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: February 18, 2012

Option Name:

Water reuse in Wyoming

Description of Option:

Interbasin diversions operated by Cheyenne total about 8,000 AFY. Assuming 50% of that amount is returned to the system via wastewater, 4,000 AFY could be available for reuse. Currently, Cheyenne uses about 2,000 AFY for irrigation of golf courses and parks. Therefore, 2,000 AFY of additional reuse water may be available.

Location: Describe location(s) where option could be implemented and other areas that the option would affect, if applicable. Attach a map, if applicable.

Increased reuse of municipal wastewater in the vicinity of Cheyenne, Wyoming, allowing Cheyenne to use that water to meet future demands or possibly to reduce diversions from the Colorado River basin.

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.

Water rights in this region are extreme complex. It is possible that 2,000 AFY could be reliably available if water rights allow the reuse of the water.

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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 artificial recharge into the municipal wellfield, or by return of highly treated wastewater into the reservoirs serving as sources of water supply to the City. Although extensive studies and permitting would 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 indirect potable reuse through aquifer storage and recovery or discharge to water supply reservoirs, an extensive permitting process will 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. Another consideration is that the extensive capital infrastructure used for the interbasin diversion from the Little Snake River would not be as fully utilized.

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. The quantity may decline if there is increased use of water saving appliances and the population of Cheyenne doesn't grow. However, both of these factors reduce the total quantity of water supply needed for the City and reduce the need for imported water.

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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 Cheyenne by importation from the Little Snake River or locally from Crow Creek or wells is quite good. Reuse of the wastewater will result in an increase in the mineral content of the reused water, but the TDS should remain well within secondary drinking water standards.

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 largely offset by the energy saved by avoiding pumping Little Snake River water over large distances and several mountain ranges.	

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
	The water left in the Colorado River system would generate hydropower at Lake Powell and Lake Mead.

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

Location(s)	Anticipate Benefits or Impacts
	The water left in the Colorado River system would enhance river flows and reservoir levels, thereby enhancing recreation. However, the water no longer diverted would result in somewhat lower levels in Hog Park, Seminoe, Rob Roy, Granite Spring, and Crystal Reservoirs.

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 interbasin diversions.

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	Any potential habitat impacts would have to be evaluated.

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

No major effects

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