

January 2020

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# 24" HEAVY DUTY MULTI-PURPOSE FLAT RISER LID

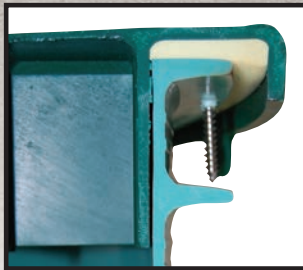
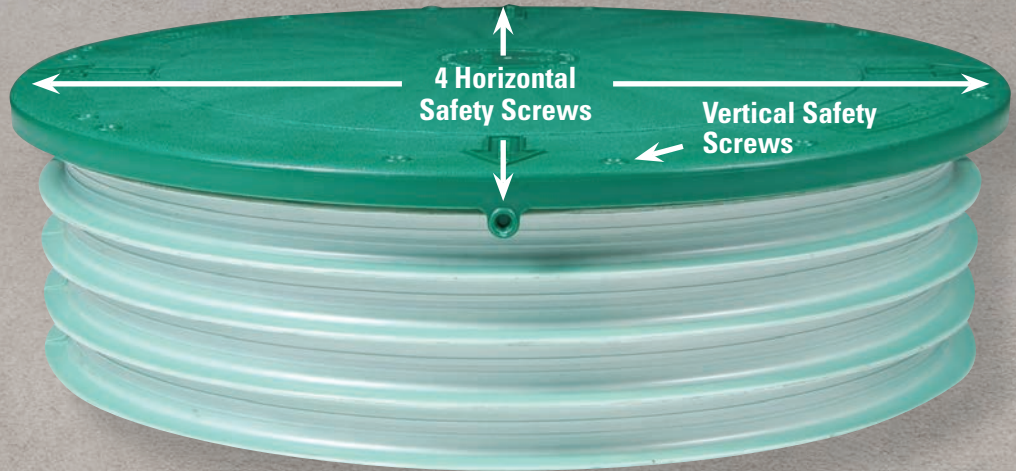


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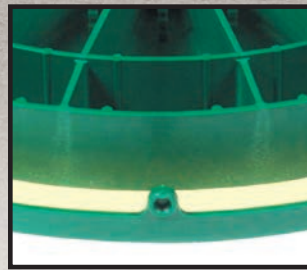
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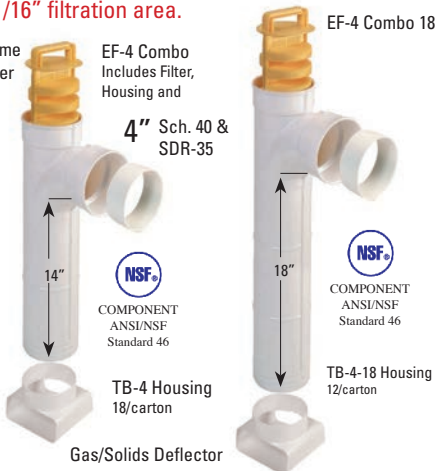


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### INSTALLER PROFILE:

#### Loving the Industry

By David Steinkraus

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Richards Septic Service in Greenville, Michigan, is going strong after 58 years in business. From left, Zach Rodriguez, Joe Rodriguez and Ron Richards are shown with a Freightliner dump truck. (Photo by Amy Voigt)

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7:30 a.m.-5 p.m. Central time, Mon.-Fri.

Website: [www.onsiteinstaller.com](http://www.onsiteinstaller.com)

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### EDITORIAL CORRESPONDENCE

Send to Editor, *Onsite Installer*, P.O. Box 220, Three Lakes, WI 54562 or email [editor@onsiteinstaller.com](mailto:editor@onsiteinstaller.com).

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## Coming in February 2020

ISSUE FOCUS: WWETT Show Issue

System Profile: Tough job in Arkansas

Basic Training: Hydraulic vs. organic loading





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## Enjoy this issue!

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





Jim Kneiszel



Send your comments, questions or opinions to Jim Kneiszel at [editor@onsiteinstaller.com](mailto:editor@onsiteinstaller.com).

# My Best Wishes for a Successful 2020

We enter a new decade with optimism for continued growth for the onsite industry and an opportunity to work smarter and do more good

**W**e've ushered out the 2010s, a decade of great change in the world of decentralized wastewater treatment, and are embarking on a new period with new challenges in the decade ahead.

We wave goodbye to a decade that saw growing urgency over protecting our water resources and the environment in general.

We learned a whole lot more about pollution of sensitive coastal waterways and the negative impact of blue-green algae. The technology doers in the wastewater industry took us further away from conventional tank and drainfield septic systems in a growing number of regions beset by issues of development and population density.

Onsite installing contractors faced many challenges on the business front. The decade started with a long, slow economic recovery following a recession that hit close to home, starting with an implosion of the real estate market. Many of you had to trim your staffs just to survive, then as the economy rallied, you were cautious about adding employees for fear your workload wouldn't support them. A health insurance catastrophe gripped small-business owners for years, and we still don't know where that situation is headed.

As we head into the 2020s, a new optimism is taking hold, though we recognize there will be many challenges ahead. Generally installers continue to see business rallying, with more orders for replacement and new-construction systems on the horizon. State and county health departments are focusing more on required inspections and maintenance of systems, which should lead to a steady stream of upgrades of septic systems that are well past their due date. New technologies are taking hold that will efficiently treat wastewater on smaller lots, opening up more land for development.

As *Onsite Installer* starts its 16th year of publication, I have some "pie in the sky" wishes for installers in 2020 and beyond. My hope is that:

## **Greater profitability allows you to provide improved employee benefits.**

Sometimes construction-related trades can lag behind the rest of the employment world in providing competitive benefits for workers. These jobs are sometimes seen by applicants more as transient positions than as the entryway to long-term careers. But that doesn't jive with the fact that you'd give your eyeteeth for a few seasoned technicians with knowledge of the onsite industry. What would another crew of workers who can hit the ground running mean to your company? A lot, I know. So as you get busier,

**It's great to hear about individual installers ... working on Habitat for Humanity home builds.** While typical volunteers on these projects can quickly learn to frame a house or shingle a roof, your special knowledge of decentralized wastewater makes your contribution so valuable.

work to lure more good prospective workers who will stick with the industry for decades to come. As you build on the bottom line, I hope you can start to support a health insurance program for your employees. And a retirement plan, at least a matching 401(k) program. How about flexible scheduling, weekends off, paid uniforms, a wellness program and more paid days off? Give more to your workers and they will give more back to you in effort.

## **Worker safety improves to the point where nobody in our industry is severely injured or killed on the job.**

The goal of every installer is to send the crew out and bring them back safely at the end of every day. Making it happen takes some planning and attention to a safety program. Start by having your trucks stocked with the right safety equipment: gloves, hard hats, reflective vests, eyewear and tools to ease strains on hardworking bodies. Keep shoring boxes handy for when you're working in deep excavations. Start each day with a tailgate meeting including an important safety reminder. Encourage your crew to make safety suggestions, and reward workers who bring unsafe conditions to your attention. Shoot for a year of no missed days due to worker injury. For my part, I want to go through 2020 without seeing an OSHA violation in a photo submitted to the magazine.

## **You don't have an equipment breakdown at the worst possible moment.**

Losing control of your busy work calendar is only one idled excavator away. Start 2020 by building an equipment maintenance list so you avoid



things like broken belts and leaky hydraulic hoses at the most inopportune time. Pay close attention to manufacturers' recommended service intervals and remain vigilant about routine inspections, particularly as equipment ages. If you rely on a few pieces of equipment for jobs every week, think about how many hours are on the clock or years you've been pushing those machines and then plan for replacement. Aim to sell machines before they saddle you with frequent and expensive repairs to keep going.

### **Your revenue beats payroll and expenses every month of the year.**

Slow seasons seem to be a thing of the past for many installing contractors. Even in northern regions, I routinely hear about busy companies pushing projects into the holiday season and then looking to resume as soon as possible in the spring. But you still have to strive to find ways to keep your most valuable employees working — and generating revenue — 12 months a year. That may mean working on your marketing to keep customers thinking about projects in the winter and spring seasons. In areas where weather forces you to slow down, look for new ways to keep money coming in and your people working. Your business will be healthier and more prosperous if you can avoid having months where expenses top revenues.

### **No holiday celebrations are interrupted by an emergency call.**


Wouldn't you love to make it through those busy holiday weeks without a call about a tank alarm going off or wastewater surfacing in the drainfield? Pushing routine maintenance may be the answer. Continually market inspection and maintenance services to your customers. Send out mailers, make phone calls and post on social media offering preventive visits ahead of those periods when you typically get emergency calls. When you install a system, offer favorable terms to customers who will buy into routine inspection and filter cleaning. If you don't already have an employee focused on maintenance, consider dedicating resources in that area. Do all of these things and you may be able to sit back and enjoy an afternoon of football after that big holiday feast.

### **You find the time to offer your expertise to a charitable cause.**

There are so many ways for installers to contribute their time and treasure to worthy community projects and less-fortunate people. Think of the good you can do by donating a few days a year to moving dirt and installing or repairing an onsite system for a charity. Perhaps a homeless shelter, food bank or church needs excavation work done or an onsite system fixed. You have the unique skills to contribute to the improvement of your community. It's great to hear about individual installers or state onsite trade associations working on Habitat for Humanity home builds. While typical volunteers on these projects can quickly learn to frame a

house or shingle a roof, your special knowledge of decentralized wastewater makes your contribution so valuable. When you can, donate your services. It will reflect well on your business locally and on the wastewater industry globally.

### **You enjoy health and happiness throughout the year.**

We all know someone in the industry who suffered from serious illness or passed away over the past decade. It's good to take a moment to reflect on and pay tribute to those we've lost. And it's time to remember that good health is the most important ingredient in a happy and successful life. I wish you the best as you move forward doing valued onsite installing work. Be sure to balance your busy work life and time spent enjoying life with family and friends. 



## **YOU PICK 'EM; Have your say in the Contractors' Choice Awards.**

When it comes to installing and maintaining septic systems, you rely on tried-and-true favorite products to reach your goals as a successful contractor. Now is the time to let everyone know about the vendors who have become your faithful business partners through the Onsite Installer Contractors' Choice Awards. And it's easy! Simply go to [www.onsiteinstaller.com/contractors-choice/vote](http://www.onsiteinstaller.com/contractors-choice/vote) and click on your preferred choices in the following categories: septic tanks, risers/lids, alarms/control panels, filters, ATUs, commercial systems, drainfield components and pumps. One vote is allowed per device, per person in each category. Winners will be announced at the 2020 WWETT Show Feb. 17-20 at the Indiana Convention Center in Indianapolis.



- Residential
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## WATERTIGHT TESTS

### Ensure New Tanks Won't Leak

There are many reasons to ensure that all septic tanks are watertight, and several locations on a septic tank where leakage can occur. A new tank can be tested for watertightness by filling it with water (hydrostatic testing) or by vacuum testing. This article breaks down how to do both.

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## TOP 10 Most-Read Articles

If you missed them, here's a chance to check out our most popular online articles from 2019. We covered everything from installing accessible clean-outs to recommendations for a slaughterhouse system to how to do a two-peg test to ensure accurate surveying equipment. Enjoy this look back at 2019.

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## Overheard Online

"You end up paying for leads and calls, but you're booked out so far that those leads have no choice but to call a competitor who can serve them sooner. Why waste your money on leads you have to pass off to someone else?"

– When Marketing Can Be Too Much of a Good Thing  
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## ALTERNATIVE LOANS

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Sooner or later, most companies need access to financing so they can buy more equipment, acquire new office space or make some other important capital investment. Traditional lending options aren't always available for various reasons, but that doesn't mean you have to give up on finding financing. Find out more in this exclusive online story.

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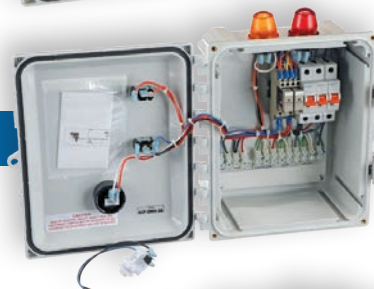
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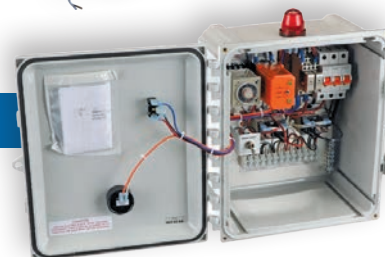
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## INSTALLER PROFILE

◀ Zach Rodriguez, left, and Joe Rodriguez pump an old tank in preparation for a septic system replacement. (Photos by Amy Voigt)



# LOVING THE INDUSTRY

Zach Rodriguez returns to what he loves best, working with family and providing comprehensive onsite wastewater service to the folks in western Michigan

By David Steinkraus

**R**ichards Septic Tank Service is 58 and still going and growing. When Zach Rodriguez is ready to take control of the company still owned by his grandparents, he'll have a successful venture in western Michigan.

"This year was kind of our growing year. We've taken on a lot of other aspects within our business," he says.

Rodriguez has been back in the family business for only three years. Like many children from multigenerational family businesses, he grew up with the company but then left, heading for the oil fields of North Dakota. "I went out there to blossom and figure out what direction I needed to take

and to step out of this a little bit," he says. "I loved it. I absolutely loved it."

He worked for a service company and operated equipment, so those skills remained fresh when he decided the time was right to return to Michigan. It was his grandfather, Ron Richards, who asked if he wanted to take a role in the family business. Rodriguez was ready. Time away from home was getting too long, and he had missed the birth of his nephew, among other family events.

"It was time to return," he says. "I was out there with three buddies. We all set a date. It took us six months longer than we wanted, but we made it back."



## BROAD SERVICES

The diverse company is split. Rodriguez currently runs the installing division. His father, Joe Rodriguez, runs the pumping division, but when he retires, the divisions will merge. To keep everything simple for that eventuality, the website and other business services remain integrated.

Richards Septic provides onsite installing and repairs, excavation, pumping, and portable restrooms. Installations cover a range of systems. If the requirement is a conventional gravity septic system, Richards Septic's crews can usually do four a week.

"We have a mixture of soils around our area. One week we can do all conventional gravity systems. The next week we can do two raised mound systems," Zach Rodriguez says.

They try not to do a string of raised mound systems because of the time required to haul in material for the mounds. They are capable of installing aerobic treatment units, and have used EZflow (Infiltrator Water Technologies) on a few jobs where drainfield space was limited, but these technologies are not in demand yet in their area.

"We're familiar with it all, and we like to stay current and up to date," Rodriguez says.

Greenville is close enough to Grand Rapids (population 188,000) that Richards Septic can find work in the area around the city. They use the pumping business to probe new areas for business. It costs the least amount of money to send a vacuum truck somewhere compared to other crews, Rodriguez says.

First they'll target an area with ads for pumping. If those generate business, they'll do more ads and start promoting other services. One area not targeted with ads is generating occasional pumping business, apparently because people see the trucks and call the number written on the side, Rodriguez says.



« Zach Rodriguez hops aboard a Freightliner dump truck to deliver materials to a job site.

"We have a mixture of soils around our area. One week we can do all conventional gravity systems. The next week we can do two raised mound systems."

Zach Rodriguez



▼ Zach Rodriguez makes connections between two tanks for a replacement septic system.



## GETTING TO WORK

“We’re trying to get a little more sophisticated with our customer base, finding out what areas people are located in and tracking prices so we know what works best,” he says.

What they don’t do is go head-to-head with the companies based in Grand Rapids, Rodriguez says. It’s where the work is supposed to be, but Richards Septic doesn’t agree, he says. “We’re small-town people. We like being able to tend to the people in our local spots. We hand work off to those guys, and they hand work off to us,” he says.

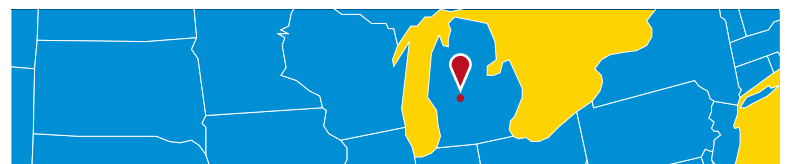
His most interesting job lately was a raised mound because he supervised the job himself and did the work along with a new employee. It was 25-plus feet of lift from a lake lot. “We were battling water in the tanks, and the spring rains made it a task to get in and out. I enjoy the difficult ones — the ones where you go home and don’t ever want to do it again,” he says.

The raised mound was a tough job to toss a new employee into, Rodriguez says. Finding employees is also a tough job in his area. “Putting in a system is a labor-intensive task, and it is hard to find people. It’s a younger guy’s job right now,” he says.

When a longtime employee died in 2019, Chase White, the boyfriend of Rodriguez’s sister Emily, came to help the company. “At that point, I was short a driver and he stepped up.”

“Right now we have the people we need,” Rodriguez says.

As the company grows, there will be a need for more workers.



## Richards Septic Tank Service Greenville, Michigan

- Owners:** Ron and Carol Richards
- Founded:** 1962
- Employees:** 11
- Service area:** 50-mile radius from Greenville
- Services:** Onsite installing and repair, excavation, pumping, portable restrooms, real estate inspections
- Affiliations:** Michigan Septic Tank Association
- Website:** [www.richardssepticsservice.com](http://www.richardssepticsservice.com)

New people have options when they are hired. For example, White first did pumping, but it didn’t fit his talents, Rodriguez says. Now he’s running equipment and is doing very well.

“We’re trying to see the diversity in people and use what we have rather than outsource talent,” he says.





▲ Zach Rodriguez cuts corrugated pipe from Advanced Drainage Systems.

## WORD-OF-MOUTH WON'T DO IT ALL

"We were quite sought after to do a lot of work. We didn't have to advertise too much. Now it seems like a lot of people have machines, and people are leaving companies and buying machines," says Zach Rodriguez, installation supervisor for Richards Septic Tank Service.

That means more competition in an area that once didn't offer much competition to the 58-year-old company. Referrals from satisfied customers aren't enough to keep up with the competition, so Richards Septic has changed its strategy and implements more advertising plans.

The company still uses the local phone book, but it also uses Facebook, Rodriguez says. They have turned to Google Ads, and those have generated quite a bit of business. This is required to capture the younger generation, he says.

"I'm 27 years old. When I go to look for something, I search for it on Google," he says.

Rodriguez manages marketing for the company, and he takes as many photos as possible of the company's work to post on Facebook. A post from last summer shows portable restrooms lined up and the text, "Portable restrooms are set up for Lakeview Summerfest. Make sure you get a chance to stop by to enjoy all of the festivities!"

So much is new in the business that it's a challenge for Rodriguez to keep track of where everyone is so he can take photos. "I do a lot of weekend activity. My girlfriend puts up with a lot."

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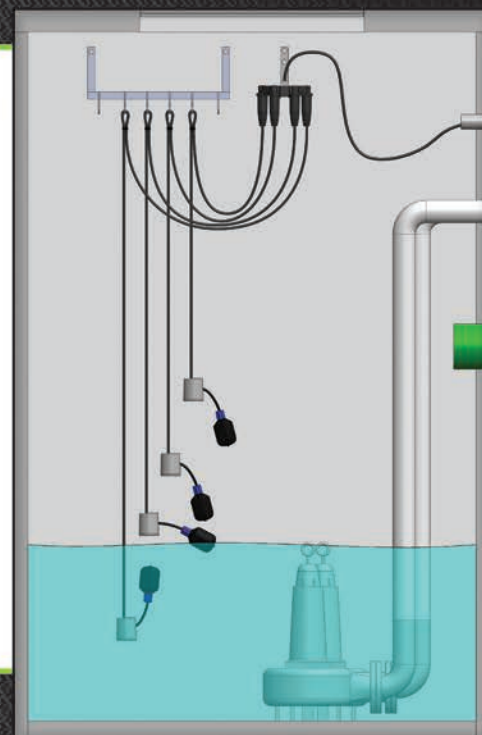
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◀ Zach Rodriguez uses a Leica Rugby 680 laser level system on a job site.

▼ Becky Richards runs PVC pipe to a new septic tank for a residential system.



## EQUIPMENT CORNER

A diverse business like Richards Septic needs a variety of equipment. The company has:

- Four vacuum trucks, all with steel tanks: a 1994 Kenworth with a 2,300-gallon tank and Masport HXL400 pump, a 1999 Sterling with a 3,600-gallon tank and Fruitland pump, a 1995 Kenworth T800 with a 4,000-gallon tank and Masport HXL400 pump, and a 2014 Kenworth T800 with a 5,000-gallon tank and Jurop/Chandler pump. They also have a 6,000-gallon tank trailer with a Challenger 607 pump (National Vacuum Equipment) and a 1994 Kenworth semitractor.

- For dirt work: a 2000 Case 9020B excavator; Case 450B bulldozer, 1994 Case 850G dozer, 1999 Case 1150G dozer and 1986 Case 1450B dozer; 2016 Bobcat T650 skid-steer; and 1997 Case 580 Super L backhoe loader.

- For the portable business: about 230 units to rent, all of them from Satellite | PolyPortables and Five Peaks.

- Two trucks for the portable restroom end of the business: a 2000 Chevrolet 3500 with a 275-gallon waste and 80-gallon freshwater tank and Conde pump (Westmoor) and a 2003 Chevy C4500 with a 400-gallon waste and 165-gallon freshwater tank and Masport HXL4 pump.

All trucks were built in-house with the exception of the 2014 Kenworth, built by U.S. Tanks Industry. In many cases, they repurpose chemical application tanks from the agriculture industry for their vacuum units.

- MyTana jetter.

- Trojan Worldwide camera and locator.

They don't have a mini-excavator yet, but they're working on it. Their installation work is changing in a way that would make a mini-excavator useful. There are more jobs at small lake lots where a zero-swing excavator would be ideal, Rodriguez says. "We'd rather do 10 reasonably priced jobs instead of one high-priced job," he says of the trend toward smaller projects.

"I built the whole portable restroom truck myself — designed it from the ground up and stuck it together. That consumed a lot of my after-hours time, lot of weekends, late nights."

**Zach Rodriguez**

## SERVICE TRENDS

Aside from installations, other parts of the business are growing. In 2019 the number of portable restrooms exceeded the 200 mark. They also acquired a Satellite | PolyPortables urinal unit, and that has helped at events where beer is served and the amount of liquid waste would rapidly fill standard units. It also means women are not competing as often with men for standard units, and it allows two standard units to be rented elsewhere.

Rodriguez's aunt, Becky Richards, handles that part of the family company. She's constantly communicating with customers to improve service, he says, and part of winter maintenance is to overhaul units so they stay clean. "We get a lot of compliments on our portable restrooms. That's what pushed us to grow. We don't really advertise them, and they've grown on their own."

"We don't want to take over the area. We just want a good quality product going in," he says.

"I built the whole portable restroom truck myself — designed it from the ground up and stuck it together," he says. He powder-coated all the pieces for longevity. "That consumed a lot of my after-hours time — lot of weekends, late nights."

Richards Septic has always done inspections, and in 2019 it invested in a camera and jetter. There has always been a demand for jetting, and until 2019, the company outsourced that. But the steady business convinced them having a jetter would be useful.





▲ Zach Rodriguez uses a Case backhoe to dig a trench leading to a new septic tank.

## BUSY AND HAPPY

"In the last 1 1/2 years, we've really stepped up our pace. It gets a little overwhelming on some days, but you can't give up," Rodriguez says.

Rodriguez has a rough plan in his mind for the next 10 years. Within that time, his father plans to retire. Rodriguez sees a limit on growth.

"I wouldn't really like to be a big operation. I'd like to offer good quality — what my great-grandpa started with, how my grandpa ran it, my dad — and maintain the same values. I surely do enjoy what we do here." ■

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# New York's Suffolk County to Continue Building Infrastructure in Advanced Onsite Systems

By David Steinkraus

Suffolk County Executive Steve Bellone said last fall that the county will install 1,200 nitrogen-reducing onsite systems in 2020. This would more than double the number of advanced systems installed monthly under the current grant program, he says, according to the newspaper *Newsday*.

The county, which occupies the eastern end of Long Island, has been troubled with near-shore pollution coming in part from onsite wastewater systems. Thousands of homes in the county rely on cesspools for treatment, and the county and some municipalities have passed laws requiring the use of nitrogen-reducing systems in new construction and for significant remodeling.

Also in New York, the East Hampton Town Board is considering an increase in the rebate program for replacement of onsite wastewater systems with nitrogen-reducing systems.

Financial support for homeowners would increase to a maximum of \$20,000 — an increase of about \$5,000 — and would allow the town to pay contractors directly instead of requiring property owners to pay costs upfront and then apply to the town for reimbursement. Changing from a rebate program to a direct-payment grant program will remove the possibility that homeowners need to report rebate money as taxable income, reports *The Southampton Press*.

## Michigan

After an internal debate that lasted 10 months, Kalkaska County commissioners voted 6-1 to end the county's point-of-sale septic inspection program and a well-inspection program. The programs are operated by District Health Department No. 10.

People in favor of retaining the program told commissioners they want the government to help protect water quality. Opponents complained that the need for inspections delayed land transfers.

Because the program is through the District Health Department, the boards of all 10 counties in the health district must approve Kalkaska County's request to withdraw. All but one county, Manistee, has done that. News reports say the Manistee County Board will take up the issue at a later date. Commissioners in Manistee recently worked to close loopholes in their inspection program.

## Washington

The Clallam County Board of Health tabled a proposed septic system fee and recommended the county draw on its reserves to support a state-mandated septic program.

The health board had proposed a fee of \$13 annually to fund 2 1/2 environmental health staff positions. The county is supposed to oversee regular septic system inspections, make sure failing systems are repaired and maintain accurate records. But those tasks have never been fully funded even though the county adopted its program in 2007, reports the *Sequim Gazette*.

On the day before the fee was tabled, the county board ordered the hiring of one environmental health person because the county had received a \$240,000 grant.

Only one member of the health board voted against tabling the fee. Bob Lake told the other board members that by telling the county to use reserves, the cost of the program would be partly borne by people who don't have septic systems instead of only by those who do.

Clallam County occupies the northern shore of the Olympic Peninsula from the Pacific Ocean almost to the mouth of Puget Sound.

Also in Washington, for years people have wondered about high bacteria counts in Whipple Creek. "Traditional measures of bacteria, they tell you that bacteria is there, but they don't tell you what it's from," Jeff Schnabel, stormwater infrastructure manager with Clark County Public Works tells *The Columbian* newspaper of Vancouver.

Advanced molecular testing found markers of human intestinal bacteria in five tributaries of the creek, which empties into the Columbia River. That result suggests failing septic systems are releasing bacteria, the newspaper says.

County ordinances require gravity septic systems to be checked every three years by a county-certified inspector. Pressure systems must be inspected every two years, and advanced systems require annual inspections.

Chuck Harman, onsite septic program manager for Clark County Public Health, says his department would use the results to work with property owners. Clark County is on the north bank of the Columbia River, opposite Portland, Oregon. ■

"Rules and Regs" is a monthly feature in *Onsite Installer*™. We welcome information about state or local regulations of potential broad interest to onsite contractors. Send ideas to [editor@onsiteinstaller.com](mailto:editor@onsiteinstaller.com).



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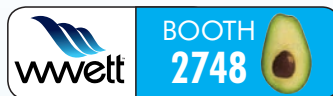
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# Declines in Household Water Use Are Good News

Average daily flow changes through more efficient toilets and washing machines will impact future onsite system designs

By Jim Anderson and David Gustafson

**W**hen we conduct a basic training workshop covering individual sewage treatment systems, we start with a discussion about the amount and characteristics of flow. This is done for two reasons. First, before a site evaluator, designer or installer can make decisions about the system to be installed, they must know the characteristics of the material they want to treat. Second, flow is something the homeowner or business owner can control — unlike the soil and site conditions, which are natural and do not change dramatically if left in their natural condition.

There has been a continuing effort on the part of industry and manufacturers to make water-using devices more efficient and to use less water. Is less water being used by homeowners? And if so, how does this impact domestic or commercial systems that rely on soil for the final treatment and dispersal medium?

In 2016, a study looked at residential water-use changes from 1999 to 2016. While this study focused on data from 23 water utilities across the country and the use of averages can sometimes be misleading, the results probably indicate in general what is going on with our customers as well.

## Another 32% of the households had leaks larger than 10 gallons/hour! ...

Bottom line: Check for leaks on your service calls and stress the importance of fixing them as soon as possible.

### CREDIT BETTER APPLIANCES

Overall, they found average household water use declined by 22% and average per-person use declined by 15%. The average household decline is positive from a water conservation perspective and because our systems will receive lower wastewater volumes. The difference between household- and individual-use declines can be explained by the interesting fact that as the number of residents increases, their daily average per-person use declines. This probably makes sense if you think of an individual still using the dishwasher, washing machine and other water-using devices somewhat less

efficiently (not full loads). But with more people in the house, these usage activities are shared.

The largest reduction in flow occurred in the washing machine, with a 36% change. In 1999, very few households (2%) indicated they had a high-efficiency clothes washer. In 2016, two-thirds reported having a high-efficiency machine. Back in the early 1990s, we would estimate the average clothes washer typically used 50 gallons per wash. The 1999 study indicated the average was 41 gallons per load; in 2016, this was down to 31 gallons per load — quite a flow reduction over 30 years. Average number of loads per day did not change, which means the reduced water use is due to the higher-efficiency machines and the ability to adjust water use by load size.

Water usage for toilets — one of our personal favorites because we long have encouraged installers and service providers to work with customers to limit extraneous flushes for things that should not be put down the toilet — decreased 23%. To which we said: “Fantastic, people are finally not flushing as much!” The celebration ended when we read that flushing frequency was unchanged. Again, the reduction in flow is due to the increased use of low-flow toilets. So it looks like we still need to talk about limiting unnecessary flushes. One final toilet-related thought: The toilet still is the largest single water-using device in the home. Even with the numbers coming down, there is still work to be done.

One depressing aspect of this study involved the presence of plumbing leaks. If the home is on municipal sewer and water, leaks have consequences of higher individual sewer and water charges. As we have discussed numerous times, leaks can have disastrous consequences for onsite systems, resulting in hydraulic overload and system failure, which can cost homeowners a large amount of money to fix.

The study indicated that only 5% of households did not have leaks, while 63% had leaks of less than 10 gallons per hour. If the leak is a gallon per hour, 24 gallons of unnecessary water are added to and treated in the system; probably not a big deal in most cases. However, at 10 gallons per hour, 240 gallons are added. If the family has a 450-gpd system and is already using 250 gallons per day on average, this level of leakage is enough to put the daily amount of water delivered above system capacity. It will ultimately fail if this continues indefinitely.

Another 32% of the households had leaks larger than 10 gallons/hour! In these cases, failure of their septic system will occur in a very short time — a matter of days or weeks instead of months. Bottom line: Check for leaks on your service calls and stress the importance of fixing them as soon as possible.



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## IMPROVE BEHAVIORS?

The study concludes that these changes are due primarily to use of more efficient devices and not changes in behavior. Newer homes exhibited the highest reductions because they are equipped with the higher-efficiency units. The trend is expected to continue, so these changes should be factored into future system design planning.

For onsite systems, this means we can expect average flows to continue to decrease over time and they could be incorporated into the flow estimate part of the equation for system sizing. However, system size reductions can only occur as a part of an overall analysis of soil and site conditions, flow volume and wastewater characteristics. So size reduction may not be as obvious or straightforward as homeowners would like. We will explore the volume/wastewater-strength issue in an upcoming column. □

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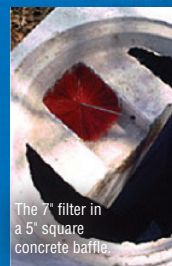
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## SYSTEM PROFILE

▼ Space is often limited on Martha's Vineyard. At this property, NitROE equipment is set beneath a driveway. A heavy slab and traffic-rated risers and lids protect the components. (Photos courtesy of KleanTu)

# Engineer John R. Smith Moved to His Retirement Destination and Found a Wastewater Challenge to Tackle

A batch of pilot onsite systems on Martha's Vineyard are testing a new nitrogen-reduction design using wood chips to filter effluent in an environmentally sensitive ecosystem

By David Steinkraus

**J**ohn R. Smith had semiretired as an engineer and decided to spend more time in his rental house on Martha's Vineyard, an island about 4 miles south of Cape Cod, Massachusetts. Then he went to a one-day conference about nitrogen pollution of the island's nearshore waters, and his plans changed.

The town of Tisbury has 95% of its residences on septic systems and was struggling with nitrogen levels in its estuaries. With the cost of sewers prohibitive, town officials were interested in finding an alternative technology that could reduce nitrogen pollution and be retrofitted on existing home onsite systems or used in new construction. With a grant from the Massachusetts Clean Energy Center, the town and Smith's company, KleanTu, partnered to develop the NitROE system.

There are 10 pilot systems in the ground in Tisbury, plus an eleventh in the town of Falmouth on Cape Cod. Five of the installations were retrofits where the NitROE system was inserted between the septic tank and

drainfield. The other six were on properties where the existing system failed and had to be replaced or where there was new construction.

### A tank for carbon

At the core of the NitROE system is a partitioned concrete tank. One-half is an aeration chamber to convert ammonia from the septic tank into nitrate. The other half is filled with wood chips serving as a carbon source for bacteria that convert the nitrate into nitrogen gas, which is vented to the atmosphere.

There is about a 3-inch head difference for effluent moving through the NitROE tank. Wastewater comes in from the septic tank at about 51 inches from the bottom and leaves about 48 inches from the bottom. This is enough to make gravity operate the system. Except for a small external air pump, it's almost a completely passive technology with no recirculation required, Smith explains.





◀ Richard Donahue (left), KleanTu's field operations manager, watches as Jonathan Devaney, technician at KleanTu, installs aeration and access piping below a rock wall.

▼ Installer Aaron Fontaine covers the NitROE system installed under a driveway. The fill is clean sand, and he is being careful to place soil around the aeration and access piping.

A standard septic tank with a modified concrete top houses the NitROE equipment. "When we started getting into this, we did not want to come in with different materials than are used with a standard septic system installation," Smith says.

A plastic baffle forms the partition inside the NitROE tank.

"We use plastic lumber in the baffling because that way it's going to last forever," Smith says. This plastic lumber has 60% recycled content, and like the products available at your local home improvement store, it can be shaped with standard woodworking tools for decks or other uses. Metal components are stainless steel.

Wood chips are covered with water, and because oxygen cannot reach them, one fill should last about 30 years, Smith says. When 30 years is up, or if the chips don't last as long as expected, the chamber can be refilled with fresh chips without excavating the tank, he says. An access port above the wood chip chamber allows a pump truck to vacuum out the chips, just like sludge, and then fresh chips are poured in.

### Cost variables

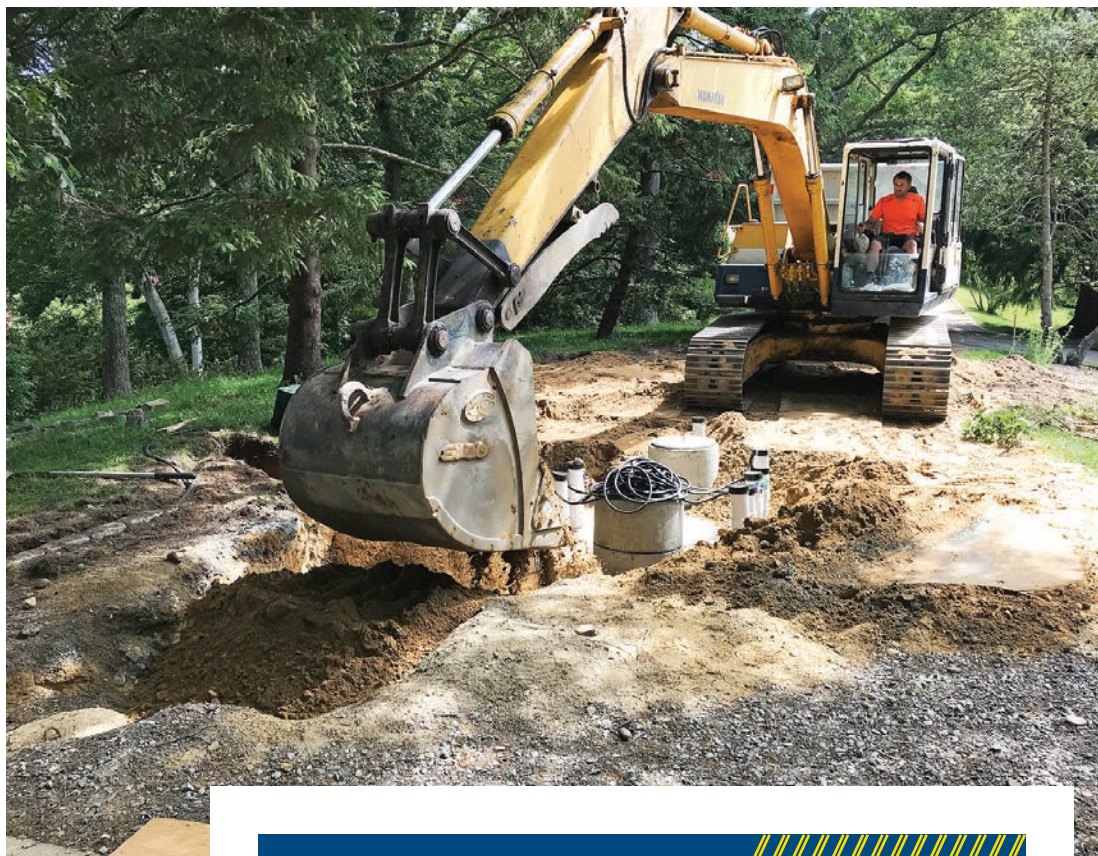
Three installations required 2,000-gallon tanks that are not produced on the island and had to be shipped from the mainland. That added about \$4,000 to the cost, Smith says.

NitROE components are installed by KleanTu technicians at a space the company has in the yard of precast tank manufacturer Goodale Construction. Goodale delivers the modified tank as it would any other product.

Retrofits are challenging and can push up the installation cost because what's in the ground is often a mystery. "An analogy is changing the faucet in an older house," Smith says. Any owner of an old house knows projects can quickly become complicated.

Elevations can change because pipes and distribution boxes settle, Smith says. Tanks are commonly intact. It's the pipes and D-boxes that are weak points. "One installer touched a pipe going to a D-box and the D-box crumbled," he says.

At another home, after installation, the air pump continually kicked off.



## System Profile

**Location:** Town of Tisbury, Massachusetts  
**Facility served:** Individual homes  
**Designer:** KleanTu, Edgartown  
**Installers:** Retrofits, Aaron Fontaine; new installations, Tim Peters, Nick Peters, Gabe Bradley, Chris Miller and Danny Rogers  
**Type of system:** NitROE nitrogen reduction  
**Site conditions:** Sandy soil  
**Hydraulic capacity:** 330-660 gpd

Smith sent in an electrician who had not worked on the original project, and he found the pump was not on a dedicated circuit. Whenever another appliance came on, the pump kicked off. When the electrician added a dedicated circuit, the problem disappeared.



## SYSTEM PROFILE



◀◀ This is the finished view of a property where NitROE equipment is installed beneath a driveway.

✔ A small green access port is the only sign of the NitROE equipment at this house on Martha's Vineyard. The air pump for the aerobic part of the system is concealed under the faux rock to the right at the base of the rock wall.



### Experience required

Many localities are looking to improve water quality by reducing nitrogen, so retrofits may be a more common use of this technology. But you need experience to do them, Aaron Fontaine says. He owns Three Star Co. and has installed several NitROE systems into existing treatment trains.

The hard work comes in dealing with old systems and everything else built on top of them. On one job, he had a waterline to the right, a power line to the left, and two more power lines parallel to the road behind him. The leach pit was beneath all that because it had been put in years before the utilities and set so deep that utility workers probably didn't know it was there, he says.

"You have to know your stuff, just like renovating a house. Once you're in it, you can't back out," Fontaine says. "You can't take this on and figure a one-day project. If it goes bad, you're looking at a weeklong project."

It helps to have an honest talk with property owners, Fontaine says. He would lay out the possible variations that could increase the cost and present the job as an investment.

His machines were a Komatsu 150 excavator and Bobcat S250 skid-steer. Sites were too small to allow the use of anything else.

"The jobs we did couldn't have been any more challenging unless we ripped out the whole thing and redid it," he says. "One of them we did — this one was pretty bad, actually — had two leach pits and a distribution box that didn't work."

With several jobs behind him, Fontaine says the work will only become easier.

### Results

Smith says results from the first set of installations show effluent with total nitrogen less than 10 mg/L on average.

"In addition to significant nitrogen reduction in effluent coming out of the wood chips, we are also seeing suspended solids and BOD both averaging below 30 mg/L. With such results, there is a real opportunity for reducing the size of the leachfield, in my view," Smith says.

One surprise was the Massachusetts winter. Smith said he anticipated wastewater temperatures would fall from about 70 degrees F in warmer

"In addition to significant nitrogen reduction in effluent coming out of the wood chips, we are also seeing suspended solids and BOD both averaging below 30 mg/L.

**With such results, there is a real opportunity for reducing the size of the leachfield."**

**John R. Smith**

months to about 50 degrees F during winter. Instead, sampling showed temperatures of 39 to 42 degrees F, and that reduced the effectiveness of the systems because lower temperatures reduce leaching of carbon from the wood chips and slow biological activity.

The temperature drop caused a small increase in nitrogen concentrations during the winter, but overall nitrogen removal was still good. Treated wastewater showed nitrogen levels in the range of 10 to 20 mg/L on average. With time, treatment efficiency should only improve after the bacteria acclimate even more to their environment, he says.

Results from last summer show eight of nine installed NitROE systems have average total nitrogen discharges of 5 mg/L while individual unit discharges range between 1 to 8 mg/L, Smith says. In one installation, he says, total nitrogen concentration was reduced from 170 to 5 mg/L. ■



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# Working in Colorado Can Be a Real Blast

With rocky terrain and small building lots, dynamite and creative drainfield design are important tools for members of the Colorado Professionals in Onsite Wastewater

Compiled by Betty Dageforde

*In States Snapshot, we talk to a member of a state, provincial or national trade association in the decentralized wastewater industry. This time we visit a member of the Colorado Professionals in Onsite Wastewater.*

### Association involvement:

We've been members of the Colorado Professionals in Onsite Wastewater for about three years. Starting in September 2019, we are their installer trainers, teaching the National Association of Wastewater Technicians courses.

### Benefits of belonging to the association:

Being members keeps us informed about the newest stuff that's going on in the industry. We also form a lot of good relationships with the other people in it.

### Biggest issue facing your association right now:

Colorado seems to have everything pretty buttoned up as far as that goes, but ongoing efforts include ensuring good communication with installers. They currently have no issues getting members, considering how much work is out there right now.

### Our crew includes:

We have two employees, Phil Cooper and Pat Keyes.

### Services we offer:

The majority of our work is septic installations (mostly advanced treatment systems), repairs and inspections.

### Typical day on the job:

I'll go to the job sites and work there for the day. Then I go home, and after the kids get down, I get back on the computer and start drumming up business. We also do two to four meetings at different job sites every week, doing a semi-inspection and quoting the job.

### The job I'll never forget:

Water is always an issue here. We ran into one job where we didn't hit any water until the very end of the drainfield, and then it started coming in. It was a surprise. We had dug all the test pits and there wasn't any water. We had to redo the entire system. We moved it uphill. We always build a clause into the contract for these situations. It's mostly just charging for time, it's not throwing some massive expense on. It takes an extra day or two, and the engineer has to sign off on it and come back out and redo everything.



Seamus Doone, his daughter Kennedy, and Kellen Doone

### Seamus Doone

co-owner

**Business:** Doone Brothers Sewer and Septic Services, operating out of Lakewood and Arvada, Colorado, mostly serving mountain communities on the eastern slope of the Rocky Mountains. Seamus owns the company with his brother, Kellen, 34.

**Age:** 31

**Years in the industry:** We've owned our company for about five years but have been in the industry for the better part of a decade.

### My favorite piece of equipment:

Our Caterpillar 308 full-size excavator has power and versatility. It's small enough to get in anywhere, and it's big enough to do any job.

### Most challenging site I've worked on:

Working in the mountains, we always run into rocks. On one site, all the offsets were exact. We had to put two fields in and a tank, and it was a small lot. Everything had to be exactly the right offset from the house. A blasting company had to come in and dynamite the field so we could actually dig it. When you blast, you lose a lot of regular dirt and you're left with a lot of rock. You have to remove the rock and bring in other material to backfill over the field.



### **Oops, I wish I could take this one back:**

We sometimes have issues with customers wanting to add on to a project but not wanting to pay for it. For example, we dug a foundation for a home where we had to execute a grade plan without a grade plan, and then they ended up bringing in a grade plan after we were done and telling us we had to reexecute to that plan. You don't want to take on work where you don't know when you'll be paid and or how the money's going to be paid — unless you're getting paid in escrow. But then they often want you to start before the actual closing date of the house.

### **If I could add any wastewater-related service, it would be:**

Bigger systems.

### **The craziest question I've been asked by a customer:**

How does the water get to the field?

### **If I could change one industry regulation, it would be:**

Sometimes providing gradation reports on sand of less than 30 days is difficult because most pits don't have gradation reports on their sands within 30 days. So you have to get an independent company to do it. But the counties are being really good about it. Actually I really do support all the regulations. They all make sense. I think it's good to treat water. That's obviously what the goal is on all of this. I know it makes it a little more difficult on homeowners sometimes when they're buying or selling a house, but in the end, the idea is just to have water that's treated. I support all that.

### **Best piece of small-business advice I've heard:**

"Don't let anything get you rattled." The guy who told me that, Jim Solomon, owner of The Pool Man, said it a little more colorfully than that.

### **Planning for the future:**


We want to just keep growing and expanding into more areas of the state and moving into as many areas of onsite wastewater as possible.

### **If I wasn't working in the wastewater industry, I would:**

Probably be in marketing. That's what I got my degree in. My brother has a degree in accounting.

### **Crystal ball time - This is my outlook for the wastewater industry:**

I think this industry is great. My hope for the future is that fewer people will go onto big pipe and more people will start using onsite wastewater

systems. They provide better water treatment and you maintain and retain the water you're pulling out of the ground. You're putting it right back to where it came from. 

**Would you like to see someone in your state or provincial wastewater trade association profiled in Snapshot?**

Send your suggestions to Jim Kneiszel at [editor@onsiteinstaller.com](mailto:editor@onsiteinstaller.com).



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# Drainfield Media and Design

By Craig Mandli

## DRAINFIELD COMPONENTS



### Advanced Drainage Systems Septic Stack

The Septic Stack system from Advanced Drainage Systems is available in configurations of 9, 11 and 13 pipes. The units are designed to allow for exceptional soil contact without the use of gravel, functioning as a trickle filter to disperse effluent into the voids in and around specially banded ADS pipe. The pipe is engineered with holes and slots, allowing it to collect and disperse 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](http://www.ads-pipe.com).

### Clarus Environmental WW4

The WW4 effluent filter from Clarus Environmental is mounted in the outflow of the septic tank to provide protection from solids moving out of the tank and into the dispersal area. A secondary screen provides continued protection during servicing. When the primary cartridge is removed to be cleaned, the secondary screen blocks solids from sloughing off and traveling to the dispersal area. After the primary cartridge is cleaned, the secondary screen can be removed and cleaned. It can handle up to 4,000 gpd and can be assembled on site in a multifilter configuration for larger flows. 800-928-7867; [www.clarusenvironmental.com](http://www.clarusenvironmental.com).



### Geomatrix Systems GST Leaching System

The GST Leaching System from Geomatrix Systems is an adaptation of the stone leaching trench. This traditional leaching system has been improved with the use of a removable form to accurately shape and construct leaching fingers along the



sides of a central distribution channel. The system is constructed with 3/4-inch washed stone and is surrounded with ASTM C-33 sand. The fingers increase the sidewall surface area by more than six times that of a traditional stone trench. The narrow profile of the leaching fingers and central distribution channel, combined with the uniform profile of the sand treatment media, enhance oxygen transfer efficiencies, which can result in better wastewater treatment and a longer leachfield life span, according to the maker. It has direct stone-to-soil contact for enhanced long-term performance and can be configured with standard gravity, pressure and/or time-dosed distribution. 888-764-5247; [www.geomatrixsystems.com](http://www.geomatrixsystems.com).

### Infiltrator Water Technologies Quick4 Plus Chambers

Providing maximum strength and large storage volumes to accommodate peak flows, the Infiltrator Water Technologies Quick4 Plus Chamber offers design and installation flexibility including a small footprint. 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 midtrench. Midtrench 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](http://www.infiltratorwater.com).



### Jet Inc. BIO JET 7 Plus

BIO JET 7 Plus from Jet Inc. is a nonhazardous and nontoxic bacterial aid used to degrade FOG, fatty acids and lignin while lowering BOD, COD and nitrates. When added to a system, the bacteria attacks grease and organic materials, converting them to liquid and then to carbon dioxide and water. Continuous use can help decrease odor, maintenance and emergency blockages, according to the maker. 800-321-6960; [www.jetincorp.com](http://www.jetincorp.com).





## Presby Environmental Advanced Enviro-Septic

Advanced Enviro-Septic (AES) from Presby Environmental is a passive onsite wastewater treatment system for residential, commercial and community use that removes 99% of wastewater contaminants. It requires no replacement media or additives and no electricity or mechanical devices. The NSF 40 Class 1-certified system treats effluent efficiently, providing long system life and protecting the environment, according to the maker. It quickly and naturally establishes multiple bacterial treatment environments throughout the system that break down and digest wastewater contaminants that leave the septic tank. Following the filtering of suspended solids, it releases highly purified wastewater to the soil, recharging the groundwater and preventing soil and groundwater contamination. It is BNQ certified for secondary and advanced secondary treatment. 800-473-5298; [www.presbyeco.com](http://www.presbyeco.com).



## TUF-TITE Distribution Box with Speed Leveler

The noncorrosive TUF-TITE Distribution Box with a Speed Leveler in each outlet provides a simple, stable, reliable and permanent means for dividing septic tank effluent flow, according to the maker. Distribution boxes come in four sizes: four-, six-, seven- and nine-hole. Risers are available on the four-, seven- and nine-hole boxes. All boxes come with a one-piece watertight seal that accepts 1.5-, 2-, 3- and 4-inch SDR 35 or Schedule 40 pipe, including corrugated, for easy installation. 800-382-7009; [www.tuf-tite.com](http://www.tuf-tite.com).



## Real-Tite Plugs stainless steel top expansion plug

Stainless steel top expansion plugs from Real-Tite Plugs provide a leak-proof seal while withstanding heavy traffic without damaging pipe openings or the plug itself in residential and commercial applications. The plug is designed as one unit with a weather-resistant flush 12-gauge stainless steel top that contains a stainless stop bolt, which prevents the lower wedge from being disengaged from the plug and dropping into the pipe opening. The plug is reusable, incorporating a wide neoprene gasket that seals behind and over the internal threads of the opening, as well as provides a lip seal at the end of the pipe for a three-way seal. It is available in half-inch increments from 1 1/2 to 4 inches and may be applied to iron or plastic pipe, with or without threads. It will seal pipe with damaged threads. 800-877-0610; [www.real-titeplugs.com](http://www.real-titeplugs.com).



## Sim/Tech Filter orifice shields

Orifice shields from Sim/Tech Filter are designed to prevent drain media, such as drain stone, from blocking discharge holes, promoting even distribution of effluent in pressurized systems. The shields have a sturdy design that keeps them firmly in place after snapping them on the laterals, according to the maker. The large amount of open area between the pipe and shield allows for easy placement over the holes and reduces media clogging by debris. The enclosed design has a large amount of open area, but all openings are small enough to prevent media from entering the shield. Two styles are available — for top-discharge distribution holes and bottom-discharge holes. Shields are available to fit 3/4-, 1-, 1 1/4-, 1 1/2-, 2- or 3-inch pipe. 888-999-3290; [www.simtechfilter.com](http://www.simtechfilter.com).

## VENT PIPE FILTERS

### Polylok Poly-Air

The Poly-Air activated carbon roof vent from Polylok is designed to help remove offensive odors, such as hydrogen sulfide, as they come out of the roof vent. The 6-inch unit offers 5 pounds of activated carbon, while smaller units offer 1 pound. 877-765-9565; [www.polylok.com](http://www.polylok.com).



### Simple Solutions Distributing WVI Inline

The WVI Inline activated carbon filter from Simple Solutions Distributing is installed in an attic or crawl space inline of existing vent to remove septic odor. The filter comes in 4- and 6-inch sizes, with the smaller able to be bushed down to 1.5-, 2- and 3-inch sizes. It comes with 2 pounds of Sulfursorb Plus activated carbon, which is poured into the 2-inch fill port. The unit is equipped to accept an optional screw-in saturation indicator that changes color to indicate when carbon needs to be changed. It can be installed in any climate where septic or sewer vent odor exists and the roof vent filter needs to be hidden. 973-846-7817; [www.industrialodorcontrol.com](http://www.industrialodorcontrol.com). ■





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## CASE STUDY

# Drainfield Media and Design

By Craig Mandli

## Filtration system a fit for brewery waste streams



**Problem:** A craft brewery in the Adirondack region of New York was building a larger facility and needed a solution for their wastewater streams while keeping space available for further expansion as well as 100% reserve area for the leachfield. The tasting room has 100 seats with 30 employees and a 6,100-gpd brewery. The brewery produces high waste streams, and the drainfield needed a total capacity of 7,000 gpd. The site has well-draining soils of 1.2 gpd by square foot.

**Solution:** Waste streams in the brewing process are managed and separated to help control waste and contaminant strength by side-streaming things such as spent grains, yeast and off-spec beer. A membrane bioreactor was designed to reduce waste strength from 3,000 mg/L BOD and 500 mg/L TSS to less than 180 mg/L BOD and less than 80 mg/L TSS. Effluent from the brewery then goes to a 3,000-gallon pump station where it is distributed to an Eljen GSFF, or Geotextile Sand Filter, drainfield. Effluent from the tasting room goes to a 2,000-gallon septic tank and then also goes out to the drainfield. Champlain Contracting installed the system designed by Chazen Engineering, which is comprised of nine laterals of 27 Eljen GSF B43 modules. Effluent is further treated as it goes through the GSF modules and through ASTM C33 sand before being dispersed through the native soil.

**Result:** The new brewery is open, and the designed system is treating the wastewater as expected. 800-444-1359; [www.eljen.com](http://www.eljen.com). □

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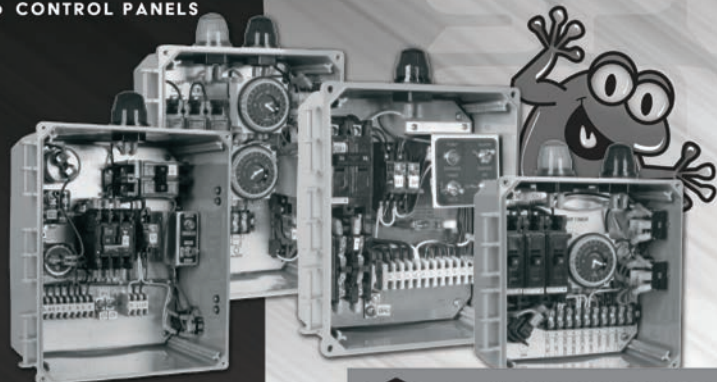
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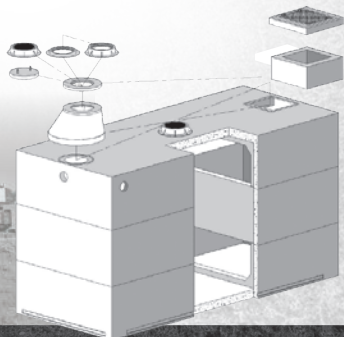
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## PRODUCT NEWS

### PRODUCT SPOTLIGHT

## Hiblow USA offers XP series of compact, lighter and cooler-running air pumps

By Craig Mandli



The air pump is often the only moving part in a more conventional septic system design — so it must be dependable. Staying in service 24 hours a day and through all four seasons of the year, the XP series of linear air pumps from Hiblow USA — distributed in the U.S. by Wholesale Septic Supply — is designed to provide efficiency, reliability and a long service life to onsite systems.

According to Mike Miner, director of sales and marketing for Hiblow USA, the XP series is built with the same quality standards as the company's flagship HP models. "It may be smaller and have a sleeker design, but it's built with the same toughness," he says.

The XP series is run by a neodymium magnet, which allows it to only draw 0.9 amps of power when running, reducing electrical costs for the customer. The neodymium magnet also helps the unit maintain lower operating temperatures. The unit's smaller footprint ensures it will fit in applications and housings used by the industry. It weighs 9.5 pounds.

"As the main aeration blower for aerobic septic systems, great care was taken to make sure it operates within the same parameters as other units," Miner says. "This is very important to ATU manufacturers and the septic industry as a whole because ATUs are tested using aerators that use certain pressures and airflow. We wanted clients to have an approved alternative for the system if they wanted to switch over."

Currently, the energy-efficient XP is offered in 40, 60 and 80 lpm models. Each model is also offered with or without an integrated low-pressure alarm module to signal if the system is not receiving the proper amount of air.

"More homeowners are now cognizant of how their wastewater system contributes to their electric bill, so the XP adds even more sustainability to their onsite system with its greatly reduced need for power," Miner says. "The XP has been in service overseas for over 10 years. It is another tool to keep in the truck when servicing, repairing and installing onsite systems." 844-660-0901; [www.wholesalesepticssupply.com](http://www.wholesalesepticssupply.com). □

## SJE Rhombus MilliAmpMaster WPS control switch

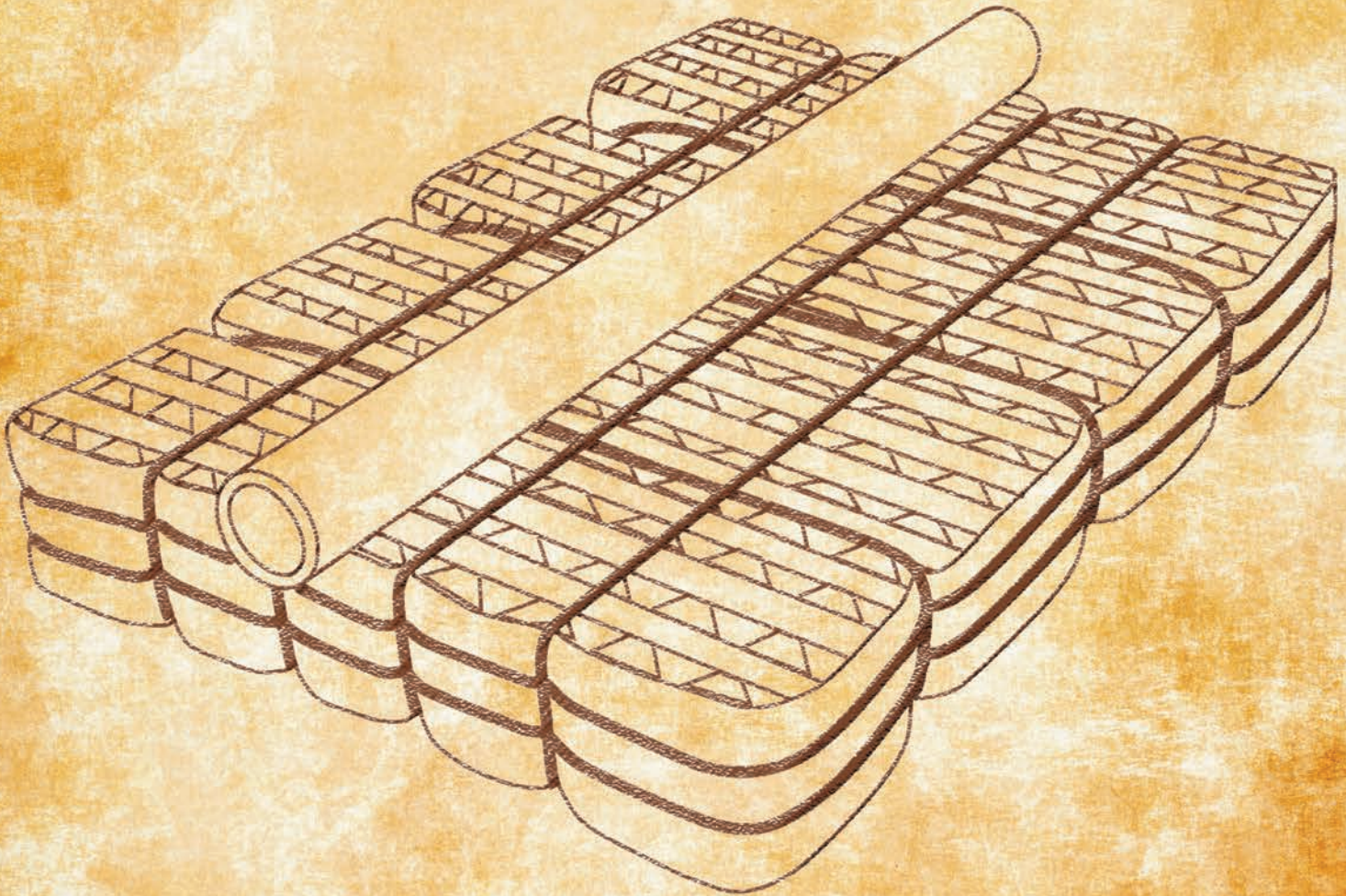
The MilliAmpMaster WPS control switch from SJE Rhombus offers reliable low-current control for AC and DC applications in potable water applications, according to the maker. It is CSA certified to meet NSF/ANSI 61 standard for use in potable water, and it is approved for use in tanks of 250 gallons or greater per float. The internal switching mechanism has sealed gold cross-point contacts for reliable low-current operation. The float is made for low-current applications down to 0.160mA at 125-volt AC. The float housing is made with high-impact, corrosion-resistant polypropylene. It features three-wire cable, single-pole double throw, that can be wired as normally open or normally closed. The narrow-angle control float switch activates/deactivates at approximately 1.5 inches above and below horizontal with a 3.5-inch tether. 888-342-5753; [www.sjeinc.com](http://www.sjeinc.com). □





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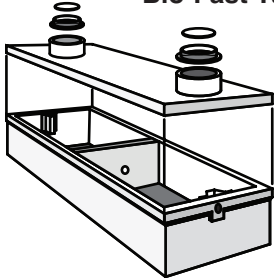
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## INDUSTRY NEWS

### Norweco and Norwalk Precast Molds expand warehouse

Norweco and Norwalk Precast Molds are expanding. In 2007, Norwalk Precast Molds purchased the 205 Industrial Parkway property in Norwalk, Ohio, to allow for continued growth and innovation. The expansion will more than double current space and allow continued growth. Norweco and Norwalk Precast Molds trace their beginnings to 1906. In the 1970s, the Norwalk Vault Co. was split into three separate companies: Norweco, Norwalk Precast Molds and Norwalk Concrete. The 105,000-square-foot expansion is expected to be finished in the summer.

### Women in Industry initiative recognizes Cisneros from BioMicrobics

The inaugural event for the Women in Industry initiative recognized leading women of STEM advocacy at a conference last fall in Chicago. Jennifer Cisneros from BioMicrobics received the Leadership in Manufacturing award, presented by Vaughan. There were more than 60 nominees from around the world. □



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Wastewater Association;  
www.kentuckyonsite.org;  
855-818-5692

## MAINE

Maine Association  
of Site Evaluators;  
www.maineese.com

Maine Association of  
Professional Soil Scientists;  
www.mapss.org

## MARYLAND

Maryland Onsite Wastewater  
Professionals Association;  
www.mowpa.org; 443-570-2029

## MASSACHUSETTS

Yankee Onsite  
Wastewater Association;  
www.maowp.org; 781-939-5710

## MICHIGAN

Michigan Onsite Wastewater  
Recycling Association;  
www.mowra.org

Michigan Septic  
Tank Association;  
www.msta.biz; 989-808-8648

## MINNESOTA

Minnesota Onsite  
Wastewater Association;  
www.mowa-mn.com;  
888-810-4178

## MISSISSIPPI

Mississippi Pumpers Association;  
www.mspumpersassociation.com;  
601-249-2066

## MISSOURI

Missouri Smallflows  
Organization;  
www.mosmallflows.org;  
417-631-4027

## NEBRASKA

Nebraska On-site  
Waste Water Association;  
www.nowwa.org; 402-476-0162

## NEW HAMPSHIRE

New Hampshire Association  
of Septage Haulers;  
www.nhash.com; 603-831-8670

Granite State Designers and  
Installers Association;  
www.gsdia.org; 603-228-1231

## NEW MEXICO

Professional Onsite Wastewater  
Reuse Association of  
New Mexico;  
www.powranm.org;  
505-989-7676

## NEW YORK

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

## NORTH CAROLINA

North Carolina Septic  
Tank Association;  
www.ncsta.net; 336-416-3564

North Carolina  
Portable Toilet Group;  
www.ncportabletoiletgroup.org;  
252-249-1097

North Carolina Pumper Group;  
www.ncpumpergroup.org;  
252-249-1097

## OHIO

Ohio Onsite  
Wastewater Association;  
www.ohioonsite.org;  
740-828-3000

## OREGON

Oregon Onsite  
Wastewater Association;  
www.o2wa.org; 541-389-6692



## PENNSYLVANIA

Pennsylvania Association of  
Sewage Enforcement Officers;  
[www.pa-seo.org](http://www.pa-seo.org); 717-761-8648

Pennsylvania Onsite Wastewater  
Recycling Association;  
[www.powra.org](http://www.powra.org)

Pennsylvania Septage  
Management Association;  
[www.psmna.net](http://www.psmna.net); 717-763-7762

## TENNESSEE

Tennessee Onsite  
Wastewater Association;  
[www.tnonsite.org](http://www.tnonsite.org)

## TEXAS

Texas On-Site  
Wastewater Association;  
[www.txowa.org](http://www.txowa.org); 409-718-0645

Education 4 Onsite  
Wastewater Management;  
[www.e4owm.com](http://www.e4owm.com); 713-774-6694

## VIRGINIA

Virginia Onsite Wastewater  
Recycling Association;  
[www.vowra.org](http://www.vowra.org); 540-377-9830

## WASHINGTON

Washington On-Site  
Sewage Association;  
[www.wossa.org](http://www.wossa.org); 253-770-6594

## WISCONSIN

Wisconsin Onsite Water  
Recycling Association;  
[www.wowra.com](http://www.wowra.com); 888-782-6815

Wisconsin Liquid Waste  
Carriers Association;  
[www.wlwca.com](http://www.wlwca.com); 888-782-6815

## NATIONAL

Water Environment Federation;  
[www.wef.org](http://www.wef.org); 800-666-0206

National Onsite Wastewater  
Recycling Association;  
[www.nowra.org](http://www.nowra.org); 800-966-2942

National Association of  
Wastewater Technicians;  
[www.nawt.org](http://www.nawt.org); 800-236-6298

## CANADA ALBERTA

Alberta Onsite Wastewater  
Management Association;  
[www.aowma.com](http://www.aowma.com); 877-489-7471

## BRITISH COLUMBIA

British Columbia Onsite  
Wastewater Association;  
[www.bcosa.org](http://www.bcosa.org); 778-432-2120

WCOWMA Onsite Wastewater  
Management of B.C.;  
[www.wcowma-bc.com](http://www.wcowma-bc.com);  
877-489-7471

## MANITOBA

Manitoba Onsite Wastewater  
Management Association;  
[www.mowma.org](http://www.mowma.org); 877-489-7471

Onsite Wastewater Systems  
Installers of Manitoba, Inc.;  
[www.owsim.com](http://www.owsim.com); 204-771-0455

## NEW BRUNSWICK

New Brunswick Association of  
Onsite Wastewater Professionals;  
[www.nbaowp.ca](http://www.nbaowp.ca); 506-455-5477

## NOVA SCOTIA

Waste Water Nova Scotia;  
[www.wwns.ca](http://www.wwns.ca); 902-246-2131

## ONTARIO

Ontario Onsite  
Wastewater Association;  
[www.oowa.org](http://www.oowa.org); 855-905-6692

Ontario Association of  
Sewage Industry Services;  
[www.oasisontario.on.ca](http://www.oasisontario.on.ca);  
877-202-0082

## SASKATCHEWAN

Saskatchewan Onsite Wastewater  
Management Association;  
[www.sowma.ca](http://www.sowma.ca); 877-489-7471

## CANADIAN REGIONAL

Western Canada Onsite  
Wastewater Management  
Association;  
[www.wcowma.com](http://www.wcowma.com);  
877-489-7471 □

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