

- **Board of Directors**  
**Water Planning and Stewardship Committee**

March 11, 2008 Board Meeting

---

**9-2**

---

**Subject**

Review of Metropolitan's Water Use Efficiency Effort and Future Opportunities

---

**Description**

In accordance with water resource targets set in the 2004 Integrated Water Resources Plan Update, Metropolitan staff is advancing and executing its Water Use Efficiency (WUE) efforts. The goal is to increase conservation, water recycling, and other local projects through significant financial investment and institutional influence. The aggressive goals of the 2004 IRP Update expects most new demands from Southern California to be met through water use efficiencies. The potential impacts of global climate change, regulatory challenges, and the upcoming IRP Update are fueling interest in new WUE potential and goals. This board letter outlines Metropolitan's current WUE effort and provides a policy review paper on potential ways to increase efficiencies through new methods.

**Detailed Report**

In partnership with the member agencies, Metropolitan promotes water use efficiency through: research and development; financial incentives; initiatives to influence consumer behavior; advancing plumbing codes and code compliance; and enhancing retail customer conservation through price (**Attachment 1**). Since 1990, Metropolitan has invested over \$205 million in conservation incentives producing 118,000 acre-feet annually and \$173 million in recycled water supplies reducing potable water demands by 98,000 acre-feet annually. In addition, Metropolitan has invested \$71 million in groundwater recovery producing 49,000 acre-feet annually. This direct financial investment has also had a positive influence on increased public awareness, customer acceptance of conservation and alternative supplies like recycled water, and legislative standards and regulatory improvements. Metropolitan's member and retail agencies fund some WUE projects and programs without Metropolitan financial assistance. In all, the region's projects and programs, including customer self-funded improvements and ongoing compliance with plumbing codes, produce over 1.1 million acre-feet annually. One tangible result of this WUE is the reduction of per capita water use in Metropolitan's service area by nearly 20 gallons per day since 1990.

The potential impacts of global climate change, regulatory challenges, and the upcoming IRP Update are giving staff the opportunity to look at new options to achieve additional water use efficiency. In the attached White Paper (**Attachment 2**), staff introduces options including:

- Local Ordinances and State Legislation
- Improved and Leveraged Incentives
- Alternative and Partnered Funding
- Increased Local and Alternative Supplies
- Improved Public Education and Communication

**Potential Next Steps**

Staff will review each of these options and will be seeking board direction. Some options, if they are to be pursued, would require new board authorizations, directives, and potentially increases in funding.

**Policy**

---

By Minute Item 37324, dated September 1988, the Board established financial incentives for water conservation and authorized funding new and emerging technologies.

By Minute Item 43747, dated October 12, 1999, the Board authorized partnerships with state and federal agencies under Metropolitan's Conservation Credits Program.

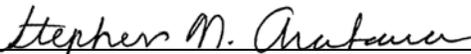
By Minute Item 43021, dated June 9, 1998, the Board adopted the Local Resources Program.

By Minute Item 47049, dated April 10, 2007 the Board authorized a new approach for the Local Resources Program.

**Fiscal Impact**

---

The estimated annual cost of the current authorized conservation program for incentives, education, and outreach is \$20 million to \$25 million per year. The current cost of the Local Resource Program is \$30 million per year and increasing as projects produce more supplies. The cost of a revised WUE program is currently unknown and would depend on future administrative and board actions.

  
\_\_\_\_\_  
Stephen N. Arakawa  
Manager, Water Resource Management

2/28/2008

Date

  
\_\_\_\_\_  
Jeffrey Kightlinger  
General Manager

2/29/2008

Date

**Attachment 1 – Metropolitan’s Existing Water Use Efficiency Summary Table**

**Attachment 2 – Metropolitan Water District of Southern California White Paper on Future Water Use Efficiency**

**Metropolitan’s Existing Water Use Efficiency Summary Table**

Metropolitan and member agency water use efficiency efforts fall into three comprehensive categories: (1) research and development programs; (2) incentive programs; and (3) consumer behavior, code compliance, and price response programs. The following table summarizes Metropolitan’s current water use efficiency programs within this framework.

<b>Component</b>	<b>Description &amp; Goal</b>	<b>Ongoing Programs &amp; Activities</b>
<p>Research &amp; Development</p>	<p>Evaluate and pilot new water use efficiency technologies and updated practices for future implementation through incentive programs, plumbing codes, local ordinances, industry standards, or behavior modification</p>	<ul style="list-style-type: none"> <li>(1) Innovative Conservation Program</li> <li>(2) Enhanced Conservation Program</li> <li>(3) Studies &amp; Database</li> <li>(4) Annual Program Review</li> <li>(5) California Urban Water Conservation Council Steering Member</li> <li>(6) WateReuse Foundation Board Member</li> </ul>
<p>Incentives</p>	<p>Encourage the installation and use of proven cost-effective water use efficiency technologies or practices with the ultimate goal of creating market transformation leading to new plumbing codes, behavioral norms, and industry standards for water conservation and recycled water</p>	<ul style="list-style-type: none"> <li>(1) Residential Conservation                             <ul style="list-style-type: none"> <li>(a) Regional Administered Incentives</li> <li>(b) Member Agency Administered (Phasing Out)</li> </ul> </li> <li>(2) Commercial, Industrial, &amp; Institutional Conservation                             <ul style="list-style-type: none"> <li>(a) Regional Administered Incentives</li> <li>(b) California Friendly Builder Program</li> <li>(c) Water Savings Performance Program</li> <li>(d) \$15 million Public Sector Program (includes recycling)</li> </ul> </li> <li>(3) Local Resources Program                             <ul style="list-style-type: none"> <li>(a) Recycled Water Incentives</li> <li>(b) Groundwater Recovery Incentives</li> </ul> </li> <li>(4) Seawater Desalination Program</li> </ul>
<p>Consumer Behavior, Code Compliance, and Price Response</p>	<p>Multi-pronged approach to create ongoing water savings from new plumbing codes, behavioral changes, industry standards, local ordinances, and retail water pricing to encourage water conservation and use of recycled water</p>	<ul style="list-style-type: none"> <li>(1) State &amp; Federal Legislation                             <ul style="list-style-type: none"> <li>(a) Plumbing Code</li> <li>(b) Model Landscape Ordinance</li> <li>(c) Appliance Standards</li> </ul> </li> <li>(2) Communication Plan                             <ul style="list-style-type: none"> <li>(a) \$6.3 million media campaign</li> </ul> </li> <li>(3) School Education Program</li> <li>(4) Community Partnering Program</li> <li>(5) California Friendly Landscape Training</li> <li>(6) WateReuse Leg &amp; Reg Committee Member</li> </ul>

## **Metropolitan Water District of Southern California White Paper on Future Water Use Efficiency**

### **Overview**

In 1990, Southern Californians used an average of 205 gallons of water a day at home and on the job. Today the region's per-capita water use is closer to 185 gallons a day. Various conservation strategies by the Metropolitan Water District, local water districts and plumbing code reforms are the reason for the reduction. The water that is not consumed because of conservation is roughly equal to what Southern Californians consume annually from the Colorado River, Metropolitan's second largest imported supply.

Conservation is indispensable to keeping demand in balance with supplies. Conservation's role will increasingly come into public focus in the face of mounting challenges to Metropolitan's imported water supplies. Worsening environmental conditions, new pumping restrictions and climate change are among the threats to maintaining the imported supplies from the Colorado River and the Sacramento-San Joaquin Delta. Lowering local demands and increasing local supplies will continue to emerge as important water management tools. Yet the "easy" conservation reforms are largely enacted. Future steps to lower demand and increase local supplies are achievable. But they will face obstacles because they will be expensive, test the limits of public acceptance or require the cooperation of other governments or the private sector. An overall strategy of short-, mid- and long-term actions is necessary to create the appropriate portfolio of conservation and local supply measures. Some initiatives may be stand-alone actions. Others may be part of Metropolitan's long-term blueprint for water reliability, the Integrated Resources Plan (IRP). This White Paper represents an overview of the various options.

For Metropolitan, conservation incentives began on an episodic basis due to dry weather in the 1970s and evolved into ongoing efforts in the 1990s. Conservation became a core water resource in a long-term strategy document, the 1996 Integrated Resources Plan. This plan marked a historic milestone for Metropolitan. Lowering local demand and increasing local supplies were officially recognized as essential to maintain reliable water supplies. Importing water from the Colorado River and Northern California's Sacramento-San Joaquin Delta, while vital baseline supplies, were viewed as insufficient by themselves to meet future demands. In 2004 Metropolitan revised its IRP and took a further step. The plan assumed that local conservation/supply efforts would provide the water necessary for future growth. And to ensure that imported supplies would be available during drought cycles, Metropolitan invested in an array of new storage projects. The largest was its new reservoir, Diamond Valley Lake. But programs were also created in the San Joaquin Valley and within Metropolitan's service area to store water underground. All told, Metropolitan's storage capabilities increased 14-fold since the drought cycle of the early 1990s. This storage network has allowed Metropolitan to take advantage of wet years on the Colorado River and the Delta in some previous seasons. At the moment Metropolitan maintains less than a year's supply of water in storage (excluding emergency supplies).

This storage is sufficient to prevent a sudden disruption to the Southern California economy due to changing water conditions. But the water reserves act as a temporary cushion rather than a permanent solution to changing circumstances for Metropolitan. The IRP called for Metropolitan to analyze its success and assumptions over time. Given all the challenges now facing Metropolitan, now is an appropriate time for such a review.

The IRP assumed that Metropolitan would be able to maintain imported supplies from the Delta by storing more water in wet years and relying less on the Delta in dry years. While Metropolitan lost some supplies from the Colorado River when California in 2003 was required to lower its total river diversions, the plan was to rebuild these supplies over time. Since the 2004 IRP, however, the following dramatic changes have taken place:

- The Delta ecosystem has headed on a downward path rather than one of recovery. Population indices of key in-Delta fish species are at or near historic lows.
- New pumping restrictions in the Delta have fundamentally shifted Metropolitan's water planning. No longer can Delta supplies be expected to help replenish Metropolitan reserves in an average rainfall year. New conservation is necessary in an average year, among other actions, merely to stay in balance.

- Pacific Ocean conditions appear to be shifting in ways that are lowering food supplies and diminishing fish populations up and down the coast. The fall run of Chinook salmon through the Delta, once regarded as a stable fishery, has decreased to levels below the minimum target range.
- The Colorado River, meanwhile, has experienced a drought longer than the IRP and Metropolitan's water forecasts anticipated.
- The emerging consensus among scientists tracking climate change is that precipitation in the Colorado basin will likely diminish further, in the decades ahead.
- The emergence of invasive quagga mussels in sections of Metropolitan's water delivery system reflects a new threat to importing and distributing water supplies.

The emerging trend is clear. Metropolitan's imported supplies, while they remain important baseline sources for our service area, face threats of reduction.

Efforts to lower demand and increase local supplies, meanwhile, have also faced new challenges as these programs have matured:

- **Desalination.** The permitting process for seawater desalination has proven more difficult than originally anticipated. Concerns have increased for desalination projects when they propose to use existing ocean water intakes at electrical power plants. New and future regulations to address climate change and reduce carbon dioxide emissions will also affect desalination facilities because of their considerable use of electricity.
- **Recycling/Reuse.** Metropolitan has faced unexpected customer resistance to utilize available recycled water due to hookup/re-piping costs and quality misperceptions. Regional water quality boards have demonstrated a mixed record in providing an achievable pathway to storing recycled water in groundwater basins or apply it for overlying irrigation. Local acceptance to recycled water has been mixed as well.
- **Conservation.** New technologies exist to lower water use, such as irrigation controllers that adjust to weather conditions, but customer interest is not widespread. Some consumer resistance is due to the complex nature of the devices themselves. Some is financial. Some is due to a lack of availability at retail outlets of water-saving irrigation controllers, low-water-use native plants, and new higher efficiency bathroom fixtures. From a pure cost-benefit perspective, purchasing water-saving technologies are not always offset because of the comparatively low price of water.

The emerging trends are decidedly mixed. Surveys by Metropolitan find widespread awareness of Southern California's water challenges. But the path to increased regional self-sufficiency reveals a variety of obstacle that must be overcome. The following discussion examines various options:

**A: Local Ordinances and Regional Partnerships.** Metropolitan does not sell water directly to any Southern Californian. That is the job of 300-some public water districts, local governments and private companies. Metropolitan can draft, for example, model ordinances for tiered water rate structures that have proven to result in conservation, or model ordinances to replace higher-water-using toilets at the time an existing home is resold, or ordinances to require California Friendly landscapes and irrigation for new residential and commercial construction. But local agencies or water purveyors would have to adopt these ordinances. Metropolitan has potential tools to motivate local action on these ordinances. Future long-term water plans, for example, could assume their implementation for Metropolitan to maintain overall supplies and demands to be reliably in balance. Regardless, Metropolitan-local partnerships will have to expand in the coming revision of Metropolitan's IRP.

**B: State Legislation.** Improvements to building and plumbing codes over the years have provided the largest and most reliable source of water conservation for Metropolitan. They are particularly valuable in how they lead to savings that Metropolitan can quantify and accurately predict in long-term water plans. It is important to remember past successes in looking for future progress. Building and plumbing code changes, once enacted, provide water savings without Metropolitan needing to take or fund any further actions.

**C: Existing Metropolitan Programs.** Metropolitan has developed over the years an array of residential, commercial and industrial programs. They provide a solid foundation for expanding conservation activities. While commercial, industrial and institutional programs have largely focused on activities inside their facilities, the programs could potentially broaden to emphasize outdoor water use efficiency. Existing programs with member agencies, for example, could be reevaluated. Demand reductions could potentially be accelerated by rewarding incentive funds on a matching basis rather than as stand-alone subsidies.

**D: New Funding Mechanisms.** Metropolitan has a finite ability to underwrite conservation projects based on its existing revenues. New sources of revenue, however, could lead to new ways to lower demand and increase supplies. A potential source of new revenue is to examine the small assessment that is currently charged to property owners annually throughout Metropolitan's service area. This assessment, dating back to the creation of Metropolitan, has been retiring specific debts relating to the State Water Project and Colorado River aqueduct. The assessment rate has declined over time as the debts have been retired and as property values have increased. If the assessment rate were to remain stable, however, a new source of revenue could flow to Metropolitan. Likewise, if property owners were to voluntarily accept an increase in the Metropolitan property assessment, Metropolitan could potentially provide up-front funds for those property owners so they can permanently lower water demands through irrigation and landscaping changes. Other governments are beginning to explore this same funding mechanism.

**E: Recycled Water.** Opportunities for recycled water exist for large, small and medium scales, yet there are obstacles at each level to reach that potential. On a large scale, more wastewater plants could be treating the water to Title 22 drinking water standards so that the supply could be stored either above or below ground, or used directly to offset potable demand for large irrigation or industrial use. But new partnerships would have to be forged with sanitation agencies. And regional boards would have to implement (or be required to implement via state legislation) consistent, achievable regulations to allow the capturing of this water resource. At a medium scale, technology is emerging for treatment plants in new neighborhoods (on sites the size of a gasoline station) to recycle water for local landscape and non-potable uses. Development standards, however, do not yet require these kinds of facilities. Technology to retrofit existing homes or yards to capture gray water has not yet achieved practical application in California, although some overseas projects are claiming success. New products on the market and additional incentives may be necessary.

**F: Outreach.** A key to lowering demand is changing the personal behavior of millions of Southern Californians, particularly behaviors that would not pose undue hardship to adjust. Up to 70 percent of residential water use occurs outdoors, irrigating lawns and landscapes, sometimes excessively. In a Metropolitan survey last year, 77 percent of residents agreed that the overuse of sprinklers is a problem. Outreach was once an episodic event by water districts when conditions were dry. Outreach is evolving into a permanent campaign to educate residents about water's new reality. Metropolitan has sought to reinforce this message by dramatically increasing its outreach spending in 2007 and with plans to continue additional outreach efforts indefinitely. But the future need will go beyond broad outreach efforts through mass-market advertising. Local governments, the building industry, environmental groups and community organizations will need to engage in Metropolitan's long-term water planning efforts and to realize their increasing roles to maintaining a reliable water future for the region. And an enhanced role for science must be identified. Changing precipitation patterns and environmental conditions in the Delta and Colorado River are predicted to influence the size of available supplies. A strong education program for the next generation would contribute toward acceptance of recycled water and native landscape.

**G: Seawater Desalination.** To date Metropolitan has committed to provide incentive funds for local water districts to pursue seawater desalination projects. While this strategy has demonstrated some success, the ocean is largely an untapped potential resource. Metropolitan may have to play a more active role in desalination if the policy choice is to increase its role in the overall water portfolio. The obstacles have proven significant. The permitting process has proven to be time-consuming and politically challenging. In the future, mitigation to reduce seawater desalination's "carbon footprint" and its use of electricity may be necessary. Individual member agencies may not have the financial resources, even if interested, to bring new plants on-line. The question that looms is whether Metropolitan in any circumstances should directly pursue a desalination project on its own or with local partners.

**H: Storm water.** For more than 100 years, storm water has been captured by flood control dams and then released downstream over time as a way to recharge groundwater basins. However, substantial amounts of storm water still end up in the Pacific Ocean or evaporate because there is not the infrastructure to capture and store all of this supply. Like recycling, this is a potential water resource that Metropolitan is unable to manage on its own. New partnerships would be necessary with flood control districts, sanitation agencies, groundwater basin entities and public works agencies. There are many physical, logistical and institutional barriers to expand a storm water banking opportunities on a medium or large scale. But these obstacles are surmountable, particularly as other government agencies, through successful outreach, begin to better appreciate their role in maintaining a reliable water system.

### **Next Steps**

The Metropolitan Board of Directors reviewed in December 2007 an action plan to update its long-term water strategy, the IRP, in light of the changing water circumstances facing Southern California. The goal is to identify an achievable, sustainable water plan – possibly through 2030 in order to comply with state laws that require long-term blueprints. Targets to lower local demand and increase local supplies will be closely examined. They could very well increase. Regional forums will take place this year for initial discussions with follow-up efforts with stakeholders to review specific proposals next year.

In addition, Metropolitan can take stand-alone actions separate from its long-term planning process. The need for progress may warrant new actions before a new IRP is scheduled to be adopted in mid-2009. Uncertainties relating to Metropolitan's Delta supplies could continue and require an action plan on local conservation for near- and mid-term steps. This action plan could act as a bridge to the new long-term plan.