

Section 4: WATER CONSERVATION ANALYSIS

This Section presents the water conservation measures evaluated and selected for the 2008 Water Supply and Water Conservation Management Plan. The updated water conservation program expands the existing Metro Water District program to further enhance water conservation into the future. The program resulted from an extensive analysis of the current program, evaluation of new methods and measures, and stakeholder involvement. The process yielded a program of water conservation measures that has the potential to reduce Metro Water District water demand up to 13 percent beyond trends without conservation by the end of the planning period.

Water conservation was considered first in the planning process, prior to looking at new or expanded sources. This Section discusses the process for evaluation and selection of the water conservation measures that build on progress from the 2003 Plan. In general, the water conservation program includes the measures that were most cost-beneficial across the Metro Water District. After identifying the water savings resulting from the water conservation program, additional sources and reservoirs were considered as discussed in Section 6 to meet outstanding demand.

EXISTING WATER CONSERVATION PROGRAM

Water conservation is an essential element of water resources management within the Metro Water District. With the adoption of the 2003 Water Supply and Water Conservation Management Plan, the Metro Water District and its member water providers immediately began implementing the recommended water conservation measures. Table 4-1 lists the water conservation measures in the existing program. Much progress has been achieved through this program. For example, the majority of local water providers have adopted tiered water rates; the Metro Water District has also begun a toilet rebate program; and many local water providers have begun aggressive leak detection and repair programs. More detail on progress of implementation items is provided on an annual basis by the Metro Water District in the Activities and Progress Reports. Through the plan update process, the goal is to build on this successful water conservation foundation.

TABLE 4-1
Existing Water Conservation Measures in Metro Water District in 2003 Plan, as amended

Number	Measure Description
1.	Establish conservation pricing by all local water providers.
2.	Replace older, inefficient plumbing fixtures.
3.	Require pre-rinse spray valve retrofit education program.
4.	Enact legislation to require rain sensor shut-off switches on new irrigation

Number	Measure Description
5.	Require sub-unit meters in new multi-family buildings.
6.	Assess and reduce water system leakage.
7.	Conduct residential water audits.
8.	Distribute low-flow retrofit kits to residential users.
9.	Conduct commercial water audits.
10.	Implement education and public awareness plan.

EVALUATION OF ADDITIONAL POTENTIAL WATER CONSERVATION MEASURES

An important step in updating the water conservation program was the review and screening of additional potential water conservation measures. The process included a review of the current water conservation measures required by the 2003 Plan, identification of additional water conservation measures that may be appropriate for the region, and the screening of these water conservation measures to a short-list for detailed evaluation (benefit-cost analysis). To accomplish this process, a list of 45 potential water conservation measures were identified and evaluated.

Each potential conservation measure was ranked against three qualitative criteria, listed below. Scores for each criterion were based on a scale of 1 to 5, with 5 being the most acceptable. Measures with low scores were eliminated from further consideration, while those with high scores were passed into the next evaluation phase (cost-effectiveness analysis). The three qualitative criteria are:

- **Technology/Market Maturity:** Is required technology available commercially and supported by the local service industry? For example, a water-saving device would score very low if it is not yet commercially available in this area.
- **Service Area Match:** Is the technology appropriate for the area's climate, building stock, or lifestyle? For example, promoting xeriscape gardens for multifamily or commercial sites may not be appropriate where water use analysis indicates relatively little outdoor irrigation.
- **Customer Acceptance/Equity:** Are customers willing to implement measures? If not, the water savings would be too low to be significant. Measures should also be equitable to ensure that one category of customers does not benefit while another pays the costs without receiving benefits. Customer acceptance may be based on convenience, economics, perceived fairness, or aesthetics.

The screening process resulted in a short-list of 16 new potential water conservation measures (beyond those currently adopted by the Metro Water District) for consideration. These water conservation measures were placed into two categories: those that were assessed quantitatively using a cost-benefit model and those that were assessed on a qualitative basis. The qualitative measures provide opportunities for water savings and good stewardship of water resources but are better suited to qualitative analyses as precise water savings attributable to these measures are not available. Estimates of implementation costs for both the quantitative and qualitative measures were taken into consideration.

COST-EFFECTIVENESS ANALYSIS

The Least Cost Decision Support System (DSS) model, as described in Section 3, was used to evaluate the quantitative water conservation measures (measures 1 through 16 in Table 4-2). Because of interactions between measures when assembled into a conservation program, each existing as well as potential new measure was modeled individually as well as in packages to assess the overall water savings.

An economic screening analysis was performed, as illustrated in Figure 4-1. First, the DSS model evaluated each of these 16 water conservation measures individually, simulating them as if they were implemented alone. The DSS model evaluated potential water savings based on conditions specific to each county. Information specific to each county and each water use sector was used to evaluate potential savings for each conservation measure. For instance, the DSS model calculated the savings for pre-rinse spray valve retrofits based on the number and age of restaurants specific to each county as well as the percent of total restaurant use for those devices. Similarly, the DSS model calculated the water savings for toilet retrofits by county based on the number and age of the single-family housing stock as well as the percentage of single-family use of water for toilet flushing. Based on existing information, and forecasted demands, potential savings for each measure were quantified. Next, the individual water conservation measures were ranked based on the cost of the water saved (cost / million gallons saved) and the best water conservation measures were selected. Combinations of the best individual water conservation measures were then placed in several different “Option Packages” or programs.

Three water conservation packages were identified for the Metro Water District, each with varying degrees of water savings and costs. The existing adopted water conservation measures provided the backbone for each of these packages. Package A was composed of the 10 existing water conservation measures to provide a benchmark for the analyses. Package B was composed of Package A plus four new water conservation measures. Package C is comprised of all 16 evaluated water conservation measures.

Finally, the option packages were evaluated to determine how much water savings could be obtained when these water conservation measures were combined (this accounts for overlapping measures and interaction). Feedback from the Technical Coordinating Committee and Basin Advisory Councils was used in conjunction with input from the Metro Water District to create the most appropriate overall option package.

The time value of money was explicitly considered. The value of all future costs and benefits was discounted to 2006 (the base year) at the real interest rate of 3.0%. The DSS model calculates this real interest rate, adjusting the current nominal interest rate (assumed to be approximately 6.1%) by the assumed rate of inflation (3%). Cash flows discounted in this manner are referred to as

FIGURE 4-1
Evaluation Process of Water Conservation Measures



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"Present Value" sums herein, and are used in order to properly make comparisons of water conservation measures.

Benefit-cost analyses can be performed from several different perspectives, based on who is affected. For planning water conservation programs for local water providers, the perspectives most commonly used for benefit-cost analyses include the local water provider and the community. The local water provider or "utility" benefit-costs are based on the benefits and costs to the local water provider. The "community" benefit-costs includes the local water provider benefit and costs together with account owner/customer benefits and costs. These include customer energy benefits and costs of implementing the water conservation measure, beyond what the local water provider pays.

The local water provider perspective offers two advantages for this analysis. First, it considers only the program costs that will be directly borne by the local water provider. This enables the local water provider to fairly compare potential investments for conserving and supplying water. Second, because revenue shifts are treated as transfer payments, the analysis is not complicated with uncertainties associated with long-term rate projections and rate design assumptions. Because of the local water provider's paramount role in the Metro Water District's water conservation program, the local water provider or utility perspective was primarily used to evaluate elements of the water conservation measures.

COMPARISON OF MEASURES

Table 4-2 shows the evaluation of water conservation measures for the Metro Water District, which is a sum of the individual results for each county. This table presents the estimated water savings for each conservation measure, how much each would cost and the benefit-cost ratios for each of the measures considered on a stand-alone basis, i.e. without interaction or overlap from other measures that might affect the same end use(s). Note that water conservation measures with benefit-cost ratios less than 1.0 have a negative Net Utility Benefit. Water savings shown are averaged over the 29-year analysis period. Other key statistics include the cost of water saved in dollars per million gallons (\$/MG), and the benefit-cost ratios. Benefits and costs are defined below:

- *Utility benefits and costs:* Those benefits and costs that the utility would receive or spend.
- *Community benefits and costs:* Community benefits equal utility benefits plus customer energy (cost to heat water) benefits. Community costs include utility and customer costs.
- *Water benefits:* Based on assigning a typical unit value for avoided treated and distributed surface water at a cost of \$3,000/MG. The \$3,000/MG is based on national surveys that indicate the typical cost for surface water treatment plant capital as well as operations and maintenance costs per million gallons treated.
- *Costs for the utility:* Includes measure set-up, annual administration, and payment of rebates or purchase of devices or services as specified in the measure design.
- *Customer costs:* Includes costs of implementing the measure and maintaining its effectiveness over the life of the measure.

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TABLE 4-2
District-Wide Results of Conservation Measures Evaluation

Conservation Measure		Present Value of Water Utility Benefits (million \$) (Note 1)	Present Value of Total Community Benefits (million \$) (Note 1)	Present Value of Water Utility Costs (million \$) (Note 1)	Present Value of Total Community Costs (million \$) (Note 1)	Water Utility Benefit-Cost Ratio	Total Community Benefit-Cost Ratio	Average Water Savings (MGD) (Note 2)	Cost of Savings per Unit Volume (\$/MG)	Net Utility Benefit (million \$)	2035 Water Savings (MGD) (Note 3)
1	Conservation Pricing	\$231.5	\$293.5	\$13.6	\$13.6	17.03	21.59	11.85	\$104.74	\$217.9	19.8
2	Replace Older Inefficient Plumbing Fixtures	\$55.5	\$55.5	\$22.3	\$47.0	2.48	1.18	2.43	\$840.48	\$33.1	2.4
3	Rain Sensor Regulations	\$23.4	\$23.4	\$5.7	\$21.7	4.07	1.08	1.23	\$424.72	\$17.7	2.5
4	Multi-Family Submetering	\$44.8	\$102.9	\$1.2	\$102.5	36.91	1.00	2.19	\$50.47	\$43.6	4.6
5	Water Loss Reduction (Audits & Leak Detection/Repair)	\$431.6	\$431.6	\$161.8	\$161.8	2.67	2.67	14.65	\$1008.44	\$269.8	35.5
6	Residential Water Audits	\$2.9	\$5.2	\$0.4	\$4.2	7.47	1.26	0.14	\$258.33	\$2.5	0.2
7	Low flow showerhead & aerator distribution	\$35.1	\$118.8	\$16.2	\$19.5	2.16	6.10	1.60	\$924.35	\$18.8	1.9
8	Commercial Water Audits	\$80.6	\$128.5	\$30.3	\$39.6	2.66	3.24	4.04	\$684.09	\$50.3	8.5
9	Public Information	\$34.6	\$70.0	\$36.2	\$36.2	0.96	1.93	1.52	\$2,177.87	-\$1.6	1.2
10	High Efficiency Toilets Rebate	\$125.9	\$125.9	\$44.4	\$84.6	2.84	1.49	5.65	\$717.12	\$80.5	6.7
11	Install High Efficiency Toilets and Urinals in Gov Buildings	\$14.7	\$14.7	\$7.9	\$16.6	1.88	0.89	0.68	\$1,055.61	\$6.9	0.9
12	Hotel & Motel Water Audits	\$9.5	\$9.5	\$1.2	\$3.2	7.84	2.99	0.44	\$252.33	\$8.3	0.6
13	Commercial Kitchen Spray Wash	\$9.6	\$26.2	\$1.7	\$1.7	5.57	15.11	0.44	\$355.28	\$7.9	0.6
14	Irrigation Meter Pricing	\$44.0	\$44.0	\$4.6	\$35.0	9.65	1.26	2.25	\$185.21	\$42.5	3.8
15	Washer Rebate	\$24.4	\$74.1	\$12.4	\$37.2	1.97	1.99	1.12	\$1,011.97	\$12.0	1.4
16	Car Wash Recycling	\$8.6	\$8.6	\$0.1	\$3.3	87.77	2.60	0.40	\$22.19	\$8.5	0.6

Notes:

1. Present Value calculated using 3% interest rate
2. Annual water savings averaged over the 29-year planning period
3. 2035 water savings represent water savings realized in the year 2035

BEST OPTION PACKAGES

Table 4-3 provides a short description of the 26 water conservation measures and the option packages in which they were placed. Three option packages were designed to accomplish an increasing level of water savings. The DSS model was used to quantify the interaction between measures in terms of water savings and benefits to estimate the combined savings and benefits from the three best option packages. This analysis was performed at the county level and then aggregated to the Metro Water District level.

TABLE 4-3
Descriptions of the Conservation Measures Evaluated Quantitatively and Qualitatively

Conservation Measure		Applicable Category	Distribution Method and Incentive	Description	Package
1	Establish Conservation Rates	Water Provider	Water Provider	Implement or modify rate structures to provide inclining block rates that charge customers more per unit for higher use.	A, B, C
2	Replace older, inefficient plumbing fixtures	Existing Indoor - Residential	Water Provider	To speed the conversion of older, inefficient plumbing fixtures towards current lower flow models, local water providers will be required to implement a program targeting the replacement of older plumbing fixtures. Low flow fixtures are defined according to current code standards.	A, B, C
3	Rain-sensor shut off device on irrigation controllers	New Development - SF & MF & CII	Statewide Requirement	To reduce wasted irrigation water, establish regulations requiring rain sensor irrigation shut-off switches on all new irrigation systems - both residential and non-residential. A new State law was established to implement this requirement across the Metro Water District.	A, B, C
4	Multi-family Sub metering requirement	New Development - MF	City/County or Water Provider Requirement	A water provider policy or local ordinances should be adopted to require that all new multi-family buildings (i.e. apartments, town homes, condominiums) be built with sub-meters that bill for water service, based on volume of use.	A, B, C
5	Water loss reduction	Water Provider	Water Provider	Water providers must identify methods to reduce leakage in their systems, and to reduce unbilled water. Each water provider should perform a distribution system water audit based on the International Water Association (IWA) methodology, in order to maintain uniform assessments of leakage and set targets at the economic level of leakage.	A, B, C
6	Residential water audits	Existing Indoor & Outdoor - SF & MF	Water Provider	Water providers will provide water audits (indoor and outdoor use) to residential customers. The largest 25 percent of water users should be targeted to evaluate water saving measures, and audits should be made available to customers who complain about high water bills.	A, B, C

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Conservation Measure		Applicable Category	Distribution Method and Incentive	Description	Package
7	Low flow showerhead & aerator distribution	Existing Indoor - SF	Water Provider	Water providers will distribute low-flow retrofit kits to customers. These kits could include low-flow showerheads, faucet aerators, and other applicable retrofit items. The kits would be distributed to the portion of the service areas that have pre-1992 homes.	A, B, C
8	Commercial water audits	Existing Indoor - CII	Water Provider	Water providers will provide water audits (indoor and outdoor use) to commercial customers. This audit will include a feasibility report that outlines changes to process and operations to reduce water usage. The Pollution Prevention Assistance Division (P2AD) of the DNR can be used to train auditors in performing the water audits.	A, B, C
9	Expand public education program	Water Provider	Metro Water District and Water Provider	Public education would be used to raise awareness of other conservation measures available to customers. Programs could include emphasis on school programs but also include landscape classes for homeowners, poster contests, speakers to community groups, radio and television time, and printed educational material such as bill inserts, etc. Program would continue indefinitely.	A, B, C
10	High Efficiency Toilet (HET) Rebates (possible refinement to Plan Action No. 2)	Existing Indoor - Residential	Water Provider	Provide a rebate for the installation of a high efficiency toilet (HET). HET's are defined as any toilet that is 1.28 gallons per flush or less.	B, C
11	Installation of HETs and high efficiency urinals in government buildings	Indoor - Government	Local Government and Water Provider	Install high efficiency toilets and high efficiency urinals in government facilities. Replacements would include urinals flushing with 0.5 gpf or less and toilets that flush 1.28 gpf or less.	B,C
12	Focused water audits for hotels/motels	Existing Indoor - CII	Water Provider	Provide water audits to hotels and motels. Standardize the types of services offered to reduce costs. Included would be bathrooms, kitchens, ice machines, cooling towers, landscaping, and irrigation systems and schedules.	C
13	Restaurant low flow spray rinse nozzles (possible refinement to Plan Action No. 3)	Existing Indoor - CII	Water Provider	Provide installation of 1.6 gpm spray nozzles for the rinse and clean operation in restaurants and other commercial kitchens.	C
14	Irrigation meters pricing (possible refinement to Plan Action No. 1)	New and Existing Development – MF & CII	Water Provider	If allowed, these meters will be charged on a separate rate schedule that recognizes the high peak demand placed on the system by irrigators - at a rate much higher than base rate.	B, C

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Conservation Measure		Applicable Category	Distribution Method and Incentive	Description	Package
15	Clothes washer rebates	Existing Indoor - SF & MF & CII	Water Provider	Water provider would offer a rebate for the purchase of an efficient clothes washer until such time as they are required to be sold in stores.	C
16	Require car washes to recycle water	New Outdoor - CII	City/County Requirement	Pass a regulation that required all new drive-through car washes to recycle water, in order to get a water meter.	B, C
Qualitative Measures					
17	Water waste ordinance	All Categories	Metro Water District to Develop Model Ordinance	Model ordinance would provide a general policy statement for local governments that would prohibit water waste such as runoff from over-watering landscaping, irrigation during rainfall events, not repairing leaks, and other wasteful activities.	Optional Education Toolbox
18	Prohibit HOA or CC&R conditions that mandate irrigation	SF & MF	Metro Water District to Determine Approach	Homeowners Associations would not be allowed to require automatic irrigation systems nor specify the amount of watering per week. Metro Water District will research the feasibility.	Optional Education Toolbox
19	Cooling Tower Education	CII	Metro Water District	Provide education to industry about efficient use of cooling towers.	Optional Education Toolbox
20	Promote water efficiency aspects of green buildings	New Development - All Categories	Metro Water District	Metro Water District staff to work with local green building associations, developers, designers, vendors to promote incorporating water efficiency into building design.	Optional Education Toolbox
21	New home efficiency award program promotion (WaterSense)	New Outdoor - SF & MF	Metro Water District	Co-sponsor award program to developers that are "green builders" and offer homes for sale that meet certain criteria such as EPA's new Water Sense program for new homes. This could be combined with energy efficient homes.	Optional Education Toolbox
22	Award program for water savings by businesses	Existing Indoor - CII	Metro Water District Sponsor	Metro Water District would sponsor an annual awards program for businesses that significantly reduce water use.	Optional Education Toolbox
23	Offer landscape training classes to homeowners	Existing Outdoor -SF	Water Provider with Cooperative Extension Service	Conduct a landscape water efficiency training program for homeowners in the spring of each year.	Optional Education Toolbox
24	Xeriscape demonstration gardens	Water Provider Property or Other Public Property	Water Provider	Donate or acquire a portion of public or private land to create a demonstration garden displaying living examples of low water-using gardens and landscaping. The Water provider would provide signs and brochures to educate those people visiting the garden.	Optional Education Toolbox
25	School education	Water Provider	Water Provider	The Water provider would sponsor school conservation by providing presentations, opportunities for field trips, and/or coloring books, etc. to teach students the importance of conserving water.	Optional Education Toolbox

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Conservation Measure		Applicable Category	Distribution Method and Incentive	Description	Package
26	Provide historical water use on water bills	All Categories	Water Provider	Provide detailed information on customer's historical water use, including typical usage and trends.	Optional Education Toolbox

Notes:

gpm = gallons per minute

gpf = gallons per flush

SF = single family

MF = multi-family

CII = commercial, industrial, institutional

Selection criteria for the water conservation measures in each option package included the following, by program:

- Program A includes the existing measures from the 2003 Plan, as amended.
- Program B includes Program A measures plus two new additional measures and three revised existing measures. Program B is designed to be the midpoint program and includes cost-effective measures that are able to conserve significant amounts of water.
- Program C includes all the quantitative measures presented in Table 4-3.
- An optional education toolbox category was developed to provide guidance on optional measures for utilities. All of the qualitative measures were assigned to this category, which can be used to enhance the education and public awareness program measure.

DISTRICT-WIDE RESULTS OF OPTION PACKAGES EVALUATION

Table 4-4 presents key evaluation statistics compiled from the individual county DSS models. Assuming all measures are successfully implemented, projected water savings in MGD are shown for 2035, as are the costs to achieve this water demand reduction. The costs are expressed in two ways: total present value over the 30-year period and the cost for each million gallons of water saved.

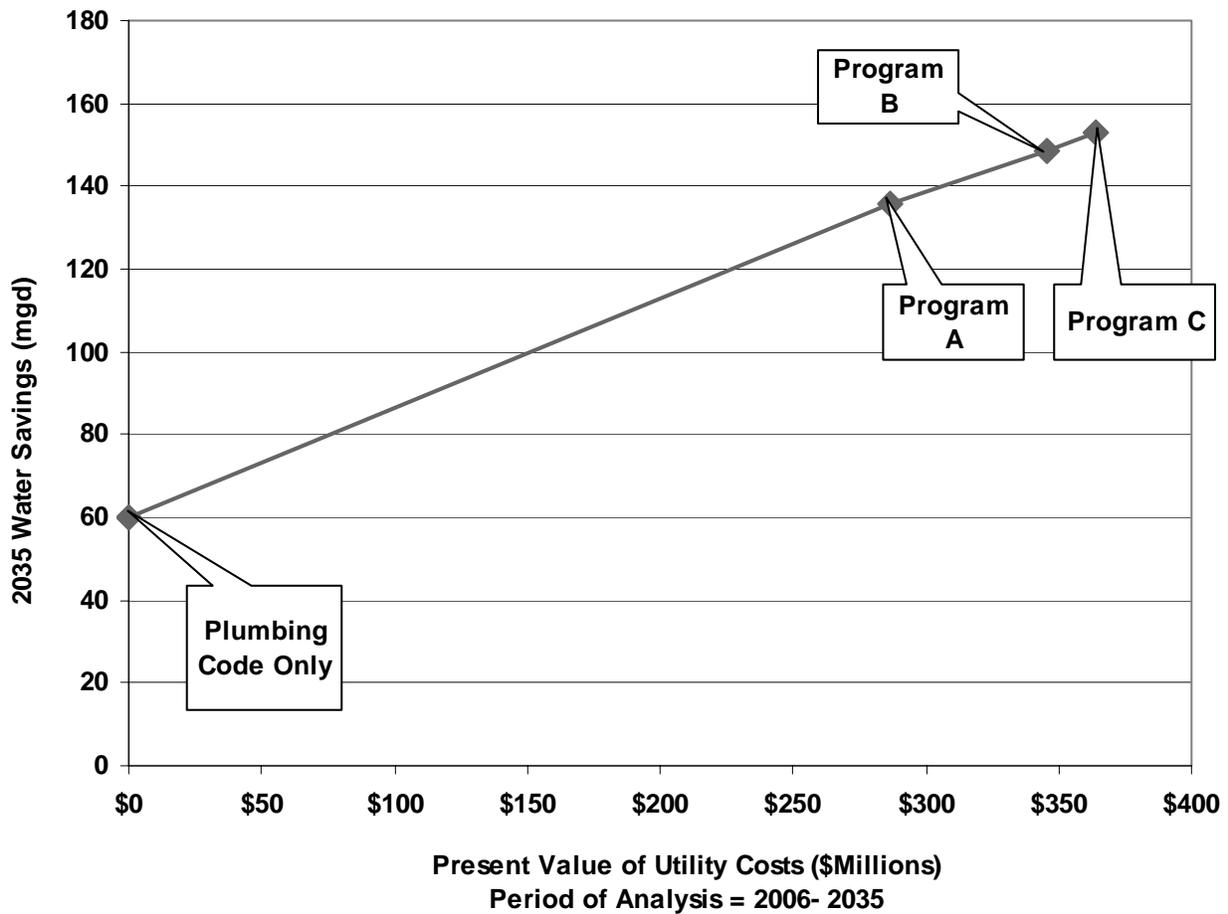
TABLE 4-4
District-wide Results of Option Packages Evaluation

Conservation Option Package (includes plumbing code)	Water Utility Benefit-Cost Ratio	2035 Water Savings (MGD)	2035 Indoor Water Savings (MGD) ¹	2035 Outdoor Water Savings (MGD)	Water Savings as a percent of 2035 Without Conservation Trend	Present Value of Water Utility Costs (million \$)	Cost of Water Saved (\$/MG)
A	2.5	136.0	117.3	18.7	12%	\$286.9	\$675
B	2.6	148.4	125.4	23.0	13%	\$345.7	\$654
C	2.6	153.1	130.1	23.0	13%	\$364	\$650

Notes:
 Present Value is determined using an interest rate of 3%
 Programs A, B and C include plumbing code savings
 Cost of water saved is present value of water utility cost divided by total 30-year water savings.
 1. Includes non-revenue water reduction savings.

The 13 percent water savings in Table 4-4 reflects only conservation beyond 2006 and does not incorporate total savings since 2001, when the Metro Water District began comprehensive regional water conservation planning. It is anticipated that there will be a 20 percent reduction in per capita use from 2001 to 2035. See the ‘Comparison with 2003 Plan’ discussion at the end of this Section for an explanation of how this compares to water saving estimates in the 2003 Plan. Figure 4-2 shows the cost of the three option packages for the local water provider versus the amount of water saved for each water conservation program.

FIGURE 4-2
Present Value of the Three Water Conservation Option Packages



COUNTY RESULTS OF OPTION PACKAGES EVALUATION

Table 4-5 presents selected evaluation statistics for the three option packages for each of the Metro Water District’s 15 counties. Water savings tend to vary based on the size of the county, the age of the housing stock and plumbing fixtures, the amount of commercial and outdoor water use, and the age and condition of the distribution system as indicated by the amount of non-revenue water.

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TABLE 4-5
County Results of Option Packages Evaluation

County	Water Utility Benefit-Cost Ratio			2035 Water Savings (MGD)			2035 Water Savings (% of 2035 Without Conservation Trend)			Present Value of Water Utility Costs (\$M)		
	A	B	C	A	B	C	A	B	C	A	B	C
Bartow	4.5	4.4	4.4	8.8	9.0	9.0	16%	16%	16%	\$ 11.1	\$ 11.9	\$ 12.3
Cherokee	2.1	2.2	2.2	5.8	5.9	6.0	11%	12%	12%	\$ 13.7	\$ 14.6	\$ 15.2
Clayton	1.3	1.6	1.7	4.2	5.0	5.1	9%	11%	11%	\$ 19.5	\$ 23.3	\$ 24.0
Cobb	3.3	3.5	3.5	10.4	12.3	13.0	9%	10%	11%	\$ 18.1	\$ 26.7	\$ 29.4
Coweta	1.8	1.9	2.0	3.9	4.2	4.3	12%	13%	13%	\$ 10.3	\$ 11.0	\$ 11.3
DeKalb	2.7	2.7	2.7	15.4	17.0	17.4	13%	14%	14%	\$ 32.6	\$ 43.7	\$ 45.6
Douglas	2.1	2.1	2.1	5.0	5.2	5.2	17%	17%	17%	\$ 11.3	\$ 12.5	\$ 12.8
Fayette	1.5	1.5	1.6	2.8	2.9	2.9	11%	11%	11%	\$ 8.1	\$ 9.2	\$ 9.5
Forsyth	3.4	3.7	4.0	7.9	9.8	11.8	11%	14%	17%	\$ 14.7	\$ 17.7	\$ 21.6
Fulton	4.1	3.9	3.9	32.4	35.0	35.7	12%	13%	14%	\$ 45.0	\$ 60.3	\$ 63.4
Gwinnett	2.5	2.7	2.7	19.3	21.1	21.4	12%	13%	13%	\$ 47.9	\$ 55.3	\$ 57.6
Hall	1.3	1.5	1.6	5.0	5.3	5.4	9%	9%	9%	\$ 16.6	\$ 18.4	\$ 18.9
Henry	1.6	1.7	1.7	5.5	5.8	5.9	11%	12%	12%	\$ 16.9	\$ 18.6	\$ 19.1
Paulding	1.4	1.5	1.5	4.7	4.8	4.9	9%	9%	9%	\$ 14.3	\$ 14.7	\$ 15.3
Rockdale	3.6	3.5	3.5	4.9	5.1	5.1	22%	23%	23%	\$ 6.8	\$ 7.8	\$ 8.0
Total	2.5	2.6	2.6	136.0	148.4	153.1	12%	13%	13%	\$ 286.9	\$ 345.7	\$ 364

Notes:

Present Value is determined using an interest rate of 3%

Variations in forecasted water savings amongst counties depends on the existing plumbing stock, age of infrastructure, and demographics.

RECOMMENDED WATER CONSERVATION PROGRAM (B)

Water Conservation Program B was selected as the recommended program. Although all three water conservation programs were evaluated as cost effective for the local water provider, Program B represented an approach that would be widely accepted. This aggressive water conservation program will achieve significant savings and maximize returns on investments in the program. Implementation of Program B realizes the majority of the water savings available while Program C requires spending 5% more (or \$19M) to gain less than 5 MGD of additional water savings. Implementing the measures in Program B provides additional water conservation benefits on the foundation provided by the existing measures without exceeding the number of measures that a local water provider can realistically implement. However, the additional measures in Program C may be held in reserve for implementation as substitution measures if one or more of the measures in Program B is determined to either be too difficult to implement, or if expected water savings do not materialize.

FUTURE WATER DEMAND WITH OPTION PACKAGES

Figure 4-3 is a graphical representation of how the three option packages would reduce overall water demands in the Metro Water District below the baseline level (which includes natural conservation related to current plumbing codes). By 2035, the average water savings across the Metro Water District would be as follows:

Program A – 7% (76 AAD-MGD)

Program B – 8% (88 AAD-MGD)

Program C – 8% (93 AAD-MGD)

The savings listed above are beyond the 5 percent (60 AAD-MGD) Metro Water District benefits achieved by 2035 through natural replacement associated with the plumbing code.

Beyond 2006, a total conservation benefit of 13 percent over current water use trends is expected from conservation program B in combination with natural replacement benefits. The Metro Water District currently uses water efficiently with a relatively low adjusted per capita water use; therefore the 13% reduction is aggressive. This reduction is also significant given the age of the housing stock and extent of the distribution systems in the Metro Water District. Comparisons of per capita demands and percent savings through conservation can often be misleading. Communities using water very efficiently will not be able to achieve the same large percent reductions as communities who are not as efficient with their current water use. Newer urban areas have more efficient housing stock and therefore may have lower per capita demands than older communities.

The 13 percent water savings reflects only conservation beyond 2006 and does not incorporate total savings anticipated since 2001, when the Metro Water District began comprehensive regional water conservation planning. It is anticipated that there will be a 20 percent reduction in per capita use from 2001 to 2035. See the ‘Comparison with 2003 Plan’ discussion at the end of this Section for an explanation of how this compares to water saving estimates in the 2003 plan.

FIGURE 4-3
Metro Water District Annual Average Day Water Demand Forecasts (2006-2035)

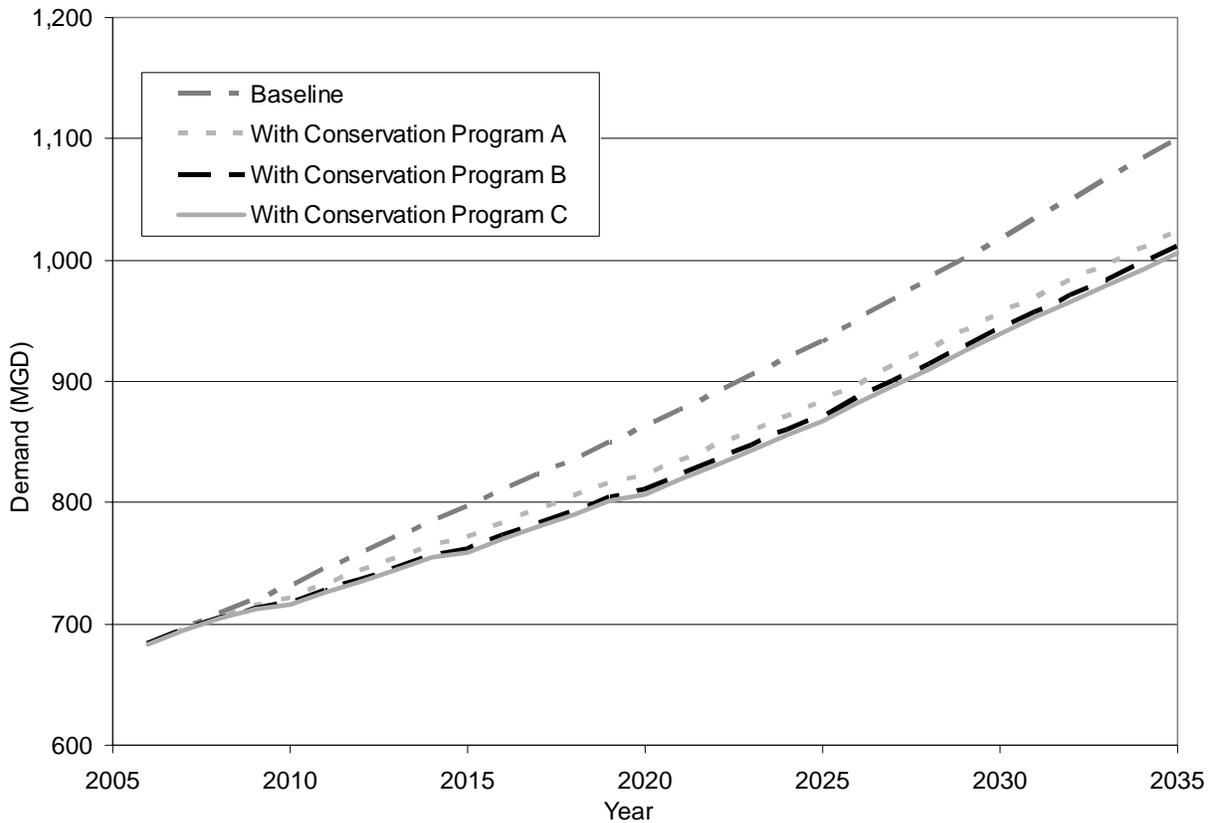


Table 4-6 provides the 2035 average annual day water use forecasts for each county in the Metro Water District after the savings from the recommended water conservation program have been applied. The water demand forecasts that include the savings from water conservation will be used in the remainder of the Water Supply and Water Conservation Management Plan to determine water supply and facility needs.

TABLE 4-6
Metro Water District 2035 Water Use Forecasts by County

County	2035 Forecasts		
	Without Conservation AAD-MGD	Baseline AAD-MGD	Recommended Conservation Program AAD-MGD
Bartow	55.4	52.8	46.4
Cherokee	50.5	47.8	44.6
Clayton	45.0	42.7	40.0
Cobb	121.0	115.3	108.7
Coweta	33.5	31.9	29.3
DeKalb	123.4	116.0	106.4
Douglas	29.7	27.5	24.5
Fayette	26.0	24.3	23.1
Forsyth	69.5	66.9	59.7
Fulton	263.2	250.0	228.2
Gwinnett	161.5	153.6	140.4
Hall	57.3	54.3	52.0
Henry	49.2	46.9	43.4
Paulding	52.0	49.2	47.2
Rockdale	22.0	20.2	16.9
District Total	1,159.2	1,099.4	1,010.8

Water conservation is essential to meeting projected Metro Water District water demands. By the year 2035, the planned level of water conservation could reduce water demands by approximately 88 AAD-MGD, or 8 percent District-wide (beyond the savings achieved through the plumbing code). This can be achieved through more efficient indoor and outdoor water use and reduction of water losses by local water providers through system leakage detection and elimination programs. Each of these water conservation measures are described in greater detail in Section 5, Water Conservation Program.

COMPARISON WITH 2003 PLAN

The DSS model used for the water conservation analysis for the 2003 Plan as well as for the 2008 Plan Update looks at existing water use and forecasts forward. Many changes have occurred since 2003 in population, water use, drought restrictions, natural conservation due to plumbing code changes, and the Metro Water District’s aggressive water conservation program.

The Metro Water District’s first Water Supply and Water Conservation Plan was adopted at the end of 2003. In four short years, the local governments and water providers in the Metro Water District made great progress in implementing the Plan’s conservation requirements. This update continues and improves upon the Metro Water District’s commitment to water conservation.

This Plan update shows the Metro Water District will use less water and be more efficient in 2035 compared to the 2003 Plan estimates for 2030. With an additional 5 years of growth and

development, Table 4-7 shows that both the total consumption and the total per person forecasts are lower as compared with the 2003 Plan.

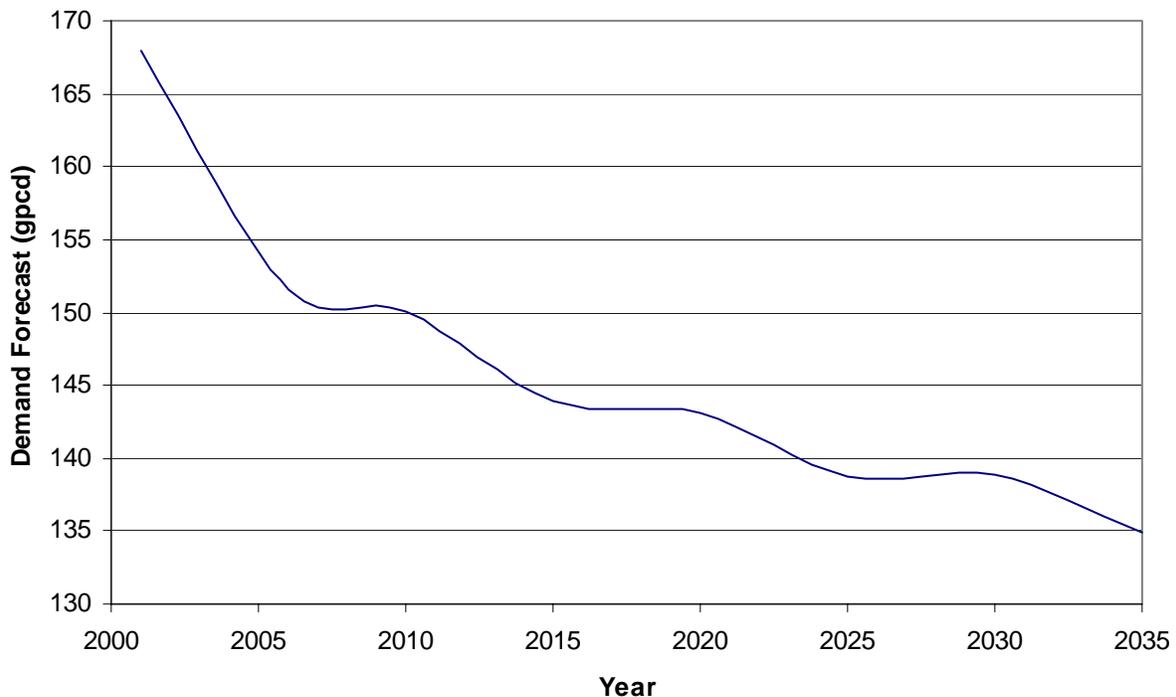
TABLE 4-7
Comparison of 2003 Plan and this Plan Update

Comparison	2003 Plan (2030 forecasts)	Draft Update (2035 forecasts)
Planned Future Water Demand with Recommended Conservation Program	1,081 AAD-MGD	1,011 AAD-MGD
Future Per-Capita Demand Under District Plan	138 gpcd*	135 gpcd*

* Total gallons per capita per day – this number reflects all the water used in the Metro Water District divided by the population within the Metro Water District.

Figure 4-4 shows a 20% reduction in per capita demand from 2001 to 2035 based on implementation of the Plan update. The starting point of 168 gallons per capita per day (gpcd) reflects billing data for 2001 collected for the 2003 Plan. The 2006 data shows a 151 gpcd, used in this Plan update. The end point reflects the benefit of the conservation program in this Plan update.

FIGURE 4-4
Metro Water District Overall Per Capita* Water Use Trends (2001 – 2035)



* Overall per capita = total water demand supplied by public water systems in the District divided by the District's population.

Section 4: WATER CONSERVATION ANALYSIS

The water conservation measures in this Plan update go beyond the measures in the 2003 Plan. This update includes:

- The 10 water conservation measures from the 2003 plan
 - Conservation pricing
 - Replace older, inefficient plumbing fixtures
 - Pre-rinse spray valve retrofit education program
 - Rain sensor shut-off switches on new irrigation systems
 - Sub-meters in new multi-family buildings
 - Assess and reduce water system leakage
 - Conduct residential water audits
 - Distribute low-flow retrofit kits to residential users
 - Conduct commercial water audits
 - Implement education and public awareness plan
- 3 of those 10 water conservation measures are strengthened
 - Irrigation meter pricing at 200 percent of the first tier rate
 - 1.28 gpf toilet rebate program only by 2014
 - Minimum local education requirements
- 2 new water conservation measures are added
 - Install 1.28 gpf toilets & low flow urinals in government buildings
 - Require new car washes to recycle water

This Plan update identifies future water conservation opportunities based on current water use patterns. This Plan's updated conservation forecasts are based on more accurate data:

- Updated population and employment forecasts
- Housing stock age data reflects increased emphasis on local census data and the 2006 American Community Survey which shows our housing stock is younger and more water-efficient.
- Base year water use data from 2006 provides a lower starting point of 151 gpcd for forecasts versus 2001 data of 168 gpcd used in the 2003 Plan; reducing future water demand forecasts.

The availability of better data for the Plan update produces a more robust plan while maintaining the same commitment to water conservation. In fact, comparing the per capita demand from the beginning of the regional water conservation program to the 2035 per capita demand, the Plan update demonstrates a 20% reduction in demand.

FIGURE 4-5
Comparison of Baseline and Plan with Conservation between 2003 and 2009 Plans

