

January

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PRE-SHOW ISSUE
FEBRUARY 22-25
INDIANAPOLIS, IN



KNOW YOUR AUDIENCE

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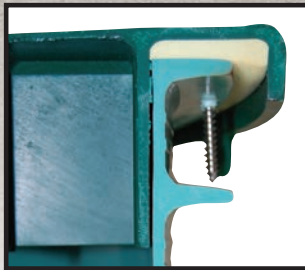
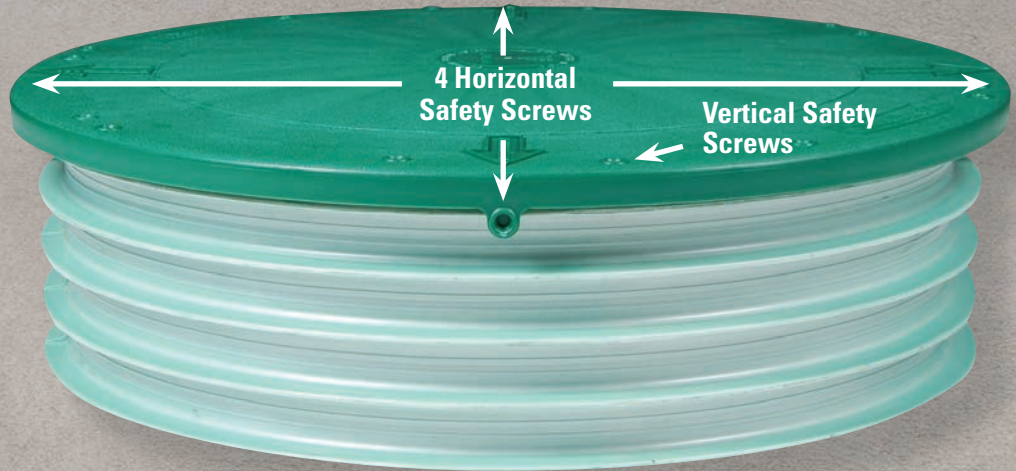
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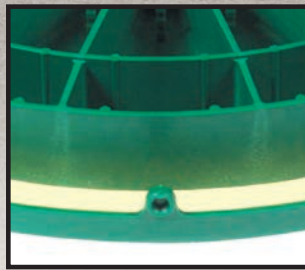
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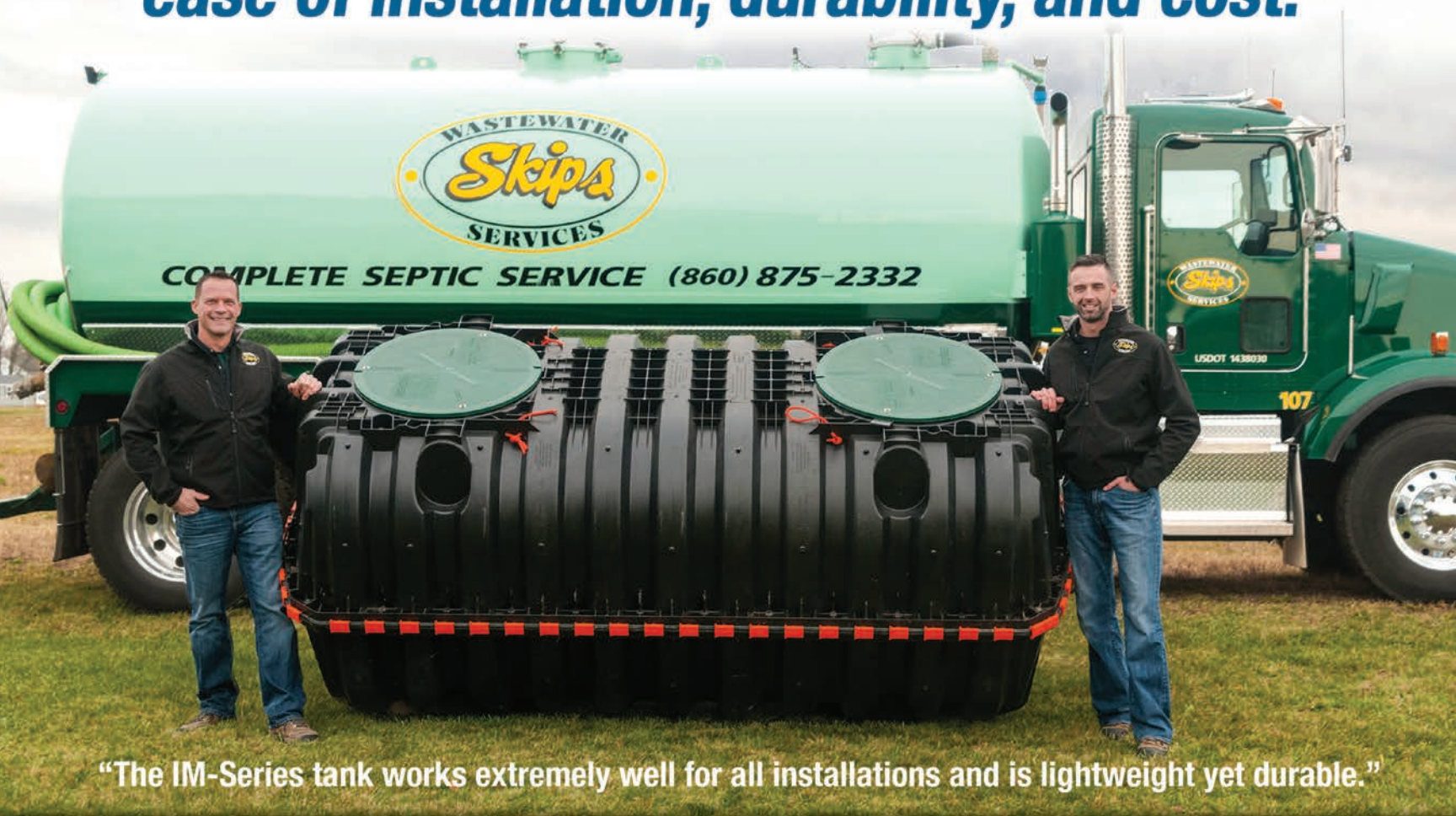
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Established in 2004, Onsite Installer™ fosters higher professionalism and profitability for those who design and install septic systems and other onsite wastewater treatment systems.

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Will You Work in Your Golden Years?

There are good reasons to put off retirement as long as you're in good shape and enjoy installing wastewater systems

By Jim Kneiszel



Like the trades in general, it's clear the onsite installing workforce is aging. Heading into 2017, a certain number of you might be wondering how many more years you can stay actively involved in the installing business.

It's often said age is just a number, and if the body is willing, a tradesman can continue to run a successful business as long as he or she wants to. And perhaps it will become more important for installers to keep working up to and past the traditional Social Security retirement age of 65. Many of you are probably in the group of workers to which reaching 65 doesn't mean collecting a full Social Security check. For example, if you're in your 50s, you probably won't be able to collect full benefits until you are 67 years old.

So you may love your job and have financial reasons to hold off on retirement. If so, you're in a growing crowd. Recently I received a report from retirement planning expert John Eikenberry (www.eikenberryretirement.com) talking about how older workers are choosing to put off retirement. He cited a Pew Research Center study showing 18.8 percent of American workers are still on the job at age 65, up from 12.8 percent in 2000.

REASONS TO STAY

"Some people say they keep working because they can't afford to retire. Some people don't want to retire because they love what they do," Eikenberry said. At age 68, he's keeping at it and said there are many benefits — including the obvious financial incentives — to keep working well into your 60s. Here are a few:

- **Reduce financial stress.** Eikenberry said one of the biggest worries for retirees is living a long time and running out of money. He suggests that even the cash from working a part-time job can help put those fears to rest.
- **Staying physically fit.** How many times have you heard that the best way to stay healthy is to keep moving? Getting into the cab of the truck every day and heading out to the job site can keep your heart healthy, your joints moving and your muscles stretching.
- **Giving your brain a workout.** Eikenberry cited a 2016 study in the journal *Neurology* that determined activity and mental challenges may delay dementia symptoms. "Talk to people in their 50s and 60s and you'll see that does scare us. Work gives us the ability to keep our minds active," he said.

How many times have you heard that the best way to stay healthy is to keep moving? Getting into the cab of the truck every day and heading out to the job site can keep your heart healthy, your joints moving and your muscles stretching.

As for the financial case for staying at work and putting off Social Security payments, Eikenberry said collecting Social Security early, when you qualify at age 62, can drastically reduce your earning power. Take Social Security at 62, and you're restricted to earning \$15,720 annually. After hitting that limit, for every \$2 you earn at a job, \$1 is deducted from your Social Security payment. The penalty lessens significantly if you wait to retire.

THE LONG HAUL

So maybe you're not quite ready to sell the business or pass it down to the next generation, and you've determined to keep working as long as you're physically capable and enjoy the work. But every year you recognize growing limitations to getting down in the trench and working with a shovel and a rake. How can you ease the burden and continue to run a vibrant installing business? Here are a few ideas for you to consider for the upcoming busy season:

Change the focus of your business

I have met several installers whose strategy was to sell the heavy equipment and transition the business to operations and maintenance. Today's advanced onsite systems require more care and open up a new niche in the industry. An inspection business requires less equipment to take care of, less physical labor and may even get you out of a big service truck. I recently talked to an installer who moved into inspections and makes his calls in his dream car, a late-model Chevy Corvette. He might not make quite as much money as he did installing systems every week, but his stress level is down drastically and he stays sharp on the latest wastewater innovations.

Trim your workload

Who says you have to work sunrise to sunset five days a week and even stretch it into the weekends when demand is high? Deliberately decide to limit your workload and schedule accordingly. Maybe ramp down to three or four



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days a week and stop taking on work when it appears you wouldn't be able to complete all of the jobs on your schedule. Maybe you can partner with a friendly competitor and pass on excess workload rather than make promises you don't really want to keep. You've reached a point where many customers respect your work and reputation and you can say "no" or offer to wait and do the job next year.

Add machines that make the job easier

Find smart ways to ditch the hand shovel in favor of automation. Buy a mini-excavator or a skid-steer with multiple attachments to perform some of the challenging physical jobs you've always completed by hand. Rakes, drills and trenchers, for example, can lighten your load and speed up your work.

Find a successor to train into the business

If you run a family business, start turning over the tough jobs to the younger generation. They're the ones with the strong backs and the enthusiasm to grow the business. Let them work the long hours in the hot sun, while you pitch in but act more as the supervisor on the job site. If you don't have someone to take over, start looking for a prospect who will one day buy the business from you. If you don't see that as a likelihood, another viable option is to put your business up for sale and offer to stay on for several years as an employee and mentor to the new owner. This way you can draw back on hours and give up some of the stressful decision-making involved with running a small business.

Retire to the office

So you have a crew or two you've led over the years? Send them out on their own while you stay back at the office and concentrate on less physical — but just as important — tasks. Improve your marketing program to land more work. Get involved with your state onsite association and push for better industry rules and regulations like you've always wanted to. Spend more time educating your customers or getting involved in the community. There are so many ways to build the business that you've always been too busy down in a hole to pursue.

KEEP ON TRUCKIN'

Too many people in their 50s and 60s assume their business will be winding down and they'll want to walk away to enjoy the fruits of their labors. Then many of them figure out that what they enjoyed all along was the challenge of work and running a business.

Over the years, I've observed that folks who are driven to build a successful small business are not typically the retiring type. They might try going on a Caribbean cruise or start a model-railroading project, but they usually determine they want to keep a hand in their profession as long as they're able.

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SEPTIC CARE

End Bad Laundry Habits

Lint, laundry detergent, pretreatment and stain removers all can wreak havoc on an onsite system. Homeowners often have no idea how their system works or how septic systems can be damaged by chemicals they put down the drain. Here is some background knowledge and pointers you can give to homeowners to help them keep their system functioning properly.

onsiteinstaller.com/featured

DRIP DESIGN

Choosing a Filter

In this exclusive online story, our expert Jim Anderson discusses the three choices of filter options available when designing a drip system. All three will function adequately with the proper pretreatment, so the designer needs to weigh the pros and cons of each. Read about the considerations for each filter type here. onsiteinstaller.com/featured

QUICK CLEANUP

Speeding Up Site Restoration

This month's cover stars depend on a favorite tool that has nothing to do with digging holes or building a drainfield, but everything to do with customer satisfaction. A power rake speeds up restoration after an installation and leaves behind a much better-looking surface than customers imagined. The Knoops discuss how useful the power rake is in this exclusive online sidebar. onsiteinstaller.com/featured



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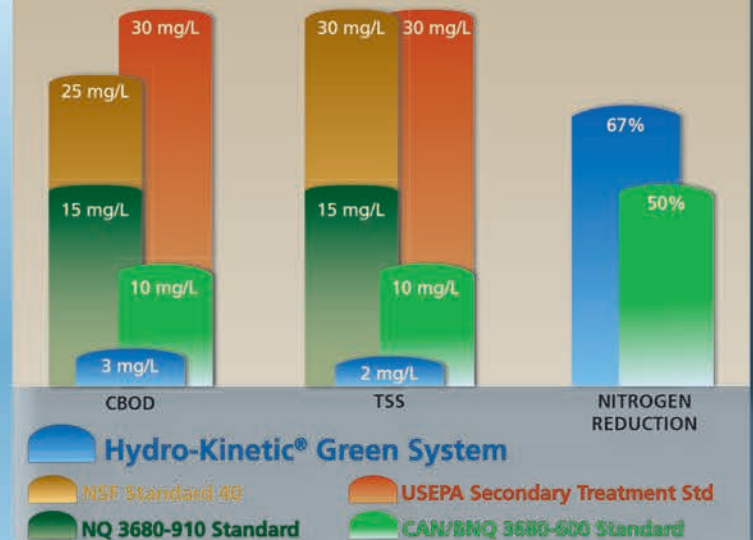
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KNOW YOUR AUDIENCE

Gerry and Amy Knoop listen to customer questions and adapt their onsite service offerings to match the needs of the rural Canadian marketplace

By David Steinkraus | Photos by Bruce Bell

Change comes slowly but steadily in rural areas, and that is how Denby Environmental Services grew during the past few decades in Beachville, Ontario, Canada, about 80 miles southwest of Toronto. Denby has not rushed or fought to quickly build a secure niche for itself. Owners Gerry and Amy Knoop have instead followed a measured strategy: listening to their customers, adding services according to demand, and sometimes limiting what they do in order to ensure that service remains top-notch.

Onsite installations in the area are split evenly between conventional septic and advanced treatment units. “More often than not it comes down to how many dollars the homeowner chooses to spend,” says Adam Knoop. He is one of Gerry and Amy’s sons, and works in the family business with his brother, Tim.

There are other factors, Gerry says. Some municipalities require ATUs. There are many small lots and properties in or governed by the rules for protected lands such as conservation areas. And sometimes customers want nothing other than an ATU because they are concerned about protecting the environment. Customers could live on farms or rural properties and in small towns with community systems consisting of individual septic tanks feeding a common sewer pipe.

WORKING THE TERRITORY

Denby also does larger projects. Two recent jobs were at mobile home parks. One used a large Enviro-Septic system from Presby Environmental and the other employed 20 Ecoflo units from Premier Tech Aqua. Both systems handle flows of more than 12,000 gpd. Good relationships with the engineers who design these systems help the company bid successfully on these big projects. The Knoops are able to evaluate the site, do soil tests, and then bid.

Employees like the larger jobs, too, Amy says, because they know what’s ahead for each day and know their work location for a few weeks. “Being in the service industry that is not always possible. Most days we receive a request from a customer who needs something looked after right away, so plans change in order to accommodate them.”

The company has been asked to install systems at a distance but tends to restrict itself to about a 60-mile radius. Further out, installations can be impractical because they can require overnight lodging, Gerry says. When that cost is factored in, contractors closer to the job may have a lower bid.

For maintenance it’s a different story. A smaller service vehicle — such as the company’s four-wheel-drive Honda CR-V or Subaru Forester — can handle a trip of 60 or 120 miles for ATU maintenance. Denby has contracts

<<OPPOSITE PAGE: The Denby Environmental team includes, from left, James Egan, Tim Knoop, Adam Knoop, Dan Derbowka, Lynn Toman, Gerry Knoop, Amy Knoop and Brad Swartz. The fleet behind them includes vacuum trucks carrying Vacutrux tanks and Wallenstein pumps.

>>RIGHT: Adam Knoop operates a Hitachi EX160 excavator while Dan Derbowka and James Egan guide a new Infiltrator Water Technologies tank into place on a job site.

to maintain about 1,000 ATUs from various manufacturers. An aid to doing this business is being certified on systems, Gerry says. That puts Denby on manufacturers' lists of approved providers. If a local contractor finds a job that is beyond his expertise, Denby may get the call to help.

THERE WHEN YOU NEED US

Calls are important in the Denby office. They're so important that the Knoops abandoned automated answering years ago. In a time when people regularly talk to answering machines with multilevel option menus, Denby went another direction.

"Being in another industry was good. It was a great experience where I learned a lot from both the customers and my boss. But the family business is better; working together, dealing with the environment, and helping to protect it."

Gerry Knoop

"We feel that our customers would like to hear a voice. Everyone wants to talk to a person," Gerry says. "We learned years ago that when people reach an answering machine they tend to get frustrated with having to wait for a response. They may just hang up, and we have lost a potential customer. When they are having problems with their septic they like to have an answer right away."

During the day — between 7 a.m. and 6 p.m. — a receptionist answers the calls. If she can't provide an answer, she forwards the call and takes a message. Existing customers are happier and some people become customers because of the personal service. When a customer has an emergency, that human contact can prevent frustration from building, which makes the technician's job easier when they arrive at the work site, Gerry says. Calls after hours and on weekends are forwarded to Gerry's cellphone.

Gerry has had people call, text and email about their problems, and he is always happy to help.

Many of the issues are resolved with a phone call. And while those calls may not result in immediate business, they're a time investment in building the business, according to Gerry.

"I've had customers call who lived a good distance away. If you can talk them through a problem, many are able to fix it themselves. You save them



Denby Environmental Services, Beachville, Ontario, Canada

OWNER: Gerry and Amy Knoop

FOUNDED: 1975

EMPLOYEES: 8

SERVICE AREA: 100 miles

SERVICES: Onsite system design and installation, residential and commercial pumping, septic maintenance and repair, portable sanitation and landscaping

ASSOCIATIONS: Ontario Onsite Wastewater Association, Ontario Association of Sewage Industry Services, Woodstock District Chamber of Commerce, Canadian Federation of Independent Business

WEBSITE: www.denbyseptic.com





James Egan prepares an aerator from Norweco in the Denby Environmental Services shop.

a service call charge and maintain a good relationship with the customer,” he explains. “When that customer encounters a problem he cannot handle, he’ll think of us.”

Another part of the company’s service emphasis is handing out educational materials, some from the provincial government, some from the Ontario Association of Sewage Industry Services, some from the Ontario Onsite Wastewater Association — where Gerry serves on the board of directors — and some based on information the Knoops compiled themselves.

“We’ve had those guys since the early ‘90s. As a small business you are feel a sense of obligation. You want to keep them employed. Everyone has families and bills to pay.”

Amy Knoop

SPREADING THE WORD

Human contact extends to advertising. “We like to think a lot of our business comes from referrals,” Gerry says.

Recently, the company started doing more advertising by improving its website, renting a mobile sign along a two-lane county road with steady traffic, and more effective signage on its trucks. They know the mobile signs work because people call and say the sign reminded them to have a tank pumped.

Denby uses online phone book advertising, Amy says, and they pay for the print listing, because it is a nominal additional amount. “We did a little research before signing up again this year and found that many of our local competitors still use the Yellow Pages. We have also started a Facebook page. It is fairly easy and inexpensive advertising for the time being.”

Denby has not yet explored the various computer and smartphone technologies available for the industry, Gerry says. All of the employees carry company iPhones, and although he knows there are many software tools available, he and his family haven’t taken the time to dig into them. Currently they use Streets & Trips software from Microsoft (now discontinued) to route vehicles on service-maintenance trips.

COPING WITH THE WINTER SLOWDOWN

When the Canadian winter sweeps in, system installations come to a halt, along with a good deal of other work at Denby Environmental Services. Yet the company has remarkable longevity in its employees — two have been around for close to 25 years — because owners Gerry and Amy Knoop make the effort to provide for them.

In the offseason, three people in the shop are sufficient to handle the wastewater work coming in, and to perform necessary equipment maintenance. For years, other jobs kept the rest of the workers busy in the offseason.

“We used to do snow removal just to keep our staff employed, and we had a major contract with General Motors, a contract we held for more than 30 years. But when the automotive industry took a plunge, they were looking to save money, and we were not successful in working with them on the price,” Gerry says.

Now they believe it was a blessing for the company because everyone was tired of doing snow removal. Denby had to maintain a separate set of

equipment — snowblowers, plows and pickup trucks — and had to carry extra insurance.

“When we lost the contract, I learned quickly who obtained that business. I got on the phone and said, ‘Look, I have equipment and I have people, and we’re not competing with you.’”

For the last five years, four Denby employees have worked for another company during the winter. They are employed four to five months clearing snow, maintaining sidewalks and parking lots for the new Toyota plant in Woodstock, Ontario.

“We have an understanding with that company. They take them through the winter and we take them through the rest of the year,” Amy explains. “And we’ve had those guys since the early ‘90s. As a small business you feel a sense of obligation. You want to keep them employed. Everyone has families and bills to pay.”

And Denby saves in another way because it does not have to recruit and train replacements for employees who leave to find full-time work.



Gerry Knoop (left) works with a Laserline laser level with auto-slope option while installing a system.

One favorite piece of technology is their GPS transmitters from Global Fleet Management. Each truck has one, which makes it easier to dispatch the nearest truck to a call. In one instance, it helped Gerry reassure a customer who had expected service at a specific time. “I had a call from a man at a park who had been waiting 15 minutes for my driver to show. I told him he should have been on site by this time, so I checked the GPS tracking app. Sure enough, he was on site, working at a different location from where the gentleman had been calling.”

BUSINESS ROOTS

The family business began in the 1970s, when Gerry opened Knoop Landscaping to earn more money for his family, who emigrated from the Netherlands to Canada 10 years earlier. When his father, also named Gerry, became unemployed, Gerry Jr. headed out to work other jobs, and left his dad with the now-sustainable landscaping business. In 1990, Gerry Sr. acquired another family enterprise, Denby Sanitation, from owner Jud Denby. Gerry Jr. primarily worked in the welding industry, but helped out with the family business. After Gerry and Amy married, she did the bookkeeping for the company.

(continued)

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>> RIGHT: James Egan performs maintenance on a Premier Tech Aqua Ecoflo Biofilter.

BELOW: Gerry Knoop rakes gravel using a Kubota L3940 tractor.



“I’ve had customers call who lived a good distance away. If you can talk them through a problem, many are able to fix it themselves. You save them a service call charge and maintain a good relationship with the customer.”

Gerry Knoop

In 2001, Gerry Jr. returned to take up the family business as his father retired, and for a few years worked in partnership with his brother. Since 2008, the company has been co-owned by Gerry and Amy.

“Being in another industry was good. It was a great experience where I learned a lot from both the customers and my boss. But the family business is better; working together, dealing with the environment, and helping to protect it,” Gerry says.

Lately, the company has been doing more landscaping work based on customer demand. The business is currently split about evenly between installing, pumping and maintenance, and landscaping.

You may have seen Denby’s newest vacuum truck at the 2016 WWETT Show. It’s a Vacutrax unit built on a Dodge Ram 5500 chassis. There’s a 1,000-gallon galvanized tank split to carry 600 gallons of wastewater and 400 gallons of freshwater. This is the vehicle for the company’s new venture in portable sanitation.

In addition, the company has:

- A 2007 Mack with a 4,400-gallon galvanized tank.
- A 2009 International with a 3,400-gallon galvanized tank.



All the trucks were built by Vacutrax and carry Elmira Machine Industries / Wallenstein Vacuum pumps. The 2007 Mack has dual pumps to efficiently remove peat media from Ecoflo Biofilters.

Installation work is done with a Hitachi 160 excavator, Bobcat E32 and E35 mini-excavators, a Bobcat T190 skid-steer, Kubota L3940 tractor and a Case 450 bulldozer. A 2014 Freightliner tri-axle dump truck and a 5-ton International single-axle dump truck, with boxes from Wiltsie Truck Body in Alymer, Ontario, handle the hauling work.

CONSTANT DIVERSIFICATION

The Knoops began looking into portable sanitation after customers inquired about rentals.

Presently they have a Comfort Station single restroom model from McKee Technologies - Explorer Trailers and about 20 portable restrooms from PolyJohn Canada. In the beginning, technicians were servicing the



Brad Swartz, Dan Derbowka and Tim Knoop unload organic media for a Premier Tech Aqua Ecoflo Biofilter installation.

units with one of the large vacuum trucks, but that was impractical for restroom pickup and delivery, and because the septic trucks had no onboard freshwater tanks for restroom servicing, Gerry says.

At the moment, they're still feeling out the market, with most units going to small construction sites. The addition is not unlike other successful business niches they've built over the years. Try something new and perhaps it will lead to an expanded customer base.

"We faced a choice to commit to delivering the service, buy the necessary equipment, and give it a shot, or to give up," he says. "We committed." □

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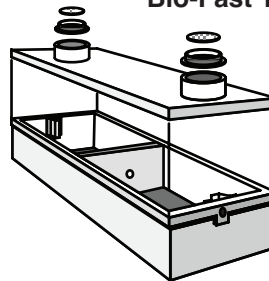
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A Step-By-Step Look at Compliance Inspections

It's time for the permitting authority to put its stamp of approval on your most recent system build. Let's dissect the process.

By Jim Anderson and David Gustafson

Last month, we reviewed in general terms what is involved in a compliance inspection and what sets it apart from real estate inspections and those conducted to establish a comprehensive operation and maintenance plan or program for a system.

Compliance inspections of new or replacement systems determine if the system, as installed, meets all current code requirements. These inspections are conducted by agents of the permitting authority: the county, municipality, township, etc. Inspectors can be employees or contracted individuals or companies, but they are representatives of the permitting authority and not involved in any of the site evaluation, design or installation work.

It's a good idea to take a closer look at elements needed for new-system inspections. Our thoughts here are based on our experiences in the development of the comprehensive program in Minnesota. We remind people that "we," or the state, did not get to the current program overnight, but rather it was developed since passage in 1972 of a shoreline protection act. We won't bore you with all the details of everything that has happened over that period of time. We mention this to explain that in all of our states, the rules and regulations have gone through and will go through constant revision, refinement and hopefully improvement. As professionals, we need to always be involved in the process and recognize that the process is never finished.

In our view, a compliance inspection begins the day a plan and design is filed with the permitting authority to construct a new system on the site in question. We can consider "new" to include not only the first system constructed on a property, but also replacement systems or expansions to existing systems.

STARTS IN THE FIELD

The inspection actually begins with fact checking and field checking information from the site evaluation used in the design of the system. This means all setback and easement requirements are verified. Location of all system components should be checked to see that there is adequate area and access to construct the system.

The soil information should be checked and verified in the location of the drainfield. Is the estimation of separation distance to the soil limiting layer correct based on the soil analysis, including color, structure and texture? Questions about the soil analysis and how the system design may be affected should be ironed out at this point. Once the information is checked and field-verified, a construction permit can be issued.

This is the point where installers obviously become more involved unless they also do site evaluation and design work. It is the installer's responsibility to build the system according to the design specifications in a manner that ensures compliance with all applicable rules and regulations. This is why the installer needs to be familiar with and understand all the rule requirements.

Inspection of the construction is conducted by either an employee of the local permitting authority or their authorized representative or business. This employee or business ethically should not be involved in the initial siting or design of the system.

Inspection of the construction is conducted by either an employee of the local permitting authority or their authorized representative or business. This employee or business ethically should not be involved in the initial siting or design of the system.

LOOK AT COMPONENTS

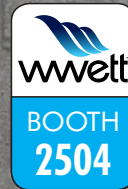
The inspection should include all components and aspects of the system. This is why the installer should stake out and check each of the component locations to verify they are within the setbacks. With clear markings, the inspector can readily see where everything fits. Again, if there are questions, now is the time to resolve them, rather than after the fact when a variance may be needed to obtain the certificate of compliance allowing the system to be put into use. A lot of the specifics then become commonsense items in terms of whether the right products or equipment are installed and in the proper location at the proper elevations.

Piping from the house to the septic tank should be checked for the proper grade to provide for flow through the pipe. Clean-outs should be checked and verified. The sewage tank or tanks should be inspected for correct size, as called for in the design and according to the regulation. Are those tanks installed at the correct elevations? Are the connections in and out of the tanks properly made so they are watertight? Is the piping between system components properly bedded and at the proper grade?

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If there are pumps and controls in the system, the electrical connections should be checked against electrical code standards. At the time of inspection, the controls should be checked to make sure everything operates when turned on, including the high-water alarm.

In the drainfield or final dispersal portion of the system, the bottom of trenches should be checked for proper elevation and meeting required vertical separation distances. The piping in the trenches or bed should be checked for proper alignment, proper hole spacing and connections. This is especially important for pressure distribution laterals.

FINAL EVALUATION

The distribution media should be checked to determine if it meets the durability requirements and, if they are proprietary products, that they are correct according to the design specifications. In pressure distribution systems, water should be run through the system to determine the pressure in the laterals meets the design requirements and the pump is able to deliver the proper dose required.

Finally, when the system is covered the site should be inspected to determine there are not any low areas, that excess water is directed away from the drainfield and will not infiltrate into other system components, and the area is properly seeded and mulched. If everything is correct, the permit to operate the system can be issued. If there are any problems to be corrected, they are listed for the installer, who then makes the corrections before a final inspection to verify the project is completed satisfactorily and the permit is granted. □

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State of Washington Expands Septic System Replacement Loan Program

By Doug Day

The Washington departments of Ecology and Health have expanded a septic system replacement program in the western part of the state to cover more counties. Loans of up to \$15,000 are available at variable low-interest loan rates and flexible repayment options over 180 months based on income guidelines. The loan length can be extended up to five additional years. Along with primary residences, rental units and second homes are eligible if the system is at least 25 years old, if it is failing and there is evidence to support it, the homeowner has been contacted by local health officials, or if orders have been issued to make repairs.

Connecticut

The town board in Beacon Falls has denied a petition from one of its members to create a property tax credit of up to \$500 for people with septic systems. The town's sewer system is supported by tax money rather than user fees, so people not hooked up to it are paying for its operation. Selectman Kurt Hummel presented the petition with 25 signatures, but the board voted to take no action. Hummel, who says he pays \$380 annually to have his septic tank pumped, has been paying taxes for the sewer system for 20 years even though he can't connect to it because it hasn't been extended down his street. The town is looking to enter into a regional wastewater agreement with a nearby town, which would result in a change to user fees to support the sewer system.

Ohio

After 10 years of operating under onsite wastewater rules imposed by the U.S. Environmental Protection Agency, Trumbull County (east of Cleveland) is now subject to the same regulations as all other counties in Ohio. The county was under the more strict EPA regulations due to a consent decree signed in 2006 because of the number of septic systems that were discharging raw sewage to ditches and bodies of water. Sand filters or

secondary treatment are no longer required for systems that discharge water offsite, which added about \$3,000 to the cost. The county may now also grant variances from connecting to a sewer system if a property has a functioning septic system, and can consider septic systems for lots that were not eligible under the consent decree but are under state regulations. The EPA has provided funding for repair and replacement of septic systems; \$300,000 in 2015.

Maryland

While the Legislature has yet to take formal action on Gov. Larry Hogan's reversal of a requirement to use the best available technology for all septic systems in the state, Wicomico County is following the lead with plans to repeal its own impact fee for septic systems. Hogan's action would overturn a 2012 law and require BAT only in environmentally sensitive areas, such as proposed by the governor. In reaction, County Executive Bob Culver announced a proposal to permanently repeal the \$5,200 impact fee on new home construction, which has been subject of a moratorium since 2016, as proposed by Culver and approved by the County Council. The local impact fee was created about 10 years ago to pay off debt from school construction and repairs.

South Carolina

The owner of a South Carolina septic company has been sentenced to 18 months in federal prison and a \$10,000 fine for illegally dumping septage. Timothy Howard, 51, owner and operator of American Waste Inc. was charged in federal court for two violations of the U.S. Clean Water Act. He was convicted of dumping septic waste into a grease trap at a restaurant in April 2011, and into a local sewage system in June 2013. Court documents also said he made false statements to local police and hid more than 85 percent of his septage handling activities from records submitted to the state. "Intentional acts by rogue septic haulers pose serious risks to the health of our community and environment," Andy Castro, assistant special agent in charge of EPA's criminal enforcement program in Atlanta, said in a news release from the U.S. Attorney's office. "Those who operate within this industry must adhere to the regulations and laws for which they are permitted."

Idaho

The Idaho Department of Environmental Quality has begun the process of updating the technical guidance manual for septic systems. The proposed changes involve soil design groups, graywater systems and conditions for approving the use of composting toilets. Specific changes are available on the agency's website. □



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Good Neighbors Partner to Solve Tricky Onsite Challenge

Twin Presby AES fields placed on a shared lot help adjacent lakefront homeowners continue to enjoy their Lake Michigan beachfront getaways

By David Steinkraus

On the northern coast of Indiana, cooperative neighbors were key to a wastewater solution that serves the needs of adjoining properties on the sandy shore of Lake Michigan.

The two homes are only a few hundred feet from the water. The eastern one was built in the 1950s, and the owner wanted to update it. Builders took it apart, reused some of the material, expanded it to eight bedrooms from the original three or four, and put the whole thing back into the same footprint as the original house. (Keeping the same footprint made permitting easier.) The four-bedroom house to the west had an old wastewater system with some dry wells.

Both homes needed new wastewater systems, and the owner of the eastern house planned to host large family gatherings. The eastern home sat on a lot that is 80 by 150 feet. The lot for the western house was 40 by 150 feet. A vacant lot between the homes was put up for sale, says Jon Houseknecht, owner of Sunset Septic & Excavating Inc. in La Porte, Indiana. Rather than have another house between them, the owners of the existing homes purchased the 40- by 150-foot lot for use as an absorption field.

They split the lot, each adding half to their original lakefront properties. In a creative solution, Sunset was called in to build systems featuring side-by-side Presby Environmental Advanced Enviro-Septic (AES) fields, each sized to serve the individual needs of the homeowners. Because of the grade, the Presby fields had to overlap the boundary of the split lot, so the homeowners granted each other an easement for construction and maintenance of the fields.

“I’d done work for both of these customers,” Houseknecht says. “After the winter winds pile up mounds of sand along the shore, we go up there in the spring with a bulldozer and level the beach.”

SYSTEM PROFILE

Location:	Michigan City, Indiana
Facility served:	Two private homes
Designer:	Planned Environment Associates, Chesterton, Indiana
Installer:	Sunset Septic & Excavating Inc., La Porte, Indiana
Type of systems:	Presby AES
Site conditions:	Sandy soil on coast of Lake Michigan
Hydraulic capacity:	1,200 gpd for the east house, 600 gpd for the west house

<<OPPOSITE PAGE: An empty lot between two homes became the site for a shared Presby AES system to serve both houses. In the foreground is a parking area made to divert water away from the Presby field. (Photos courtesy of Jon Houseknecht)

>>RIGHT: Blake Johnson of Sunset Septic works on one of the drainage lines for a parking area at the double-home system installation in Indiana. Sleeved pipes collect water and send it to a 500-gallon catch basin (center right). From there, water flows through an 8-inch line to Lake Michigan. This system keeps water from flooding the Presby AES systems installed downhill.

TOO MUCH WATER

“When I first looked at the project, there had just been a rain. The lot is one of the lowest spots on Lakeshore Drive, and it sheds a lot of water to the lake. They had 1-foot-deep erosion right at that lot, and it worried me because a Presby system must be kept out of the water,” he says.

Dealing with future water from rain and melting snow was the first task. The landscape architect on the project thought a 4-inch tile would suffice, but Houseknecht knew it would not move enough water to protect the proposed Presby AES installation. He looked at the vacant lot between the homes and suggested another solution: a parking area that would serve both homes.

That’s what Sunset built. Technicians took off about 18 inches of soil in an area of 40 by 20 feet. For drainage lines, they laid 4-inch pipe covered with a fabric sleeve, and filled in around and over them with about 10 inches of septic slag. (Septic slag is a porous byproduct of the process that converts iron ore into steel, and it’s easy for Sunset to obtain from the nearby steel-making city of Gary, Indiana.) On top went 6 inches of pea gravel.

“The easterly house had a low backyard, and when we dug that out we hit water, so we had to start pumping, and we had to use more than one pump.”

Jon Houseknecht

Lines from the parking area run into a 500-gallon catch basin that settles dirt and grit. From there an 8-inch SDR 35 pipe runs about to the beach. The elevation change was about 10 feet, enough so the pipe could discharge over the top of the seawall. To provide a splash basin that would not erode, Sunset technicians removed some of the sand, laid a base of geotextile fabric and covered it with stone.

CUSTOM SYSTEMS

Each home has its own septic tank arrangement feeding a Presby field.

The east house has three 4-inch lines converging in a 1,250-gallon concrete tank from Rochester Concrete in Rochester, Indiana. Wastewater flows next into a second 1,250-gallon tank, also from Rochester Concrete. A third 1,250-gallon concrete tank holds a Zoeller model M267 pump and sends water through 2-inch lines to a distribution box. From there, 4-inch pipes dose 420 feet of Presby AES pipe.

The west house has a single 4-inch line feeding a 1,250-gallon Rochester tank followed by a 1,250-gallon dosing tank with a Zoeller M267 pump that sends water to 240 feet of Presby AES pipe.



ABOVE: When installation was almost complete, technicians from Sunset Septic and Excavating still had to deal with the vent stacks for the Presby system. The green pipes were placed against the house for support, and subsequent painting made them almost invisible.

BELOW: With the original grade restored, sod laid and vent pipes painted, there is little evidence that a wastewater system is here. A fence discourages vehicles from entering the absorption area.





ABOVE: Sunset on the Lake Michigan shore of Indiana shows why people want to live here and the important resource that onsite technology helps protect.

>>RIGHT: Jon Houseknecht, and his sons Cody and Colt, inspect a tank at the shared wastewater system on the shore of Lake Michigan.



The Presby fields were constructed with 6 inches of spec 23 sand below, a foot of sand around the pipes, and 6 inches of sand above. Topsoil went above that, and the grade was sloped toward Lake Michigan. The property owners laid sod to finish the site. Technicians excavated about 2 to 3 feet of soil to build the bed so that the new grade matched the original grade when they were done.

“When I first looked at the project, there had just been a rain. The lot is one of the lowest spots on Lakeshore Drive, and it sheds a lot of water to the lake. They had 1-foot-deep erosion right at that lot, and it worried me.”

Jon Houseknecht

The dosing pumps are controlled by floats. The eastern house already had an alarm system, so technicians tied the new floats into that. For the western house they installed an Alarmbot from CSI Controls. Houseknecht likes the Alarmbot system because electrical components are outside the tank.

“I’ve always had an issue with components inside a tank. When a pump fails you often find a tank completely full or more than full, and if components are inside the tank, then you have electricity mixing with water,” he says.

Excess sand from the excavations was spread on the beach. The state of Indiana forbids people from removing sand from the lakeshore, Houseknecht says.

Technicians did the job with the company’s Takeuchi TL126 skid-steer, John Deere 450H dozer, Takeuchi TB125 mini-excavator and Hitachi 120 excavator.

WATER AND MORE WATER

Not only was moving rainwater off the site a concern, but so was dealing with the water technicians found when they began work.

“The easterly house had a low backyard, and when we dug that out we hit water, so we had to start pumping, and we had to use more than one pump,” Houseknecht says.

One pump moved water out of the excavations and toward Lake Michigan. Another was a sewage ejector pump placed in the bottom of a plastic barrel cut in half and with notches cut in its sides to let in water. Water from the barrel flowed into the septic tank to hold it down during installation, and excess water flowed over the sides of the barrel and was picked up by the first pump.

The tanks were custom ordered in halves. Technicians set the bottom half, filled that with water to hold the tank in place, then applied the sealant and set the top half.

The west home was slightly higher in elevation, but technicians still had to use the barrel technique to pull water out of the excavation.

A smaller challenge was the vent pipes.

“We started with green SDR 35 pipe, but that would give you just a green stick very visible against a white house,” Houseknecht says.

Spray paint solved that problem for pipes placed against the west house. The east house also had two pipes, but the property had an arbor, so technicians could support the pipes with the arbor, and the arbor conceals the pipes.

“Aside from allowing water to flow easily, another reason for the stacks is to move more air through the Presby fields. The more air we can put through there, the more drying we can have throughout the field,” Houseknecht says.

Homes along the lakeshore in this part of Indiana have municipal water service, and many residents wanted municipal sewer, but it was never installed probably because of the cost, Houseknecht says.

Yet because of onsite technology these homeowners can remain in their homes and enjoy the lake while their wastewater systems help keep it clean. **□**

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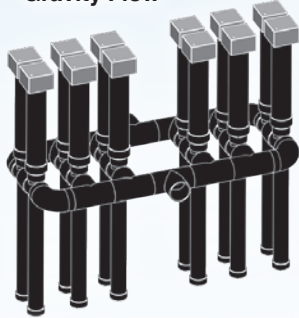
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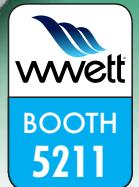
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Fusion Series from Clarus Environmental helps meet secondary treatment standards

By Craig Mandli

Increasingly stringent environmental regulations, especially around bodies of water and other sensitive areas, often call for a little extra treatment help. Clarus Environmental designed the company's new Fusion Series systems to combine the best elements of anaerobic and aerobic digestion for additional wastewater treatment. The system was on display in the company's booth at the 2016 Water & Wastewater Equipment, Treatment & Transport Show.

According to the maker, the system readily and consistently meets the secondary treatment standards of 9 mg/L CBOD5 and 9 mg/L TSS. Because the Fusion is equipped with built-in pretreatment, no additional septic tank is required.



Courtney Leghart, right, former product line manager for Clarus Environmental, discusses the Fusion Series treatment system with WWETT Show attendees. The system combines elements of anaerobic and aerobic digestion to provide secondary wastewater treatment. (Photo by Craig Mandli)

"The Fusion is going to be a fit where secondary treatment regulations are mandated by a county health department," says Susan Vandyke, marketing coordinator for Clarus Environmental. "It is a product that would take the place of an existing system to help produce an even cleaner effluent."

Being a relatively new technology, operators and installers from several wastewater treatment industries came to the Clarus booth to learn more. "People wanted to know how the flow of effluent works, and how we avoid freeze issues," says Courtney Leghart, former product line manager for Clarus Environmental. "There was a lot of interest in the unit."

The system's two types of media provide a stable environment to ensure that strong bacterial colonies remain even after high-flow events that may impede the performance of a normal septic tank, according to company representatives.

The anaerobic chamber uses fixed media to improve the efficiency of traditional primary treatment, while the aerobic chamber employs suspended media in two zones to enhance secondary treatment. The upper zone provides a stable home for beneficial bacteria to colonize, while the packed lower zone provides a filtration mechanism as a sludge return process enables the efficient reduction of suspended solids in the effluent.

FOR HOMES & SMALL PLANTS

Additionally, an automatic backwash routine stirs the media with air, twice daily, to thoroughly break up accumulated solids. These solids are then returned to the sedimentation chamber. Denitrification is achieved by returning nitrified effluent to a carbon-rich anoxic environment in the first chamber.

Although wastewater constituents and flow rates can vary from day to day, the Fusion continues to perform consistently, effectively and efficiently, company reps explain. The system can even sustain low- or no-flow periods for several months with little or no disruption of effluent quality. It is available in a variety of treatment capacities, from 450 gpd to 4,000 gpd.

"It is designed for residential homes, but actually has an application for secondary treatment with smaller treatment plants when installed in series," says Leghart. "It would take the load coming out of the plant and treat it to secondary levels, and would be more cost-efficient than adding onto the plant."

All models up to 800 gpd are NSF Standard 40-certified to produce an effluent quality of 9 mg/L CBOD5 and 9 mg/L TSS. The Fusion's design enables it to be installed without a pretreatment tank to accommodate sites with limited space. Effluent disposal options include conventional trenches, dosed systems, drip irrigation or disinfection with direct discharge. It requires only four pipe connections, and consumes less than 80 watts of power per day. Those factors make it a solid fit for the attendees at the WWETT Show, according to Vandyke.

"These guys at WWETT are the septic experts who recommend treatment options to the homeowner," she says. "That's why it's so important that we are here. Talking with those people helps guide our technology." **800/928-7867; www.clarusenvironmental.com.** □



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Installer Licensing Will Raise Industry Professionalism

Vermont leaders currently license onsite system designers, but are now working with the wastewater industry to offer broader certification and continuing education

By Doug Day

As things stand today in Vermont, only designers of onsite wastewater systems are licensed by the state. There is no registration or certification of installers or maintenance providers. That could change in 2017, as the Agency of Natural Resources' Drinking Water and Groundwater Protection Division is looking at the possibility of licensing installers, according to program manager Ernie Christianson.

Septage haulers are permitted by the Waste Management and Prevention Division. Solid Waste Compliance Chief Barb Schwendtner says it is a fairly simple program with straightforward permitting requirements.

What's the status of licensing installers in Vermont?

Christianson: We've been looking into it for more than a year. We had several meetings around the state with designers and installers, and will continue discussing it with the hopes, if we have the support, of going to the Legislature with a bill in 2017 to have a licensing program. The reaction so far is very positive. They would like to have it be a recognized profession with continuing education. One of the stipulations that I gathered from the meetings is if we go down this road, we need to be able to provide good continuing education classes.

What are the prospects and timeline?

Christianson: I think it's too early to tell because we need a larger sampling of the installers to get a general agreement. It looks very positive. We still need to go in front of the Legislature. If we do, we need to present a sound proposal prior to the session that starts in January.

So who is licensed in Vermont?

Christianson: We have approximately 300 designers in three classes. Class 1 are professional engineers who have completed a college-level soils identification course. They are licensed by the Secretary of State and the Vermont Board of Professional Engineering and can design any wastewater system.

Class A and Class B designers are licensed by the Agency of Natural Resources. We give the exam and determine the continuing education requirements, which are 12 hours every two years with four of those being field or laboratory courses. Class A can design wastewater systems that do not require site modifications, that will serve a single-family residence with a design flow of 1,350 gallons per day or less. Class B can design systems

"I & A systems are also required to have a maintenance agreement. The treatment unit must have a vendor-approved service provider and they are the only one allowed to service it."

Ernie Christianson



that may require site modifications or the use of approved innovative and alternative (I & A) products, that will serve a single-family residence with a design flow of 1,350 gallons per day or less. I & A includes any system designed to lower BOD and TSS. There are also Class Bs who can design systems for more than one single-family residence and commercial systems.

Generally, the homeowner hires a designer and the state approves the design. The homeowner then hires an installer, and the designer certifies the final installation and submits that to the state. I & A systems are also required to have a maintenance agreement. The treatment unit must have a vendor-approved service provider and they are the only one allowed to service it.

Schwendtner: Septage haulers only need to apply for a permit, there is no test. They have to give us information about the trucks they want to register, including VIN and license plate numbers. There is also a background check for the company and key employees, those with financial decision-making roles. There are some violations that prohibit you from getting a permit. If you have more than one serious environmental violation you can be prohibited from getting a permit, then there is a category for the typical felonies like murder, extortion, bribery, and that kind of thing.

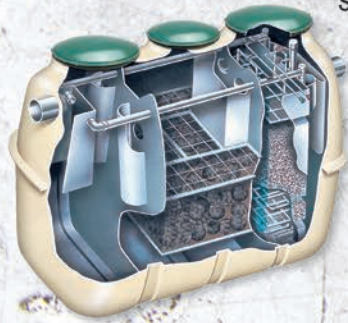
Individual drivers do not have to be licensed or registered with the Agency of Natural Resources. If it is a sole proprietorship, the permit is issued to that individual. If it's a corporation, the permit is issued to the

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corporation. There are about 400 licensed waste haulers, but that includes all waste transporters, including garbage haulers.

(Disposal of septage is regulated by the Department of Environmental Conservation Watershed Management Division. Septage can be land-applied, sent to a wastewater treatment plant or out-of-state incinerator, or dewatered and landfilled.)

How do you communicate with the licensed designers?

Christianson: I started a quarterly newsletter to inform them of updates, program changes or legislation, and we have a designer page on our website where they can keep up with continuing education courses being offered. They can also access the more recent information on our policies and guidance documents.

What are the big issues for onsite wastewater right now?

Christianson: There haven't been any, but we are in the process of rewriting our rules. Once we finish, it will go back to our Technical Advisory Committee for review.

The design criteria basically remain the same. It's more of an update and minor changes, and we've added new dispersal methods and technologies, including a provision allowing bottomless sand filters. Manufacturers now can request approval of new systems and technologies under our I & A provision and we can allow them even though they may not be specified by the rule. But a bottomless sand filter is not a proprietary technology with a manufacturer, so it needs to be incorporated into our rules.

If all goes well, we'll have a new set of rules by early this year. □



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It's Not Just a Place to Toss Your Wrenches Anymore

The latest pickup toolboxes are engineered to offer the busy contractor improved functionality and a stylish truck accessory

By Peter Kenter

Toolboxes used to be made of wood or steel and tossed into the back of a pickup truck, where they'd be strapped down to prevent sliding into the back of the cab at every red light and stop sign. Far from weatherproof, they'd rust and age over a few short years. A new generation of customized, rust-free aluminum pickup toolboxes has taken over, and while there's currently no revolution in their design, they continue to evolve to meet the needs of installers and other contractors.

While new toolboxes are far more functional and specialized than their primitive ancestors, truck owners have also become much more concerned about appearance, looking for boxes that complement their trucks and present a professional image, says Alex Golin, owner of Auto Truck Depot in Calgary, Alberta, Canada. They provide a wide range of truck accessories, from toolboxes to racks, bed covers, running boards, brake controllers, hitches and towing accessories through a retail store and online.

"We've come a long way from tool chests and work boxes," he says. "The next evolution was crossover toolboxes that sit over your bed rails, but still open up with one hinged flap. Next came the gull-wing style that you could open from either end. Finally, we saw the manufacturers combining toolboxes and auxiliary fuel tanks together in the mid-1980s."

CHOOSE THE RIGHT STYLE

Regardless of style, the boxes are now largely made of diamond plate metal.

"Aluminum has become the most popular material for toolboxes," says Golin. "The metal is lightweight and it doesn't rust when constantly exposed to the elements. However, we still see some buyers on a budget choosing black or white steel."

Installers should be careful to choose a toolbox with an efficient design that meets their needs.

"The single-lid crossover design is still our most popular style," says Golin. "Although you can conveniently reach into the gull-wing from both sides of the box, the design of the center hinge limits the size of tools you can easily store in it. The single lid allows you to store tools that measure the full length of the box."

Toolbox width remains relatively constant at about 21 inches. What is changing is the depth of the toolboxes.

"Deep-profile toolboxes go down about 19 inches and almost rest on the bed," says Golin. "We're now seeing low-profile boxes that only go down



ABOVE: A gull-wing hatch design offers convenient access from both sides of the truck. A single-lid crossover design allows bigger tools to be stowed in the box. (Photos courtesy of Highway Products)

RIGHT: A sturdy diamond plate design offers durability and good looks.



about 12 inches and still provide access underneath the toolbox, so you can carry lengths of pipe or full sheets of plywood."

If truck beds use tonneau covers or a fifth-wheel hitch, toolboxes must also be appropriately sized to fit.

TOOLS & FUEL

The three most popular sizes for larger auxiliary fuel tanks combined with toolboxes are: 43 to 50 gallons, 75 to 80 gallons and 92 to 100 gallons. However, each successive increase in capacity widens the toolbox base.

"The largest fuel tanks are 60 inches wide and you can only fit those models on trucks with beds 8 feet and longer that have a wheel well base located further back," says Golin.

Tanks come bare bones with fuel caps, but optional accessories allow



Color-matched toolboxes lend work pickups a cleaner, more professional look.

contractors to do anything from pump fuel using a hand crank to using an electric pump, or flipping a switch that feeds fuel directly into the fill spout of the main fuel tank via gravity.

While auxiliary tanks have primarily been designed to carry extra diesel fuel, Golin says that some manufacturers are now supplying gasoline tanks, offering double-walled designs to meet safety standards. “Not everybody drives a diesel and many contractors need to fuel gasoline-powered equipment on their job sites,” he says. “We’re now offering them and I think that a gasoline option on combo tanks will be an emerging trend.”

“The single-lid crossover design is still our most popular style. Although you can conveniently reach into the gull-wing from both sides of the box, the design of the center hinge limits the size of tools you can easily store in it.”

Alex Golin

Proper toolbox mounting is critical — especially for fuel/tool combos.

“An 8-foot truck bed isn’t actually rigid,” Golin says. “It’s meant to twist. When you have a big toolbox combo unit bolted onto the bed and you’re driving over bumpy terrain and your truck bed twists, it’s going to cause the seals and the welds on the auxiliary tank to break. You can mount the combo box onto pressure-treated plywood and rubber on top of that to absorb the twisting motion so it won’t impact the welds and seams.”

Most toolboxes are impervious to thieves — it would require outsized effort to steal the tools inside. However, extra security is now available via a recessed padlock. “The locks are surrounded by an enclosure so you can’t use cutting tools to access the padlock,” says Golin.

COLOR TRENDS

He notes that contractors have become more concerned about how equipment impacts their company image in recent years, shifting their preference from exposed aluminum to aluminum painted in glossy black to match a preference for black pickup trucks.

“When you’ve got no chrome on your vehicle, the last thing you want to do is to draw attention to this nice, bright shiny toolbox that looks nothing like the rest of your truck,” he says. “I’ve had one customer who is a contractor waiting six weeks to have a toolbox custom-painted in black, when an exposed aluminum model could have been delivered inside of a week — and the black box will be kept under a tonneau cover so you’ll only see it when he’s towing.”

But even shiny black designs are beginning to fall out of favor for powder-coated matte black. “I was just talking to one of the manufacturers of tool/fuel combo boxes and they’ve completely switched their production line from shiny black to matte black,” Golin says.

Maintaining the toolboxes is simply a matter of washing them along with the truck.

“Even aluminum, when it isn’t washed, will see the dirt oxidizing the finish and turning it from shiny to dull,” says Golin. □

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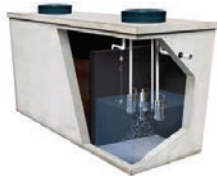
By Craig Mandli

The Water & Wastewater Equipment, Treatment & Transport Show will fill the Indiana Convention Center Feb. 22 to 25 with the best products and services the industry has to offer. To make sure you don't miss out on any of the new, innovative industry offerings in Indianapolis, be sure to check out the interactive floor plan on the WWETT website (www.wwettshow.com). All attendees are sure to bring home a new idea or product to assist them in the coming year.

Here's a look at some of the most exciting products and services that will be on the WWETT Show floor:

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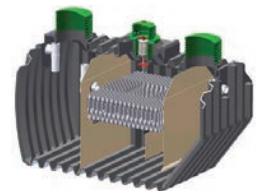
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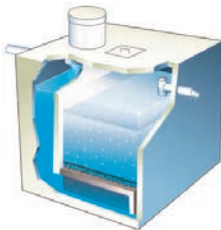
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ONE BIOTECHNOLOGY LIQUID BioOne

Liquid BioOne from One Biotechnology is a 100 percent natural drainline, septic and grease trap maintainer. Applied on a regular basis after a drain or septic treatment, it can help to maintain free-flowing drains, eliminate odors and reduce the number of back-ups between scheduled pumpings. It doesn't contain enzymes or caustic agents and is safe for people, pets and pipes, displaying the EPA's Safer Choice Program logo that "allows customers to quickly identify and choose products that can help protect the environment and are safer for families." Adding it to customers' lines and grease traps does not emulsify FOG and move it down the line. 800/951-4246; www.onebiotechnology.com; **Booth #6152.**



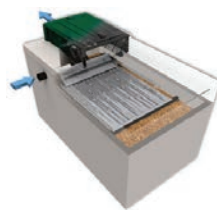
POLYLOK PL-CPE4A

The Polylok PL-CPE4A is a submersible 4/10 hp 115-volt single-phase effluent pump with a 2-inch NPT vertical discharge. It has a maximum head of 38 feet and a maximum flow of 56 gpm. The pump is designed with a 3,450 rpm oil-filled permanent split-capacitor motor and has an amp rating of 6.6 for 115 volts, a cast iron housing and volute equipped with a cast iron vortex impeller capable of passing a 3/4-inch-diameter solid. The stainless steel shaft is supported by two single-row oil-lubricated ball bearings. The shaft seal is an inboard seal design with a secondary Exclusion V seal. 877/765-9565; www.polylok.com; **Booth #2001.**



PREMIER TECH AQUA ECOFLO

The Ecoflo biofilter from Premier Tech Aqua is offered as a nitrogen-reducing unit, thanks to an add-on kit comprised of a pressurized flow divider, which recirculates a fraction of the water back to the primary tank, and a simplex control panel, which manages the dosing pump cycles and monitors all records. Available in ready-to-use roto-molded shells or as a kit to be integrated into existing tanks made by local precasters, this ecological, high-performance and low-maintenance unit uses a 100 percent natural and compostable coco husk-based filtering media. 717/479-0005; www.premiertechaqua.com; **Booth #4112.**



PRESBY ENVIRONMENTAL ENVIROFIN

The EnviroFin passive onsite wastewater treatment and dispersal system from Presby Environmental is designed with the same principles as Enviro technology. It is designed to ship easily and fit into a smaller space than the other Presby technology while maintaining high treatment levels. 800/473-5298; www.presbyenvironmental.com; **Booth #6002.**



RITAM TECHNOLOGIES SUMMIT RENTAL SYSTEM

The Summit Rental System from Ritam Technologies allows users to keep their familiar QuickBooks environment and take advantage of automated billing. Every transaction is instantly memorized, meaning the user only has to touch accounts when something changes. Billing is automatic, whether monthly, 28-day, or special event. It allows for automatic "from" and "to" billing dates, prorations, damage waivers and delivery charges. Routes can be built from a single point of entry, and inventory assigned instantly. QuickBooks continues to capture revenue totals, balances the checkbook, and an accountant can continue using it for tax reporting. It enables route optimizing with the latest mapping software and mobile route management. 800/662-8471; www.ritam.com; **Booth #4300.**

(continued)



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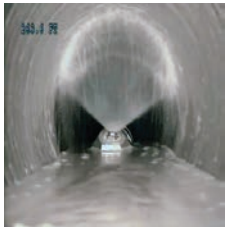
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ROOTX CHEMICAL ROOT CONTROL

Chemical root control from **RootX** is designed as a long-term solution to pipeline root intrusion, as it stunts new root growth without damaging the pipe, clearing pipeline roots that can cause blockages resulting in sanitary sewer overflows. The simplicity of the application means crews can perform root control on demand or as scheduled preventive maintenance.

It is registered with the EPA for both sanitary and storm use (EPA Reg. No. 68464). 800/844-4974; www.rootx.com; **Booth #6002.**

SALCOR 3G UV WASTEWATER DISINFECTION UNIT

The **3G UV Wastewater Disinfection Unit** from **Salcor** is proven for residential, commercial and municipal uses, and is UL certified NEMA 6P Flood-proof and NSF/Washington State Protocol six-month tested (with 21 upstream treatment systems). It inactivates pathogens, including superbugs. Rated at 9,000 gpd gravity flow, it is a reliable building block for large water recovery/reuse systems. When installed in 12-unit parallel-series arrays with ABS pipe fittings, systems are disinfecting over 100,000 gpd. Gravity flow equalizes without distribution boxes. Each unit has a foul-resistant Teflon lamp covering, two-year long-life lamp, speedy installation, minimal annual maintenance, and energy efficiency of less than 30 watts. 760/731-0745; **Booth #3000.**



SEALING SYSTEMS INFI-SHIELD GATOR WRAP

Infi-Shield Gator Wrap from **Sealing Systems** prevents infiltration and erosion by providing a watertight seal around any manhole, catch basin or pipe joint. It resists harsh soil conditions and provides a root barrier for any crack or joint.

It is made of a stretchable, self-shrinking, intracuring halogenated-based rubber. The backside of each seal is coated with a cross-linked reinforced butyl adhesive. The seal is designed to stretch around the joint and then overlap, creating a cross-linked and fused bond between the rubber and butyl adhesive. It installs easily with no special tools and can be immediately backfilled. 800/478-2054; www.ssisealingsystems.com; **Booth #4122.**

SEE WATER WS SERIES

WS Series simplex control panels from **See Water** are ideal for sewage pump chambers, grinder pumps, sump pump basins and lift stations. The system has a clear-front NEMA-4X heavy-duty polycarbonate enclosure, an IEC contactor, a motor protective switch, individual float status indicator, and dry contacts for high liquid, pump run and pump fault. The panels are UL listed. 888/733-9283; www.seewaterinc.com; **Booth #2776.**



SIM/TECH FILTER PLEATED FILTER

Pleated filters from **Sim/Tech Filter** are available for gravity effluent filtration in septic tanks and turbine pump filtration in pump tanks. Filtration size is 3/32 inch in two dimensions. Flow channels in the pleated material result in increased longevity. All filter types start at over 2,000 square inches of filtration area. The 45 percent open area (over 900 square inches) is equivalent to 800 linear feet of 3/32-inch slots. Various configurations and larger units are available. 888/999-3290; www.simtechfilter.com; **Booth #2405.**

SJE-RHOMBUS MYSKY

The **MySpy Wi-Fi messenger system** from **SJE-Rhombus** provides remote notification of potential alarm conditions, including sump high-water level or over/under temperature alarms, via text or email. Alarms notify the user both locally (audible and visual alarms) and remotely via an existing Wi-Fi network. The alarm will notify up to four contacts for alerts. The system has a NEMA 1-rated enclosure for indoor use, automatic alarm reset and 9-volt DC battery backup. The touchpad includes test and silence buttons for the alarm horn and LED indicators for alarm (red), power on (green) and network status (blue). Optional float switch models and splice kit are available. 888/342-5753; www.sjerrhombus.com; **Booth #2504.**



T&T TOOLS MANHOLE COVER OPENER

The manhole cover opener and septic tank lid remover from **T&T Tools** has a T-handle design that integrates the strength of a 5/8-inch heat-treated hex shaft. This T-handle allows the user to securely use both hands to grip the hook and remove the cover. The weight of the cover is effectively transferred to the grip of both hands, allowing for a better pulling posture. The 5/8-inch hex shaft is heat-treated and hardened, creating a durable, long-lasting tool while reducing the chance of bending. The working end is designed to fit in a wide variety of openings. It is available in 24-, 30- and 36-inch lengths. 800/521-6893; www.mightyprobe.com; **Booth #6004.**

TRANS LEASE

An independent lease and finance company, **Trans Lease**, covers the U.S. and Canada, with a focus on the transportation industry. The company's specialty markets division covers specific industries, such as industrial cleaning and excavation. 877/600-6423; www.transleaseinc.com; **Booth #5259.**





TUF-TITE RISER

Tank risers from **Tuf-Tite** have internal supports or ledges to reinforce internal plastic safety lids. The ledges will strengthen the company's plastic internal safety lids or a variety of internal safety devices made by others, such as concrete, fiberglass or rope

netting. The riser lids come with all necessary mounting hardware including safety screws. 800/382-7009; www.tuf-tite.com; **Booth #6114.**

WATER CANNON 16T55

The 16T55 turnkey jetter package from **Water Cannon** is road-ready with an onboard 200-gallon water tank capacity and customizable jetter hose up to 500 feet. It includes a two-wheel road-ready commercial jetter trailer, electric-rewind high-capacity hose reel that can hold 500 feet of 3/8-inch or 350 feet of 1/2-inch hose, poly toolbox, lights, front jack with wheel, safety chains, and aluminum fenders. The jetter includes a Honda GX690 twin-cylinder electric-start engine, V-belt drive, trailer-mounted skid, and 15-gallon EPA- and CARB-approved poly fuel tank. Its TS-Series General triplex plunger pump supplies 8 gpm at 3,500 psi. It has a pump-mounted jetter pulse valve, foot valve with 8-foot jumper hose, and three jetter nozzles – the Penetrator, Flusher and De-Greaser/De-Icer. 800/333-9274; www.watercannon.com; **Booth #5255.** □



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Drainfield Media and Design

By Craig Mandli

CHAMBERS

Infiltrator Quick4 Plus Chambers

Providing maximum strength and large storage volumes to accommodate peak flows, the Infiltrator Quick4 Plus Chamber offers design and installation flexibility including a small footprint. Fast and easy to install, the 4-foot chambers are available in standard, low-profile and high-capacity models. A Contour Swivel Connection permits up to 15-degree turns, right or left. The All-in-One Endcap can be used at either end of the chamber row for an inlet/outlet, or can be used mid-trench. Mid-trench connection allows for center-feed chamber rows. Center-feed connections allow for easy installation of serial distribution systems. The Periscope allows for raised invert installations. No stone or geotextile is required for installation. 800/221-4436; www.infiltratorwater.com.



Sim/Tech Filter STF-BTPS Bow Tie

The STF-BTPS Bow Tie pipe stand from Sim/Tech Filter is designed for use in chamber systems where the distribution piping is suspended above the soil. The stand is independent of the chamber, allowing the pipe to be installed prior to chamber installation and before the squirt test is performed. They install by a quick and easy squeeze-and-release action. The stand can be installed on the pipe before placing it in the trench, and is easily adjusted to desired spacing. They store flat for economical shipping and easy storage. Versions are available to fit 1-, 1 1/4-, 1 1/2- and 3-inch pipe. 888/999-3290; www.simtechfilter.com.



DRAINFIELD COMPONENTS

Bio-Microbics RetroFAST or RetroFITT-ee

The RetroFAST or RetroFITT-ee (energy-efficient version) unit from Bio-Microbics is designed as a simple upgrade to enhance a conventional septic system or renovate a biologically failed septic system. It installs directly in the existing tank to create an optimized treatment environment using submerged, fixed-film media for microbial growth with an energy-efficient aeration system. It constantly sends effluent rich in dissolved oxygen to the drainfield. Where sites and regulations allow, it can be used in new installations. It is designed to immediately deliver high levels of treatment to help prevent formation of clogging layers. 800/753-3278; www.biomicrobics.com.



Clarus Environmental Spider Valve

The Spider Valve assembly from Clarus Environmental ensures appropriate filtered effluent distribution when regulations require pressurized splitting or when small lots require lateral lines of unequal length. Combined with a pump, customizable orifices within the manifold prevent individual laterals from receiving more than their share of total flow. A convenient sizing program is available to allow customization for any project. It is available in models serving up to 10 laterals. Each assembly includes 5/32-inch predrilled washers and a union for each washer. Unions allow washers to be removed for cleaning and maintenance. It comes with 3 feet of 1/2-inch PVC flexible pipe on each discharge for easy assembly. It mounts in a 24-inch-diameter access riser. 800/928-7867; www.clarusenvironmental.com.



E-Z Treat Company Re-Circulating Synthetic Sand Filter

The Re-Circulating Synthetic Sand Filter from E-Z Treat Company has passed NSF-350 Water Reuse, NSF-245 and NSF-40 testing. The reuse system was sampled for 34 weeks including double stress tests instead of the normal 26 weeks with one stress test. Test results indicate BOD of 2, TSS of 1.9, turbidity of 2, DO of 3.5 and pH of 7.2. Systems are available from 100 to 100,000 gpd. 866/753-4770; www.eztreat.net.



Polylok distribution box

Distribution boxes from Polylok allow installers to choose the height of inlets and outlets. They come with a seal that accepts 2-, 3-, 4-inch and corrugated pipe (the 20-inch unit accepts 6-inch pipe). The 12-inch unit comes with stabilizing feet to anchor the box. 877/765-9565; www.polylok.com.



Presby Environmental EnviroFin

The EnviroFin passive onsite wastewater treatment and dispersal system from Presby Environmental is designed to have a small footprint and ship easily, while maintaining and exceeding NSF/ANSI Standard 40 treatment. Effluent leaves the septic tank and enters the fin distribution unit, where it settles and breaks down suspended solids. Skimmer tabs located at the perforations prevent grease and suspended solids from leaving the FDU. Effluent is



distributed to the eight treatment fins, which are filled with coarse green plastic fibers, filtering and digesting more suspended solids while creating a massive bacteria treatment area. Each treatment fin has a perforated pipe functioning as an air duct across the top, providing oxygen to promote bacterial growth. 800/473-5298; www.presbyenvironmental.com.

Tuf-Tite distribution box

Noncorrosive distribution boxes from Tuf-Tite are designed to be strong, stable and permanent. They are available in four sizes: four-, six-, seven- and nine-hole. Risers are available for the four- and seven-hole units. All boxes come with a one-piece watertight seal that accepts 1.5-, 2- to 3-, and 4-inch SDR35 or Schedule 40 pipe, corrugated for ease of installation. 800/382-7009; www.tuf-tite.com.



PIPE



Advanced Drainage Systems Septic Stack System

The Septic Stack System from Advanced Drainage Systems is available in configurations of 9, 11 and 13 pipes. The units allow for high soil contact without using gravel. They function as a trickle filter, dispersing effluent into the voids in and around the specially banded pipe. This pipe is engineered with holes and slots, allowing it to collect and disperse the effluent as it passes over corrugations in the pipe. Systems are available for use in both residential and commercial applications in trench, bed and mound configurations, as well as pressure dosing. 800/821-6710; www.ads-pipe.com.

VENT PIPE FILTER

The Dirty Bird

The Dirty Bird is a septic vent concealer shaped like a birdbath that meets all U.S. Environmental Protection Agency septic-venting regulations and controls odors via a replaceable charcoal filter. It is easy for homeowners to install in five minutes or less, and its charcoal filter is easily replaced. Gases escape through venting holes at the bottom surface of the pedestal, which prevents rain/foreign objects from entering the septic system. It is fade-resistant (UV stabilized), lightweight and recyclable, and is available in granite, sandstone or terracotta colors. It is constructed of low-density polyethylene and all-stainless hardware. It is 32 inches high, with a basin width of 23 inches and a footprint of 12.25 inches. 866/968-9668; www.thedirtybird.com. □



Sand filters help provide treatment for limited-space area

Problem: Rustic lakefront cottages on China Lake in Kennebec Valley, Maine, were being converted to seasonal condominiums. An additional drainfield was needed to supplement existing conventional systems to accommodate an increase in the number of cottages and daily design flow. While there were adequate soils on the site, there was limited space for a new drainfield and septic tank.



Solution: Kane Coffin, from E. S. Coffin Engineering & Surveying, designed a 1,990 gpd system to take effluent from 10 of the two-bedroom cottages. Kempton Tobey & Son Inc. installed the drainfield in a bed configuration consisting of six rows of 23 Eljen GSF modules placed on a base of ASTM C33 sand. The modules were spaced 1 foot apart, and overall dimensions of the bed was 23 by 93 feet. The effluent was moved to the drainfield from one of the existing pump stations on site, delivering 4 gallons per module per dose to the bed system.

Result: The system was installed with little overall site disruption and provided treatment and disposal in the same footprint. The quick installation ensured the condominiums were ready for the next year's vacation season on the lake. 800/444-1359; www.eljen.com. □



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Missouri

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New Hampshire Association of Septage Haulers;
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New Mexico

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Long Island Liquid Waste Association, Inc.;
www.lilwa.org; 631/585-0448

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North Carolina Septic Tank Association;
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North Carolina Portable Toilet Group;
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Saskatchewan Onsite Wastewater Management Association;
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Komatsu America celebrates 30 years in Chattanooga

Komatsu America celebrated 30 years of manufacturing in Chattanooga, Tennessee, with a weeklong celebration. The Chattanooga plant opened in February 1985 as Komatsu's first plant in the U.S. The plant hosted daily tours, concluding the week with a ceremony. □



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We heard you! Polylok now offers risers in 2" and 3" heights. Whether you are working with a septic tank, distribution box or drainage box, stacking these new heights with our existing series of 6" and 12" risers will enable you to get **the perfect fit every time!**

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Lid-Lok Safety Device
 (20") 3009-LOK
 (24") 3008-LOK



24" Dual Safety Cover
 3009-KYDC



24" x 2" Riser
 3008-GR2



20" x 2" Riser
 3009-GR2



20" x 3" Riser / Riser Pan
 3009-LPRP

OTHER SIZES AVAILABLE

- 24" x 3" Riser / Riser Pan - 3008-RP
- 24" x 6" Riser - 3008
- 24" x 12" Riser - 3008-R12
- 20" x 6" Riser - 3009
- 20" x 12" Riser - 3009-R12
- 20" Riser Pan - 3009-RP
- 12" x 6" Riser - 3017-R



1-877-959-7751 / www.polylok.com
 For more information call or visit our website today!