
- **ADWR should proactively engage in ongoing training of technical and planning staff to ensure that the most current climate information is used as a backdrop for all planning, projections, program implementation and decision making.**
- **The time horizon for projections should be expanded to incorporate longer-term climatic trends, including consideration of the impacts of wetter and dryer climatic conditions, higher temperatures and shifts in seasonal precipitation.**
- **Programs that are designed to respond to long-term drought on the Colorado, such as the AWBA, should be proactively evaluated to ensure that the water stored is recoverable and water supplies are reliable in the context of unexpected climate extremes.**

## **OBSERVATIONS**

Climate and hydrologic research, as well as longer-term forecasts, are certainly not new; but knowledge about climate and its links with hydrology has increased substantially in sophistication and complexity over the past few decades. Coming up to speed on

understanding the new developments is challenging. However, by making the effort, water managers can do a better job of averting or ameliorating negative climate impacts on water resources. Likewise, a better-developed climate framework allows decision makers to identify and take advantage of new opportunities when they arise, such as planning for environmental restoration or banking of extra water during extended periods of higher than usual precipitation.

ADWR should develop alternative scenarios that more accurately reflect the high degree of climate variability typical of this region. Incorporation of data on maximum and minimum historical conditions, as well as projections for possible future conditions derived from climate models, into the Department's hydrologic models is recommended. Also recommended is consideration of a greater range of climatic variation in institutional and infrastructural planning, conservation efforts, and general water management practices.

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## **ISSUE 6: COST-EFFECTIVENESS OF CONSERVATION EFFORTS**

There is a need to evaluate and determine the most cost-effective way of achieving water conservation. In addition, there are questions about whether the conservation programs in the management plans have received adequate economic analysis to ensure that they meet the statutory standards for each sector.

### **BACKGROUND**

There has been substantial discussion about whether investments made in conservation are cost-effective. There is a need for better economic analysis of follow-up data after implementation of programs, so that adequate analysis of both provider and end-user benefits can be done. Individual providers may not be in a position to do an analysis to evaluate which conservation programs should be implemented in their service area. The Auditor General's report indicated that ADWR should have an economist on staff who could evaluate the economic implications of potential regulations. There are numerous research needs relative to evaluating programs and identifying the proper type of program to implement for individual providers.

This approach could be useful whether or not there is a shift to directly regulate "end users" in the municipal program.

### **SOLUTIONS CONSIDERED**

**The following ideas have been considered. Additional ideas may be added to this list.**

- **ADWR could provide individualized assistance to providers regarding improving the conservation message in rate structures, selecting the most effective conservation programs, and getting access to renewable supplies.**
- **More money should be available for research on effectiveness of conservation programs.**
- **ADWR should evaluate future regulations and requirements using a more thorough economic analysis.**
- **Evaluate whether safe-yield can be reached more effectively through other means (e.g. recharge rather than education or rebates, etc.).**

- **Evaluate how much is a “reasonable amount” to pay for each acre-foot saved through conservation programs.**

## **PRELIMINARY RECOMMENDATIONS**

- **ADWR should evaluate future conservation programs for cost-effectiveness as part of a regional, coordinated approach. An evaluation of whether water management goals can be more efficiently reached through measures other than conservation should be included.**
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## **ISSUE 7: EXEMPT WELLS**

Although the volume of groundwater withdrawn from exempt wells is estimated to be negligible, not enough data are available to calculate the actual impact of exempt wells. In some sub-areas, high densities of exempt wells may exacerbate the physical and environmental problems associated with groundwater withdrawals and exempt wells may adversely impact nearby wells. Finally, because exempt well owners pump groundwater without a replenishment obligation, they do not contribute to achieving safe-yield.

### **BACKGROUND**

Withdrawals of water from exempt wells do not require groundwater rights; additionally, exempt wells are exempt from many provisions of the Arizona Groundwater Code. Exempt well owners are not required to meter groundwater withdrawals, file annual water use reports, or pay groundwater withdrawal fees. Within an Active Management Area (AMA), groundwater withdrawals from an exempt well must not exceed 35 gallons per minute (gpm) when used for domestic or stockwater purposes. New exempt wells drilled after 1980 used for non-irrigation purposes other than domestic and stock watering purposes (such as a small commercial enterprise) must not exceed 10 acre-feet per year (in addition to the 35 gpm limit).

Because exempt well owners do not report water use, groundwater withdrawals are estimated from average gallons per capita per day and the number of exempt wells registered. Approximately 5,500 exempt wells were registered in the Tucson AMA in 1997. This number is expected to increase to approximately 8,700 by 2025. Based on ADWR estimates, groundwater withdrawals from exempt wells accounted for less than 1% of the Tucson AMA’s residual groundwater pumping in 1997 (approximately 2,590 acre-feet). Groundwater withdrawals from exempt wells are expected to account for approximately 2% of the Tucson AMA’s residual groundwater pumping in 2025 (approximately 3,760 acre-feet). However, if all of the exempt wells were pumped at the legal maximum capacity, approximately 495,060 acre-feet could be pumped from exempt wells in 2025.

Another exempt well issue concerns well spacing requirements for non-exempt wells. When a new non-exempt well (including a replacement well in a new location) is proposed to be drilled, a hydrologic impact analysis must be completed to ensure that the new well will not impact existing wells, including existing exempt wells. This means that the driller of a replacement well in a new location must consider exempt wells that did not exist at the time the original well was drilled. Conversely, when a new exempt well is proposed to be drilled, impacts on other wells are not considered. Likewise, the impact of multiple exempt wells in a particular location is never considered.

## **SOLUTIONS CONSIDERED**

The following ideas have been considered. Additional ideas may be added to this list.

- **Do statistical sampling to collect additional data on groundwater withdrawals from exempt wells.**
- **Develop well spacing and impact rules for all wells (including exempt wells).**
- **Place a moratorium on construction of exempt wells within the service area of municipal providers.**
- **Modify AWS Rules to include exempt wells and dry lot subdivisions.**
- **Restrict/limit construction of exempt wells in some sub-areas (“critical area management”).**
- **Coordinate with the Arizona Department of Real Estate to identify illegal subdivisions and require an AWS certificate (join the GRD).**
- **The impact on exempt wells drilled after a certain date would not be considered in permitting new non-exempt wells or replacement wells in new locations (well spacing and impact rules).**
- **Create new fees based on cost recovery for processing exempt well permit applications.**
- **Create an impact fee for new exempt wells to be used for replenishment.**
- **Require a landowner to obtain water from a municipal provider if the property is within a reasonable distance of the provider’s distribution system.**

## **PRELIMINARY RECOMMENDATIONS**

**A statistical survey of exempt wells should be conducted to determine the number operating and the volume of groundwater withdrawn. The sampling should be used to determine the impact of pre-1980 and post-1980 exempt wells on 1) achievement of safe-yield; 2) areas of special concern within the AMA such as riparian and subsidence-prone areas; and 3) whether additional regulations should be recommended for exempt wells.**

**A moratorium should be placed on construction of new exempt wells within the service areas of municipal providers with designations of assured water supply within safe-yield AMAs if service can be provided to the site by the provider at a reasonable cost.**

**New exempt wells (those drilled after adoption of new legislation) should be excluded from the protection offered by ADWR’s well spacing and impact rules if they are in or near a service area and a water provider is willing to provide service to the site at a reasonable cost to the well owner. If the provider has offered to extend lines to the property as needed and provide service under the customary rate structure, and the exempt well owner has refused to become a customer of the provider, the exempt well owner could not impact the provider’s ability to locate a new or replacement production well.**

**The application fees should be increased to reflect the real cost (including staff time) of reviewing the applications for exempt wells.**

**ADWR should coordinate with the Arizona Department of Real Estate, ADEQ, ACC, and local land use jurisdictions to improve monitoring and enforcement of illegal subdivisions, with the intent of preventing them in the future and encouraging all subdivisions to comply with the AWS rules.**

### **OBSERVATIONS**

It should be noted that the Department currently does not require owners of grandfathered irrigation rights under 10 acres to measure and report groundwater withdrawals; additionally, owners of small Type II non-irrigation grandfathered rights (10 acre-feet or less annually) are only required to estimate groundwater withdrawals (not required to measure groundwater use). Ideally, new regulations should address both new and existing exempt wells. However, it may be easier to implement restrictions on new exempt wells.

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### **ISSUE 14: RESIDUAL MUNICIPAL PUMPING**

Municipal water providers that are designated as having an assured water supply are allocated a volume of "mined groundwater" and can slowly phase in use of renewable water supplies. The volume of mined groundwater and the long phase in period allows continued groundwater pumping, especially in the short term. However, once this groundwater account is depleted, municipal providers must replenish any continued groundwater pumping. Non-designated municipal water providers have no obligation to use renewable supplies for existing uses although new subdivisions built in their service areas are required to replenish excess groundwater. Although the municipal sector is the only sector with a replenishment obligation through the Assured Water Supply Program, there are concerns about the impact of continued municipal groundwater pumping on achievement of the safe-yield goal.

### **BACKGROUND**

Municipal groundwater pumpage accounted for 43% of the AMA's residual pumping in 1997, over 151,000 acre-feet. The Assured Water Supply program requirements to use renewable water supplies are expected to reduce the municipal sector's residual pumping to 21% of the total or 41,000 acre-feet by 2025.

Municipal providers have service area rights that, unlike other rights, are not quantified by a specific volume. Instead, the volume of water that providers may use is governed by per capita conservation requirements in the management plans. Thus, as the population of a service area grows, the water provider can serve an increasing volume of water as long as it is within the per capita conservation limits. For designated providers, water service must also be consistent with the safe-yield goal, i.e. renewable supplies must be used.

In order to subdivide land, developers must demonstrate an assured water supply. This can be done in one of two ways. The developer can obtain water service from a "designated provider" that has demonstrated an assured water supply for its entire service area or if the development will be served by a provider that is not designated the developer must obtain a certificate of assured water supply. A key component of this demonstration is "consistency with the management goal". This criterion requires that any "excess groundwater" pumped in the service area must be replenished with a renewable supply somewhere in the AMA. However,

both designated providers and certificated subdivisions are given a groundwater allocation that allows for the pumping of groundwater that is not subject to replenishment. For designated providers, this volume is approximately 1,900,000 acre-feet and is calculated based on the providers' 1994 water demand. The mined groundwater allocation factor for certificates declines over time to zero after 2025.

Undesignated providers are not subject to any replenishment obligation for their existing customers. Current pumpage associated with these users is 22,000 acre-feet/year. In addition there is about 1,000 acre-feet of additional pumpage associated with unbuilt subdivisions that received certificates prior to the 1995 Assured Water Supply Rules and that are not subject to replenishment. All subdivisions that received certificates prior to the 1995 Assured Water Supply Rules can continue to use groundwater.

Both certificates and designated providers are allowed to draw on their groundwater allocations while use of renewable water supplies are phased in. All certificate and assured water supply designations in the AMA are based on membership in the Central Arizona Groundwater Replenishment District (CAGRDR). Standard contracts with the CAGRDR require that a minimum amount must be declared as excess groundwater subject to replenishment. For designated providers and certificates this minimum is 1/30 beginning in 1995 increasing to 20/30 by 2014. Thereafter replenishment is required only for the actual excess groundwater used.

There is concern that the large volume of water in the groundwater allocations and the long phase in of renewable water supplies may create a short-term problem in the use of renewable supplies.

Another municipal groundwater use issue is that one water provider (Arizona Water Company) pumps water inside the Tucson AMA at Oracle Junction, but delivers it both inside and outside of the AMA in Oracle. Because some land being subdivided in Oracle is not in an AMA, an assured water supply is not required. Instead, the much lower standard of water adequacy is applied. This situation allows for increased mining of groundwater in the AMA to serve new users without any replenishment obligation.

## **SOLUTIONS CONSIDERED**

**The following ideas have been considered. Additional ideas may be added to this list.**

- **Consider a requirement that all municipal providers' pre-1995 customer water use would be subject to replenishment. Requiring replenishment would allow private water companies to recover the higher cost of renewable supplies through rate increases which must be approved by the Arizona Corporation Commission. A phased-in replenishment obligation could be developed that would alleviate customer rate shock.**
- **Restructure the member service area CAGRDR contracts so that the minimum volume of mined groundwater in the provider's groundwater account that is subject to replenishment is increased.**
- **Encourage providers to use renewable supplies as early as possible (while they are available and cheaper) and save groundwater supplies for later.**
- **Require that part of the groundwater allocation be preserved for CAP drought protection.**
- **Through a legislative change, require that land being subdivided outside an AMA that is served water from wells within an AMA demonstrate an assured water supply based on requirements for the AMA.**

## **PRELIMINARY RECOMMENDATIONS:**

- **Investigate the feasibility of requiring non-designated water providers to phase-in the use of renewable supplies for pre-1995 customer water use in their service areas. This would likely involve a replenishment obligation that would ramp up, with an ultimate obligation similar to that for designated water providers. Part of this investigation would include an analysis of the necessary legal mechanisms that would ensure that private water companies subject to rate review by the Arizona Corporation Commission could pass through the costs of renewable supply use/replenishment to their customers.**
- **Investigate the CAP drought protection needs of designated water providers as they relate to the mined groundwater account volume including the implications of requiring that part of the designated provider's account be preserved for drought protection. Investigate how this potential requirement relates to the drought protection provisions of the Arizona Water Banking Authority.**
- **Through a legislative change, require that land being subdivided outside an AMA that is served water from wells within an AMA demonstrate an assured water supply based on requirements for the AMA.**

## **OBSERVATIONS**

There are several issues associated with these recommendations. One issue is the volume of water that would be reasonable to set aside for drought protection. If the volume of water that must be "saved" for drought protection is relatively small there would be little effect on residual groundwater pumping. The Groundwater Code and/or the AWS rules would need to be amended to require that all providers use renewable water supplies or to modify the mined groundwater account provisions. There could be serious concerns about any contract changes and any attempt to preclude use of a portion of the mined groundwater account. Designated providers with little or no demand in 1994 have very small groundwater account volumes and thus virtually no water to "save" for drought. How to provide drought protection for these providers (beyond that provided through the Arizona Water Banking Authority), is a concern.

Because of the AWS program, the municipal sector is the only sector subject to mandatory replenishment. This program is the major tool in achieving the safe-yield goal and requires substantial economic investment. Because of this there are equity issues between designated and non-designated providers and between the municipal and the other water use sectors.

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## **ISSUE 15: SHIFT IN CONSERVATION FOCUS TO END USERS**

The municipal conservation program, which focuses on municipal water providers, is not as effective as it could be if it addressed the end users more directly. A shift in the conservation focus from regulation of water providers to target "end users" in order to increase the effectiveness of safe-yield and conservation goals is suggested.

## **BACKGROUND**

In the agricultural and industrial conservation programs the end users are directly regulated, because each individual farm and rightholder is subject to conservation requirements. On the

other hand, municipal conservation requirements are focussed on water providers, rather than their customers (with the exception of "individual users" that have special requirements).

Since the adoption of the First Management Plan in 1984, most municipal water conservation requirements have been based on the average gallons per capita per day served by a water provider to its customers. Subsequently, an optional Non Per Capita Program was developed. It is the customers of the water providers who make the ultimate decisions about the use of water, yet with minor exceptions, they are not directly regulated by the municipal conservation program. In general, water providers do not have the authority to control the behavior of their customers. The suggestion is that there be a restructuring of the conservation program to increase DWR's responsibilities in the conservation arena and reduce the role of the municipal providers.

Although reductions in demand have undoubtedly been achieved, they are difficult to document and are frequently masked by the effects of weather and demographic factors. Average per capita usage across the AMA has varied between 163 and 196, with trends highly correlated with weather. Municipal providers that have implemented conservation programs have in some cases seen their per capita water use increase, which has caused frustration. Other providers who have made very few efforts to implement conservation have experienced reductions in water use.

The price that is now paid for groundwater in all sectors does not reflect its full value. In most cases, the price only includes energy costs, the cost of building the distribution system, and administrative costs. There is no component of the price that is a charge for the water itself. If groundwater costs reflected the cost of replacement supplies, utilization patterns would change dramatically. Most water resource managers agree that a carefully designed rate structure, which could include significant price increases, is one of the most effective tools to encourage "end users" to use water efficiently. Implementation of rate structure changes that are not associated with a cost increase, either through a pump tax or some other surcharge, is usually very difficult.

## **SOLUTIONS CONSIDERED**

- **The existing TMP Code language requiring "For municipal uses...the program in each plan shall require additional reasonable reductions in per capita use to those required in the second management period and use of such other conservation measures as may be appropriate for individual users" could be construed to mean reasonable reductions in per capita use on an AMA-wide basis, rather than on a service area (provider) basis. Although other sections of the statute may conflict with this interpretation, the intent is to focus on regulation of and/or assistance to the end user or customer, rather than municipal providers, with a stronger role for DWR in regional achievement of conservation objectives.**
- **DWR could substantially enhance its conservation activities to include one or more of the following: regional coordination of local water related ordinances; implementation of direct assistance programs such as rebates, audits, training programs, etc; programs to ensure a strong conservation message in rate structures; cost/benefit analysis for implementation of particular programs in particular service areas; regional education programs with a consistent message to build support**

for conservation activities; and direct responsibility for reductions in per capita use AMA-wide.

- Pricing mechanisms that reflect the true value of water should be developed. Any increase in revenue that results could be used to fund infrastructure for renewable supply utilization and/or regional conservation programs.
- Rate structures should be used to encourage conservation by the end user.
- A surcharge on water use to support conservation on a pass-through basis could be put on customers' bills, potentially on a sliding scale that targets high users.
- An increase in the pump tax could be used to pay for a regional conservation program and staff administered by DWR. This pump tax could be AMA or sector-specific, and applied on a sliding scale to other sources of water as well as groundwater to ensure ongoing revenue streams to pay for conservation.
- A partnership approach between DWR and the providers would require providers to be actively involved in implementation of conservation programs that are developed with DWR assistance.

#### **PRELIMINARY RECOMMENDATIONS**

A paradigm shift in responsibility is needed from the provider to the user to achieve conservation goals. To accomplish this shift, ADWR should be responsible for coordinating water conservation programs. ADWR would collaborate with providers to revise the municipal provider conservation program (for both public and private water companies) to target end users. This could include:

- Developing and implementing statewide and regional public education campaigns and school programs with a consistent message to build support for conservation activities and motivate behavioral change.

**While the Statewide Conservation Office started with good intentions, Arizona does not have a consistent, unified message on conservation. One-consistent message from the State could augment the positive efforts of various other entities promoting conservation. Additionally, the State should pursue how to better explain to the public all the positive efforts Arizona has done in managing its water resources.**

- Researching, developing and implementing regional conservation projects that would be done in partnership with municipal providers. These programs could include direct assistance programs such as rebates, tax credits or incentives; community education programs such as workshops and training programs; regional coordination of local water-related ordinances; and/or programs to ensure a strong conservation message in rate structures.

Some efforts have been made from the implementing of a state tax-credit for water saving devices by Water CASA to dish cleaning sprayers for restaurants by ADWR. Other individual efforts have been made. However, again a strong coordination of conservation projects has not occurred.

- Consider requiring a state surcharge for high water users to encourage an understanding of the true value of groundwater earmarked for conservation programs and/or development of infrastructure. The surcharge would go directly to fund state sponsored conservation or water infrastructure development programs rather than to the general fund.

This concept has not had a full and wide discussion. It is doubtful that the current Legislature would permit such a surcharge from being implemented.

- An increase in the pump tax could be used to pay for a regional conservation program and staff administered by DWR or other programs to facilitate achievement of safe-yield. This pump tax could be AMA or sector-specific, and applied on a sliding scale to other sources of water as well as groundwater to ensure ongoing revenue streams to pay for water management activities. This recommendation was developed in the context of the municipal conservation program, and is not supported by the agriculture or mining sectors.

Increasing the pump tax has not been discussed in a broad setting either specifically for conservation or for other water management purposes. Such a discussion would be met by opposition but it is still a discussion that should be had.

The largest change towards shifting conservation focus to the end user was the ADWR and stakeholders going through a lengthy process to revisit and revise ADWR's municipal conservation program. The end result was the Modified Non-Per Capita Conservation Program, also known as the Best Management Practices, which acknowledged what municipal providers are already doing in the area of conservation, that municipal providers are in the best role of deciding what conservation efforts will work in their service area, and allows municipal providers to develop their own conservation programs. The Modified Non-Per Capita Conservation Program also helps to target those municipal providers who have done very little in the way of conservation. Per legislation passed, this Program then has become part of the Third Management Plan. While the Modified Non-Per Capita Conservation Program was intended to streamline ADWR's administration efforts of past municipal conservation programs, it has yet to be seen if ADWR will be able to move away from past bureaucratic tendency.

## **OBSERVATIONS**

There are a number of equity issues created by having regional financing of conservation programs when it cannot be guaranteed that the benefits of such programs are distributed in direct proportion to the payments within the municipal sector. Providers in the Non Per Capita

Program already pay for specified conservation programs. There may be opposition to giving DWR primary responsibility for implementation of conservation programs in the region. Having a requirement to pay for conservation through a pump tax should avoid the ACC pass-through problem for private water companies (for an explanation, see the Residual Municipal Pumping Issue Paper), since taxes presumably can be passed through to customers as a cost of doing business. A regional conservation approach might allow more flexibility to respond to systematic stresses such as drought.

It should be noted that current Groundwater Code provisions place the responsibility for conservation with the entity that owns the groundwater right. Since ADWR is not a rightholder, it may be controversial to put ADWR in the position of responsibility for the efficiency of water use without having direct control over the water right.

This shift in focus could result in a more cooperative approach between the Department and providers to achieve conservation goals. Although it is clear that an increase in the pump tax or a surcharge would require a legislative amendment, it is unclear at this time what other changes in legislation and/or the management plans would be required to implement this proposal.