WASH WORKING PAPER NO. 32

MODEL FOR WATER CONSERVATION BASED ON BEHAVIOR MODIFICATION PRACTICES

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Chapter 1

INTRODUCTION

Water is a necessity of life. When it is limited, it is treated with respect and used only for the basic needs of survival and personal hygiene. With technological advances and economic development, water becomes more readily available to a greater number of people and begins to be taken for granted, and wasted. Often, only the water purveyors, who must pay for the water supply facilities and their operation, appreciate the true cost and value of a water supply.

Cairo, Egypt enjoys a plentiful water supply from the Nile. Yet, water wastage in Cairo is said to be approximately 50 percent of that supplied. It does not make economic sense to expand the water supply system unless water wastage is controlled and water usage is properly managed.

Water conservation programs should be an integral element of any utility's management responsibilities. These programs should include a wide range of activities, from technical measures such as leak detection, to price incentives through metering, to public education designed to modify human behavior. A sound water conservation plan should include an analysis of where and how water losses occur, whether through leakage, misuse, or inappropriate practices, together with an assessment of the wide varieties of methods designed to improve the situation.

In response to a request from USAID, this report examines the role of behavior modification through public education in water conservation programs. However, unless undertaken in the context of an overall program of conservation, with sound institutional support, public education alone is certain to yield little sustained improvement. Accordingly, this report outlines the components of a comprehensive water conservation program in addition to programs for public education.

1.1 Water Losses and Misuse

Water losses and misuse need to be examined according to where responsibility lies for their correction. The consumers, whether in private dwellings, or in industry or commerce, have different problems than the water utility. In both cases, the problems can be simple or complex to identify and to correct.

The water utility faces difficulties on a massive scale. With many kilometers of piping in its network and many pumping stations, the Cairo distribution system has a large potential for leakages. Leakage detection and correction programs are the primary methods of conserving water in many cities throughout the world.

Potable water is often used for urban irrigation and for the watering of parks, which may be a substantial portion of the total usage in arid areas. This water is often unmetered. The use of planned irrigation techniques such as drip irrigation and time-limited watering can reduce the amount of water

used. Another method of water conservation for urban irrigation is to use reclaimed or untreated water.

Consumers have their own role to play in water wastage control and conservation. Leaks often occur in plumbing fixtures or in the plumbing itself. Some causes of these leaks, such as leaky washers on taps, may be obvious to the consumer, while others may go undetected.

Lack of consumer awareness is one of the biggest reasons for water misuse. Whether it be the residential, commercial, or industrial setting which is considered, many consumers are not aware of the amount of water required to perform a task and therefore they waste water. Part of the education program of water conservation should provide data on model residential use. The commercial and industrial settings are more complex and require individualized attention.

1.2 Water Conservation Plans

In order for any water conservation plan to work, there must be a commitment by all concerned parties to be involved and to perform their respective roles. The public will not respond to requests for public conservation if they perceive that the water utility is not doing its share to conserve water.

Accordingly, a good starting place for establishing a comprehensive plan is to identify how and where water is used or lost and to perform benefit/cost analyses on the identified problems and solutions. These analyses will examine the benefits (water savings expressed in quantity) and costs of specific corrective measures. The water saved per unit cost provides a method for prioritizing corrective measures. Also, if the benefits are greater than the costs, then the specific corrective measure is worth taking. These analyses need to be performed for all possible conservation efforts including public awareness campaigns. The analyses themselves can be a part of the public awareness campaign so that the public can be made aware of the actual costs of water and of water wastage.

Measures which contribute to the utility's water conservation efforts include both preventive and corrective components. The implementation of national or city codes to govern the installation of water pipes and provide inspection of water line construction is an example of a preventive measure.

An effective method of conserving water is the installation of water meters for each dwelling unit. This serves two functions. First, the consumer is aware of how much water is actually used. Second, by monthly reading of water meters, an accurate account of water consumption can lead to accurate billing for water usage. The consumer then has an economic incentive to conserve water. Studies have shown that a meter for each housing unit in multiple housing facilities leads to substantially less per capita usage than having one master meter for the building. Retrofitting of meters may not be cost effective, but plumbing codes should require individual meters on all new construction. As metering becomes more prevalent and the consumer becomes accustomed to receiving water bills, an increasing block rate structure can be introduced to provide even greater incentives for conservation. It may take years of ongoing consumer awareness before this is acceptable to the public.

As a result of public education, consumers should be in a position to make their own water conservation plans. Modification of behavior regarding water is one part of the plan. Consumers can learn to detect leaks in the plumbing and have the leaks fixed. Consumers can also become aware of the availability of water-conserving plumbing fixtures and appliances. The consumer can modify existing fixtures. For commercial and industrial consumers, the plan can include a survey of water needs and processes in which water wastage can be found and eliminated.

1.3 Institutional Responsibilities

Comprehensive water conservation programs are likely to be far more significant and more sustainable than by public education programs alone. As successful programs in other cities are evaluated for application to Cairo, it must be realized that water conservation in those cities was achieved by comprehensive programs, not public education alone. Another factor in evaluating the programs is that unaccounted-for water in these systems was considerably less than the 50 percent found in Cairo. The remainder of this report is devoted to the proposed public education component of a water conservation program.

Chapter 2

PUBLIC EDUCATION

2.1 Approaches to Water Conservation: Reaching the Public

The task of making the public aware of the need for water conservation calls for the integration of several tasks found in three different professions. In addition to the skills needed from experience with the water industry, knowledge of the fields of education and public relations is needed. If the public feels that the effort is only haphazard, or that they are only being told part of the situation, they will not respond favorably.

All public relations campaigns and education programs need to target the audience for their campaigns. Children do not have the same level of comprehension as do adults. When children are taught on their own level, they can understand the basic message as well as adults, even if they do not understand the more comprehensive issues. If the overall intent of the water conservation program is to change the behavior of individuals with respect to water, then young children are the best target. Young children have not yet formed personal habits and a public awareness campaign can be a part of their formation.

Another dimension of educating the public at different levels is the reinforcement of the message which one group gives to the other. Young children who are the most open to the message, will hear the message and then see people around them acting differently. This leads them to question these actions. In raising questions, the young children are repeating the conservation message to their elders and thus are teaching them.

The education of the older youth can be in more detail than that for the young children, and can have a good subsidiary effect. As the older children become more civic-minded and became involved with activities at school or in youth organizations, they can further the campaign as part of these activities. Young adults provide the largest and most influential target for water conservation practices in domestic settings.

There are many ways to present the message of water conservation to the public. They vary in their effectiveness and in their costs. Not one of these methods should be considered alone, but should be used in conjunction with others in an organized fashion. One of the most direct ways for presenting the conservation message is to deliver brochures with the monthly bills or door-to-door in a major campaign. Unfortunately, these brochures are often not read by the consumer or may be read by only one person in the household. Thus, they are not the most effective means of persuasion when used alone.

In-depth teaching can be done through the schools and neighborhood meetings. These presentations can incorporate films and slides to help demonstrate the problems of water usage and how to correct them. Films should be aimed for the level of the specific audience. Newspapers, TV, and radio can also be provided material on a continuing basis to help remind the public of the situation. The mass media can assist in two ways. One method is the use of news stories

describing methods of conservation or updates on how well the public education campaign is working to promote conservation. Another method is through public service announcements which are simple statements concerning the need for conservation. Another approach to sustain the message is through billboards, posters, bumper stickers, and tee shirts with key slogans on them.

Once a campaign is mounted with a target audience and specific means of teaching in mind, the next item for consideration becomes what to teach. At the most basic level, teaching should answer the following questions: who, what, when, where, how, and why. More specifically, the subjects which are dealt with the most successfully in the United States through films and brochures are:

- how water is collected, treated, and distributed
- general water consumption facts
- personal water wasting habits
- leak detection and repair
- water closet trouble shooting
- emergency water shut-off procedures
- water saving devices
- water metering, billing, and user rate charges
- tips on how to water gardens

Some statistics are included here as an example of information sent to consumers in brochures. They were compiled from Great Britain as well as the United States. They show typical figures and indicate that the citizens of Great Britain use less water on a per capita basis than do those of the United States.

TABLE 1

DAILY PER CAPITA WATER USE IN THE HOME, 1970
(Percentages are approximate)

	UNITED STATES		GREAT BRITAIN	
Use	% of Total	Liters	% of Total	Liters
Water Closet	45	110	37	50
Showers/bathing	30	72	37	50
Laundry/dishes	20	49	22	30
Drinking/cooking	5	11	4	5
		242		135

These figures represent water use in the home. Gardening, washing cars, and other outdoor uses vary according to location and climate with general usage being much higher in the United States.

The suggested methods of conserving water should be examined and modified for conditions in Cairo. The amount of water used and the amount of potential conservation for each task varies according to location, climate, and culture. What is acceptable water conservation to some people is viewed as unnecessary restriction by others. Thus, the public education program for Cairo should be unique to Cairo, but draw on knowledge from other places.

2.2 Methods of Conserving Water through Behavior Modification

IN THE BATHROOM

- Take shorter showers. Turn off the shower while lathering the hair and the body. Shower less frequently and take sponge baths or use a bidet. Instead of showers, take baths in a tub filled with just a little bit of water. Allow young children to bathe together.
- Do not use the WC for disposal of any sort of trash. Flush only when necessary.
- Do not run the water while brushing teeth, shaving, or washing hands and face. Fill the sink partway for shaving and washing and run the water for only as long as necessary for wetting and cleaning the toothbrush.

IN THE KITCHEN

- For washing dishes, plug the drain and fill the sink.
- For dishwashers and washing machines, use only with a full load. Partial loads waste water.
- Keep cold water in the refrigerator rather than running the tap and waiting for colder water.

IN THE GARDEN

- Collect water which is run waiting for hot water. Use this for the garden.
- Collect "used" water, such as rinse water, unconsumed coffee or tea, etc. for use in the garden.
- Water lawns and gardens during the cooler times of day to reduce evaporation loss.

OTHER TIPS

- Don't run the hose while washing a car. Use a bucket and sponge.
- Use a broom to sweep the sidewalks rather than a hose.

ADDITIONALLY AND MOST IMPORTANTLY

- Look for and fix leaky washers or taps that do not turn off, leaks from breaks in the plumbing, or running WCs.

2.3 Examples of Water Conservation Programs Which Include Consumer Education

There have been many local water conservation programs in the United States. Some have been due to temporary shortages from summer droughts. Others have been long-term projects involving a comprehensive water conservation plan. The examples selected for this report are comprehensive plans and include public education as part of the plans. They have been selected as representative of plans which were balanced, successful, and had effective public education programs. Two of these plans were implemented before a major drought occurred in California in 1976 and 1977. Due to the drought, many measures were taken to implement the programs more quickly and some mandatory measures were taken. The programs continued after the drought and continue even now.

In evaluating these programs, it must be remembered that they were developed for the specific needs of the areas involved. Water conservation must be specific for the climate, needs, and culture of Cairo. Some examples of actual materials used in these programs are included in Appendix B.

2.3.1 East Bay Municipal Utilities District (EBMUD), California

EBMUD developed a comprehensive program to conserve water in the early 1970's. The program was divided into several categories according to who was involved. The basic categories were the utility itself, special groups such as the industrial, commercial, and public (government) sectors, and the general public.

During the drought, an overall reduction in water usage of 38 percent was achieved. This reduction was the result of all the conservation measures implemented, including some strict legal measures. Since the drought, water consumption has increased to pre-drought levels. It has been estimated that without some of the conservation achieved, the return to pre-drought consumption levels would have been reached much sooner.

The key component of the EBMUD's water conservation efforts is in leak detection. Between 1974 and 1978, leaks amounting to about five percent of daily water production were corrected. From 1978 to 1982, further leak detection and correction conserved an additional one percent of daily water production.

Within the special group categories, there were several recommendations for conservation. Generally, consultants assisted industry and commerce in water conserving techniques specific to each situation. The methods employed to conserve water are still in use.

A major public awareness program also was undertaken by EBMUD. Four specific approaches to user groups were used. In the first approach, brochures were mailed both with water bills and separately. The brochures differed from month to month to address different topics.

A second approach of the public awareness campaign was the use of the mass media to reach the general public. Especially during the drought, water was the subject of many articles and news stories. In addition to stories done by the press, news conferences and press releases were used by the utility to gain additional news coverage and publicity. Tours of facilities and explanations of the problems were given to the press so that they became more knowledgeable on the subject. All of this news and information reinforced the radio and television public service announcements which were used. These public service announcements were simple messages on themes of water conservation. The messages were designed to be short and concise so that they could be remembered more readily. In addition, special events, such as a "Camel Day" when everybody was asked to reduce water usage to a bare minimum, received a great deal of publicity from the media.

The third approach of the public awareness campaign was personal contact. Special speakers went to civic groups and organizations such as the Chamber of Commerce and talked about water conservation. The speakers used visual aids such as slide shows and films. These speakers also went to schools, delivering talks designed for the age of the audience. Meetings with special groups such as building contractors and plumbers were also arranged.

A fourth, special campaign was undertaken which involved conservation literature produced by EBMUD's own public information office and which is still in use. Some of this literature is geared to adults and some to children. EBMUD also developed comic books which demonstrated the need for conservation to children and a curriculum on water conservation for use by teachers in the schools. Youth and civic groups provided volunteers to assist in the distribution of water conservation literature at fairs and around shopping districts.

A water conservation kit was developed for distribution by employees, scouts, and other organizations. It included two brochures, one about water conservation and another describing how to use materials in the kits. The materials included a plastic bag to fill with water and place in the water tank of the WC (to reduce the volume of water use per flush). Also included were orifice discs to reduce the amount of water used in water lines (to conserve water supplying showers and sinks).

EBMUD's public awareness campaign was intended to make consumers aware of the overall problem and some solutions. After the public had learned more about the water utility itself, they also were provided with additional information such as explanations of billing formats and rates. Most of the public awareness campaign was directed toward behavior modification in two areas. One

was in the use of water saving devices in WCs, showers, and sinks. In the emergency situations such as the droughts, the consumers were expected to alter their personal habits, but for normal conditions, water-saving devices achieved most of the conservation.

Another area of behavior modification concerned the watering of private lawns and gardens. Water conserving methods of irrigation were explained to consumers. Also, consumers were told about species of plants and grasses native to the East Bay area which do not require as much water for survival as imported species.

2.3.2 North Marin County Water District (NMCWD), California

NMCWD began its water conservation program around the same time as did EBMUD. One focus of its program was the requirement that all new dwellings include water-saving plumbing fixtures. These fixtures included low-flush WCs, shower flow controllers, and devices for regulating home irrigation.

A public awareness campaign began with the use of the mass media and brochures distributed along with the bills. Some programs were established in the schools. Special information and press releases were furnished by NMCWD to promote the need to conserve. The main thrust of the public awareness campaign involved door-to-door distribution of water saving kits by scouts and other service organizations.

The general manager of NMCWD indicates that the public campaign resulted in approximately a ten percent overall reduction in water usage. With continuing programs it is expected that an overall reduction of 15 percent can be achieved. In emergency conditions such as drought, 30 percent reduction may be achieved.

Conservation efforts at NMCWD are now focused on retrofitting plumbing fixtures in existing dwellings, especially low-flow shower heads. A program is being developed to make the public aware of how much money can be saved on their water bills by the use of new fixtures. The program involves distributers, plumbers, advertisers, and of course, the public.

NMCWD has published a book on water conservation which focuses on water saving devices.

2.3.3 Washington Suburban Sanitary Commission (WSSC), Maryland

WSSC, which serves suburban Washington, D.C., began its water conservation efforts in 1970.

The effort at conserving water by the WSSC centered around consumer education and involvement, use of water conserving plumbing devices and appliances, and legal measures. WSSC estimates water conservation of 10 to 17 percent from these efforts.

The consumers were saturated with information from all sources about the need to conserve water. The news media had stories about all facets of the programs run by WSSC as well as stories about local governments' actions on implementing and enforcing new ordinances. Since all of these programs were employed simultaneously, no breakdown is available on how effective consumer education alone might have been.

Legal measures included the modification of building codes to require that water-saving plumbing fixtures be installed in all new apartments and homes. A new user rate structure also was implemented which encouraged water conservation by charging higher rates for higher water usage (increasing block rate structure).

Modification of consumer plumbing fixtures was performed in conjunction with public awareness campaigns. WSSC provided flow reducing insert devices for showers and WCs along with information on how to use them and why they were needed.

The public awareness campaign began with WSSC making a request to the public to enter a "water-saving idea contest". In this contest, the public submitted more than 1,000 ideas on ways to conserve water. These ideas were printed in a handbook and distributed as part of the public awareness campaign. Monetary prizes were given as incentives and rewards for participants in the contest. The intent of the contest was more for publicity than to collect new ideas.

In a similar manner, poster contests with prizes were held. These contests were held primarily within the schools and the posters reflected learning by the children about water conservation. The posters were then used in public places to increase public awareness.

Other methods used in the public awareness campaign included preparing television and radio announcements on the theme of "I saved water". A film and various slide shows were also produced by WSSC with specialist consultants.

The films and slide shows were used by special speakers who spoke at schools, civic clubs, and trade or professional groups, including apartment building owners, plumbers, builders, and other groups. Currently, the films and educational materials are used by teachers in the schools who are trained by personnel from the water utility.

WSSC also collected information about specific water saving appliances and plumbing fixtures which were available to the public. They undertook a program wherein flow reducing devices were installed in dwellings of one portion of the service district. The devices and instructions were distributed by scouts and other civic groups. Further attention was drawn to this project by the use of questionnaires. The consumers using these devices were questioned as to their perception of the effectiveness of the devices, which served to maintain their interest in the program.

2.3.4 Denver, Colorado

The Denver program began in the late 1970's due to drought conditions as well as difficulties encountered in trying to enlarge water and wastewater facilities. The program in Denver included aspects of water reuse, irrigation restrictions, changes in user rate structures, plumbing code revisions, retrofitting of plumbing fixtures, and public education measures.

Public education for conservation used school programs as a major focus. One full-time teacher was involved with teaching about water conservation throughout the school district. An animated cartoon film developed in Denver has been one of the key points in the education program.

Denver coordinated its water conservation program with energy conservation programs. The water authorities, gas and electric authorities, and local contractors built show homes to demonstrate the different types of water-efficient and energy sufficient appliances and fixtures which the public can use. They have also developed what they call Xeriscape. This comes from the Greek word Xeros which means dry. This Xeriscape demonstrates the use of creative landscaping with plants which do not require much water. This fits in with Denver's restrictions that consumers can only irrigate lawns and gardens every third day.

2.4 Summary of Public Education Programs and Techniques

These programs had several common elements. In general, they all used well-planned public relations and educational techniques with which to conduct the public awareness campaigns. These campaigns included the following:

- Information concerning the water utility's conservation activities distributed through the mass media and brochures;
- Several short, simple messages or slogans expressing the need for water conservation;
- More detailed presentations to schools, civic organizations, and trade groups on techniques to save water by behavior modification;
- Demonstrations of methods and appliances to conserve water;
- Public participation in spreading the message by means of contests or by having civic and school groups involved with the items summarized above.

Chapter 3

SUMMARY DISCUSSION AND RECOMMENDATIONS

Water conservation is achieved by ongoing, long-term programs which are part of a comprehensive and permanent water management plan. The water utility should determine water use patterns and losses and then take steps to implement long-range plans evaluating the cost effectiveness of various programs. As work progresses on the implementation of the programs, the public should be kept informed of the progress. News coverage of the water industry is one of the most effective methods for enhancing consumer awareness of the need for water conservation.

Public education programs should be well defined and planned before being implemented. In addition to the news articles on television, in the newspapers, and on the radio, slogans and posters are very effective means to utilize the mass media toward the goal of conservation. Billboards, posters, tee shirts, and bumper stickers help to keep the issue before the consumers. However, the best in-depth public education will come from well developed curricula in schools and by films and slide shows which can be used by schools or organizations.

Experience indicates that when a program is begun it must be carried out from all directions and at all levels. The consumers need to have the message presented in more than one way and the message must be extended for a length of time or else the consumer will return to old behavioral patterns. The consumer needs to be saturated with the message. Part of the educational process is to let the consumer see that there are, in fact, incentives for behavioral patterns to change.

With 50 percent of its water supply unaccounted for, Cairo, Egypt would benefit from a study which identified all sources of water loss. A water management program could be established which would include long-term and short-term management practices, and most particularly, a leak detection program. These management practices should be developed and implemented with special attention to the needs, climate, and culture of Cairo.

In conclusion, consumer education is just one aspect of an overall program to achieve water conservation. In a city the size of Cairo though, even conserving one litre per capita per day due to public awareness constitutes a large volume of water and financial savings.

APPENDIX A

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APPENDIX B

Samples of Consumer Education Materials

WATER USE AND DEMAND REDUCTION FACT SHEET

The average North Carolinian uses between 50 and 75 gallons of water each day. About 75% of this water is used indoors (NC Agricultural Extension Service estimate).

--By practicing water conservation, this amount can be reduced by as much as 40%.

Conventional flush toilets use about 40% of the water consumed in the home. Each flush requires between 5 and 8 gallons of water.

--New water saving toilets use only 3.5 gallons or less per flush. This is a savings of about 35%. Devices such as toilet dams, plastic bottles, or plastic bags can also help save substantial amounts of water if installed in the toilet. Also, use the toilet only for its intended purpose--don't use it as a trashcan or ash-tray.

Bathing--especially uncontrolled showers--accounts for up to 35% of household water use. Water flow through the showerhead may range from 5 to 12 gallons per minute. A typical shower uses between 25 and 40 gallons of water. About 60% of the water used is heated water.

--Low flow showerheads and in-line restrictors can reduce flow to 3 gallons per minute or less. This can result in a water savings of as much as 75%! Even more water can be saved by shortening the amount of time you spend in the shower, and by rinsing down, turning the water off, soaping up, and turning the water back on only to rinse.

Each inch of water in the tub equals about 5 gallons of water. A bathtub filled with 5 inches of water consumes 25 gallons.

--Bathe with less water--you'll get just as clean as before!

Running faucets have a flow rate of 4 gallons per minute or more. A faucet left running for 3 minutes while you are brushing your teeth or shaving, or rinsing vegetables will probably use at least 12 gallons.

--Low volume faucet aerators can be installed and may cut the flow rate down to between .5 and 2.0 gallons per minute. Additional steps can be taken to cut water use here. Do not let the water run while you are: brushing your teeth; shaving; or washing the dishes or vegetables. Use a cup of water to rinse out your tooth-brush; use a sink full of water to rinse dishes in, or place them in a dish rack and rinse them all at once; clean the vegetables in a pan of water, not under the running spigot; and rinse your razor in a shallow-filled sink.

(Published as a public service by the Orange Water and Sewer Authority, 8/81)

Leaks can be big water wasters. They may easily account for 10% of our water bill. A 1/32 of an inch pipe or faucet leak can waste more than 25 gallons each day, while a 1/8 inch leak may waste 400 gallons or more daily. A toilet leak (caused by a worn out tank ball or a defective valve assembly) can silently waste hundreds of gallons of water each day.

--The best way to check for a leak in the toilet is to put a couple of drops of food coloring in the toilet tank. If, without flushing, the color appears in the bowl, you have a leak. This should be fixed immediately. Faucets that are dripping water from either the handle or spout should also be repaired promptly.

Automatic dishwashers and clothewashers use a lot of water. An average of 15 gallons per cycle is required for dishwashers and 40 to 45 gallons is needed for clotheswashers.

--To save water, only wash when you have a full load of clothes or dishes. If replacing an appliance in your house, shop around for a machine with a water conservation design. It will save you money!

An outdoor hose left running flows at a rate of about 8 gallons per minute.

--Turn off the hose when it is not in use, and use it only for necessary chores. Use a spray nozzle attachment which allows you to shut the flow of water off. Use the hose only to rinse the car, do not leave it running while you are washing it as well. Use a broom, not the hose, to clean off the driveway and sidewalk.

It takes about 1/5 of a kilowatt-hour of electricity to heat one gallon of water for use in bathing, dishwashing, etc. With the cost of electricity hovering at around $.05 per kilowatt-hour and constantly on the rise, the cost of heating hot water is certainly a substantial one. By taking steps to conserve on hot water consumption in the shower, while washing clothes and dishes, while shaving, and in your other daily activities, you should notice a sizeable reduction in your electric bill.

Your lawn and garden may not require as much water as you think they do. In fact, too much water can be harmful to plants.

--A one inch soaking once a week is normally all the water your lawn and garden need to stay healthy.

If you would like more information about water conservation, please contact

OWASA
P. O. Box 366
Carrboro, NC 27510

Following are some common sense tips for saving water around your home. Most of the ideas suggested below will not cause you any inconvenience. In the future you will receive more helpful conservation hints.

In the Bathroom:

Shower—Use only for wetting and rinsing. Shower for a maximum of 5 minutes.

Toilet—Do not use it as a wastebasket or ashtray. Install plastic bags or bottles, or toilet tank dams in the water closet. These devices must be placed where they will not interfere with the moving parts of the flushing mechanism.

Bathtub—Take baths in a partially filled tub.

Sink—Turn the water off while you are brushing your teeth or shaving.

In the Kitchen/Laundry:

Dishwasher and Washing Machines—Use only when you have a full load to wash.

Washing Dishes—Rinse dishes in a sink filled with water, or gather them in a dish rack and rinse all at once.

Outdoors:

Lawn and Gardens—Water only when needed, and only during early morning or late evening. Do not water sidewalks, driveways, and gutters—these don't grow a thing!

Car Washing—Use a bucket to wash, and a spray nozzle on the hose to rinse. Do not leave the hose running while washing the car.

Remember—thousands of gallons of water can be saved each year in every household if we all practice water conservation. So be alert! If you see water being wasted in your own home, tighten up! Be conservation conscious when using water.

WE ARE ASKING FOR IDEAS

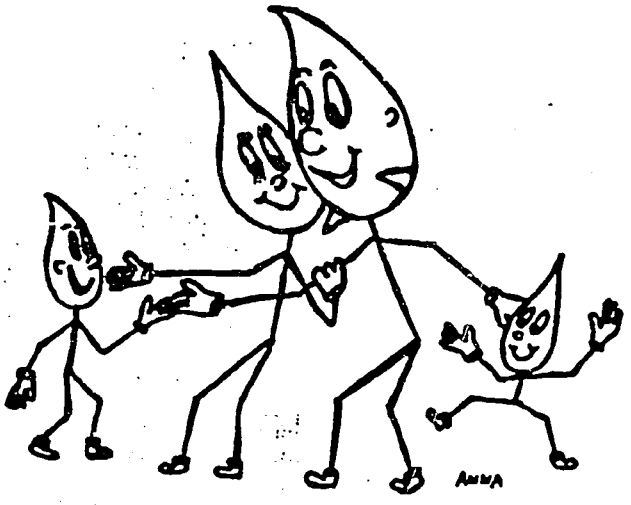
Water conservation involves each person in our community. For this reason we are asking our customers to take the time to share their suggestions to help conserve water. If you have an idea you want to share, please send it to OWASA. We will use the best of them in a water conservation brochure we are now putting together.

For more information about water conservation, contact the folks at:

OWASA
PO Box 366
Carrboro, NC 27510

Inserts upcoming in future months will include:

- Conservation Quiz
- Tips For Saving Water Inside and Out
- Water Saving Devices Available From OWASA



FAMILY GUIDE TO EASY WATER CONSERVATION

An Introduction

This is the first part of a four part series which will describe some easy steps your family can take to become a water-conserving family, and the benefits you can receive by practicing conservation.

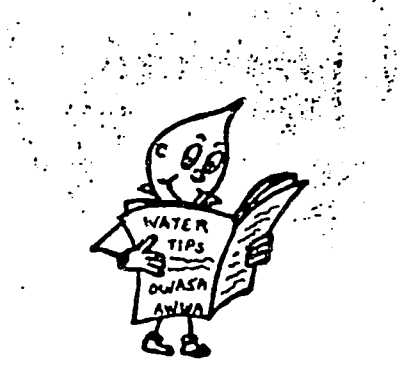
WATER OWASA SEWER

Published as a public service by the Orange Water and Sewer Authority.

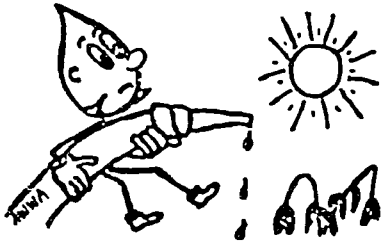
When you opened this pamphlet you probably did so because you were curious. You are probably wondering why the Orange Water and Sewer Authority has prepared this brochure on water saving and why your family has received its own copy.

A lot of Carrboro and Chapel Hill residents have expressed interest in learning about what they can do to help stop pollution and improve our water resources, and other residents wish to learn more about water conservation. OWASA has produced this series of pamphlets to answer some of these questions. Perhaps more importantly, it is to make more families in our community aware of the need for practicing conservation in and around the home.

The folks at OWASA hope your family will find this series on water conservation to be interesting and helpful, and that you will follow some of the tips provided in order to help conserve our precious water resources. We suggest that you keep these brochures and other information on conservation in an easily accessible notebook for all your family members to read.



In the past, the people of this community were accustomed to having a relatively cheap, seemingly endless supply of water. However, as the population of the Carrboro-Chapel Hill community increased, serious water shortages were soon encountered.



It was then that we began to recognize the importance of practicing water conservation in our daily activities. Everyone, including Mom, Dad, Junior, and Sis, had to think of ways for the family to save water.

People in our area are now beginning to realize that it is common sense to use water wisely around the home. Now, water conservation is becoming a way of life for us. We are learning that there are many benefits to the families who reduce wasteful consumption of water:

- Smaller monthly water and sewer service bills.
- Less energy and money spent to heat hot water.
- Reduced amounts of wastewater.
- Less energy used to pump and treat water.
- Reduced threat of water shortages in our area.

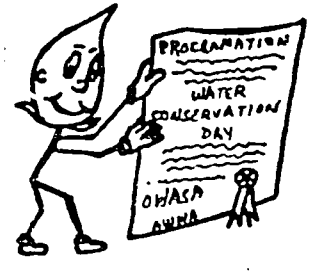
Accomplishing Conservation...

Four general methods can be used to bring about a reduction in water consumption. Through *public education programs* water consumers can be made aware of the importance to both themselves and the community of conserving water and of simple but effective ways to conserve. OWASA prefers this approach, as it is a very cost-effective method. However, it is only successful if *your* family participates.

Through *installation of various types of water saving devices* consumers can save a substantial amount of water. These devices provide an inexpensive and lasting approach to water conservation. Contact OWASA for more information about devices which you can obtain at cost.

Through *water rates* consumers may be motivated to save water in order to save money. The commodity rate structure of OWASA is a conservation-oriented structure.

Finally, there are *regulatory measures*, such as ordinances or laws requiring the use of water saving devices or conservation practices. During past water shortages, the governments of Carrboro, Chapel Hill, and Orange County have placed into effect restrictions on water use.



MAKE EVERY DAY A CONSERVATION DAY

Other Outdoor Use:

Don't run the hose while washing the car. Use a bucket for soapy wash water, and use the hose only for rinsing. Use a shut-off nozzle on the hose. A free-flowing hose lying in the driveway doesn't help get the car any cleaner and it wastes a lot of water.

Use a broom, not a hose, to clean driveways and sidewalks.

All Around the House:

Check for leaks in pipes, faucets, couplings, and hoses. A leak only 1/32 of an inch can waste 25 gallons a day, while a 1/8 inch leak wastes as much as 400 gallons daily.

Insulate hot water pipes and heater to reduce the amount of water that must be run to get hot water to the faucet. You get a bonus by saving on your gas or electricity consumption!

It isn't hard to reduce wasteful water consumption in your home, and it doesn't require a great change in our lifestyles. It's mostly a matter of using good common sense. By following the tips suggested in this brochure, your family can save thousands of gallons of water each year.

Remember—use water wisely around your home. Become a water conserving family!

2

OWASA would greatly appreciate your participation and feedback in this conservation effort. Here are few questions for you to consider. We'd enjoy hearing from you!

1) What suggestions do you have, or what does your family do to conserve water at home?

2) Were you aware of the water supply situation in our community?

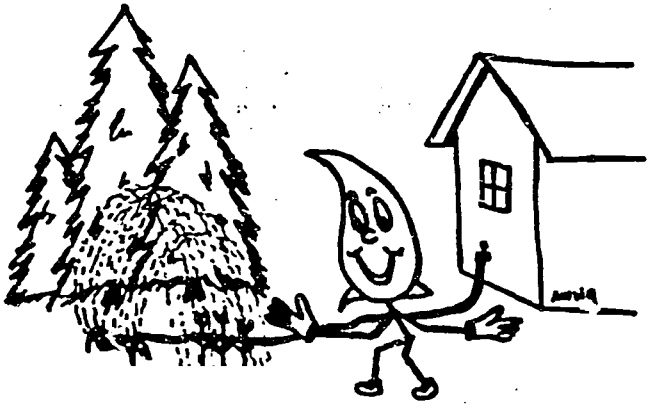
3) Has this series of pamphlets been informative? In what way, or why not?

4) Do you wish to receive more info from OWASA regarding water conservation? If so, what type of info?

For more information and assistance, please contact:

OWASA
PO Box 366
Carrboro, NC 27510

9/81



FAMILY GUIDE TO EASY WATER CONSERVATION

Saving Water Inside and Out

Is your family full of conservation awareness?

If you answer yes to this question, your family has probably already undertaken some simple water saving and money saving steps such as the ones listed below. If you answer no, you should carefully read the following list of things you can do around the home to reduce the amount of water your family uses. Remember—by practicing water conservation you will not only help to save water, your family will also save money by reducing its monthly water, sewer, and energy bills.

Want to learn more? Read on!

Published as a public service by the Orange Water and Sewer Authority.

Saving Water in the Bathroom:

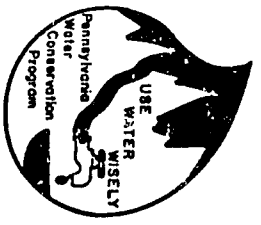
- Take shorter showers. Five to twelve gallons of water are wasted every extra minute you spend in the shower. Turn off the water while you apply soap to your body or lather your hair. Limit family members to only a couple of minutes in the shower—they'll get just as clean!
- Install water saving showerheads or flow restrictors. Contact your local hardware or plumbing supply (or OWASA) for information about these inexpensive and easy-to-install devices. You can reduce water use in the shower by as much as 70 percent with these devices.
- Bathe in a partially filled tub.
- Shower with a friend! Let your younger children bathe together.
- Stop using the toilet as an ashtray and trashcan. Every unnecessary flush wastes from 5 to 8 gallons of water.
- Put plastic bags, bottles, or tank dams in your toilet tank. Fill a bag or bottle with water and put some pebbles in it to weight it down. Place in the water closet tank, away from any operating mechanisms. Or put dams in your water tank. These will reduce the amount of water wasted by your toilet (call OWASA for info on toilet dams, which are available to you at cost).
- Check toilets for leaks. Put a couple of drops of food coloring in your toilet tank. If, without flushing, the color appears in the bowl, you have a leak. This should be fixed immediately, as this wastes many gallons of water each day.
- Do not run the water while you are brushing your teeth or shaving. Rinse your toothbrush in a cup and your razor in a partially filled sink. A running faucet wastes water!

Saving Water in the Kitchen/Laundry:

- Use your dishwasher only for full loads. A dishwasher uses about 14 gallons of water per load.
- When washing dishes by hand, don't leave the water running continuously for rinsing. If you have two sinks use one for rinsing—fill it partially full with rinse water. Otherwise, use a spray tap or gather dishes in a dish rack and rinse all at once.
- Don't let the faucet run while cleaning the vegetables. Rinse them in a stoppered sink or in a pan of clean water.
- Keep a bottle of cold drinking water in the fridge. Running water until it becomes cold enough to drink wastes nearly a gallon of water.
- Do not use your garbage disposal as often. Peel veggies over newspaper and discard all food wastes into the trashcan rather than the disposal. Better yet, start a compost pile with these food wastes.
- Use your washing machine only when you have a full load of clothes. It takes about 45 gallons of water to wash one load—whether or not the washing machine is empty or full.
- Use low sudsing detergents. These require less water for rinsing (the amount of foam has no effect on cleansing power).
- Don't bother rinsing dishes in the sink before you put them in the dishwasher. Scrape them clean and let the machine do the rest.
- For hand laundering, put a stopper in the washtub for both wash and rinse. Don't let the faucet run.

Lawn and Garden Watering:

- Do not give the lawn and garden more water than they need. A one inch watering once a week should be plenty.
- Deep-soak your lawn and garden. When you do water, do it long enough for the moisture to soak down into the roots where it will do the most good. A light watering evaporates quickly. If you let the water sink deep, plants will develop deeper root systems and won't need watering as often.
- Water during the cool hours of the day. This will help reduce evaporation losses. Early morning watering is generally better than dusk since it helps prevent the growth of fungus.
- Water only the lawn and garden. Sidewalks, gutters, and driveways don't grow a thing. Position the sprinkler and hose so that water lands only where it's supposed to.
- Mulch around gardens and trees. Mulch slows the rate of evaporation and discourages weed growth, which also robs plants of water.
- Collect "used" water from everyday activities (rinse water, cold coffee, cooking and dish water, etc.) and use on lawns and flower gardens.
- In summer, keep the grass at about 2 inches high. This helps to shade the root system and holds soil moisture better than closely cut lawns.
- Keep the lawn and garden free of weeds.
- Dig basins around trees and shrubs to help catch and hold water.
- Fertilize the lawn and garden with care. Well-nourished, they will require less water.



USE WATER WISELY

WATER CONSERVATION
Pennsylvania Department of
Environmental Resources
P.O. Box 1467
Harrisburg, Pa. 17120
(717) - 787 - 5008

RESIDENT

"For more information
call or write..."

OR

YOUR WATER SUPPLIER

WATER CONSERVATION
Pennsylvania Department of
Environmental Resources
P.O. Box 1467
Harrisburg, Pa. 17120
(717) - 787 - 5008

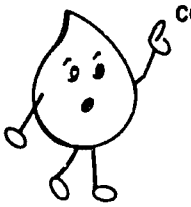
You don't miss the water 'til the well runs dry. How many times have you heard that old proverb? Unfortunately, sometimes our water supplies are so low, those words take on a new meaning for us.

For most of us, water use is a habit. We are accustomed to having water available at the twist of a faucet. We usually don't think about how much water we use.

During times of drought, every citizen can help conserve his community's water supply by becoming aware of personal water use habits, especially in the home.

The best way to learn to conserve water is to notice your habits. Do you let the water run while brushing your teeth or shaving? Do you often luxuriate in a long, hot, pounding shower or in a steaming bathtub full of water? Do you run the dishwasher when it is only half full? These habits use a great amount of water.

By evaluating your water use habits, you can significantly reduce your water consumption. You can save money too. Not only do you have to pay for your water, you also have to pay the cost of heating it, and for treatment of the water when it goes down the drain.



**WHEN WATER IS SHORT
BE A GOOD SPORT
CONSERVE !!**

NORMAL DAILY WATER USE

Be aware of how much water you use. Awareness is the first step in conservation. The following table indicates the average daily water use for a family of four.

Use	Gallons Per Day	% Of Total Daily Use
Toilet	100	39
Bathing & Hygiene	88	34
Laundry	35	14
Kitchen	27	11
Housekeeping	5	2
Total	255	100

The following chart can give you an idea of how much water can be saved by installing water use restrictors on some household plumbing fixtures.

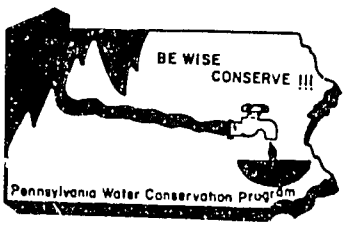
Fixture	Water Use
Conventional Toilet	4–6 gal./flush
Water Saving Toilet	3.5 gal./flush
Conventional Showerhead	3–15 gal./min.
Low-Flow Showerhead	2–3 gal./min.
Top-Loading Washer	35–50 gal./load
Front-Loading Washer	22–25 gal./load
Regular Faucet Aerator	2.5–6 gal./min.
Flow Regulating Aerator	.5–2.5 gal./min.

Water-saving devices such as shower flow restrictors, toilet tank displacement devices, and flow control faucet aerators are inexpensive and easy to install. These devices save valuable water and energy without requiring changes in personal water using habits. Assuming that electricity is used to heat domestic hot water at a cost of $10.00/1000 gallons ($.04/Kwhr.), a family of four can save over $40 annually in hot water heating costs by installing a shower flow restrictor or over $80 annually by installing a 2 gal./min. showerhead. Even greater energy savings can be experienced by installing flow control faucet aerators.

We suggest using the following guidelines for keeping individual water use under 40 gallons per day when water use restrictions are imposed.

Uses	Gallons Per Person Daily
Showering	15
Toilet	10
Personal Hygiene	4
Kitchen (Cooking and Drinking)	1
Laundry	5
Dishwashing	4
Housekeeping	1
Total	40

Hints that will SAVE YOU Water, Energy & $$

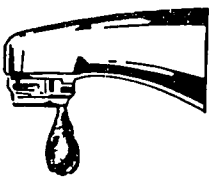


REPAIR ALL LEAKS

A dripping faucet is more than annoying...it's expensive. Even small leaks (80 drips per minute) can waste almost seven gallons of water a day.

Leaks inside the toilet can waste up to 200 gallons of water a day. Toilet leaks can be detected by adding a few drops of food coloring into the tank. If the colored water appears in the bowl, the toilet is leaking.

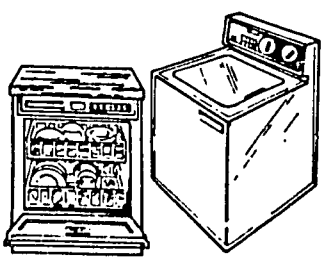
To detect other plumbing leaks, check your water meter. Turn off all faucets in the building, then record the meter reading. Do not use any water for 15 minutes, then record the meter reading again. If the reading has changed, you have a leak. Call the plumber!

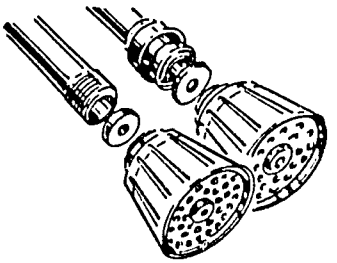


HOW TO SAVE WATER IN THE KITCHEN AND LAUNDRY

- Use a dishpan or plug the sink for washing and rinsing dishes.

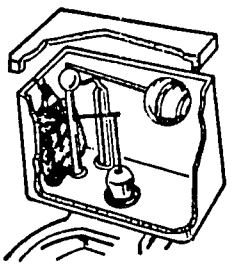
  Run the washing machine and dishwasher only when they are full.
- Wash dishes only once a day.
- Keep a bottle of cold drinking water in the refrigerator instead of letting the tap run until the water gets cold.
- Do not prewash clothes unless absolutely necessary.
- Use the proper water level or load size selection on the washing machine.
- When purchasing a new washing machine, consider a front-loading model (22 to 25 gallons per load) or a suds-saver option (12 gallons per load).





HOW TO SAVE WATER IN THE BATHROOM

- Take showers instead of tub baths. Consider bathing small children together.
- If your shower has a single handle control or shut-off valve, turn off the flow while soaping or shampooing.
- Install a low-flow showerhead or flow restrictor in your showerhead. They are inexpensive, easy to install and save water and energy.
- Don't let the water run while brushing teeth or shaving. Fill a glass for rinsing teeth. Plug the basin to rinse your razor.

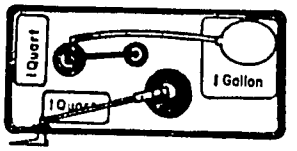


HOW TO REDUCE TOILET WATER USE

Nearly 40 percent of all water used in the home is flushed down the toilet. Toilets use from four to six gallons of clean water with every flush. To reduce the amount of water used with every flush, displace water in the tank with water dams, water bags or plastic bottles filled with water.

Remember:

- Don't use the toilet as an ashtray or wastebasket or flush unnecessarily.

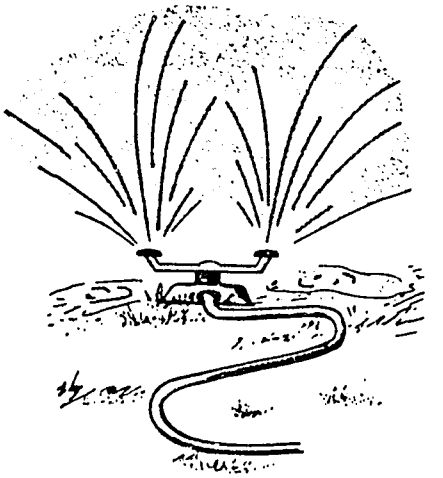


BOTTLE KIT CONSERVATION DEVICE

HOW TO SAVE ON WATER USED OUTSIDE THE HOME

The following water saving measures should be practiced regularly but remember, during mandatory water rationing, all water use outside the home is prohibited!

- Use a broom, not a hose, to clean driveways, steps and sidewalks.
- Wash the car with water from a bucket. Use the hose only to rinse the soap off the car.
- Use an on-off nozzle on your hose.
- Water the lawn or garden only during the coolest part of the day. Don't water on windy days.
- Set sprinklers to water the lawn or garden only, don't sprinkle the street, sidewalk or gutters.
- Use mulch around shrubs and garden plants to reduce evaporation from the soil surface and to cut down on weed growth.
- Use native plants in landscaping your lawn.
- Native plants require less care and water than ornamental varieties.



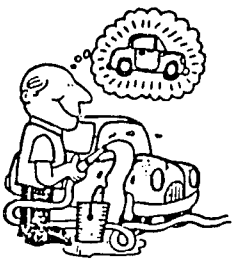
HOW TO CONSERVE WATER IN THE COMMUNITY

- Restaurants should serve water only when it is requested.
- Make sure schools and other public buildings have water-saving flow restrictors on faucets and shower heads, and displacement devices in toilet tanks.
- Ask your water utility if it has a leak detection program which reduces unaccounted for water losses and operating costs.


water lawns, not sidewalks
I'M A LEAKY FAUCET PLEASE FIX ME
save water and power WASH FULL LOADS
Native Plants Save Water
shower shorter, save water, save energy
conserve water
Water is life... don't waste it
• Along with the air we breathe, water is one of life's most vital resources . . . especially good water, which becomes less and less plentiful as demands increase.
• There's one thing you can do, personally, to help combat the problem of diminishing resources—Conserve Water.
• The little signs on the top and left half of this sheet can be peeled off and placed wherever you use water—as miniature posters to help remind people not to waste water.
USING IT BEATS WASTING IT
EAST BAY MUNICIPAL UTILITY DISTRICT
P.O. BOX 24055 OAKLAND, CA 94623 (415) 835-3000

Water Conservation Today & Tomorrow

A Compendium of Practical Advice for Personal Water Conservation



Water Conservation, Today

When most of us turn on the water tap, we expect—and get—pure drinking water. We use water in so many ways, every day, that it is easy to take it for granted. We seldom think about how our lives would change if water were not always ready at our fingertips.

In 1976, EBMUD customers used more water than in any previous twelve-month period—an average of 222 million gallons a day. But the following year, water use in the East Bay dropped to 138 million gallons a day. The difference was caused by drought, when water rationing was required for the first time in EBMUD's history.

With very little rain or snowfall to feed the system's reservoirs, water conservation became a necessity. People who had rarely thought about water and how it got to their kitchen faucet, installed flow restrictors and fixed leaks. Lawns and gardens were left unwatered. Industries changed their systems, and water was reused where possible.

And it worked. Although Pardee Reservoir, EBMUD's main water source in the Sierra Nevada foothills, was down to its lowest point since it first was filled in 1930, the combination of an emergency supplemental supply and the superb conservation efforts of consumers meant there was enough water to last until rain and snow brought the drought to an end.

Today, the drought is history—but the lessons learned from it must not be forgotten. The complex system which supplies our water is vulnerable to whims of nature in the form of flood, earthquake, or drought. Water is a precious and limited resource—but our supply can be made to last longer through conservation.

Since the drought, East Bay water use has increased. EBMUD is preparing for the future by seeking new sources of water, but development of additional supplies may be expensive and take years. The extra water made available by conservation is attainable today, if we start and continue good habits of water use.

We can't always prevent or predict water shortages. We can learn not to waste the water we do have, and to minimize the effects of any future shortage by making water conservation a way of life now.

Household Water Conservation

You can save on your water bill, save energy, and help control water pollution by using less water in the home.

One of the biggest costs in delivering water is the use of the energy needed to filter it, pump it to homes, and clean it up after it's used. Heating water uses even more energy.

Two-thirds of residential water used inside the house is for flushing toilets and for showers and baths. Much of that water goes into the sewer needlessly, where it adds to the volume of sewage and puts an extra burden on the treatment plants.

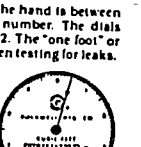
Meet Your Meter

Your water meter can be a valuable conservation tool. Learn how to read it—it can tell you whether your water use has increased or decreased, and help you look for leaks. Since EBMUD residential customers receive bills every two months, you can check how much water you've used—or saved—without waiting for the bill.

The water meter usually can be found in front of the residence near the curb. Carefully remove the concrete lid to expose the meter, and flip open the meter cover. You will see one of the two types of meter faces used in EBMUD's system. If you have questions or need help, call your EBMUD business office.

Round-reading meter. This is the type of meter most commonly found in EBMUD's service area. To read it, start with the dial marked "100,000" and read each dial around the meter to the "10" dial. If the hand is between numbers, use the lower number. The dials shown here register 80632. The "one foot" or unmarked dial is used when testing for leaks.

Straight-reading meter. The reading is taken from the number shown under the words "cubic feet," including the zero painted on the face, this meter reads 81710. The needle on the face is used when testing for leaks.

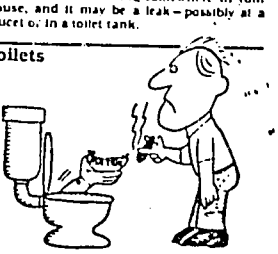


Simply subtract the current reading from the previous reading to find out how many cubic feet (one cubic foot is 7.48 gallons) of water you used since you checked the meter last.

All EBMUD meters measure water in cubic feet, but you will notice your bill indicates water usage in units of 100 cubic feet. One hundred cubic feet equals 748 gallons of water.

Looking for Leaks. Whichever type of meter you have, you can use it to see if your house has any plumbing leaks. Turn off all faucets, inside and outside, firmly. Then see where your meter's testing needle is pointing. Check again fifteen minutes later. If it has moved, water is flowing somewhere in your house, and it may be a leak—possibly at a faucet or in a toilet tank.

Toilets



Each time a toilet is flushed, about five to seven gallons of water flows into the sewer. There are two ways to cut down on that amount of water—first, don't flush as often; and second, reduce the water per flush. One less flush per person a day adds up to about five million gallons saved in the East Bay.

- The toilet is not a trash can, and it should not be used to flush away tissue, gum wrappers, cigarette butts, spiders, diapers, or anything else that should go into the wastebasket or garbage can. Please use the toilet only for its intended purpose.
- Most toilets can operate just as well by using less water to flush. There are a variety of methods of reducing the flow, including commercial toilet dams and weights, but most are variations of the water displacement principle. That is the theory behind putting bricks in the toilet tank, but please do not use bricks. It is all too easy to crack your tank with the extra weight, and after a while the bricks may disintegrate and cause serious and expensive problems in your plumbing system.

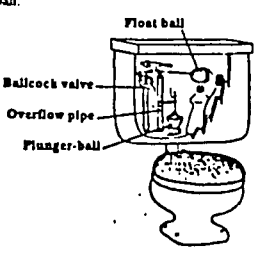
An inexpensive, safe, and easy method of displacement is to use plastic bottles such as soap and laundry softener bottles. (Soak paper labels off before placing the bottles.) Fill them with water, weight them, and place them in the tank, taking care that the bottles don't interfere with the workings of the toilet mechanism. Using bottles gives you better control over the volume of water in the tank, and it doesn't cost you anything.

However, don't displace so much water in the tank that you must flush it twice to clear the bowl. Double flushing wastes more water than it saves.

- Other devices are available to replace toilet mechanisms which allow varying amounts of water to be released depending on the type of flush needed. Check hardware and plumbing supply stores for these and other water-saving devices.
- When shopping for a new toilet, look for water-saving features. Most toilets now manufactured are shallow-trap models which use 3½ gallons or less per flush. Some specialty toilets, usually marketed for commercial use, may be adapted for use in residences. These include pressure toilets which use air to provide some of the flushing action, waterless toilets, and composting toilets.

Toilet Maintenance

Toilets are notorious for their hidden leaks and they can waste hundreds of gallons of water in a month undetected. Nine out of ten customer complaints about high bills can be attributed to leaky toilets. A toilet will leak when it is out of adjustment or when its parts are worn, so it is important to check it periodically. Leaks usually occur at the overflow pipe or at the plunger-ball.



- At the overflow pipe, look for water flowing over the top of the pipe. If it is, the water level is too high. Gently bend the float arm down so that the valve shuts off when the water level is a half inch below the top of the overflow pipe (see illustration). Sometimes the ballcock assembly itself is worn, however, allowing water to run continuously into the tank. If so, it needs replacement.
- Plunger-ball leaks may be detected by adding a few drops of food coloring to the water in the tank. Check about 15 minutes later to see if the color has appeared in the bowl. (Don't flush the toilet while it's being tested). Or use a leak detection kit provided by EBMUD on request, which uses a vegetable dye pill for the same purpose.

If you see color in the bowl, you need to replace the plunger-ball. If you plan to do-it-yourself, EBMUD's free water conservation plumbing booklet can provide more information.

Showers and Baths

Most showers use between three and six gallons a minute. A five-minute shower can use 30 gallons of water, and longer showers can become an extravagant waste of water and energy.

- The best way to reduce water for showers is to take shorter showers with the faucets only partially opened. Next time you take a shower, time yourself. Five minutes is usually enough to do the job. EBMUD offers a timer which may be hung on a hook or attached to the wall to help you get the five-minute habit. The cost is $5.00.
- Try a "navy shower": Wet down, turn off the water while you scrub, then turn the water on again for a quick rinse.
- If you are remodeling or replacing your fixtures, consider installing a low-flow showerhead. There are also a number of devices on the market for reducing the flow in existing showerheads.
- It can take awhile before the water will run hot from the tap or shower; while you're waiting, collect the cold water in a jug or pan and use it to give the houseplants or the dog a drink.
- A partially filled tub bath will use far less water than a long shower, though a short shower may use less than a full tub.
- A full tub may contain 60 gallons of water, so don't fill it to the brim. Bathe children together to save hot water and time.
- Wrapping hot-water pipes and the water heater with insulating material can save energy as well as reduce the time it takes for hot water to flow from the tap.

When you save hot water, you save the energy used to pump it, heat it, and treat it, too.

Shaving, Tooth Brushing, Hair Washing

- While you shave or while you brush your teeth, don't leave the water running. Turn it off while you lather up or brush, then turn it on again to rinse.
- When shaving, or washing your hands or face, put a stopper in the sink to "pond" the water used for dunking the razor or washcloth. A faucet left running wide open can put about three gallons a minute straight down the drain.

Kitchen

The big user of water in the kitchen is the automatic dishwasher. It will use about 14 gallons a run, whether there is a full load or just a teacup in it.

- Load the washer fully before running it. You'll save water and energy.

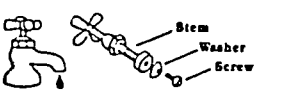
- Dishes don't need to be thoroughly rinsed before they are put into the dishwasher. Usually if they are scraped clean first the dishwasher can handle the rest.
- If your dishwasher has a drying cycle, you can bypass it, and let the dishes air-dry. Just turn off the control knob and open the door.
- When washing dishes by hand, don't leave the water running. A sink or dishpan full of wash water and one of rinse water will do the job.
- Flush scraps down the garbage disposer with cold, not hot water. Hot water melts grease which can later congeal and clog drainpipes.
- When you scrub vegetables and prepare foods, put a stopper in the sink instead of letting the faucet run.
- Water won't get much colder if you let it run when you want a drink. Keep a jug of water cold in the refrigerator instead.

Laundry

A washing machine will use about 35 gallons of water a load, whether it is a week's worth of clothes or just a couple of washcloths. The same idea applies to both dishwasher and washing machines—save up for a full load and make your water work efficiently.

- If your washer has a water-level adjustment, use it when you wash smaller loads.
- Newer model washers are equipped with a variety of water-saving features, such as adjustable temperature and water-level controls. If you're in the market for a new washer, ask about some of these features.
- Save hot water and energy by using detergents formulated for cold water washing. Cold water is gentler on synthetics and delicate fabrics, too.
- For hand laundering, put a stopper in the washtub for both washing and rinsing, and don't let the water run.

Leaks



Lots of water flows from little leaks. A deceptively small drip can waste 70 gallons of water in a day, and more than 1000 gallons a day can pour through a steady leak only one-sixteenth inch in size. And when a hot water tap is dripping, you are wasting energy also.

Most leaks, besides toilet leaks, are in the faucets, and are most commonly the result of worn washers. It is a good idea to make a regular check of every tap in the house a couple of times a year to see if all the faucets are working properly.

If water still drips after you have tigned the faucet off firmly, take it apart as shown in the diagram and replace the old washer with a new one of the same size and style. It is important to get a replacement washer that will fit easily inside the "cup" and spread out to the edges when screwed down. If it still drips you might have a more difficult problem, which would best be handled by a plumber.

For more information on repairing leaks in different types of faucets, consult EBMUD's "Water Saver's Guide to Home Plumbing," available on request.

If you think you still have a leak after you have checked all possible pipes and taps, call the EBMUD business office nearest you (see the list on the inside back cover). We will advise you what to do about it, and if necessary will send an inspector out to help you locate the leak. You will have to make your own plumbing repairs, however, or hire a plumber to make them; the Utility District does not provide plumbing services.

Shutoff Valves & Emergencies

You never know when your water heater is going to blow out, or when a pipe will burst, or when a faucet will decide to become a fountain. When these kinds of disasters happen you will need to know how to shut off the water.

Most sinks, washbasins and toilets in the house have shutoff valves below them which will cut the water off at that fixture. The hot water heater also has a shutoff valve which will cut off the hot water in the house. Unfortunately few homes have shutoffs for bathtubs and showers. It is a good idea to check your house to find all the shutoff valves and make sure they work.

In addition to all the other valves, most homes have a main shutoff which will turn off all the water coming into the house. It is usually located where the water supply line enters the house. Locate the main valve and make sure it works. You should have a plumber correct the situation if you do not have a shutoff or if it doesn't work.

Gardens & Outdoor Use

About half the water used by EBMUD residential customers goes into gardens—and the proportion is even higher east of the Oakland-Berkeley hills, where the weather is warmer.

The basic principle for efficient watering is to give plants only as much water as they need, and only when they show signs of needing it.

- Established plants can survive on less water than you might expect. Rather than following a fixed schedule for watering, watch the plants. If leaves begin to curl under slightly at the edges, or lose a bit of their gloss, or if the lawn doesn't spring back immediately after you step on it, it is time to water.
- Water in the cool of the day, such as mornings and evenings, and at windless times, in order to reduce water loss from evaporation, spray, and runoff. Watch the weather—there's no need to water before a rainstorm.
- To encourage deep root growth, lawns should be watered slowly and deeply. Deep rooted lawns will not need watering as often. Use a kitchen timer to remind you not to overwater.
- Keep the garden free of weeds which steal water from plants. Use mulches such as gravel, bark, leaves or plastic film over the rooting area of plants to reduce evaporation and discourage weed growth.

- Adjust sprinklers and hoses to water plants, not the sidewalk. If you are installing a watering system, the "drip" irrigation method can cut water use by 20 to 50 percent. If time or money prohibits a drip system, try less expensive "soil soaker" hoses as a substitute.
- Grey water—the water left from dishwashing or bathing—usually may safely be used on ornamental shrubs and the lawn. To avoid any possibility of health hazard, don't use it on vegetables.

If You Are Planning New Landscaping Plan ahead and plant a garden which will save you work, time—and water. Your yard can be green and flowery with minimum care if you plant part or all of it with drought-tolerant Mediterranean zone and California native plants.

- Cut back on lawn area—less lawn means less watering and mowing.
- Wait until fall and winter to start new gardens—winter rains help in establishing new root systems which need more water.
- Make sure the plant and location are suited for one another. Keep shade plants in the shade, water-loving varieties at the bottom of slopes or adjacent to lawns. Keep low-water plants separate from thirsty plants—drought-tolerant species may suffer from too much watering.
- Condition the soil for water conservation. Sandy soil loses water by evaporation and gravity; with clay soil, water will run off before it soaks in. Use soil amendments such as compost, peat moss, or leaf mold to achieve a balanced loam.

EBMUD has information available on request on California native plants, water-short gardening, and drip irrigation systems. If you'd like more, we suggest you talk to your local nursery, or check the library for books on native plant gardening. Here are a few titles:

Selected Native Plants in Color and *Selected California Native Plants with Commercial Sources*, Saratoga Horticultural Foundation;

Plants for California Landscapes, State of California Department of Water Resources;

Native Plants for use in the California Landscape and *Ornamental Shrubs for use in the Western Landscape*, Emile Labadie;

Growing California Native Plants, Marjorie Schmidt;

New Sunset Western Garden Book, Lane Magazine and Book Company.

Other Outdoor Use

As much as 600 gallons of water can flow through a ¾ inch garden hose in an hour—a hose running unattended can waste thousands of gallons in a very short time.

- When washing the car, use a bucket for soapy water, and don't leave the hose running while you wash. A shut-off nozzle on the hose will do the trick. Use the hose only for rinsing the car.
- Use a rake and a broom instead of the hose to clean up leaves and debris on your sidewalks, yard and gutters.
- And on those hot summer days when kids are just itching for a water fight, we would suggest water balloon battles rather than garden hose fights, and use the lawn as the field of valor.

A Good Way of Life

Water conservation is a good way of life. The many suggestions for water-saving contained in this booklet may seem overwhelming at first, but we're not asking you to drastically change your style of living. We do want you to think about your water and where it comes from, and to think about making that water supply last a little longer. Follow the water-saving ideas that seem practical to your way of life, and think of your own ways to save water. You'll be surprised at how small changes in habit can add up to a big water saving.

	Normal Use	Conservation Use
Shower	Water running, average 25 gallons	Wet down, soap up, rinse off 4 gallons
Brushing Teeth	Tap running 10 gallons	Wet brush, rinse briefly ½ gallon or less
Tub Bath	Full 60 gallons	Minimal water level 20-30 gallons
Toilet Flushing	Depending on tank size 5-7 gallons	Using tank displacement devices 4-6 gallons
Dishwashing	Tap running 45 gallons	Wash and rinse in dishpan or sink 5 gallons
Automatic Dishwasher	Full cycle 14 gallons	Short cycle 11 gallons
Shaving	Tap running 20 gallons	Fill basin 1 gallon
Washing Hands	Tap running 2 gallons	Fill basin 1 gallon
Washing Machine	Full cycle, top water level 35 gallons	Short cycle minimum water level 25 gallons
Outdoor Watering	Average hose 10 gallons per minute	Lowest practical use—little or none

EAST BAY MUNICIPAL UTILITY DISTRICT
P.O. BOX [illegible] OAKLAND, CA [illegible]

Fresh clean drinking water is yours to use whenever you need it. But not to waste. It's too valuable. Remember that a little effort and a little common sense will make a big difference.

Following the tips in this folder can save thousands of gallons every year in every household. That's right, thousands! So be alert. If you see water being wasted in your own home, tighten up. If you see it being wasted anywhere else, speak up.

USE WATER ... AND USE IT WISELY

ORANGE WATER AND SEWER AUTHORITY

3P–250M–11/78–70013–LR

25 THINGS YOU CAN DO TO PREVENT WATERWASTE

9 THINGS YOU CAN DO TO SAVE WATER IN THE BATHROOM

1 **Check your toilets for leaks.** Put a little food coloring in your toilet tank. If, without flushing, the color begins to appear in the bowl, you have a leak that should be repaired immediately.

2 **Stop using the toilet as an ashtray or wastebasket.** Every time you flush a cigarette butt, facial tissue or other small bit of trash, you waste five to seven gallons of water.

3 **Put plastic bottles in your toilet tank.** To cut down on water waste, put an inch or two of sand or pebbles inside each of two plastic bottles to weigh them down. Fill them with water and put them in your toilet tank, safely away from operating mechanisms. In an average home, the bottles may displace and save ten or more gallons of water a day.

4 **Take shorter showers.** Long, hot showers can waste five to ten gallons every unneeded minute. Limit your showers to the time it takes to soap up, wash down and rinse off.

5 **Install water-saving shower heads or flow restrictors.** Your local hardware or plumbing supply store stocks inexpensive water-saving shower heads or restrictors that are easy to install.

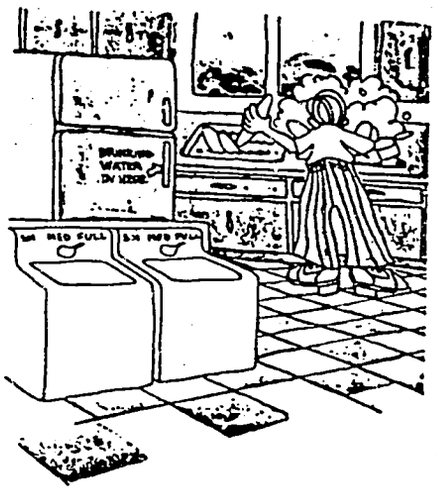
6 **Take baths.** A bath in a partially filled tub uses less water than all but the shortest showers.

7 **Turn off the water after you wet your toothbrush.** There is no need to keep water pouring down the drain. Just wet your brush and fill a glass for mouth rinsing.

8 **Rinse your razor in the sink.** Fill the bottom of the sink with a few inches of warm water. This will rinse your blade just as well as running water. And far less wastefully.

9 **Check faucets and pipes for leaks.** Even the smallest drip from a worn washer can waste 20 or more gallons a day. Larger leaks can waste hundreds.

28



6 THINGS YOU CAN DO TO SAVE WATER IN THE KITCHEN AND LAUNDRY

1 **Use your automatic dishwasher only for full loads.**

2 **Use your automatic washing machine only for full loads.**

3 **If you wash dishes by hand, don't leave the water running for rinsing.** If you have two sinks, fill one with soapy water and one with rinse water. If you have only one sink, gather washed dishes in a dish rack and rinse them with a spray device or panful of hot water.

4 **Don't let the faucet run while you clean vegetables.** Just rinse them in a stoppered sink or a pan of clean water.

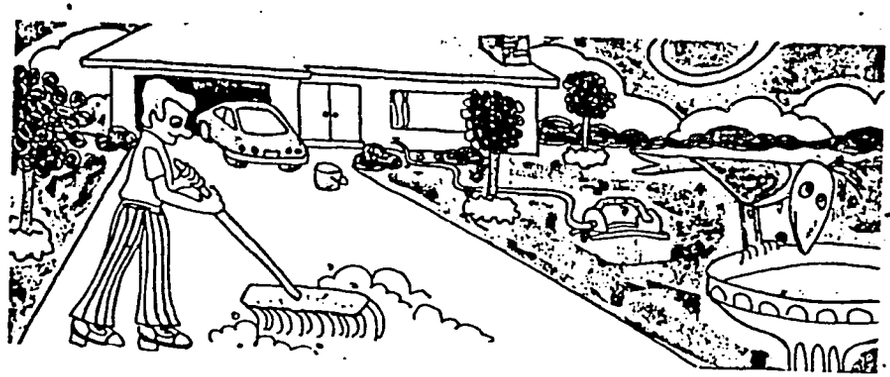
5 **Keep a bottle of drinking water in the refrigerator.** Running tap water to cool it off for drinking is wasteful.

6 **Check faucets and pipes for leaks.** Leaks waste water 24 hours a day, seven days a week and often can be repaired with only an inexpensive washer.

10 THINGS YOU CAN DO TO SAVE WATER OUTSIDE

1 **Water your lawn only when it needs it.** A good way to see if your lawn needs watering is to step on the grass. If it springs back up when you move, it doesn't need water. If it stays flat, fetch the sprinkler.

2 **Deep-soak your lawn.** When you do water, do it long enough for the moisture to soak down to the roots where it will do the most good. A light sprinkling can evaporate quickly and tends to encourage shallow root systems.



3 **Water during the cool parts of the day.** Early morning generally is better than dusk since it helps prevent growth of fungus.

4 **Don't water the gutter.** Position your sprinklers so water lands on the lawn or garden, not on paved areas. Also avoid watering on windy days.

5 **Plant drought-resistant trees and plants.** Many beautiful trees and plants thrive with far less watering than other species.

6 **Put a layer of mulch around trees and plants.** Mulch will slow evaporation of moisture and discourage weed growth, too.

7 **Use a broom, not a hose, to clean driveways and sidewalks.**

8 **Don't run the hose while washing your car.** Clean the car with a pail of soapy water. Use the hose just to rinse it off.

9 **Tell your children not to play with the hose and sprinklers.**

10 **Check for leaks in pipes, hoses,** faucets and couplings. Leaks outside the house may not seem as bad since they're not as visible. But they can be just as wasteful as leaks inside. Check frequently and keep them drip free.