CONSERVATION Current

A Newsletter Published by the New Mexico Water Conservation Alliance

Sandia Leads in Cooling Tower Efficiency

When Sandia National Laboratories facilities engineers were looking for ways to conserve water, early attention focused on cooling towers. The cooling towers at Sandia use about 75.5 million gallons of water a year to operate air-conditioning and process-cooling systems. This large water use makes them a prime target for conservation improvements.

Cooling towers are found in almost all large buildings, industrial plants, or wherever waste heat must be disposed. While the size, construction, and other details differ, most cooling towers work by bringing heated water into contact with air. As some of the water evaporates, it carries off excess heat and cools the remaining water, which is recirculated through the system. Because cooling towers work by evaporating water, they can be among the largest water users in any installation where they are used. While there is not much that can be done to reduce water usage through evaporation, other mechanisms through which cooling towers consume water can be controlled.

One such mechanism is called "blow-down." As the water in a cooling tower evaporates, the minerals and other contaminants in the remaining water become more concentrated. This can cause scale or sediments to build up in the towers or in the equipment that is connected to them. In order to prevent damage, some of the water, the blow-down, is drawn off the system and replaced with clean water, or make-up, from the local supply.

One approach to reducing scaling and sedimentation is to introduce treatment chemicals to the water. While this is effective, it increases the expense of operating cooling towers and the potential for pollution from chemicals being sent to the sewer with the blow-down.

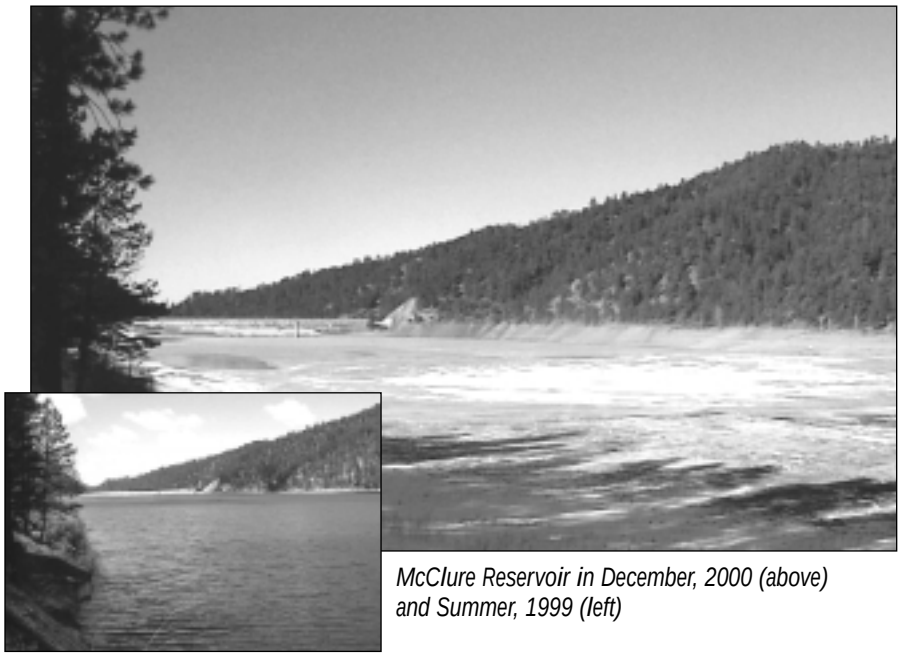
Cooling tower at Sandia's Microelectronics Development Laboratory uses recycled process water for make-up.

Sandia's water conservation and pollution prevention programs cooperated on a pilot project to reduce blow-down and chemical usage. In the pilot project, the cooling tower was outfitted with electronic equipment to monitor scale, corrosion, and water use. Visual inspection and water chemistry tests were used to monitor cooling tower water parameters such as chemical treatment level, calcium, silica, and conductivity. By increasing the water flow to design level and changing out the distribution nozzles in the first two rows of the hot water pan to a larger diameter, the tower concentration cycles (the total quantity of make-up water divided by the total blow-down) were increased from 2.5 to 4.0. This represents a 20% reduction in water use and a 50% reduction in chemical use.

In an extraordinary collaboration between the Sandia Facilities Management and Operations Center's water conservation program and the Microsystems Science, Technology and Components Center, used ultra-pure water from microelectronics fabrication operations is being reclaimed for use in the laboratory building's cooling towers.

Microelectronics fabrication requires large amounts of treated, ultra-pure water for various process uses. After the water is used, it is generally sent to the sewer, even though it is still very clean by ordinary industrial standards. At Sandia's Microelectronics Development Laboratory, this water is used for make-up in the building's cooling towers. The reclaimed water is very low in hardness which allows for 10 or more cycles of concentration. Water savings from this project are estimated at 20 million gallons per year.

For more information on these and other water conservation projects at Sandia National Laboratories, contact the water conservation program leader, Darell Rogers, at 505-844-5842 or dmroger@sandia.gov.



McClure Reservoir in December, 2000 (above) and Summer, 1999 (left)

Santa Fe Ordinance Handles Crisis

This article is based upon a presentation made at a recent Alliance meeting by Craig O'Hare, City of Santa Fe.

As most New Mexicans remember, last year's winter was extremely dry. It was followed by a dry spring and hot summer; and, like other New Mexico municipalities, the city of Santa Fe found itself in a water shortage emergency.

Fortunately, Santa Fe has had a water emergency ordinance in place for some time. While some last-minute adjustments were required, it was ready to go into effect when the water shortage became critical. Three of the four stages of the ordinance were implemented.

Stage 1, with its voluntary restrictions, began in early June. Extensive radio and print advertising asked users to reduce their consumption, but it had only a small impact. By late June, the mandatory restrictions of Stage 2 went into effect. Stage 2 restricted landscape irrigation to evening and nighttime hours, discouraged planting new landscaping, and prohibited planting of turf grass. Enforcement was stepped up for standing violations like letting water run outside property boundaries. After an initial publicity campaign, enforcement entered a zero-tolerance mode, with fines being added to the customers' water bills.

Stage 2 brought demand down but didn't achieve the needed results, because the expected late summer monsoon rains never really materialized. So in early August the city declared a Stage 3 emergency. All landscape installation was banned, and irrigation was allowed only once a week, even in city parks. These restrictions were very effective, bringing water demand down to about half of the pre-emergency peak (except for the irrigation days). When the rains finally came, reservoir levels stopped dropping, and the city did not have to invoke Stage 4, which would have banned all outdoor watering. The ordinance worked to control demand.

In the aftermath of the emergency, the city and other groups are examining ways to avoid similar occurrences in the future. The parks department is exploring low-water-use turfgrasses to reduce water use and demonstrate landscape conservation. The City Council's Public Utilities Committee is considering conservation billing and growth management measures like limiting the number of connections per year to the water utility. They are also concerned with making the emergency restrictions more equitable. This past year the restrictions were particularly onerous on the landscaping industry. One possibility is to require landscaping retrofits (changing out high-water-use plants, adding graywater irrigation systems, etc.) and mandate the use of licensed landscaping contractors to do it.

Many climatologists believe last year's drought is part of an extended dry spell. If this is the case, the need for emergency ordinances like Santa Fe's will continue.

For more information on the Santa Fe water emergency and the ordinance, contact Craig O'Hare of the City of Santa Fe Water Utility Division, 505-954-7125, cohare@ci.santa-fe.nm.us, or Dan Ransom, 505-954-7107, dransom@mail.pnm.com.

New Education Materials Available

Conserve Water Educator's Guide

A new guide for teachers of students in Grades 6-12 contains a group of innovative, challenging, and fun activities and case studies to help explore water conservation issues. The guide is produced by The Watercourse, a not-for-profit water science and education program based at Montana State University. There is a charge for the materials, but it is minimal.

To order copies of the Conserve Water Educator's Guide, *or to find out more about The Watercourse, call 406-994-5392 or visit their website at http://www.montana.edu/wwwwater/index.html.*

Water: A Never Ending Story, Grades 4-7 (Curriculum and Video)

A collection of hands-on, interdisciplinary activities, organized into a complete curriculum on water, and designed to help students cultivate a water conservation attitude. Activities include science, math, art, and language arts and can be easily differentiated to accommodate all learning skills.

Originally sponsored by the Intermountain Section of AWWA, Water: A Never Ending Story *has been reprinted by the New Mexico Office of the State Engineer. Limited supplies are available to teachers and educators by calling 800-WATERNM.*

New Web Sites Everywhere!

New web sites are springing up everywhere. Here are some interesting ones to check out.

Sandia National Laboratories initiated a new water conservation site in December. It is located at http://www.sandia.gov/aqua/aqua.htm and includes descriptions of conservation projects and results, along with contacts for more information.

To find out about Rio Rancho's water conservation programs, go to their new conservation web page at http://ci.rio-rancho.nm.us. Click on *Utilities* and go to *Conservation*.

The California Urban Water Conservation Council posts its new water conservation newsletter, *The Toilet Paper*, on its web site at http://www.cuwcc.org/product_news.htm. The newsletter's first volume covers all the latest news on low-flow toilet performance standards, purchase specification issues, toilet flapper durability and new products. Other issues will cover other water conservation topics as well.

Another site in California, http://www.wateright.org, provides an education tutorial on weather-based irrigation scheduling, along with irrigation scheduling guidelines for homeowners, turf managers and agricultural operators at local sites. Although designed for that state, it's an interesting site to browse.

The Texas Water Wise Council has launched a multi-purpose site to provide information on water-efficient outdoor watering practices and to keep its members up to date on conservation events. The site is located at http://www.WaterWiseTexas.org.

And remember to check the updated, expanded conservation web pages for the Office of the State Engineer at http://www.ose.state.nm.us, and the Water Conservation Alliance at http://wrri.nmsu.edu.

Alliance Elects New Officers

At its January meeting, the Alliance elected new officers for 2001. Colleen Logan, water conservation officer for the City of Rio Rancho, is the new president. She replaces outgoing president Dee Fuerst. The new vice president is Lorri Skeie-Campbell, conservation program specialist with the City of Albuquerque. Continuing in their offices for another year are Bob Matthews, secretary, and Lonnie Burke, treasurer.

Register Now for Drought-Proofing Workshop

Many New Mexico communities had difficulty meeting their water demands during the 2000 drought. To learn how to be better prepared to deal with drought impacts, municipal water suppliers are invited to attend a half-day workshop on March 21 at the Sheraton Old Towne in Albuquerque.

The workshop will be part of the annual conference held by the New Mexico Rural Water Association. Participants will learn how to prepare drought contingency programs, initiate water conservation measures including appropriate water rates, and make water supply systems more efficient through proper water use accounting. Water conservation experts from Texas, Colorado and New Mexico will discuss these topics and provide useful handouts, including a new municipal water conservation planning guide.

You may register for the whole conference, or just attend the workshop by paying the one-day conference fee of $55.

To register, contact the New Mexico Rural Water Association at 505-884-1031, or e-mail Dionne Shirley at dionne@nmrwa.org. You may also register online at http://www.nmrwa.org.

Free Workshop for Facility Managers

A water resource management workshop for facility managers will be held April 10-11 in Albuquerque. The U.S. Department of Energy's Federal Energy Management Program (which also includes water conservation) is hosting the event in association with the New Mexico Water Conservation Alliance.

The workshop will cover a broad range of topics to help managers evaluate their facilities and implement a water management plan and water conservation measures specific to the federal government sector. Included in the list of topics will be opportunities for saving water through reuse/recycle and other efficient technologies and techniques, along with water auditing, leak detection, and metering.

The workshop is targeted at federal facility managers but is also open to other non-federal staff, limited only by space availability. The workshop is free and will be held at the Public Service Company of New Mexico's conference center from 8:00 a.m. to 4:30 p.m. each day.

Register now to secure your spot at the workshop. Call the workshop registration line at 509-372-4368 (contact: Nicole Roy) or register through the form provided.

For more specific information on the workshop, contact Kate McMordie at 505-899-3609 or kate.mcmordiestoughton@pnl.gov.

Registration Form:

Water Resource Management Workshop
April 10-11, 2001 • Albuquerque, NM

Name (please print)

Title

Agency

Mailing Address

Phone Fax

E-mail Address

To register on-line,
please visit www.pnl.gov/femp

To register by phone,
please call Nicole Roy at 509-372-4368

To register by fax, complete this
form and fax it to: Nicole Roy 509-372-4990

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