

2.7 School Education

A. *Applicability*

This BMP is intended for a Municipal Water User Group (“utility”) that serves schools as a part of its customer base. Lessons learned by students about good water use habits are often shared with the whole family. A utility may have already accomplished this BMP if it has a current school education program that meets the criteria of this BMP. Before deciding whether this BMP is necessary, review existing curriculum to see if the local school district is already offering a water conservation related curriculum.

Once a utility decides to adopt this BMP, the utility should follow the BMP closely in order to achieve the maximum water efficiency benefit from this BMP.

B. *Description*

School education programs, while not directly related to an equipment change, may result in both short and long-term water savings. Behavioral changes by the students based upon greater knowledge are often shared with parents and implemented at home. To be effective, a school education program should provide curriculum material appropriate to the grade level of the student, increasing in complexity from elementary school through high school. If such a curriculum does not already exist, local curriculum experts may be willing to help develop the desired materials.

A complementary aspect can be to include a water audit unit as part of the curriculum where the students take flow measurements of showerheads and faucet aerators at their homes. If the showerheads and faucet aerators are higher than the current standard, the students would receive efficient showerheads and faucet aerators to install with the assistance of their parents. This unit can be successfully implemented in grade 5 or higher and can meet the requirements of this BMP without additional curriculum development.

The circumstances and challenges of the local water resources should be considered in choosing or developing a conservation curriculum. Grade level appropriate material is important in ensuring that the students understand the information. When possible, curriculum material used in the classroom should address the Texas Essential Knowledge and Skills⁶ (“TEKS”) for the grade level and subject area. Texas state education guidelines for testing of skills are an important consideration as well. A quality water conservation program for schools provides teachers with materials that contribute to learning mathematics, science, social studies and history while educating the students about water conservation and local water resources. Already developed curriculum is available from the Texas Water Development Board, EPA, other public agencies, nonprofit organizations and private companies.

Another option beyond offering a supplemental curriculum is to offer an education entertainment show for grades 1 to 4. These shows can be very popular with teachers and often do not have the

same requirement for the material to meet TEKS. In addition, the percentage of students that can be reached is often higher than for adoption of a curriculum.

To evaluate the effectiveness of the education materials, presentation or show, the utility should use an evaluation tool such as a pre- and posttest or survey.

C. Implementation

Implementation should consist of at least the following actions:

- 1) Evaluate local, regional, state or national resources available to determine applicability to the utility's local water conditions. Consider creating an advisory committee of local educators to assist in choosing or creating the curriculum;
- 2) Implement a school education program to promote water conservation and water conservation related benefits.

Programs include working with school districts and private schools in the water suppliers' service area to provide instructional assistance, educational materials, and classroom presentations that identify urban, agricultural, and environmental issues and conditions in the local watershed and water service area. When possible, educational materials should meet the TEKS guidelines.

A water oriented curriculum that is focused on conservation and resource issues should be made available for all grades.

- a. Grade appropriate programs and/or materials should be implemented for grade levels 1 to 6 initially. Alternatively, a presentation or educational show can be offered for some or all of these grade levels.
- b. For grades 7 to 8 and for high school students, the utility should do one of the following: distribute grade appropriate materials for high school science, political science, or other appropriate classes; present assembly type programs to high schools; sponsor science fairs with emphasis on conservation; or implement education programs with community groups like Scouts, 4-H clubs, etc.

The utility can elect to meet this BMP by focusing only on grades 1 to 6 or 7 to 12 and achieving higher participation rates.

In conjunction with the Showerhead and Aerator BMP, consider providing a water audit unit as part of the curriculum where the students take flow measurements of showerheads and faucet aerators at their homes. If the showerheads and faucet aerators are higher than the current standard, the students would receive efficient showerheads and faucet aerators to install with the assistance of their parents. This unit can be successfully implemented in grade 5.

D. Schedule

Depending on the program option(s) selected, the following schedule should be followed:

- 1) Utility should adopt or develop the program in the first year and start implementation in the second year for grades 1 to 4.
- 2) Utility should adopt or develop the program in the second year and start implementation in the third year for grades 5 to 6.
- 3) Utility should adopt or develop the program in the third year and start implementation in the fourth year for grades 7 to 8.
- 4) Utility should adopt or develop the program in the fourth year and start implementation in the fifth year for grades 9 to 12.

E. Scope

Select items 1 and 2 or item 3.

- 1) The utility should strive to reach 10 percent of students in grades 1 to 6 with a presentation or curriculum each year by the third year of implementation, following the schedule above, and
- 2) The utility should strive to reach at least 10 percent of students in grades 7 to 12 with a presentation or curriculum each year by the third year of implementation following the schedule above. Or,
- 3) Alternatively this BMP will be met if the utility only focuses on grades 1 to 6 or 7 to 12. The program would be developed in the first year and implemented in the second year for either alternative. The utility should strive to reach either 15 percent of students in grades 1 to 6 each year by the third year of implementation or 15 percent of students in grades 7 to 12 by the third year of implementation.
- 4) The utility can count as participants students reached through clubs and educational events; and students impacted by utility sponsored program outside the utility service area.
- 5) For smaller utilities, or those in which service area boundaries overlap school district boundaries with another water utility, jointly operated or funded programs should be considered.

F. Documentation

To track the progress of this BMP, the utility should gather and have available the following documentation:

- 1) Number of school presentations made during reporting period;
- 2) Number and type of curriculum materials developed and/or provided by water supplier, including confirmation that curriculum materials meet state education framework requirements and are grade-level appropriate;
- 3) Number and percent of students reached by presentations and by curriculum;

- 4) Number of students reached outside the utility service area;
- 5) Number of in-service presentations or teacher's workshops conducted during reporting period;
- 6) Results of evaluation tools used, such as pre- and posttests, student surveys, teacher surveys;
- 7) Copies of program marketing and educational materials; and
- 8) Annual budget for school education programs related to conservation.

G. Determination of Water Savings

Water savings for school education programs are difficult to quantify and therefore estimated savings are not included in this BMP. If the retrofit kit is distributed, water savings can be calculated as described in the Residential Retrofit BMP. A 1991 study conducted for The Harris Galveston Coastal Subsidence District found an average savings of 18 percent or 1,400 gallons per month¹ in homes where the student and parent had installed efficient showerheads and aerators on bathroom and kitchen sinks.

H. Cost-effectiveness Considerations

A true cost-effectiveness analysis cannot be determined without a measure of water savings. By implementing this BMP, the utility will enhance its public image, increase customer goodwill, and increase the viability of its overall water conservation efforts.

School education costs vary widely due to the varying types of programs. Curriculum units can be developed and implemented for \$1 to \$3 per student. Educational entertainment programs can be developed or contracted out for \$2 to \$5 per student. There are prepackaged contractor programs with extensive features that cost up to \$35 per student. Most programs will require utility staff oversight and outreach efforts to schools and students.

If showerhead and faucet aerator kits are distributed as part of this BMP, the costs for the kits will be similar to those described in the Residential Retrofit BMP.

I. References for Additional Information

- 1) *Effectiveness of Retrofit in Single Family Residences*, Prepared for Harris Galveston Coastal Subsidence District, Roger Durand, University of Houston , 1992.
- 2) *Water Savings and Beyond: A Multi-Resource Conservation Collaboration in the Seattle School District*, Broustis, D., et al, Water Sources Conference Proceedings, AWWA, January 2002.
- 3) *'Water in our World' and 'Down the Drain' Programs Close the Water Curriculum Gap for 5th and 6th Graders*, Jefferson, C., et al, Water Sources Conference Proceedings, AWWA, January 2002.
- 4) *Water Sourcebook*, Tennessee Valley Authority, Environmental Education Section, Knoxville, Tennessee, May 1994.

- 5) *Effectiveness of Retrofit in Single Family Residences and Multi-Family Projects*, Texas Water Development Board, Roger Durand, University of Houston-Clear Lake, 1993.
- 6) *Texas Essential Knowledge and Skills*. <http://www.tea.state.tx.us/teks/>
- 7) *Major Rivers*, Texas Water Development Board & Lower Colorado River Authority.
- 8) *Learning to be WaterWise*. <http://www.getwise.org/wwise/>
- 9) *Project Wet*. <http://www.water-ed.org/projectwet.asp>
- 10) *Conservation Curriculum Resources*, EPA.
<http://www.epa.gov/teachers/curriculumconservation.htm>
- 11) *Gulf Coast Curriculum Resources*, EPA. <http://www.epa.gov/gmpo/edresrc.html>
- 12) *National Project for Excellence in Environmental Education*, North American Association for Environmental Education (NAAEE). <http://www.naaee.org/npeee/>
- 13) *H2O House Water Saving Home*, California Urban Water Conservation Council and EPA. <http://www.h2ouse.org/>
- 14) *TWDB Education and Public Awareness Page*.
<http://www.twdb.state.tx.us/assistance/conservation/Education.htm>
- 15) *What Education Program is Right for your Community*, Vogel, C., Water Sources Conference Proceedings, AWWA, January 2002.