



Winter 1993

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Recommended Citation

Helen Ingram & David R. White, *International Boundary and Water Commission: An Institutional Mismatch for Resolving Transboundary Water Problems*, 33 Nat. Resources J. 153 (1993).

Available at: <https://digitalrepository.unm.edu/nrj/vol33/iss1/13>

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International Boundary and Water Commission: An Institutional Mismatch for Resolving Transboundary Water Problems

INTRODUCTION

The International Boundary and Water Commission (IBWC) of the United States and Mexico is an institution designed to facilitate joint action while protecting national sovereignty. The IBWC has two commissioners, one from each country, each of whom heads a separate administrative section. Each section represents the interests of its own country and is responsible to its own government. While actions are taken jointly, each section develops its negotiating position through the political processes of its own country. The IBWC thus facilitates parallel national action on water related problems occurring between the two nations.

At a time when nationalism appears to be on the ascendancy throughout the world, it may be that the IBWC can provide a useful model for other nations that share borders. The breakup of the Soviet Union and other countries has created many new boundaries, each with its attendant transboundary resource management problems.¹ The IBWC is exemplary in that it has officiated over the peaceful settlement of many disputes since it was founded over a century ago.

However, the IBWC is a low visibility institution which usually operates at technical and bureaucratic governmental levels. While different from and preferable to unilateral action in response to shared problems, the parallel national actions undertaken by the IBWC fall considerably short of true binationalism. In recent years the IBWC has received criticism for its failure to aggressively address problems before they become critical, for failure to be environmentally sensitive, and for failure to include state and local governments and nongovernmental orga-

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1. S. Udall & R. Varady, *Environmental Conflict and the World's New International Borders*, 6 Transboundary Resources Rep. (forthcoming 1993).

nizations (NGOs) in its decisionmaking processes.² The purpose of this article is to assess the performance of the IBWC on the basis of its established record in resolving water problems.

To be considered a success the IBWC must demonstrate a record of addressing past problems and rendering them more tractable, so that they are closer to resolution today than when they first emerged. Further, the IBWC must demonstrate not only resiliency but flexibility; the longevity of an institution can sometimes lead to greater legitimacy, but some organizational theorists believe that agencies exhibit natural life cycles and will decline over time.³ The United States–Mexico border region is changing rapidly, and new transboundary resource management challenges are being created. At this critical time, it is important to evaluate whether this historic institution can successfully adjust to these changes.

This article will first review previous scholarly and professional evaluations of the IBWC, and more specifically the Commission's United States Section, particularly in relation to the latter institution's ability to respond to state and local problems. The positive and negative aspects of its institutional design and general performance will be identified. Following the literature review, the article will turn to an in-depth evaluation of the IBWC's record in relation to water problems at a particular location on the border, as the strengths and weaknesses of the United States Section's performance in the neighboring cities of Nogales, Arizona, and Nogales, Sonora, (referred to jointly as Ambos Nogales) are assessed. Finally, the chapter will provide an evaluation of the parallel national approach employed by the IBWC, and recommend the sort of institutional changes that will be needed in the future.

LITERATURE REVIEW

Authoritative scholars of the IBWC have called the agency one of the most prestigious international resource management agencies in the world.⁴ The source of its United States Section's strength is thought to be its autonomy from the executive branch, similar to the autonomy exhibited by the United States Army Corps of Engineers in the 1950s. Like the Corps, the United States Section has essentially been an engineering arm

2. S. Mumme, *New Directions in U.S.-Mexican Transboundary Management: A Critique of Current Proposals*, Paper Presented at the Annual Meeting of the Ass'n of Borderlands Scholars and the Western Social Science Ass'n (Apr. 23–25, 1992) (Denver, CO.).

3. S. Huntington, *The Marasmus of the ICC: The Commission, the Railroads and the Public Interest*, 61 *Yale L. J.* 467 (1952); M. Bernstein, *Regulating Business by Independent Commission* (1955).

4. S. Mumme & S. Moore, *Agency Autonomy in Transboundary Resource Management: The United States Section of the International Boundary and Water Commission, United States and Mexico*, 30 *Nat. Res. J.* 661 (1990).

of Congress, although its operations have been confined to the area of the United States–Mexico border. The United States Section has served the constituency needs of members of Congress by constructing projects that are visible symbols of the members' ability to "bring home the bacon" from Washington. This special relationship with Congress has enabled the IBWC to be quasi-independent of the Department of State, just as the Corps of Engineers has been able to assert its independence from the Department of Defense.⁵

Another source of autonomy has been the IBWC's technical expertise. The technical cast of the Commission is apparent in the requirement that each Commissioner be an engineer. This expertise is bolstered by the Commission's virtual monopoly over border resources data acquisition, and by the 1944 United States–Mexican water allocation treaty that made the United States Section the formal conduit of information regarding the Mexican federal authorities' desires and intentions with respect to solving border water problems.⁶

While the literature has stressed that the United States Section has a good deal of autonomy and independence from the federal executive branch, writers have also found that the agency is closely tied to municipalities, states, and their representatives in Congress.⁷ Among border states, Texas has exerted particular influence. The central office of the IBWC's United States Section is in El Paso, and the Texas congressional delegation has usually gotten at least veto power over the President's selection of the next United States Section Commissioner. One Congressman, Representative Rooney from Brooklyn, was fond of calling the IBWC the "Texas Boundary and Water Commission."⁸

These sources of power upon which the United States Section of the IBWC has drawn has enabled it to avoid politicization and predation by other United States federal agencies.⁹ A price has been exacted in exchange, however. Border states and their congressional delegations have been able to exercise a "state veto" over international initiatives of the United States Section,¹⁰ and there are other further politically imposed limits to what the IBWC is able to do. Assessing its strategies in 1986,

5. J. Nienaber Clarke & D. McCool, *Staking Out the Terrain: Power Differential Among Natural Resources Management Agencies* (1985).

6. Treaty Regarding Utilization of Waters of Colorado and Tijuana Rivers and of the Rio Grande, Feb. 3, 1944, U. S.-Mex., 59 Stat. 1219.

7. H. Ingram & S. Fiederlein, *Traversing Boundaries: A Public Policy Approach to the Analysis of Foreign Policy*, 41 W. Pol. Q. 725 (1988).

8. A. Utton, *Book Review, Statecraft, Domestic Politics, and Foreign Policy Making: The Chamizal Dispute*, 31 Nat. Res. J. 255 (1991).

9. Mumme & Moore, *supra* note 4, at 678–80.

10. S. Mumme, *Regional Power in National Diplomacy: The Case of the U.S. Section of the International Boundary and Water Commission*, 14 *Publius* 115 (1984).

Mumme wrote that the IBWC was likely to react very conservatively to opportunities to expand its functions or jurisdiction:

First, the Commission cannot be expected to be venturesome in promoting the expansion of its water management functions, even though it is perhaps the best situated and most authoritative agency capable of advancing such recommendations. . . . Second, it is likely to be very reluctant to take upon itself functions that can just as well be conducted by some other agency or set of agencies in each country. . . . Third, the Commission is likely to resist, as it has in the past, setting fixed priorities and developing a long term list of management objectives in the water management and environmental spheres.¹¹

The tendency of the United States Section to move cautiously has generated recent literature written by both scholars and activists which is highly critical of the IBWC. Among the charges brought against the agency are that: it is slow in exercising functions related to water quality; it is stodgy or conservative in responding to environmental pressures; it is overly concerned with secrecy and reluctant to disclose information; and that it has failed to involve the public in its decisionmaking processes.¹²

These recent criticisms have presented the agency with new and unfamiliar challenges. Some supporters of the Commission believe that it will be able to rise to the challenge by making incremental changes to its policies and procedures. A determination of whether or not the IBWC has been successful in solving actual or emergent water problems, or is likely to make changes in response to recent criticism, is best made in the context of demonstrated practice. To make such an assessment it is necessary to examine a specific case in more depth.

AMBOS NOGALES

The Problem

Ambos Nogales is located in a small, narrow valley which is tributary to the Santa Cruz River. The Santa Cruz River has its headwaters just north of the border in the United States, but then flows south into Mexico before curving around to the west and then flowing north back across the border and beyond. Nogales is bordered by numerous hills, especially at the higher, southern end of the valley where the hills are

11. S. Mumme, *Engineering Diplomacy: The Evolving Role of the International Boundary and Water Commission in U.S.-Mexican Water Management*, 1 J. Borderlands Stud. 73, 90 (1986).

12. Mumme, *supra* note 2, at 3.

quite steep. The valley and surrounding hills are drained by the Nogales Wash and its numerous tributaries. During the course of its 16-mile journey to the Santa Cruz, the Nogales Wash flows through the heart of downtown Ambos Nogales only a few hundred yards from the community's largest automobile and pedestrian border crossing. Because the valley is bisected by the United States–Mexico border, water flowing through the valley flows not only downhill, but across national and state boundaries.

The local topography and patterns of settlement have combined to produce severe water quality problems. The population on the Sonoran side of the border has grown dramatically, most recently in response to border industrialization, at rates which have outstripped development of that city's urban infrastructure. Thousands of makeshift dwellings have been built on the steep hills and arroyos surrounding the valley, beyond the limits of municipal water supply, wastewater collection, and garbage removal services. Heavy rainfall and subsequent runoff causes sewage and other contaminants to be washed down from the hills, through neighborhoods and commercial districts on both sides of the border, and eventually into the Nogales Wash. The problem is especially severe during the monsoon storms of July and August, when the region typically receives over 50 percent of its annual rainfall.

Ambos Nogales also has water supply problems, although so far shortages have been restricted to the Sonoran side. For most of Nogales, Sonora's publicly supplied water is drawn from 12 major wells and an infiltration gallery in a shallow aquifer underlying the Santa Cruz River several miles southeast of the city, and from 14 smaller wells in aquifers underlying the Nogales Wash and its tributaries within the city. Production from the Santa Cruz wells has fallen drastically during periods of drought, which has left the population on the Sonoran side of the border vulnerable to water supply shortages. Most recently, water service was severely interrupted during the summer of 1989.¹³ Since 1991, Nogales, Sonora has also received water that has been piped in from the new "Los Alisos" well field 20 miles south of the city in the neighboring Rio Magdalena watershed. An unknown but presumably much smaller quantity of water is obtained by owners of private wells within the city.

The potable water supply for the much smaller population on the Arizona side of the border has been more reliable. The two primary sources of water are a series of wells in the aquifer underlying the Santa Cruz River several miles northeast of the city, and wells in an aquifer underlying a tributary of Nogales Wash on the northwest outskirts of the city. The effect of Sonora's upstream groundwater withdrawals on the

13. H. Ingram & R. Varady, *The Sonoran Pimería Alta: Shared Environmental Problems and Challenges*, Paper Presented at Conference "500 Years After the Meeting of Two Worlds—A Cultural Legacy in Pimería Alta, Nogales," (Jan. 25, 1992) (Sonora).

productivity of Arizona's Santa Cruz wells is unclear, though unlike the wells in Sonora the Arizona wells have never run dry. Residents on the Arizona side of the border also receive water from public and private wells in the aquifer underlying Nogales Wash, though this water is generally used only for nonpotable purposes.

Flooding, Drainage, and Sewerage

For over 50 years the City of Nogales, Arizona has looked to its congressional delegation and the United States Section of the IBWC to solve its flooding, drainage, and wastewater problems. For example, in response to fatal, damaging floods in 1931, the Mayor of Nogales wrote to Congressman Lewis Douglas and Senator Carl Hayden asking that the governments of the United States and Mexico take steps to eliminate the flood hazard facing the two cities.¹⁴ In turn, Arizona members of Congress contacted Secretary of State H. L. Stimson. Stimson replied that United States Section Commissioner L. M. Lawson would visit Ambos Nogales soon with his Mexican counterpart, and suggested that the congressmen advise Arizona's governor of the impending IBWC investigative trip.¹⁵ The eventual results of this and other meetings were a series of storm drains, channels, and flood control conduits aimed at keeping the water within its banks on both sides of the border. An unintended consequence of these measures was that stormwater collectors and channels facilitated the flow of water, including contaminants, across the boundary even during normal flow conditions.

Residents on the Arizona side of the border followed a similar path when sewerage problems became a priority several years later, as seen in a telling piece of evidence found in the papers of Arizona Senator Carl Hayden. A 1946 letter indicates that city officials contacted their congressional delegation and the United States Commissioner directly, with state officials becoming involved only when they were asked to provide supporting documentation. A sanitary engineer at the Arizona Department of Health hurriedly prepared a report on sanitary problems in response to a telegram signed by the entire Arizona congressional delegation and submitted the report directly to the United States Commissioner. Because the situation the engineer observed in 1946 so closely parallels that observed more recently, parts of the report are useful to quote at length:

The twin cities of Nogales, Arizona and Nogales, Sonora should be considered, from a public health

14. Letter from H. Karns to L. Douglas (Jan. 21, 1931) (Pimería Alta Historical Society Files) (Nogales, AZ, Folder City Archives/Flood Control Project)[hereinafter PAHS Files].

15. Letter from H. Stimson to C. Hayden (Jan. 30, 1931); Letter from H. Stimson to L. Douglas (Jan. 30, 1931) (available from PAHS Files).

standpoint, as a single community, for the only line of demarcation between the two communities is the international boundary line. Nogales [Arizona], therefore, for the purpose of this report, has an over-all population of 30,000. Imports, exports, and tourists are the principal industries of this community. As far as the boundary line is concerned, the local population goes back and forth routinely. Food is purchased from sources on both sides of the line for use in either one or the other or both communities. . . .

Of this population of approximately 30,000 only 25 percent is sewerred, and this chiefly in Nogales, Arizona, with only a few down town business houses in Nogales, Sonora connected to a short special sewer line which terminates in the Nogales, Arizona system. Nogales, Arizona, considered by itself is practically 100 percent sewerred. Considering Nogales, Sonora, disposal in this community is chiefly by means of unsanitary outdoor privies. . . . Occasionally in the past it has been noted by local health authorities that domestic sewage has been drained directly into the international storm drain. . . . The situation then is this, that the sewage disposal south of the border is on top of an impervious rock foundation permitting, during the rainy season at least, drainage of contaminating material to the storm drain, and down the streets on both sides of the line toward the Santa Cruz River. This, of course, creates a definite public health hazard to the population on both sides of the line of this important community. . . .

The principal source of water for both sides of the line has been the Nogales, Arizona water plant and system which has a pumping rate of approximately 750 gallons per minute. The majority of this water is used on the United States side of the line. South of the line, water service lines are not extensive. The consumption of water in Nogales, Sonora is at the present time at a minimum because of the lack of adequate water service systems at all homes. Here again the down town business houses are the principal consumers. The majority of the public obtain their water for domestic use in buckets. The picture, however, will change for the water project south of the line [which included several wells and the original infiltration gallery at the Santa Cruz River] is at this writing 50 percent completed. . . . Here again a sanitary problem will be aggravated in that water consumption will be definitely

increased because of the installation of water facilities, resulting in the production of a tremendous amount of liquid waste in comparison to that in existence up to now.¹⁶

The state engineer further pointed to the adverse health effects of the existing sanitary problems. Several cases of typhoid and dysentery had been reported in Santa Cruz County, the numbers of such illnesses rising during the rainy season. The report included a statement saying that the Arizona Department of Health had for some years been advocating "a single sewerage system and disposal plant [for the entire town] which would most efficiently and economically handle the situation."¹⁷ The report concluded it "is urgently recommended that since this apparently is an international problem as well, that adequate means be provided to effectively solve the situation."¹⁸

The strength of the ties between the congressional delegation, local officials, and the United States Section is illustrated by the state sanitary engineer's report. Clearly, the state was being asked to provide reasons for something that the congressional delegation and the United States Section had already decided to support. Through its reference to the situation as an "international problem" the letter also helps to explain why local officials sought aid through the congressional-United States Section connection.

The report said that for most purposes Ambos Nogales should be considered a single community with open communication. While the IBWC had previously been asked to help with flood control, the two communities had jointly solved a number of other water-related issues without outside help. As the letter indicated, the two communities had up until that time a single water supply system serving downtown businesses and other residents. Further, many of these same businesses were connected to the Nogales, Arizona wastewater treatment plant. These solutions seem to have been worked out without resort to international decisionmaking, and without seeking the permission of higher authorities. Therefore, the existence of an international boundary had not in the past prevented the implementation of binational responses forged at the local level.

Representing community water issues as international issues provided advantages far beyond the facilitation of cooperation and agreement, which the Nogales community appeared quite capable of forging on

16. Report: Sanitary Sewage Disposal Problem, Nogales, Sonora, Mex.-Nogales, Arizona, U.S.A., Sanitary Engineering Div., Ariz. State Dep't of Health, at 1-5 (Feb. 7, 1946), (Carl Hayden Papers, Dep't of Archives and Manuscripts, Univ. Libraries, Ariz. State Univ., Tempe, Arizona, Box 255, Folder 52)[hereinafter Hayden Papers].

17. *Id.* at 8.

18. *Id.*

its own. The involvement of the IBWC, together with United States congressional appropriations committees, also created a direct pipeline of funds running from the United States' national treasury to Ambos Nogales. The availability of federal funds meant that the city of Nogales, Arizona did not need to compete with other Arizona communities for scarce wastewater treatment project funding, and also made it possible to deflect a large portion of the costs to United States taxpayers. A 1949 letter from the Commissioner of the United States Section of the IBWC to Senator Hayden after United States funding for the proposed wastewater treatment project had been secured acknowledged the roles of Congress, Nogales, Arizona, and the IBWC in the funding process:

My Dear Carl:

You will recall that through your good offices there was set up an item in the Boundary Commission appropriations for what is known as the Nogales Sanitation Project, located in Nogales, Arizona and Nogales, Sonora.

The project consists of the building of an outfall sewer extending from a point in Mexico to a point in the United States about two miles north of the boundary line, and a disposal plant located in the United States at the northerly end of the outfall line. The sewerage from both of the collecting lines to be built in Mexico and from the existing collecting lines with the United States will enter the outfall sewer and be conveyed to the disposal plant. The slope of the topography is from Mexico to the United States, and therefore the outfall line and treating plant must be located in the United States. It is estimated that the total cost of the works will be around \$400,000, of which fifty percent will be allocated to each nation. . . .

You may be interested I am sure, of the official notice that we have received from the Mexican Section of this Commission, that arrangements have been completed whereby funds needed for Mexico's contribution have been made available for this Section of the Commission. Accordingly, I have instructed the engineers of this Section to complete the plans for the project in order that construction may be begun at an early date.

. . .

You and all concerned, including the Arizona delegation in Congress as well as the officials of the City of Nogales, are to be congratulated for making funds available to this Section for the successful working out

of this problem, the solution of which is so necessary to the health of both cities of Nogales.¹⁹

The United States Congress–United States Section funding conduit was to prove valuable for more than just the construction phase of the wastewater treatment project. The costs of operation and maintenance were originally to be a local obligation, split between the cities of Nogales, Arizona, and Nogales, Sonora, in proportion to the share of the effluent that each city produced. But even before the new plant became operational in 1951, the mayor of Nogales, Arizona urged Senator Hayden to find some means to help the city defray its costs of operation. An arrangement that provided partial federal funding of local operation and maintenance obligations had previously been worked out by Senator Hayden and the IBWC for a wastewater treatment project in the nearby border cities of Douglas, Arizona, and Agua Prieta, Sonora, and Senator Hayden was able to push similar legislation through Congress for the benefit of Nogales, Arizona.²⁰

The availability of free engineering services was an additional benefit to Nogales, and was frequently used. The United States Commissioner explained to Senator Hayden that “[t]his Commission is now and has been for some time, set up on an engineering basis. This is necessary since the problems which are encountered along the international border require engineering solutions.”²¹ Engineering solutions offered by the IBWC were employed by the city of Nogales again and again, as mounting problems regularly outstripped previous solutions.²²

By 1958, just seven years after the first international wastewater treatment facility was completed, the plant design capacity was being continuously exceeded and raw sewage was being bypassed into the Nogales Wash. At first the problem was due to the infiltration of groundwater into leaky sewer pipes rather than to sewage in excess of plant design, and the extent of the crisis varied according to whether the weather was wet or dry. However, in 1963, following increased population growth and attendant increases in the amount of sewage produced by the two cities, the IBWC recommended construction of a new wastewater treatment facility at a larger site farther north of the border, as requested by the city of Nogales, Arizona.

Negotiations for the new facility were prolonged, and the United States Section was slow to act despite prodding from Arizona’s congres-

19. Letter from L. Lawson to C. Hayden (July 30, 1949) (Hayden Papers, *supra* note 16).

20. Letter from J. Robins to C. Hayden (Jan. 4, 1951); Letter from B. Brown, Acting Assistant Secretary of State to T. Conolly, Chairman, Senate Committee on Foreign Relations (July 13, 1951) (Hayden Papers, *supra* note 16).

21. Letter from L. Lawson to C. Hayden (Mar. 19, 1946) (Hayden Papers, *supra* note 16).

22. Letter from W. Moore to J. Quigley, Comm’r, Federal Water Pollution Control Administration (Mar. 29, 1966) (Hayden Papers, *supra* note 16).

sional delegation. While the city's relationship with the IBWC held open the possibility of both action and funding, neither came easily. Eight years after the first reports of sewage being bypassed by the treatment plant, a state health official wrote to the Federal Water Pollution Control Administration to state that such reports had become increasingly frequent and that there had been no indication when concrete action would occur.

We recently requested the International Boundary and Water Commission to provide facilities to at least chlorinate the raw sewage when it is bypassed until new facilities are provided. We have just received a reply from Mr. Friedkin [United States Section Commissioner] stating they have no funds which can be expended for this purpose, and it is the responsibility of the City of Nogales, Arizona, to provide this treatment.²³

The state official expressed frustration that he could not deal directly with Sonoran officials and asked that the Federal Water Pollution Control Administration use its influence with the State Department or take action itself. Things, he said, were very frustrating because everything must go through the IBWC.²⁴

An agreement between Mexico and the United States was finally reached in 1967. IBWC Minute 227 provided for construction of an enlarged international wastewater treatment plant nine miles north of the border, together with a new trunk line to carry the sewage the additional distance.²⁵ Sixty percent of the new plant's capacity was allocated to Mexico, but Mexico was asked to pay only the amount that would have been necessary to expand the plant at the existing site, which amounted to 29 percent of the total cost of the project. Forty-six percent of the cost was borne by the IBWC's United States Section, 17 percent by the City of Nogales, Arizona, and eight percent by the United States Environmental Protection Agency.²⁶

The new facility was completed in 1971. By 1976 the need for further expansion was already evident, and once again planning, design, and negotiations for enlargement of the facility were lengthy and tortuous. In 1986 a formal proposal was made to the Mexican Commissioner from the United States Section suggesting that both countries expand the International Wastewater Treatment Plant. The Mexican Section replied that it preferred to use its money to build a new plant on its side of the border.

23. *Id.*

24. *Id.*

25. IBWC Minute No. 227, Enlargement of the International Facilities for the Treatment of Nogales, Ariz., and Nogales, Sonora Sewage, El Paso, Tx, (Sep. 5, 1967).

26. Position Paper, Nogales International Wastewater Treatment Plant, Prepared by U.S. Section, International Boundary and Water Commission, El Paso, Tx, at 3 (Oct. 1987).

United States interests were very much opposed to that idea, and in 1988 convinced the Mexican Section to sign IBWC Minute 276.²⁷ Minute 276 required Mexico to repair leaking sewer lines and build new lines on its side of the border, and to join the United States in paying for another expansion of the international wastewater treatment plant. Mexico agreed to pay \$1 million in 10 equal annual installments for plant expansion while Nogales, Arizona paid over \$3 million, the United States Section of the IBWC paid \$5.9 million, and the United States Environmental Protection Agency paid \$1.7 million.²⁸

Expansion of the facility began in 1989, but history again repeated itself as the capacity of the enlarged plant continued to lag behind the rapidly expanding waste stream. The plant's design capacity of 15.75 million gallons per day (mgd) was exceeded during periods of peak usage even before the facility became fully operational. In addition, the treated effluent from the plant was not meeting Arizona water quality standards due to high levels of mercury, cyanide, and other pollutants, presumably due to the lack of industrial pretreatment of wastes. The city's future growth was threatened when this failure to meet standards resulted in state action to suspend new sewer connections in Nogales, Arizona.²⁹

Water Supply

The allocation of water supplies is a highly contentious issue in the arid West, and states jealously guard their water allocations both from each other and from the Mexicans. The history of United States–Mexico negotiations over the allocation and salinity of the Colorado River are fraught with conflict.³⁰ Typically the literature portrays the states as impediments to the equitable apportionment of water with Mexico.³¹ However, in the case of water allocation decisions related to the Santa Cruz River watershed, the IBWC has been a reluctant participant as well.

The IBWC's involvement in Ambos Nogales water supply problems is not as extensive as it is for flooding, drainage, and sewerage problems. The IBWC did not become involved in the former until the 1950s, when Mexico began to construct municipal water supply works which Nogales, Arizona feared would threaten its own water supplies. At that time a number of Nogales-area interests asked the IBWC's United States

27. IBWC Minute No. 276, Conveyance, Treatment and Disposal of Sewage from Nogales, Ari., and Nogales, Sonora Exceeding the Capacities Allotted to the United States, and Mexico at the Nogales International Sewage Treatment Plant, Under Minute No. 227, Ciudad Juárez, Chihuahua, (July 26, 1988).

28. These figures were displayed on a sign posted outside the Nogales International Wastewater Treatment Plant during its most recent expansion (July 1990).

29. Nogales Int'l, Feb. 6, 1991, at 1, col. 1.

30. P. Friedkin, *A River No More* (1984); M. Jamail & S. Ullery, *International Water Use Relations Along the Sonoran Desert Borderlands* (1979).

31. H. Ingram & S. Fiederlein, *State Government Official's Role in US/Mexico Transboundary Resource Issues*, 28 Nat. Res. J. 431 (1988).

Section to investigate the possibility of negotiating an allocation agreement for the waters of the Santa Cruz that would be similar to agreements dividing the flows of other United States–Mexican rivers.

The IBWC was reluctant to open such negotiations, for reasons made clear in a frank letter from the United States Section Commissioner to Senator Hayden.³² The Commissioner indicated that the United States was already using more than half of all waters derived from the joint United States/Mexico portion of the Santa Cruz River watershed, despite the fact that only 34 percent of the drainage area contributing that water was in United States territory. The Commissioner therefore thought that Arizona should be very careful about engaging in negotiations on the subject.

The next year the Commissioner's office of the United States Section issued a report which urged that every effort be made to find a United States solution that could be implemented without negotiation of an international agreement. Among the suggested possibilities were a pipeline from the Santa Cruz River before it first crossed into Mexico and a dam on the United States side near Nogales to catch and store the river's flood flows.³³

In contrast with the position taken by the United States Commissioner, local water interests in Nogales expressed great interest in a binational solution between the two federal governments. At a high level meeting in the offices of the Arizona Interstate Stream Commission that was attended by the United States Section Commissioner, the Chair of the Santa Cruz Water Users Association spoke about the local view:

We also feel that it might be possible for our State Department to negotiate some sort of treaty with Mexico to put in a common water supply system for both cities; . . . a common system of withdrawing and distributing the water, much as they have handled the sewage and flood control system which has worked fairly satisfactorily.³⁴

To document similar Mexican interest, the chair of the water users association introduced a letter from the mayor of Nogales, Sonora, to the chairman of the Santa Cruz River Committee, which stated in part:

32. Letter from L. Lawson to C. Hayden (Oct. 30, 1953) (Hayden Papers, *supra* note 16, at Box 199, Folder 18).

33. Summary Statement by Office of the Commissioner, United States Section, IBWC, Santa Cruz River Development—United States and Mexico (Sep. 2, 1954) (Hayden Papers, *supra* note 16, at Box 199, Folder 18).

34. Minutes of Meeting Held May 9, 1956, 11:00 a.m. in the Offices of the Arizona Interstate Stream Commission, Mayer-Heard Building, Phoenix, Ariz., called for the purpose of further considering the matter of the Santa Cruz River, at 4 (Hayden Papers, *supra* note 16, at Box 199, Folder 18).

During my incumbency as Mayor of Nogales, Sonora, and in my present capacity, the future of our city's water supply has been and is one of my primary concerns. On many different occasions this matter has been the subject of informal exploratory discussions with interested friends in Nogales, Arizona.

We have always agreed that the problem is a joint international one and that a joint solution between our respective federal governments would provide the most favorable solution.³⁵

Despite the favorable attitude toward international negotiations expressed by local interests, such negotiations did not occur. The reasons are aptly expressed by Arizona Governor McFarland in the meeting minutes:

When it comes to negotiating a treaty, it becomes a Federal and not a State matter. [United States Section Commissioner] Colonel Hewitt . . . gave us the definite impression that if we entered into a treaty we would get less than we now have. . . . If we're going to go into a general proposition whereby the Federal Government is going to give up something it wouldn't be very good for Arizona.³⁶

While no other serious attempt to allocate surface or groundwater supplies near Ambos Nogales appears in the historical record, water supply problems, especially in Mexico, have by no means abated. Control of the treated effluent that emerges from the international wastewater treatment plant, most of which is originally generated in Mexico, has become a larger issue with each enlargement of the plant. To Sonorans, this water represents a potential source of water supply that could be used for industrial processes and irrigation.³⁷ Arizonans see the effluent flowing into the Santa Cruz River from the wastewater treatment plant as the sole source of water for a thriving riparian area that is an important habitat for wildlife and which provides many recreational opportunities.

Since at least the early 1960s the Mexican Section of the IBWC has supported the idea of building a facility on its own side of the border to treat Sonoran wastewater flows. The idea is attractive to the Mexicans because the construction funds for such a project would be spent on their own side of the border, and siting the plant in Sonora would enhance opportunities to reuse the treated water on that side as well.

35. *Id.*, at 5.

36. *Id.*, at 6.

37. R. Sánchez & F. Lara, *Manejo Transfronterizo Del Agua En Los Dos Nogales: Estrategias Para Nogales, Sonora, Reporte Tecnico, El Colegio De La Frontera Norte, Tijuana, Baja California (Junio 1992)*.

The United States Section has strongly opposed these plans, which is part of the reason that negotiations between the two sections of the IBWC have taken so long. The United States Section has been opposed in part because the slope of the valley from south to north would require that the sewage be pumped a considerable distance uphill to the proposed treatment plant. Breakdowns in the pumping plants, like those that occur frequently in the Sonoran water supply system, could lead to spills and renegade sewage flows across the border.³⁸ Other reasons are also apparent, as the United States Section has argued in the past that

[t]he enlarged plant constructed, operated and maintained in this country to provide complete secondary treatment and disposal in accord with the standards of the State of Arizona, would assure for the United States interests satisfactory solution of the serious border sanitation problem. An incidental advantage would be the retention of the treated sewage effluent in the United States for possible utilization.³⁹

So far the United States Section has been successful in its ad hoc efforts to convince the Mexican Section not to build a separate treatment plant, even though IBWC Minute 227 specifies that Mexico is the owner of effluent generated from water south of the border.⁴⁰ Should the Mexicans renew their efforts to reclaim the water instead of allowing it to flow to Arizona, the vital riparian habitat below the international wastewater treatment facility would be severely harmed. To date, the IBWC has not taken any initiative to negotiate a long-term agreement on this water supply issue.

Evaluation of the Problem-Solving Capacity of the IBWC in Ambos Nogales

While the IBWC has succeeded in bringing some benefits to the Ambos Nogales area, it would be difficult on the basis of the historical record to argue that the agency has been successful as a problem solver. It is true that the IBWC's United States Section has been a conduit of federal subsidies for flood control and wastewater treatment facilities, but it is by no means clear that Nogales, Arizona has been the recipient of more federal subsidies than have other cities that are not associated with the IBWC. And unlike some cities along the border, Nogales has not profited from the construction of federally funded dams, desalination facilities, or other major water works.

38. Position Paper, *supra* note 26, at 7–8.

39. Nogales Border Sanitation Problem, Memorandum of Current Status and Proposed Course of Action (May 10, 1965) (Hayden Papers, *supra* note 16, at Box 356, Folder 5).

40. IBWC Minute No. 227, *supra* note 25.

Throughout the 1970s and much of the 1980s the Federal Water Pollution Control Act was also available to provide United States cities the size of Ambos Nogales with up to 90 percent federal financing for the construction of wastewater treatment facilities. However, it would have been difficult for Nogales, Arizona to receive adequate funding under this program given the conflict between the program's United States targets and the binational nature of water issues in Ambos Nogales.

It should also be observed that Nogales, Arizona's direct connection to the IBWC's United States Section through the state's congressional delegation has allowed the State of Arizona to escape responsibilities it otherwise would have had to bear. The state has not had to provide funding for Nogales water projects that it would routinely expect to fund in its nonborder cities. This has allowed the state to avoid dealing with the border as a state issue.

It is clear that after 50 years Ambos Nogales has been unable to transcend the problems introduced by its topography. Water continues to run downhill, and in Ambos Nogales "running" water means contamination. The construction of wastewater treatment facilities consistently lags behind demand, and is increasingly expensive. There is a possibility that the depletion of the transboundary aquifer will eventually bring water shortages to Arizona as well as to Sonora. Should the Mexicans choose to reclaim their wastewater, a valuable riparian habitat will be lost. There is also evidence to suggest that problems are worsening. Recent tests suggest the existence of a plume of chemical contaminants moving north from Sonora in the shallow and shared aquifer underlying Nogales Wash.⁴¹

Despite the broad jurisdiction of the IBWC, nothing approximating comprehensive, anticipatory water management has occurred in Ambos Nogales. The Commission's solutions to problems have been physical, engineering responses, and these have been implemented only after problems arise, not before. Remedial responses have not been sufficiently sensitive to the dynamics of economic and demographic change in the border region. The IBWC, and particularly the United States Section, have not correctly anticipated water and sewer needs of Ambos Nogales because it has not been a participant in the community's planning processes.

The advantages of locating the IBWC at the federal level where national economic plans and policies are made have not been realized. There is no evidence that the IBWC has participated in decisions with natural resource and water implications, including trade and industrialization decisions that have lured many Mexican workers to the border. There has been little attempt to make sure that resource limitations are taken into account when creating policies to ensure that growth is anticipated, or to secure funding for infrastructure before growth occurs.

41. The Udall Center for Studies in Public Policy, Interim Ambos Nogales Water Resources Study (Aug. 1990) (unpublished manuscript).

Another serious consequence of the United States Section's past performance is the discouragement of grass roots, binational responses to shared problems. The natural tendency of the residents of Ambos Nogales to collaborate on important decisions is seldom either appreciated or reinforced by the federal agency that takes formalistic stands and keeps neighbors at arm's length. The two cities collaborate informally in fighting droughts and fires, but when decisions reach a federal level, negotiations are aimed toward formulating a United States position that leaves out the Mexicans. Often, as in the case of water supply, the United States federal position actually works to put the Mexicans at a disadvantage.

It can be argued that the parallel national approach of the IBWC should at the least build support and consensus for peaceful international solutions to problems. Whether or not this occurs will depend upon the agency's assessments of environmental sensitivity, public relations skill, and openness to public participation, to which our attention now turns.

Incorporating Environmental Concerns and Public Participation

The literature on the IBWC's United States Section suggests that the agency has historically been an insular organization that has not been open to public participation. Its interests have been focused on the construction of public works projects rather than on preservation of the environment, and, at least until the passage of the National Environmental Policy Act, its actions were often environmentally insensitive.⁴² Its orientation has been toward congressional delegations, not to the press or to nongovernmental organizations.

Organizations can change, however, and so it is worthwhile to review recent events in Ambos Nogales in order to ascertain the current flexibility of the IBWC and the United States Section. The foregoing review of contaminated water flows across the border confirms that the IBWC had a great deal of experience in working with sewage problems of the type that occurred in 1990. However, some things in 1990 were quite different. The level of interest expressed by the local press and the public was significantly greater, and local officials who were responsible to the public were less content to patiently wait for action by the IBWC and its United States Section.

In early April 1990, the *Nogales International* reported that residents along the Santa Cruz River were complaining that the river smelled "like an open sewer."⁴³ The Deputy Director of the Santa Cruz County Health Department believed the problem was due in part to incompletely treated sewage effluent entering the river from the international wastewater treatment plant. Ongoing plant expansion allowed the plant to operate

42. S. Dedina, *The Political Ecology of Transboundary Development: Land Use, Flood Control, and Politics in the Tijuana River Valley* (1992) (unpublished manuscript).

43. *Nogales Int'l*, Apr. 4, 1990, at 1, col. 2.

under less strict state permit requirements.⁴⁴ The superintendent of the plant thought that the smell was instead due to an accumulation of algae growing in the river. He stated what was needed to alleviate the problem was "heavy rains to raise the river to a three to five foot flow which would wash out the weeds and algae."⁴⁵

Three months later the superintendent's theory was tested when the area received more than three times its normal precipitation for the month of July.⁴⁶ Flooding forced a number of families from their homes,⁴⁷ caused sewer lines south of the border to break, and sent flood waters mixed with contaminants down Nogales Wash toward the Santa Cruz River.

The Arizona Department of Environmental Quality tested the flood waters in Nogales Wash and the Santa Cruz River on July 9 and measured fecal coliform bacteria at 8000 colony-forming units per 100 milliliters (8,000 CFU/100 ml), twice the maximum allowed by state standards. On August 15, after a Sonoran sewage line had broken, the measurement rose to 1.6 million CFU/100 ml.⁴⁸ Measurements in September were even higher, peaking at 16 million CFU/100 ml.⁴⁹ A *Nogales International* editorial titled "Dangerous Health Problems" argued the need for immediate action because "lives depend on it."⁵⁰ Santa Cruz County passed a resolution expressing its concern and sent copies to members of Arizona's congressional delegation and other federal officials, including the Commissioner of the United States Section of the IBWC.

The response from Arizona's congressional delegation was immediate. One congressman reported that in a conversation with the United States Section Commissioner he had learned that the United States Section had requested that the Mexican Section immediately repair broken sewer lines in Sonora.⁵¹ But continuing health fears prompted local and state officials to take further action. The Santa Cruz County Board of Supervisors and the Nogales City Council each declared a state of emergency. The Governor of Arizona signed a declaration of emergency and allocated \$50,000 to build a temporary dam for the treatment of contaminated water in Nogales, Arizona.⁵² Sandbags filled with chlorine granules were placed in the Nogales Wash at the boundary and where the concrete channel ends and widens into a stream.⁵³

44. *Id.*

45. *Nogales Int'l*, Apr. 18, 1990, at 1, col. 3.

46. *Nogales Int'l*, Aug. 8, 1990, at 12, col. 1.

47. *Nogales Int'l*, Sep. 19, 1990, at 1, col. 1.

48. *Nogales Int'l*, Aug. 29, 1990, at 1, col. 3; *Nogales Int'l*, Sep. 12, 1990, at 1, col. 4.

49. *Nogales Int'l*, Oct. 10, 1990, at 1, col. 3.

50. *Nogales Int'l*, Sep. 19, 1990, at 4, col. 1.

51. *Id.*

52. *Arizona Daily Star*, Oct. 6, 1990, at 1B, col. 2; *Nogales Int'l*, Oct. 10, 1990, at 1, col. 3.

53. *Arizona Daily Star*, Oct. 14, 1990, at 5B, col. 3.

These actions did not completely alleviate mounting public health concerns, however, as continuing test results indicated conditions remained that increased the possibility of an outbreak of hepatitis.⁵⁴ The \$50,000 allocated by the Governor of Arizona did not last long, and by the end of October funds were nearly gone.⁵⁵

Meanwhile, no official word from the IBWC had been received by local officials in Nogales, Arizona, which prompted the *Nogales International* reporter covering the story to write a commentary titled "Federal Agencies Ignoring Nogales."⁵⁶ The newspaper also editorialized that the United States Section Commissioner, Narendra N. Gunaji, should be fired.⁵⁷ In Washington Commissioner Gunaji met with members of Arizona's congressional delegation, and his office released a statement saying that "my response to this highly publicized situation has been low-key because of sensitivity on the treaty matters with Mexico."⁵⁸ The United States Section Secretary, visiting Nogales, remarked that the lack of response by the IBWC "was blown out of proportion."⁵⁹

In early November 1990, the United States Section revealed its proposed solution to the sewage crisis to the congressional delegation. The plan called for chlorination of the contaminated water crossing the border in Nogales Wash and for pumping facilities to divert these flows into the international wastewater treatment plant.⁶⁰ Within weeks these actions were implemented.

For several months the water problem appeared to be under control, but in March 1991, tests in the Nogales Wash showed levels of cyanide and mercury which exceeded EPA limits.⁶¹ The United States Section acted positively by forming an Arizona task force which included representatives from the governor's office, the Arizona Department of Environmental Quality, the City of Nogales, and Santa Cruz County. The United States Section convened a meeting with the task force and staff from the state's congressional delegation in Tucson on March 26, 1991 to discuss the situation.

Several people, including the local press, were not allowed into the Tucson meeting because, according to an IBWC official, "we'll be discussing a number of issues including our relationship with Mexico. There will be sensitive issues discussed."⁶² At about the same time the *Nogales International* reported that the IBWC was slow to reply to a letter from the

54. Nogales Int'l, Oct. 17, 1990, at 12, col. 1.

55. Nogales Int'l, Oct. 24, 1990, at 17, col. 1.

56. Nogales Int'l, Oct. 24, 1990, at 5, col. 1.

57. Nogales Int'l, Oct. 24, 1990, at 4, col. 1.

58. Nogales Int'l, Oct. 31, 1990, at 14, col. 1.

59. *Id.*

60. Letter from N. Gunaji to D. DeConcini, Sen. from Ariz. (Nov. 9, 1990) (on file with author).

61. Tucson Citizen, Mar. 27, 1991, at 1A, col. 2.

62. Nogales Int'l, Apr. 3, 1991, at 6, col. 1.

mayor inquiring about the cyanide and mercury problem.⁶³ When the United States Commissioner explained that his own efforts "are of no avail, if the Mexicans are not responding to my concerns," this was interpreted by the *Nogales International* as "Mexico bashing," and it again called for the United States Commissioner to be removed from office.⁶⁴

The longer range strategy adopted by the United States Section followed a familiar pattern, as the IBWC once again recommended that the wastewater treatment facility be enlarged. But this time they recommended that a new treatment facility, perhaps in Mexico but most probably adjacent to the existing plant, be built to treat only Mexican sewage, and that the existing plant henceforth be dedicated to treat only United States wastes. The new plant would use a more sophisticated technology, and according to United States estimates the construction and modification would eventually cost at least \$100 million.⁶⁵ In 1992 the President included \$5 million for this project in the budget he submitted to Congress, but hopes for this solution dimmed when Congress eliminated all funding for planning and feasibility studies for the project from the 1993 budget.⁶⁶

Evaluation of Recent Environmental and Public Sensitivity of the IBWC

It would be difficult not to conclude that the United States Section has had serious public relations problems recently in Ambos Nogales. There is no doubt that the press and local officials have had a good deal to do with constructing this problem, and the United States Section did respond, albeit perhaps with too little care in its choice of words. And in its defense the United States Section could also cite the usual difficulties encountered in these types of matters: other crises and projects along the border also required its attention; there was no money available for a rapid response because its fiscal year ended five days before the declaration of emergency and there had been no agreement on the 1991 budget; and action involved a joint venture with Mexico and it was necessary to discuss matters with the United States Section's Mexican counterpart before presenting data to anyone else.⁶⁷

But the United States Section responded very much as it had in the past, despite the fact that public consciousness of environmental and health effects had changed. The press and local officials reacted to this change, while the United States Section did not. And members of Arizona's congressional delegation did not support the IBWC as they had previously either. Instead they became involved much more directly, often

63. *Id.*

64. *Id.*

65. Arizona Daily Star, Feb. 20, 1992, at 1B, col. 1.

66. Arizona Daily Star, July 30, 1992, at 1B, col. 1.

67. Interview with N. Gunaji, Comm'r, U. S. Section, IBWC, El Paso, Tx., Feb. 14, 1991.

taking a more binational perspective than that espoused by the IBWC. Members communicated with Mexico outside the IBWC framework, including one United States Senator who wrote directly to the President of the Republic of Mexico appealing for his help.⁶⁸ All of the delegation members took positions in favor of greater United States government involvement in preserving a clean border environment.

The increased congressional activism is not difficult to explain. The number and influence of nongovernmental organizations interested in the border and the environment had increased, partly as a function of the free trade debate. Clearly, legislators did not want to base their environmental records on what they could accomplish through the usual channels with the IBWC. Further, congressional action on border projects has become politicized. Instead of being a typical pork-barrel constituency service, new wastewater treatment projects have become intertwined in the free trade/environmental debate. The United States Section's reputation for nonpolitical professionalism was of little help in securing funding for the latest proposed expansion of the Nogales international wastewater treatment facility.

The United States Section of the IBWC is impeded from displaying greater environmental sensitivity by the narrow construction of its mission. It seems doubtful that regulatory solutions and planning can be avoided if border environmental health is to be protected, and yet the United States Section is unlikely to change. As scholars explained in 1990,

[m]oving into the broader realm of environmental management would engage the Commission, and the United States Section, in the business of policing domestic interests, which would provoke controversy. It would raise the public profile of the Commission and expose it to criticism, potentially undermining the united front clientelism critical to its effectiveness as an agency. The leadership of the United States Section may not be willing to expose the agency, and the Commission, to those risks.⁶⁹

Unfortunately for the IBWC and its United States Section, the Ambos Nogales experience suggests that remaining true to the old way is no way to avoid criticism. If flexibility, sensitivity to public relations, and heightened environmental consciousness is what will be necessary to address border water problems in the future, then the recent responses of the United States Section of the IBWC to the problems in Ambos Nogales indicate that the agency will continue to fail. This should not be surprising given that the literature on established bureaucracies suggests that it is extremely difficult, if not foolhardy, to attempt to fundamentally and

68. Nogales Int'l, Nov. 7, 1990, at 11, col. 2.

69. Mumme & Moore, *supra* note 4, at 683.

TABLE 1. Past Characteristics of IWBC Decisionmaking

Past Characteristics of IBWC Decisionmaking	Necessary Attributes of Decisionmaking Arena
Reactive	Anticipates problems prior to emergency
Technical expertise	Social expertise
Secrecy and closed decisionmaking	Open and participatory deliberation of issues
Biased toward physical solutions	Use of range of policy tools including planning, regulation, and technology transfer
Dependent upon federal action and funding	Capable of negotiating and funding local solutions
Parallel national action and funding communication to Mexico through formal channels	Binational action and expansion of informal communication among local officials

quickly change organizational perspectives and standard operating procedures.⁷⁰

CONCLUSIONS

The left-hand column of Table 1 summarizes the past characteristics of the United States Section of the IBWC which no longer serve to contain conflict. The right-hand column lists attributes and institutional arrangements that are more responsive to state and local interests, and which the United States Section must have if it is to be successful in the future:

The issue is whether or not the parallel national mode that in the past was designed to preserve national sovereignty is adequate to resolve problems in the future. Given the clear consequences of the past pattern, we think not. As the Ambos Nogales case study illustrates, the United States Section has failed to "solve" problems and failed to avoid conflict or to build effective support. It is important for the United States Section to be capable of not only planning the construction of projects, but also responding to what will inevitably become more frequent on the border: toxic spills, water shortages and droughts, health scares, etc. The institu-

70. B. Hogwood & B. Peters, *The Pathology of Public Policy* (1985); J. Wilson, *Bureaucracy* (1989).

tion must become skilled at working with the media and with public relations.

Even more fundamentally, institutional arrangements should be capable of addressing water-related issues associated with population and industrial growth. It should be possible to design policies that do not subsidize waste generators by providing federal funding to clean up contaminated water. It would be better to attack the sources of the problems by internalizing the costs of wastes in the rates charged for disposal. And those who benefit from the low cost labor in Mexico should have some responsibility for paying the costs of expanding water supply, wastewater collection, and treatment systems.

The proposal to alter the design and mission of the IBWC, as opposed to establishing entirely new institutions, certainly deserves more debate. Yet several things seem certain. In the future, knowledge of the social sciences, communication, and negotiation are likely to be more useful than technical expertise in resolving border water problems. Secrecy will only serve as a hindrance to long-range planning. Binational approaches that include pollution prevention and planned growth will require far greater state and local involvement.