

## Appendix J

# SHOULD YUMA DESALTER OPERATE? VARIED, COMPLEX ISSUES ARE RAISED

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In May, I visited the Yuma Desalting Plant, which has recently been the focus of much attention. Whether or not the plant is operated has implications for water deliveries to Mexico under U.S. treaty obligations and is important to Central Arizona. It is also important to those concerned about the Cienega de Santa Clara environmental habitat. My visit was very informative.

The U.S. Bureau of Reclamation built the plant to address the high salinity of tail water from the Wellton-Mohawk Irrigation District. About 100,000 acre feet of irrigation water applied to district land but unused by crops was flowing back to the Colorado River. Its very high salt content raised concerns about the water. To meet the requirements of Minute 242 of the 1944 treaty with Mexico, the treatment plant was built to remove the salt from the Wellton-Mohawk tail water. To keep the salty water from flowing into the Colorado River while the plant was under design and construction, Reclamation built a 53-miles bypass canal. This canal diverted the water to the Santa Clara Slough in Mexico.

The bypass canal was built as an interim measure prior to the plant becoming operational. Completed in 1992, the plant operated only for a short period in 1993. It was shut down due to operational issues. Also, excess Colorado River flows met water obligations to Mexico without operating the plant.

Over the years the Santa Clara Slough, now known as the Cienega de Santa Clara, has benefited from this "bypass" water. In recognition of the important habitat of the Cienega and surrounding area, the Mexican government declared the region a Mexican National Biosphere. There is significant interest in keeping the Wellton-Mohawk tail water flowing to the Cienega. But, at the same time, the water was intended to be used to meet the U.S. obligation to deliver 1.5 million acre feet of water to Mexico annually. During wet years, meeting this obligation has not been of concern. In times of drought, however, every drop of water counts, and the water deliveries to the Cienega do not count toward meeting the U.S. obligation. Many Arizona water interests are concerned that the federal obligation to deliver 1.5 million acre feet of water annually to Mexico be satisfied without causing disproportionately adverse effects to Arizona.

What started out as a water quality issue has essentially become a water quantity matter. With drought conditions persisting, storage along the Colorado River is at very low levels. If Wellton-Mohawk water is not treated for delivery to Mexico, that water has to come from elsewhere. Recently, the water has come from storage at Lake Mead. If river supplies, including amounts in storage, are short, Central Arizona Project deliveries are the first to be cut, as the CAP holds the most junior rights to the river. The worst case scenario: The entire 1.5 million-acre-foot CAP entitlement would be cut before others with Colorado River allocations experience cutbacks. This is why the Central Arizona Water Conservation District, the operators of the CAP, have been advocating operation of the Yuma Desalting Plant.

Water issues are complex. And the question of whether or not to run the Yuma Desalting Plant is no exception. There are multiple implications to consider, including environmental and economic. The U.S. Bureau of Reclamation, with responsibility for operating the Yuma Desalting Plant and managing the Colorado River generally, is considering its options. Governor Napolitano, who recently visited the plant, and others in Arizona are likewise evaluating alternatives. Scrutiny of the complicated modeling of the Colorado River scenarios continues. Significant uncertainties are involved. We know there will be shortages. Their frequency and severity over the next 100 years will determine the impacts on the region served by CAP and the Colorado River watershed more generally. If CAP experiences a cutback, users of non-Indian agricultural water will be the first to be cut back

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within the Arizona system.

These users of CAP water have rights to use groundwater, but their ability to do so depends on the condition of their well delivery systems, and there could be significant cost implications associated with the re-substitution of groundwater for surface water. The Arizona Water Banking Authority has been storing water on behalf of CAP municipal water users for several years. So, the impact of any future municipal supply cutbacks will depend on their cumulative size relative to the amount of water stored by the bank. If agriculture returned to groundwater and municipal water users began drawing upon stored water, water tables throughout Central Arizona would obviously be affected

What are the costs and benefits of running the Yuma Desalting Plant to treat the tail water from the Wellton-Mohawk Irrigation District? A lot of effort is going into identifying alternatives, including land fallowing in Arizona. Everything depends upon projections and assumptions. The answer to the question is difficult to provide but must be pursued.

Visiting the plant and the adjacent national water treatment research center helped me realize that the Yuma Desalting Plant is an asset, not the "white elephant" it has been called. It can be operated, if not to treat the irrigation tail water, then to treat water for other purposes, such as delivery of Colorado River water to municipalities in Arizona and/or in Mexico.

Yes, issues related to operating the plant are complex. Their resolution will likely require not only careful analysis but compromise and flexibility.

*Note: Good background papers on the Yuma Desalting Plant are "The Yuma Desalination Plant: Arizona Perspectives," by Tom Carr, Arizona Department of Water Resources (August 2002) and "Dealing with the Colorado River's Salinity: What is the Future of the Yuma Desalting Plant?" by Sue McClurg, Water Education Foundation (Winter 2003-2004).*

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## Appendix K

# GOVERNOR'S WATER MANAGEMENT COMMISSION EXECUTIVE SUMMARY DECEMBER 2001

The December 2001 **Final Report** of the Governor's Water Management Commission (Commission) completes a two and a half-year examination of the Groundwater Code (Code) and water quantity management in Arizona's Active Management Areas (AMA). The Commission concludes that the goals and legal framework of the Code are sound and as such should continue to guide water management decisions and investments in the AMAs. Further, the Commission endorses the statutory management goal of each individual AMA, recognizing as appropriate their differing hydrologic and political characteristics.

The **Final Report** briefly describes the issue identification efforts of the Commission's Technical Advisory Committee (TAC) and the five individual AMA Task Forces that preceded the appointment of the Commission. It also details the Governor's charge to the Commission, the activities of the Commission, and the approximately 50 individual recommendations the Commission is forwarding to the Governor.

Governor Jane Dee Hull appointed the 49-member Commission in June 2000 to review the 21-year-old Groundwater Management Act and recommend changes—if necessary—to ensure that the five Active Management Areas within the State continue to maintain a reliable, sustainable water supply to meet current and future needs. Specifically, the Governor charged the Commission to:

1. "Evaluate progress toward meeting the goals of the 1980 Groundwater Management Act and the management goals of each of the five Active Management Areas to assure that the goals are appropriate and achievable."
2. "Evaluate mechanisms to reduce the use of mined groundwater, increase the utilization of renewable water supplies and most efficiently meet the water needs in the Active Management Areas."
3. "Evaluate whether changes are needed in statutes, rules, or policies to improve the effectiveness of water management in the Active Management Areas at the state and local levels of government."

The Commission held 18 public meetings and two weekend retreats, also open to the public. Additionally, 300 meetings with extensive public involvement were held by Commission subcommittees and work groups and by the TAC and AMA Task Forces. The issues for Commission consideration were presented in a series of seven issue papers developed by the individual AMA Task Forces and the 33-member TAC. The initial issues included: continued groundwater pumping by existing right holders as well as new industrial users and the impact of this pumping on achieving the management goals; how to address sub-area or critical area conditions; proliferation and concentration of small capacity exempt wells; utilization of renewable supplies; concerns about the Central Arizona Groundwater Replenishment District (CAGR); and long-term water supply reliability.

The Commission, after extensive debate, achieved consensus on approximately 50 recommendations for public review. A series of public Open Houses were held in each AMA the first week of October 2001 to solicit public comments. These comments were used to further refine the recommendations and in late October 2001, the Commission adopted their conclusions and the final package of recommendations for the Governor to consider.

The Commission recognizes that although groundwater mining has not been eliminated, water users, in response to the goals and requirements set forth in the Code, have significantly reduced groundwater mining in three of the five AMAs since the 1980s. However, current data indicate the Phoenix, Prescott and Tucson AMAs may not reach their goal of safe-yield by 2025. The actions recommended by the Commission, which include a number of statutory changes, are focused on fine-tuning aspects of the Code and other activities. These actions will assist in further reducing groundwater mining and will maintain the stability and certainty necessary for

investments in water supplies, delivery infrastructure and efficiency improvements which are vital to Arizona's future.

The Commission recommendations will: increase the utilization of renewable supplies to help ensure sustainability; address allowable pumping to reduce groundwater mining; protect ecologically significant habitats; and enhance water resources planning and technical assistance. The major recommendations are summarized below in the seven categories established by the Commission. The full set of recommendations is covered in detail in Section V of the Commission's **Final Report**.

**A. Renewable Supplies** – Utilization of renewable supplies has increased over the past 20 years, facilitated by the construction of surface water treatment plants and the completion of the Central Arizona Project (CAP) allowing the use of Colorado River water either directly or indirectly through artificial recharge and recovery projects. The Commission addressed issues related to the utilization of renewable supplies in all AMAs. These issues included: 1) how to maximize the use of available renewable supplies until currently unused CAP water is fully utilized by municipal, industrial and Indian entities; 2) how to ensure that regulatory programs and institutions promote efficient storage and use of renewable supplies; 3) how to facilitate cooperative efforts to finance infrastructure; 4) how to define the long-term role of the Central Arizona Groundwater Replenishment District (CAGRDR); and 5) how to ensure the long-term adequacy of renewable supplies to achieve a sustainable water supply.

Recommendations include authorizing enabling legislation for a multi-jurisdictional infrastructure financing authority to issue revenue bonds or use other financing alternatives intended for financing multi-jurisdictional water infrastructure projects that benefit a specified geographic area.

The Commission is also recommending changes to the authority and responsibilities of the CAGRDR. The CAGRDR is an entity that currently uses excess CAP water to replenish mined groundwater on behalf of certain subdivisions or water providers in the Phoenix, Pinal and Tucson AMAs for assured water supply purposes. Two of the most significant changes recommended are a requirement for the CAGRDR to establish a replenishment reserve to help secure water supplies for CAGRDR members and an enrollment fee for new subdivisions. This "reserve" would take advantage of currently available CAP supplies to store sufficient water to meet 20 years of demand for CAGRDR members.

The Commission also made a number of general recommendations in the category of Renewable Supplies that do not specify statutory or rules changes, but which are intended to encourage actions outside of the Commission process.

**B. Allowable Groundwater Pumping** - While a number of major water users within the AMAs have become less reliant on groundwater, other existing right holders and even new users continue to rely on groundwater. Issues addressed by the Commission include: 1) the continued pumping of groundwater pursuant to legitimate withdrawal authorities allowed under the Code, described as "holes in the bucket", which are projected to negatively effect the ability to achieve AMA management goals; and 2) the localized impacts that may be created by groundwater withdrawals. Recommendations developed to address these issues include: 1) new well permitting and impact requirements; 2) a "mined groundwater tax" for existing municipal and industrial groundwater users; 3) an obligation for new municipal and industrial groundwater users to utilize renewable supplies or replenish their mined groundwater with renewable supplies; and 4) changes to the exempt well statutes.

The Commission considered and then proposed a recommendation that would limit certain new wells from being drilled within "designated riparian area protection zones" located within the AMAs. These zones are proposed to be legislatively delineated on a map and are based on a 1/2 mile buffer adjacent to specified stream segments or cienegas within an AMA. The limitations apply not only to non-exempt wells, but exempt wells (a well with a pump capacity of 35 gallons per minute or less). Aside from this recommendation being limited to new wells in an AMA, several other exclusions apply including: 1) replacement wells; 2) stock watering wells; and 3) exempt wells used for domestic purposes and proposed to pump less than two acre-feet per year. There are also provisions that allow certain categories of users to get waivers if a demonstration of hardship or non-impact on the

designated riparian area can be made.

The Commission is also recommending changes that would eliminate or reduce groundwater mining by certain municipal and industrial water users within the AMAs. (Designated water providers and members of the CAGRDR are not included in this recommendation, as they are subject to the Assured Water Supply Rules.) First, the recommendation requires certain existing municipal and industrial water users (who currently have no obligation to use renewable supplies) to pay a phased-in "Mined Groundwater Tax." This tax would be used to replace a portion of the mined groundwater or to fund water-planning activities aimed at finding a mechanism to reduce reliance on mined groundwater. Second, certain new municipal and industrial water users would be required to make use of renewable supplies or replenish all of their mined groundwater over a period of time. This would also result in a statutory expansion of the CAGRDR's current authority and allow the CAGRDR to enroll industrial customers as well as municipal customers who predate or are not required to comply with the Assured Water Supply Rules. Finally, the recommendation eliminates issuance of certain new groundwater permits or rights without a full replenishment obligation after 2025 (2040 in Pinal AMA). This last proposal applies in all AMAs; however, provisions for Pinal, Prescott and Santa Cruz recognize the unique conditions within these areas. Additionally, certain users are exempted from this recommendation including agricultural users, metal mining operations and untreated water providers.

The Commission is also recommending changes to the exempt well statutes. These changes only apply within the AMAs. The first proposal would require that new exempt wells be limited to a pump capacity of 20 gallons per minute (a reduction from the current 35 gallons per minute); however, up to 35 gallons per minute could be requested based on a demonstrated need for a higher flow rate. A second set of proposals relates to exempt wells that are within the service area of (or affected by) a water provider or other groundwater withdrawal authority. Within a municipal provider service area, new exempt wells would not be permitted without a denial of service from the provider. Another provision would limit the ability of existing exempt well owners to prevent the drilling of new non-exempt wells (using more than 35 gallons per minute) and would eliminate the ability for a new exempt well owner to protest impacts from a subsequent new non-exempt well.

**C. Environment & Economic** - The Commission recognized that environmental concerns were not addressed in the 1980 Groundwater Code. A number of proposals to protect the environment were presented and discussed. The following recommendations address some of the water needs of environmental habitats within the State. First, the Commission recommends the establishment of zones around specified and legislatively adopted riparian areas for protection from new groundwater withdrawals, within the AMAs. This recommendation is directly linked to the discussion above under the Allowable Groundwater Pumping category.

The Commission is also recommending several statutory changes to increase funding and responsibilities of the Arizona Water Protection Fund.

**D. Conservation** – ADWR establishes "conservation requirements" for agricultural, industrial, and municipal water users within the AMAs. Issues raised included the role and effectiveness of conservation efforts in achieving the goals of each AMA and potential improvements for the current programs.

The recommendation in this category is for the Governor to initiate creation of a nonprofit cooperative association to serve Arizona's need for effective water conservation, education and research throughout the State.

**E. Management Goals** – The Commission concluded that the management goals were appropriate in each of the AMAs; however, the Commission also recognized the unique needs of the Pinal, Prescott, and Santa Cruz AMAs. As such, the Commission recommends local water users and the Department of Water Resources continue to work together to develop new programs to achieve the management goals in these AMAs.

**F. Water Resources Planning** - The Commission recognizes the need for better data and long range planning in the AMAs and throughout Arizona. Specifically the Commission recommends: 1) continued support for funding the current Rural Watershed Initiative; 2) initiation of discussions between stakeholders from throughout Arizona to develop and fund a planning process for addressing the state's future water demands; and 3) preparation of a

periodic report on hydrologic conditions and progress towards meeting the goals of each AMA, and a separate biennial summary report of conditions in the AMAs to the Legislature.

**G. Costs Of Water Management Programs** - The Commission recognizes that some of the 50 recommendations they are forwarding to the Governor will create additional work for the Arizona Department of Water Resources and water users throughout the state. The Commission recommends the Governor and the legislature consider mechanisms to ensure the Department of Water Resources has sufficient resources to carry out programs recommended by the Commission, to maintain current programs and to provide timely and quality technical assistance and water management planning for the State of Arizona.

Arizonans, by working together on water resources, have already achieved enormous gains in our effort to manage this vital resource effectively. The Commission is confident that implementing the package of recommendations we are forwarding to the Governor will maintain and enhance Arizona's water management efforts.

## Appendix L

# AMA MANDATORY CONSERVATION REQUIREMENTS

Mandatory, enforceable conservation requirements are specified in the AMA Management Plans for the agricultural, industrial and municipal water use sectors.

### **Agriculture**

In general, water use for irrigated agriculture is limited through the establishment of maximum annual groundwater allotments for each irrigation-grandfathered right. These allotments are based on acreage and crops grown between 1975 and 1980, multiplied by the water requirements of those crops and assuming maximum conservation efficiency. Alternatively, agricultural water users now have the option to apply for a “best management practices program,” implementing measures designed to reduce overall water use and increase irrigation efficiencies. In addition to these volumetric limitations, there is a prohibition on new irrigated agricultural acreage within the AMAs.

### **Industry**

Industrial water use is defined as a non-irrigation (non-agricultural) use of water not supplied by a city, town or private water company, including animal industry use and expanded animal industry use. Industrial water users include: (1) turf facilities (schools, parks, golf courses, home owner associations and lakes over ten acres in size), (2) sand and gravel facilities, (3) metal mining facilities, (4) large-scale power plants, (5) large-scale cooling facilities, (6) dairy operations and (7) cattle feedlot operations. These industrial rights are generally regulated with annual volumetric groundwater allotments, but the management plans also require the use of specific conservation technologies in particular industries such as metal mining and sand and gravel.

### **Municipal**

The GMA requires municipal water users (cities, towns, private water companies and irrigation districts that supply water for non-irrigation uses) to develop programs that result in reasonable reductions in per capita use. These reductions are based on a gallons per capita per day rate for customers within the service areas of the municipal providers that serve more than 500 people or use more than 100 acre-feet of water per year. The gallon per capita per day rate is converted to an annual volume for each water provider, allowing the water provider to develop its own conservation program and measures that will achieve the targeted reduction set by the State. The measures that have been employed by municipal water providers to meet the state targets include conservation oriented rate structures, landscaping and plumbing ordinances, and education, incentive and water audit programs. Municipal providers that qualify for an AWS also have the option to apply for a “best management practices” type of program.

No other states have comprehensive groundwater conservation programs that are as rigorous as those within the AMAs, though some states do have drought-related measures that are more stringent.



**Appendix M**  
**Storage and Recovery for Phoenix, Pinal and Prescott AMAs through 2002 and Tucson AMA through 2003**  
**(rounded to nearest acre-foot)**

PHOENIX AMA	Annual Capacity			Water Stored			Credits Recovered			Total Credits Remaining in Storage		
	CAP	Effluent	Other	CAP	Effluent	Other	CAP	Effluent	Other	CAP	Effluent	Other
GSF Total	448,000	130,950	100,000 P6	1,511,108	17,748	0	72,600	3,170	0	1,439,771	14,577	0
USF Total	390,682	286,812	S/V 200,000 P6	510,267	162,165	110,574 S/V	14,637	32,682	102,962	501,687	129,252	6,922 P6
USF Total/Outside AMA	20,000	0	0	16,571	0	0	0	0	0	16,571	0	0
USF & GSF Totals	858,682	417,762	SV 300,000 P6	2,037,946	179,913	89,174 S/V	87,236	35,853	81,567 S/V 1,181 offset	1,958,029	143,829	
<b>TUCSON AMA</b>												
GSF Total	82,986			184,603			22,671			161,932		
USF Total (Includes Outside AMA)	151,000	65,196	600	346,859	76,431	277	90,793	65,153	277	256,065	11,278	0
USF & GSF Totals	233,986	65,196	600	531,461	76,431	277	113,464	65,153	277	417,997	11,278	0
<b>PINAL AMA</b>												
GSF Total	286,000	0	0	1,069,919	0	0	6,411	0	0	1,065,406	0	0
USF Total	0	798	0	0.0	1,056	0	0	166	0	0	891	0
USF & GSF Totals	286,000	798	0	1,069,919	1,056	0	6,411	166	0	1,065,406	891	0
<b>PRESCOTT AMA</b>												
USF Total		8,961	6,721		19,486	1,488		2,948	1,594		14,964	-106

Notes: P6 = Plan 6 water; S/V = Salt and Verde Rivers water; GSF = Groundwater Savings Facility; USF = Underground Storage Facility; CAP = water stored and credits remaining in Pinal AMA include 61,099 acre-feet stored by AWBA for Nevada.



## Appendix N

# COUNTY EFFORTS TO COORDINATE LAND USE PLANS WITH WATER SUPPLIES

In spite of the limited authorities available to counties, efforts have been made to coordinate land use plans with water supplies. Some examples include:

- In the Golden Valley area of Mohave County, 22 square miles were down-planned in part to preserve water supplies and to establish lot-splitting limits. Mohave County will approve power plants only if they use “dry cooling” technology when the aquifer is threatened by depletion or subsidence. The County also has added to its water conservation element a goal that seeks water supplies in perpetuity.
- In the Empirita Ranch area of Pima County, because of water availability concerns, the land acquisition agreement included pumping limits on groundwater to protect Cienega Creek and reduced housing densities were included in the Comprehensive Plan.
- Santa Cruz County has a rural planning zone that recommends limits on new development and a rural zoning pattern to sustain limited groundwater resources.
- Yavapai County has included reduced densities in the Comprehensive Plan in response to water supply concerns.

Though most of Pima County is within an AMA and as with other AMAs, issues related to riparian protection are not specifically addressed in state law or the management plans. Pima County has identified a number of regional plan policies that are intended to reduce risk to riparian areas, including (Pima County, 2002):

- limiting pumping near shallow groundwater by using land use controls and the purchase of development and water rights;
- maximizing the use of CAP and effluent and limiting specific water uses;
- limiting rezonings outside of the CAP and effluent water delivery areas and providing incentives to landowners;
- using CAP and effluent for riparian restoration;
- limiting turf water use through a golf course water ordinance;
- minimizing human impact to aquatic and riparian ecosystems by development, roads and trails; and encouraging land use decisions that maintain the function and quality of watercourses.



## Appendix 0

# GROWING SMARTER LEGISLATION REQUIRING A WATER RESOURCES ELEMENT

(excerpted)

### 9-461.05. General plans; authority; scope

D. For cities and towns having a population of more than two thousand five hundred persons but less than ten thousand persons and whose population growth rate exceeded an average of two per cent per year for the ten year period before the most recent United States decennial census and for cities and towns having a population of ten thousand or more persons according to the most recent United States decennial census, the general plan shall include, and for other cities and towns the general plan may include:

5. A water resources element that addresses:

- (a) The known legally and physically available surface water, groundwater and effluent supplies.
- (b) The demand for water that will result from future growth projected in the general plan, added to existing uses.
- (c) An analysis of how the demand for water that will result from future growth projected in the general plan will be served by the water supplies identified in subdivision (a) of this paragraph or a plan to obtain additional necessary water supplies.

F. The water resources element of the general plan does not require:

- 1. New independent hydrogeologic studies.
- 2. The city or town to be a water service provider.

### 11-821. County plans; definitions

C. In addition to the other matters that are required or authorized under this section and article 1 of this chapter, for counties having a population of more than one hundred twenty-five thousand persons according to the most recent United States decennial census, the county plan shall include, and for other counties the county plan may include:

3. Planning for water resources that addresses:

- (a) The known legally and physically available surface water, groundwater and effluent supplies.
- (b) The demand for water that will result from future growth projected in the county plan, added to existing uses.
- (c) An analysis of how the demand for water that will result from future growth projected in the comprehensive plan will be served by the water supplies identified in subdivision (a) of this paragraph or a plan to obtain additional necessary water supplies.

E. The water resources element of the comprehensive plan does not require:

- 1. New independent hydrogeologic studies.
- 2. The county to be a water service provider.



## APPENDIX P

# INDIAN WATER RIGHT SETTLEMENTS

BONNIE G. COLBY

### **Ak-Chin Water Settlement**

The 21,840-acre Ak-Chin Reservation was established in 1912 and is located in the midst of a productive agricultural area in south central Arizona. Prior to completion of the Central Arizona Project (CAP), neighboring irrigators, as well as the Ak-Chin Indian Community, were wholly dependent on groundwater for irrigation and domestic purposes. By the 1960s, the Indian community was irrigating approximately 10,000 acres with groundwater pumped from depths of 40 to 50 feet. Due to the success of the tribal farming enterprise, the Indian community had achieved near economic self-sufficiency. Extensive off-reservation pumping nearby caused sharp declines (approximately 20 feet per year) in groundwater levels beneath the reservation and the Indian community's irrigated acreage declined from 10,000 to less than 5,000 acres.

The Indian community asked the United States in 1976 to file suit against non-Indian pumpers on behalf of the community. In recognition of its trust responsibility to provide the Ak-Chin with a reliable water supply, the federal government entered into negotiations with the community to settle its water claims. The State of Arizona and local non-Indian water users supported this approach.

After two years of negotiations and before a lawsuit was filed, the Department of the Interior reached an agreement with the Indian community. The settlement provided for both an interim water supply to meet the emergency needs of the Indian community and a permanent water supply within 25 years. The settlement envisioned developing a well field on nearby federal land to provide the interim supply. Under the act, the federal government would be liable for the replacement cost of the water if it failed to meet the delivery obligations.

While the federal administration was supportive of the Ak-Chin's claim to water, it was concerned about overall cost and federal liability, in light of the uncertain nature of the water supply. Despite these concerns, the settlement was passed by Congress and signed by President Carter in 1978. Although enjoying the support of the State of Arizona and local water users, this first settlement was opposed by most other western states. Senator Barry Goldwater and Representative John Rhodes were influential in securing the Ak-Chin settlement.

The settlement was amended in 1984 when the anticipated water supplies proved insufficient and too costly. The revised agreement, negotiated with the active involvement of Senator Goldwater and Representatives Morris Udall and John McCain, provided for the federal government to pay damages for failure to make timely delivery of the interim water supply and modified the funding and delivery schedules for the permanent water supply. The federal government provided the community with \$15 million to meet interim water needs, contributed other economic development grants and loan forgiveness worth \$28.7 million and moved the permanent supply deadline up to 1988. In exchange, the Indian community relieved the federal government of its responsibility to provide an interim water supply and agreed to an overall reduction in its permanent water entitlement. Under the revised settlement, the community receives 75,000 acre-feet of water in normal years, as little as 72,000 acre-feet in dry years and up to 85,000 acre-feet in wet years.

The water supply was secured by reallocating 50,000 acre-feet per year of Colorado River water from the Yuma Mesa Division of the Gila Project to the Ak-Chin Indian Community. This water, which is delivered to the community through the CAP canal, was an unused portion of a 300,000 acre-feet allocation available to the Yuma Mesa Division under contracts entered into according to the Boulder Canyon Project Act of 1928. The transferred Colorado River water retains its priority date, a priority superior to that of the CAP, making the entitlement senior

by Arizona standards.

The federal government provided the Yuma Mesa Division with a \$9.4 million grant for improvements and conservation measures and to forgive federal loan obligations worth approximately \$17.8 million in exchange for transferring 50,000 acre-feet of its CAP allocation. The balance of the Community's water entitlement is provided from the Ak-Chin's 58,300 acre-feet CAP allocation. The portion of these supplies not needed to meet the obligations of the settlement is to be re-allocated on an interim basis to the CAP, potentially making additional water available to central and southern Arizona water users. This latter provision makes excess Ak-Chin water available for future Indian water settlements in Arizona. Arizona's agricultural community argues that they were promised any excess water. This proved to be a contentious issue in the San Carlos Apache Tribe settlement, which relies on this source of water to satisfy tribal entitlements.

The federal government bears the entire financial obligation under this settlement and also is responsible for the replacement cost of any water that it fails to deliver to the community. The federal Office of Management and the Budget has strenuously opposed federal liability for damages in more recent Indian water settlements and now also insists on reasonable local contributions.

The original settlement did not provide for off-reservation leasing of any portion of the Indian community's entitlement, due to strong opposition to the principle of off-reservation marketing by the State, western governors, local irrigators and other non-Indian interests. In 1992, fourteen years after the original legislation's enactment, Congress passed a bill, supported by the State of Arizona, the Indian community and local water users, that amends the settlement to allow off-reservation leasing of portions of the water entitlement in select areas of the state.

In an innovative agreement, the Ak-Chin leased part of their water right under a 100-year contract to a large Arizona developer. By increasing their water efficiency through drip irrigation and computer monitoring systems, the community was able to lease 10,000 acre-feet annually to provide the 100-year assured water supply to the Del Webb Corporation for a planned community of 40,000 people north of Phoenix.

In addition, the Arizona Department of Water Resources (ADWR) promulgated a new rule to specifically accommodate transactions like the Ak-Chin-Del Webb deal. Under current Arizona law, a developer needs a 100-year perpetual assured water supply before its development can be approved. Conversely, most tribal settlements restrict tribal water leasing to contracts not exceeding 100 years. Thus, if a developer leases 100 years of water from a tribe to meet its assured supply, the developer must find replacement water for the last years of the 100-year period. Under the new rule, developers and tribes may renew 100-year leases each year to satisfy the state requirement of 100-year assured supplies. The new ADWR rule gives flexibility to providers using Colorado River or CAP water leased from an Arizona Indian community to meet their assured water supply requirements. If the leased water initially satisfies the 100-year assured supply requirement, the department will wait until the fiftieth year to review the developer's assured supply certificate. At that time, the developer must show evidence of active negotiations with the tribe to renew the lease. To ensure security to customers, tribal leased water can account for only 15 percent or less of the provider's total water supply.

The Ak-Chin Water Settlement of 1978 was among the first Indian water right disputes resolved through a legislative settlement. This settlement has several interesting features:

- The original settlement agreement was between the United States and the Ak-Chin Indian Community and did not involve the State of Arizona or local water users directly.
- This is one of only two Indian water settlements passed by Congress in which the federal government bears the entire financial burden.
- Imported surface water supplies were used to satisfy the Community's entitlement.

- The Ak-Chin settlement had to be amended in 1984, six years after its enactment and further amended in 1992, illustrating the difficulty of achieving finality on these complex issues.

The active involvement of key members of Arizona's congressional delegation, who held leadership positions in Congress, greatly assisted in the formulation and passage of this settlement and amendments.

### **Salt River Pima-Maricopa Indian Community Water Settlement**

The Salt River Pima-Maricopa Indian Community Water Settlement addresses water disputes that have existed between the Indian Community and other water users in the Salt River Valley for more than 110 years. This agreement illustrates the increasing complexity of Arizona settlements. Only a few of the significant aspects of the settlement are discussed here.

- These disputes involved the water supplies and water delivery arrangements of two Indian Communities, seven Phoenix area cities and towns and three irrigation districts.
- The settlement relies on intricate arrangements for water transfers and exchanges, leasebacks, contract modifications and ratifications and modified storage rights to satisfy the Community's water entitlement.
- Determining an equitable measure of the local cost share posed a major obstacle in obtaining federal approval for the bill.

Pima and Maricopa Indians irrigated land along the Gila River in central Arizona prior to the arrival of Spanish explorers. During the mid-1800s, immigrants, miners, and the United States army relied on these tribes for much of their food and hay supplies. In order to protect these lands from encroachment by non-Indians, the Gila River Indian Reservation was established in 1859. Beginning in 1868, upstream diversions by non-Indians depleted much of the water supply available to the reservation. During the 1870s, Pima and Maricopa Indians in search of more dependable water supplies began migrating from the Gila River Reservation to cultivate lands along the Salt River. By 1879, the Indians had brought about 3,400 acres under cultivation. In order to protect these Indians from further displacement by non-Indians, some of whom were attempting to homestead on the Indian's improved lands, the Salt River Pima-Maricopa Indian Reservation was created by Executive Order in 1879.

In 1905 a suit was filed in state court to determine the priority and ownership of water rights in the Salt River Valley in preparation for completion of the Salt River Project (SRP), an early Bureau of Reclamation project which serves Phoenix area farms and cities. The federal government filed claims on behalf of the Salt River Pima-Maricopa Indian Community on the basis of its prior appropriation rights under state law. The United States filed no claims for reserved water rights, even though the Supreme Court's landmark *Winters* case had been decided in 1908. The resulting Kent Decree, issued by the court in 1910, awarded the Salt River Indian Community 18,766 acre-feet per year of the natural flow of the Salt and Verde Rivers. The Indian community's repeated appeals to have the United States reopen the Kent Decree were unsuccessful.

The water supply problems of the Indian community were compounded when it was excluded from receiving storage water from the SRP. In 1935, the Secretary of the Interior and the SRP agreed to build Bartlett Dam on the Verde River, in part to provide 20,000 acre-feet annually to the Salt River Reservation. The Bartlett Dam agreement provides a complex accounting system to allocate the storage rights behind the dam. When Bartlett Dam was operated with other SRP reservoirs, this accounting system worked to the disadvantage of the Indian Community, effectively reducing its water storage credits.

For many years the Indian community protested the water entitlement it received under both the Kent Decree and the Bartlett Dam agreement. By the early 1980s the community had initiated a series of lawsuits against the federal government, the SRP and local cities and irrigation districts. Concurrent efforts to negotiate

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failed to yield an acceptable compromise. In the 1980s, when the Community was joined in the Gila River Adjudication, the United States claimed a total of 202,000 acre-feet annually on behalf of the Community.

Because these lawsuits threatened key water delivery arrangements for irrigators and for the Phoenix metropolitan area, non-Indians had a strong incentive to seek a negotiated settlement, rather than await the uncertain outcome of litigation. Negotiations resumed in 1985, with the added incentive of developing a cost-sharing plan to speed completion of the CAP. The overall cost of the settlement and how it was to be distributed among the federal government, the Indian community and local water users emerged as a critical issue that shaped the character of the final agreement. After more than two years of intensive negotiations, a local settlement was reached in 1988 and ratified by Congress later that same year.

The settlement entitles the Indian Community to a maximum of 122,400 acre-feet annually (4.5 acre-feet per acre water duty applied to the 27,200 irrigable acres on the reservation). The water is to be provided from a combination of sources, including

- firming up existing rights under the Kent Decree and Bartlett Dam agreement,
- a series of exchanges involving CAP and non-CAP Colorado River water,
- Salt and Verde River water, and
- groundwater pumped from beneath the reservation.

In addition, a trust fund was established to enable the Community to rehabilitate, further develop, and maintain its irrigation systems and to put the settlement water to beneficial use.

The settlement relies upon complex transfers, leases and exchanges to provide water for the Indian Community and to protect existing non-Indian water users. For instance, the settlement requires the cities to provide the Indian Community with 20,000 acre-feet annually of Salt and Verde River water available through the SRP. In exchange, the Secretary of the Interior will provide the cities with 22,000 acre-feet per year of pre-CAP priority Colorado River water. The settlement provided that the Colorado River water could be made available from the Wellton-Mohawk Irrigation and Drainage District (WMIDD) near Yuma, even though WMIDD is not a party to the settlement. In exchange, WMIDD received certain benefits from the federal government. Another provision of the act authorizes the Community to lease its entire 13,300 acre-feet per year CAP allocation to local cities for 99 years for \$16 million. This leasing provision is the only exception to the settlement's blanket prohibition on marketing or using the community's entitlement off-reservation. Surrounding non-Indian water users are limited in their groundwater use by the Groundwater Management Act (GMA). The tribe may pump 38,000 acre-feet annually from groundwater wells, but groundwater use restrictions could become more stringent in the future if the East Salt River sub-basin is no longer in "safe yield," as determined by ADWR.

The overall goals of these arrangements were to satisfy the Community's entitlement with native groundwater and surface flows, to minimize the impact of the settlement on existing non-Indian water users and to provide the cities with renewable surface supplies. In addition to protecting existing water supplies, a major goal of local non-Indians in this settlement was to preserve and affirm existing water delivery agreements.

Local cities negotiated lease contracts with the Community for the CAP water. Phoenix contracted back in the late 1980s to begin taking their leased portion of the Community's water in 2001. In exchange, the City of Phoenix provided the Community a one-time lump-sum payment of approximately \$1,200 per acre-foot. One of the important features of the lease is that the water retains its Indian priority and character. This means that when Phoenix orders the water, the city is not obliged to pay the CAP capital repayment cost it would if it were ordering the water as "the city." In addition, in times of shortage, the water retains its Indian priority date.

Congress has made necessary appropriations for settlement implementation. The settlement has been approved by the court presiding over the Gila River general stream adjudication and will be incorporated in the

final decree of that adjudication. Implementation of this settlement is proceeding smoothly.

### **Zuni Heaven Settlement**

The Pueblo of Zuni reservation is located in northwestern New Mexico, near the four-corners region where Arizona, New Mexico, Utah and Colorado join. From time immemorial, the Zuni Tribe has made a pilgrimage to Kothluwala:wa, or "Zuni Heaven." Zuni Heaven is a relatively flat and marshy riparian area of the Little Colorado River, approximately three miles downstream of the Zion Reservoir near Hunt Valley, Arizona. For many centuries selected members of the Zuni Tribe have trekked by foot or horseback over 110 miles to perform religious ceremonies for two days during the summer solstice period every four years. In 1877, the land that comprised Zuni Heaven was lost to the tribe as a result of an executive order. In 1984, Congress passed a law to reacquire lands around the religious site in northeastern Arizona as well as permanent rights of ingress and egress. Recently, the tribe purchased other lands needed for the restoration of the area in fee simple.

Though the Zuni reacquired the land, Zuni Heaven was much altered due to the construction of the Zion Dam in 1920. The dam trapped sediment in the reservoir so outflows scoured the channel of the Little Colorado River to the extent that the river abandoned its historical floodplain and caused rapid destruction of the surrounding wetlands that supported watercress, cottonwoods and willows. Groundwater pumping by nearby non-Indians exacerbated the destruction by draining the artesian springs. Finally, the introduction of non-native plants like tamarisks, along with cattle grazing, further damaged the Zuni religious site.

Under the 1984 congressional act and subsequent 1990 legislation, the Zuni are funded to coordinate with the Bureau of Reclamation, the Environmental Protection Agency and the Arizona Water Protection Fund to develop a program to restore the wetlands. The legislation establishes the Zuni Indian Resource Development Trust Fund and provides an appropriation of \$25 million to aid in the restoration plan. Further, the act declares certain private lands in Arizona to be Zuni Indian Reservation. According to the legislative history, the lands were redesignated as reservation because "extensive damageS to the trust lands within the Zuni Indian Reservation have occurred, including severe land erosion, loss of timber and minerals, spoliation of archaeological sites, and loss of the use of water; . . . these damages have occurred, in part, by reasons of acts and omissions of the United States in breach of its trust responsibility" (Zuni Claims Settlement Act, 1990).

Further, to successfully ensure proper habitat restoration, the Zuni acquired a couple of large ranches upstream from the Heaven. Though few water rights were associated with the purchase of the ranches, the Zuni need this land to facilitate the volume of water delivery necessary to properly irrigate the critical restoration areas. Some parties to the settlement objected to the Zuni putting such fee lands into trust. Eventually, the talks focused on allowing a small corridor of land along the Little Colorado River to go into trust, with the rest remaining in fee unless Congress passed legislation authorizing the trust status.

Water quality was another important issue. Some parties to the negotiations wanted the tribe to waive water quality damages, *i.e.*, waive the right to sue for a certain quality of the tribe's entire decreed right. The tribe was willing to waive claims beyond a level of "natural water quality," or reasonable rises and falls of water quality due to currently practiced circumstances. The tribe was not willing to waive claims to damages that result from the introduction of a hazardous substance into the water supply.

In the later stages of the negotiation, the parties proposed to enable the tribe to purchase water rights surrounding the Zuni Heaven land in order to retire those rights from use. Though the tribe asserts a Practicably Irrigable Acreage-type claim for the fertile area, the dominant focus of the four-year settlement negotiation was for water to restore the religious spot as an "oasis." Non-Indian reliance on groundwater pumping altered the natural hydrologic conditions so that springs no longer irrigate the area. The cornerstone of the negotiated settlement is a voluntary exchange of water rights so the Zuni may use mostly surface water to irrigate the land to its original wetland habitat. The parties agreed to allow the Zuni Tribe, or the United States on its behalf, to purchase up to 3,600 acre-feet of rights from willing upstream sellers in the Norviel Decree Area, with the rights retaining the Norviel Decree priority date. Once these rights are severed and transferred for the benefit of the tribe, state law will no longer apply and the tribe may use the water in any way it deems appropriate on the reservation.

In addition, the parties agreed not to object to Zuni pumping of up to 1,500 acre-feet per year of groundwater on-reservation to supplement the surface water irrigation. The groundwater will be used to ensure constant saturation of the most critical religious habitat, even in drought or shortage years. Further, two large utility companies with operations in the area developed “non-interference” groundwater compacts with the tribe. SRP agreed not to pump groundwater south of a specified area, and Tucson Electric Power agreed not to move their groundwater pumping operation any closer to the Little Colorado River than its current site. Finally, smaller, private parties to the settlement, who are located within an area critical to the restoration habitat, agreed to limit their groundwater pumping to a rate below 500 gallons per minute. These agreements are “Pumping Protection Agreements” that effectively create buffer zones surrounding the reservation that require limited or no use of groundwater by non-Indians in that area.

Some parties in the settlement maintained that the Zuni Heaven deal had to be included in an overall Little Colorado River settlement. Though the Zuni Heaven portion of the Little Colorado River talks is minute compared to the claims, issues and price tags of other interests, the Zuni lands represent a significant piece of leverage with which other Native Americans would like to bargain, due to their close proximity to powerful utility interests. In addition, the federal government has multiple, and sometimes competing, trust obligations in the Little Colorado River negotiation and must make sure a binding and favorable agreement for one tribe does not unduly prejudice another trust beneficiary. While there was some resistance to the Zuni Heaven settlement being introduced as a stand-alone piece of legislation, all local parties eventually signed off on the settlement agreement.

Senator Jon Kyl, accompanied by Senator John McCain, introduced the Zuni Indian Tribe Water Rights Settlement Act of 2002 in July of the 107th Congress. The bill is an agreement with the tribe, the United States, the State of Arizona and major water users in the area of the tribe’s religious lands in northeastern Arizona. The settlement provides the tribe with necessary resources to acquire lands around the religious site from willing sellers to restore the wetland environment that previously existed. In exchange for this settlement, the tribe waives its rights and claims it may have in the pending Little Colorado River Adjudication. The bill was reported from committee to the Senate in October 2002 after changes were made over concern about the water quality waiver provisions and the United States’ liability as sovereign and trustee, right-of-way access across tribal trust land and sovereign immunity and removal issues. The bill passed Congress and was signed into law by President Bush on June 23, 2003.

### **Southern Arizona Water Rights Settlement**

Achieving a legislatively approved settlement is not an end in itself but an important milestone on the way to settlement implementation. No settlement can anticipate all the problems that will arise in the future. Since negotiators had little experience to guide them, some of the earlier pioneering agreements were incomplete or had deficiencies or problems that must be reconsidered. The Southern Arizona Water Rights Settlement Act (SAWRSA) is one example.

The Tohono O’odham Nation located near Tucson historically has used groundwater to irrigate the crops of its agriculture-based culture. In the late 1970s, groundwater depletion began to make farming on the reservation increasingly expensive and difficult. To resolve the tense situation between thirsty Tucson and the tribes, the federal government promised a “firm delivery” of imported surface water and reclaimed municipal effluent in the Southern Arizona Water Rights Settlement. As a condition to receiving their entitlement, the tribe agreed to limit groundwater pumping beneath the San Xavier Reservation to 10,000 acre-feet annually and to the existing pumped quantity below the Schuk Toak Reservation. The tribes have the right to off-reservation marketing of their groundwater entitlement, as long as it is marketed within the Tucson Active Management Area (AMA). In addition, the federal government is liable for damages in the amount of replacement costs if it fails to make its “firm delivery” quantity. The settlement also authorized the federal government to construct and operate delivery systems on and off the reservations to enable the Nation to put their entitlements to beneficial use. Additionally, SAWRSA uses a three-way deal with the City of Tucson so the Secretary of the Interior can use the city’s effluent to satisfy the nation’s entitlement.

Further amendments to SAWRSA are currently included in the proposed Gila River Basin settlement. The proposed SAWRSA amendments have many provisions. The proposed amendments would oblige the Secretary of the Interior to deliver 37,800 acre- feet of agriculturally suitable water annually to the San Xavier and Schuk Toak Districts of the Nation, as well as another 28,200 acre-feet annually of non-Indian agricultural priority water from the main project works of the CAP. As a condition of its water delivery, the proposed amendment requires that the Nation limit the quantity of groundwater withdrawals by non-exempt wells beneath the reservation districts. The Nation must also allocate as the “first right of beneficial consumptive use” a certain amount of its water to groundwater storage, instream flows and riparian and vegetation habitat. The Nation will enact and maintain a comprehensive water code to manage and establish permit requirements for the water resources of the Nation. Significantly, this code must be specifically sensitive to the Nation’s allottees and must include specific permitting and judicial review processes for allottee applications.

The 1982 SAWRSA provided that the City of Tucson would deliver about 22,000 acre-feet per year of effluent to the federal government to assist the United States in meeting its total obligation to the tribe. The Nation has declined to use effluent for its agricultural needs, so the Department of the Interior looked for ways the federal government could recharge the effluent in exchange for state groundwater credits or CAP water delivery. The proposed SAWRSA amendments include a mechanism for the federal government to receive groundwater or CAP credits from the state for recharging Tucson’s effluent so the Nation may use or save such credits. These amendments to SAWRSA will allow the Nation to receive groundwater credits for certain recharge and storage acts and for the retiring of their grandfathered well rights. Like their non-Indian neighbors, the Nation would like to develop these flex credits under the GMA code to have the groundwater for its future use or value. A significant change in the 2000 act allows the Nation to market its waters within the three-county CAP service area, not just the Tucson AMA.

The SAWRSA amendments within the proposed Gila River settlement also are designed to settle litigation by Nation allottees that arose from the 1982 settlement as well as adjust some of the old restrictions on the Nation’s water usage. Tribal allottees contend that they had only token representation in the 1982 negotiations and dispute some of SAWRSA’s terms. The proposed SAWRSA amendments would reallocate benefits between the Nation and the allottees as well as provide additional water to the Nation.

### **Yavapai-Prescott Indian Tribe Settlement**

In 1994, Congress enacted the Yavapai-Prescott Indian Tribe Water Settlement Act. The Act settles the tribe’s water rights claims by: (1) confirming the tribe’s right to pump groundwater within the boundaries of the reservation, (2) providing for the relinquishment of the tribe’s CAP contract, the proceeds to be used for a water service contract with the City of Prescott, and (3) providing that the tribe may divert a portion of the water from Granite Creek currently diverted by the Chino Valley Irrigation District.

The Act also provides authorization to the Tribe and the City of Prescott to market their CAP water to the City of Scottsdale, which has been completed. The Act required a state appropriation of \$2 million that was made in the 1994 session of the Arizona State Legislature and was added to the tribe’s CAP proceeds fund. The Gila River General Stream Adjudication approved this settlement for incorporation into the final decree in that case.

### **Little Colorado River Settlement Talks**

As early as 1986, an attorney for the Hopi Tribe suggested the establishment of a Settlement Committee to explore possibilities for a negotiated settlement. In 1987, Judge Minker, the Superior Court Judge for the adjudication, set forth the general framework of the adjudication, including a schedule for preparation of hydrographic survey reports (HSRs). Among many provisions was the establishment of a Settlement Committee “to meet and explore the settlement potential of this litigation.” The parties involved in the settlement negotiations include four tribes, multiple state and federal agencies, four large electric power utilities and numerous water districts, water users and municipal and county governments.

The ADWR filed the Hydrographic Survey Report for the Silver Creek watershed, part of the Little

Colorado River adjudication, in 1990. At the conclusion of the objection period, more than 3,450 objections had been filed by individuals and three tribes (Navajo Nation, Hopi Tribe and San Juan Southern Paiute) or the United States on the behalf of the tribes in an effort to protect Indian water rights. In 1992, Special Master Thorson commenced proceedings to resolve objections to the Silver Creek HSR. Initially, objections were organized into contested cases involving many issues of broad legal significance concerning state law water rights. The complexity of this litigation soon convinced the parties and the court that a different approach was necessary.

In January 1994, Judge Minker modified previous orders concerning the schedule for HSRs, requesting ADWR to proceed with an Indian Lands HSR. This change in focus was rooted in the excessive numbers of objections filed to the Silver Creek HSR, resulting in numerous pleadings, contentious hearings and undue burdens on all parties, especially small claimants, and on the court. Judge Minker sought to curtail lengthy and costly litigation by focusing attention on claims of reserved rights of Indian lands and federal agencies.

During the first half of 1994, Judge Minker granted stays of the litigation schedule for the ongoing Silver Creek proceedings. This was done to enable the parties to concentrate on prospects for settlement, rather than expend time and resources at litigation. After Judge Minker stayed litigation, the Settlement Committee met frequently and settlement negotiations intensified. This was especially true after Judge Minker appointed Judge Michael C. Nelson, Presiding Judge of the Apache County Superior Court, as settlement judge to oversee and manage the negotiations. In the ensuing time, all parties have praised Judge Nelson's effectiveness and dedication to the settlement process.

The first focus among the parties was to seek protection of existing water uses while providing some means of developing "wet water" for Indian lands. As talks were getting underway, Secretary of the Interior Bruce Babbitt suggested that any settlement should address issues surrounding the Black Mesa Mine. The Hopi Tribe and others, including some environmental groups, have opposed Peabody Western Coal Company's use of underground water from the N-Aquifer to slurry coal from Black Mesa Mine to the Mohave Generating Station in Laughlin, Nevada. Secretary Babbitt urged consideration of a pipeline from Lake Powell to the Black Mesa Mine and to the various Indian communities in the basin.

Under Judge Nelson's guidance, negotiations were split into "North" and "South" issues. On the "North" side, talks involved the proposed Lake Powell pipeline and sharing of water resources available to the Navajo Nation and the Hopi Tribe. The "South" issues are those affecting the vast majority of individual, non-Indian claimants in the watershed. Primary among the issues is grandfathering existing uses, some means of assuring future uses and developing "wet water" for the Navajo Nation.

At the same time, the Pueblo of Zuni and water users in the eastern portion of the watershed engaged in fruitful talks, also with Judge Nelson's help. On a fourth front, state parties and federal agencies have conducted negotiations with respect to the non-Indian federal claims of the National Park Service, Forest Service and Bureau of Land Management. During 2001, parties filed several stipulations as to water right abstracts. The adjudication court has indicated it will approve the stipulations, once minor technical changes are made.

In early 1998, in fact, Judge Minker expressed frustration about continuing to pursue a settlement that perpetually seems to be just beyond reach. Truth about actual settlement possibilities may lie in confidential documents not available for review. The Navajo Nation and Hopi Tribe concur on the need for a pipeline from Lake Powell to the two reservations. Senator Kyl commissioned a \$1 million study through the Bureau of Reclamation to review existing reports concerning the feasibility and cost of the pipeline and other water development projects. The tribes have agreed to forego any challenge to existing surface water and groundwater uses ("grandfathered" uses) in exchange for limiting future surface diversions. The tribes have proposed methods to manage shared aquifers and the waters of five washes and arroyos that traverse both reservations. CAP water may be made available to supply the reservations, but there are significant questions about diversion of that water from Lake Powell.

There is a proposal to divert excess water in the southern portion of the watershed that flows north toward

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the reservations from the Mogollon Rim. Reservoirs would be constructed or enlarged in the "Three Canyon" area. The Endangered Species Act or other environmental laws could affect the new or expanded reservoirs or proposed pipelines.

Water marketing has been an important issue for the Navajo Nation. The ADWR has firmly opposed any possibility of marketing water, especially CAP water, outside of the watershed.

Finally, Judge P. Ballinger, who replaced Judge Minker as the adjudication judge, has requested ADWR to proceed with the Hopi Tribe HSR. In anticipation of returning to litigation, Judge Ballinger has ordered parties to submit disclosures concerning the claimed reserved rights of the Hopi Tribe, Navajo Nation, San Juan Southern Paiute Tribe and the Zuni Pueblo. The Hopi Tribe and the United States also were invited to file new or amended statements of claimant.

To summarize, settlement negotiations remain active on some of the unresolved issues in the Little Colorado River Adjudication. It is not possible to predict whether a comprehensive settlement can be achieved and lengthy litigation averted.