

July 7, 2006

Conservation Before Shortage II:

Proposal for Colorado River Operations

I. Background/Context

In August of 2005, various non-governmental conservation organizations introduced the “Conservation Before Shortage” proposal into the U.S. Bureau of Reclamation’s (Reclamation) process for the “Development of Lower Colorado River Basin Shortage Guidelines and Coordinated Management Strategies for Lakes Powell and Mead Under Low Reservoir Conditions” (Shortage Guidelines). The “Conservation Before Shortage” proposal suggested an approach to the management of shortages in the Lower Colorado through the implementation of a tiered program of voluntary and compensated water conservation, tied to the surface elevation of Lake Mead.

Since the time of that proposal, the seven Basin States have reached agreement on a far-reaching proposal to transform management of Colorado River system water through conjunctive management of Lakes Mead and Powell, modification and extension of the existing Interim Surplus Criteria, and the adoption of shortage guidelines. Perhaps most significantly, the Basin States’ proposal 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” (ICS). ICS can be generated through extraordinary conservation measures, funding of system efficiency improvements, and recognition of water exchanges.

As currently constituted, the Basin States’ proposal is largely concerned with water deliveries between and among the Basin States, with ICS programs and related mechanisms confined to the states of the Lower Basin. While these programs will clearly benefit water management on the Colorado River system, we suggest that significant benefits for U.S. water users, Mexican water users, and the environment could be gained by expanding portions of the Basin States’ proposal to include additional potential domestic water users, provide for direct federal participation, and leave the door open to potential international implementation of ICS programs.

In addition, we strongly suggest that there remain significant potential advantages to some of the concepts expressed in the original “Conservation Before Shortage” proposal, particularly the use of voluntary, market-based conservation as a method to mitigate involuntary shortages. By combining that proposal with an expanded ICS program we believe that “Conservation Before Shortage II” is a powerful tool for mitigating against shortages and helping to meet the federal government’s bypass flow replacement obligations under the Colorado River Basin Salinity Control Act.

Conservation Before Shortage II meets the purposes identified in the Basin States’ original proposal: delaying and minimizing the onset of shortage in the Lower Basin and the risk of curtailment in the Upper Basin through conservation, more efficient reservoir operations and water supply augmentation. It also meets multiple federal objectives on the Colorado River,

including the watermaster’s continued federal oversight and management of the river, the protection of important environmental resources, and replacement of the bypass flow.

Over the past several months, the conservation organizations that developed the original Conservation Before Shortage proposal have, with technical assistance from Reclamation’s modeling staff, developed a revised version of the proposal (hereafter referred to as “CBS II”). This document describes the essential elements of the CBS II proposal, the rationale behind these elements, its relationship to the states’ proposal, and the significant potential benefits associated with the CBS II approach.

II. Elements of Conservation Before Shortage II

A. Shortage Guidelines to Reduce Deliveries/Releases from Lake Mead

Shortage Conditions

At elevations below 1000 feet, the Secretary would impose involuntary shortage conditions to the extent necessary to maintain an elevation of 1000 feet (absolute protection of elevation 1000 feet).¹

Conservation Conditions

In years when the August 24-month study projects the elevation of Lake Mead on January 1 will fall within the elevation ranges for “conservation conditions” identified below, on behalf of the Secretary of the Interior (Secretary), Reclamation will engage in a program to purchase ICS credits in the amounts corresponding to those ranges. To the extent permitted by law and through the appropriate authorities, Reclamation will also seek to generate such ICS credits by purchasing water from users in Mexico (temporarily reducing deliveries of Colorado River water to Mexico). Federal ICS creation requirements would follow identical triggers and reductions to the involuntary shortages proposed under the Basin States’ alternative:

- Elevation greater than 1050 to 1075 feet: 400,000 acre-feet
- Elevation greater than 1025 to 1050 feet: 500,000 acre-feet
- Elevation greater than 1000 to 1025 feet: 600,000 acre-feet

Reclamation would maintain an accounting system to track cumulative Main Outlet Drain Extension bypass flow replacement obligations (to the extent not otherwise satisfied via other mechanisms) and banked federal ICS credits. ICS credits created when the elevation of Lake Mead is at or below 1075 feet would first be credited against the cumulative bypass flow “deficit.” Federal ICS credits created in excess of this deficit would be credited to the federal ICS account up to the amount of the federal cap of 1.5 million acre feet (see below). Federal ICS credits created in excess of the federal cap would become system water.

¹ In the event that a shortage is declared when Lake Mead is at or below elevation 1000 feet, and a bi-lateral determination of an extraordinary drought is also made under the 1944 Treaty, deliveries to Mexico would be reduced in the same proportion as consumptive uses in the Lower Basin are reduced.

All funding for creation of federal ICS up to the amount of the 1.5 million acre foot cap would be provided by the federal government in recognition of the bypass flow replacement and environmental benefits. Thereafter, 50% of funding would be provided by the federal government, with the remaining 50% derived from fees assessed against Lower Basin water and power users using the mechanisms described in the original CBS proposal (see Attachment A).

B. Coordinated Reservoir Operations (Lake Mead and Lake Powell).

CBS II does not address coordinated reservoir operations. However, for the purpose of highlighting the differences between CBS II and the Basin States' alternative in Reclamation's modeling exercise, reservoir operations at Lakes Mead and Powell would be coordinated as described in the Basin States Alternative.

C. Lake Mead Storage and Delivery of Conserved and Non-system Water

ICS credits generated via extraordinary conservation activities, tributary conservation, system efficiency projects, and other mechanisms would be handled under rules identical to the Basin States Alternative, except as follows:

- ICS credits could be generated by entities that are not current Colorado River delivery contract holders (although a delivery contract with the Secretary would be required for the storage and delivery of ICS credits). Entities eligible for participation in the ICS program would include:
 - U.S. federal agencies
 - State agencies
 - Private entities, including U.S. non-governmental organizations
 - Mexican federal agencies
 - Mexican water users
- All participating entities would follow the Basin States rules for storage and withdrawal of ICS credits (including restrictions on creation and use of ICS credits during shortage and surplus conditions, 5% system set-aside for creation of ICS², and reductions to stored ICS to account for evaporation losses), except:

² The Basin States' proposal provides that at the time ICS credits are created by extraordinary conservation, the entity creating the credits will dedicate 5% of the ICS credits to the system on a one-time basis to provide a water supply benefit to the system, while 10% of the ICS credits would be set aside under the Reservoir Storage Alternative. Quite possibly, the set-aside rate of 10% may be too modest. We suggest that Reclamation analyze the benefits and costs of a larger set-aside.

- U.S. federal government would be permitted to purchase or create and bank ICS credits during Conservation Conditions (see below), but would be subject to the same rules for delivery and use of ICS credits as other users.
- Mexico would be permitted to create, bank, and deliver ICS credits during “Normal,” “Full Domestic Surplus,” and 70(r) surplus conditions but not during Conservation, Shortage or Flood Control Surplus conditions. Same-year ICS reallocations within Mexico that do not result in system storage would not be subject to the 5% system set-aside (as this would not alter Treaty deliveries). Water banked by Mexico in Lake Mead would be subject to the 5% system set-aside as well as evaporative loss charges. Mexico’s participation in the ICS program would operate under a Treaty minute reflecting procedures to alter delivery schedules to accommodate transfers of ICS within Mexico, as well as procedures for temporary reductions and corresponding increases in Treaty deliveries to allow for banking in Lake Mead.
- The maximum amount of ICS credits that could be created in any one year would be limited to 950,000 acre-feet per year, allocated among the participants as follows:
 - California contractors: 400,000 acre-feet per year (state proposal)
 - Nevada contractors: 125,000 acre-feet per year (state proposal)
 - Arizona contractors: 100,000 acre-feet per year (state proposal)
 - United States: 100,000 acre-feet per year (except during Conservation Conditions, see above) (potentially allowing use of water for environmental projects)
 - Mexico (government/users): 125,000 acre-feet per year (enough water to bank and deliver 200,000 acre-feet of a 250,000 acre-foot flood flow every 5 years with the last 50,000 acre-feet scheduled as part of Mexico’s annual delivery in the year of the flood flow release, plus allow for other environmental, municipal, industrial, and other uses, accounting for the 5% system set-aside and up to 5% annual evaporation loss for banked water)
 - All other users: 100,000 acre-feet per year
- The maximum cumulative amount of ICS credits that would be available at any one time would be 4,200,000 acre-feet, allocated as follows:
 - California contractors: 1,500,000 acre-feet (state proposal)
 - Nevada contractors: 300,000 acre-feet (state proposal)
 - Arizona contractors: 300,000 acre-feet (state proposal)

- United States: 1,500,000 acre-feet (3-5 years of Conservation Conditions acquisitions, 15 years of ICS recovery)
- Mexico: 400,000 acre-feet (enough water to bank 200,000 acre-feet of a 250,000 acre-foot flood flow every 5 years with the last 50,000 acre-feet scheduled as part of Mexico's annual delivery in the year of the flood flow release, plus approximately 2-3 years cumulative storage for other uses)
- All other: 200,000 acre-feet (2 years storage to allow for purchase and storage of water during cheaper market conditions)
- The maximum amount of ICS credits that could be recovered in any one year would be limited to 1.6 million acre-feet per year, allocated as follows:
 - California contractors: 400,000 acre-feet (state proposal)
 - Nevada contractors: 300,000 acre-feet (state proposal)
 - Arizona contractors: 300,000 acre-feet (state proposal)
 - United States: 100,000 acre-feet (maximum volume of federally-banked ICS that could be recovered each year for environmental use, including MSCP, at Mead elevations above 1075 feet) (10 years worth of recovery)
 - Mexico: 400,000 acre-feet (enough to provide for unlikely confluence of 250,000 acre-feet flood flow plus significant non-environmental use in one year)
 - All other: 100,000 acre-feet (enough to implement restoration in the limitrophe reach, plus water available for additional projects).
- During Conservation Conditions, the federal government is required to acquire ICS from U.S. and/or Mexican users pursuant to shortage guidelines in volumes of 400,000, 500,000, and 600,000 acre-feet (see II.A, above).

D. Interim Surplus Guidelines for deliveries/releases from Lake Mead and all other operation criteria

CBS II does not address the Interim Surplus Guidelines or other operating criteria. However, for the purpose of highlighting the differences between CBS II and the Basin States' alternative in Reclamation's modeling exercise, all other river operation criteria, including operation of the Interim Surplus Guidelines, would be the same as proposed in the Basin States Alternative.

III. Rationale for Conservation Before Shortage II

Conservation Before Shortage II is founded on the principle that the Secretary should take greater responsibility to operate the Colorado River in a manner that minimizes shortages in the Lower Basin and avoids the risk of curtailment in the Upper Basin through conservation, more efficient reservoir operations, and increased flexibility in the management of river resources, while protecting or enhancing environmental values associated with the Colorado River. Three elements of CBS II highlight this principle:

- (1) voluntary, market-based water conservation as an alternative to and mitigation mechanism against involuntary, uncompensated shortages on the Lower Colorado River;
- (2) voluntary, market-based mechanisms to protect or enhance flow dependent environmental values, in close alignment with applying such mechanisms to mitigate against involuntary, uncompensated shortages; and
- (3) potential expansion of ICS programs (pending appropriate diplomatic consultations) to include water users in Mexico and to improve the management of Colorado River water supplies in both countries.

A. Voluntary, Market-Based Conservation as an Alternative to Involuntary Shortage

As discussed in the original Conservation Before Shortage proposal (see Attachment A), we believe that there are significant potential advantages to the use of voluntary, market-based conservation as an alternative to and as a means of mitigating against involuntary shortages.

- Based on extensive modeling performed for the Lower Basin states, reductions of 400,000, 500,000 and 600,000 acre-feet at Lake Mead elevations 1075 feet, 1050 feet and 1025 feet, respectively, appear to provide optimal results in preventing larger involuntary shortages that perform better than the 200,000, 400,000, and 600,000 acre-foot reductions proposed in the original CBS proposal.
- It is desirable to protect the elevation of Lake Mead at no less than 1000 feet under any condition to protect Southern Nevada Water Authority's lower intake structures, as well as the new minimum power pool if proposed low-pressure turbines are installed at Hoover Dam.
- It is preferable for Lower Basin water users to voluntarily engage in predictable, small-scale reductions in use – and receive compensation for those reductions – rather than face large-scale, involuntary and uncompensated disruptions in water deliveries that could cut into municipal and agricultural water supplies and create unmitigated economic impacts.
- There is a large volume of Colorado River water which could be temporarily conserved through voluntary, market-based mechanisms such as part-year fallowing or forbearance agreements, dry year options, or other similar arrangements to reduce Lower Basin

consumptive use on an occasional, temporary basis as an alternative to involuntary shortages to low-priority users.³

- Users of Colorado River water in Mexico may wish to participate in short-term, voluntary and compensated conservation agreements, to reduce the probability of larger, uncompensated future reductions due to a declaration of shortage under the 1944 Treaty with Mexico.⁴

The ICS program suggested in the Basin States' proposal will likely result in the identification of numerous opportunities for extraordinary conservation activities that could be used to accomplish reductions in water use in the Lower Basin. These mechanisms could not be utilized by other water users when the elevation of Lake Mead is at or below 1075 feet, creating a readily available supply of ICS credit-eligible water that could instead be utilized by the federal government as a means of temporarily reducing water use on a voluntary, compensated basis.

CBS II would also create an obvious means of implementing a significant portion of the federal government's bypass flow replacement obligation. The recently published report led by the Central Arizona Water Conservancy District "Balancing Water Needs on the Lower Colorado River: Recommendations of the Yuma Desalting Plant/Cienega de Santa Clara Workgroup," includes recognition that replacement of the MODE bypass flow is primarily necessary during shortage conditions to ensure that accumulated system water deficits resulting from the bypass flow do not result in shortages to Lower Basin users. One of the primary recommendations in the report is the creation of a "shortage alleviation trust fund" which would be used, in combination with fallowing programs or other conservation mechanisms, to provide replacement water to compensate for accumulated bypass flow deficits during shortage conditions. The recommendations of the workgroup have been widely circulated among Lower Basin water users and have received significant support among both water users, water managers, and environmental interests.

Use of the ICS mechanism by the federal government when Lake Mead elevation is at or below 1075 feet would provide an ideal means of implementing this recommendation of the YDP/Cienega de Santa Clara workgroup. ICS credits that the federal government would be required to purchase when Lake Mead elevation is at or below 1075 feet could be retired for the benefit of the system to the extent necessary to eliminate any accumulated bypass flow replacement deficit; only after this deficit is extinguished would ICS credits accrue to the federal government for other uses.

³ Some 4.5 million acre-feet of Colorado River water are used to irrigate crops in the Lower Basin states, and more than 1 million acre-feet are used to irrigate crops in Mexico. Conservation of between 400,000 and 600,000 acre-feet through the use of part-year fallowing programs, dry year options, or other similar arrangements would constitute only 7-11% of total Lower Basin agricultural use in the United States and Mexico. (However, as even small-scale reductions in agricultural water use may have third-party impacts, provision should be made to support community economic development in affected areas.) Conversely, even under the Basin States' tiered shortage proposal, involuntary shortages could have significant economic consequences, disrupting water banking plans in Arizona and cutting low-priority municipal and agricultural use in the U.S. and Mexico (resulting in unpredictable loss of farm income, economic disruptions from municipal shortfalls, or requiring expensive municipal conservation efforts or efforts to secure agricultural water to support hardened municipal demand).

⁴ Such an agreement would likely require a new Minute to the 1944 Treaty with Mexico. Fallowing agreements in Mexico would have to be administered by the appropriate authorities.

B. Voluntary, Market-Based Conservation to Protect or Enhance Environmental Flows.

This proposal suggests two mechanisms for protecting and enhancing environmental flows in close alignment with the mechanisms to mitigate involuntary and uncompensated shortages, although other mechanisms may also be appropriate for consideration. First, extending the ICS program to include a broader range of participants than current Colorado River contractors provides an opportunity to ensure that some portion of the water developed via extraordinary conservation activities could be dedicated to environmental uses, via the participation of interested parties (such as conservation organizations) in ICS creation. There are several proposed restoration efforts in the United States – such as a restoration proposal for the limitrophe reach of the Colorado River – which could potentially benefit from access to ICS water supplies during normal conditions.

Second, direct participation of the federal government in the ICS program could be an excellent mechanism for purchasing water for environmental purposes or other public benefit uses by the federal government. Although these credits would only be available for use when the elevation of Lake Mead is greater than 1075 feet, they could be used to provide “bridge” supplies for restoration projects, run pilot restoration projects, or meet other interim water supply needs.

C. ICS for Mexico

As discussed in detail in a draft proposal entitled *Taking ICS to Mexico: International Opportunities in the Seven States Agreement* (see Attachment B), ICS credits could be used to firm urban water supplies in both countries, implement long-studied environmental restoration projects in the Colorado River 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. In addition, during shortage conditions, extension of the ICS program to include Mexico would expand the pool of participants who could provide voluntary, compensated reductions in water use as an alternative to involuntary shortages in the United States.

An extension of the ICS program to include Mexico would likely require the adoption of a new Minute to the Treaty of 1944, and would obviously require diplomatic discussions and negotiations likely to occur in a different venue than Reclamation’s domestic process to develop Shortage Guidelines. However, we strongly suggest that the current federal process should leave the door open to the eventual approval of a binational extension of the ICS program, to limit the costs of future review of such a program and encourage the initiation of binational discussions about such a program. Since critical elements of the Basin States’ proposal – most notably the proposed shortage policy and proposed policies for 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

IV. Additional Issues

To characterize the impact that these concepts would have on river management outcomes, we have attempted to minimize the differences (and thus the number of modeling variables at play) between CBS II and the Basin States' proposal. While we do not necessarily agree with or endorse all of the approaches suggested in the Basin States' proposal, we have not attempted to alter many of its basic elements, including the proposed modification and extension of the Interim Surplus Guidelines, new conjunctive management of Lakes Mead and Powell, or the imposition of Shortage Criteria only through 2026. However, CBS II incorporates these elements of the Basin States' proposal for comparative and analytical purposes only.

We do not assume the various proposals under consideration, including CBS II and the Basin States' proposals, are consistent with the existing law. Reclamation should clarify, during the environmental review process, how or whether these proposals would function within existing laws.