

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: _____

Option Name:

Water Imports Using Ocean Routes - Icebergs

Description of Option:

This option involves towing an iceberg wrapped in some type of plastic to California and capturing the meltwater. System features for this option would include a land-based or offshore facility to dock the iceberg and capture the meltwater.
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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.

Icebergs would most likely be towed from the Arctic.
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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.

The total amount of water available in the form of icebergs has not been quantified. A small iceberg contains from 250 to 850 AF of 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.

The concept of towing icebergs has been around for a long time, and a considerable amount of study has been devoted to the feasibility of towing and using icebergs as a water source. As recently as May 2006, there were reports that Thames Water was considering towing icebergs from the Arctic to help alleviate drought conditions. The major problems identified with this concept include the need to wrap icebergs to avoid losing most of the water during transport and energy cost associated with transport. To date, this concept has not been demonstrated to be 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 cost information for towing icebergs has not been developed.

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

The permits required for towing icebergs would depend on the place of origin.

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.

Not assessed

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

The primary technical issues of towing icebergs are wrapping the iceberg to reduce water loss and fuel consumption by the vessels towing them.

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.

Not assessed

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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.

Iceberg water is considered to be extremely pure and free of pollutants. A Canadian company manufactures vodka using iceberg 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
A concern is the energy consumption required to transport the water. Fuel cost are a major expense for the iceberg option.	Probably diesel fuel for the towing vessels

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 Effect

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

Location(s)	Anticipate Benefits or Impacts
	No Effect

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

Location(s)	Anticipated Benefits or Impacts
	Primary concern is increased air emissions from towing vessels.

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

No Effect

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

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