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**U.S. House of Representatives**  
**Committee on Natural Resources**  
**Washington, DC 20515**

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DEMOCRATIC STAFF DIRECTOR

August 13, 2012

The Honorable Gene L. Dodaro  
Comptroller General of the United States  
U.S. Government Accountability Office  
441 G Street NW  
Washington, DC 20548

Dear Mr. Dodaro:

Water and energy are two fundamental, inextricably linked building blocks of the U.S. economy. Large amounts of water are consumed in generating thermoelectric power and in extracting oil, gas, uranium and coal. At the same time, large amounts of energy are used in extracting, treating and distributing water. Thus, shortages in water could cause shortages in energy, and vice versa. As America's population grows and the climate changes, we will have to make more efficient use of water and possibly develop new water supplies.

Currently, 52 percent of the country is experiencing moderate to exceptional drought conditions.<sup>1</sup> These conditions have forced state officials to make difficult choices involving energy and water. One local regulator in Pennsylvania suspended 64 permits to withdraw water from streams and other sources for extraction purposes, including for heavy drilling in northeastern Pennsylvania's patch of the Marcellus Shale reservoir.<sup>2</sup> Droughts like this will only become more frequent and severe in coming years, according to a recent report from the Intergovernmental Panel on Climate Change (IPCC).<sup>3</sup> Increasingly, energy production may have to compete for water needed for other purposes, including drinking water and agriculture.

Available and developing technologies have the potential to significantly reduce water use for all of these purposes. Several oil and gas companies are developing techniques that reduce their water use and address potential drinking water contamination. Gas turbines could reduce water use in power generation by as much as

<sup>1</sup> The U.S. Drought Monitor as of August 7, 2012, available at <http://droughtmonitor.unl.edu/>

<sup>2</sup> E&E News, "Drought conditions strain driller's water use in major Pa. watershed," 19 July 2012

<sup>3</sup> Intergovernmental Panel on Climate Change, "Managing the Risk of Extreme Events and Disasters to Advance Climate Change Adaptation," 2012.

60 percent compared to conventional steam turbines, and dry cooling systems could cut water consumption by up to 10 percent compared to wet circulation cooling. Similarly, communities and water districts across the country are working on ways to reuse and recycle water for agricultural and municipal use.

Since 2009, GAO has issued five reports examining the interdependencies of energy production and water use.<sup>4</sup> In these reports, GAO has shown that a considerable amount of water is used to cool thermoelectric power plants, grow feedstock and convert them into biofuels, and extract oil and natural gas—especially from oil shale formations in Colorado and Utah, where water scarcity is a significant problem. An assessment of technologies available to reduce water use would complement this previous work and help guide future policy action to address the energy-water challenge.

Because energy security and the availability of water are critical elements of U.S. national and economic security, I request that GAO's Center for Science, Technology, and Engineering conduct an assessment of available and developing technologies that could reduce water use and water scarcity. Specifically, I request that you assess:

1. Technologies to reduce fresh water consumption and employ alternative water sources in thermoelectric power plants;
2. Technologies to reduce fresh water consumption and prevent or address water contamination in drilling and mining activities, such as commercial oil and shale-gas development and uranium mining;
3. Technologies to improve the efficiency of drinking water and waste water processes;
4. Technologies to reduce the impact of agriculture on water resources;
5. Technologies to provide new fresh water supplies through approaches such as desalination that converts sea water and brackish water into new sources of fresh water for power generation or human consumption;
6. Locations in the United States facing water scarcity problems that would benefit most from such available and developing technologies. This includes assessing (1) the amount of water currently being used in such locations for

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<sup>4</sup>GAO, *Energy-Water Nexus: Information on the Quantity, Quality, and Management of Water Produced during Oil and Gas Production*, GAO-12-156 (Washington, D.C.: Jan 9, 2012); *Energy-Water Nexus: Amount of Energy Needed to Supply, Use, and Treat Water Is Location-Specific and Can Be Reduced by Certain Technologies and Approaches*, GAO-11-225 (Washington, D.C.: Mar. 23, 2011); *Energy-Water Nexus: A Better and Coordinated Understanding of Water Resources Could Help Mitigate the Impacts of Potential Oil Shale Development*, GAO-11-35 (Washington, D.C.: Oct. 29, 2010); *Energy-Water Nexus: Many Uncertainties Remain about National and Regional Effects of Increased Biofuel Production on Water Resources*, GAO-10-116 (Washington, D.C.: Nov. 30, 2009); and *Energy-Water Nexus: Improvements to Federal Water Use Data Would Increase Understanding of Trends in Power Plant Water Use*, GAO-10-23 (Washington, D.C.: Oct. 16, 2009).

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thermoelectric power plants, drilling and mining, drinking water and waste water, and agriculture; and (2) the amount of water that could be saved by adopting available or developing technologies in each of these areas.

Thank you for your consideration of this request. Given the importance of both energy and water to the United States' future economic security and prosperity, such an assessment will inform the Congress in its policy deliberations and assist in formulating an appropriate long-term national vision and strategy. Please contact Reece Rushing or Camille Calimlim Touton of the Natural Resources Committee, at 202-225-6065 to discuss in detail the specific scope of work and timeline for completion.

Sincerely,

A handwritten signature in blue ink that reads "Edward J. Markey". The signature is written in a cursive style with a large, stylized "M".

Edward J. Markey