

Taking ICS to Mexico: International Opportunities in the Seven States Agreement

Introduction

The Seven Basin states recently reached agreement on a far-reaching proposal to improve the management of Colorado River system water through conjunctive management of Lakes Mead and Powell, modification and extension of the existing interim surplus guidelines, and the adoption of shortage guidelines. Perhaps most significantly, this agreement introduces a series of new mechanisms to increase flexibility within the Lower Basin delivery system and water allocations, including the creation of a new category of water: “Intentionally Created Surplus,” which can be generated through extraordinary conservation measures or the funding of system efficiency improvements, and the recognition of water exchanges.

At the present time, the states’ proposal is largely concerned with operations between and among the Basin states, particularly the states of the Lower Basin, although some elements of the proposal (such as water exchanges) have apparently contemplated Mexican participation. However, it would appear that significant benefits for U.S. water users, Mexican water users, and the environment could also be derived from expressly extending portions of the proposed agreement to water users in Mexico – while helping Mexican users to more readily bear burdens that could otherwise be imposed by the alterations proposed in the states’ accord.

In particular, an extension of proposed policies related to Intentionally Created Surplus (ICS), system efficiency improvements, and water exchanges to include water users in Mexico could provide significant assistance in resolving difficult issues related to urban, agricultural, and environmental water supplies in Mexico, while opening enormous opportunities for both U.S. and Mexican water users to obtain water supplies via funding of irrigation efficiency improvements, the construction of urban water infrastructure, water supply replacement or enhancement, desalination, and other projects. These credits could be used to firm up urban water supplies in both countries, engage in long-studied environmental restoration projects in the Delta, and increase flexibility in Mexico’s agricultural sector – creating economic, environmental, and social benefits in both countries while offering the United States and Mexico a venue for cooperation in the otherwise contentious area of water management at the border.

These outcomes would meet all three of the purposes identified in the Basin States’ original proposal: improving cooperation and communication, providing additional security and certainty in the water supply of the Colorado River System, and avoiding circumstances which could otherwise form the basis for claims or controversies over the Colorado River Compact and other applicable provisions of the Law of the River.

While an extension of this agreement to include Mexico would likely need to occur on a different timeframe than for the domestic implementation of the agreement, the domestic process should at least not close the door on an international program, and would

preferably encourage the initiation of binational discussions on the issue. Since critical elements of the states' current proposal – most notably the proposed shortage policy and proposed policies for unilateral water exchanges – will already require consultation with Mexico and/or the adoption of a new Minute, these opportunities could be considered in the same diplomatic process.

Binational Challenges for the Seven States' Agreement

Mexico has no storage system for Colorado River water, and as such, is effectively dependent on the U.S. reservoir system to guarantee water deliveries to meet municipal and agricultural demands. In addition, although the Mexicali Valley has significant groundwater resources, Mexico does not currently operate a water bank or other shortage mitigation program comparable to those in place in the United States (e.g., the Arizona Water Bank). At the same time, the lack of storage in Mexico effectively prevents Mexico from accumulating reserve supplies that could be used to meet environmental needs in Mexico (such as pulse flooding the in Delta region, which has been identified as a necessary precondition to effective restoration of key riparian areas). In the face of a rapidly growing population, ongoing efficiency and water accounting issues in its agricultural sector, and increasing pressure to protect and restore critical environmental resources in the Delta, Mexico faces a uniquely challenging situation with regard to the management of its water resources.

Of particular concern for Mexico in the states' proposal could be the provisions related to the implementation of shortages on the Lower Colorado. Although the Treaty of 1944 provides that Mexico is to share “proportionately” with U.S. users in times of “extraordinary drought,” the precise meaning of this provision remains unclear, and it has never been invoked since the time of the Treaty's execution. The states' agreement, for the first time, unilaterally and precisely defines a set of proposed parameters under which shortages would be implemented against the Mexican allocation. Because Mexico has no readily available mechanisms to reduce or mitigate against shortage impacts on its users (such as reservoir storage or water banking), the potential for shortages will cause understandable concern for Mexican water users – similar to those that have arisen among low-priority users in the U.S.

Similarly, although conjunctive management of Lakes Mead and Powell as proposed in the states' agreement will doubtless help to reduce the probability that such shortages will actually occur, this will potentially come at the cost of decreasing the probability of future spills from these reservoirs in the future, since reservoirs may be drawn down further in the event of drought, increasing available capacity to absorb flood events in the future. The states' proposal also appears likely to create incentives to further increase the efficiency of U.S. water delivery systems by providing opportunities to receive ICS credits for the funding of these projects (e.g., Southern Nevada Water Authority's proposed funding of the Drop 2 reservoir); these projects will further reduce normal-year deliveries to Mexico. Combined with gradually increasing efficiency in agricultural water use, this will continue to pose challenges for the maintenance of critical environmental

values in the Delta, which receive virtually all of their current water supplies from agricultural return flows, excess deliveries, canal leakage, and occasional flood events.

However, the states' proposal also offers a potential opportunity to promote binational solutions to these concerns as well as a broader suite of water issues in the border region – particularly insofar as it could be used to promote improvements in agricultural efficiency, water infrastructure, and municipal water quality and supply in Mexico. A brief discussion of these opportunities is provided below, together with examples of how particular programs might work. Of course, any projects undertaken would require the review, approval, and continuing oversight of both countries. However, it is critical to note that each of these programs could be undertaken without altering Mexico's basic Treaty entitlement to Colorado River water; any decrease (or increase) in Treaty deliveries would be matched by a mutually agreed-to compensation program or a proportionate increase (or decrease) in water deliveries in a later year. None of these programs would change Mexico's right to Colorado River water deliveries under the 1944 Treaty.

Expanding Three Elements of the States' Proposal to Mexico: How It Could Work

Intentionally-Created Surplus (ICS)

Under the states' proposal, a contractor could generate "ICS credits" by engaging in extraordinary conservation activities that have the effect of reducing the use of Colorado River water. These activities could include land fallowing, canal lining, desalination, or other extraordinary conservation measures agreed to by the states, so long as they result in the savings of water that would otherwise have been beneficially used as a part of a state's basic entitlement (surplus water cannot be used), the contractor plans and identifies the intended savings in advance (by September 15 of the preceding year), and the credits are first used to offset any delivery overruns.

These ICS credits would then be stored in Lake Mead for use by the contractor at some future time, subject to annual reductions to account for storage losses to reservoir evaporation, and a 5% "system tax" that would accrue to the benefit of the river system as a whole. The remaining credits could then be used during any year with "normal" operating conditions. During shortage or surplus conditions, the credits could not be used, and they would be reduced on a pro-rata basis in the event of a spill. However, for the purposes of determining calendar year declarations of surplus, normal, and shortage conditions, stored water that is subject to ICS credits would be considered system water – helping to keep reservoir levels higher in Powell and Mead and avoid shortages in the Lower Basin.

ICS credits would be subject to both yearly and cumulative maximums for each state, with California limited to no more than 400,000 acre-feet per year and a total credit of 1.5 million acre-feet, and Arizona and Nevada to 100,000 and 125,000 acre-feet per year, respectively, and total credits of 300,000 acre-feet. Recovery of ICS credits is similarly

limited to 400,000 acre-feet annually for California and 300,000 acre-feet annually for Arizona and Nevada.

- How it could work in Mexico:¹
 - Mexican users could engage in extraordinary conservation activities in Mexico with the effect of reducing actual beneficial use such that deliveries to Mexico under the Treaty could be temporarily reduced below 1.5 million acre-feet in any one year. This would generate ICS credits that would be available for delivery to Mexico in later years, under the same rules applicable to U.S. users, resulting in temporary increases in deliveries above the 1.5 million acre-foot Treaty obligation.
 - Example: Pronatura Sonora pays to temporarily fallow low-productivity lands in the Mexicali Valley, saving 30,000 acre-feet of water a year over a period of years. Treaty deliveries in each year are accordingly reduced below 1.5 million acre-feet, resulting in increased storage in Lake Mead. Pronatura receives an ICS credit which it can deliver to Mexico in a future year as a pulse flow for a riparian restoration project (after reducing the ICS credit for reservoir evaporation and paying the 5% system tax).

System Efficiency Projects

In addition to creating ICS through extraordinary conservation activities for existing uses of Colorado River water, the states' proposal allows for Colorado River users to receive ICS credits in exchange for making capital contributions to projects that would increase the overall efficiency of the Colorado River delivery system. The credits would comprise a portion of the water saved through the efficiency project, and would not be stored, but would rather be provided to the user that developed the credit on a predetermined schedule for some period of years.

- How it could work in Mexico: Mexican or U.S water users could fund delivery system efficiency improvements and receive proportionate amounts of temporary ICS credits for their investments that could be used under the same rules applicable under the states' proposal. These temporary credits would have the effect of either increasing (if funded by a Mexican user) or reducing (if funded by a U.S. user) Treaty deliveries to Mexico for an agreed period of time. After the temporary ICS credits expired, the system efficiency improvement would accrue to the country in which the project was undertaken.
 - Example: Metropolitan Water District develops a cooperative program with CNA and the U.S. federal government to invest in upgrades to the Mexicali Valley irrigation system, including canal lining and water

¹ The legal mechanism for implementing the extension of ICS and water exchanges to Mexico is discussed below.

accounting infrastructure, resulting in significant savings of water that would otherwise have been lost in the delivery system while improving or at least maintaining agricultural productivity. MWD receives a fixed amount of ICS credits for a period of years that can be used as a “bridge” supply until permanent water transfers from U.S. agricultural sources are completed. After the expiration of that period, all ICS credits revert to Mexico. Mexico, in turn, commits to dedicate a portion of the water saved to natural habitat restoration in the Colorado River Delta. With the approval of the U.S. Fish and Wildlife Service and appropriate international agreements, this could even result in some partial credit under the Multi-Species Conservation Program. Mexico uses the bulk of efficiency savings from the program to improve urban and agricultural water supplies, including offsetting expected impacts from the lining of the All-American Canal.

Water Exchanges

Finally, the states’ proposal allows Colorado River users in the Lower Basin to secure additional water supplies by funding the development of a non-Colorado River System water supply in one state for use in another state by exchange. The new water supply would be used in place of the Colorado River water supply, allowing the user that provided the funding to use the Colorado River water that is no longer used through and agreement with the Secretary of the Interior. The states’ proposal expressly contemplates exchanges with Mexico, albeit only unilateral exchanges in which non-Colorado River System supplies would be developed in Mexico, with the savings used in the United States.

- How it could work in Mexico: This program could be extended to a bilateral program in which water could be exchanged in either direction, with exchanges resulting in commensurate increases or decreases in Treaty deliveries (indeed, it is unclear why Mexico would agree to a purely unilateral program as proposed by the states).

Opportunities in Mexico

The examples cited above suggest just a few of the opportunities which could be explored if the states’ proposal could be extended to users in Mexico - opportunities that could help not only to offset the impacts of the states’ proposal, but also to meaningfully improve the tools available to meet human and environmental needs in the border region.

Over the years, there have been a number of proposals suggesting means by which the United States and Mexico might cooperate to improve both agricultural efficiency and municipal water quality in the border region. Notably, in 1991, the United States Bureau of Reclamation (BOR) and the Comisión Nacional del Agua (CNA) released a joint proposal entitled “International Cooperative Water Conservation and Irrigation Efficiency Improvement Program between the Republic of Mexico and the United States

of America” that was championed by Dennis Underwood. This proposal noted similarities between cropping patterns and irrigation methods in the Imperial and Mexicali Valleys, and based on the experience of municipal and industrial users in California with investment in efficiency improvements (that were otherwise beyond the means of farmers in the region), suggested that similar investments in the Mexicali Valley could produce significant short and long-term water supply benefits.

Observations of water management in the Mexicali Valley suggest that there remain significant opportunities for improving water delivery and use through system automation, operational changes to improve the timing and quantity of deliveries, conversion to high capacity farm turnouts, canal lining, spill interception, land leveling, installation of canal turnouts for rapid delivery, improved cropping patterns, changed field irrigation practices and adaptation to low water-use technologies, improvements to drainage, and improved maintenance procedures. Water conserved from these efforts could be beneficial in terms of providing replacement supplies in the face of shortages, reducing dependence of local farmers on groundwater supplies, and providing environmental benefits.

For example, the Mexicali Irrigation District (DDR 0014) reports approximately 645,000 af/yr (800 mcm/yr) in conveyance losses that are recoverable (as opposed to conveyance losses that recharge groundwater supply²). Based on some extremely rough estimates, of this total conveyance loss, approximately 150,000 af/yr (200 mcm/yr) may be attributable to seepage from major canals. Much of this latter seepage apparently occurs along approximately 70 kilometers of unlined canal sections, which could potentially be lined, by one estimate, for around \$600 million pesos (US \$56 million). These include the Reforma canal (28 km, estimated lining cost \$150 million pesos or US \$13.7 million), the Revolución canal (20 km, no lining estimate available), the Alimenta del Sur canal (5.5 km, no lining estimate available), and the Nuevo Delta canal (16 km, lining cost \$300 million pesos or US\$27.4 million).³ None of these sections reportedly cross or recharge aquifers from which significant amounts of groundwater are recovered or that support river flows or wetlands. The total estimated costs of all of these lining projects would likely be comparable to the \$80-\$90 million construction cost for the Drop 2 storage reservoir, but could potentially produce a far larger quantity of savings at a much lower cost per acre-foot.

The opportunities associated with an international expansion of the seven states proposal are not limited to agricultural water use. Mexico is currently experiencing increasing risks of shortages to municipal and industrial water supplies in the Mexicali Valley and the major communities to the west of the Valley – as well as significant concerns related to water quality due to high water salinity in the Mexicali Valley region and water

² The extent to which the aquifers are interconnected and to which such losses are recoverable without impacting groundwater recharge that is pumped for irrigation or that supports river flows or wetlands should be verified by geo-hydrologic investigation, modeling, and monitoring.

³ These figures are rough estimates based on informal discussions with a former employee of CONAGUA and are provided for illustrative purposes only. The estimated costs for lining the Nuevo Delta canal reach are apparently high due the location of this reach over a geologic fault.

pollution. These concerns create a significant opportunity for the use of tools such as ICS and system efficiency investments to improve these supplies – and perhaps just as significantly, opportunities to invest in desalination or other technologies to replace low-quality Colorado River supplies or otherwise improve water quality for municipal use.

Creating a Delta Water Supply

These proposals would necessarily require consideration of environmental needs in the Colorado River Delta. As numerous studies have pointed out, the remaining Delta ecosystem largely depends on “system inefficiencies” for its water supply – such as return flows from agriculture, effluent flows, canal leakage, and releases in excess of Treaty requirements from the U.S. These proposals would create inevitable incentives to reduce these inefficiencies in Mexico (just as the states’ proposal creates incentives to reduce inefficiencies in the United States). As such, it is essential that any program in Mexico provide a mechanism for replacing (or improving) the Delta’s water supplies while meeting critical agricultural and municipal needs.

To a certain extent, this issue could be addressed through implementation of an ICS mechanism in Mexico. Several recent studies, including a recent Packard Report, “Immediate Options for Augmenting Water Flows to the Colorado River Delta in Mexico,” have investigated options related to taking existing, marginal agricultural lands in Mexico out of production and utilizing the water associated with those lands for environmental purposes. The Sonoran Institute and Pronatura Noroeste-Sonora, together with other NGO partners, are currently in the process of exploring just such an option, focusing on highly marginal lands in the southern portions of the Mexicali Valley where salt buildup and shallow groundwater create economic challenges for agricultural production. Although funding for these efforts has not yet been secured, mechanisms have been identified for holding water derived from these lands via water trusts, wheeling water to appropriate locations, and designating protected receiving areas in the riparian corridor to ensure that water is used for environmental benefit.

Nevertheless, reliance on non-governmental organizations alone will not guarantee the continued availability of water to support key ecosystem values in the Delta. To ensure the continued viability of the Delta ecosystem – and to avoid ongoing uncertainties for U.S. and Mexican water users associated with environmental challenges to water allocations – any international program should include a process for securing necessary environmental flows, such as the dedication of a portion of the proceeds of various water-saving programs to provide a permanent, reliable supply of water to replace current supplies and support environmental uses in the Delta.

Making a Binational Proposal Work: Changes to the States’ Proposal and the Treaty of 1944

Implementation of a binational program for Intentionally-Created Surplus, efficiency improvements, and water exchanges would of course require an alteration to the current framework of the Treaty of 1944 between the United States and Mexico. Currently, the

Treaty requires the delivery of 1.5 million acre-feet of water to Mexico annually, absent surplus or extraordinary drought.

It should be noted that none of the proposals discussed above would have the result of altering the basic entitlements of either the United States or Mexico under the Treaty; regardless of the program developed, Mexico would continue to have the same 1.5 million acre-foot entitlement to Colorado River water even if the precise timing (or the place) of the delivery of that entitlement was altered). As such, the implementation of such programs should not result in any conflict with other provisions of the Law of the River, and in particular the Colorado River Compact, since no change in position between the U.S. and Mexico would occur.

However, the implementation of the proposals discussed above would require temporary reductions or increases in deliveries above or below this basic number to the extent that water was stored or released from Lake Mead in response to programs generating ICS via extraordinary conservation or investment in system efficiency improvements, or else via water exchanges between parties in the U.S. and Mexico. As such, an appropriate alteration to the delivery rules under the Treaty would be required.

This could be effectively accomplished via the addition of a new Minute to the Treaty of 1944, adopted through the International Boundary and Water Commission (IBWC). Pursuant to the Treaty of 1944, IBWC is authorized to build and manage waterworks, to resolve problems and negotiate further agreements regarding international waters, and to settle treaty-interpretation disputes.⁴ The Treaty grants broad jurisdiction to IBWC to “plan, build, and manage water works; to enter into further agreements regarding international waters,” and 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.”⁵ Assuming appropriate approvals could be obtained from the U.S. and Mexican federal governments, IBWC should thus have appropriate authority under the Treaty to implement a binational program for ICS, water efficiency improvements, and water exchanges based on the same rules applicable to the other Lower Basin states. In addition, any international agreement would need to address a number of technical issues that would be associated with these programs, including the development of appropriate accounting methods for water conservation, and the identification of conservation priorities and opportunities to which water generated for ecosystem use might be put.

Such a new Minute could be modeled after the new regulations or guidelines that would need to be adopted to implement the states’ proposal in the U.S. As the shortage criteria for deliveries to Mexico and the states’ existing proposal for unilateral water exchanges would also likely require implementation via a new Minute, these issues could be explored under the same diplomatic process.

⁴ See Mexico-U.S. Water Treaty of 1944, Art. 24, 59 Stat. at 1255-1257.

⁵ See Mexico-U.S. Water Treaty of 1944, Art. 24(d).

Obviously, these proposals would require diplomatic discussions between the U.S. and Mexico before they could be appropriately implemented, which would place the implementation of an international ICS program on a different timeframe than that anticipated for the adoption of a domestic program. However, as the operation of such a program would likely require consideration of environmental concerns under the National Environmental Policy Act, as well as appropriate recognition in any guidelines that may be adopted by the Secretary to implement the states' agreement. For example, the rules used to guide the storage and release of ICS credit water would need to recognize the potential for delivery of ICS to Mexico pursuant to the Treaty of 1944, rather than solely by reference to Section II(B)(2) of the Decree and forbearance agreements between the states. Similarly, rules defining the maximum amount of ICS credits that could be generated in any one year, and the cumulative amount that could be subject to storage in Lake Mead, would also need to reference the potential for Mexican use of this system.

To ensure that a potential international program could be eventually implemented in conjunction with the states' proposed program, and assuming that there is interest among Mexican water users in such an international program, we suggest that the proposals discussed above should be appropriately considered as a part of the U.S. Bureau of Reclamation's ongoing public process for the "Development of Lower Colorado River Basin Shortage Guidelines and Coordinated Management Strategies for Lakes Powell and Mead Under Low Reservoir Conditions."