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Is Greywater Harvesting Worth the Effort and Expense?

Though many homeowners are still leery of greywater systems or simply do not feel the urgency, the technology's potential water-, energy-, and cost-savings have spawned widespread interest.

By [NIGEL F. MAYNARD](#)

Mark Larson, AIA, looks forward to the day when a client gives the green light on greywater harvesting, a system that allows homeowners to capture and reuse wastewater. So far the co-principal of Minneapolis-based Rehkamp Larson Architects hasn't had any takers. "Most clients are leery of it," he says. "Plus, in the Midwest, water availability isn't a crisis, so there's no [sense of] urgency."

Allison Ewing, AIA, LEED AP, feels Larson's pain. Though Ewing's firm, Charlottesville, Va.-based Hays + Ewing Design Studio, incorporates water conservation in all of its projects, it hasn't yet found a client willing to do greywater collection. "We've tried to put greywater systems into multiple projects, but they've always been cut during the 'value engineering' phase," she explains. Like Larson, Ewing attributes part of the reluctance to her location. Water supply issues aren't as grave a concern on the East Coast as they are in other regions of the country. Still, increasing drought conditions in unexpected places are slowly changing perceptions, she says.

POTENT NONPOTABLE Greywater is generated from typical household activities such as shaving, showering, and laundering. Because greywater accounts for 50 percent to 80 percent of a typical household's wastewater volume, environmentalists say letting it flow into the sewer is, well, a waste—and a missed opportunity. It can easily be captured, treated on site, and reused in toilets or landscaping, which would obviate the need to use potable water. "There is so much wastewater generated from a house, so we love the idea" of reusing it, Larson says. "It's back to basics."

The benefits of greywater reuse extend far beyond individual households, though. "If you think about it, using greywater means city wastewater treatment plants are using less energy and less chemicals, which is good for the community," says Pete Muñoz, P.E., LEED AP, senior engineer with Natural Systems International, a Santa Fe, N.M.-based water infrastructure engineering firm. Plus, homeowners who recycle their greywater will save significant amounts of water and money over time.

Muñoz says it's this long view that has spawned widespread interest in greywater harvesting, particularly for moderate- to large-scale commercial, industrial, and residential buildings. The Resource Access Center, a low-income, mixed-use building by Portland, Ore.-based Holst Architecture, is one such project. "It's the first time our firm is using a greywater system, and it's the first time greywater is being used on a commercial scale in Portland," says architect Dave Otte, AIA, LEED AP, a project manager at Holst. "Only recently did the city allow it in commercial projects."

Otte says greywater harvesting makes sense for this building because the Portland area gets more rain than it can use in the winter but experiences water shortages in the summer. With a system in place, water from the showers and washers will be filtered for large particles and collected in a tank before it goes into a second tank with a UV filter for finer contaminants. The water that emerges will then be used to flush the toilets year-round.

The product Holst is using, from Montreal-based Brac Systems, accounts for roughly \$300,000 of the overall \$27.5 million budget, but Otte says the project will reap significant savings because of it. "Right now we're trying to negotiate lower service-development fees with the city," he says. "We're also likely to get a reduced rate on our water-use fees, so the developer is anticipating a 10-year to 15-year payback on the system." The financial risks seem reasonable, Otte says, since the Housing Authority of Portland will likely operate the building for a long time.

PROJECTS

Dennis S. Yasar, president of Brac Systems, says his company offers a number of systems—including tanks, filters, and pumps—in various sizes to meet the needs of both commercial and residential markets. The products collect water from sinks, baths, and even air conditioners, making them highly versatile. “An air-conditioning unit can generate as much as 15 gallons of water per day,” he explains. “That water can be put to good use.”

BRINGING HOME THE HARVEST According to Yasar, greywater systems are becoming more commonplace in the residential space as well. His company has sold more than 1,300 residential systems in the last three years alone.

John Quale, LEED AP, assistant professor of architecture at the University of Virginia in Charlottesville, is interested in greywater harvesting and a fan of the process, but his take on the system's prospects in the single-family house is less enthusiastic. To investigate its effectiveness, Quale—who also directs the university's ecoMOD research and design/build project—is installing a modest system on one of his houses. “It's a small-scale tank system for a sink and a shower,” he explains. “The technology is perfect for this type of domestic application, because it's only five gallons.” Homeowners can fairly easily manage systems of this size, he continues, but once you get into more complex whole-house systems, the questions begin. Will homeowners change the filter on a regular basis? Will they perform the routine maintenance? Will they be careful about what goes down the drain?

“I'm a little worried about many people doing this in their homes, because there are legitimate health concerns,” Quale continues. “For a homeowner, it's one extra thing to think about, whereas in a large-scale apartment building, these things would be taken care of by an engineer.” Still, he adds, “If the technology continues to evolve, it could become more feasible.”

TREAD CAREFULLY Fortunately, greywater harvesting systems can be simple affairs or complex setups. They can be as basic as a pipe that drains underground to a mulch basin for irrigation, for example. “That's the low-tech solution,” Muñoz says, and it would essentially cost the same as “putting in an extra pipe—possibly as little as \$20 or \$30. Packaged systems with all the bells and whistles,” on the other hand, “can go as high as \$4,000 to \$5,000.”

In either case, greywater must be treated with care. Though it comes from non-sewage sources, it can contain significant amounts of bacteria and contaminants. “Greywater breaks down very fast,” Muñoz explains. “It can smell bad pretty quickly, so it shouldn't stand around for more than 24 hours.” Homeowners must also be mindful of what goes down the drain.

What's more, many city codes don't allow water from kitchen sinks to be reused, because of potential contamination from certain food particles or high concentrations of household cleaners. And in some jurisdictions, water from washing machines is prohibited, because homeowners may wash cotton diapers, which can compromise water integrity.

Perhaps the most crucial thing to remember about greywater harvesting is that acceptance of the practice varies by region and even municipality. “We've found over the last 10 years that it's less a problem of selling it to clients and more about the regulatory agencies,” Muñoz admits.

In the end, Muñoz says greywater harvesting is a viable water-saving strategy that can contribute to LEED points in multiple ways. Architects interested in pursuing the practice should begin by conducting a water audit to see where their area's water comes from and where its wastewater goes. In many cases, they'll discover methods far superior to the conventional treatment process.

Nigel F. Maynard is Senior Editor for residential architect magazine. This article appeared in the May/June issue of [residential architect](#).



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