

A New Era

Anxious water districts, green plumbers, and Australian marketers predict blue skies ahead for greywater.

By Ed Ritchie

Art Ludwig, of Oasis Water, was more than pleasantly surprised when 75 plumbers and water-related tradespeople were waiting to attend his graywater workshop at the unfriendly hour of 6:30 a.m., in Cottonwood, AZ. “The hardware and regulations and political climate are all converging, and this issue of graywater use is accelerating,” says Ludwig, a consultant that has worked on water and wastewater systems in over 20 countries around the world. Arizona introduced new regulations for use of all types of reclaimed water on January 16, 2001.

Graywater is defined as wastewater, collected separately from sewage flow, which originates from a clothes washer, bathtub, shower, or sink—but not from a kitchen sink, dishwasher, or toilet. Arizona allows residents to use it for landscape irrigation up to 400 gallons per day, without any formal permitting process. But, users must adhere to 13 best management processes.

Graywater, as a conservation method, has gained wide acceptance with water agencies in drought-ridden Australia, but not in the US, where it’s been constricted by public indifference, as well as inconsistent health and building codes. Despite these challenges, some states (New Mexico recently adopted most of Arizona’s guidelines) and water agencies are pushing ahead, and, as Ludwig noted, their efforts are about to get a significant boost from a convergence of powerful forces.

To start, the demand for conservation is growing. Consider the severe drought conditions in states such as California, Arizona, and Georgia, says Val Little, director of the Water Conservation Alliance of Southern Arizona, at the University of Arizona. “Absolutely, there is a growing urgency, and, because of the desert and scarce rainfall, Arizona has been at this much longer than other areas of the country,” Little says. “People are paying attention, and they are more willing to entertain ideas, regulations, and incentives that they would not pay attention to five or ten years ago. On the other side, water is becoming more expensive to find, pump, treat, and deliver. So, there’s some additional pressure.”

California offers a prime example of the pressurized connection between water and energy. In 2005, the state’s Energy Commission released a study that said 19% of the state’s electricity and 33% of its natural gas and diesel was consumed by water in some way. The situation gets worse during droughts, because hydro-electricity falls, yet the energy demands rise due to lower water supplies and deeper groundwater levels, that require even more energy to pump water to the surface.

Unfortunately for California, complicated laws have restricted progress, and spawned some instances of negative publicity, such as the media attention given to bootleggers known as “Graywater Guerillas” (see sidebar). However, California’s regulations are part of the inspiration for a graywater pilot program conducted by the Metropolitan Water District (MWD) of southern California, a cooperative of 26 cities and water agencies serving 18 million people in six counties. The MWD

imports water from the Colorado River and northern California to supplement local supplies, and helps its members to develop water resource-management programs.



Photo: Soquel Creek Water District

A water-wise plant and grass workshop

Regarding water conservation, the district holds a grant competition to find water conservation products to add to its roster of consumer products that qualify for rebates. Two graywater products won grants of \$75,000 each to prove their worthiness for future consumer rebates from district water customers, and, naturally, their legality in California. “One of the things we’re interested in is the bureaucracy and how hard it is to get permits from local cities,” says Bill McDonnell, MWD’s senior resource specialist. “What can be done to streamline the process and get the information to the inspectors easily? A lot of our cities want to know how that works.”

If the products prove to be viable conservation tools, the information will be distributed to MWD members and the district will recommend them for rebates. Just as importantly, the district has a legislative group that promotes water conservation legislation. “If we had a report that said these graywater products are good, but there’s a challenge from state rules and regulations, we would ask the legislature folks if it was something they could work on,” McDonnell says.

Legislation is definitely the problem, according to water conservation consultant John Koeller, P.E., of Koeller and Company, in Yorba Linda, CA. Koeller has authored many research reports for the California Urban Water Conservation Council, and notes that municipalities and water districts haven’t promoted graywater products and solutions because of the “patchwork” of health codes throughout the US.

Nonetheless, Koeller expects that efforts by the MWD and others will help the market for graywater products to explode over the next 10 years. “We would like to think that these pilot programs will have an effect on the health codes, and the International Association of Plumbing and Mechanical Officials [authors of the Uniform Plumbing Code] has a task force attempting to bring order out of chaos regarding this subject,” he says. “We think, with all the studies that are going on and all the interest in graywater, that there will be a meeting of the minds. I give it a 10-year window where we’ll see major changes.”

At the California Urban Water Conservation Council’s Web site, Koeller has noted the recent activities of six graywater product manufactures now entering the US market. Included in the group are WaterSaver Technologies and Perpetual Water, both winners of the recent MWD grants.

The entrepreneurs behind Perpetual Water and WaterSaver are counting on Koeller’s explosive predictions for the future. Perpetual Water’s product comes from Australia, and is marketed in the US by Ralph Petroff, cofounder of ADS Environmental Services, an international water conservation

company with 55 offices in 12 countries. Petroff sold ADS to a Swedish company in 1995, but his experience with water conservation while working in Australia led him to Perpetual Water's products, and, he sees great opportunities for graywater in the US.

"There is white-hot interest in onsite water treatment in the US," Petroff says. Perpetual's first product is a whole-house unit targeting the new-home construction market. Other than sewage, it captures all of the house's water, including showers, laundry, and bathroom sinks. According to Perpetual's research, it amounts to about three-quarters of the house's water, with the remaining 25% considered black water sewage.

Laboratory tests in Australia show that the product creates what Petroff describes as "tap water-quality" water that's appropriate for irrigation, laundry, or even washing a car. "It's very reasonably priced at \$4,900, comparable to something like an air conditioning unit," Petroff says. "Now you can take water and put it on your lawn, or just store it."

Perpetual's other product is just for laundry units. It costs about \$950 and takes the laundry water (typically the number-one source of graywater in the house), and converts it to water that can be used for landscape irrigation, such as watering lawns.

Lower on the price scale is the WaterSaver Technologies' Aqus, a product planned to retail at just \$295, but its function is limited to lavatory sink water. It collects and treats a sink's water, and automatically refills a toilet's reservoir, so potable water isn't used to flush the toilet. An override valve allows fresh water if the graywater source isn't enough.

A user-friendly approach is what the graywater market lacks, according to Mark G. Sanders, chairman of WaterSaver Technologies. "When water has a grey color and light odor, and stains bathroom fixtures is okay for the enthusiasts," Sanders says. "But, in this case, we're offering treatment and a simple system that doesn't require dials and knobs. It may require a little annual maintenance and a major servicing every five years, but, otherwise, you can just forget about it."



Photo: Steve Lehtonen

Steve Lehtonen, Director of Green Plumbers U.S.A., with California Governor Arnold Schwarzenegger

Sanders is traveling the country doing presentations to inspectors and plumber's associations. "It's not a complicated device, and once a person sees it working and understands how it chlorinates the water and takes out large particulates, there aren't too many people that aren't ready to approve it." So far, plumbers associations in Albuquerque and Santa Fe, NM, are testing units, and the Soquel Creek Water District—an agency that serves roughly 50,000 customers in Santa Cruz County, CA—also has a unit for testing.

According to Ron C. Duncan, Soquel's conservation and customer service field manager, the district is in overdraft, drawing more water from the aquifer than it replenishes. Proximity to the Pacific Ocean means eventual saltwater intrusion, so conservation and a search for alternative supplies are urgent. "Almost all of the water we save by conservation will be a lot cheaper than either salt water intrusion or supplemental supply purchasing," Duncan says. "We are looking at the WaterSaver approach and

think it's a great concept. The unit and these kinds of products have a strong future and make a lot of sense. The days of flushing fresh potable water down the toilet are gone."

At this point, Duncan says testing the Aqus is as far as the district can go, because Soquel's legal department interprets California law as allowing only the use of recycled water (such as tertiary recycled water rather than graywater) to flush toilets, but not in single-family residences. However, Duncan and the district's board of directors think California's laws are overdue for an overhaul, so they lobbied their state senator to push for revisions in graywater usage.

"The systems, like WaterSaver's, make graywater, [but,] it's filtered and treated with chlorine or ultraviolet light," Duncan explains. "So, it's a cross between graywater and tertiary-recycled water. When these laws were written, they were looking at a different kind of water and a different kind of technology. Yet, you still can use recycled or fresh water for flushing. To me, it's just mind-boggling; I think there's going to be a big change in the next few years."

So manufacturers are entering the market, and water agencies certainly want more tools for conservation, but what about consumers? According to Little, consumers need more information. That's the overwhelming response from studies and the experiences of water agencies in Arizona. In a recent study, the Water Conservation Alliance of Southern Arizona found that, of those surveyed, the top reason for not reusing graywater was "don't know how." "We all agree that the technology is here, but, there needs to be an education of the market and the right segment of the population," Little says.

Ron Duncan, the conservation and customer service field manager for Soquel Creek Water District (Soquel, CA), has advice that will work for both graywater and traditional conservation. "We do everything to reach consumers," he says. "We run continuous ads in three local newspapers, and we include coupons as billing inserts. We have tied all our customer service and office people into this conservation effort. When they got to speak to customers they offer fliers about our conservation rebate programs so everyone in the district is doing double duty."

Of course the district's Web site offers a wealth of information, and it links with the county's utility, Pacific Gas & Electric Co., so customers can benefit from California's rebate programs. Also, a CD-ROM about water-conserving landscape irrigation is in the works, but Duncan says it's the hands-on approach that counts. "We do a lot of outreach and attend the big shopping mall events that are coming in February," Duncan says. "We also do the farmers markets a couple of times a year, so there are a lot of individual appearances by employees." That philosophy extends to Soquel's future customers too.

District staff members visit schools and distribute a special brochure for kids. At public appearances, Duncan regularly has parents recounting stories of their water-conscious kids touting conservation when they see waste in the home. "We have to start focusing more on educating this younger generation, so it's automatic, and not something that they have to think about or remember," Duncan notes.

Beyond educating consumers, Little observes that the installation of graywater systems is a service niche that hasn't been filled by commerce, or handyman, or environmentally conscious vendors. "We get calls from the public for referrals on those kind of craftspeople," Little says. That problem may soon be resolved by another import from Australia, "green plumbers".

GreenPlumbers began with the Master Plumbers and Mechanical Services Association of Australia. The program puts plumbers in a better position to advise and inform consumers and install the next

generation of energy and water efficient products. To date, there are more than 5,500 plumbers on the roster, and the program has recently launched in the US. “It’s very exciting for us, because we started in late August 2007 with our program in the United States, and we have had an outpouring of support,” says Steve Lehtonen, director of GreenPlumbers USA, and executive vice president of Plumbing Heating and Cooling Contractors of California.

“We have been scrambling, and all the companies that have perfected their products in Australia over the last decade have contacted us. That should motivate American commerce and manufactures to hurry up,” he adds.

The final motivation for acceptance of graywater is financial. Not surprisingly, Arizona leads the way, and now offers tax credits for costs associated with installing a water conservation system. The credit is equal to the lesser of 25% of the cost of the system or \$1000. For corporations, there’s a credit for costs when installing a plumbing stub out that collects all graywater sources. The credit cannot exceed \$200 for each separate house or dwelling.

Ultimately, with conservation demands on the rise, and a new generation of products and solutions gaining ground, it could very well be blue skies ahead for graywater. And, according to Bill McDonnell of the MWD, it comes down to the fact that there aren’t that many new options in conservation methods.

“If you think about it, we have high-efficiency toilets, urinals, shower heads, and washing machines,” McDonnell says. “We’re running out of things in the house, so, indoor residential graywater is one of last areas that we haven’t yet tapped into.”