VI. URBAN WATER MANAGEMENT PLAN PROGRAMS

A. INTRODUCTION

This chapter describes and evaluates the District's Urban Water Management programs for the 2006 - 2010 period. It describes the water conservation programs that were in effect prior to preparation of the District's previous *Urban Water Management Plans,* as well as the programs that are being continued and refined in the present Plan. This chapter also draws upon the conservation programs described and developed in the SFPUC's *Wholesale Customer Conservation Program.*[1]

The Mid-Peninsula Water District is a signatory to the *Memorandum of Understanding regarding Urban Water Conservation in California* (MOU) and is therefore a member of the California Urban Water Conservation Council (CUWCC). The MOU contains 14 demand management measures that signatories to the MOU agree to implement as part of their good faith efforts to optimize water savings. The CUWCC calls these demand management measures Best Management Practices (BMPs). In the *Urban Water Management Planning Act* they are termed DMMs (Demand Management Measures).[2] The BMPs/DMMs are examples of sound water management practices that have been found to be cost effective and practicable in most instances throughout California. The BMPs are generally consistent with the water conservation practices that have been implemented by the Water District under the existing *Urban Water Management Plan* (and in some cases, for much longer). Accordingly, the District's water conservation programs presented later in this chapter have been organized in a format that is consistent with the list of BMPs that are being implemented statewide by the CUWCC.

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[1] SFPUC, *Wholesale Customer Water Conservation Potential,* 2005.

[2] In 1995, when the previous UWMP was prepared the MOU had 16 BMPs which were also listed in the *Urban Water Management Planning Act.* The CUWCC revised the BMPs in 1998. Senate Bill 553, adopted on September 28, 2000, revised the *Urban Water Management Planning Act* to again make the DMMs and BMPs consistent.

B. PREEXISTING WATER CONSERVATION PROGRAMS

A number of important water conservation policies and practices had been implemented by the District prior to the preparation of its 1995 *Urban Water Management Plan.* These measures include the following:

1. METERING

All District water connections are metered. This practice is recognized as sound urban water management practice as well as a basic water conservation measure (DMM 4). The District's sources of supply are also metered, and the supply meters can be cross-checked against sales data to allow the District to identify water lost in the transmission/distribution system.

2. SYSTEM PRESSURE CONTROL PROGRAM

The District operates with 9 pressure zones and has installed a number of pressure reduction stations at locations throughout the District so as to reduce high static pressures in its system and at individual water connections. Pressure management is particularly important for the District because of the steep topography in the service area. Pressure reducers help conserve water by reducing the quantities lost when fixtures leak or water is inefficiently applied.

3. LEAK REDUCTION

The amount of water lost in the transmission and distribution system has historically been very low and is expected to remain low as a result of the District's pipeline replacement, meter testing and leak detection programs.

Pipeline Replacements. The District has an on-going program to replace old and deteriorated pipelines, which account for most leaks. In the past few years the District has invested over $250,000 per year in small pipeline replacement projects yearly. Pipeline segments are selected for

replacement based on age and leakage records. The District expects to continue this program for the term of this Plan, and beyond.

Free Leak Detection Service. Upon request, District personnel will check for water leakage in a customer's own plumbing system. The District does not charge for this service.

Alerts by Meter Readers. The recorders used by the District's meter readers are set to signal when comparably high or low readings are entered. These alerts are investigated by a customer service technician who checks for meter malfunctions. If none are found, the technician pressure tests the customer's system to look for leaks, plumbing malfunctions, etc. and recommends corrective actions.

4. Home Retrofit of Plumbing Fixtures

The District has been providing free water service retrofitting devices since 1978 and continues to provide free kits to customers requesting them. The kits consist of low-flow showerheads, faucet aerators, toilet displacement devices, and dye kits for toilet leak detection. Thousands have been distributed since the program began. The availability of these home retrofit devices is publicized through bill stuffers and public events.

5. Leak Repairs

District staff repairs all distribution system leaks as quickly as possible after they are discovered.

6. Public Education

Since the 1977-78 drought, the District has had an on-going public relations campaign to encourage water conservation. Representatives of the District's management staff have spoken on water conservation at local service clubs, neighborhood association meetings, etc. In addition, the District's semi-annual Newsletter to customers typically includes one or more articles on water conservation topics, and water conservation information is provided on the District's web site.

For the Belmont Community Fair the District has developed a model of water system that shows how water flows through Belmont and how water is used productively and how it is wasted. The District also has give-away-bags with water tips, water bottles with water tips, a small ruler with leak information, and magnets with conservation messages.

The District has purchased and developed a number of pamphlets, flyers and information sheets containing water conservation information. These are available at the District office or can be mailed upon request. The following is a partial list of the brochures and leaflets that are currently available from the District:

- Water - A Vital Resource
- Water Conservation
- Sunset Magazine reprint on water conserving plants and garden care
- A bumper sticker: Rain or Shine, There's Never Enough Water to Waste
- About Water Emergencies
- Let's Learn About Water
- Why Waste Water?
- Water Conservation Hints

7. Demonstration Garden

In 1995 the District developed a demonstration garden featuring 17 examples of low water use plants from a palette of California native shrubs and flowers. When a new District Office was completed (at a new location) in 2000, it's landscaping was designed to serve as a demonstration site for water conserving landscape plantings.

C. DEMAND MANAGEMENT PROGRAMS — 2006 - 2010

1. DMM 1. WATER SURVEY PROGRAMS FOR SINGLE-FAMILY AND MULTI-FAMILY RESIDENTIAL CUSTOMERS (BMP 1)

PAST EFFORTS. The District routinely responds to customer concerns about possible leaks or high water bills. In addition, the District's meter readers and billing clerks have been trained to check for unusual changes in water consumption by comparing past water usage with the current billing data when it is being collected or processed. Customers are notified of any apparent anomalies and are offered free water conservation kits and/or assistance from District staff in checking for potential causes of the identified increases in water use.

As a result, operations personnel have visited many homes and business establishments to conduct pressure tests and plumbing inspections to determine if there is a leak or other source of wasted or misused water. A number of malfunctioning toilets, faucets and irrigation devices are discovered and repaired annually as a result of this program.

This program continues to be implemented on an on-going basis. Currently, it is felt that this ad hoc approach of focusing on customers with self-reported problems or unusually high consumption is the most efficient method of allocating the District's limited staff time that is available for water audits.

Residential water surveys were evaluated in the DSS Model for SFPUC Wholesale Customers, and for Mid-Peninsula, it was determined that the benefit-cost ratio would be 1.8 with a projected cost of $1,353 per million gallons of water saved. While positive, the benefit-cost ratio is marginal, especially when compared with some of the other water conversation programs the District could implement.

IMPLEMENTATION. During the term of this UWMP, the District will investigate the feasibility of designing a cost-effective residential water survey program. The District has a very small staff and would most likely have to engage a specialized outside contactor to design a program and perform the surveys. At the current cost of water, the benefits from a survey program may not be

sufficiently high to warrant the investment, particularly considering the benefits of investments in other DMMs, as described below.

Residential Water Survey programs will be considered in future Urban Water Management Plans, and, assuming that the cost of water from the regional system rises as projected, residential surveys will become more cost-effective in future years. The District will continue its efforts to maximize distribution efficiency and reduce the volume of lost and unmetered water, and will also continue to aggressively respond to all customer concerns regarding leaks and unusually high water usage. The District staff believes that the volume of un-metered water, which is already low by industry standards, will be further reduced during the term of this Plan as a result of continuing pipeline replacement programs, the current system-wide water audit (DMM 3, below), and anticipated meter upgrade programs.

2. DMM 2. Residential Plumbing Retrofit

Past Efforts. The District has operated a voluntary residential water conservation program almost continuously since the severe drought of 1976-77, although the program has been given extra emphasis during the years when mandatory conservation has been in effect.

The program consists of the distribution of water conservation kits containing informational packets, toilet displacement devices, low flow showerheads and dye tablets for toilet leak detection. It is thought that over 3,000 residential retrofit kits have been distributed since 1986.

Since 1992, all new and replacement plumbing fixtures sold in the state have been required to comply with applicable water conservation specifications. While the District has had relatively few new residential connections in the past 5 years (less than 120), homeowner remodeling work is common, and results in the replacement of many old plumbing fixtures with new water conserving fixtures for reasons of aesthetics, convenience and reduced water consumption. As noted above, in Table 9, the plumbing code changes are expected to lead to a 7.8% reduction in overall demand from the Suburban purchasers by 2030. This would translate into a 296 AFY cumulative conservation reduction in demand from the Mid-Peninsula Water District system.

FURTHER IMPLEMENTATION. During the term of this Plan, the District will continue the distribution of low flow showerheads, faucet aerators, toilet displacement devices (as needed) and toilet flappers (as needed) to all customers, (the majority of whom are residential users living in pre-1992 homes). This would be done in conjunction with DMM 7 (Pubic Information) and would be intended to also meet the compliance criteria established by the CUWCC for this BMP (BMP 2).

The DSS model Conservation Measures Evaluation for this DMM calculated a benefit-cost ratio for MPWD for this DMM of 2.6. The projected cost of implementation for each million gallons of water saved was calculated to be $799.

The District's program of distributing home water conservation kits in response to customer concerns about high water bills or in the course of investigations for potential residential leaks will be continued (DMM 1).

3. DMM 3. DISTRIBUTION SYSTEM AUDITS AND LEAK DETECTION AND REPAIR (BMP 3)

PAST EFFORTS. The District completes a leak detection survey of the entire distribution system every other year. Each survey requires about a month and is completed by an outside contractor working at night (when it is quieter) with highly sensitive listening technology. Any leaks found in the distribution system are repaired as quickly as possible.

Daily monitoring of system pressures from around the District's complex system of pressure zones and storage tanks allows the staff to identify anomalies in the operating parameters that may indicate new leaks. Suspect areas can be inspected and monitored to quickly identify leaks, which are then be repaired. Pipeline segments that show a history of multiple leaks are routinely replaced, either by District staff or by outside contractors.

The District also tests all large meters bi-annually and conducts random tests of small meters from various locations around the District annually.

The District has not had unmetered water volumes higher than 9% of production in any of the past 30 years; since 1990 unmetered water has ranged from a low of 1% in 1996 to a high of 7.7% in 2000. Over the past 6 years it has averaged 4.2%. Since a portion of unmetered water can be accounted for (i. e. fire fighting, hydrant flushing, etc.) the level of unaccounted-for water is even lower

IMPLEMENTATION: BMP 3 requires system audits when un-accounted for water exceeds 10% of production, a level the District has not exceeded in over 30 years. Because of the low level of unaccounted-for water the District is in full compliance with BMP 3.

The District recognizes the value of system audits and leak detection programs in reducing water losses and in minimizing the volume of unaccounted-for water. Leak detection efforts, pipeline replacements, and all related efforts to maintain a tight and efficient distribution system will be continued throughout the term of this Plan. In addition, the District is reviewing options for a meter replacement program, which could further reduce lost water, as well as operational costs. (See DMM 4, below.)

4. DMM 4. METERING WITH COMMODITY RATES (BMP 4)

CURRENT PROGRAM. The Mid-Peninsula Water District is fully metered and bills all customers by volume of use. The current rate structure provides financial incentives for conservation by its low volume residential customers. It provides for a low ("Lifeline") charge of $1.36 per unit for the first 2 units per monthly billing period, a higher rate of $3.24 per unit for 3-30 units, and a still higher charge of $3.84 per unit for 31 units or more per billing period. All non-residential (commercial) customers are billed on a uniform, volume of use, basis. Currently they pay $3.24 per unit.

IMPLEMENTATION. This BMP is being fully implemented. The inclining block rate structure applies to all single-family home residential customers, which account for almost 57% of the District's water sales.

5. DMM 5. LARGE LANDSCAPE CONSERVATION PROGRAMS AND INCENTIVES (BMP 5)

PAST EFFORTS. The largest irrigators in the District include the City of Belmont, with irrigation meters at Hallmark Park, Twin Pines Park, Island Park and others, Caltrans, with several irrigation meters for landscaped rights-of-way, and the College of Notre Dame with several water meters for landscape accounts. The cost of water has proven to be the primary incentive for these users to carefully manage their water usage and initiate water conservation efforts.

IMPLEMENTATION: The District will work with its largest irrigation water customers to support all efforts to improve efficiency and encourage conservation. The effort will start by identifying existing dedicated irrigation meters (now classified in the "Other" category). Subsequently, the staff will consider the feasibility of developing recommended water use budgets for the 10 largest use dedicated irrigation meters. The budgets would be equal to the reference evapotranspiration rate for the Belmont area (See Table 2) applied to the area irrigated from each meter. Customers could be notified of the water budgets through messages on water bills for irrigation accounts showing the relationship between the water budget and actual consumption.

For large commercial or institutional accounts without dedicated irrigation meters (but with large landscape irrigation use) the District will offer the following services when found to be cost effective:

a. Preparation of a voluntary water use budget;
b. Installation of a dedicated landscape water meter.

Implementation of this program would generally satisfy the implementation criteria for BMP 5. In addition, the District will continue to maintain the water efficient demonstration garden at the District's headquarters.

6. DMM 6. HIGH-EFFICIENCY WASHING MACHINE REBATE PROGRAM (BMP 6)

PAST EFFORTS. From 2001 through 2004, the District offered $75.00 rebates to residential customers purchasing high-efficiency clothes washers with a water use factor of 9.5 or less, in conformance with the CUWCC criteria for BMP 6. The rebate program was conducted jointly with BAWSCA and participating member agencies. Comparable rebates were available from PG&E, bringing the total rebate incentive to $150 for each clothes washer. During this time, the Mid-Peninsula awarded 330 rebates, with the number of rebates increasing with each year. The CUWCC BMP Cost and Savings

Study estimates that the average water savings for a high-efficiency clothes washer is approximately 5,100 gallons a year. Therefore, the District is receiving a conservation benefit of as much as 1.68 mg a year (5.16 AFY) with the rebates of the past 4 years. If the machines remain in service for 12 years, the incentives (which cost the District approximately $25,000) will have conserved over 62 acre-feet of water, for an investment cost of less than $403 per acre-foot – roughly $140 below the current SFPUC wholesale cost of water and $675 below the projected wholesale cost of SFPUC water in 2015.

IMPLEMENTATION. The District intends to continue offering High Efficiency Washing Machine Rebates through 2006. In 2005, BAWSCA stopped awarding rebates on machines with a 9.5 water factor, and increased the rebate level to $150 on machines with a 5.5 water factor. In January 2007, the California clothes washer standards tighten, and all new washing machines sold in the state will have to meet the 9.5 water factor standard. At that time the District, and other BAWSCA participants, will re-evaluate the current program and consider whether to continue to provide rebate incentives for the most efficient washing machines.

The DSS Model confirms that DMM 6 is cost-effective for the District. It indicates that the washing machine rebate program has a favorable 6.9 benefit-cost ratio for the Mid-Peninsula District with a projected cost of $304 for each million gallons saved, and a potential long-term demand reduction of 2.2 AFY.

7. DMM 7. PUBLIC INFORMATION (BMP 7)

The Mid-Peninsula Water District has an on-going public information program and has conducted community outreach and public education activities in past years. (See B, 7, above.) In the early 1990's the public information program efforts were aimed at motivating people to respond to the specific drought emergencies that were occurring, while in recent years the public information efforts have focused on general water conservation and wise water use.

IMPLEMENTATION: Activities that have been accomplished in past years and will be continued in the coming 5-year UWMP cycle include the following:

Brochures and Flyers. The District typically prepares and mails Newsletters to all customers on a semi-annual basis. The Newsletters have included articles and information on water conservation issues and have informed customers of the types of assistance the District can offer to help customers conserve. They have also included yearly water quality reports to customers.

Water conservation messages such as "Water Conservation Hints" and "Why Waste Water" are also routinely included in District communications with customers questioning bills, or raising other related questions.

Water conservation flyers and brochures have been kept at the reception desk in the District Office and made available to interested customers coming to pay bills or make inquiries. Many brochures have been distributed through this means.

In the event of a drought, or pending drought, the District will use general mailings, separate from the monthly billings, to announce water conservation programs, whether voluntary or mandatory, and to appeal to customers to reduce their water consumption. These efforts would be supported with stepped-up public information initiatives using a variety of local media outlets.

Bill Stuffer Inserts. The District has the ability to distribute informational water bill inserts. They can be obtained from BAWSCA, AWWA and other sources, or developed in-house. The District will continue to use bill stuffer inserts to communicate with customers throughout the term of this plan.

Past Usage Information. The District includes past usage information on customer bills and will continue to do so in coming years.

In past dry years, mandatory water conservation programs implemented by the District have been announced with ads in the *San Mateo Times* and *The Independent*. In the event of a future drought, the District will again implement an active advertising effort to reinforce the need for active citizen participation in the conservation effort.

Demonstration Gardens. The District maintains a demonstration garden at the District headquarters at 3 Dairy Lane, and a second demonstration garden at 1513 Folger Drive in Belmont

(the former District office). The gardens showcase drought tolerant landscape plantings that are appropriate for Belmont. All the plants are labeled so that customers can identify them for purchase at local nurseries.

Service Club Presentations. The General Manager and Board Members make presentations to local service clubs (Chamber of Commerce, Kiwanis, SIRS, etc.) whenever requested and are available to make presentations to homeowner and neighborhood associations or other community groups on water supply and water conservation related topics. These efforts will be continued through the term of this plan.

Web Site. The District maintained a web site has a section on Water Conservation. It provides information about the District's rebate programs, free water conservation kits, and water conserving landscaping and yard irrigation practices.

8. DMM 8. SCHOOL PROGRAMS (BMP 8)

PAST AND CURRENT ACTIVITIES. Beginning in 1999, Mid-Peninsula sponsored the participation of 20 students in Water Kollege, a week-long summer educational camp developed for the Water District by Kollage Community School For the Arts in Belmont as a creative and user-friendly approach to water conservation at the elementary school level.

From these roots the "Our Water" program was developed and adopted by the Bay Area Water Supply and Conservation Agency (BAWSCA). As a BAWSCA member, Mid-Peninsula has made the "Our Water" program available to students within the District. In the past year, the District and BAWSCA sponsored the "Our Water" program for fourth grade students in the Belmont/Redwood Shores School District, and provided scholarships for 15 students from Nesbit Elementary School to attend summer camps and Kollage Community School.

"Our Water" is an innovative curriculum for the fourth grade that combines visual, literary and performing arts instruction with water conservation lessons from the Water Education Foundation's "California Water Story." As the "Our Water" students learn valuable lessons in water conservation, they create original works in visual art, poetry, theater, music and dance. At the session's conclusion, children present their works in a live performance where parents and the

community can witness their accomplishments. Works of art are also displayed for the public to see. In June 2002, "Our Water" received the prestigious "Clair A. Hill Award for Excellence" from the Association of California Water Agencies.

Although the District is pleased with the "Our Water" program, it has been informed that it may not be available in future years, so other options for educational programs are being investigated.

IMPLEMENTATION. If the "Our Water" program continues to be offered, the District will work with BAWSCA and faculties of the Belmont/ Redwood Shores Elementary School District to support its continued implementation in the local schools. If it is not available, the District will then offer another option, such as WaterWise program, under which participating students are provided with kits containing water efficient products and educational materials, which they then install, monitor and evaluate under the guidance of the program staff. In any event, the District will continue to include a line item in the annual budget for funding public information and school programs (DMM 7 and 8).

9. DMM 9. CONSERVATION PROGRAMS FOR COMMERCIAL, INDUSTRIAL AND INSTITUTIONAL (CII) ACCOUNTS (BMP 9)

PAST EFFORTS. The District has only about 500 commercial accounts, 50 industrial accounts and 100 institutional/public authority accounts. However, in aggregate they average about 27% of total water sales. The District has responded to requests for water audits and conservation suggestions to all customers in these categories as they have been made. Many of the Institutional accounts are for irrigation meters, which are addressed in DMM 5.

The District reviews the landscape plans and inside water fixture appliances for all new commercial/industrial customers. This ensures landscaping and water fixtures that require low water use are installed before the new customer is connected to the District's system.

DESCRIPTION. The implementation program for BMP 9 is quite specific and very staff intensive. It would require the District to identify and rank all CII users by sector, contact the largest accounts and offer and conduct water surveys for them. BMP 9a calls for establishing a low flow toilet rebate program for these customers.

The SFPUC *Wholesale Customer Water Conservation Potential* study evaluated several commercial water conservation measures that are essentially equivalent to BMPs 9 and 9a. According to the DSS Model results, commercial water audits would have a favorable benefit-cost ratio (1.9), although other options for encouraging conservation in these sectors would have much greater benefits for comparable costs.

IMPLEMENTATION. Based on relatively unfavorable benefit-cost benefit ratio projected for CII water audits, the District will claim an exemption from BMP 9, and will focus on other, more cost-effective programs for the CII sector during the term of this UWMP.

A low flow toilet and urinal rebate program for CII customers, consistent with BMP 9a, will be developed in 2006 and continued though the term of this Plan. The DSS model predicts that this program would have a benefit-cost ratio of 12.5, costing the District an estimated $169 per mg saved ($519 per acre-foot saved).

The District will also continue its program of offering low-flow spray-rinse nozzles (1.6 gpm) to restaurants and commercial kitchens in its service area. The District initiated this program in 2004, and approximately 30 nozzles have been installed to date. According to the DSS Model, Mid-Peninsula would have a cost-benefit ratio of 15.1 for this conservation measure, with an implementation cost of $134 for each mg saved. The average long-term water savings would be as much as 5.6 AF a year.

Other conservation programs focused on the CII sectors that will be evaluated and implemented, as feasible, during the term of this Plan will include programs in the hotel/motel sectors such as the EPA's WAVE software, focused water audits and a financial incentive program for hotel retrofits. The District will also consider requiring 0.5 gallon per flush urinals in all new commercial buildings. All of these measures were reviewed in the DSS Model and resulted in benefit-cost ratios of 6 or greater.

10. DMM 10. WHOLESALE AGENCY ASSISTANCE PROGRAMS (BMP 10)

DESCRIPTION. This demand management BMP requires wholesale water suppliers to provide financial incentives, or equivalent resources, to their retail water agency customers for the advancement of water conservation efforts.

IMPLEMENTATION. Since the Mid-Peninsula Water District is not a wholesale water supplier, this BMP would not be applicable to the District. As a purchaser of water from the San Francisco Public Utilities Commission, the District has taken advantage of some of the programs offered in conjunction with BAWSCA, including the "Our Water" school program, and will continue to do so in the future.

11. DMM 11. CONSERVATION PRICING (BMP 11)

EXISTING RATE STRUCTURE. The Mid-Peninsula Water District has a 3-tier inclining block rate for all residential customers and a uniform rate for all commercial, institutional and irrigation accounts. The residential rates have a low lifeline fee of $1.36 per unit for the first 2 hcf units (1 unit = 100 cubic feet = 748 gallons) per month or an average of approximately 50 gallons/day per residence. The rates for higher usage are $3.24 for 3-30 units per month and $3.84 for any consumption in excess of 31 units per month. Commercial rates are $3.24 per unit. In addition, all customers are billed a monthly service charge determined by the size of the meter.

The Mid-Peninsula Water District has no jurisdiction over sewer rates, which are set by the Cities of Belmont and San Carlos. The City of Belmont charges by volume of use which is based on the Water District's sales to individual accounts during wet weather months. The current rate is $X .XX/hcf, based on the annualized average of water consumption in the winter months. The sewer charges are billed annually in conjunction with the collection of property taxes.

IMPLEMENTATION. The Water District will continue implementing a conservation pricing rate structure.

12. DMM 12. CONSERVATION COORDINATOR (BMP 12)

DESCRIPTION. This BMP calls for the agency to designate a water conservation coordinator and support staff (if necessary) whose duties are to include the coordination and oversight of conservation programs, the preparation and submittal of annual BMP Implementation Reports, the coordination of conservation programs with operations staff and with management, and related activities.

IMPLEMENTATION. The District's Operations Manager and the Office Manager share a variety of water conservation related responsibilities. The Office Manager has focused on the District's Public Information activities including the HEWS and ULFT rebate programs, the Belmont Community Fair, and the school programs, while the Operations Manager has been responsible for implementing the low-flow spray rinse valve retrofit program, filing the annual BMP compliance reports, and administering preparation of the UWMP.

Over the term of this Plan, the District will consider adding a Water Conservation staff position, so it can implement additional programs effectively.

13. DMM 13. WATER WASTE PROHIBITION (BMP 13)

DESCRIPTION. This BMP calls for water agencies to enact and enforce certain prohibitions against wasteful water use on an on-going basis, i.e. during drought and non-drought periods. The ordinances should prohibit, at a minimum, gutter flooding, non-recirculating fountains, non-recirculating systems in any new car wash or commercial laundry installations, and any new single-pass cooling systems.

PAST ACTIVITIES. The Mid-Peninsula Water District's Rule 21 has prohibited the waste of water, as well as certain non-essential uses of water, since 1991. Rule 21 provisions address both normal operating conditions and water shortage emergency conditions. The rule provides for potentially more stringent penalties for non-compliance during water shortage emergencies, up to and including citations for a misdemeanor violation. In non-emergency times the District still has the ability to issues warnings and, ultimately, to discontinue service if the provisions of Rule 21 are

violated. The wasteful water use practices, in both drought and non-drought times, that are prohibited by Rule 21 include the following:

a) Use of potable water for backfill consolidation or other non-domestic construction purposes when reclaimed water or water from other sources is available;

b) Use of water when the customer has been given notice to repair broken plumbing, sprinkler, or irrigation systems and has not done so after a warning setting a reasonable time for repair;

c) Use of water that results in flooding or runoff to gutters, streets, storm drains, watercourses, or other unlandscaped areas;

d) Use of water for washing vehicles, sidewalks, buildings, or other hard surfaced areas with a hose, unless the hose has a positive shutoff nozzle or valve.

In addition, Rule 21 expands the definition of prohibited water uses during declared water emergencies to include such uses as the filling of new swimming pools and installation of new water dependent landscaping.

IMPLEMENTATION. With Rule 21, the Mid-Peninsula Water District has appropriately implemented DMM 13.

14. DMM 14. RESIDENTIAL ULTRA LOW FLUSH TOILET REPLACEMENT (BMP 14)

PAST ACTIVITIES. The District has never instituted a program of rebates or other incentives to promote the installation of ultra-low-flow toilets.

IMPLEMENTATION. The SFPUC *Wholesale Customer Water Conservation Potential* study indicates that Mid-Peninsula's benefit-cost ratio for a residential ULFT rebate program would be 1.0 and the cost of water saved would be about $1,957 per mg. As noted above, in the discussion of DMM 9, the Benefit-cost ratio for rebating commercial toilet replacements would be much higher (12.5).

The District will consider developing a ULFT rebate program for both residential and commercial customers in 2006, and implementing it over the remaining term of this Plan. However, because there are many other, more cost effective conservation options, the District may choose to exempt itself altogether from Residential ULFT Rebate program specified as BMP 14.

15. Other Potential Conservation Measures

The SFPUC's *Wholesale Customer Water Conservation Potential* study identified 32 potential water conservation measures that could be potentially effective in the areas served by the Suburban purveyors. Some would not be cost effective for Mid-Peninsula, while others are included in the DMM's addressed above. However, several conservation measures that are not DMMs but may be cost effective and beneficial for the District were identified by the DSS model. In addition, the District is investigating the feasibility of a large-scale meter replacement project, which could have significant operational and conservation benefits. All of these measures are described below:

1. Meter Replacement Program

The purpose of calibrating and/or replacing water meters that have been in service for some time is to a) enhance revenue by ensuring payment for all water sold, b) encourage conservation by ensuring that customers pay for all water delivered, and c) increase the agency's ability to account for its distributed water. This program is an integral part of the District's water management strategy, but is not included on the list of BMPs.

Currently a substantial portion of the District's smaller meters are approaching the end of their useful life, and are obsolete, in that they require time-consuming visual reads and manual recording. The District is considering upgrading the meter stock to electronic touch read meters, which are also more accurate at very low levels of flow. If implemented, the Meter Replacement Program could further reduce the District's proportion of unaccounted-for water. Since unmetered water volumes are already very low, the conservation benefits of this program, relative to its cost, would not be very high. However, the program would greatly reduce meter-reading costs, which are among the District's highest operational expenses.

2. Require ULFT Retrofitting at Time of Sale of Existing Buildings.

This program would require that a certificate of compliance be filed with the District in conjunction with the sale of any residential or commercial building. The certificate would verify that a plumber has inspected the property and that ULF toilets are either present or were installed at the time of sale, or before close of escrow. The DSS model projected a cost-benefit ratio of 7.3 for this conservation measure with a cost of $274 per mg saved and a potential long-term conservation benefit of 56 AFY.

3. Xeriscape Education and Homeowner Irrigation Classes.

These conservation efforts involve sponsorship of staff training for stores where plants and irrigation equipment is sold to educate sales people about the benefits of low water use plants and efficient irrigation. In addition, the District would sponsor classes for homeowners at these stores or other suitable venues to provide tips and training on water efficient irrigation using drip systems, smart controllers, low volume sprinklers, and irrigation schedules appropriate to the local climate.

The DSS model calculates that these programs would have very favorable cost-benefit ratios of 12.7 and 6.2 respectively, and could result in conservation savings of up to 63 AFY with relative modest investments. The modeled costs were $146 per mg saved for Xeriscape Education and $295 per mg saved for Homeowner Irrigation Classes.

4. Require Sub-metering of Multi-Family Units. This conservation measure would involve adopting and enforcing a District ordinance that requires the installation of a separate water meters for each unit in a multi-family residential building. Research has indicated that indoor water use is about 10% lower when residents are responsible for paying their own water costs. The DSS model predicts a 6.1 benefit cost ratio for this program, with a cost of about $312 per mg saved, although the long-term average annual water savings would be only 1.1 AFY, because it is not expected that a large number of new multi-family buildings will be built in Belmont.

5. Enforce Landscape Requirements for New Landscaping Systems.

This conservation measure involves the active enforcement of requirements on the use of native or low-water-using plants for new landscaping. The enforcement procedures would require proof of compliance with existing State (AB 235) requirements in order to obtain a water connection on all new multi-family residential or commercial projects. Non-compliers would face a surcharge on their water bill until they complied.

Low water using landscaping can reduce irrigation water demand by 15% compared to traditional landscaping. The DSS Model computed a cost-benefit ratio for MPWD of 5.2 for this conservation measure, with an implementation cost of $336 for each mg saved. The estimated water savings for this measure was estimated to be 3.4 acre-feet per year.

6. City Department Water Use Reduction Goals

This program would involve working with the City of Belmont to identify ways to reduce water use for City operations including both indoor uses and irrigation uses. Financial assistant in the nature of rebates for installing ULFTs, low-water use urinals and Eto irrigation controllers rebates could be offered to encourage water use efficiency. In addition, staff assistance in developing and monitoring landscape irrigation budgets could be provided. Potentially, this program could be extended to the School District and to the landscaped areas in Redwood City and San Mateo that are served by MPWD.

The DSS Model predicted that this program could have a benefit-cost ratio of 7.9 and has the potential to achieve a long-term savings of 9 AFY at a cost of $246 per acre-foot.

D. WASTEWATER DISPOSAL AND WASTEWATER RECLAMATION OPPORTUNITIES

1. Wastewater Disposal Facilities and Available Supplies

The Cities and of Belmont and San Carlos are responsible for the collection of sewage in the District's service area. The South Bayside Systems Authority, a four member Joint Powers

Authority, undertakes treatment and disposal. The members include the cities of Belmont, San Carlos, and Redwood City, plus the West Bay Sanitary District. SBSA operates a major sub-regional treatment plant south of the San Mateo Bridge, providing sewage treatment service for over 200,000 people on the Peninsula from Belmont and Redwood Shores south to Menlo Park and west to Portola Valley.

The treatment plant has a designed capacity of 29 mgd (dry weather flows) and provides tertiary-level treatment. Almost all of the treated effluent is discharged to San Francisco Bay, although there is an ample surplus of reclaimed water available for non-potable uses such as irrigation and industrial applications.

In 1991, the Mid-Peninsula Water District joined several local water agencies and municipalities in the preparation of a Reclaimed Water Master Plan. The Master Plan identified 231 potential users, including a small number within the District's boundaries. The Master Plan concluded that these users could take about 4.0 mgd and estimated that the capital investment for pipelines and related facilities needed to transport the reclaimed water to all of these users would be $67 million (1991 dollars). Annual operations and maintenance costs were estimated at $1.1 million (1991).

Although it was concluded that the costs of implementing the full Master Plan would be too high, subsequent investigations indicated that less ambitious projects, in geographic proximity to the treatment plant would be feasible. In 2000, Redwood City and SBSA initiated the First Step project, which provided and distributed 0.25 mgd of non-potable unrestricted recycled water for landscape irrigation to customers at the eastern end of Redwood Shores peninsula in Redwood City. The project was successful and was extended for two additional two-year periods (2002-2004 and 2004 - 2006). In 2004 the project distributed 32.7 mg of recycled water for landscaping, a truck fill station for construction dust control and other uses.

The 2005, the City of Redwood City and SBSA initiated design and construction of permanent recycled water treatment and storage facilities at the treatment plant and an expanded distribution pipeline system. The permanent project will supply recycled water to customers in Redwood Shores, the "Greater Bayfront Area," the Port of Redwood City and portions of central Redwood City. By 2010, it is expected that the system will distribute over 900 AFY, increasing to 1,400AFY in 2020 and 2,000 AFY in 2030.

Consistent with the conclusions of the 1991 Master Plan, cost-effective delivery of recycled water from the SBSA plant to potential irrigation sites in Belmont is not feasible, and the District does not expect that reclaimed water will be available within the District boundaries within the foreseeable future.

IMPLEMENTATION: The District will continue to support SBSA and Redwood City in the development of a permanent and successful recycled water program serving areas closer to the treatment plant, and will welcome any potential future extensions of the distribution system into Belmont.

E. IMPLEMENTATION PROGRAM AND SCHEDULE

Table 17 summarizes the District's implementation program for the *Urban Water Management Plan*. The implementation program is based on a five-year time horizon, beginning in 2006. The schedule is intended to provide general guidance to the District for the enactment of the water conservation programs described in this report. The Board of Directors will maintain full flexibility in funding and scheduling the various programs, and the implementation schedule may be modified as a result of Board actions. As required by State law, the entire plan will be reviewed after five years.

TABLE 17

IMPLEMENTATION PLAN SUMMARY

DMM #	*Program*	*2006*	*2007*	*2008*	*2009*	*2010*
1	Residential Water Surveys	D	D	D	O	O
2	Residential Plumbing Retrofit	D	D	O	O	O
3	System Water Audit, Leak Repairs	O	O	O	O	O
4	Metering with Commodity Rates	O	O	O	O	O
5	Large Landscape Conservation	D	D	O	O	O
6	High-Efficiency Washing Machine Rebates	D	O	O	O	O
7.	Public Information Program	O	O	O	O	O
8.	School Programs	O	O	O	O	O
9.	CII Water Conservation	D	D	D	O	O
10.	Wholesale Agency Assistance	NA	NA	NA	NA	NA
11.	Conservation Pricing	O	O	O	O	O
12.	Water Conservation Coordinator	E	O	O	O	O
13.	Water Waste Prohibition	O	O	O	O	O
14	Ultra Low Flush Toilet Replacement	D	D	D	D	D
-	Meter Replacement	D	O	O	O	O
-	Wastewater Reclamation	NA	NA	NA	NA	NA
-	CII ULFT Program	D	O	O	O	O

Key to Symbols:
- = No Activity
O = Ongoing Program
D = Develop Program
E = Expand Program
NA = Not Applicable