Technical and Physical Feasibility Fact Sheet
Alternative 22: Conservation Incentives

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1. Definition of Alternative

A-22: Provide local government programs that offer subsidies for adoption of water efficient technologies and utilization of water saving devices.

2. Summary of the Alternative Analysis

This analysis examines implementation of subsidy programs to promote installation of low-water-use technologies that can be administered through regional or local governments or water suppliers and can build on current local and national programs. Existing programs serve as a model for public water supply systems to initiate incentive programs to encourage consumers to reduce water usage. Rebates or "give-aways" demonstrate a commitment by water utilities and policy makers that they think it is important to change water wasting fixtures, appliances and landscapes. These incentives provide a balance to mandatory requirements the utility or jurisdiction may impose.

3. Alternative Evaluation

3.1 Technical Feasibility

Enabling New Technologies and Status

Water-efficient technologies and water saving devices are available in the general market. Reduction in household water use since the mid-1980s stems primarily from improvements in the efficiency of plumbing fixtures and appliances (Vickers, 2001). As time passes, devices will be produced that hopefully further increase in efficiency and affordability. Toilet design is likely to be improved to address some of the current technical drawbacks and to provide enhanced

features (e.g., avoid blockage and allow for easy control of the amount of water used for each flush, as is found in existing European models).

Infrastructure Development Requirements

The infrastructure needed for this alternative is related to administrative staff and financial resources rather than to water distribution infrastructure.

Rebates are generally provided through the water billing system, so the system's programming structure must be capable of making bill adjustments for customers approved to receive rebates.

Incentives other than rebates could also be provided. For instance, conserving households (ones with a large reduction or that are consistently under their category's average) could be provided a "discount" on their water bill. Another incentive could be a streamlined administrative procedure for new construction that incorporates low-water design and technologies that exceed minimum standards. Other administrative incentives for new construction or building permits for renovations could include (1) a "trade" for something else in the plan approval process or (2) a streamlined review process for planned developments that emphasize water conserving designs and technologies.

Total Time to Implement

Rebate programs are in place in Albuquerque, Rio Rancho and possibly other jurisdictions in the Middle Rio Grande planning region. Additional or broader programs could be implemented when staff is made available to oversee, process, and inspect installations, and when the interested utility determines that it can provide rebates instead of collect revenue from customers.

The City of Albuquerque has an estimated 126,643 single family and 63,285 multifamily dwellings (MRCOG, 2002). Some of these homes are new construction or have already installed water conserving fixtures and landscapes. Rebates are targeted to conversion of older, high-water-use dwellings, yet only a fraction of residences have participated in the rebate program. As the 50 years of the regional water plan elapse, older fixtures, landscapes, and irrigation systems will be replaced with new, water-conserving ones. Rebates can speed that

process. Setting a target date for complete saturation can guide how aggressive a rebate program should be.

Santa Fe had a toilet give-away program during the recent drought. Lessons can be learned from jurisdictions that have experience with giving away conservation devices.

3.1.1 Physical and Hydrological Impacts

Effect on Water Demand

Rebates are an incentive to speed up the installation of water-saving devices. Savings accrue as more of the items are installed over time. Water savings estimates from replacing non-conserving with conserving fixtures and appliances are summarized in Table 22-1. Refer also to the fact sheet for A-18, *Urban Conservation* for information on potential savings.

Table 22-1. Correlation of Rebate-Targeted Fixture to Acre-Feet Savings and Cost: City of Albuquerque Rebate Program 1996-2002

Item	Savings Per Unit Converted	Year Rebate Established	No. of Items Needed to Save 1 ac-ft/yr	Total No. of Rebates from Established Year to 2002	Total 2002 Savings Due to Items Converted 1996-2002 (ac-ft/yr)	Rebate Per Unit	Total Expenditure 1996-2002	Cost ($)/ac-ft of Savings Over 25-Year Life of Converted Item
Toilet: Convert from 5 to 1.6 gallons/flush	122 gallons/week	1996	51	43,261	842	$87.52	$3,786,203	$180
Xeriscape: Convert bluegrass to low water plants	19 gallons / per ft^2 /yr	1997	17,500 ft^2	1,586,819 ft^2 (1,127 properties)	93	$0.25 (per ft^2)	$317,079 [b]	$140
Clothes washer: Convert from 51 to 27 gallons/load [c]	115 gallons/week	2000	54	3,474	64	$100	$347,400	$215

Source: City of Albuquerque Water Conservation Office

[a] Unless otherwise noted.

[b] Personal communication with Jean Witherspoon, October 14, 2002 using billing and rebate program data. These numbers exceed the data reported in the City of Albuquerque's *2001 Water Conservation Annual Report* because of additional rebates issued since the annual report was written (for xeriscaping, price changed from $.20 to $0.25).

[c] Vickers, 2001, p. 119.

ac-ft/yr = acre-feet per year ft^2 = square feet

As seen in Table 22-1, water can be saved by replacing high-water-use toilets, landscapes, and clothes washers with low-water-use items that are currently available. To save 1 acre-foot of

water per year, approximately 51 toilets, 54 clothes washers, or 17,500 square feet (ft^2) of landscape must be replaced. The City of Albuquerque has sponsored a water conservation rebate programs since 1995. Between 1995 and 2002, 42,082 toilets, 1,127 landscapes (1,586,819 ft^2) and 3,474 clothes washers have been replaced with low-water-use designs (Witherspoon, 2002; Cisneros, 2002). Data from this program (Table 22-1) indicate the savings and costs that can be expected from a rebate program.

In Albuquerque, utility customers have been offered a toilet rebate for about seven years. Approximately 4,000 to 8,700 toilets have been replaced each year, saving an estimated 2.9 gallons per flush or 122 gallons per week per fixture. (Witherspoon, 2002; Vickers, 2001)

The Albuquerque xeriscape rebate program has been operating for about six years. Initially, a rebate of \$0.20/ft^2 was offered; this was later increased to \$0.25/ft^2. Approximately 150 to 300 properties have converted (175,000 to 425,000 ft^2) each year. Xeriscape with drip system saves an estimated 30 inches/ft^2 (or 19 gallons/ft^2 per year) as compared to a bluegrass lawn with sprinklers (Witherspoon, 2002; Vickers, 2001). Note that xeriscapes can exhibit a delay in total water savings because newly installed xeric plants need more water to get established the first year or two. Savings are realized after the second year, if the homeowner is aware of how they can reduce watering (Cisneros, 2002).

The City of Albuquerque's clothes washer rebate program has been operating for approximately three years. About 700 to 1,200 washers have been replaced each year, saving an estimated 23 gallons per load or 115 gallons per week (Witherspoon, 2002; Vickers, 2001).

As clothes washers are more costly to replace, the target number of clothes washers to be replaced in a rebate program may be lower than for toilets or other lower cost items.

The amount of water saved will accrue over the life the installations, as shown in Table 22-1.

Effect on Water Supply (surface and ground water)
This alternative will not affect water supply.

Water Saved/Lost (consumption and depletions)

Savings projected from this alternative are presented in Table A-22. The savings for xeriscaping represent a reduction in consumptive use. However, since water from washing machines and toilets is returned to the wastewater treatment plant, the savings shown on Table A-22 represent savings in diversions rather than in consumptive use.

Impacts to Water Quality (and mitigations)

Replacing sprinklers with drip irrigation can reduce run-off and therefore reduce migration of lawn chemicals and soil into the river.

Watershed/Geologic Impacts

None specific to this alternative. Refer to the fact sheet for A-18, *Urban Conservation*.

3.1.1 Environmental Impacts

Impact to Ecosystems

None specific to this alternative. Refer to the fact sheet for A-18, *Urban Conservation*.

Implications to Endangered Species

None specific to this alternative. Refer to the fact sheet for A-18, *Urban Conservation*.

3.2 Financial Feasibility

3.2.1 Initial Cost to Implement

As seen in Table 22-1, a cost per acre-foot can be calculated by the amount of water saved from the rebate program and comparing this to the cost of providing rebates. Using the rebate level currently offered by the City of Albuquerque and an accrued water savings (over the 25-year life of the converted item), rebate costs per acre-foot of saved water range from $10 for xeriscape rebates to $180 for toilet rebates to $215 for clothes washer rebates. Since the xeriscape option represents a savings in consumptive use and is the least expensive option, it provides the highest value.

Currently, replacing a high-water-use clothes washer with one that uses less water has a high initial cost to the consumer. Without a rebate, there may be little financial incentive for buying a more expensive, water-saving model. However, the significant water savings that can be realized make washers an effective rebate target (as seen in Table 22-1, it takes only 54

washers to save an acre-foot per year). Local jurisdictions should consider increasing the rebate amount for washers to make this a more economical choice for middle Rio Grande residents.

Table 22-1 summarizes costs found in the existing Albuquerque program. Costs can vary depending upon the amount of the incentive and the participation rate. Because rebates are provided as a "deduction from billed water," the actual cost of the program is related more to foregone revenue than capital outlay. Ability to forego revenue is contingent upon the water utility's cash flow and fiscal health.

Water rate "discount incentives" for highly conserving customers would similarly imply that the utility can afford to forego revenue.

Administrative incentives do not have to cost revenue or cause foregone revenue. Administrative incentives such as streamlined permit processing does not cost revenue, but does require trained staff with enough time set aside to make these cases a priority to clear to process toward approval.

The cost per acre-foot is calculated in Table 22-1 on the basis of the rebate provided and does not account for staff time to administer the program.

It can take a number of years to yield a return on investment for a water conserving installation, but the savings are long-term.

3.2.2 Potential Funding Source

The water utility and customers will share the cost for the installations. Generally rebates do not cover 100 percent of the cost of installation.

If the utility cannot forego revenue to keep up with demand, other funding sources such as grants, capital investment programs, or "borrowing" from other funding categories within the utility may be sought.

3.2.3 Ongoing Cost for Operation and Maintenance

Estimated operation and maintenance costs can be derived from the ongoing program in the City of Albuquerque (Table 22-1). By 2050, it is likely that low-water use fixtures will be used by all water consumers. Technology may improve water saving yields after that point. Rebate programs (and programs that offer free fixtures) boost the rate at which these fixtures are replaced. Saturation of the marketplace with low-water technologies and devices will eventually eliminate the need for rebate programs.

References/Bibliography

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