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Albert E. Utton*

An Assessment of the Management of U.S.–Mexican Water Resources: Anticipating the Year 2000

How do we get from here to the year 2000? We are told every drop of water in the major drainage basins is already appropriated, yet the population is projected to double by 2000. How do we cope with that?

What is the institutional situation for managing water resources in the U.S.–Mexico border area? How well have the institutions performed in the past? Given projections for dramatic population increases in the future, what problems should we anticipate? How should we handle them? What anticipatory action should be taken?

In answering these questions, we will look at surface water apportionment, surface water quality, and groundwater quantity and quality. This will be something of a report card, with recommendations for the future.

THE INSTITUTIONAL CONTEXT

The management of the water resources on each side of the border is complicated by a multiplicity of governmental units on each side. On the U.S. side, prime responsibility over water resources is placed in four different states each having its separate, independent, and different water law system. In addition, there is a considerable federal role played by a variety of agencies such as the USGS, the Bureau of Reclamation, the Corps of Engineers, and the Environmental Protection Agency.

On the Mexican side, the federal government exercises the dominant role through a variety of agencies such as the Secretaria de Agricultura y Recursos Hidraulicos, and the Secretaria de Asentamientos Humanos y Obras Publicas. At the international level, the International Boundary and Water Commission is the designated institution for carrying out the terms of the 1944 water treaty. The 1944 Treaty gave the Commission the following general charge:¹

The application of the present treaty, the regulation and exercise of the rights and obligations which the two Governments assumed thereunder, and the settlement of all disputes to which its observance and

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1. Treaty on Utilization of the Waters of the Colorado and Tijuana Rivers and of the Rio Grande, Feb. 3, 1944, United States–Mexico, Art. 2, 59 Stat. 1219, T.S. No. 994 (effective Nov. 8, 1945).

execution may give rise are hereby entrusted to the International Boundary and Water Commission.

The Commission consists of a United States section and a Mexican section. Each is headed by a commissioner who is accorded diplomatic status by his government. Each may employ whatever staff deemed necessary, and each government bears the expenses for its own section. The costs of joint projects are shared by the two governments. The commission and its personnel are allowed to move freely in the territory of either country for the purposes of carrying on observation, studies, and field work.

As provided in the 1944 Treaty, the jurisdiction of the full commission "shall extend to the limitrophe parts of the Rio Grande (Rio Bravo) and the Colorado River, to the land boundary between the two countries, and to works located upon their common boundary."² For example, the Rio Grande from Fort Quitman, Texas, to the Gulf of Mexico forms the boundary between the two countries. The storage dams authorized by the treaty on this stretch of the river are therefore international and under the jurisdiction of the full commission, but with each section retaining jurisdiction and control of the works in its country.³ The commission is further empowered to make studies and recommendations and prepare plans for flood-control works and hydroelectric plants, but approval and actual construction of such projects are the responsibility of the two governments through their respective sections. Article 24 gives the commission power to construct, operate and maintain water-measuring stations in the limitrophe sections of the boundary river.⁴ The commission is authorized to investigate and prepare plans for flood-control works on the lower Colorado from the Imperial Dam to the Gulf of California, both in Mexico and the United States, as may be recommended by the commission and approved by the two governments.

In addition to the authority for investigations, studies, and recommendations regarding the construction of flood-control and hydroelectric facilities, the International Commission is authorized to perform the many administrative functions required for carrying out the treaty. For example, the commission keeps records of the quantities of water belonging to each nation; it maintains measuring stations in order to calculate diversion and consumption by the two countries.⁵

2. *Id.* See also, the resolution of the Senate ratifying the treaty, April 18, 1945, reprinted in DOCUMENTS ON USE AND CONTROL OF WATERS OF INTERSTATE AND INTERNATIONAL STREAMS, 451 (Dept. of the Interior, 1956).

3. Treaty on Utilization of Waters, *supra* note 1, Arts. 6 and 7. The planning of the Amistad Dam is an example of the work of the full commission.

4. *Id.*, at Art. 24(f) at subdivision 152.2(A).

5. *Id.*, at Art. 9(j).

The commission is authorized "to settle all differences that may arise between the two governments with respect to the interpretation or application of this treaty, subject to the approval of the two governments."⁶ A simple appellate procedure is thus established: the commission makes the initial decision, but it is subject to review by the two governments; the United States Department of State and Mexico's Ministry of Foreign Relations are the reviewing agencies.⁷ If the commission members are unable to agree, the commissioners are to inform the State Department and the Ministry of Foreign Relations respectively, "reporting their respective opinions and the grounds therefor and the points upon which they differ" so that the differences may be settled through normal diplomatic channels.⁸

APPORTIONMENT OF WATER SUPPLY

The Treaties of 1906⁹ and 1944¹⁰ apportioned the waters of the principal rivers, the Rio Grande and the Colorado.

The 1906 Treaty guarantees 60,000 acre feet per year to Mexico from the Elephant Butte Dam in the upper Rio Grande.¹¹ With certain conditions, the 1944 Treaty provides Mexico with 1,500,000 acre feet per year from the Colorado¹² and, also with certain conditions, apportions the waters of the Rio Grande below Fort Quitman between the two countries according to the terms of the Treaty.¹³

Some twelve hundred miles of the boundary between Mexico and the United States is formed by the Rio Grande. All but one hundred miles of this river boundary is below Fort Quitman, and is thus in the lower Rio Grande basin. Average annual inflows to the Rio Grande from Mexico accounts for about 60% of the water flowing in the lower Rio Grande, and that from the United States contributes approximately 40%. The Treaty of 1944 allocates the average annual waters of the lower Rio Grande about equally between the two countries.¹⁴ To the United States is allocated:

all of the waters contributed to the main stream by the principal

6. *Id.*, at Art. 24(d).

7. *Id.*, at Art. 2.

8. *Id.*, at Art. 24(d).

9. Rio Grande Irrigation Convention with Mexico, May 21, 1906, United States-Mexico, 34 Stat. 2953, T.S. 455.

10. Treaty on Utilization of Waters, *supra* note 1, Arts. 10 and 15.

11. Rio Grande Irrigation Convention, *supra* note 9, Art. I.

12. Treaty on Utilization of Waters, *supra* note 1, Arts. 10 and 15.

13. *Id.*, Pt. II.

14. *Water Treaty with Mexico: Hearings before Committee on Foreign Relations, U.S. Senate, 79th Cong., 1st Sess. (1945)* [hereinafter cited as *Hearings*]. See also, Tipton, *Engineering Memorandum on Treaty with Mexico Relating to the Utilization of the Waters of Certain Rivers* in THE SIX STATES COMMITTEE, 74 (1944).

United States tributaries below Fort Quitman;¹⁵ one-half of the flow in the main channel of the Rio Grande between the lowest major international storage dam; one-third of the flow into the main stream from the principal Mexican tributaries¹⁶ above Salineno, Texas, which is guaranteed by Mexico to average at least 350,000 acre-feet per year over a five year period;¹⁷ all of the water coming from the San Juan and Alamo Rivers and any return flow coming from land irrigated by these two rivers¹⁸ and one-half of all other waters flowing into the main channel of the Rio Grande.

Mexico is not guaranteed any of the flow of the principal U.S. tributaries below Fort Quitman. She receives two-thirds of the flow of the principal Mexican tributaries above Salineno, Texas; all of the waters reaching the main channel from the San Juan and Alamo Rivers; and one-half of all other flows occurring in the main channel of the Rio Grande.¹⁹ Thus, although the larger portion of the water of the Rio Grande below Fort Quitman comes from Mexican tributaries, the United States receives about one-half of all the water of the river.²⁰ These allocations and their administration by the International Boundary and Waters Commission have been a model of international cooperation.

At times the apportionment on the lower Rio Grande has been questioned, and Dr. Oyarzabal has recommended that it be re-examined, in view of the fact that Mexican tributaries contribute over two-thirds of the supply, yet the flow of the Rio Grande is divided nearly equally.²¹

However, the apportionment of the lower Rio Grande was part of the trade-off for the agreed division of the Colorado, and the thought of reopening the apportionment does not generate much enthusiasm. In addition, there are a number of smaller rivers which the two countries share which have not been apportioned. These include the San Pedro, which flows north from Sonora to southeastern Arizona; the Santa Cruz, which rises in Arizona, loops south into Sonora, and then flows back into Arizona; and the New River, which flows north from Mexicali into California.

By and large, we can give a good report on the apportionment of the surface flows shared by Mexico and the United States. The two countries

15. Treaty on Utilization of Waters, *supra* note 1, Art. 4B(a): "All of the waters reaching the main channel of the Rio Grande (Rio Bravo) from the Pecos and Devils Rivers, Goodenough Spring, and Alamito, Terlingua, San Felipe and Pinto Creeks." See also, *Hearings*, *supra* note 14, at 1809.

16. The primary tributaries are the Conchos, San Diego, San Rodrigo, Escandido, and Salado Rivers and Las Vacas Arroyo. Tipton, *supra* note 14, at 74-75.

17. There is a saving clause which permits Mexico to make up any deficiency in one five-year cycle in the next five-year cycle if the deficiency was caused by "extraordinary drought or serious accident." Treaty on Utilization of Waters, *supra*, Art. 4.

18. *Id.*, Arts. 4A, 4B.

19. *Id.*, Art. 4A.

20. *Hearings*, *supra* note 14, at 1809.

21. Oyarzabal, *La Calidad de Las Aguas Del Bajo Rio Bravo*, in this volume.

have been able to agree amicably on the division of the major rivers, leaving only the minor rivers unapportioned.

However, there is one major problem relating to quantity which has not been adequately resolved, and which has the potential for seriously affecting the relations of the two countries. That is the question of how to share the available supply during times of drought on the Colorado River.

The Treaty provides that in the event of "extraordinary drought or serious accident" the guaranteed quantity to be delivered by the United States will be reduced in the same proportion as are consumptive uses in the United States.²² This "extraordinary drought" provision is the major remaining water quantity issue.

The generality of the drought language could lead to substantial problems in times of water shortage. Cesar Sepulveda observes that these questions "could seriously affect the relations between the two countries," and goes on to illustrate the concern of Mexico:

The Treaty of 1944 failed to specify whether the drought could occur in the total region served by a river system, or only in a portion of it, and also did not define the intensity nor the duration of the drought. Further, no precise measurement is provided. Such imprecisions give rise to many interesting hypothetical questions. For example, if severe drought conditions do indeed exist in the United States during one year, the reduction in consumption would not be immediately calculable, and until such calculations would be made, would Mexico not be entitled to receive her full allotment of water?

And a respected American commentator adds "[i]t takes little imagination . . . to foresee conflict if Mexico's deliveries are ever cut . . ." under the "extraordinary drought" provision.²³ However, a like provision in the 1906 Treaty has been implemented in a manner acceptable to both governments.

Summary and Prognosis

- 1) The major surface flows have been amicably apportioned;
- 2) The waters of the boundary reaches of the Rio Grande and Colorado Rivers are presently completely committed or near committed;
- 3) In view of the full appropriation, as population and economic development increase along the border and in the major drainage basins of the Colorado and Rio Grande, greater conservation measures will have to be taken to stretch the available supply, and more water intensive

22. Treaty on Utilization of Waters, *supra* note 1, Art. 10.

23. Meyers & Noble, *The Colorado River Treaty with Mexico*, 19 STAN. L. REV. 367, 415 (1967).

agricultural uses will have to be retired in favor of municipal and industrial uses; and

4) The question of sharing shortages on the Colorado River should, if there is a question, be timely resolved.

Water Quality

A. The Colorado

Water quality has been a prime irritant to peaceful relations of the two countries and one that both will have to watch closely. They have struggled with this problem through a series of interim agreements culminating in Minute 242, a binational agreement to constitute a "permanent" solution to the salinity problem. Minute 242 was signed August 30, 1973, by Commissioners Herrera of Mexico and Friedkin of the United States. Its most important provision is that the salinity of the water upstream of Morelos Dam shall be no more than 115 parts per million plus or minus 30 parts per million over the annual average salinity at the Imperial Dam. This in fact means that farmers in the Mexicali Valley of Mexico will be irrigating with water which is no more than 115 parts per million plus or minus 30 parts per million higher than the salinity of the water which their American neighbors in the Imperial Valley across the international boundary receive from the Imperial Dam.

In order to reduce the salinity upstream from Morelos Dam to the 115 plus or minus 30 parts per million above the salinity at the Imperial Dam a reverse osmosis desalting plant near Yuma, Arizona, and a canal through the Santa Clara Slough to the Gulf of California in Mexico are required. The canal is to carry the brine produced by the desalting plant. All of the construction cost is to be borne by the United States.

The other principal elements of the agreement are: 1) "that the United States will support efforts by Mexico to obtain appropriate financing on favorable terms for the improvement and rehabilitation of the Mexicali Valley;" 2) that each country "shall limit pumping of groundwaters in its territory within five miles . . . of the Arizona-Sonora boundary near San Luis to 160,000 acre-feet . . . annually;" 3) "the United States and Mexico shall consult with each other prior to undertaking any new development of either the surface or groundwater resources, or undertaking substantial modifications of present developments, in its own territory in the border area that might adversely affect the other country;" and 4) that the Minute 242 constitutes the "permanent and definitive solution of the salinity problem."²⁴

Nonetheless, there still is potential for water quality questions to arise

24. See Brownell & Eaton, *The Colorado River Salinity Problem with Mexico*, 69 AM. J. INT'L. L. 255 (1975).

between the two countries. There is a range of potential water quality impacts from energy development in the Colorado River Basin but, as Professor Bishop states, "the water quality problem of most concern to both the United States and Mexico is salinity."²⁵

The water of the Colorado is the lifeblood of the thirsty southwestern United States and the Mexicali Valley of northwestern Mexico. It presently supplies the needs of 15,000,000 people in supplying water for their cities and irrigating the agriculture, mining, and industrial enterprises within the basin, not to mention the recreational, fish, and wildlife uses of the river. In addition, that basin is being called upon to meet the nation's energy demands. It has been said that the Colorado River Basin is one of the richest storehouses of energy resources in the United States. Within the four states of New Mexico, Arizona, Colorado, and Utah, conservative estimates indicate that there are more than 23.5 billion tons of recoverable coal reserves, of which more than half are of the low sulphur variety which is in demand for electrical generation. In addition, these four states contain nearly 90% of the uranium reserves of the United States, and virtually all of the domestic oil shale reserves are located in Colorado, Wyoming, and Utah.

As Professor Lee Brown and associates point out, "it is an inescapable conclusion that the upper Colorado will play an important role in any U.S. effort to achieve even semi-independence from foreign energy sources."²⁶

Numerous projections of energy-related water consumption in the Colorado have been made. The 1974 "Report of Water for Energy in the Upper Colorado River Basin," prepared by the U.S. Department of the Interior, concluded that "under this set of projections, there could be significant shortages occurring in all states on the upper basin except Wyoming by the year 2000." More recent studies have been less pessimistic. The August 1975-76 "Water Assessment" of the U.S. Water Resources Council concludes that "the projected future modified flow of the outflow point of the region implies surplus water still available after the year 2000 for upper basin use."²⁷ The various projections vary as to when a water crunch might arise in the Basin.²⁸ Technological changes in electrical generation techniques, for example, may affect these figures

25. Bishop, *Impact of Energy Development on Colorado River Water Quality*, 17 NAT. RES. J. 649, 669 (1977).

26. Brown et al, *Some Remarks on Energy Related Water Issues in the Upper Colorado River Basin*, 17 NAT. RES. J. 635 (1977).

27. U.S. Water Resources Council, 1975 Water Resources Assessment, Specific Problem Analysis, Upper Colorado Region, Tech. Memo. No. 2, at 45 (Aug. 1976).

28. See, Weatherford and Jacoby, *Impact of Energy Development on the Law of the Colorado River*, 15 NAT. RES. J. 171 (1975).

significantly,²⁹ but whatever the estimate, there is unanimity that significant additional demands for consumptive use will be placed upon the Colorado River for energy developments.

Because Mexico's allocated share of the waters of the Colorado is a prior obligation under the Colorado River Treaty, one would not anticipate water quantity disputes except possibly in the case of an extreme drought which both nations would be affected by under the terms of the treaty. However, water quality is another matter and the question of salinity on the Colorado may again be a future water issue between Mexico and the United States.

Bishop, in his study, says "the impacts of pollutants on stream quality levels in the upper Colorado River Basin are potentially significant in areas of intense energy development."³⁰ And he goes on to state that "the most pervasive and important water quality problem facing the United States and Mexico is salinity. Since the two countries have agreed under Minute 242 on a salinity level for water delivered to Mexico, an important water quality concern is the effect of energy development on the future salinity levels in the river."³¹

Various studies have attempted to assess the changes in Colorado River salinity as a consequence of future development, and it generally is agreed that increased energy development will lead to increased consumption and that salt concentrations in the river therefore will rise with accelerated energy development. This increase can be expected because of reduced amounts of water for dilution. Various strategies have been devised to contain salt releases into the Colorado and under Minute 242 the desalting plant at Yuma has considerable capacity for taking salt from Colorado River waters, but water and salt mass balance model studies have analyzed the effect of future development of compact waters in the Colorado Basin for a variety of alternative energy development futures and Bishop concludes that "the total dissolved solid concentrations are seen to increase below Imperial Dam even though the total salt load in the River is reduced via water diversion for energy. Thus, salinity concentrations are more affected by taking water that serves for dilution out of the river than by the removal of salt load from the water."³²

The Yuma desalting plant has substantial capacity for meeting future salinity increases but, since the projections are for increased salinity concentrations and since the quality of water delivered to Mexico is tied to the quality of water delivered to the Imperial Valley in the United States, there has to be a continuing concern about water quality in the

29. Brown et al, *supra* note 26, at 637.

30. Bishop, *supra* note 25, at 655.

31. *Id.*, at 661.

32. *Id.*, at 669.

Colorado and, as Bishop concludes, "these effects of future development will have to be considered in the planning and implementation of programs to meet water quantity and quality commitments to Mexico."^{32a} On the other hand, the Congress by passage of public law authorizes studies and works by the Department of the Interior to guard against an increase in the salinity of the Colorado River at Imperial Dam.

Summary and Prognosis:

1) Present efforts being undertaken under Minute 242 and the Salinity Control Act have the promise of keeping salinity levels within acceptable limits;

2) The conservation of existing supplies will have to be intensified at all levels, including the use of new technologies in agriculture and energy production activities;

3) Many water intensive uses such as farming will have to be reduced to accommodate new populations and economic growth. This is already happening at a substantial rate;

4) Finally, this growth will require constant review and vigilance so as to anticipate and avoid unacceptable increases in salinity as well as other contaminants.

B. The Rio Grande

At the present time, the waters of the Rio Grande generally are of acceptable quality for beneficial uses on both sides of the border.³³ Also, it should be noted that in Texas a number of the border cities which discharge wastewater into the river have under way improvements to their sewage treatments plants.³⁴ Nonetheless, with greatly increasing populations, there will be placed greater stress on the river. The situation can be summarized as follows:

- 1) The increase in population and urbanization in the Rio Grande Basin will result in increasing demands on the surface water supply and also has the potential to cause serious adverse effects on water quality.³⁵
- 2) Although surface water of a quality suitable for irrigation will be required in an amount much larger than for other uses, high quality water to meet increasing municipal and industrial demands may

32a. *Id.*

33. Rohlich, *Surface Water Quality in the Border Area Between El Paso and the Gulf of Mexico*, in this volume.

34. Whittington, "Comments on the Surface Water Quality in the Border Area Between El Paso and the Gulf of Mexico" (Paper presented at Transboundary Resource Needs Conference, South Padre Island, Texas, April 23-24, 1981) at 6.

35. Rohlich, *supra* note 33, at 7.

impose a severe burden on the surface water resources in the region.³⁶

- 3) On the positive side is the fact that much of the population increase will be in the lower Rio Grande Valley where waste water is not returned to the river, thus significantly mitigating the adverse effects of increasing population on water quality.³⁷
- 4) Oyarzabal reports that salinity readings presently range from medium to high levels in the irrigation district in Mexico below Anzalduas Diversion Dam.³⁸
- 5) If present trends continue in Anzalduas Dam in Mexico,³⁹ we could reach high levels of salinity by the year 2000.⁴⁰
- 6) Continued urban and industrial development has the potential to increase the contaminant levels of heavy metals.⁴¹
- 7) Pesticide contamination is a matter requiring continued surveillance.⁴²

Recommendations made by the U.S.-Mexico Study Group included:

- 1) The authorities on both sides of the frontier should give urgent attention to developing appropriate means to guard against the potential of worsening water quality.⁴³
- 2) Analytical studies on historical water quality records must be continued so as to detect changes in quality before serious adverse effects occur.⁴⁴
- 3) Monitoring of water quality of the Rio Grande/Rio Bravo must be continued on a basin-wide scale, and in a spirit of international cooperation. Information must be exchanged freely.⁴⁵
- 4) Full cooperation should be given to the International Boundary and Waters Commission in carrying out its duties to resolve "border sanitation problems" under Minute 261 of the 1944 Treaty.⁴⁶
- 5) Increased water conservation and transfers from water intensive uses will be necessary.

Minute 261 and the Expanded Role of the IBWC

In addition to the more widely publicized Colorado salinity problem, numerous other serious quality problems have arisen from transboundary

36. *Id.*

37. Proceedings, Anticipating Transboundary Resource Needs and Issues, South Padre Island, Texas (April 23-24, 1981).

38. Oyarzabal, *supra* note 21, at 16.

39. *Id.*

40. *Id.* at 17.

41. *Id.*

42. *Id.*

43. *Id.*

44. Proceedings, Anticipating Transboundary Resource Needs and Issues, *supra* note 37.

45. *Id.*

46. *Id.*

ivers. For example, on the New River, California residents were greatly concerned by pollution coming from Mexico. News reports declared "Raw sewage, dead dogs, fish, and industrial waste flowing north across the Mexican border via the New River are creating a major health hazard. . . ." ⁴⁷ Headlines declared "New River: A Sewer from Mexico," ⁴⁸ and "California Fights River Flow of Mexican Wastes." ⁴⁹ The New River rises in Mexico near Mexicali and flows northward into California to the Salton Sea, southeast of Palm Springs, carrying highly contaminated water. The contamination was said to come from inadequately treated sewage and industrial discharges. The extent of the problem was such that American officials had to erect signs warning that the water was contaminated.

Arizona farmers have been concerned by pollution in the San Pedro River which flows north from Sonora into southeastern Arizona. The flows at times are extremely discolored, and farmers were concerned about possible damage to their agricultural land and crops. Residents were disturbed about possible health effects on themselves and their families. The likely source of this contamination was the large copper works in the Cananea area in Sonora; ⁵⁰ this source has been eliminated.

Mexico residents similarly complained about the dumping of offal into the Rio Grande by meat packing companies, as well as the stench drifting across the border from those companies situated in El Paso; ⁵¹ this problem also has been corrected.

The IBWC has dealt with these situations and done a great deal in identifying "border sanitation problems" and in reaching binational agreement for the building of facilities to handle international sewage problems in the border area such as at the twin cities of Nogales, and Douglas-Agua Prieta, as well as the arrangements for temporarily alleviating the sewage problem of Tijuana. ⁵²

However, the explosive population growth in the border area has made it very difficult to keep up. At Nogales, the facilities were designed for a population of 20,000 but were overtaxed by a 1967 population of 29,000 which, in turn, led the IBWC to expand the works to serve 102,000 for 1980 which, again, probably falls short of the actual population. ⁵³ The

47. Washington Post, Dec. 11, 1978, at A3, cols. 1-4.

48. *Id.*

49. New York Times, Nov. 20, 1978, at A19, cols. 1-4.

50. Conversations with the Office of the Attorney General of Arizona, April 1979.

51. Note of April 6, 1961, in 6 M. Whitman, DIGEST OF INT'L. L. 258 (1968).

52. See, International Boundary and Water Commission, History and Development of the IBWC, United States and Mexico (1959). See also, Mumme, *The Background & Significance of Minute 261 of the Int'l. Boundary and Water Commission*, 11 Calif. Western Int'l. L.J. 223 (1981).

53. Victoria, *Population Change in the Northern Border Area Municipios of Mexico 1970-80*, in this volume, and Applegate, *Environmental Problems of the Borderlands*, Table 1 (1979).

population of Tijuana has doubled or tripled every decade between 1930 and 1970.⁵⁴ The population of Mexicali increased 2011% between 1940 and 1970.⁵⁵

In addition, the mandate of the IBWC has been construed very narrowly. The geographic jurisdiction of the Commission is limited to "the limitrophe parts of the Rio Grande . . . and the Colorado River, to the land boundary between the two countries and to works located upon their common boundary,"⁵⁶ and the subject matter jurisdiction of the Commission was described by narrow and now outdated language in the 1944 Treaty. Section 3 of that Treaty restricted its environmental attention to "border sanitation problems" when it called on the two governments to "give preferential attention to the solution of all border sanitation problems."⁵⁷

The Commission since 1944 has narrowly construed the phrase "border sanitation problems" and has largely limited its concern to projects such as sewage disposal works, and has not expanded its focus to other environmental hazards. Mumme suggests the Commission "has interpreted its powers conservatively, in such a manner as to preclude the possibility of any serious controversy over the propriety of its jurisdiction."⁵⁸ Of course, one must not overlook the strategic role of the Commission in reaching a solution of the Colorado River salinity problem through Minute 242. As population and economic growth have increased more problems have arisen, and there has been a felt need for the Commission to take a more active role in their resolution.⁵⁹

As a result, on February 16, 1979, Presidents Carter and Lopez-Portillo issued a Joint Communique calling upon the IBWC "to make immediate recommendations for faster progress toward a permanent solution to the sanitation of waters along the border."⁶⁰ The Commission responded with Minute 261.⁶¹

What does Minute 261 change?

A. Broadened Definition of Water Quality Problems

1) In a key clause it provides:

That the two Governments recognize as a "border sanitations prob-

54. Gutierrez, *El Desarrollo Economico y de Poblacion en la Ciudad de Tijuana*, 17 NAT. RES. J. 615 (1977).

55. Stoddard, *Population Changes for Selected Border Cities: 1940-1970* (1978).

56. Treaty on Utilization of Waters, *supra* note 1, Art. 2.

57. *Id.*, Art. 3.

58. Mumme, *supra* note 52, at 223, 226.

59. *Id.* at 229.

60. White House Joint Communique of Mexican President Jose Lopez-Portillo and President of the United States Jimmy Carter, on the occasion of President Carter's visit to Mexico 1-6 (Feb. 14-16, 1979).

61. Int'l. Boundary & Water Comm., U.S. & Mexico, Minute No. 261, Recommendations for the Solution of Border Sanitation Problems, El Paso, Texas (Sept. 24, 1979).

lem," . . . each case in which, in the judgement of the Commission, the waters that cross the border, including coastal waters, or flow in the limitrophe reaches of the Rio Grande and the Colorado River, have sanitary conditions that present a hazard to the health and well-being of the inhabitants of either side of the border or impair the beneficial uses of these waters.⁶²

This offers the opportunity for a much broader approach to water quality problems by expanding the Commission's efforts beyond traditional sewage disposal works to solving any water quality problem which presents a threat to the health or well being or might impair the beneficial use of the waters. This language is broad enough to cover the range of problems from salinity to toxic industrial wastes, and agricultural practices as well as municipal sewage.

B. Broadened Authority for Commission to Take Initiative in Identifying Water Quality Problems

New authority is given to the Commission to determine when, in its judgment, a "border sanitation problem" exists, rather than requiring the prior mutual agreement of the two governments. By Minute 261, the two governments have given their prior approval and mandated the Commission to determine when there is a "border sanitation problem."⁶³

C. Possible Extension of Commission's Jurisdiction Beyond the Border

The language has the capacity to expand the Commission's jurisdiction beyond the limitrophe parts of the Rio Grande and the Colorado River to any tributaries since contaminants found in the limitrophe reaches or that cross the boundary may easily derive from tributaries beyond the limitrophe reaches of the river or the boundary. To interpret the language of Minute 261 more narrowly would be to defy the hydrology of drainage basins and unduly limit the Commission's ability to identify and deal with water contaminants which reach or have an impact in the border region, but whose source is upstream in the drainage basin or even beyond, in the case of air-borne contaminants (outside IBWC jurisdiction).

D. Asks Other Agencies to Assist the Commission as the Lead Agency in Dealing with Border Water Quality Problems

Section 3 of the Minute calls on all of "the competent agencies of each government to provide the Commission with the information and technical advice that it requires."⁶⁴

62. *Id.*, at para. 1.

63. *Id.*

64. *Id.*

E. Expresses the Mandate of the Governments that Border Water Quality Problems be Dealt With as a Matter of Priority

The Minute contains a great deal of language expressing a specific intent to give a sense of priority to water quality questions. The Commission is to give "permanent attention" and "immediate and priority attention" to border sanitation problems.⁶⁵ The governments are to "urgently" carry out the execution of remedial measures to correct specific border sanitation problems identified by the Commission with the "greatest speed and timeliness possible."⁶⁶

The Commission is mandated to take the initiative on a case by case basis in the "identification of the problem, definition of conditions that require solution, specific quality standards which should be applied, the course of action that should be followed for its solution, and the specific time schedule for the implementation."⁶⁷

Thus, Minute 261 will not, by itself, solve all border water quality problems. The delicate binational considerations, and cooperation between the two governments will still have to be worked out on a case by case basis but, nonetheless, the mandate of the Commission is clearly extended and the intent of the Minute is for the Commission to take a greater initiative in the solving of "border sanitation problems" more broadly defined to include a wider range of water quality issues, and these initiatives are to be taken as a matter of priority.

Groundwater Quantity and Quality

The heaviest groundwater users in the United States are the states which are contiguous to Mexico,⁶⁸ and yet, paradoxically, the law and institutions of these border states are woefully inadequate to control the exploitation of their groundwater resources.⁶⁹ In addition, international competence over aquifers divided by the frontier is largely undefined; it is fair to say that the legal and institutional situation is chaotic.⁷⁰ Still largely true is Professor Clark's statement that none of the border states "has adequate legislation or regulations for the protection and management of diminishing supplies within the state and along the border areas. New Mexico has the only public control system, but regulations under

65. *Id.*, at para. 2.

66. *Id.*, at para. 5.

67. *Id.*, at para. 4.

68. Clark, *Institutional Alternatives for Managing Groundwater Resources*, 18 NAT. RES. J. 153, 155 (1978).

69. Burman & Cornish, *Needed: A Groundwater Treaty Between the United States and Mexico*, 15 NAT. RES. J. 385, 388-91 (1975).

70. It has to be noted, however, that the IBWC has done a remarkable job of resolving groundwater problems to date with a minimum of treaty mandate or international practice as precedent.

it do not contemplate joint controls in the area of the border. Arizona and Texas have virtually no controls except voluntary ones, and the California law is beholden to similar rules of capture which do little to discourage excessive pumping and waste."⁷¹

Although both Arizona and California have made or are making efforts to reform their groundwater law, in contrast to the legal situation on the U.S. side of the border, Mexico does have legal authority to control groundwater withdrawals. The national government, through the Secretariat of Water Resources, can regulate extraction and the Secretary, on his own initiative, can establish prohibited groundwater zones if existing developments or the aquifer are in danger of being adversely affected,⁷² or if it is otherwise in the public interest.

Coincident with the near legal vacuum, significant population and economic growth are projected on both sides of the border, making it reasonable to anticipate that there will be increasing pumping and accelerating demand placed on groundwater resources bisected by the international boundary between the two countries.⁷³ This increased demand, combined with a striking absence of institutions for either resolving disputes or managing the resource, raises the specter of dispute between the two countries.⁷⁴

Perhaps the best example of potential conflict between the two countries due to the increased competition for transboundary groundwaters is that of the cities of El Paso and Juarez.⁷⁵

The metropolitan area of Ciudad Juarez, Chihuahua, and El Paso, Texas, has over one million inhabitants. Both cities depend largely on shared groundwater reservoirs for their municipal water supplies. Studies indicate that both sides now are pumping at a rate faster than the groundwater reservoir is being recharged. Day reports that:

Between 1903 and 1976, water levels fell as much as 73 feet in the center of El Paso and 85 feet in Ciudad Juarez. Based on a digital model study, Meyer predicts extensive Hueco Bolson drawdown by 1991 concentrated in the center of Juarez and northeast El Paso. Annual recharge to bolson aquifers may be as little as 5 percent of the annual withdrawal.⁷⁶

71. Clark, *supra* note 68, at 155-56.

72. Teclaff, *Abstraction and Use of Water: A Comparison of Legal Regimes*, UN Doc. ST/ECH/152 62 (1972).

73. See Alba, *Condiciones y Politicas Economicas en la Frontera Norte de Mexico*, 17 NAT. RES. J. 571 (1977); Bradley & DeCook, *Ground Water Occurrence and Utilization in the Arizona-Sonora Border Regions*, 18 NAT. RES. J. 29 (1978); and Day, *International Aquifer Management: The Hueco Bolson on the Rio Grande*, 18 NAT. RES. J. 163 (1978).

74. See Day, *supra* note 73.

75. *Id.*

76. *Id.*, at 168.

He suggests that, "Indigenous Rio Grande groundwater supplies are already overdeveloped and serious doubts exist that there is sufficient water to support expected growth in total water demand."⁷⁷ He goes on to conclude:

Although the imbalance in expanding water use and long term availability does not pose an immediate problem, over the long term water supplies for the international community, which is presently heavily dependent on the Hueco Bolson, will probably become more distant, more expensive, more scarce, and possibly of lower quality. Scientific evidence at hand does not permit an accurate estimate of the cost.⁷⁸

Dr. Neal Armstrong of the University of Texas adds a water quality dimension:

Groundwater from the Hueco Bolson deposits is being mined in El Paso County and the Juarez area, and depletions in storage are causing saline water encroachment from the aquifers and degradation of groundwater quality. The amounts of fresh to slightly saline water that can be removed under "safe yield" conditions have not as yet been determined. Induced recharge or leakage from the alluvium is slowly degrading the quality of groundwater pumped from the Bolson deposits. Water quality degradation will also occur due to lateral and vertical encroachment of saline water from adjacent saline water sands in the Bolson deposits as the fresh to slightly saline water in storage is depleted.⁷⁹

Recommendations for the Future

Considering that the population in the border region is projected to double by 2000 and the admonition that "economic development presupposes the protection of adequate legal guarantees . . .,"⁸⁰ how do we provide users who are dependent on groundwater a secure supply? Given that the UN Water Conference has exhorted countries sharing water resources to "review existing and available techniques for managing shared water resources, and coordinate development of such resources,"⁸¹ and yet being aware of Professor Teclaff's realism in observing that groundwater "because of the nature of its occurrence and its association with that sovereignty which has always attached itself to land in international law, may be the very last element of the environment to be

77. *Id.*, at 169.

78. *Id.*, at 177-78.

79. Armstrong, *Anticipating Transboundary Water Needs and Issues in the United States-Mexico Border Region*, in this volume.

80. JENKS, *THE COMMON LAW OF MANKIND* 172 (1958).

81. Report of the UN Water Conference E77, II Annexes (Agenda Item 12) 51 (1977).

considered,"⁸² what suggestions can we make to improve the security of water supply and thereby the investment of groundwater users in the border area? How can we assure that each nation will receive a fair share of the transboundary resources in the border region, adequately protected so as to avert unnecessary and damaging conflict between the two neighbors? How can we avoid what Professor Clark calls "education by disaster"?⁸³

The following proposals are made with a view to improving the allocation and management of transboundary groundwaters in general and the U.S.-Mexico border region in particular.

A. General Considerations⁸⁴

1. There must be conjunctive management of surface and groundwater in areas where supplies are interrelated. In the management of international groundwaters it is essential to recognize the interrelationships between surface and groundwaters, which are frequently interconnected. Contrary to hydrologic reality, the law frequently has made distinctions which separate surface water from underground waters. The distinctions have failed to recognize interrelationships between surface and underground waters.

2. Legal rights should take into account the hydrologic fact that water is a fugitive resource and that therefore the legal rights are to the control and use of the water, not the ownership of the water.

3. Decisions such as the spacing of wells and the rate of drawdown need to be carried out according to a reasoned development scheme, bearing in mind both water quality and water quantity.

4. Hydrologic information needs to be developed carefully in order to plan for the use of the supply over a calculated period, to determine safe yield, and to prevent salt water intrusion.

a. There should be a system of measurement of withdrawals from wells.

b. Records must be kept of withdrawals over a period of time.

5. Controls must be placed on drilling in those areas where present and future uses may be endangered.

6. Allocation procedures, including permits, must be flexible in order to anticipate and minimize conflicts and shortages and facilitate transfers to other uses.

7. The planning process should be flexible enough to allow for planned

82. L. Teclaff & E. Teclaff, *Transboundary Groundwater Pollution: Survey and Treaty Law*, 19 NAT. RES. J. 629, 667 (1981).

83. Clark, *supra* note 68, at 157.

84. *Id.*, at 158. See also, Mumme, *The U.S.-Mexican Conflict Over Transboundary Groundwaters: Some Institutional and Political Considerations*, 12 CASE W. J. INT'L. L. 505 (1981).

depletion over a calculated period by certain uses such as irrigation or municipal water supply. The planned depletion or mining of water can be justified in the same way as the mining of nonrenewable mineral resources such as oil, coal, or copper, but the decision to mine has to be made after thorough investigation, and the development must be orderly and rational; this is particularly so where the groundwater resource is divided by an international boundary, in view of the fact that depletion of the resource and the consequent damage to the other country cannot be easily corrected by natural recharge.

8. The management effort must include and be related to all water quality matters.

9. Management should be placed in an international agency with authority which is broad enough to carry out the policies of the countries concerned and strong enough to enforce the policies designed for particular groundwater areas along and near the border.

10. Underground water resources divided by international boundaries may be equally apportioned and in that apportioning, shared groundwater may be treated in the same manner as shared surface water.

11. The amount and quality of groundwater available to the affected countries within their shared international drainage basins and from shared groundwater aquifers should be included as elements in the determination of an equitable apportionment of their shared water resources.

12. The Helsinki rules of the International Law Association, especially Articles II, IV, and V thereof, provide a useful basis for interested parties in negotiating an agreed statement of their legal interest in the groundwater resources shared by the countries.

13. The allocation of shared groundwater should not be determined by national legal regimes acting unilaterally, but rather the parties should determine their respective rights to shared natural resources through amicable deliberation and negotiation.

14. Groundwater resources hydrologically not interconnected with surface flows, and not situated physically astride the boundary should be excluded.

*B. A Management Proposal*⁸⁵

The IBWC should be given jurisdiction over groundwaters intersected by the international boundary, and authority to apportion the waters of the aquifer and close the area to withdrawals beyond that allowable as determined by the physical criteria of the aquifer. Allocation of trans-

85. Utton, *International Groundwater Management: The Case of the U.S.-Mexican Frontier*, 57 NEB. L. REV. 633, 640 (1978).

boundary water resources whereby each nation is allocated its equitable share of the groundwaters is more likely than a comprehensive management approach due to the sovereign sensitivities of nation states. Therefore, the following outline of an allocation process is suggested:

1. The IBWC should be empowered to declare any groundwater resource that is divided by the international boundary to be a "designated international groundwater area" when in its judgment (a) demand is likely to exceed recharge so as to endanger sustained yield or water quality due to salt water intrusion, (b) groundwater withdrawals are likely to affect or be interrelated with surface waters previously allocated by treaty, (c) prudent management of the groundwater resource including the decision to mine groundwater makes such designation desirable, (d) the area is an important resource of drinking water, or (e) the area is highly susceptible to contamination.

2. Upon declaring a "designated international groundwater area" and after carrying out the necessary hydro-geologic studies, the Commission should equitably apportion the designated area between the two countries using established engineering criteria. The Commission already is obtaining information concerning aquifer thickness, saturated thickness, depths, area, quantity, and quality of the area, as well as transmissibility, permeability, recharge rates, and other pertinent hydrologic data which would be necessary in apportioning the waters of the designated area.

3. Using this data, the Commission should then apportion the water bearing in mind the following:

- a. The geography of the area, including each nation's proportion of total surface area overlying the designated international groundwater area;
- b. The hydrology of the area, including (1) each nation's proportion of the total volume of the water in the designated international groundwater area which lies within that nation's territory, (2) the contribution of recharge by each nation, and (3) other relevant hydrologic considerations;
- c. Pre-existing utilization by each state;
- d. Other relevant considerations such as those suggested in the Helsinki rules,⁸⁶ and

86. The Helsinki Rules on the Uses of the Water of International Rivers, in *Management of International Water Resources: Institutional and Legal Aspects*, UN Doc. ST/ESA/5 188-89 (1975). Article V of the Helsinki Rules provides:

(2) Relevant factors which are to be considered include, but are not limited to:

- (a) The geography of the basin, including in particular the extent of the drainage area in the territory of each basin State;
- (b) The hydrology of the basin, including in particular the contribution of water by each basin State;

- e. The protection of the water quality of each nation's allocation.
4. The actual allocation, administration, and enforcement of water rights within each nation's portion of water in a designated international groundwater area would be within the national jurisdiction of that nation and its appropriate political subdivisions.
5. In addition, there should be a generally overriding, supervisory enforcement power lodged in the Commission to ensure that each nation lives within the total water budget allocated to it by the basic apportionment, and that each nation abides by its obligations for protecting the water quality of the aquifer.
6. In the event of prolonged drought which in the judgment of the Commission significantly affects recharge, the Commission should be authorized to reduce the total allowable withdrawal from the designated international groundwater area for so long as the Commission deems necessary, and each nation's withdrawal shall be accordingly reduced proportionately.

*C. Water Quality*⁸⁷

- 1) The IBWC should have power to promulgate water quality standards and regulations.
- 2) These standards and regulations should:
 - a) identify toxic and hazardous pollutants,
 - b) require a continuing record of such substances from origin to disposal,
 - c) establish criteria for the safe storage of wastes,
 - d) provide for the inventory of dump sites, abandoned as well as active, that have the potential for causing transboundary pollution.
- 3) The IBWC should be given the power to develop management programs for intercepting and containing groundwater contamination.

-
- (c) The climate affecting the basin;
 - (d) The past utilization of the waters of the basin, including in particular existing utilization;
 - (e) The economic and social needs of each basin State;
 - (f) The population dependent on the waters of the basin in each basin State;
 - (g) The comparative costs of alternative means of satisfying the economic and social needs of each basin State;
 - (h) The availability of other resources;
 - (i) The avoidance of unnecessary waste in the utilization of waters of the basin;
 - (k) The degree to which the needs of a basin State may be satisfied, without causing substantial injury to a co-basin State.

- (3) The weight to be given to each factor is to be determined by its importance in comparison with that of other relevant factors. In determining what is a reasonable and equitable share, all relevant factors are to be considered together with a conclusion reached on the basis of the whole.

87. L. Teclaff, *supra* note 82 at 660-67.

4) Special measures should be undertaken to protect drinking water supply. The Teclaffs suggest that the "sole source" concept could be utilized to advantage.⁸⁸ That concept, as developed in the Safe Drinking Water Act of 1974,⁸⁹ provides for the designation of an entire aquifer as a "sole source" if it is the sole or principal drinking water source for an area. Such designated protection zones should include, if possible, the entire area of an aquifer shared by two or more states or at least that part of it in which activity in one state might cause pollution in another state or states. Land use concepts should be employed such as the "limited use zone," whereby specific contaminating activities such as waste disposal would be limited to specific areas so as to contain the most polluting activities within the smallest possible area and thereby isolate them from areas of natural recharge value. The concepts of "limited use zones" and "sole source" are really counterparts to each other. The sole source designation would exclude polluting activities from the vicinity of the source of drinking water, and limited use zones would confine contaminating activities to limited areas.

5) The actual enforcement of water quality standards and regulations within each nation would be within the national jurisdiction of each nation respectively, and its appropriate political subdivisions. In addition, there should be a general overriding, supervisory enforcement power lodged in the IBWC which is strong enough to enforce the implementation of the standards and regulations promulgated by the Commission.

How to Cope with Twice as Many People on the Same Amount of Water

Report Card and Prognosis

1. The division of surface water supplies has been largely completed and has been carried out equitably and amicably by mutual agreement.

2. However, the language of the 1944 Treaty for sharing shortages in the Colorado River basin in times of drought carries the potential for serious conflict between the two countries as populations increase.

3. Stretching available supplies to meet increased demands will require significant conservation efforts, and increased transfers from water intensive uses such as agriculture to meet municipal and industrial needs.

4. The avoidance of conflict over water quality problems will require continuing vigilance and cooperation on the part of both countries.

5. Fortunately, Minute 261 provides the IBWC increased authority to deal with water quality issues in the border region.

6. However, the IBWC will have to act with vigor and initiative to

88. *Id.*, at 664.

89. 42 U.S.C. 300F (1976).

resolve the complex and difficult pollution problems which will arise from the dramatically increasing demands being placed on the drainage basins in the border region.

7. Competition for groundwater resources will increase greatly, particularly in urban areas such as El Paso-Juarez.

8. The legal authority for making sure that each country receives its fair share of transboundary groundwaters is nearly non-existent. In fact, the issue has barely been addressed.

9. Given this combination of increased competition and inadequate legal protection, the likelihood for conflict likewise will increase.

10. The International Boundary & Water Commission should be given authority by Treaty to identify and designate international groundwater areas and on an aquifer by aquifer basis determine the fair and equitable share of both countries of these waters, and to ensure that each country's fair share is protected.

11. The IBWC should be given authority to protect the water quality of transboundary groundwaters.

12. Much of what has been recommended is politically impossible until the governments recognize the problems and give the IBWC additional authority.

Thus, in our final assessment, we can see much that has been accomplished, much that has yet to be done to avoid new conflicts between the two countries as populations grow, as demands for water increase, as new problems arise.

In general, we might have a report card as follows:

U.S.-MEXICO WATER MANAGEMENT REPORT CARD		
	GRADE	COMMENT
Surface Water Apportionment	A-	Good effort, some work remains to be done.
Provision for Sharing During Droughts on the Colorado River	C	Need for clarification. Potential for conflict, although handled well on Rio Grande.
Resolution of Surface Water Quality Problems	B	After a shaky start, great improvement shown under Minutes 242 & 261; there is hope for the future.
Management of Groundwater Resources (so as to Assure Each Country a Fair Share and to Protect the Quality of the Water Supply)*	C-	Preliminary effort has been made in Minute 242. Much remains to be done. Potential for dispute great.

Construction and Management of
International Storage Facilities

A

Model of cooperation.

**Additional Remarks*

The worst grade is in the groundwater area, but it should be pointed out that this is entirely understandable, since the problem has only recently become apparent. Groundwater has been out of sight and out of mind. Only with increased pumping caused by increased demand has the problem surfaced. It now behooves us to address it before it becomes more serious.

On the plus side, the two countries have amicably resolved the Yuma groundwater problem with Minute 242, one of the few international agreements expressly dealing with transboundary groundwaters, and the IBWC is carrying on an inventory of groundwater supplies and is exchanging data between the U.S. and Mexican sections of the IBWC. Nonetheless, all of this can at most be described as a preliminary effort. The two nations have yet to face fully the problem. The two countries must muster the political will to grant the IBWC the mandate necessary.

It should be pointed out that this somewhat tongue in cheek grading largely is not a report card on the IBWC. The IBWC has performed admirably within the mandate given it and would be given high marks consistently. It has to operate within the realm of political possibility, like a swimmer crossing a shark-infested body of water. It carried out the negotiations on Minute 242 with professionalism, to the credit of both nations, and the political will was mustered. It has been moving ahead with a progressive posture, developing and exchanging groundwater data within a limited authority. Now it will be better able to deal with water quality problems with its expanded mandate under Minute 261. The IBWC long has proven it will act professionally and efficiently once given the authority. However, even the history of the 1944 Treaty illustrates the diversity of political interests and pressure groups, especially in the United States, and the resultant difficulty in agreeing to give sufficient management authority to the international body.⁹⁰ Thus, these grades to a large extent grade us, the "body politic" of the two nations, and our ability to come to grips with questions of binational water management. The ability of the IBWC to deal with groundwater problems, for example, is largely a political one. It will depend upon our willingness, especially in the United States, to reach the necessary political consensus to allow the

90. See Meyers & Noble, *supra* note 23. See also, N. HUNDLEY, DIVIDING THE WATERS (1966) and D. LEMARQUAND, INTERNATIONAL RIVERS: THE POLITICS OF COOPERATION 25 (1977).

Commission to deal with transboundary groundwater resources in a prudent, professional, and rational manner.

UNA EVALUACIÓN DEL MANEJO DE LOS RECURSOS HIDRAULICOS ENTRE LOS ESTADOS UNIDOS Y MEXICO: PREVISIONES PARA EL AÑO 2000

La distribución de los recursos de agua de superficie ha sido llevada a cabo, amigablemente, por acuerdo mutuo. Sin embargo, a medida que la población y el desarrollo económico se incrementan a lo largo de la frontera, se deberán tomar medidas más intensas para la conservación. Los problemas de calidad de agua requerirán una vigilancia continua por parte de ambos países. En los que respecta a los recursos de agua subterránea, la competencia aumentará grandemente. La Comisión Internacional de Límites y Aguas, debiera recibir autoridad para distribuir agua subterránea y regular las normas de su calidad.

Distribución del Abastecimiento del Agua

El reparto de los recursos del agua de superficie se han completado casi totalmente y se ha llevado a cabo amistosamente, por mutuo acuerdo.

Sin embargo, el lenguaje del tratado de 1944 para compartir la escasez en la cuenca del Colorado en tiempo de sequía tiene posibilidades de conflicto serio entre los dos países conforme la población crece. El Tratado prevee que en caso de "Sequía extraordinaria o accidente serio" la cantidad garantizada para entrega por los EUA será reducida en la misma proporción en que lo son los usos de consumo en los EUA. El Tratado no especifica si esta sequía puede ocurrir en todo el río, servido por los sistemas o sólo en una parte y tampoco define la intensidad o duración de la sequía.

En vista del reparto completo, en tanto que las poblaciones y el desarrollo económico se incrementan a lo largo de la frontera y en las cuencas mayores, se deben tomar medidas más serias de conservación para aprovechar al máximo el agua disponible. Los usos intensivos agrícolas del agua deberán ser eliminados más y más en favor de usos industriales y municipales.

Calidad de Agua

Los esfuerzos que se llevan a cabo en el presente, bajo el Acta 242 y la Ley de Control de Salinidad prometen mantener el nivel salino dentro de límites aceptables. Sin embargo para evitar conflictos sobre problemas de calidad de agua se requerirá vigilancia continua y estrecha cooperación por parte de ambos países.

Afortunadamente el Acta 261 provee, para la Comisión Internacional de Límites y Aguas, mayor autoridad para tratar con el aspecto de la calidad del agua en la región fronteriza. La Comisión puede hoy tomar la iniciativa en identificar problemas de calidad de agua. Asimismo el lenguaje del Acta 261 puede ampliar la jurisdicción de la Comisión a corrientes tributarias más allá de la región. Sin embargo la Comisión deberá resolver los problemas complejos y difíciles de contaminación que surgirán de las demandas dramáticamente crecientes que gravitan sobre las cuencas de la región fronteriza.

La competencia por los recursos del agua subterránea se incrementará en gran medida, especialmente en áreas urbanas como El Paso-Juárez. Coincidiendo con la creciente demanda no existe autoridad legal para asegurar que cada país reciba su justa proporción de las aguas subterráneas transfronterizas. Dada esta combinación, la posibilidad de conflictos seguirá aumentando.

La Comisión debe recibir atribuciones en un tratado, a fin de identificar y designar áreas internacionales de aguas subterráneas. Debe determinar la porción justa y equitativa de ambos países de estas aguas sobre la base de acuífero por acuífero y asegurar que cada porción sea protegida. La dotación real, la administración y el ejercicio de los derechos de agua dentro de la porción de cada nación en una área designada caería dentro de la jurisdicción nacional de cada país.

Ademas la Comisión debiera tener autoridad para promulgar las normas y reglamentos de calidad de agua. Debe desarrollar programas de administración para interceptar y contener la contaminación de aguas subterráneas. Se debiera tomar medidas especiales para proteger el abastecimiento de agua potable. Los gobiernos deben reconocer los problemas y darle a la Comisión la autoridad adicional que sea necesaria.