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## PHOENIX WATER CONSERVATION PROGRAM

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Good afternoon. I'd like to review how the Phoenix Water Conservation Program is designed. In square miles, Phoenix is the second largest municipality in the country; Oklahoma City is the largest. We deliver services to about one million customers. In 1980, Governor Bruce Babbitt sponsored the Groundwater Management Code which organizes the state into three active management areas. Within those areas, the major municipalities must meet conservation goals in gallons per capita per day (gpcd). Phoenix's goal for the current 10-year period is 251 gpcd. This year we are at about 245 gpcd; it has been a fairly wet year. This criterion may be revised because it tends to favor larger population areas whereas some smaller population areas cannot possibly meet the goals set by the state. High population concentrations require proportionately less turf/agricultural irrigation.

Phoenix delivers about 245 million gallons of water per day. Our ultimate goal is to have no groundwater discharged by the year 2025; currently, ground-

water provides ten percent of our water needs. The Salt River Project provides 65 percent of our needs through surface water from the Salt and Verde rivers. The Central Arizona Project (CAP) provides 25 percent of our water, but we try to use as little CAP water as possible because of its high treatment costs resulting from a higher concentration of solids. During the summer I get comments from users of cooling towers; they know when CAP water proportions have increased because their chemical treatment costs increase noticeably.

Phoenix's water consumption is divided into three major groups: 51 percent single-family use, 17 percent multi-family use, and 32 percent industrial, commercial and institutional use. Four major programs address these groups: residential, Xeriscape, turf irrigation, and non-residential. The residential program was the first program established because of a 1985 emergency requiring sewer-flow reduction. The program also deals with evaporative coolers, some pool and spa

recommendations, and multi-family considerations. Multi-family issues are becoming more important due to landscaping considerations and the fact that residents often do not feel a need to conserve since they often do not directly pay for water use.

We have several community outreach programs. Field personnel have retrofitted 50,000 homes with showerheads, flush reduction and displacement devices, and faucet aerators. Another 65,000 homes have been retrofitted by customers after having come to our office with their water bill and obtaining a retrofit kit. We have a cooperative program with Southwest Gas called Seniors Helping Seniors, where senior citizens are trained to retrofit seniors' homes for both energy and water efficiency. That program has been a great success and has had some wonderful socialization benefits as well. Large facility training is conducted by field staff who demonstrate how hotel and hospital facilities can retrofit plumbing. In addition, we have an aggressive school education and community affairs program.

Xeriscape is our second major program. A full-time staff botanist works with community organizations and the city to develop lists of plants that can and cannot be used in public right-of-ways. The botanist also works with design, siting, and water features. Water fountains are very popular in Phoenix but can be controversial and are subject to siting restrictions.

Currently, we are discussing energy considerations that landscaping can help allay. Many people want to put in turf because they feel it makes the home cooler. Our research projects demonstrate you can obtain just as much shading with less water by using Xeriscape trees and plant material.

Every October, native wild flowers are promoted through the distribution of about 10,000 wild flower seeds packets. Nearly 3,000 homeowners participate annually in residential Xeriscape workshops. Homeowners are invited to bring their home's site plan and are helped to design a more water efficient landscape.

The third program area is turf irrigation. Any facility with over 10 acres of turf must adhere to a specific water application rate per year set by the state. Each municipality is responsible for making sure that each customer adheres to their quota or the municipality can pay a large fine. We help our customers through the Arizona Meteorological Network (AZMET) that was established by the University of Arizona. Four weather stations are located throughout Phoenix's park system. Any large-turf customer can use the computer to determine what the recommended water application rate should be for that day. The

computer data base also provides weather information. The Parks Department is one of the city's largest customers. Our turf irrigation specialist has done a terrific job in training Parks Department personnel in scheduling, using proper spray heads and equipment, and making changes in cultural practices that have long been tradition. We are now working with other city departments, helping them with conservation plan development and employee education.

Our fourth program deals with non-residential water use. Pepsi Cola Bottling Co. was one of my first site visits. Because 40 to 50 percent of water use in the non-residential sector is cooling use, whether by cooling towers, chillers, fuse scrubbers or machinery coolers, we have targeted cooling for efficient water use.

In 1987, Phoenix started the two-phase Best Available Technology Study. The first phase determined what the major water uses were within Phoenix, and the second phase designed an implementation and outreach program. Last year we formed the Industrial/Business/Government Water Conservation Program. We conduct about 20 site visits yearly for our largest customers. An engineering firm, under contract with us, visits customers, prepares a complete water audit of the facility, and makes conservation recommendations. We then require the customer to develop a conservation plan. We present a Mayor's Award annually to any company that has developed conservation actions or plans. This year we have 13 awardees who conserved 101 million gallons of water. We will also present two media awards for promoting public conservation awareness.

It is very important to recognize water conservation programs developed by people who are willing to jump on the bandwagon, yet have few financial resources. We have one weatherman who joined the AZMET program and publicizes the daily water production figures and what the turf irrigation application rate should be. Recognition will be given to the city's bus system for putting up our conservation posters at bus benches at no charge when space is available.

Before developing codes, ordinances, or new outreach programs, we present our ideas to an advisory committee comprised of representatives from each of the 13 major industries within Phoenix. Their feedback has been extremely helpful in code development. We hold half-day and full-day seminars and workshops on cooling management, general conservation planning, and just this year, workshops for vertical industries. Programs are provided for hospitals, hotels, and other

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commercial enterprises. A new commercial landscaping and maintenance program also has been developed.

Finally, an exciting new development in water conservation is integrated resources planning. We are working with gas and electric utilities in developing cooperative conservation plans for non-residential customers. You get a lot more "bang for the buck" if a facility manager can see from the outset how much money will be saved over the long-term by developing a conservation plan.

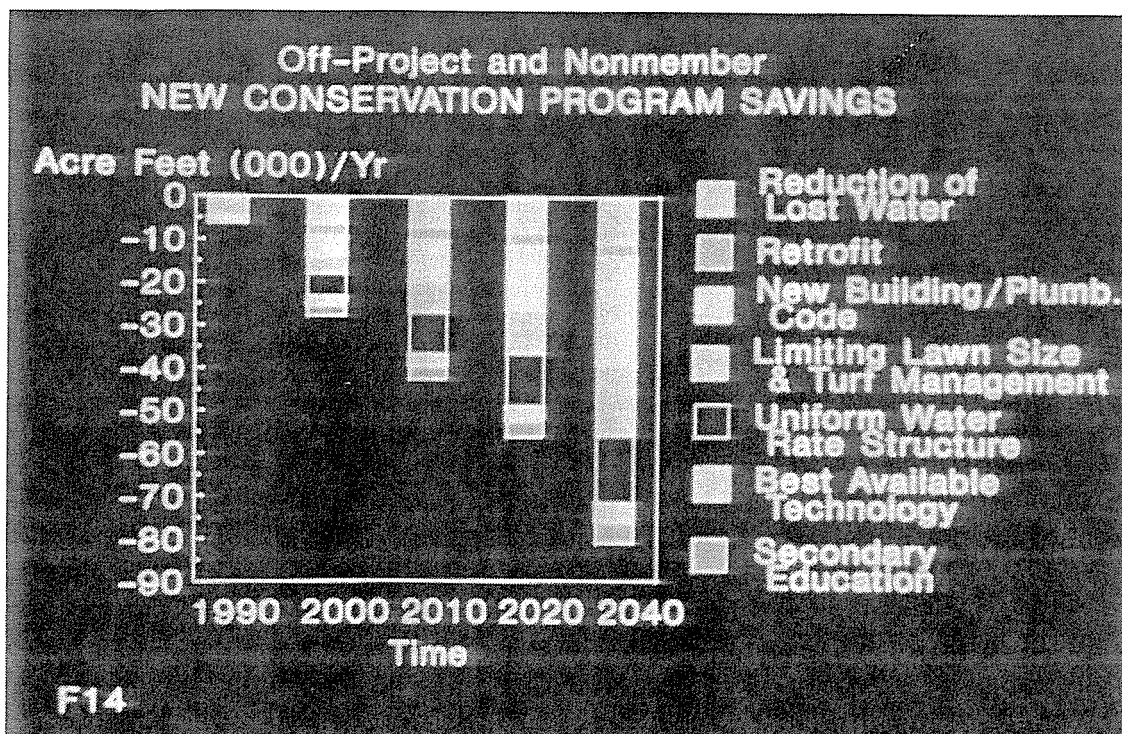
Employee education is very important as the following story will attest. Not long ago we walked into the bakery section of a grocery store and happened upon, not a dripping faucet, but a running faucet. I asked the bakery worker how long the faucet had been running like that and she shrugged her shoulders and said, "Well, as long as I've been here." I asked, "How long is that?" She said, "A year." That one faucet accounted for 20 percent of the grocery store's water bill and proved two things. First, the employees were not taught enough to care, and second, the manager did not do a very good job of walking around his store checking on what was happening.

We also work through trade associations like the Hotel Engineering Association and the Hospital Engineering Association. Members attend seminars free of charge and we've had a very positive response from engineers who wanted to do something but they just didn't know how to go about it.

Table 1 shows projections for the impact of different conservation programs by the year 2040. Note that secondary education is included. We are integrating conservation planning into the high school curriculum. The EPA has cooperated with us in developing conservation education through the Heritage Fund. To meet new EPA restrictions, we must build significant changes into our wastewater treatment system and must pass these environmental charges on to the customer. This will, in some instances, increase a non-residential customer's bill by 43 percent. This can mean a significant increase in water charges, particularly for industrial-class customers. Conservation is also affected because sewer rates are tied to water consumption. We are very proud of what we have been doing with water rate development. We have been working very hard with citizen committees on water rate development. We have learned that consensus on volatile topics such as water rates is impossible but informed consent is something we work toward.

The Desert House, a \$1.8 million project was started in 1985. The project was started by the University of Arizona after they retrofitted a home in Tucson called "Casa del Agua." They wanted to build a home from scratch that would be representative of a medium single-family home in the Phoenix area. The home was built on the premises of the Desert Botanical Garden as part of their Center for Arizona Living, and is a

Table 1.



partnership project of the City of Phoenix, the Arizona Energy Office, Salt River Project, and the Desert Botanical Garden. The project should be completed by February 1993 and will be used for research. Ground-water tanks have been placed under the home and will be used once the county health authority gives their approval. Research data will be collected by computer in a tunnel under the house.

One last suggestion in looking at water conservation: keep in mind the inter-relationship between water, wastewater, and water quality and their impacts on water conservation. *Money* magazine's September 1992 issue provided their annual list of the best U.S. cities in which to live. Amazingly, most important on the selection criteria of the residents, over and above crime and education considerations, was water quality. It has become the priority issue in our water services department.