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## **Water savings assessed**

**By Cherry Sokoloski  
North Forty News**

In all the deliberations about the Northern Integrated Supply Project, a common complaint has been that the Army Corps of Engineers--and the project applicant--didn't give enough credence to the benefits of water conservation.

Conservation provides both possibilities and limitations, when it comes to supplying the water needs of northern Colorado communities. In June, the North Forty News asked water conservation experts about potential water savings from both municipalities and the agricultural sector, as part of the solution for supplying the thirsty--and growing--Front Range.

### ***Urban conservation***

Aurora was recognized in 2007 as having outstanding conservation practices. The city was rated number one among 13 Front Range communities studied by Western Resource Advocates, a nonprofit environmental law and policy organization.

Aurora had to act quickly in the record drought year of 2002, when its reservoirs stood at 26 percent of average. The city put severe water restrictions in place, and those emergency measures became a jumping-off point for longer-range conservation policies in effect today.

For example, Aurora prohibits water wasting, such as allowing water to run down a street gutter.

Before the drought, water consumption in Aurora was about 180 gallons per capita per day. Water usage has crept back up since the worst drought years, but consumption is still at 137 gpcd today. That compares with consumption of 155 gpcd in Fort Collins and 140 gpcd in Frederick, one of the participants in the

## Northern Integrated Supply Project.

There are 15 participants in NISP, and according to the draft environmental impact study for the project, average water consumption for the partners is 161 gpcd. However, that figure is based on water use from 1998 to 2003, and many of the communities have put conservation programs in place since the severe drought of 2002.

The following are some of the water conservation policies and practices used in Aurora, as provided by Aurora's water conservation supervisor Kevin Reidy.

- Tiered water rates, with higher rates for greater consumption.
- Rebates for water-efficient appliances such as washing machines, toilets, showerheads and faucets. Some of these items are provided by the city at no charge.
- Free indoor water audits and landscape irrigation audits.
- Lawn permits: Permit requirements for new lawns include soil amendments, an irrigation clock and sprinkler heads with check valves. Irrigation systems are inspected by the city before a permit is issued.
- Bluegrass turf: Front yards may include only 25 to 40 percent bluegrass; back yards are limited to 45 percent. Residents may, if they choose, have 100 percent xeriscape lawns.
- Reclaimed water: The city reuses some of the water that would normally go to a water treatment plant. This water is treated to a lesser degree at a special plant, then used as nonpotable water on Aurora's golf courses and parks.
- New automatic car washes and power-washing facilities: water recycling is required.
- Staffing: The Water Conservation Division of the Aurora Water Department had two employees in 2002; that number has increased to 13.
- Enforcement: Water monitors issue a warning for a first violation. After that fines are stiff, from \$250 per violation for single-family homes to a minimum of \$800 for a commercial violation. However, the city emphasizes an educational approach. In 2007, 632 warnings were issued, but only four fines were levied.

Reidy estimated that Aurora's entire water conservation program will save 8,000 to 10,000 acre-feet of water over the next 20 to 25 years. The long-range programs now in place will add up to big savings over the long haul, he explained, much like regular savings translate to a healthy retirement account. "The sooner you start, the better," he commented.

Aurora is not a NISP participant.

## ***Ag conservation***

Agriculture uses 80 to 85 percent of the water in Colorado, so conservation champions argue that if agriculture used water more efficiently, that could provide more water for other users, namely towns and cities.

However, there are problems with that argument even when it comes to terminology. Reagan Waskom, director of the Colorado Water Resources Research Institute based at Colorado State University, explained that with agricultural water rights, there is a big difference between "efficiency" and "conservation."

Efficiency refers to strategies such as lined irrigation ditches and pivot sprinklers. For example, flood irrigation with unlined ditches is considered 30 to 40 percent efficient, while pivot sprinklers are rated as 75 percent efficient. As a result, flood irrigation requires the farmer to divert more water to put the same amount on the crop.

However, even with efficiency measures, the farmer still uses the same amount of water for a given crop. That amount, called the "consumptive use," is all the farmer is entitled to under his water right. The rest of the water diverted to his property, including water that is "saved" by using these efficiency methods, must go back to the river as "return flow." People downstream - often in another state - have rights to this return-flow water.

So, whether or not a farmer uses efficiency measures, he is still entitled to only the amount of water historically consumed by his crop. The water "saved" cannot be sold to a municipality or used to irrigate additional acreage.

Conservation, on the other hand, refers to using an amount of water that is actually less than what has been historically consumed. Conservation can be accomplished in several different ways: practicing deficit irrigation, or using less than the optimum quantity of water for a crop; changing to different crops that require less water or have a shorter growing season; reducing the number of irrigated acres; or reducing evaporation losses.

Conservation does increase the amount of water available to other entities--but at a cost. Outcomes can include reduced crop yields, greater exposure to pests and increased management costs--all detriments to the agricultural producer.

Using conservation methods (less water) on a large scale would change the return-flow picture, Waskom said, so it would impact water rights downstream. "We need to figure this out," he said, and that endeavor will involve both legal and engineering work.

When it comes to conservation, Waskom said, "We think it is a path of the future, but no one has figured out how to administer it."

Another question is, who would bear the costs?

Currently, Waskom noted, the Colorado Water Conservation Board is tackling the issue. The board has allocated \$1.5 million to fund conservation projects that it can study. It's a worthwhile effort but a complicated one, Waskom said.

Water-sharing arrangements between farmers and cities are also a possibility. But

while the legalities of these arrangements are worked out, Waskom said, it's simpler and less expensive for cities to simply buy up ag water while it's still available.

With the hurdles involved, he added, ag conservation cannot make up for all the water that NISP would provide

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