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METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

*[Signature]*  
Executive Secretary

January 19, 1994

To: Board of Directors (Water Problems Committee--Information)  
(Finance and Insurance Committee--Information)

From: General Manager

Subject: Ultra-Low-Flush Toilet Program Update

Report

This report addresses the following issues: (1) the cost-effectiveness of the ultra-low-flush (ULF) toilet program; (2) the need for significant long-term investments in conservation; and (3) various alternatives available to finance these investments.

Since your Board adopted the Conservation Credits Program in 1989, Metropolitan has 61 ultra-low-flush (ULF) toilet projects that are either completed or pending with 23 member agencies. Cumulatively these projects account for 596,000 ULF toilets, a Metropolitan cost of \$34 million, a combined Metropolitan and member agency cost of \$70 million, and an annual water savings of 24,000 acre-feet (AF).

Recently your Board adopted a Conservation Credits Program flat-rate incentive of \$60 per ULF toilet. The flat rate has greatly simplified administration of Metropolitan's ULF toilet program and has led to more creative ways of financing member agencies' share of program costs through the use of co-pay options in which end-users agree to pay some portion of the cost of the program.

Metropolitan and its member agencies, in an effort to enhance the implementation of ULF toilet programs, have created what staff believes is a highly successful approach for developing partnerships with community-based organizations (CBOs) to target-market and implement conservation programs for specific community segments such as retired individuals, ethnic and lower-income communities, etc. This approach has proven successful, largely because it effectively combines water agency conservation objectives with a variety of objectives important to local communities. In these programs, Metropolitan achieves its water conservation objectives; and local communities achieve employment opportunities, funding for community service projects, skilled work forces, heightened

community pride, and lower residential water bills. CBO programs are complimentary to the traditional rebate programs.

In an effort to determine the cost-effectiveness of ULF toilet retrofit programs, Metropolitan funded a study to evaluate the Santa Monica and Los Angeles programs to determine measurable water savings. State-of-the-art statistical methodology utilized empirical data gathered from 23,000 participating households and compared that to a randomly selected control group of non-participants, while controlling for household characteristics and climate variation. Household characteristics were obtained for participants through in-person interviews at the time of inspection of ULF toilet installations and for non-participants through detailed telephone surveys.

Benefit/cost analysis based on the results of the study are shown in Exhibit A. Based on the method of analysis used and whether Metropolitan's, the member agency's, or the retail customer's perspective is chosen, the results vary. However, overall, the analysis shows that ULF toilets provide very cost-effective water, with payback ranging between 0.8 and 6.2 years, depending on perspective, and a regional cost per AF of \$313.

It should be noted that the investment in conservation programs by Metropolitan and its member agencies and subagencies is projected to increase in the future. Based on Metropolitan's current long-range planning estimates for supply and demand, the actual level of investment will depend on the optimum mix of resources determined through the integrated resources planning process. However, detailed analysis clearly indicates conservation programs will be a cost-effective component of the resource mix.

Traditionally, Metropolitan has funded conservation projects from current income, fully expensing entire project costs in the year incurred. This approach does not recognize that many conservation programs have extended useful lives and that benefits accrue over many years, not just in the year of program implementation. For example, ULF toilets have useful lives of 20 years or more. By disallowing project costs to be amortized over the projects' useful lives, this financing approach impacts current rates only \$8-9 per AF, but the impact will increase in the future as the ULF toilet program grows. However, by capitalizing conservation projects that are capital-intensive and recognizing only the debt amortization as a current expense, rate increases could be smoothed out over the life of the projects rather than rates being impacted in the year of project implementation.

Many water agencies in California are already adopting this approach of capitalizing ULF toilet program expenditures. Members of the California Municipal Utilities Association (CMUA) have created a Joint Powers Authority called the Financing Authority for Resource Efficiency of California (FARECal). Conservation projects that would be too small to finance independently can be financed by FARECal as part of a group of projects, thereby reducing the costs of issuance in certain cases. For Metropolitan, with its extensive financing capabilities, FARECal is not the best financing alternative. However, some of Metropolitan's member and subagencies might benefit from participation in FARECal.

Some of the options available to Metropolitan for financing conservation are bonds, certificates of participation, and commercial paper. Of these, commercial paper can be best matched with the useful lives of ULF toilets. In June 1991, your Board authorized the issuance of \$200 million of commercial paper, of which \$140 million has not been issued. In addition, another option that would be highly beneficial to water agencies would be legislation requiring that homes be retrofitted upon resale, which would shift the cost of retrofitting directly to the consumer.

#### Board Committee Assignments

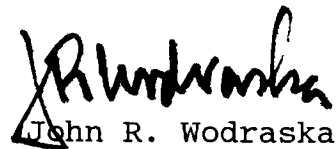
This letter is referred for information to:

The Finance and Insurance Committee because of its authority to study, advise, and make recommendations with regard to the authorization of appropriations pursuant to Administrative Code Section 2441(d); and

The Water Problems Committee because of its authority to study, advise, and make recommendations with regard to policies, sources and means of importing water required by Metropolitan pursuant to Administrative Code Section 2481(a).

#### Recommendation

For information only.



John R. Wodraska

MDM:c1

Attachment

## EXHIBIT A

The following tables details the cost/benefit analysis of ULFTs from the perspective of: Metropolitan, Member Agencies, ULFT Program Participants, and the Region. The figures displayed account for the time value of money. The cost summary shows direct costs of \$65 for Metropolitan, \$60 for Member Agencies, and \$25 installation costs for Program Participants, totaling \$150 per ULFT installation. The Assumptions table consists of annual savings estimates per ULFT, the alternative cost of water from each perspective, the useful life expectancy of 20 years for ULFTs, and an appropriate escalation and discount rate to account for the time value of money. The third table consists of the annual value of water savings per ULFT for the first 12 years of its life. This can be calculated by multiplying the annual savings by the escalated alternative water costs and discounting to present dollars. This is the benefit per ULFT installed if there were no costs. The fourth table shows how the benefits balance against costs by year. Example: from Metropolitan's perspective, three years after a ULFT is installed its net present value (NPV) is a negative \$33.12, but in year eight the investment has returned a NPV of \$17.79. Finally, the last table indicates the number of years until pay back and the cost of ULFT water savings per AF.

Perspective:	Metropolitan	Member Agency*	Participant*	Regional
	(a)	(b)	(c)	(a + b + c)
Program Costs:	\$60	\$55	\$0	\$115
Administration Costs:	\$5	\$5	\$0	\$10
Installation Costs:	\$0	\$0	\$25	\$25
Total:	\$65	\$60	\$25	\$150

Assumptions:	Metropolitan	Member Agency*	Participant*	Regional
Annual Production/ULFT (AF/YR):	0.039	0.039	0.039	0.039
Alternative Water**:	\$275	\$389	\$800	\$800
Cost Escalation Rate:	4.5%	4.5%	4.5%	4.5%
Discount Rate:	6.0%	6.0%	6.0%	6.0%
Useful Life:	20	20	20	20

## Annual Value of Water Produced Per ULFT:

1	\$10.77	\$15.23	\$31.32	\$31.32
2	\$10.62	\$15.02	\$30.90	\$30.90
3	\$10.49	\$14.84	\$30.52	\$30.52
4	\$10.38	\$14.68	\$30.18	\$30.18
5	\$10.27	\$14.53	\$29.87	\$29.87
6	\$10.17	\$14.39	\$29.59	\$29.59
7	\$10.08	\$14.27	\$29.34	\$29.34
8	\$10.00	\$14.15	\$29.10	\$29.10
9	\$9.93	\$14.05	\$28.89	\$28.89
10	\$9.86	\$13.95	\$28.69	\$28.69
11	\$9.80	\$13.86	\$28.50	\$28.50
12	\$9.74	\$13.78	\$28.33	\$28.33

## Cumulative Cost/Benefit By Year:

1	(\$54.23)	(\$44.77)	\$6.32	(\$118.68)
2	(\$43.61)	(\$29.75)	\$37.22	(\$87.78)
3	(\$33.12)	(\$14.90)	\$67.74	(\$57.26)
4	(\$22.74)	(\$0.23)	\$97.93	(\$27.07)
5	(\$12.48)	\$14.30	\$127.80	\$2.80
6	(\$2.30)	\$28.69	\$157.39	\$32.39
7	\$7.78	\$42.95	\$186.73	\$61.73
8	\$17.79	\$57.11	\$215.83	\$90.83
9	\$27.72	\$71.15	\$244.72	\$119.72
10	\$37.58	\$85.10	\$273.41	\$148.41
11	\$47.38	\$98.96	\$301.91	\$176.91
12	\$57.11	\$112.74	\$330.24	\$205.24

## Results:

Years Until Pay back	6.2	4.0	0.8	4.9
Cost/AF Over Life of ULFT:	\$135.56	\$125.13	\$52.14	\$312.83

\* Assumes recovery of direct costs only.

\*\* Includes waste water costs for Participant and Regional perspectives.