

## Groundbreaking Ideas...

# Don't Turn Up Your Nose at this Technology

Every year more than 20 billion gallons of untreated sewage and stormwater escape from overflowing sewer and malfunctioning septic systems into waterways and groundwater in Allegheny, Armstrong, Beaver, Butler, Fayette, Greene, Indiana, Lawrence, Somerset, Washington and

The major obstacle to widespread use of waterless urinals is the perception about hygiene and odor. Although a valid concern, flush-free urinals are actually a hygienic improvement over their water-flushing cohorts.



Westmoreland counties. One method to control sewage problems (see related "Speaking Out" article on page 3 to read about other solutions) is to reduce the amount of wastewater that needs to be treated. Green building practices encourage designs that mitigate stormwater run off, as well as high-performance, water-saving technologies. One example of the latter is the no-flush urinal, of which there are currently two

manufacturers, Waterless Company and Falcon Waterfree Technologies. Various models of their water-free urinals not only save a precious resource, but also save money through design and maintenance, and, believe it or not, offer hygienic advantages over traditional flush urinals.

The founders of Waterless and Falcon were once partners, but disagreements on design issues caused them to separate. The new competition between these two companies has been good for advancing the development of this sustainable commercial technology. In principal, their two systems are similar: urine flows to a disposable trap-cartridge and is contained under a layer of lighter-than-water liquid; excess urine flows down the drain without the need for a water flush, saving between one to three gallons of water with each use. Both companies claim their product can save an average of 40,000 to 45,000 gallons of water per urinal annually. With acceptance from local code agencies and wider implementation in area facilities, this technology could have a wide-ranging impact on the region's water usage and subsequent treatment, while producing significant savings on water bills for build-

ing owners.

Aside from these benefits, the no-flush urinals can decrease installation and maintenance costs. If specified for new construction there is a notable savings through decreased plumbing costs, as the systems need no water supply, only a drain. Although Waterless Company estimates a related annual savings of \$80 to \$120 per toilet, mainly through the elimination of mechanical components that regularly clog or break, there are material and labor costs associated with replacement of the trap-cartridges approximately every three to four months.

Philadelphia architect Scott Kelly needed a way to convince clients to use waterless urinals for their projects so he brought several of them to Harrisburg to tour the Turnpike Authority's office building where 14 units are housed. "After I initially toured this building with its users, we did a few calculations to determine the increase in construction costs for the waterless urinals over standard urinals. While the increase was \$2,500, the owner is now saving \$2,200 per year in water bills. That's an 88 percent return on investment—without even including the money saved in flush valves!"

As one could guess, the major obsta-

cle to widespread use of waterless urinals is the perception about hygiene and odor. Although a valid concern, both brands of flush-free urinals are actually a hygienic improvement over their water-flushing cohorts. Falcon and Waterless models are designed to dry out completely after each use, thereby eliminating the moist environment in which airborne bacteria (from co-existing flush toilets) settles and thrives.

The use of the lighter-than-water trap fluid, BlueSeal<sup>®</sup>, separates urine from outside air, subsequently containing unpleasant smells. The design of Waterless Company's cartridge removes a small portion of BlueSeal<sup>®</sup> with each use, so more of the agent must be added after every 1500 uses. The addition of this liquid is unnecessary in the more complex (and expensive) trap design used by Falcon.

As communities struggle with combined sewer overflows and related issues, water-reducing technologies such as these urinals will play a much more important role. Also, as the public gains an understanding of the environmental, economic and health advantages of this equipment, its acceptance in the marketplace will grow.

For further information, visit the Waterless Company at [www.waterless.com](http://www.waterless.com) and Falcon Waterfree Technologies at [www.falconwaterfree.com](http://www.falconwaterfree.com).

## CONSERVE *continued from front cover*

and heated and each of the walls was about 24 inches thick."

During the process of evaluating green alternatives, several options for HVAC were considered: a raised floor system, normally a good technology for offices, wasn't suitable for a historic building; the payback for geothermal heating was thought to be too long, particularly due to the difficulty of drilling the wells; and, aesthetically, too many panels would have been required for radiant cooling. The decision was therefore made to install a roof-mounted natural gas-fired unit with an economizer. This unit, along with a humidity-reducing dessicant wheel, allowed the cooling load to decrease from

350 sq. ft./ton to 550 sq. ft./ton. "This commitment was made prior to utility deregulation, when power cost 13 cents per kilowatt hour," says Gary Goodson, also formerly with CCI. "Electric units now seem to be the way to go, more so for reliability and maintenance rather than power costs. There was no way to know that, however, back then." Although well-performing and clean-burning, the unit is noisy and unreliable. Additionally, the maker of the unit went bankrupt, leaving WPC with no warrantee.

Originally designed as a passively cooled structure with a large center hall, significant thermal mass and high ceilings, the Burke Building also boasts large, operable windows with original interior wooden shutters. Low-e film coatings on the façade windows were considered, but would have changed the exterior look. The commendable goal of one watt per square foot was achieved for lighting, aided by interior windows that transmit daylight well into the building, skylights, LED exit lights and direct-indirect lighting fixtures.

An effort was made to reuse materials and to use healthy materials. Some of these are detailed in the "green high-

## green highlights

**sustainable site:** adaptive reuse of a historic building within an existing downtown core; bounded on three sides by occupied buildings **energy & atmosphere:** efficient, natural gas-fired HVAC unit with economizer cycle conditions 550 sq. ft./ton cooling; dessicant wheel for humidity reduction; efficient lighting of one watt/sq. ft.; skylights and borrowed lights to maximize daylighting **resources & materials:** demolished wood framing was remilled into shelving; kitchen casework was entirely reused **indoor environmental quality:** healthy finishes, wool carpets, no-VOC paint, linoleum flooring, Homasote walls, green house-keeping **process:** use of sustainable design consultants; team approach for evaluation and goal-setting; DOE 2 modeling performed

lights" section and were contributing factors to occupant comfort and productivity, which is estimated to have increased as a result of the move.

The project won a Governor's Award for Environmental Excellence and pioneered much of the green building conventional wisdom in Pittsburgh. "Back in 1995, there weren't many examples of green projects to point to here," Carrow says, "plus, LEED™ wasn't really usable yet." (WPC is now considering registering their headquarters as a LEED™ Existing Building.) "Despite all the bumps in the road, this building was a natural for us; it symbolizes what we are."



A wall-mounted uplight fixture complements natural daylighting, while tin ceilings preserved from the turn-of-the-century reflect light deeper into the interior space.

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Designed by Robert Casey & Associates, Ltd.

Rebecca L. Flora, AICP - Executive Director  
Gary R. Goodson - Deputy Director  
Megan Moser, Ph.D. - Director of Education & Research  
Marc Mondor - Project Manager  
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