Technical and Physical Feasibility Fact Sheet
Alternative A-56: Conservation Education

Acknowledgements: This fact sheet was written by Myra Segal Friedman of EJJ Associates as part of the "Evaluation of Alternative Actions for Technical, Physical, Hydrological, Environmental, Economic, Social, Cultural, and Legal Feasibility and Water Quality Issues and Legal Overview" contracted to Daniel B. Stephens & Associates, Inc. The format and organization of the fact sheet and the definition of the alternative were developed by the Water Assembly.

1. Definition of Alternative

A-56: Establish region-wide educational programs, including public and private school curricula, to encourage voluntary conservation of water.

2. Summary of the Alternative Analysis

Long-term water conservation starts with children. Teaching children to understand the value of water will help them develop a conservation ethic and the habits to become tomorrow's water-wise adults (NM OSE, 2001). School outreach programs are also an effective way to reach entire families, as children will educate their families about water use and conservation. Effective school outreach includes:

- New school outreach programs in jurisdictions that do not already have such programs and enhanced programs in other jurisdictions. Water resources can be instituted as part of the elementary school curriculum throughout the Middle Rio Grande Water Planning Region.

- A "traveling" trained staff person, who would visit numerous school classrooms each year, participate in water and science fairs, and coordinate other water educational activities.

3. Alternative Evaluation

3.1 Technical Feasibility

Enabling New Technologies and Status

Existing school outreach efforts would be used as a starting point. The curriculum should engage students and get them actively involved in water conservation strategies. Many curricula exist, both locally and nationally, that could be used as models (U.S. Bureau of Reclamation, 2000).[1] Also, several existing programs could be used as the basis for a broader water conservation outreach program. For example:

- The City of Albuquerque currently employs a full-time school outreach coordinator who visits 180 classrooms each year and participates in water fairs and science fairs. Approximately 4,500 students, primarily third-graders, are currently reached through school visits.

- Independent water fairs also reach students. For instance the annual Children's Water Festival reaches more than 1,000 students.

Infrastructure Development Requirements

The existing Middle Rio Grande Council of Governments (MRCOG) regional website (http://www.mrgcog.org) could be enhanced to include interactive tools that enable children (and adults) to create water budgets for their homes. Various websites currently offer interactive water calculators to help users understand how much water they use and where they use it. [2] These web calculators provide a simple method for doing a "home water check-up" and allow children to compare their home use with the average use. A link could be established from local jurisdiction websites to the MRCOG website so access is broadened and duplication of efforts is reduced.

One example of student-oriented projects that could be used is to make each student responsible for establishing a household water budget and determining how they can reach that budget (using an interactive web-based calculator). This activity would integrate students' math skills and water conservation knowledge. It would also familiarize students with resources

available through local and regional governments by getting them engaged in activities on the enhanced web pages.

Total Time to Implement

A regional school outreach program could be developed in three months (summer recess) and be ready to implement in schools throughout the academic year.

3.1.1 Physical and Hydrological Impacts

Effect on Water Demand

Educating children about water conservation provides double benefits. Not only do the children learn the importance of water conserving habits, they can also influence the water use patterns of their parents and other members of their families.

Precise water demand reductions through school outreach programs are difficult to calculate. Depending on the existing level of conservation awareness and activities, public education can yield between 3 and 15 percent in water savings (Witherspoon, 2001). Assuming a 5 percent reduction applied to total depletions in the region[3], this alternative could result in a 8,670 acre-feet per year reduction in demand. This amount is included in the savings listed in the fact sheet for A-18, *Urban Conservation.* School outreach programs can be responsible for a significant part of the public education effort.

School outreach programs should help reduce water waste and overuse by changing water use habits. For example, children (and their families) will become conscious of wasting water by letting the tap run while they are brushing their teeth or washing dishes. This awareness, and the resultant savings, should help ease the pressure on scarce water supplies.

Effect on Water Supply (surface and groundwater)

This alternative will not affect water supply.

Water Saved/Lost (consumption and depletions)

See the fact sheet for A-18, *Urban Conservation*, for a more thorough analysis of impact of water-conserving activities.

Impacts to Water Quality (and mitigations)

School-based water conservation programs can help students understand how non-point source pollution can start on the street where they live. Students can become aware of how chemicals from landscapes and fluid from vehicles can travel to the river or other water sources. Through this knowledge, they can educate their family members about how daily behavior may be affecting water quality.

Watershed/Geologic Impacts

School curricula could also include watershed information. This will allow students to develop a holistic view of where water comes from and how different practices impact the watershed. Through the use of resources such as *Discover A Watershed: The Rio Grande/Rio Bravo Reference and Activity Guide* (WET, 2000)[4] students can better understand local watershed issues and practices.

3.1.2 Environmental Impacts

There are no specific impacts to ecosystems or endangered species associated with this alternative (see fact sheet for A-18, *Urban Conservation*).

3.2 Financial Feasibility

3.2.1 Initial Cost to Implement

To implement this alternative, available school curricula and materials on water would be assessed by staff. Other costs would include:

- Approximately $60,000 annually for a mid-level, trained professional staff person to visit numerous school classrooms each year, participate in water and science fairs, and coordinate other water educational activities. This cost includes overhead and benefits.

- A per student materials costs of approximately $5.00 to $10.00 per year. This cost is based on existing programs. For example, in Albuquerque, to reach 4,500 school children, the cost per student is $5 for materials (such as coloring books, poster, video, pencils) for a total annual cost of $22,500 (Sparks, 2002). Similarly, a theater production on water costs approximately $2.00 per student.

- Under this alternative, the cost per acre-foot of water saved per year is $9.22.[5]

Some free publications are available from the U.S. Environmental Protection Agency and Office of the State Engineer. Other kits are also available for teachers, such as "Every Drop Counts" from the Center for Hands-On Learning ($500 per kit).

3.2.2 Potential Funding Source

Local jurisdictions could contribute a proportional amount for their share of the cost of production, purchase, and/or printing of materials.

3.2.3 Ongoing Cost for Operation and Maintenance

Ongoing costs include staff and materials as stated in Section 3.2.1, *Initial Cost to Implement*.

References/Bibliography

New Mexico Office of the State Engineer (NM OSE). 2001. *A water conservation guide for public utilities.* March 2001 [Available free by calling 1-800-WATERNM or e-mailing waternm@ose.state.nm.us].

Sparks, R.H. 2002. Personal communication between Roberta Haynes Sparks (City of Albuquerque Conservation Office) and Myra Segal Friedman (EJJ Associates). October 15, 2002.

U.S. Bureau of Reclamation. 2000. *Water conservation module for educators.* 307 p.

Watercourse and International Project Water Education for Teachers (WET). 2000. *Discover a watershed: the Rio Grande/Rio Bravo reference and activity guide.* Discover a Watershed Series. 370 p.

Witherspoon, J. 2001. Personal communication between Jean Witherspoon, (City of Albuquerque) and Myra Segal Friedman (EJJ Associates). February 9, 2001.

---

1 Water Conservation Module For Educators Sponsored by the Bureau of Reclamation, 2000, pages. Developed for middle and high school educators, this module provides background material, case studies, and activities on the topic of water conservation. Case studies are based on water

conservation scenarios ranging from a rancher in west Texas to an ice cream factory in Massachusetts, and from water's role on the space shuttle to the survival of a sailor adrift in the Atlantic. These real-life examples encourage students to use decision-making skills to work through issues related to water use and conservation. Sidebar material, illustrations, photographs, charts, and a selection of activities complement the background chapters and case studies. Cost $18.95

For other USBR Education resources, contact Kathie Marsh, Environmental Education Program Manager, Denver, Colorado kmarsh@do.usbr.gov http://www.usbr.gov/enved/ books/

Project Wet Curriculum And Activity Guide http://www.montana.edu/wwwwet/

Project WET (Water Education for Teachers) provides training workshops and teaching modules. Project WET is a non-profit water education program designed to facilitate and promote awareness and appreciation of water resources. Funded by the Bureau of Reclamation and co-published by The Watercourse and the Council for Environmental Education (CEE), 1995. 517 pages.

Water Facts are available at:

http://www.pn.usbr.gov/project/wat/facts.html#uses

[2] Examples of websites with water calculators:

http://www.tampagov.net/dept_water/conservation_education/Customers/Water_use_calculator.asp

http://www.ficus.usf.edu/docs/water_calculator/calculator.htm

http://www.provwater.com/conscalc.htm

www.H2ouse.org

www.waterwiser.org

[3] This was calculated based on a total depletion = 173,417 acre-feet per year, which includes depletions in Bernalillo, Valencia, and Sandoval Counties (except for reservoir evaporation in Sandoval County) (Wilson, 2000).

[4] This reference and activity guide for middle and high school educators is published in Spanish and English. This resource begins with a comprehensive overview of the watershed in several chapters which complements and meshes with a selection of interdisciplinary activities. Especially useful for group explorations under the guidance of a teacher or park interpreter, this resource works equally well for independent or family study.

[5] This cost assumes an annual cost of $80,000 to implement this alternative and a water savings of 8,670 acre-feet per year.