

**DEVELOPMENT OF AN URBAN WATER CONSERVATION  
REGULATORY PROGRAM**

August 22, 2008

**Proposal Description**

The State Water Resources Control Board (State Water Board) is considering development of an urban water conservation regulatory program. This activity is intended to contribute to an overall objective as stated in the Bay-Delta Workplan of achieving a 20 percent reduction in per capita water use statewide by 2020.

The State Water Board adopted the *Strategic Workplan for Activities in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary* (Bay-Delta Workplan) on July 16, 2008. Among many elements, the Bay-Delta Workplan contains proposed actions to address water use efficiency for urban and agricultural water users. The actions include an assessment of whether any or all of the 14 Best Management Practices (BMPs) identified in the California Urban Water Conservation Council (CUWCC) Memorandum of Understanding should be mandated through a regulatory program. A public workshop is scheduled to seek public input regarding whether the State Water Board should adopt an urban water conservation regulatory program and, if so, the nature and scope of such program. This discussion paper is intended as a basis for the public workshop and comments.

As used in this document, “water conservation” means those practices, techniques, and technologies that will reduce the consumption of water, reduce the loss or waste of water, or improve the efficiency of the use of water. These measures are also often referred to as demand management.

**Background**

The primary benefit of improving water use efficiency is the lowering of demand and the ability to cost-effectively stretch existing water supplies. Conservation can result in saving considerable capital and operating costs for utilities and consumers. With the increased concern over climate change, energy savings resulting from conservation take on particular importance. Consumers save energy when appliances use hot water more efficiently. Water utilities save energy through reduced pumping from the source of water supply to the consumer’s water tap and reduced chemical use in water treatment. Water conservation may also benefit the environment by reducing urban runoff that carries pollutants and by allowing water to be reserved for environmental purposes.

Once viewed and invoked primarily as a temporary source of water supply in response to drought or emergency water shortage situations, water use efficiency and conservation approaches have become a viable long-term supply option. Reduced water demands will free up water in normal and wet years. Saved water can be carried over to another time if a supplier has surface or groundwater storage, or stores water by agreement with an agency that maintains a groundwater bank and returns it for use during drought years.

Translating water use efficiency savings into specific water supply reliability benefits will depend on the water system involved, the level of savings, and the variations in water savings from one year to the next and throughout the year (Reference 1).

In 2000, California cities and suburbs used about 8.7 million acre-feet of water (Reference 1). Demand and competition for California's limited water supplies will increase as our population continues to grow and climate change impacts occur. The state's population, 34 million in 2000, will increase to about 50 million by 2030 (Reference 1). Urban water demand is expected to grow within a range of 1.4 and 5.8 million acre-feet per year by 2030, depending on factors of population, economic activity, and water use efficiency (Reference 1). Over the past century, California has met much of its increasing water needs through a network of water storage and conveyance facilities, groundwater development, and more recently, by water use efficiency, including water conservation and recycling of treated wastewater.

The California Water Plan Update 2005 identified urban water conservation as one of the key water resource management strategies with the most potential for meeting the state's future water demands. By the year 2030 the range of potential statewide conservation savings is 1.2 to 3.1 million acre-feet per year <sup>1</sup> (Reference 1). California urban per capita water use ranges from 84 to 551 gallons per day (Reference 2). While there are many reasons for such a range, inefficient water use is certainly one factor.

Efficient water use has special significance for the Sacramento-San Joaquin River Delta (Delta). The Delta and its tributary streams are the source of water for much of the State. The Bay-Delta watershed provides a portion of drinking water to 25 million people in the Bay Area, Central Valley, and Southern California. It also provides water to over 3.7 million acres of irrigated farmland. Depending on rainfall conditions, water projects in the Delta can divert anywhere from 20 percent to over 70 percent of the natural flow (Reference 3). Diversions from the Delta and its tributary streams reduce flows and alter natural flow regimes within the Delta, which can cause harmful ecological effects.

Several major water projects export water from within the Delta or from upstream watersheds, including: the Central Valley Project, the State Water Project, the San Francisco Hetch Hetchy water system, and the East Bay Municipal Utility District Mokelumne River water system. Other water projects result in consumptive losses and reduced flows within many reaches of streams. How the water from these projects is used and reused can have a direct link to diversions from the Delta. Water conservation within the regions served by water from the Delta can result in additional water made available to meet other beneficial uses.

Urban suppliers play a significant role in educating and providing incentives for customers to conserve. In 1991, urban suppliers, public advocacy groups and others formed CUWCC and signed the "Memorandum of Understanding Regarding Urban Water Conservation in California" (MOU). CUWCC was created to increase efficient water use statewide through partnerships among urban water agencies, public interest organizations, and private entities. CUWCC's goal is to integrate urban water conservation BMPs into the planning and management of California's water resources. The MOU defines 14 BMPs that signatories agree to implement, as shown in Table 1. Currently, 225 urban water suppliers representing about 75 percent of the State's urban water supply have subscribed to 14 BMPs defined in the MOU (References 4, 5, and 6).

---

<sup>1</sup> Six levels of water conservation were projected based on different levels of local implementation and state and federal funding. Within the range of potential water savings, the more feasible upper limit was about 2.0 million acre-feet per year.

MOU signatories agree to implement these measures but are allowed exemptions under certain conditions or when they can demonstrate they have implemented alternative methods of compliance with the BMPs that would be equally effective.

California Water Code sections 10620-10621 require urban water suppliers to prepare and adopt urban water management plans and to update those plans every five years. These BMPs and their implementation must be considered and evaluated in the urban water management plans. (Wat. Code, § 10631, subd. (f).)

The August 2006 CALFED report contains a detailed analysis of urban water suppliers' BMP implementation (Reference 7). For the period through 2002, 50 percent or more of the MOU signatories were not implementing 9 of the 14 BMPs. BMPs requiring significant customer interaction and water supplier financial commitments (BMPs 1, 2, 5, 9, and 14) were the least implemented (less than 10%). Because of concern by signatories that some BMPs are outdated or not as effective as other options, CUWCC formed BMP Revision Committees to develop or update implementation, criteria, coverage and documentation language for proposed revisions to the MOU. CUWCC is expected to complete the MOU revision process by the end of 2008.

The California Constitution, article X, section 2, and Water Code section 100 prohibit the waste, unreasonable use, unreasonable method of use, and unreasonable method of diversion of water. The State Water Board has broad authority under these provisions and under Water Code section 275, which directs the State Water Board to "take all appropriate proceedings or actions" to prevent waste or violation of the reasonable use standard. The State Water Board can exercise its broad authority where the implementation of water conservation measures would prevent waste and unreasonable use.

The State Water Board could undertake either quasi-legislative or adjudicative proceedings to exercise its authority to prevent the waste and unreasonable use of water. For example, the State Water Board could adopt regulations mandating compliance either with performance-based water conservation standards or with specific prescriptive water conservation management practices. Alternatively, the State Water Board could conduct adjudicative proceedings to consider whether to place specific water conservation conditions in water right permits and licenses. Lastly, the State Water Board could limit its activities to taking individual enforcement action against urban water suppliers suspected of wasting water. Some combination of these three alternatives is also possible.

### **Potential Water Conservation Actions**

Because water conservation offers significant potential to assist the state in meeting its growing water needs and reducing green house gas emissions contributing to climate change, Governor Schwarzenegger, on February 28, 2008, established a goal to achieve a 20 percent reduction in per capita water use statewide by 2020 (Reference 8). There are a number of water conservation measures in common practice and generally accepted as effective. One of the most effective water conservation measures is BMP 4, the installation of water meters and the billing of water according to the amount of water used. (See Wat. Code, § 521, subd. (b) [legislative finding that water metering and volumetric pricing are among the most efficient water conservation tools].) Since 1992, water purveyors must require, as a condition of new water service, that water meters be installed on water service facilities, with minor exceptions (Wat. Code, §§ 525 et seq.). In general, urban water suppliers must install water meters on all municipal and industrial service connections by January 1, 2025.

Table 1. California Urban Water Conservation Council MOU Best Management Practices  
(Last amended June 13, 2007)

#	BMP	Requirements
1	<b>Water Survey Programs for Single and Multi Family Residential Customers</b>	Survey 15% of residential single-family and 15% of multi-family customers within 10 years.
2	<b>Residential Plumbing Retrofit</b>	Retrofit 50% of residential housing constructed prior to 1992 with lowflow showerheads, toilet displacement devices, toilet flappers and aerators; or achieve 75% saturation of the water agency service area and be able to prove it statistically.
3	<b>System Water Audits, Leak Detection and Repair</b>	Audit the water utility distribution system regularly and repair any identified leaks; check yearly to see that water loss is less than 10%.
4	<b>Metering with Commodity Rates for All New Connections and Retrofit of Existing Connections</b>	Install meters in 100% of existing unmetered accounts within 10 years; bill by volume of water use; assess feasibility of installing dedicated landscape meters.
5	<b>Large Landscape Conservation Programs and Incentives</b>	Prepare water budgets for 90% of commercial and industrial accounts with dedicated landscape meters; provide irrigation surveys to 15% of mixed-metered customers.
6	<b>High-Efficiency Washing Machine Rebate Programs</b>	Provide cost-effective customer incentives, such as rebates, to encourage purchase of machines that use 40% less water per load. Number of clothes washers required is based on the total dwelling units x .048; up to a third fewer machines required if all of them are super high-efficiency (6.0 or less water factor).
7	<b>Public Information Programs</b>	Water utilities to provide active public information programs to promote and educate customers about water conservation.
8	<b>School Education Programs</b>	Provide active school education programs to educate students about water conservation and efficient water uses.
9	<b>Conservation Programs for Commercial, Industrial, and Institutional Accounts</b>	Provide a water survey of 10% of commercial, industrial, and institutional customers within 10 years and identify retrofiting options; OR reduce water use by an amount equal to 10% of the baseline use within 10 years.
10	<b>Wholesale Agency Assistance Programs</b>	Provide financial incentives to water agencies and cities to encourage implementation of water conservation programs
11	<b>Conservation Pricing</b>	Eliminate non-conserving pricing policies and adopt pricing structure such as uniform rates or inclining block rates, incentives to customers to reduce average or peak use, and surcharges to encourage conservation.
12	<b>Conservation Coordinator</b>	Designate a water agency staff member to have the responsibility to manage the water conservation programs.
13	<b>Water Waste Prohibition</b>	Adopt water waste ordinances to prohibit gutter flooding, single-pass cooling systems, non-recirculating systems in all new car wash and commercial laundry systems, and non-recycling decorative water fountains.
14	<b>Residential Ultra-Low-Flush Toilet Replacement Programs</b>	Replace older toilets for residential customers at a rate equal to that of an ordinance requiring retrofit upon resale.

Each customer that has a service connection for which a water meter has been installed will be charged based on actual volume of deliveries beginning on or before January 1, 2010. This schedule for installing meters and billing by water volume is accelerated for certain municipal and industrial service connections, and for urban water suppliers receiving water from the federal Central Valley Project.

There are several water rate structures that are based on charging according to the volume of use. Different structures have different effectiveness in encouraging water conservation. The four common structures consistent with retail conservation pricing are described below:

1. Constant or uniform volume charge: The volumetric rate (charge per unit volume of water) remains constant regardless of the quantity consumed.
2. Seasonal rate: The volumetric rate reflects seasonal variation in water delivery costs.
3. Increasing block rate (Tiered rate): The quantities of water purchased are divided into ranges (tiers or blocks). The volumetric rate for each block increases for each succeeding block purchased. This is also called inclining block rate or tiered rate (with increasing block implied).
4. Allocation-based rate: The consumption tiers and respective volumetric rates are based on water use norms and water delivery costs established by the utility.

These four pricing structures are options permitted under BMP 11 to achieve compliance. These options are usually combined with a fixed monthly charge to cover costs unrelated to volume of water delivered or to assure a minimum reliable source of revenue. The increasing block rate is considered the most aggressive in promoting water conservation. The State Water Board specifically identified increasing block rate (tiered pricing) in the Bay-Delta workplan as a BMP that should be evaluated as part of an urban water conservation regulatory program.

There are many variations of volumetric water rates. Some factors are discussed below:

1. Often a minimum "lifeline" rate is established based on a volume of water that would serve basic needs at economical cost to a household and that would provide extra incentive to reduce water use below this minimum. Some water purveyors tailor this minimum based on individual household characteristics, such as number of rooms in a house and number of occupants.
2. A factor in establishing volumetric water rates is determining the proportion of revenue to be collected from the minimum fixed charges and from the volumetric charges. One criterion that is considered consistent with conservation pricing is to collect at least 70 percent of revenue from volumetric charges. There are other criteria in use.
3. A consideration in establishing increasing block rates is what criteria to use. The highest block rate might be based on the marginal cost of new water development including other social costs, such as greenhouse gas effects. In very water-short areas, the highest block may be significantly higher than other blocks recognizing the critical need to limit water use.

The State Water Board may consider a mandated water rate structure that aggressively promotes water conservation, such as increasing block rate pricing, and other water conservation management practices. The key selection criteria will be (1) the potential for making significant water savings, (2) the ability to establish well-defined criteria for regulatory purposes, and (3) the ability of water suppliers to implement the measures.

### **Planned Water Conservation Strategies**

There are other activities that the State Water Board will be pursuing to promote water conservation in the urban and agricultural water use sectors, but these activities will not be a matter for discussion at the public workshop to consider mandating water conservation actions. These activities are described in the Bay-Delta Strategic Workplan and “Draft Strategic Plan Update 2008-2012” (References 3 and 9).

### **Key Issues and Questions**

State Water Board staff identified the following key issues and questions for public input:

1. Should the State Water Board adopt an urban water conservation regulatory program? What should be the scope and content of such a program? Will mandating urban water suppliers to implement certain practices or meet specific performance standards be beneficial for enhancing water conservation?
2. What is an appropriate definition of urban water supplier? Should it include both wholesale and retail water suppliers? One option is to use the definition of “urban water supplier” in the Urban Water Management Planning Act (Wat. Code, § 10610 et seq.), that is, a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers. (Wat. Code, § 10617.)
3. Should the regulatory program apply to all areas of the state or only to areas subject to certain criteria? Water conservation can provide consumer benefits even in areas that are not water short. Key benefits can be lower water bills and reduced energy use for water heating. However, water conservation has significantly greater importance in areas that are chronically water short or that depend on water exported from watersheds that are under environmental stress, such as the Delta. Perhaps the State Water Board’s regulatory authority should be focussed on these special areas.
4. Would a performance-based regulatory program, allowing latitude for urban water suppliers to select the practices to meet specified water use reductions, be an effective approach? In what form should the performance standards be expressed, for example, targeted reductions based on total urban per capita use or on water use sectors (residential, commercial, institutional, and industrial)?
5. Should the State Water Board adopt prescriptive urban water conservation management practices, such as the BMPs in Table 1? Would some of the BMPs in Table 1 be more appropriate for state wide implementation than others?

6. Are water pricing structures the most effective conservation measure to mandate on a state wide basis? Should particular volumetric water rate structures, such as increasing block rate, be specified? What criteria should be considered in defining a rate structure? What should the rate structure look like?
7. What data are available to support mandating particular water conservation practices and estimating the potential water savings associated with those measures?

## References

1. California Department of Water Resources, [California Water Plan Update 2005: A Framework for Action](#), Bulletin 160-05, Sacramento, December 2005.  
<<http://www.waterplan.water.ca.gov/previous/cwpu2005/index.cfm>>
2. Brown, Chris, California Urban Water Conservation Council, data handout provided at state agency meeting on March 27, 2008.
3. California State Water Resources Control Board, [Strategic Workplan for Activities in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary](#), July 16, 2008.  
<[http://www.waterrights.ca.gov/baydelta/strategic\\_workplan.htm](http://www.waterrights.ca.gov/baydelta/strategic_workplan.htm)>
4. [California Urban Water Conservation Council, Annual Report 2006](#), Sacramento.  
<[http://www.cuwcc.com/annual\\_reports.lasso](http://www.cuwcc.com/annual_reports.lasso)>
5. Rogers, Melinda, California Urban Water Conservation Council, personal e-mail to Rich Mills, July 17, 2008.
6. California Urban Water Conservation Council, "[Memorandum of Understanding Regarding Urban Water Conservation in California](#)," as amended June 13, 2007.  
<<http://www.cuwcc.com/memorandum.lasso>>
7. CALFED, [Water Use Efficiency Comprehensive Evaluation: CALFED Bay-Delta Program Water Use Efficiency Element](#), August 2006.  
<[http://www.calwater.ca.gov/content/Documents/library/WUE/2006\\_WUE\\_Public\\_Final.pdf](http://www.calwater.ca.gov/content/Documents/library/WUE/2006_WUE_Public_Final.pdf)>
8. Schwarzenegger, Arnold, California State Governor, [Letter to California State Senate](#), February 28, 2008.  
<[http://www.waterboards.ca.gov/water\\_issues/hot\\_topics/20x2020/docs/govltr\\_to\\_legislature022808.pdf](http://www.waterboards.ca.gov/water_issues/hot_topics/20x2020/docs/govltr_to_legislature022808.pdf)>
9. California State Water Resources Control Board, [Strategic Plan Update 2008-2012, Draft](#), May 30, 2008.  
<[http://www.waterboards.ca.gov/water\\_issues/hot\\_topics/strategic\\_plan/2007update.shtml](http://www.waterboards.ca.gov/water_issues/hot_topics/strategic_plan/2007update.shtml)>