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Indian Water Rights Settlements: A Case Study in the Rhetoric of Implementation

THOMAS R. MCGUIRE

Floyd Flores, an aide to the San Xavier Reservation District Council, spoke to a mute panel from the United States Bureau of Reclamation at a public hearing early in 1989. His concern, which he reiterated in the Tohono O'odham language for the elders, was with the proper disposition of human remains found on lands to be disturbed—subjugated—for the "San Xavier Development Project," a ten-thousand-acre farm. Juliann Ramon, a member of the district council, framed the issue at hand quite pointedly: If the remains of her ancestors were disturbed, her people would be "cursed with pain and disease until the seventh generation."¹ Other Tohono O'odham addressed the same worry at the hearing on San Xavier Reservation and at a sparsely attended hearing the previous day in Sells, seat of government for the Tohono O'odham Nation.

At the Sells meeting, tribal officials spoke by their absence. Members of the tribe's Water Resources Committee attended neither hearing, again making a statement of sorts. The Bureau of Reclamation (BOR) representatives, following a protocol they had constructed through scores of meetings with Indian and non-Indian beneficiaries of the Central Arizona Project (CAP) over the last decade, deferred their response until the preparation of the final environmental impact statement on the proposed farm (see fig. 1).

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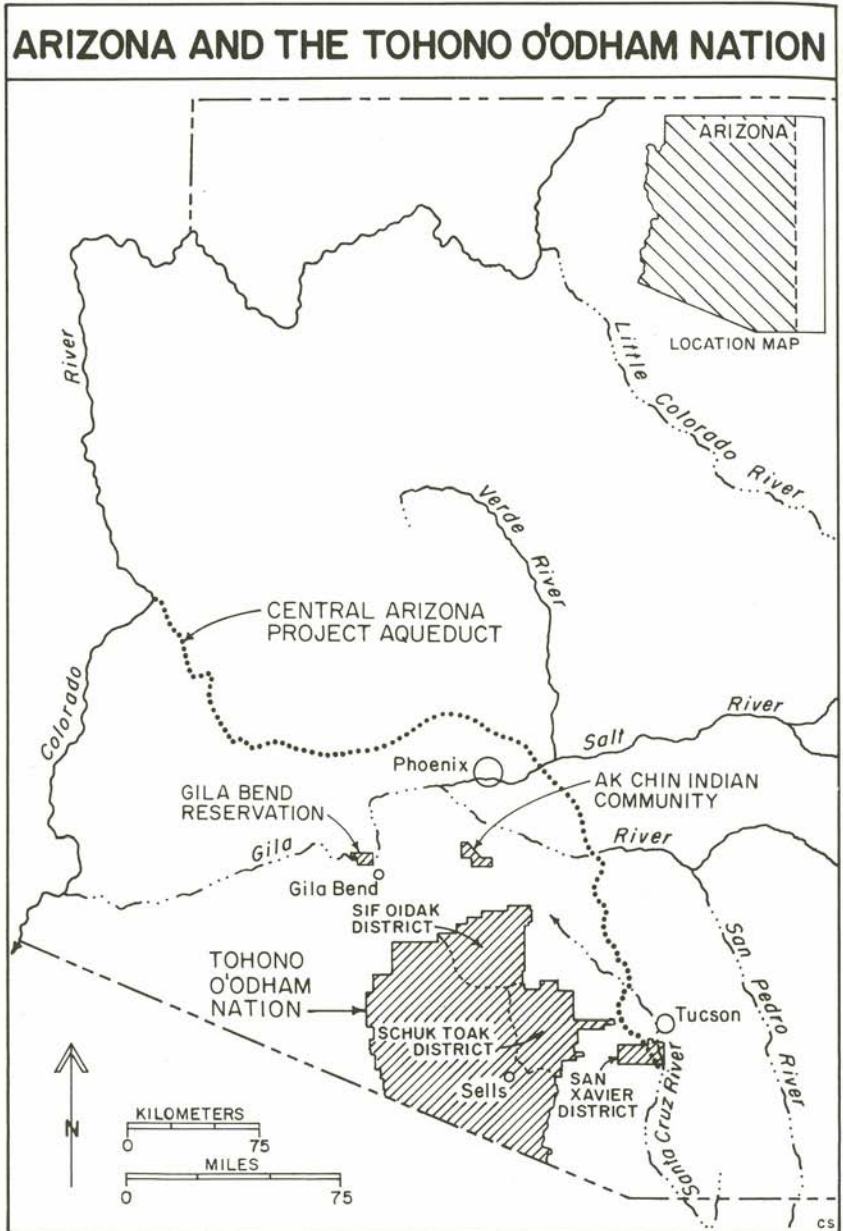


FIGURE 1. Arizona and the Tohono O'odham Nation. Map by Charles Sternberg.

By default, the dialogue at the San Xavier hearing was between past and future Indians. Nevertheless, it is the present generation of decision makers who must mediate the dialogue across time. A resolution to the dilemma facing the presumed beneficiaries of the Southern Arizona Water Rights Settlement Act was self-evident to many commentators at the public hearings in 1989. As an alternative to the proposed farm on the reservation, the city of Tucson could simply turn over to the tribe the twenty thousand acres of farmland in Avra Valley that the city had purchased for water rights—a use encouraged by Arizona's restrictive Groundwater Management Code of 1980. Close to the CAP's Tucson Aqueduct, this land now supports only tumbleweed. The transfer would make sense in that it would prevent the necessity of scraping acres of the reservation's virgin desert. In addition, the Avra Valley farms that are retired from cultivation have irrigation ditches already in place, and these lands have been leveled and diked against the flash floods of the arroyos.

The tribe's leaders in Sells and their engineering consultants and attorneys argued staunchly that the option was impractical both economically and institutionally. Although the case presented by this formidable coalition had reason, I am concerned here not so much with the truth of their contention, as with the processes by which the claim came to be formulated and contested. In a larger frame, my purpose is to document the ongoing struggle to implement—impose—a negotiated water rights settlement.

The Southern Arizona Water Rights Settlement Act of 1982 (Public Law 97-293), along with legislation in 1978 (P.L. 95-328) to resolve claims of the Ak Chin community near Maricopa, Arizona, initiated a new era of conflict resolution in the arid and semi-arid West. The conflict is between the rights of reservations as outlined in the Winters Doctrine—sufficient water to fulfill the present and future needs of the tribes—and the rapid development of the region.

Negotiated settlements prevent protracted and expensive litigation. They reflect an often fragile and difficult local consensus; they quantify a vague legal right to water; they typically involve a begrudging recognition, via the federal budget, of the government's past failures to protect the resources of its wards. And they are hailed as rational management tools, as mechanisms to meld legitimate Indian water uses into complex hydrologic and

institutional settings. Much of the analytical and partisan attention focuses on, and applauds, the act of settlement, not the implementation of an act.² I suggest, following the comments of Floyd Flores and Juliann Ramon, that we need to take a longer perspective.

In brief, the defiant discourse at the San Xavier public hearing in 1989 constituted an effort to inject some reason into the water rhetoric of the Tucson Basin. That rhetoric, constructed over the last decade, made a competing claim to reasonableness. Indeed, many of the specific struggles and compromises over water and land in the basin seemed at the time to have sensible and equitable results. These outcomes appeared, moreover, to be benignly synergistic. The Water Rights Settlement Act decided pressing questions about the allocation of scarce water and, in the process, assured that the Tucson Aqueduct would be constructed to supply both Indian and non-Indian needs. The aqueduct itself, and other features of the multibillion-dollar Central Arizona Project, were in turn made contingent upon a restructuring of Arizona's ineffectual groundwater laws. The 1980 Groundwater Management Code, a statewide measure to protect heavily overdrafted aquifers, seemed, finally, to generate a potential market for unused Indian water—an alternative, should the Tohono O'odham choose it, to a full-scale agribusiness operation (fig. 2).³

This seemingly reasonable structure—the Tucson water management system as it emerged through the 1980s—now impinges forcefully on the choices facing residents of San Xavier. To date, the Water Rights Settlement Act has not been implemented.

THE WATER RIGHTS SETTLEMENT ACT

Shortly after President Ronald Reagan signed the Southern Arizona Water Rights Settlement Act in 1982, the tribe's attorney and chief negotiator, William Strickland, underscored the thrust of the agreement with this statement: "People want to work. That's why we wanted water instead of money in the first place."⁴ Less than half of San Xavier Reservation's working-age population of 520 was employed in 1980.⁵

Because the revenues that the district will earn from the water are to be shared across the reservation, there were expectations that the water settlement would bring a measure of prosperity

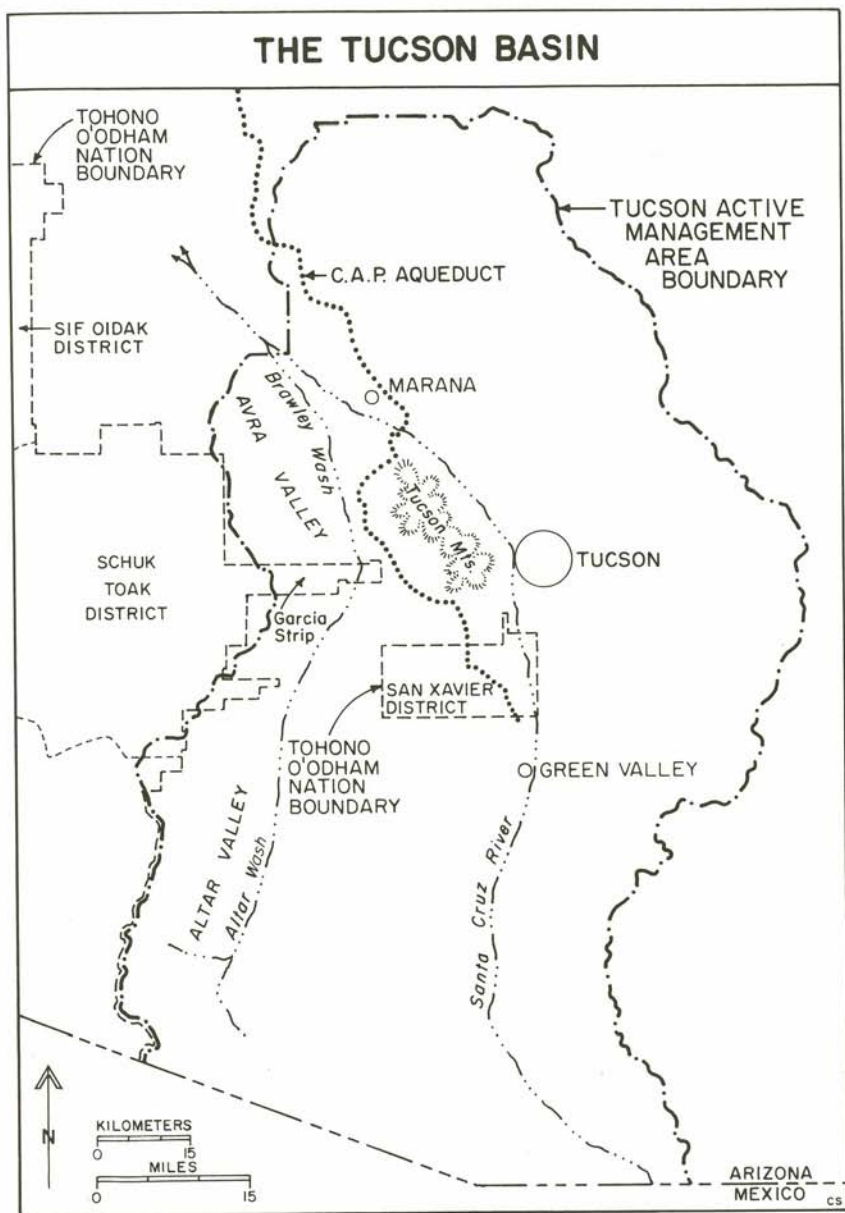


FIGURE 2. The Tucson Basin. Map by Charles Sternberg.

to all the Tohono O'odham, or at least a sense of control over their rightful resources. The Winters Doctrine heightened this anticipation. Virtually no one in the legal community in Tucson denied that the Tohono O'odham had a claim to waters sufficient to fulfill the needs of San Xavier and the other reservation districts—Schuk Toak, Sif Oidak, and Gila Bend—that contested water supplies with non-Indian neighbors. And few southern Arizonans denied that it was the actions of non-Indians that had dried up the surface flows across these districts and had drawn down the aquifers under them. The issue, brought to the attention of non-Indian water users by the tribe's lawsuit in 1975, was simply how best to make restitution to the Indians.⁶

The terms of the 1982 settlement are, briefly as follows: San Xavier and Schuk Toak districts were allocated a total of 66,000 acre-feet (af) of imported water and were required to limit their use of groundwater—San Xavier to no more than 10,000 af per year, Schuk Toak to the negligible amounts now being consumed on the sole cattle ranch straddling Brawley Wash in Avra Valley. The imported water would be from two sources: the Central Arizona Project (27,000 af to San Xavier and 10,800 to Schuk Toak) and "exchange water," water of agricultural quality acquired by the secretary of the interior in exchange for an equivalent amount of Tucson's effluent.⁷ Two other Tohono O'odham districts with water claims—both lying outside the Tucson Basin—were not included in the 1982 settlement and now await separate legislation.

The act permitted the imported water to be used for any purpose, including lease to non-Indian users within the Tucson Basin. There were financial incentives in the legislation, however, to put some of the water to agricultural use within the respective districts. For the 37,800 af of Central Arizona Project water, the federal government agreed to bear the proportionate costs for construction of the main project delivery features, as well as the costs of an efficient irrigation network on the reservation. The tribe, for its part, would have to pay the costs of subjugating the land and would be responsible for the operating and maintenance expenses of the farm. For the 28,200 af of exchange water, not even partial subsidies were attached, and it was anticipated at the time of the act that this supply would be leased to non-Indian users.⁸

Additionally, the act provided for several funds to prepare the farmlands. There were strong penalties, which would begin to

accrue on 12 October 1992—ten years from the signing of the legislation—if the United States Bureau of Reclamation had not yet completed the Tucson Aqueduct.⁹

The legislation evolved through four years of local bargaining. Various drafts were criticized on specific grounds. Occasionally, the entire concept of the water settlement was called into question. A county supervisor suggested that the bill went well beyond the Indians' needs; a spokesman for the Arizona Farm Bureau complained that the bill was a raid on Arizona's water supply; a local groundwater users' group termed the proposed legislation a charade designed to bring additional CAP water to Tucson under the guise of provisioning the reservation. Nevertheless, the act came close to satisfying the explicit goals of the Water Resources Coordinating Committee (WRCC), established in 1978 to search for a solution.¹⁰

The tribe's attorney initiated the call for this negotiating group. Composed of representatives from local agricultural associations, the mines, the city, utility companies in the county, private citizens, and the United States Army Corps of Engineers, the committee defined its overall goal as one of developing "a fair and reasonable water resources plan which will satisfy the present and future water needs of eastern Pima County." More pointedly, it sought to minimize local costs of water supply development.¹¹

Provisions in the final settlement clearly addressed the goals of the WRCC. The federal government, in fulfillment of its obligation to the Indians, bears a substantial portion of the construction costs for the CAP, although the specific payback arrangements had yet to be negotiated between the state and the federal government. Similarly, the allocation of water to the tribe, with allowances for the transfer of that allocation to other users, meant quite simply that more water would flow into the Tucson Basin, through a larger aqueduct, than would otherwise have been the case. Finally, the restrictions on Indian use of groundwater would help to maintain water levels in the city's wellfield in Avra Valley.¹²

Lacking in the act and throughout much of the negotiation process, however, was an explicit conceptualization of how the Indians' water would be used. In part, this was due to the peculiar nature of the Winters Doctrine rights upon which the allocation was based: the right of the Indians to put water to any use that would enhance the economic viability of reservations. More fundamentally, though, the lack of explicit goals was a reasonable

response to overriding uncertainty. When the act passed, little was known about the profitability of a farming venture, about the costs of subjugating reservation lands, about the price of CAP water to competing farmers in the state, nor about the strength of the water market in the Tucson Basin—although the rhetoric coming from the WRCC suggested at the time that there was an insatiable demand for Tohono O’odham water.

Ostensibly, none of the features of the act was inherently inimical to Indian interests. Water would be delivered to the reservation, and funds would be provided to develop that supply. Indeed, it was quickly hailed as a “win-win” solution to local water supply problems and the fulfillment of federal obligations to the Tohono O’odham.¹³ The act, however, was subject quickly to two processes: the evolution of Arizona’s Groundwater Management Code through the decade, and the planning and construction of the CAP’s Tucson Aqueduct. In sum, these processes decreased the very flexibility that the negotiators presumed they had incorporated into the settlement. The language of the act has not changed, but a reading of that text in 1991 is rather different from the reading of it in 1982.

THE GROUNDWATER MANAGEMENT CODE

In content and philosophy, Arizona’s Groundwater Management Code of 1980 owes as much to the legal battles in the Tucson Basin through the 1970s as it does to the exogenous demands from federal officials—with the Central Arizona Project as the carrot—for groundwater reform. The municipal government had been acquiring farmland throughout the decade, and now it demanded that the code validate the rights of the attached water supply. Simultaneously, though, the city wanted assurances that it could safely discontinue this expensive practice of purchase and retirement of farmland. The code, seemingly, met both of these objectives.¹⁴

In its final form, the code mandated “safe yield” for the state’s exploited aquifers by the year 2025. The means of achieving this balance between withdrawals and recharge is a series of five-year management plans imposing increasingly strict conservation measures on agricultural, industrial, and municipal users of water. Expansion of irrigated acreage is prohibited; should the

balance not be achieved by 2025, cities will be required to purchase remaining agricultural land and retire it from production.¹⁵

As a partial concession to proponents of local control, the code established administrative branches of the Arizona Department of Water Resources (DWR) in four "Active Management Areas" (AMAs) in the state. Each branch is empowered to impose fines on noncomplying users within the boundaries of the AMA. The boundaries of these AMAs were drawn on both hydrologic and political principles, to encompass the aquifers being pumped by significant regional water users. Thus the Tucson Active Management Area encircles the Upper Santa Cruz Basin and the adjacent Avra-Altar aquifer, utilized by the cities of Tucson, Marana, Green Valley, and Nogales, and all agricultural and industrial users within these boundaries.¹⁶

After passage of the code, the newly established staff of the Tucson Active Management Area issued discouraging projections for the region. Given reasonable assumptions about declining agricultural water use, municipal and industrial conservation and reuse of effluent, and the eventual importation of CAP water, the area would still have to overdraft the aquifer by 90,000 af per year after 2025. Significantly, however, the concern of DWR's local office was not with the letter of the law, but with the troubles this continued overdraft posed for its major constituency, the city of Tucson: a lowered water table, land subsidence, increased pumping costs, and an evident need to deepen wells and install larger pumps.¹⁷ Thus, in what was the first of several reinterpretations of the 1980 code, the staff of the Tucson Active Management Area began to talk consistently of the 2025 safe-yield deadline as a "planning goal," not a legal requirement.

Another rereading, of more direct relevance here, pertains to the retired farmland now owned by the city in Avra Valley. By defining how the city could use these former farms, the Groundwater Management Code attached a specific meaning to the landscape in Avra Valley. Not surprisingly, that meaning was one of water—to be used or banked for future withdrawal—not of land to be managed or husbanded. Within the boundaries of the AMAs, land had no value other than that attached to its water right. In short, the city had bought acre feet, not square feet, in Avra Valley.

The code ratified the city's right to utilize its existing wellfield in southern Avra Valley, adjacent to the Schuk Toak District.

And it paved the way for development in the future of wellfields in the central and northern parts of the valley, on land that the city had purchased and idled throughout the 1970s. At the time the code was established, the city had yet to develop these northern water supplies, holding them in reserve for the eventuality that the city's primary wellfield—a network of pumps within the municipal boundaries—would go dry.¹⁸

The supplementary wellfield in southern Avra Valley took on greater importance as the costs of developing the northern properties—and delivering water the length of the valley to connect into the plumbing from the south field—were calculated by city planners in the late 1970s. It was the threat posed by possible Indian pumps adjacent to the south wellfield that drove negotiators to limit groundwater rights in the Water Rights Settlement Act.¹⁹

The structure of the Groundwater Management Code had another implication for the tribe. The Active Management Area and its local bureaucracy rapidly became the most salient planning and political unit for water issues in southern Arizona, although, as mentioned above, the local staff frequently reflected the concerns of the city of Tucson, its largest constituent. Negotiations over the code and the Indian claims proceeded simultaneously through the late 1970s, and the issues became inextricably intertwined, and bounded by the spatial outlines of the Active Management Area. Thus, a key provision in the settlement act was driven by local, basin concerns: Settlement water could be marketed off-reservation, but only within the AMA. Moreover, the entire concept of the settlement was altered by the constructed geography of the AMA. Initially, the negotiation process was conceived by the tribal attorney as a mechanism to settle claims for the full reservation. In the end, the legislation addressed only those rights within the Tucson Basin.

THE TUCSON AQUEDUCT

In the summer of 1982, the Arizona Projects Office of the United States Bureau of Reclamation (APO/BOR) turned its attention to the design of the Central Arizona Project's final feature—the Tucson Aqueduct. The office had just ended a major confrontation with the Yavapai of Fort McDowell Reservation at the junction

of the Salt and Verde rivers east of Phoenix. Against the virtually unanimous wishes of water interests in the expansive metropolitan area, which had just experienced two destructive "100-year floods" in rapid succession, the BOR cancelled plans to build the infamous Orme Dam on the reservation.

The object of vehement protest from the Indians for over a decade, the proposed new dam was replaced by an intricate and expensive plan to refurbish and expand the existing dams on the Salt. "Plan 6," as the proposal was termed, was accompanied by an intensive public involvement effort designed to forge a local consensus among disgruntled residents of metropolitan Maricopa County and thus to present a united front to the secretary of the interior and to the Congress, charged ultimately with determining how to finance the alternative.²⁰

When the APO/BOR then addressed the Tucson Aqueduct, little was known regarding the cost-sharing arrangements for features of the CAP. These were, however, times of austerity: The administration had sent clear if unwritten messages to planners in the field that "least-cost" alternatives would receive favorable review. This parameter dictated the bureau's preliminary decision, in September of 1982, to route the Tucson Aqueduct through Avra Valley (see fig. 2, above).²¹

The least-cost alignment skirted the western slope of the Tucson Mountains and the Saguaro National Monument, ran close to the Avra Valley Irrigation District and the Tohono O'odham lands on Garcia Strip, then on to San Xavier District. The primary alternative to this route was an alignment east of the mountains, down through Tucson's industrial corridor, buried for most of its length in an underground pipe. This east-side alternative would then require costly feeder canals around the mountains to deliver agricultural water to the Indians and Avra Valley farmers—both substantially at federal expense.²²

Thus, for the Department of Justice, the choice was clear. Its task, over the next year, was to gain local concurrence for the west-side aqueduct. What emerged through these efforts, virtually overnight, was a distinctive performatory style for soliciting and managing public involvement. In the process, this style became legitimized; it was the management style that San Xavier's dissidents had to confront in 1989.

In its planning discussions in the fall of 1982, the BOR's staff anticipated little opposition to the route west of the mountains

and few social impacts—simply the relocation of a dozen or so families.²³ Much more resistance was expected from the “Committee on Alignment, Terminus and Storage,” formed at the request of the Bureau of Reclamation to serve as a local sounding board for its planners and engineers. Composed of representatives of “all the principal environmental, political, economic, and water-using entities of the community,” CATS, as the committee called itself, took as its mandate the task of “developing community consensus on the issues of alignment, terminus and storage.”²⁴

CATS was initially a clever, then an embarrassing, acronym. Concerned, to be sure, with overall decisions on alignment, terminus, and storage, the committee was profoundly wedded to the notion of an emergency storage reservoir on Cat Mountain, at the south end of the Tucson Mountains. The canal, as the BOR’s engineers readily admitted, would break periodically, due to continued land subsidence. And the pumps along Tucson’s portion of the aqueduct were to be designed without redundancy, thus causing interruption of flow for periodic maintenance. Tucson Water’s engineers feared that the city’s well capacity would be inadequate in the future to cover peak seasonal demands should these interruptions prove untimely. Finally, in 1981, Secretary Watt explicitly directed the BOR to include an emergency reservoir as it sketched out the Tucson Aqueduct.²⁵

The Bureau of Reclamation complied dutifully, and the preliminary plan included some wildly expensive alternatives for storing water on Cat Mountain. The least expensive means to fill the reservoir was from the east-side canal alignment—least expensive, that is, for the city of Tucson.²⁶ It was this conundrum that faced the bureau’s public involvement team as it attempted to forge a community consensus for its preferred, and predetermined, west-side alignment.

Conflict was resolved through a series of meetings between the BOR planners and members of CATS in the latter part of 1982 and on into the spring of 1983. There were some haphazard efforts by the bureau to demonstrate that Tucson did not need an emergency storage facility. The argument that prevailed was one of simple economics: Tucson risked losing the CAP altogether by insisting on a feature that the government would not finance. By May of 1983, when two public involvement meetings were scheduled, CATS had capitulated.

The first meeting was held at Marana High School in Avra Valley, to focus specifically on the CATS endorsement.²⁷ Few of the 175 residents in attendance had heard of CATS. Few appreciated the implications of the west-side alignment. The session was a free-for-all, with the BOR's advance planning staff attempting to field angry questions on property values, drowning babies and cattle, visual impairments to a relatively pristine desert, destruction of endangered plant species, interdiction of wildlife migrations, construction noise, valley fever due to spore-bearing dust, and, persistently, the lack of input from the residents of this rapidly changing rural area. The range of objections reflected a social transition from a farm-based economy to a sprawling satellite community. Responding sequentially to these queries, the BOR's staff could do little to defuse the tension.

Three days later, the planning staff convened a meeting at the Tucson Convention Center. The CATS recommendations, formally presented by the committee's chairman and endorsed in short speeches by a host of public officials and leaders of Tucson's business community, were brief. Support was given to the west-side route, and the committee recommended that "the Bureau give no further consideration to storage at the Cat Mountain site."²⁸

Departing from the protocol of the Marana meeting, the planning staff solicited questions in writing from the two hundred or so in the audience. Many of these were from Avra Valley, coming to reiterate their concerns. None were from the reservation. The questions were sorted, selected, read, and briefly answered by the presiding officials from the BOR. The public hearing closed on time and quietly. The Bureau of Reclamation issued a summary memorandum in June that preserved some of the hostility of the Marana meeting as well as the expressions of support for recommendations of the Committee on Alignment, Terminus and Storage. The memo quite explicitly transferred responsibility for the final alignment decision—a decision that weighed the costs of the alternatives against the risk of further protest from Avra Valley—away from the Arizona Projects Office in Phoenix.²⁹

A subsequent memorandum, stressing "broad community support for the West Side Plan as expressed through the public responses to the May 1983 Information Packet," announced that the commissioner of reclamation had selected that plan as the agency's proposed action, pending an environmental impact

statement.³⁰ Approved in 1985, the final plan replaced some of the open canal with underground piping along the Saguaro National Monument, Tucson Mountain Park, and Arizona-Sonora Desert Museum, all major tourist attractions for Tucson. Contractors, working double and triple shifts, have now completed much of the aqueduct through Avra Valley.

By mid-decade, few of the Tohono O'odham were aware of the encompassing constraints masked in the deliberations over the aqueduct's alignment, the Groundwater Management Code, indeed the Water Rights Settlement Act itself. The code, fueled initially by the rhetoric of water scarcity, ratified the practice of permanently retiring lands from cultivation. This stricture would hold through the decade, although the underlying philosophy of "safe yield"—indeed, the legal mandate that this be achieved by 2025—would be questioned. In the interim, when the settlement act was signed in 1982, the fear of being unable to meet this deadline still loomed large in the Tucson Active Management Area. And the act addressed this concern: It encouraged the marketing of surplus Indian water to users in the AMA.

In this context, the act raised expectations that all the reservation's districts might benefit from the resolution of the claims of the two districts within the Tucson Basin, San Xavier and Schuk Toak. There were some skeptics: Leaders from a far western district feared they would be made to share the debts, not the earnings, of an unprofitable farm venture. In the end, though, the act was a tribal measure, whose implementation thus became the responsibility of the elected leaders in Sells and their attorneys and engineers.

Ramon Garcia, patriarch of the ranch on the narrow strip of Schuk Toak District jutting into Avra Valley, was bemused by the discussions over what to do with the water awarded to his district in the settlement act. He was well aware that Garcia Strip was not his land; he insisted simply that the new farm leave him access to the ranch in the western foothills of Avra Valley. And he doubted that the aqueduct would ever be built through the valley.³¹

The Bureau of Reclamation, however, took the mandate of the Water Rights Settlement Act quite seriously—to deliver water, by 1992, to Garcia's lands and on to the San Xavier Reservation. Facing penalties if it failed to accomplish this, the BOR pushed reso-

lutely, throughout the decade, for the Avra Valley alignment and forged a consensus in Tucson behind this route.

At San Xavier, however, discussions on how to use the promised water were stalled in 1983. A more immediate crisis had unfolded.

THE PLANNED CITY

The Santa Cruz River, perennially dry now except for the effluent discharged by the city's treatment facility, flooded on the night of 1 October 1983. All but one of the area's eighteen bridges were disabled or destroyed; buildings on the floodplain were swept away; the town of Marana was evacuated; the stream's banks were gouged, exposing, at San Xavier, a prehistoric cremation site. As the wave subsided and the damage was assessed, Tucson's Convention and Visitor's Bureau issued an encouraging release to the national media: "The 100-year flood has come and gone, so, by all rights, Tucsonans should enjoy another century of great Southwest weather."³²

The storm did little to slow the dogged attempts by a Palm Springs entrepreneur to lease eighteen thousand acres of the San Xavier Reservation for a city of one hundred thousand residents. These efforts began in 1982 at the request of the Bureau of Indian Affairs, heeding the general call from the Reagan administration for "privatization" of reservation economic development. They terminated with a tribal resolution in 1986, rejecting the specific lease proposal and the philosophy of massive, long-term intrusions onto reservation land.

The center of the proposed city was on land allotted to individual Tohono O'odham farmers in 1890, when the Santa Cruz was still capable of irrigating the rich alluvium. In the 1980s, 650 descendants of the original allottees were asked individually to approve or reject the lease offered by Santa Cruz Properties, Inc. The district council also had a voice, since it retained land-use responsibility for the balance of unallotted acreage within the boundaries of the lease. Early in 1984, the district council approved the lease, subject to review by the secretary of the interior and contingent upon the consent of the majority of affected landholders. Advised by the tribe's legal counsel to respect an historic

semiautonomy of districts and allottees, the tribal council initially took no action and gave no advice to San Xavier (see fig. 2, above).

When the council in Sells did finally act on the proposal, it quieted four years of acrimonious debate at San Xavier, during which the original prolease council was removed from office and the antilease forces, many of them allottees, had organized into a strong political force with independent counsel and outside supporters—the “Defenders of O’odham Land Rights.” Features of this conflict are reviewed elsewhere, and the expected social impacts of the planned city have been analyzed in some detail.³³ Here I want to enumerate the residuals, the implications that this drawn-out moment has on the issue at hand—the “San Xavier Development Project.”

First, coincident with the battle over the proposed lease, the district council was called upon in 1984 to make preliminary decisions on how to utilize the water awarded under the Water Rights Settlement Act. The tribe’s consulting firm—an engineering and environmental planning outfit with recent experience in constructing the sixteen-thousand-acre farm on the Ak Chin Reservation—advised the district and tribe that it was unlikely to find an off-reservation market for its water. At the time, the advice appeared reasonable. The city of Tucson, a likely lessee when the act was negotiated, by now acknowledged that it would not need to supplement its own water supplies from the CAP and its existing wellfields for decades. Thus, to benefit from the water’s scheduled arrival in 1992, the Indians would have to find some means of using it on the reservation. The district council in late 1984 instructed the consulting firm to proceed with agricultural plans.

The decision was aired at a series of public hearings over the next year, with the district already deeply divided over the planned city. These hearings focused on site selection and scope, not on the wisdom of farming. Opponents of the Santa Cruz lease proposal viewed the farm as a way to lock up the district’s anticipated water supply. Those favoring the proposed city were comforted by the developer’s confidence that he could find alternative sources of water for his city. The issue, then, was where to put the new farm.

A tribally sponsored farm on allotted land would bring no ben-

efits to the tribe, violating the premise of the settlement act that all districts were to profit from the imported water. There was, then, little choice of a site for the new farm. Consultants directed their attention to the braided but virgin *bajada* (alluvial fan) west of Black Mountain, the only large and contiguous block of unallotted land within the district. In July 1985, the district council approved this site selection, outside the boundaries of the planned city.³⁴

The opponents of the Santa Cruz Properties scheme continued their fight through 1985, wresting a majority of the district council seats in that year's election. Significantly, too, one of the district's two seats on the tribal council went to an opponent of the lease. Over repeated claims by the developer that the bulk of the allottees favored the city, this representative worked to bring the issue to the council in Sells. When that council acted in 1986, it redefined the traditional relationships of semiautonomy between district and tribe. It took a definitive tribal action on a matter of direct concern to only one constituent district. This new centralism would quickly be tested as the Tohono O'odham Nation's engineers and their subcontractors—the archeologists—designed the conceptual plans and mitigation strategies for the farm site west of Black Mountain.

The cremation exposed by the raging Santa Cruz late in 1983 raised new concerns—and urgent ones—for the Tohono O'odham. Most directly, these concerns center around the archeological excavation, identification, analysis, curation, and disposition of human remains. The issue, however, is not simply a procedural one. It addresses a fundamental cosmology of the past. And, like most other issues of concern here, the O'odham were given little time to formalize and codify this cosmology. Moreover, they were asked to negotiate this cosmology—to bargain mutually acceptable working arrangements with archeologists and ancestors.

One such arrangement was worked out, contentiously, with archeologists from the Arizona State Museum. They were under contract to excavate the inhumations, crematoria, and fourteen cremations exposed by the flood of 1983.³⁵ Had the Santa Cruz Properties proposal gained approval, the entire acreage under lease would have been scrutinized by the archeologists and the medicine persons appointed by the district to oversee the exca-

vations. The thrust of this process—of negotiating culture before the blade of the backhoe and bulldozer—is to give voice to the deceased in land-use decisions on the reservation.

When we assessed the social and economic impacts of the Santa Cruz proposal in 1984, we erred. We remarked on the reluctance of the O'odham to speak for others, present and future, and thus concluded that land uses that were retrievable and reversible, such as farmland, posed a minimal threat to the unknown wishes of future generations.³⁶ Now the new district council at San Xavier, composed of veterans of the battle against the Palm Springs developer, has made it abundantly clear that previous generations must be taken into account.

THE "PROPOSED ACTION"

Coming to office through the elections of May 1987, the new district council quickly rescinded the previous council's endorsement of the eleven-thousand-acre "full development alternative" and instructed the tribe's engineering consultants to evaluate the feasibility of bringing the retired city lands in Avra Valley back into production (see fig. 3).³⁷ After a month of study, the firm reported back to the district, the nation, and the tribe's attorneys on two alternatives for off-reservation farming. Both were economically infeasible. The results of the analysis, released to the public in the environmental impact statement (EIS) for the project, were greeted with a certain amount of incredulity.³⁸

Skepticism fastened on a summary table of the draft EIS. The best alternative for Avra Valley, one utilizing only the CAP allocation, for which the federal government incurred all delivery costs, showed an annual loss of \$45 per acre. (Oddly, the plan developed for Schuk Toak District—on grazing lands that would have to be newly cleared—showed a profit.) The proposed farm on San Xavier land used an additional 11,000 af of the unsubsidized "exchange water." Despite the larger size of the San Xavier plan, total costs to the tribe—primarily for land preparation—were less than those of the Avra Valley option. And the San Xavier proposal generated a net yearly income, on paper, of \$120/acre (table 1).

Doubters pressed the query at the public hearing early in 1989: How could it possibly cost more to clear and level fewer acres of

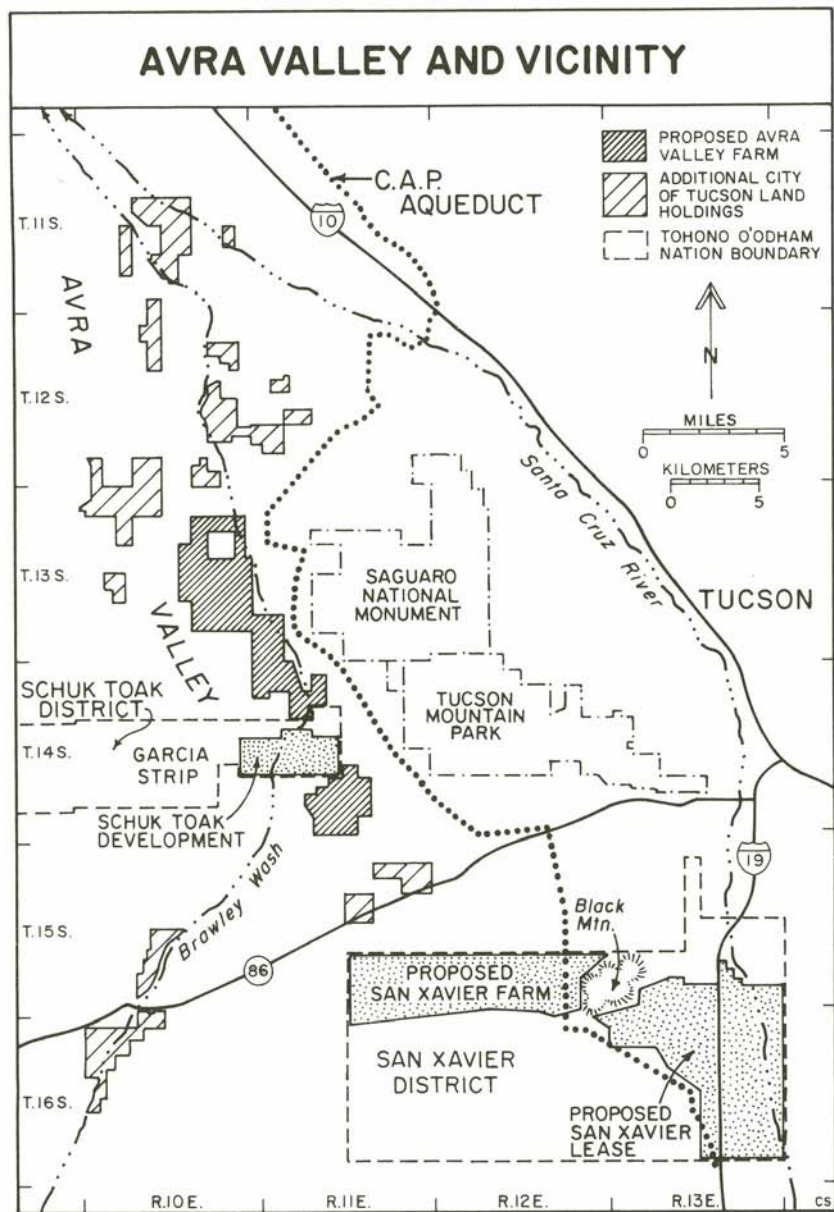


FIGURE 3. Avra Valley and vicinity. Map by Charles Sternberg.

Table 1
Farm Plan Comparisons, Tohono O'odham Nation

| | San Xavier ^a | Schuk Toak ^b | Avra Valley ^a |
|-----------------------------------|-------------------------|-------------------------|--------------------------|
| <i>Land (ac)</i> | | | |
| Net irrigated | 8,379 | 2,190 | 6,370 |
| Total | 10,871 | 2,660 | 8,154 |
| <i>Water Use (af)</i> | | | |
| CAP | 27,000 | 10,800 | 27,000 |
| Exchange | 11,110 | 0 | 0 |
| Total | 38,100 | 10,800 | 27,000 |
| <i>Project Costs (\$)</i> | | | |
| Federal | 24,570,000 | 16,087,000 | 18,600,000 |
| Nation | 17,030,000 | 6,515,000 | 19,401,000 |
| Nation's cost/acre | 1,567 | 2,450 | 2,380 |
| Total | 41,600,000 | 22,602,000 | 38,001,000 |
| <i>Nation's Annual Costs (\$)</i> | | | |
| Construction | 568,000 | 217,167 | 647,000 |
| City land lease | 0 | 0 | 554,000 |
| Farm operation | 4,717,000 | 908,850 | 2,182,000 |
| O M & R | 101,000 | 26,280 | 63,000 |
| Total | 5,386,000 | 1,152,297 | 3,446,000 |
| <i>Annual Farm Income (\$)</i> | 6,393,000 | 1,316,190 | 3,160,000 |
| <i>Annual Net Income</i> | | | |
| \$/yr | 1,007,000 | 163,893 | -286,000 |
| \$/ac | 120 | 75 | -45 |

^aDraft Environmental Impact Statement, San Xavier Development Project, U.S. Department of the Interior, Bureau of Reclamation, October 1988, p. II-21.

^bEnvironmental Assessment of the Schuk Toak Development Plan, U.S. Department of the Interior, Bureau of Reclamation, November 1988, pp. 3-73.

retired farmland in Avra Valley? Answers were not forthcoming. The EIS prepared by the nation's consulting firm had now become the responsibility of the parent agency for the Central Arizona Project, the United States Bureau of Reclamation. In the performatory style honed through years of public involvement, the hearings at San Xavier and Sells were orchestrated to receive comments on the draft EIS, not to provide responses.

The strategy backfired. Reclamation officials, taking no opportunity to respond, were chastised repeatedly at the San Xavier hearing and subsequently by incredulous editorial writers for a local newspaper, the *Arizona Daily Star*. The engineers were not present to explain and defend their report. The tribe's legal counsel did not attend. Finally, remarkable in their absence were the tribe's leaders from Sells and the tribe's Water Resources Committee, responsible throughout the planning process for communicating the wishes of the nation to its consultants. No one spoke in favor of the farm on San Xavier's land. Doubts over the calculations finally hardened into firm opposition by the presumed beneficiaries of the agency's proposed action.

The engineering firm indeed had made some risky assumptions—and some defensible ones—in its hastily prepared evaluations of the Avra Valley options. On paper, the firm amassed 8,000 acres of city-held land contiguous to the proposed Schuk Toak District farm on Garcia Strip. This was sufficient to use San Xavier's CAP allocation of 27,000 af and would permit that district to market its 23,000 af of exchange water, if buyers could be found, thus avoiding the additional expense of building delivery structures for this unsubsidized allocation. And, because San Xavier's Avra Valley farm would be contiguous to the Garcia Strip development, it could be operated under joint management, with shared labor and equipment.³⁹

However, the benefits of contiguity quickly dissipated on the engineers' spreadsheets. The fields that had been retired from cultivation had to be scraped and substantially leveled. Following the practice common throughout Arizona, these farms had been dead-leveled and furrow-irrigated. They had been supplied with water, however, by wells drilled, farm by farm, in an inconsistent pattern throughout the area. Thus, the engineers argued, the entire area would have to be systematically leveled to irrigate it efficiently from the canal feeding off the aqueduct. This necessity, at tribal expense, ostensibly accounted for the oddly exorbitant land preparation figures for the retired acreage (table 2).

Table 2
Land Preparation Cost Estimates, Tohono O'odham Nation

| | San Xavier | Schuk Toak | Avra Valley |
|----------------|------------|------------|-------------|
| Clear and grub | \$260/ac | \$180/ac | \$35/ac |
| Land leveling | \$350/ac | \$813/ac | \$1,180/ac |
| Total | \$610/ac | \$993/ac | \$1,215/ac |

Source: Extrapolated from sources cited in table 1, above.

Opponents of the San Xavier Development Project were not appeased. Indeed the Bureau of Reclamation even chose not to present this rationale publicly, for it hinged on some incomparables in technologies and cropping patterns. Moved by specific language in the settlement act—"the efficient distribution" of agricultural water—and by the realization that to dead-level the *bajada* west of Black Mountain would be grossly uneconomical, the engineers had penciled out sprinkler and bubbler irrigation systems for much of the San Xavier alternative, following more closely the natural slope of the land. Such irrigation systems do indeed conserve water, but the engineers concluded that they were inappropriate for lands in Avra Valley. The soils there are heavier than the sandy loam of the *bajada* near Black Mountain, and the existing sprinkler technology would apply water at rates greater than the infiltration capacity of the ground. Thus a traditional surface irrigation system was designed for Avra Valley and the adjacent parcel on Garcia Strip.⁴⁰

The soil morphology argument, a plausible one, carried an additional implication that constituted a further disadvantage in the Avra Valley option. The consultants altered the crop mix for the valley plan. High-valued vegetable acreage, included in the San Xavier alternative, was removed. A furrow irrigation system, it was contended, could not supply the needs of such crops for frequent applications of small quantities of water.

Thus, on balance, the Avra Valley alternative did not look good economically. Substantial costs would be incurred to re-level the abandoned fields. The technology would be simpler to manage and the initial investment would be less, but the yearly profits would be lower—negative, in fact.

Two weeks before the consultants embarked on their analysis of the Avra Valley alternative for San Xavier District, the tribe's attorney had briefed the nation on an identical request from the Schuk Toak Council. There were, in his view, insurmountable institutional barriers to the off-reservation farm. First, the settlement act, although it did not restrict water to on-reservation use, clearly envisioned that water was to be delivered to the reservation. An act of Congress—a new settlement bill—would be required to construct an off-reservation farm. A similar procedure would have to be followed to enlarge the reservation's boundaries, incorporating the city's unused holdings. Failing that, a farm outside the boundaries of the reservation would likely be subject to the \$50,000 yearly limit on cotton subsidies, a limit not imposed on tribally owned reservation farms. Finally, state law would have to be changed, specifically the prohibition of the Groundwater Management Code against bringing retired farmland back into production.⁴¹

These institutional arguments were employed by the engineers to reject an off-reservation option for Schuk Toak. They were drawn upon again to bolster the hasty economic analysis performed for San Xavier. They demand closer examination.

The crop subsidies available to tribal farms are an important consideration. The loophole used to avoid the \$50,000 limit per enterprise is that tribal farms are technically owned by all tribal members; they are thus multiple enterprises.⁴² But the argument that San Xavier would lose this benefit by farming off the reservation is irrelevant if those lands were to be annexed—by legislation—to the reservation.

Second, settlements can be changed. One already has been rewritten—the Ak Chin Act. The original settlement of 1978 called for the construction of a wellfield, at a cost that later proved to be enormous, to supply the reservation until the CAP canal was finished. The wellfield, however, would have depleted the groundwater of a nearby district of the Tohono O'odham Reservation. Upon discovering this fact, the attorney for the Ak Chin community—William Strickland—renegotiated the legislation in 1984.⁴³

State law can be changed as well: The Groundwater Management Code, though still intact, has come under intense legislative scrutiny in the past few years. Much of this pressure, which comes from the city of Tucson, concerns the retired farmland in

Avra Valley. The city now wants credit for the water it has conserved in the basin by idling farms in the past two decades. And it wants that credit applied to the future: to be able to pump 4.5 af per acre from the valley in perpetuity, not the 3 af agreed on in the code. Furthermore, the city is seeking to waive the safe-yield requirement—or goal—for the Avra Valley aquifer. Although Tucson's efforts were unsuccessful before the 1989 state legislature, the city is likely to raise the issues again.⁴⁴

Thus, the major tenets of the Groundwater Management Code of 1980 are no longer held inviolable. It would seem to be a small matter to amend the code's permanent retirement provision for this specific case—to return idled farmland back to production, irrigated not by groundwater but by surface flow from the Tucson Aqueduct.

The argument that an Indian farm in Avra Valley would lose money is still a specter. Here the sequencing of analysis—the interplay of economic and institutional arguments—is revealing. Schuk Toak Council's request to evaluate the off-reservation alternative was made in 1985 and was rejected by the consultants and tribal officials in October of 1987 on the basis of these presumed institutional barriers. When the new council from San Xavier made the same request in November 1987, the answer included a new twist. The consultants assumed that the tribe would have to lease the retired lands from the city, at \$100 per acre per year. These payments, simply for the soil, not the water underneath, would amount to \$554,000 a year (table 1, above), clearly dissipating any residual profit for the farm. If the tribe were not required to make such lease payments for untaxed municipal land upon which the city does nothing but manage weeds, the Avra Valley alternative would turn a modest profit of \$42 an acre.

To date the BOR's chosen mechanism to implement the Southern Arizona Water Rights Settlement Act remains the ten-thousand-acre farm on San Xavier Reservation.

INTERPRETING THE RHETORIC OF IMPLEMENTATION

The economic and institutional arguments were resolutely maintained by the loose coalition opposed to the Avra Valley plan. To

help explain this, I have made a wide detour through water law, water planning, and politics in the Tucson Basin. Now I will review the processes by which this constellation of interests formed over the last decade.

First, it is necessary to define the nature of the problem facing San Xavier's decision makers and their constituents in 1989, and to heed the discourse within which this problem is structured. At its most obvious level, the problem is one of putting to effective use the water rights perfected through the settlement act of 1982, and putting them to use to meet the ostensible goal of that act—sustained economic development for the reservation.

By 1989, however, that use had been rigidly defined as agricultural. Seeds of this constraint were contained in the Water Rights Settlement Act, in the form of financial incentives, and in the very quantity of water awarded to the districts. The city of Tucson had not been aggressive in seeking lease options for the award, even though it had lobbied to keep the Indians' water within the Tucson Basin and the Tucson Active Management Area and had sought, periodically throughout the decade, to obtain future rights to import water from other parts of the state, including other districts of the Tohono O'odham Nation.⁴⁵

The city's behavior may be explained by a disjuncture of supply and demand. Its own CAP allocation will start to flow in 1992, although the critical need for this water—determined primarily by expected population growth and the capacities of the existing wells—will not come until the next century. The rhetoric of imminent water scarcity, instrumental in winning congressional authorization for the CAP and a driving force behind critical provisions of the settlement act, had been refined through the decade. In short, the city could not use the O'odham water and the O'odham, restricted by the language of their settlement act, could not sell it elsewhere to thirstier consumers in California or in Phoenix.

The current district council's predecessors helped to structure the problem at hand. During the coincidental conflict over the proposed city of one hundred thousand non-Indians on the reservation, the council resolved to use the entire CAP allocation for farming within the district. The Avra Valley alternative simply seems not to have been considered at the time—perhaps due to preoccupation with the destiny of San Xavier's land, resources, and culture.

The Bureau of Reclamation, expert in water management, not human management, had begun to show the organizational strain brought on by the monumental Central Arizona Project. The Orme Dam battle of the 1970s and early 1980s was a major affair for the Arizona Projects Office in Phoenix. Planning efforts for the Tucson Aqueduct and the supply systems for the reservation, directly following the Orme fight, were haphazard. The BOR had already agreed to work itself out of a job in Arizona, to turn over the operation of the CAP to the Central Arizona Water Conservation District.⁴⁶ It had acknowledged the right of the Indians to hire their own engineering consultants under provisions of the Indian Self-Determination Act. And, in the face of unanticipated dissent from residents in Avra Valley over the alignment of the Tucson Aqueduct, the APO/BOR reinvigorated the bureau's centralized chain of command. Decisions on contested local issues were deferred to the regional office, to the commissioner, and then to the secretary of the interior. Since genuine local consensus was lacking, it became less of a planning criterion than cost.

By 1989, the APO/BOR thus had become an organizational spectator to the dispute on the San Xavier Reservation. But, as a federal agency, it retained financial liability should the water fail to reach the Indians by 1992.⁴⁷

All of these processes served to constrain the "permissible range of disagreement"⁴⁸ on the reservation. But there were institutional aspects, as well, that structured the debate over the San Xavier Development Project. These institutions were born of other conflicts.

The APO/BOR's public involvement procedure, which emerged at the hearings of the Tucson Aqueduct alignment and was legitimized by Tucson's community leaders at those hearings, was used once again at San Xavier. There were signs, however, that the Tohono O'odham were unwilling to follow that procedure, for it differed radically from the style of public debate and consensus they were used to, traditionally and in the more recent forum of council meetings.⁴⁹ And the tribe's own decision-making procedure had evolved through the decade. In the prolonged scrutiny of the planned city for San Xavier, the central council in Sells belatedly wielded its power to take action for the district. That power, once invoked, may be used again to locate a tribal farm within the boundaries of San Xavier.

Finally, there is the specific discourse of cost/benefit analyses and environmental impact statements. Jackson Lears has recast the relevant argument on power and consent first raised by Antonio Gramsci:

The available vocabulary helps mark the boundaries of permissible discourse, discourages the clarification of social alternatives, and makes it difficult for the dispossessed to locate the source of their unease, let alone remedy it.⁵⁰

The vocabulary was one of law and economics. Uncomfortable with this vocabulary, the new leaders at San Xavier chose to respond with another one altogether.

THE CHALLENGE

The defiant vocabulary developed from an entirely different and fortuitous context—that of the ancestral remains exposed by the flood of 1983. The arguments of the dissidents from San Xavier, deferring to the dead, are fully legitimate and prescient cultural statements in their own right. And they are tactical ones. They are political arguments drawn to confront politicians. They are statements in the idiom of culture and cosmology, designed to overcome what many in the district perceived as blatantly erroneous economic and institutional arguments. The arguments challenge the orchestrated public rhetoric over the San Xavier Development Project.

In fact, the challenge goes beyond this. It questions the dominant discourse surrounding Indian water claims settlements in the West. What the new leaders of the district are saying, in effect, is that they do not want to live according to the settlement written on their behalf earlier in the decade. That message could stall current negotiations elsewhere, including those being formulated by the tribe's attorney for other districts outside the Tucson Basin, claims that were dropped from the original Water Rights Settlement Act. Furthermore, the message of the new leaders challenges the authority of the Tohono O'odham Nation's central government and its engineering consultants. Finally, it questions the emergent mandate of the Bureau of Reclamation to complete, quickly, the last troublesome features of the Central

Arizona Project. It is a challenge, thus, to the dominant ideology constructed around negotiated water settlements, an ideology that privileges the acts of settlement, not their implementation.

Ultimately, the reason embodied in this challenge may prevail. The final environmental impact assessment of the San Xavier Development Project was issued late in October 1989. Now fully under the imprimatur of the BOR, the report spoke less confidently of the institutional constraints against the Avra Valley option. It acknowledged, obliquely, the intergenerational coalition that had formed on San Xavier; it spoke of reservation land as living land, off-reservation land as dead land. And the political economists from the bureau did manipulate the engineers' cost/benefit ratios. The Avra Valley option was made to produce a small paper profit—under the new assumption that the nation would not have to pay rent to the city.⁵¹ The district's officials have been pleading for more time, more latitude in the 1992 deadline.⁵²

NOTES

1. Author's notes on public hearing, San Xavier Development Plan, San Xavier District, 14 January 1989. With the adoption of a new constitution in 1985, "Papago" (an imposed designation meaning "bean Pima") became "Tohono O'odham" ("desert people"). In addition, "Tribe" became "Nation," but, consistent with local usage on and off the reservation, I have used these designations interchangeably. San Xavier, incorporated into the main reservation when the latter was established between 1911 and 1917, is still frequently referred to as the San Xavier Reservation, originally set aside in 1874. A similar history and nomenclature applies to the Gila Bend Reservation, known alternatively as San Lucy District.

2. See, for example, *Symposium Proceedings on Indian Water Rights and Water Resources Management*, ed. William B. Lord and Mary G. Wallace (Bethesda, MD: American Water Resources Association, 1989); and John A. Folk-Williams, "The Use of Negotiated Agreements to Resolve Water Disputes Involving Indian Rights," *Natural Resources Journal* 28 (1988):63-103. A skeptical view of negotiated settlements is contained in my unpublished manuscript, "Getting to Yes in the New West: The Negotiation of Policy."

3. For a summary of these events, see the following: Adrian H. Griffin, "An Economic and Institutional Assessment of the Water Problem Facing the Tucson Basin" (Ph.D. dissertation, University of Arizona, Tucson, 1980); Desmond D. Connall, Jr., "A History of the Arizona Groundwater Management Act," *Arizona State Law Journal* (1982): 313-44; Nancy K. Laney, "Transferability under the Papago Water Rights Settlement," *Arizona Law Review* 26 (1984): 421-43; F. Lee Brown and Helen M. Ingram, *Water and Poverty in the Southwest* (Tucson: University of Arizona Press, 1987).

4. W. Strickland, interview conducted by N. K. Laney, 10 January 1984, Tucson, author's files.

5. Thomas R. McGuire and Marshall A. Worden, "Socio-Cultural Impact Assessment of the San Xavier/Tucson Planned Community, Papago Indian Reservation, Pima County, Arizona" (Tucson: Bureau of Applied Research in Anthropology, University of Arizona, 1984).

6. Brown and Ingram, *Water and Poverty*. The Winters Doctrine, as enunciated by the U.S. Supreme Court in 1908, reserved unspecified quantities of water for reservations and dictated that these rights would not be lost through nonuse. Subsequent evolution of the doctrine has shifted the forum for settling disputes to state courts and has generally imposed specific quantification schemes on these rights, but the intent of the doctrine has, by and large, been upheld: to foster economically viable "tribal homelands." This history is treated fully in Daniel McCool, *Command of the Waters: Iron Triangles, Federal Water Development, and Indian Water* (Berkeley: University of California Press, 1987).

7. U.S. Department of the Interior, Bureau of Reclamation, Draft Environmental Impact Statement, San Xavier Development Project, October 1988, S-1.

8. Southern Arizona Water Rights Settlement Act (Public Law 97-293) (96 Stat. 1274); Laney, "Transferability."

9. Franzoy-Corey Engineers and Architects and the U.S. Department of the Interior, Bureau of Reclamation, "Environmental Assessment of the Schuk Toak Development Plan," Appendix B, Contract Between the United States and the Papago Tribe of Arizona to Provide Water and to Settle Claims to Water (1983), November 1988.

10. Mary G. Wallace, "Papago Participation in the Formulation of SAWRSA" (Unpublished manuscript, 1984), 28, author's files.

11. *Ibid.*, 15.

12. *Ibid.*, 29.

13. The initial bill was vetoed by President Reagan, because it contained no provisions for local beneficiaries to share the costs of the settlement. Local entities rather quickly acquiesced to a contribution of \$5 million, a fraction of the total cost of the settlement. See Joseph R. Membrino, "A Federal Perspective," in an unpublished collection of papers with the working title "An Equally Divided Court: Indian Water in the New West," ed. Thomas R. McGuire, William B. Lord, and Mary G. Wallace (under review, University of Arizona Press).

14. "Groundwater Management Study Commission, Public Information Meeting, Tucson, 3 March 1979" (Transcript, Arizona Department of Library/Archives and Public Records).

15. *Final Report*, Arizona Groundwater Management Study Commission (Phoenix: State Capitol, 30 June 1980).

16. *Ibid.*

17. *A Water Issues Primer for the Tucson Active Management Area* (prepared by Tucson Active Management Area, Arizona Department of Water Resources; published by Southern Arizona Water Resources Association, July 1983), 9.

18. Steven B. Weatherspoon, assistant city attorney, Tucson, in testimony and written report, hearings before the United States Senate Select Committee on Indian Affairs, in *Water for Five Central Arizona Indian Tribes for Farming Operations* (Washington, DC: U.S. Government Printing Office, 1977).

19. *Ibid.*

20. Curtis A. Brown, "The Central Arizona Water Control Study: A Case for Multiobjective Planning and Public Involvement," *Water Resources Bulletin* 20(1984): 331-37; Bryan H. Massam, "The Central Arizona Water Control Study: A Comparison of Alternate Plans Using Concordance Analysis and Multi-Dimensional Scaling," *Water Resources Bulletin* 20(1984): 483-91; Kenneth G. Maxey and Norman H. Starler, "Cost Sharing in Transition: The Case of Plan 6, Central Arizona Project," *Water Resources Bulletin* 23(1987): 749-59.

21. Richard M. Wheeler, Jr., Leo M. Eisel, and Gerald D. Seinwill, "Financing Federal Water Development Projects and Sharing the Costs," *Water Resources Bulletin* 16(1980):326-35.

22. U.S. Department of the Interior, Bureau of Reclamation, Draft Environmental Impact Statement, Tucson Aqueduct, Phase B, 14 December 1984. Subsequently, the two non-Indian irrigation districts in Avra Valley have declined their allocations of CAP water. The police powers presumed to exist in the state's Groundwater Management Code have not been invoked to require these districts to substitute CAP flows for groundwater.

23. Bureau of Reclamation, Arizona Projects Office, "Tucson Aqueduct—Phase B Plan Formulation Working Document," September 1982, 66.

24. "Report of the Committee on Alignment, Terminus and Storage," mimeograph, 19 May 1983, author's files. The committee worked under the umbrella of the Southern Arizona Water Resources Association, a group of local civic leaders organized to lobby for the CAP and to assess water management concerns in the basin. The acronym alludes to the saguaro cactus of the region.

25. Marybeth Carlile, "Tucson CAP Aqueduct Reliability and Terminal Storage," *Water Words* 6(1988): 1,3, Southern Arizona Water Resources Association.

26. U.S. Department of the Interior, Draft Environmental Impact Statement, Tucson Aqueduct, Phase B.

27. U.S. Department of the Interior, Bureau of Reclamation, "Memorandum: Public Meeting and Information Packet, Tucson Aqueduct—Phase B, Central Arizona Project," 2 May 1983, author's files; George Rosenberg, "CATS Committee Report," *Water Words* 2:1 & 2 (1983):3, Southern Arizona Water Resources Association.

28. "Report of the Committee on Alignment, Terminus and Storage."

29. U.S. Department of the Interior, Bureau of Reclamation, "Memorandum: Public Meetings, Tucson Aqueduct—Phase B, Central Arizona Project," 24 June 1983, author's files.

30. U.S. Department of the Interior, Bureau of Reclamation, "Memorandum: Tucson Aqueduct—Phase B, Agency Proposed Action," 9 December 1983, author's files.

31. For a brief history of Garcia Strip, see McGuire, "Land, People, and Politics in the Southern Avra Valley," in *Archaeological Studies of the Avra Valley, Arizona for the Papago Water Supply Project*, vol. 1, ed. Allen Dart (Tucson: Institute for American Research, Anthropological Papers No. 9, 1987).

32. Thomas F. Saarinen, *The Tucson, Arizona, Flood of October 1983*, Committee on Natural Disasters, National Research Council (Washington, DC: National Academy Press, 1984), 1.

33. McGuire, "Operations on the Concept of Sovereignty: A Case Study of Indian Decision-Making," *Urban Anthropology* 17(1988): 75-86; McGuire, "Fed-

eral Indian Policy: A Framework for Evaluation," *Human Organization* 49:3(1990): 206-216; McGuire and Worden, "Socio-Cultural Impact Assessment."

34. U.S. Department of the Interior, Draft Environmental Impact Statement, San Xavier Development Project, II-2.

35. John C. Ravesloot, ed., *The Archaeology of the San Xavier Bridge Site (AZ BB:13:14), Tucson Basin, Southern Arizona*, Archaeological Series No. 171, Arizona State Museum (Tucson: University of Arizona, 1987):5-10.

36. McGuire and Worden, "Socio-Cultural Impact Assessment."

37. U.S. Department of the Interior, Draft Environmental Impact Statement, San Xavier Development Project, II-5.

38. *Ibid.*, II-21.

39. Franzoy-Corey Engineers and Architects, "San Xavier Plan Formulation, Development Alternatives Considering Retired Farmlands in Avra Valley" (Tucson, 19 December 1987), author's files.

40. *Ibid.*

41. U.S. Department of the Interior, Bureau of Reclamation, Environmental Assessment of the Schuk Toak Development Plan, 2-6.

42. Roger H. Coupal, et al., "Agricultural Alternatives for the Salt River Pima-Maricopa Indian Community," *Research Report No. 39*, Department of Agricultural Economics, University of Arizona (1988).

43. McGuire, "Illusions of Choice in the Indian Irrigation Service: The 'Ak Chin Project' and an Epilogue," *Journal of the Southwest* 30(1988): 216-20.

44. Carlile, "Is Safe-Yield Sacred? What Part Does It Play in the Tucson Basin Management?" *Water Words* 7(1989): 1,3, Southern Arizona Water Resources Association; Enric Volante, "Audit suggests state reconsider water use goals," *Arizona Daily Star* (Tucson), 2 September 1989, B1-3.

45. Gary C. Woodard, "Water Farming in Arizona and Its Implications," *Water Words* 7(1989): 4-5, Southern Arizona Water Resources Association.

46. Maxey and Starler, "Cost Sharing in Transition."

47. Laney, "Transferability"; U.S. Department of the Interior, Draft Environmental Impact Statement, San Xavier Development Project.

48. T. J. Jackson Lears, "The Concept of Cultural Hegemony: Problems and Possibilities," *American Historical Review* 90(1985): 569.

49. McGuire and Worden, "Socio-Cultural Impact Assessment."

50. Lears, "The Concept of Cultural Hegemony," 569-70.

51. U.S. Department of the Interior, Bureau of Reclamation, Final Environmental Impact Statement, San Xavier Development Project, October 1989.

52. "U.S., O'odham may seek delay in CAP delivery," *Arizona Daily Star* (Tucson), 23 November 19889, B1.