

DRAFT



MEMORANDUM

Date: October 5, 2001

To: The Honorable Chair and Members
Pima County Board of Supervisors

From: C.H. Huckelberry
County Administrator 

Re: **Water Resources in Pima County**

Background

The state law that defines the Elements of the Comprehensive Plan calls for water resources planning that (1) addresses the currently available surface water, groundwater and effluent supplies, and (2) provides an analysis of how the future growth projected in the county plan will be adequately served by the legally and physically available water supply, or provides plans to obtain additional necessary water supplies.

The attached study by Ms. Barbara Tellman of the Arizona Water Resources Research Center includes the information needed to draft the Water Resources Element. It also describes the options that Pima County has to deal with water supply issues in light of the need to protect riparian and wetland areas under the Sonoran Desert Conservation Plan. Divided into five parts, the study has these chapters:

- Introduction
- Pima County Water Supply and Use in the Past
- Basic Water Information
- Water Supplies in Specific Areas
- Options for the Future

The study also has five appendices: a glossary; a section that records the viewpoints of a number of experts from the water community in response to several questions about water availability; a summary of water budgets; the proposed City of Tucson Comprehensive Plan Water Element; and the Pima County - City of Tucson Effluent Agreement.

This memorandum highlights two areas of the study: water supplies in specific areas of the County, and water conservation strategies that Pima County might implement. In the near future I will forward to the Board draft ordinance and policy provisions that promote water conservation features in new housing, and that link land use controls to water availability at the sub-basin level, so that growth is accommodated in balance with the needs of the surrounding natural system.

Water Supplies in Specific Areas

While the development community is looking for information about the availability of developable land under future County land use plans, the resource community rightly asks how much population growth can be supported by our water supply. The question about the carrying capacity of our water resource base has been answered by different groups, using different assumptions. No previous analysis has made room in the overall water budget for riparian protection or restoration.

The water budget calculated in the Third Management Plan for the Tucson Active Management Area, assuming that water conservation goals are achieved by 2010, "shows that with a population of 1,266,500 it would still be necessary to mine groundwater." (P. 34) The City of Tucson population projections predict that we will reach this population in the year 2022.

In general, the *Water Resources in Pima County* study concludes that within this short term, "water supplies will probably keep up with human demand in the urban area if there is maximum utilization of CAP and treated wastewater, if conservation is accelerated, and if the legislature approves some of the proposed changes to the law." (P. 59) However, "in the long term (beyond 25 years), the prognosis is more in doubt." (P. 59)

Furthermore, even in the short term, "there may be water supply problems in areas not within actual reach of CAP or reclaimed wastewater, if water use increases there." (P. 59) Chapter four of the study details the supply and demand issues in seven regions of Pima County. Highlights are briefly mentioned below.

1. Tucson Urban Core (P. 37)

- Bounded by Silverbell Road, Pantano Road, the Rillito River and the Airport, "this area contains most of the population in the county and most of the urban water use."
- "In this area water demands far exceed supply and demands cannot be satisfied through local renewable supplies. Since the 1960s water has been imported from the Avra Valley, but even this is inadequate and CAP water is now available for a new water supply in this area."
- "Because there has been so much pumping of groundwater, the water table here has dropped up to 200 feet and subsidence is occurring in the urban area."

2. East Tucson Valley (P. 37 - 40)

- "This area includes the Rincon Mountains, Tanque Verde Wash, and Cienega Creek, where significant riparian resources can be found. In all of these areas new groundwater pumping could negatively impact the resources."

- "The water supply for a mesquite bosque along a tributary of Tanque Verde Creek also is threatened by urban development and the pumping in the area both to serve local residents and for the city as a whole."
- "Davidson Canyon is a major ephemeral tributary of Cienega Creek that runs partly through state trust land which may be sold in the future. If this land is sold, nothing in current state law would prohibit pumping in the area and this would affect Cienega Creek."
- "In addition, at the downstream end of Pima County's Cienega Creek Preserve, a small surface water diversion removes water from the creek at a man-made underground dam. Development in the general area would threaten the water supply for the creek if wells were drilled in the area."
- "Another threat is possible at Empirita Ranch where developers are allowed to extract up to 1,600 acre feet per year from the alluvial aquifer upstream of the perennial segments of the preserve."

3. Northwest Valley (P. 40 - 41)

- "This area includes the Tortolita Mountains and ... Marana and Oro Valley. The Marana area is the only part of Pima County where supply and demand have been relatively balanced. This is because a constant flow of wastewater down the Santa Cruz River has recharged the water table in the area, as have flood flows, since Marana is on the downstream end of the area."
- "Oro Valley has a different situation. Water supplies there are limited to inflow from the northwest side of the Catalina Mountains and groundwater. "

4. Green Valley (P. 41 - 42)

- "Green Valley is located along the Santa Cruz River which is dry here except in the rainy season. This portion of the river was also ephemeral in historic times Some flow enters this area from the Santa Rita Mountains but nowhere near enough to be a dependable water supply."
- "The major water uses in the area are for mining, agriculture (today, pecan groves), and urban purposes."
- "The raw CAP pipeline extends to a location north of Green Valley - Sahuarita and could become a water supply for the region."

5. Arivaca / Altar Valley (P. 42)

- "Altar Valley has very limited water supplies and not enough renewable water to support dense development. A few intermittent streams provide habitat for a number of threatened and endangered species, including fish, birds and frogs. These streams are on or near private land which could be impacted by additional pumping."
- "Arivaca is in the Altar Valley watershed but has a highly restricted water supply. Water use in the Arivaca region is barely delicately balanced today. ... Residents of the region have studied the water supply picture They came to the conclusion that the region cannot support much more groundwater pumping."

6. San Pedro River (P. 42 - 43)

- "Only a small part of the San Pedro River flows within Pima County, but this short stretch has perennial water and prime riparian habitat."
- "At this time water supply is adequate to meet demand. Only a few people live in the region."

7. Ajo (P. 43)

- "At the opposite end of the spectrum is the Ajo region It has no surface water and only limited amounts of groundwater."
- "Rainfall is much less in Ajo than in the Tucson area, so natural recharge potential is very small."
- "It is very clear in this region that water use must not exceed supply as there are no alternative water sources."
- "A major expansion of the town's population is unlikely for several reasons, of which a significant one is lack of available water."

Pima County's Ability to Implement Water Conservation Strategies

Given that within the planning horizon there are foreseeable issues of limitations on water supplies for development and conservation purposes, the discussion of strategies and options becomes an important precursor to adoption of water conservation measures under the Comprehensive Plan. On pages 52 and 53 of the study, a summary of eleven conservation strategies are charted, along with the method for implementation and a reference to barriers to implementation. The list below cites the strategies identified for Pima County, along with potential methods for implementing such strategies.

1. Limit pumping near shallow groundwater

Potential methods for implementing this strategy include land use controls and the purchase of development and water rights.

2. Maximize use of CAP and reclaimed water

Implementation methods might include limitations on rezonings outside the service area and incentives to landowners.

3. Limit human water use in certain areas

Again, implementation methods might include limitations on rezonings outside the service area and incentives to landowners.

4. Use CAP in riparian areas

This strategy would require that the County have a CAP allocation, or achieve the conservation use of an allocation belonging to others through cooperative initiatives.

5. Reclaimed for riparian off-stream riparian

Preservation of current discharge and allocation of the resource are listed as potential implementation methods.

6. Reduce per capita consumption

Implementation methods might include landscape requirements and requirements for conservation features in new housing. A proposed water conservation ordinance will be sent to the Board in the near future.

7. Limit turf water use

Limitations on the establishment of golf course uses, and requirements that new courses use non-groundwater sources, are two suggested implementation methods.

8. Prevent subsidence

A suggested implementation strategy is that reclaimed water be used to recharge subsidence prone areas.

9. Restore and preserve natural areas

Implementation of this strategy could include floodplain acquisition, purchase of development and water rights, and limitations on rezonings.

10. Construct wetlands and riparian areas

Use of reclaimed water or CAP is suggested. Recharge projects are also suggested as an implementation method to realize this strategy.

11. Protect remote basins

This last strategy includes implementation options such as purchase of development or water rights, limitations on rezonings consistent with carrying capacity, reuse of water, and limitations on golf course uses.

Conclusion

The *Water Resources in Pima County* study reasonably concludes that "Pima County does not have enough water to satisfy the demands of a population which grows continually into the indefinite future and to provide adequate water for habitat and riparian needs unless changes are made." (P. 59)

In an echo of the conclusion to the July 1999 study on *Water Resources and the Sonoran Desert Conservation Plan*, the *Water Resources in Pima County* study ends with the words, "A regional approach to water management will help in making potential problems more manageable." (P. 59)

County staff, working with the expert community, will continue to gather data on a regional basis. The Comprehensive Plan, the Sonoran Desert Conservation Plan, and the implementing ordinances and policies that accompany these documents, will fashion solutions for Pima County so that Pima County's future actions within the unincorporated area are mindful of and contribute to the long term regional solution of balancing development and ecosystem protection through the best allocation of scarce resources.

Attachment