

Desert Rain leads the way

• • Bend home becomes first in Oregon to receive residential wastewater permit

By Rachael Rees / *The Bulletin*

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Editor's note: Tom Elliott and Barbara Scott invited The Bulletin to follow their attempt to build the ultimate green home in Bend and document the project from start to finish. This installment focuses on wastewater regulations and their efforts to meet the standards of the Living Building Challenge.

On their quest to build the greenest home in Bend, Tom Elliott and Barbara Scott have become the first in Oregon to receive state and city approval to treat and reuse residential wastewater from sinks, showers and laundry.

After more than three years of design, rejection and redesign, the city of Bend approved the couple's plan Wednesday, following approval from the Oregon Department of Environmental Quality on June 10.

"One of the toughest things is treating all the water on-site and not being able to put it into the sewer," said Morgan Brown, president of Whole Water Systems and project manager for Desert Rain's water systems.

"There were roadblocks. It's been a little bit of a torturous path."

But the end result, he said, is a system that can handle all of the wastewater from sinks, showers and laundry — known as graywater — for the house.

"We can use it and be one of the first cutting-edge graywater systems," Brown said.

Elliott and Scott still need approval for a system to treat human waste and waste from a dishwasher — known as blackwater — for the Living Building Challenge, a set of green building standards designed to be the most advanced possible.

"Small victories make the journey worthwhile," Elliott said



Photos by Dean Guernsey / The Bulletin

Reclaimed-water tanks are part of the system for treating wastewater from sinks, showers and laundry at Desert Rain that the city of Bend approved Wednesday. Owners Barbara Scott, left, and Tom Elliott, right,

To meet the challenge's water standards, the property must capture and process rain and snowmelt on-site for drinking and other household needs. Then both graywater and blackwater must be treated and returned back to the site.

After graywater travels down the drain, it enters a 1,500-gallon tank where solids settle out. From there, it flows into a 600-square-foot constructed wetland where plants and gravel purify the water. Water then travels through two different reclaimed-water tanks where it is stored until it is pumped into an irrigation system and water feature.

Ron Doughten, biosolids and water reuse program coordinator for the DEQ, said Desert Rain's permit sets a new precedent that will create opportunities for sustainable water management on residential properties.

"They're treating the graywater and storing it," Doughten said. "It's definitely something that hasn't been tried before. It will help us get some data so we know how well these systems will work, and that's exciting."

Elliott and Scott have set aside their initial blackwater-treatment plan, which called for an outhouse. They have created a new plan that will be more cost-efficient and easier to use — a two-story building called Desert Lookout.

The lower level of the building will contain a fitness room, a single-car garage and a commercial-scale composting unit that will turn human waste into compost that can be spread on trees and bushes.

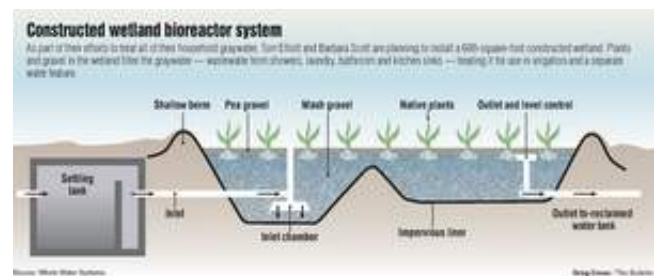
Vacuum toilets, similar to those found on cruise ships, will be installed in the main house and other dwelling units on the property, said James Fagan, co-owner of Timberline Construction and project manager of Desert Rain. They will move waste to a pumping station located underground. From there, wastewater will travel to the composter in Desert Lookout.

"We're spending less money and it's livable ... versus a bathroom," Scott said.

On June 19, Fagan, Elliott and project designer Al Tozer met with Robert Anderson, building plans examiner for the city of Bend, to discuss the newly proposed blackwater system.

While the composting unit already meets city code, Anderson said,

discuss the project with neighbor Nils Eriksson.



Dean Guernsey / The Bulletin

The entryway of Desert Rain features a cross-section of a ponderosa pine tree that was removed from the property for safety reasons and milled into usable lumber. Mark Ayres, with Central Oregon Construction Contractors, finishes concrete on a walkway that connects to the garage.

The Living Building Challenge

For more information on the Living Building Challenge, visit: <http://living-future.org/lbc>

the vacuum system and evaporation device do not.

The state plumbing code has no rules for handling human waste using the method proposed for Desert Rain, Anderson said.

To read more about Desert Rain, visit:
<http://desertrainhouse.com/> or
www.facebook.com/desertrainhouse

"They have to hire an engineer to design the system and prove that it is equivalent to the Oregon State Plumbing Code in life safety and sanitation," he said.

After a design is drawn up by an Oregon Engineer, he said, the couple can submit plans to the city. And once plans are in hand, he expects the review process to take a little more than a month to complete.

"This is cutting-edge stuff," Anderson said, noting he has been working on the Desert Rain project for about three years. "It's been a very interesting process. It's been evolving and changing. I've seen it in a county environment on large lots, but I've never seen it in a city application on a small lot."

Despite the couple's ground-breaking efforts, he said, he doesn't expect this type of system will become commonplace in Bend because of the cost involved and the length of the process.

Scott said the number one question she receives is, "When are you moving in?"

Her answer: "I don't know."

Originally, the couple hoped to move in in July. Then they pushed the date to November. And now, they say, they'll be lucky if they can move in by January.

Depending on how long the blackwater approval process takes, Scott said there's the possibility of an interim step, where she and Elliott would move in, use the graywater system, but send sewage into the city's sewer system.

Scott said this would mean no overall Living Building Challenge certification right away. But they could achieve it in the future when an approved blackwater system is in use.

"There's a big part of me that doesn't want to do this," Scott said, referring to the interim step.

"It's contrary to our overall intention." Elliott said.

The biggest factor in whether or not to hold off on the blackwater system comes down to time, Elliott said.

"The question is, will it take one month, six months or six years?" he said.

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