



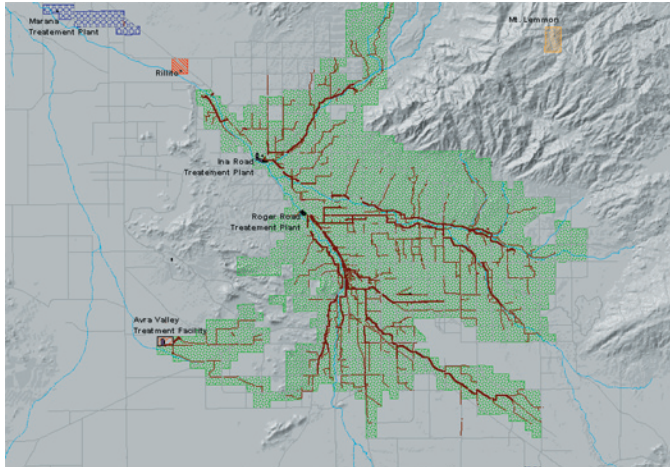
## UNIT 5 WATER CONSERVATION

### Reclaimed water

There are many things the local water utility does to conserve our water supply. In addition to the potable (drinking) water system, Tucson Water manages a separate system for delivery of reclaimed water. Tucson Water is currently the only water company in Pima County with access to reclaimed water. Reclaimed water, or effluent, is treated wastewater. Sewerage water from Tucson homes and businesses goes to the Roger Road Wastewater Treatment Plant, operated by the Pima County government. Adjacent to the County’s wastewater facility is the Tucson Water Reclaimed Water Plant, operated by the Tucson City government. Treated wastewater is pumped from the Wastewater Treatment Plant

to the Reclaimed Water Plant where the water is filtered, disinfected and tested to ensure it meets federal water quality standards. Through this process wastewater is “reclaimed,” meaning that water with no practical use due to its poor quality is treated to make it suitable for outdoor irrigation. By providing this abundant source of irrigation water, Tucson Water is reducing the amount of precious groundwater being pumped for large-scale turf irrigation.

Source: UoFA Water Resources Research Center



Wastewater treatment facilities and distribution system.

When the treatment plant began delivery of reclaimed water in 1984 the only customer was one golf course. The following sites currently use reclaimed water for irrigation: all City of Tucson golf courses, 10 private golf courses, 32 city and county parks, over 40 schools, the University of Arizona, 3 campuses of Pima Community College, and over 300 single family homes. Reclaimed water is also used to irrigate the landscaping in new road medians.

### Return of the Zanjeros

Tucson Water has resurrected the historic role of the Zanjero, the community water manager. In Tucson in the 1800s, when farming along the floodplains of the Santa Cruz River was common, a system of irrigation canals existed that carried water from the River to the fields. The water users in the Old Pueblo elected the Zanjero each year. The Zanjero’s responsibility was to make sure farmers irrigated their fields according to a community-developed schedule that would prevent waste.

In the 1990s there are several Tucson Water employees who serve as Zanjeros to assist Tucson homeowners manage their water use. At homeowner’s request, these extensively-trained employees visit Tucson Water customer’s homes with high water use, to conduct thorough home water audits and suggest ways to conserve water if necessary. During the water audits, the Zanjeros inventory all water-consuming fixtures (e.g., dishwasher, clothes washer, evaporative cooler, swimming pool, irrigation system), inspect bathrooms and kitchen for leaks, measure the flow rate of faucets and showerheads, assess the outdoor landscaping, replace or install water-saving showerheads and leaking toilet flapper valves, and discuss the water audit findings with the customer, suggesting steps they can take to minimize water waste.

### Beat the Peak

“Beat the Peak” is a Tucson Water public information campaign that has run every summer since 1977. “Beat the Peak” refers to peak demand; a time of day, or year, when the demand for water is the greatest. Tucson experiences peak

demand in summer. In response to summertime heat, water customers water their gardens more, run their evaporative coolers, and spend more time in the swimming pool. This increased need for water puts pressure on water utilities to meet demand. Every summer there are days when all operable wells have to be pumping at full capacity in order to meet demand. By means of newspaper articles, television and radio spots, community outreach, and educational materials, Tucson Water and other water providers encourage water users to voluntarily reduce their water consumption, especially by choosing to water outdoors during the cooler times of day.

### **Water Conservation Education**

The Water Smart workshop series is open to the general public and provides participants with intensive, two-hour sessions designed to teach homeowners about proper landscape design, installation, and management techniques. Along the same lines, the Smartscape Workshop series provides landscape professionals and commercial property managers with the knowledge and skills to manage landscape with the goal of increased efficiency of water use.

Tucson Water offers two distinct water education presentations to local elementary schools: *Da Drops* is designed for first through third grade learners, and *Our Water, Our Future* is for fourth and fifth grade learners. Both programs include pre- and post-visit activities, as well as interactive, in-class presentations focusing on the water cycle, water supply, and water conservation in the Tucson basin.

### **Individual Involvement**

There are many simple ways that individuals can reduce their water use. At first water-saving solutions may seem insignificant, but if you envision people throughout the Tucson area actively engaged in reducing water use the total effect can be tremendous. Taking shorter showers, running the dishwasher only when there's a full load, and covering swimming pools when they're not being used are a few of the simple water-saving habits that can make a great collective difference.





## ACTIVITY 5.1 SHOWER FLOW

*\*Activity adapted from "Saving Water at Home," [Water in Our Desert Community](#). 1994. Arizona Municipal Water Users Assoc.*

### At a Glance

As a homework assignment, students measure the volume of water flowing from their showerheads at home. In school, they calculate how much water could be saved by installing water-saving showerheads.

### Arizona Department of Education Academic Standards

Please refer to the Arizona Department of Education Academic Standards section for the ADE standards addressed by this lesson.

### Learning Objectives

Students will be able to:

- 1) Measure the water consumption of their showers at home and determine if they have a water-saving showerhead.
- 2) Calculate the amount of water that could be saved by using a water-saving showerhead versus a high volume showerhead.
- 3) Calculate the amount of water that could be saved by using a timer to limit the length of time spent in the shower.
- 4) Receive a water-saving showerhead to install at home, and a shower timer.

### Materials

data collection page (Student Activity Book)  
parent permission form  
shower flow kit  
wristwatch or stopwatch

### Procedure

In the first part of this activity the students conduct a homework assignment measuring the flow rate of a showerhead at home. By comparing the flow rate with that of a water-saving showerhead, students will be able to determine whether or not they have a water-saving showerhead. The students who do not have water-saving showerheads can report this to you. If those students are interested in receiving a water-saving showerhead they must have a parent or legal guardian sign and return the permission form included in the shower flow kit. You can request water-saving showerheads by calling the outreach education coordinator at 520 670 1442 or emailing [outreach@eeexchange.org](mailto:outreach@eeexchange.org).

Distribute a shower flow kit to each student. Included in each shower flow kit is a shower flow meter bag, parent permission form, and shower timer. Suggest that students ask a parent or sibling to assist them with this homework assignment. One can be the "timer" and the other the "filler." The procedure is:

*1. Gather the top of the Shower Flow Meter bag around the shower pipe, making sure the showerhead is inside the bag. Hold the bag in place loosely so that air may escape while filling.*

*2. Quickly turn on cold water to full flow.*

3. Let water run for exactly 5 seconds.

4. Quickly turn off water. Observe the water level on the bag. The graduation nearest to the water level shows the flow rate in gallons per minute.

5. *OPTIONAL:* For increased accuracy, empty the bag and repeat steps 1 through 4 and average the results.

Ask the students to record the showerhead flow rate in the appropriate space on the Student Activity Book page.

Also, have the students keep track of the length of time they spend in the shower the next time they take one. Have them record this in the appropriate space on the Student Activity Book page.

In class write the range of gallons per minute from the Shower Flow Bar Graph in the Student Activity Book on the chalkboard or overhead transparency. Make a tally of the class results by having students raise their hands as you go through the ranges one by one. Have each student bar graph the numbers from the tally on the Shower Flow Bar Graph in the Student Activity Book.

Now go through the same tally and graphing process with the class for time spent in the shower.

Based upon the flow rate of their showerheads, the length of time they spent in the shower and the information gathered in the two bar graphs, have the students extrapolate to answer the remaining questions on the data collection page. Remind students that “calculating the average” is the same as “finding the mean” for a given set of data.

