

SUBMIT OPTION SUBMITTAL FORM BY:

1. EMAIL TO: COLORADORIVERBASINSTUDY@USBR.GOV

2. U.S. MAIL TO: BUREAU OF RECLAMATION, ATTENTION MS. PAM ADAMS, LC-2721, P.O. BOX 61470, BOULDER CITY, NV 89006-1470

3. FACSIMILE TO: 702-293-8418

Option Submittal Form

Contact Information (optional):

Keep my contact information private.

Contact Name: _____	Title: _____
Affiliation: _____	
Address: _____	
Telephone: _____	E-mail Address: _____

Date Option Submitted: 2/27/2012

Option Name:

Water Reuse in Arizona

Description of Option:

Approximately _____ AFY of Colorado River water is diverted for municipal use in Central and Southern Arizona through the Central Arizona Project. By the year 2060, approximately 250,000 to 300,000 AFY will be available for reuse.
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Location: Describe location(s) where option could be implemented and other areas that the option would affect, if applicable. Attach a map, if applicable.

Arizona

Quantity and Timing: Roughly quantify the range of the potential amount of water that the option could provide over the next 50 years and in what timeframe that amount could be available. If option could be implemented in phases, include quantity estimates associated with each phase. If known, specify any important seasonal (e.g., more water could be available in winter) and/or frequency (e.g., more water could likely be available during above-average hydrologic years) considerations. If known, describe any key assumptions made in order to quantify the potential amount.

By the year 2060, approximately 250,000 to 300,000 AFY will be available for reuse.

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Additional Information

Technical Feasibility: Describe the maturity and feasibility of the concept/technology being proposed, and what research and/or technological development might first be needed.

Increased reuse of municipal wastewater would have to be accomplished by exchange with agricultural water users in the area, by use for irrigation of area parks and golf courses, by recharge of aquifers serving as sources for water supply, or by return of highly treated wastewater into the reservoirs serving as sources of water supply to the regional municipalities. Although extensive studies and permitting may be required, all of these options are technically feasible.

Costs: Provide cost and funding information, if available, including capital, operations, maintenance, repair, replacement, and any other costs and sources of funds (e.g., public, private, or both public and private). Identify what is and is not included in the provided cost numbers and provide references used for cost justification. Methodologies for calculating unit costs (e.g., \$/acre-foot or \$/million gallons) vary widely; therefore, do not provide unit costs without also providing the assumed capital and annual costs for the option, and the methodology used to calculate unit costs.

The technical memorandum on water reuse prepared for the earlier augmentation study for the Colorado River system estimated costs at \$900 to \$1700 per acre foot in 2007 dollars.

Permitting: List the permits and/or approvals required and status of any permits and/or approvals received.

Various permits will be required depending on the type of reuse. For agricultural reuse, the permitting will be relatively straightforward. For irrigation of area parks and golf courses, permitting should also be relatively straightforward as these activities are already being practiced. For indirect potable reuse through aquifer storage and recovery, the permitting process should be relatively straightforward as this practice is widely used in Arizona. For discharge to water supply reservoirs, an extensive permitting process may be required.

Legal / Public Policy Considerations: Describe legal/public policy considerations associated with the option. Describe any agreements necessary for implementation and any potential water rights issues, if known.

The major legal considerations relate to the water rights exchanges that might be required depending on the type of reuse. The major public policy considerations relate to acceptance of indirect potable reuse of wastewater, if that is the option pursued.

Implementation Risk / Uncertainty: Describe any aspects of the option that involves risk or uncertainty related to implementing the option.

Primary implementation risks and uncertainty relate to water rights exchanges required for agricultural reuse and the permitting required for indirect potable reuse.

Reliability: Describe the anticipated reliability of the option and any known risks to supply or demand, such as: drought risk, water contamination risk, risk of infrastructure failure, etc.

The quantity of municipal wastewater should be reliably available.

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Water Quality: Identify key water quality implications (salinity and other constituents) associated with the option in all of the locations the option may affect.

The quality of the water obtained for municipal supply in Central and Southern Arizona is generally good, although both the imported Colorado River water and local groundwater supplies have somewhat elevated mineral content. Reuse of the wastewater will result in an increase in the mineral content of the reused water.

Energy Needs: Describe, and quantify if known, the energy needs associated with the option. Include any energy required to obtain, treat, and deliver the water to the defined location at the defined quality.

Energy Required	Source(s) of Energy
Depending on permitting requirements, additional membrane treatment of the municipal wastewater may be required prior to reuse. However, these additional energy requirements would be partially offset by the energy saved by avoiding pumping Central Arizona Project water over large distances.	

Hydroelectric Energy Generation: Describe, and quantify if known, any anticipated increases or decreases in hydroelectric energy generation as a result of the option.

Location of Generation	Impact to Generation
	No major impact.

Recreation: Describe any anticipated positive or negative effects on recreation.

Location(s)	Anticipate Benefits or Impacts
	To the extent that the water reuse allows flow to remain in the Colorado River rather than be diverted into the Central Arizona Project, water left in the Colorado River system would enhance river flows and reservoir levels, thereby enhancing recreation.

Environment: Describe any anticipated positive or negative effects on ecosystems within or outside of the Colorado River Basin.

Location(s)	Anticipated Benefits or Impacts
	Major considerations are increased emissions associated with power production for potential membrane treatment that is offset by reduced power needs for pumping diversions. Any potential habitat impacts would have to be evaluated.

Socioeconomics: Describe anticipated positive or negative socioeconomic (social and economic factors) effects.

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No major effects.

Other Information: Provide other information as appropriate, including potential secondary benefits or considerations. Attach supporting documentation or references, if applicable.