

**SUBMIT OPTION SUBMITTAL FORM BY:**

1. EMAIL TO: [COLORADORIVERBASINSTUDY@USBR.GOV](mailto: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: 2-1-12

**Option Name:**

Understanding and reducing the energy industry's consumption of Colorado River basin water.

**Description of Option:**

The energy industry is evolving rapidly across the West. Investments made by this industry will have significant implications for future water use. We offer the following recommendations to understand and reduce the amount of Colorado River water used by the energy industry and to reduce related impacts on the environment and other water users.

1. Renewable energy investments are growing rapidly. Some renewable energy sources (e.g. thermoelectric solar) can require significant amounts of water. However, different solar technologies have different water requirements. For example, photovoltaic projects have very low water use. Dry-cooled thermoelectric solar can require some "make up" water for boiler systems and water to wash heliostats. By contrast, wet-cooled thermoelectric solar has dramatically greater water requirements. We recommend that basin states establish a priority for dry-cooled solar thermoelectric projects and solar PV. In particular, we recommend that basin states consider adopting the California Energy Commission's policy (32 California Energy Commission, *Preliminary Staff Assessment, Beacon Solar Energy Project, Application For Certification (08-AFC-2), Kern County* (Posted April 1, 2009), p. 4.9-5. ), which represents a de facto prohibition on wet cooling for solar facilities in California's desert regions, except in very limited circumstances. Such policies would encourage renewable investment in less water intensive technologies, producing significant water savings.
2. We recommend that state and federal regulators require the operators of oil and gas drilling operations to submit a plan for cumulative water use over the life of the project. The plan should take into account other activities that will draw water from the same sources, such as agricultural or industrial activities; seasonal and longer timescale variations in water availability; and historical drought information. Elements of the plan should include but are not limited to:
  - The anticipated source, timing, and volume of withdrawals and intended use, over the life of the project.
  - Potential impacts on other water users.
  - A description of methods the operator will use to maximize the use of non-potable water sources including reuse and recycling of wastewater.
  - An evaluation of potential adverse impacts to aquatic species and habitat, surface water, groundwater, and wetlands.
3. The Bureau of Reclamation should complete, as a part of the Basin Study, an estimate of potential total water use by the oil shale industry, based on a range of assumed levels of future development. This effort should include an analysis of the potential impacts of such water use on other water users and on aquatic resources, particularly in light of the Bureau's current projections of possible future water shortages.

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

**SUBMIT OPTION SUBMITTAL FORM BY:**

1. EMAIL TO: [COLORADORIVERBASINSTUDY@USBR.GOV](mailto: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

**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.

At this time, it is not possible to calculate exactly how much water use could be avoided by all of these recommendations. However, NRDC's report *Between a Rock and a Dry Place* (<http://www.nrdc.org/water/files/oilshalecobasin.pdf>) concluded that avoiding oil shale development in the Colorado River Basin could save 360,000 acre-feet of water per year, or more.

**SUBMIT OPTION SUBMITTAL FORM BY:**

1. EMAIL TO: [COLORADORIVERBASINSTUDY@USBR.GOV](mailto: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

---

## 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.

Solar technologies with lower water levels of water use are well developed.

**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.

By increasing our understanding of the current and potential water impacts of energy development, and by encouraging investment in renewable energy technologies with low water use, these recommendations would produce cost-effective savings. These savings should be contrasted with an alternative approach – such as the development of water intensive energy technologies that will impose additional shortages and costs on other water users.

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

**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.

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

**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.

**SUBMIT OPTION SUBMITTAL FORM BY:**

1. EMAIL TO: [COLORADORIVERBASINSTUDY@USBR.GOV](mailto: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

---

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

--

**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

**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

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

Location(s)	Anticipate Benefits or Impacts

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

Location(s)	Anticipated Benefits or Impacts

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

--

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

**SUBMIT OPTION SUBMITTAL FORM BY:**

1. EMAIL TO: [COLORADORIVERBASINSTUDY@USBR.GOV](mailto: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

--