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BASIC TRAINING:
Trench cover tips p. 30

**EDITOR'S
NOTEBOOK:**
Roe-D-Hoe
recap p. 6

SO MANY TOUGH JOBS

South Texas Aerobics finds solutions to building effective long-lasting septic systems in a landscape dominated by heavy clay p. 12

**SEPTIC TANKS
DIRECTORY**
p. 20



SYSTEM PROFILE
Tiny lake lot solution
p. 22

PRODUCT FOCUS
Septic Tanks and Components p. 32

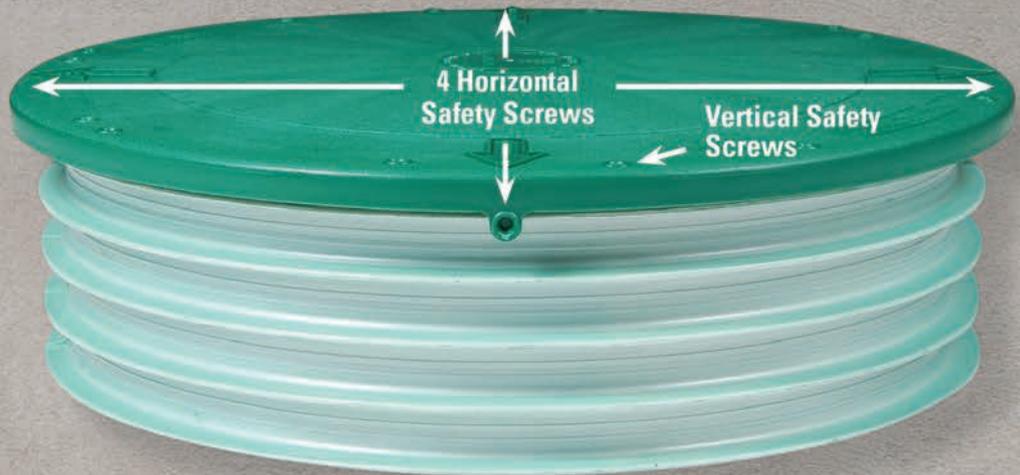


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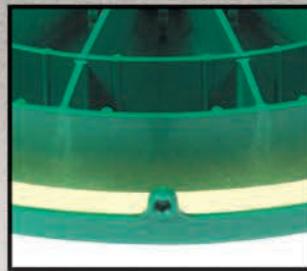
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INSTALLER PROFILE: So Many Tough Jobs By David Steinkraus

ON THE COVER:

Solving problems with heavy clay soils is a specialty for the team at South Texas Aerobics. Shown with a Case backhoe are, from left, Al. Vonda "Sissy" and Eric Bob. (Photo by Ethan Rocke)

- 6 Editor's Notebook:
Practice Makes Perfect for Roe-D-Hoe Contestants**
The finalist in the NOWRA skills competition have logged thousands of hours at the controls of excavation equipment.
By Jim Kneiszal
- 10 @onsiteinstaller.com**
Be sure to check out our exclusive online content.
- 20 Septic Tanks Directory**
- 22 System Profile:
Fitting a Lot, Protecting a Lake**
A drainfield with compact treatment modules provides a sound replacement for a failed conventional septic system on a challenging lakefront lot in northern Wisconsin.
By Ted J. Rulseh
- 26 Snapshot:
We're Behind the Times in Oklahoma ...
And We Need to Catch Up**
"We really have to change the mindset regarding education, licensing and professionalism in the industry."
- 28 Rules and Regs:
Washington State considers new rules
for reuse of nonpotable water**
By David Steinkraus
- 30 Basic Training:
Choosing the Right Trench Cover to Halt Migration of Fines**
Through the years, best practices have changed for protecting aggregate.
By Jim Anderson and Dave Gustafson
- 32 Product Focus/Case Study:
Septic Tanks and Components**
By Craig Mandli
- 36 Associations List**
- 37 Industry News**
- 38 Product Spotlight**

Coming Next Month

ISSUE FOCUS: Alarms, Controls and Monitoring Systems
Basic Training: Erosion control tips
Contractor Profile: He always dug digging

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ADVERTISER INDEX

June 2022

Acuantia.

Acuantia11



Alita Industries, Inc.31



BioMicrobics, Inc.10



BIOROCK29



BrenLin Company, Inc.8

CREST Precast, Inc.

Crest Precast, Inc.21



Eljen Corporation9

Fiberglass Tank Solutions15



Fuji Clean USA21



Infiltrator Water Technologies, LLC3



Jet, Inc.25



National Precast Concrete Association19

norweco

Norweco, Inc.39



Polylok, Inc.40



Presby Environmental5



Roth North America31



Sim/Tech Filter Inc.38



Simple Solutions Distributing LLC38



SJE Rhombus®15



T&T Tools, Inc.25



The Dirty Bird38



TUF-TITE, Inc.2



Wholesale Septic Supply17



Wieser Concrete25

Classifieds37

Enjoy this issue!

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



June 2022



Send your comments, questions or opinions to Jim Kneiszel at editor@onsiteinstaller.com

Practice Makes Perfect for Roe-D-Hoe Contestants

The finalist in the NOWRA skills competition have logged thousands of hours at the controls of excavation equipment

The Roe-D-Hoe competition at the WWETT Show has always fascinated me. While most of the trucks and machines are on static display in the cavernous Indiana Convention Center, the National Onsite Wastewater Recycling Association clears a large space for equipment operators to show off their skills.

This year they were invited to the controls of 301.5 and 301.4C mini-excavators to take on operation challenges that test fine motor skills. They involve moving small objects — including golf balls, basketballs and bowling pins — through an obstacle course in timed events. This year more than 200 operators competed for the \$1,000 first prize and a trophy belt.

Following the trade show, I talked to Roe-D-Hoe finalists about how they became proficient in operating excavators. I also asked them to share their tips for aspiring equipment operators in the onsite wastewater field. I hope their words inspire more young people to come into the wastewater industry. With housing and commercial development continuing at a break-neck pace combined with an aging installer workforce, we need all the skilled hands we can get!

The NOWRA competition, sponsored by SALCOR UV Disinfection, continued through the run of the WWETT Show, giving these finalists ample opportunity to improve their times in front of crowds of onlookers. Congratulations to these finalists:

First place: Josh Reading

Company: M&J Underground, Monee, Illinois.

Age: 42

Years operating machines: 30

Favorite piece of equipment: Caterpillar 336 excavator

Advice for the new operator: “The only way you are going to be proficient is to put in the time to hone those skills sitting in the seat and performing the work.”

Time to complete challenges: 1:19

Prize: \$1,000 and a Roe-D-Hoe belt buckle

Josh Reading would come home from kindergarten and play on his grandfather’s excavation equipment. Way back then, machine safety requirements weren’t like they are now and he could actually get the booms to move a little when he pulled the levers. That experience cemented his career path. He *had* to work with machines.

“I’ve had a fascination with heavy equipment my whole life,” Reading recalls. Then when he was 12 or 13 years old, he started helping his father on septic system installations.

“I wasn’t physically mature enough to shovel the rock all day, so Dad taught me how to run the backhoe. He would dig the trench and I would run the backhoe,” Reading says.

Learning excavation skills from an early age, it’s no surprise Reading took home the \$1,000 top prize at the Roe D Hoe. It probably also helped that Reading has entered the competition at the WWETT Show many times over the past 20 years, making the finals several times.

◀ The late James Cruver of SALCOR (third from left) is pictured with finalists in the 2022 Roe-D-Hoe. The competitors included, from left, Albert Breech, Josh Reading, Adrian Keiper, Abraham Rhoads and Justin Rozendaal. (Photos courtesy of NOWRA)





◀◀ Abraham Rhoads shows the concentration necessary to pick up bowling pins.

“Don’t wear the dirt out. Make money moving it once; break even moving it twice, and third time lose your profit.”

Abraham Rhoads

Reading obtained a college degree in management, and also joined the Operating Engineers Local 150 union. He has logged many hours in Caterpillar excavators, and in recent years has spent more time managing the company than behind the controls.

“I still get out there and dig once in a while. It’s like riding a bike for me. ... It’s in my genes,” he says. He always saw mastering the hydraulic excavator “as a work smarter kind of thing. I want to be the one pulling the levers on the machines rather than using the shovel.”

For the aspiring equipment operator, nothing beats seat time to develop proficiency. Reading likes to invoke journalist Malcolm Gladwell’s quote about mastering any craft: “10,000 hours is the magic number of greatness.” In other words, you ought to spend 10,000 on a machine to reach your full potential in the field.

“You have to address downtime too and make it a hobby more than a job,” he says. “Don’t jump around to 10 pieces of equipment. If you want to be proficient on an excavator, stay on the excavator. It comes down to hours, basically.”

Second Place: Abraham Rhoads

Company: B&K Lehner Excavating, Delaware, Ohio

Age: 34

Years operating machines: 18

Favorite piece of equipment: Caterpillar D6 dozer

Advice for the new operator: “Don’t wear the dirt out. Make money moving it once; break even moving it twice, and third time lose your profit.”

Time to complete challenges: 1:24

Prize: \$500

Coaxed by his boss to enter, first-timer Abraham Rhoads did great to finish in second place at the Roe-D-Hoe, and he thinks he can grab the top spot if he returns at the 2023 WWETT Show.

He completed the challenge of dropping a golf ball onto a traffic cone in a blistering 8 seconds, and said he would have beat everyone if he hadn’t messed up with the bowling pin challenge. He said the key to winning is staying calm and not worrying about the clock.

“Don’t think about being timed. You have to get good before you can get fast, so don’t worry about the time. Just go enjoy yourself and don’t let your nerves get the best of you. I think that’s where everybody messed up,” he says. “Don’t get flustered or aggravated or your brain won’t be in the right place.”

Rhoads started out working for a neighbor in the earth-moving business while he was in high school. He’s found great satisfaction in taking an empty piece of ground and using a variety of machines to finish out building sites, whether it’s site prep for a house or creating ditches or road beds.

Rhoads said younger equipment operators should be like a sponge and soak up important lessons from veterans in the field. “If somebody’s been in the field 30 years, he’s got to be good at what he does,” he says. Rhoads feels like “a big kid working in a sandbox” doing excavation work, mainly from the seat of Cat or John Deere machines.

“Not everybody knows how to move dirt. You have to know how to run the machines and make it efficient and effective,” he says.

Third place: Albert Breech

Company: Breech Septic and Excavating, Lucasville, Ohio

Age: 46

Years operating machines: 25

Favorite piece of equipment: Komatsu PC 400 excavator

Advice for the new operator: “Go through an apprentice program because you learn much more than yanking levers.”

Time to complete challenges: 1:26

Prize: \$200

Albert Breech is an old hand at the WWETT Show Roe-D-Hoe. He’s placed three times in the competition, finishing third in 2018 and this year, and second place in 2019. He said the skills challenges mimic the work he does as an installer and pumper.

“A lot of the things I do daily are similar,” he says, such as pulling and replacing lids from septic tanks. “I take as much work off the labor as I can. I set it in the hole to keep them from having to lift it off concrete boxes.”

For someone reluctant to enter the excavator contest at first, Breech has had a successful run. “The first time I went down there I’d never been in a competition. I wasn’t going to do it, but my wife talked me into it,” he says. This year he was in first place during qualifying rounds. “It took them two days to knock me down.”

Breech has owned his own excavating business for 11 years, and recently bought out a septic tank manufacturing company. He came up through a union apprentice program, which he says was a top training ground. The company uses union operators and he endorses that type of training background.

"With the union, you don't just learn one way to do a job. You learn 50 different ways of doing something because you're working with different companies," he says. One of the larger companies he worked with had a safety specialist, and that helped him immensely. "Once you learn safety and learn productivity, you don't have to cut corners. Apprenticeship programs teach you with safety in mind."

Honorable mention: Adrian Keiper

Company: Keiper Excavating, Wadsworth, Ohio

Age: 27

Years operating machines: 20

Favorite piece of equipment: Link Belt 145 X3 Spin Ace excavator

Advice for the new operator: "Slow down. Slow is smooth, smooth is fast."

Time to complete challenge: 1:56

First-time Roe-D-Hoe entrant Adrian Keiper is joking when he says he could probably operate equipment before he could walk. But that's not far from the truth. The third-generation worker at Keiper Excavating says he was a little boy when he grabbed his first excavator controls.

"I was that annoying kid underfoot saying 'Let me do it, let me do it, let me do it!'" At 11 or 12, he was already going out and making septic system repairs on his own. "I guess you could say it's all I've ever known."

Keiper says his company is known for taking on the jobs nobody else wants to touch. An example is when a homeowner planned to build a house 1,000 feet off the road down a 10% grade and Keiper made the site prep happen.

For Keiper, the toughest part of the Roe-D-Hoe was swapping out machines halfway through the challenges. He wasn't familiar with the Caterpillar excavators in general, and found it difficult to move from the D Series digger to the Next Gen Series between events. The machines had different controls and the hydraulics were different, adding stress to the competition.

Keiper puts in plenty of hours on Link Belt excavators, which the company moved to years ago. He says the Link Belt units are as smooth as silk and efficient to operate.

"If you don't learn something in a day, it was a day wasted," he concluded.

HOW ABOUT NEXT YEAR?

Congratulations to all the operators who grabbed the controls during the Roe-D-Hoe. How many of you will show up next year to try and beat the scores of these winners? My guess is you'll have plenty of seat time this summer to sharpen your skills and shoot for the prize money and bragging rights on the WWETT Show stage. □



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UPHILL BATTLE Installing on Steep Slopes

In many parts of the U.S., septic professionals face the challenge of steep slopes during system installation. When working on sloping sites safety is the primary concern. This online article from Sara Heeger outlines installation tips, safety reminders and distribution options that are helpful for those system installation jobs on steep slopes. onsiteinstaller.com/featured



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Faced with increased fuel costs, businesses have three options: conserve or cut their own costs as much as possible, absorb the increase by realizing lower profits, or passing along the cost to the customer. If you choose option three, you have to develop a strategy to have your customers share the pain of the increasing fuel costs. Here's how to do it as nicely as possible, so you'll be able to stay in the game without driving customers away. onsiteinstaller.com/featured



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Overheard Online

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– *Fostering a Good Relationship Between Office and Field Staff*
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SO MANY TOUGH JOBS

South Texas Aerobics finds solutions to building effective long lasting septic systems in a landscape dominated by heavy clay

By David Steinkraus



◀ Al Bob levels a sand bed before a concrete tank is set. (Photos courtesy of South Texas Aerobics)

The soil is poor and the summers are brutal, yet it is in this part of Texas Al and Vonda “Sissy” Bob have built South Texas Aerobics into a thriving business. Based in Caldwell, about 100 miles northwest of Houston, the company is so successful that the couple often refers customers to other onsite professionals, and they don’t need to advertise at all.

Business is about evenly split between new system installations and replacements, Sissy says.

“We do probably 85% aerobic around here simply because the soil is horrible,” she says.

Sand is rare. What they have on most sites is clay called *black gumbo*, she explains. “In the summertime we get cracks 2 to 3 inches wide.” When it rains, the soil forms clumps that stick to everything.

Their second-most-used technology is low-pressure dose. Next are drip systems. To work in such soil, any conventional system must be very large and very expensive, she adds. Occasionally they do install a conventional system when the soil is right. The company also pumps the tanks of systems they installed, and they do repairs. Aerators are a common failure in summer, Sissy says. Temperatures hit 100 degrees, and components running 24 hours a day can’t withstand that stress.

BOOMER BOOM

Most of their work is in Brazos County where College Station and Texas A&M are, she says. The county’s population swelled 20% between 2010 and 2020, according to the U.S. Census Bureau. Most of that is not from people moving out of a city but from retired A&M alumni (Aggies, they’re called) moving back and buying homes near their old college, she says. Lots are getting smaller while homes are getting larger. “And you end up putting in a drip system so they have some kind of driveway and some kind of green grass in the yard.”

“We do enjoy the business that we’re in. We help protect the environment, and since we’re divers, we’re all about protecting that ocean.”

Sissy Bob

▼ Al, sitting, and Eric Bob work on the installation of a Solar Aerobics onsite system at a convenience store. South Texas Aerobics cast the tanks and risers and lids are from TUF-TITE.



Other people move on quickly because of job changes. Some systems that South Texas Aerobics installed 18 or 19 years ago have had eight or nine owners since, she says. Turnover brings another challenge: owner education as people from urban areas grapple with the idea of onsite wastewater treatment.

“And aerobic systems, even though they’ve been around for 35 years or more, they still freak a lot of people out because they have a red light and an alarm,” she adds.

For new construction, customers can request a walk-through of their system to learn how it works, what the alarm sounds like, where sprinklers are, what products not to use in the house, and so on, she says.

Customers get Sissy’s cellphone number. As a licensed installer herself, she says, she can answer almost any question on the spot. “And I tell them, ‘Don’t hesitate to text me after hours. Call me if it’s an emergency, but if you just have a question, don’t hesitate because I’d rather answer it for you right then than have you worry about something all weekend long.’”



South Texas Aerobics Caldwell, Texas

- Owners:** Al and Vonda Bob
- Founded:** 2000
- Employees:** 4
- Service area:** 50-mile radius of Caldwell
- Services:** Installations, pumping, maintenance, tank precasting, repairs
- Associations:** Texas On-Site Wastewater Association, NOWRA
- Website:** www.southtexasaerobics.com



▲ Al installs a riser while Eric looks on. The tanks are part of a 1,500 gpd system installed at an oil field site.

Answering a text message, even on the weekend, has the added benefit of reducing Monday morning phone calls, she says.

TOOLS OF THE TRADE

Despite the broad range of work, the team at South Texas Aerobics is small. In addition to Al and Sissy, there are son Eric, who is full time, daughter Megan who works part time, and Brady Hodges, recently hired as a full-time maintenance technician.

To do their work, the team relies on:

- 2002 Freightliner FL70 with a 2,500-gallon steel tank, built by Al, and a Jurop 360 pump. They bought the cab and chassis in Kansas, and one feature is a Garnet SeeLevel gauge with digital readout to the gallon.
- 2015 Kenworth carrying a Fassi 40,000-pound knuckle boom crane. The crane was purchased separately and installed by Al.
- 2016 Chevy Express service van
- 2011 Chevy 3/4-ton truck for repairs and installations. Al built a custom rack for it that can carry 20-foot lengths of pipe
- 2013 Chevy crew cab 4WD 1-ton truck to move equipment
- 1997 3/4-ton Ford to haul gear
- 2020 CASE 590 Super M 4WD Extindahoe
- 2020 Takeuchi TL8 skid-steer
- 2012 Kubota KX71 tracked mini-excavator
- 2001 John Deere 4700 4WD tractor
- 1997 John Deere 544 wheel loader
- 2018 Ditch Witch walk-behind trencher

The Ditch Witch is the tool for installing all the dripfields, Sissy says. “We don’t use a vibratory plow. It doesn’t work in this soil.”

continued >>

LOOKING OUT FOR YOUR INTERESTS

Vonda “Sissy” Bob came to the board of the Texas On-Site Wastewater Association because of a business contact. About 15 years ago she met Randy Chelette when he was working for a precaster. Chelette is now executive director of TOWA and recruited Sissy for one of the board seats. He invited her, she says, because of the depth of her industry knowledge and her ability to persuade people instead of bullying them. She also jokes that she’s there to keep the boys in line.

“The board is made up of engineers, service providers, installers, transporters and supply companies. I kind of fill a niche in that we maintain and we precast, so I’m kind of an all-around provider, and there’s two of us on the board like that,” she says.

She’s been on the board since 2015 and is also president of TOWA’s Brazos Valley Chapter. COVID aside, meetings are typically held every three to four months. There’s a topic and two hours of continuing education credit for attendance.

“Plus it gets all the installers, providers and pumpers in a certain area together to talk, and the county officials show up so it’s good business relations,” she says.

Beyond that, TOWA helps clear obstacles for wastewater professionals.

“There were a lot of obstacles a few years back, a lot of miscommunication about how things should be. You know, a rule book is a rule book. It’s written to very loosely define some rules, and it’s interpreted how somebody wants it to be interpreted, and that’s from both ends — the regulating authority and the installer.”

Currently, she says, TOWA is working very closely with the Texas Commission on Environmental Quality to update the rule book to reflect new ideas and new technology.

When the pandemic hit, TOWA took action to make sure installers could continue working. Before an aerobic system is installed, an affidavit of public notice must be filed at the county clerk’s office.

“That has to be a notarized document, which means it has to be an original,” Sissy explains. The pandemic shut down county offices, and with no official paperwork, there was a definite risk to the environment and installers’ ability to work.

So the TOWA board joined with the Texas Commission on Environmental Quality to produce a letter stating that installing was an essential business. Installers kept those letters in their trucks to ward off any law enforcement officer who believed they were violating lockdown rules.



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▲ South Texas Aerobics owns a Kenworth T800 with a Fassi knuckle boom crane to deliver septic tanks. Al is at the controls and Eric is hooking up a tank for placement.

▼ Al looks on as Ryan Gerlich, an extension program specialist at Texas A&M University, installs two Clearstream ATUs for the research of timed dosing and high strength wastewater at the RELIS campus.



“If the maintenance doesn’t get marked, you were never there. We can send that photo to the county proving we were there, and we can send that photo to the homeowner proving we were there.”

Sissy Bob

Another consequence of the soil is tank choice. Fiberglass or poly tanks are usable in only a few places in their part of Texas, she says. In most of their territory, the drastic expansion and contraction of the clay soil crushes anything that isn’t concrete. “It crushes them pretty quickly, too. It takes less than 10 years,” she says.

And that is part of the reason why South Texas Aerobics makes its own tanks.

CUSTOM CONCRETE

The Bobs entered the wastewater business because Al wanted to stop working inside a welding shop all day every day and be outside working with heavy equipment. As he worked toward his state license, he helped installer friends with jobs, and one day he went to pick up a set of tanks. The owner of the precast company was so impressed by his truck driving skill, Sissy says, that he offered Al a job. And that is why South Texas Aerobics has the ability to cast its own tanks.

The Bobs built molds for state-approved concrete tanks. Al bought steel for the molds, had it rolled and welded it. They started making individual round tanks but added one-piece units as well. Round tanks are easier to move, she says, and they can be sold to people who pick them up for do-it-yourself installations. The smallest one-piece weighs 16,000 pounds.

“When we got into the one-piece units, we’re like, OK, time to get a crane truck. You cannot set them with a backhoe, and you can’t break them down,” she says.

They tried using dry-mix volumetric trucks as their source of concrete, she says, but they didn’t like the quality of the concrete. The Bobs now buy concrete primarily from Knife River Corp. in Bryan, Texas. They made the connection because an onsite customer happened to be a salesman for Knife

River. He looked at the tank being installed and offered to create a custom mix for South Texas Aerobics.

“We have our own special mix that they build just for me, and it produces a tank that will withstand 5,000 psi,” Sissy says. State minimum is about 4,000 psi, she adds. Tank bottoms are about 4 inches thick, and the walls are 3 inches. “We wanted ours stronger because of the soil expansion, and we wanted our tanks to last.”

DURING THE PANDEMIC

Both Al and Sissy contracted the COVID virus, and looking back, she can see benefits to the pandemic.

First, she says, many people with systems on the verge of failing were forced to upgrade when they saw the result of having an entire family at home all the time. At one point their waiting list was five to six months long, she says.

Also, people paid more attention to health information. “I think more people took more of an interest in bacteria and viruses,” she says. “We can tell people all day long, ‘You have to put bleach in your chlorinator. Every virus and bacteria will stay alive in that tank. It’s 72 degrees all year long. You’re not putting in bleach, you’re spraying that out on the ground. Your dog is drinking it and then coming inside and licking your baby’s face.’”

They saw an increase in the number of people maintaining their chlorinators, she said. At one point, the supply of sanitizers dried up along with

the supply of many other goods. Her advice to customers was to keep grass mowed so the UV light from the sun would kill microorganisms.

Another benefit of the pandemic, Sissy says, is that some counties began accepting plans electronically, and some are also looking into accepting payments electronically.

HOMEGROWN TECH

Sissy had her own technology idea and worked on it with a programmer. What they developed is a way to simplify the paperwork for maintenance calls. The key problem, she says, is the need to prove a technician did the work. Without that, a company could face fines, even the loss of its license.

A technician goes on a job with nothing but a cellphone or tablet. The customer receives an electronic alert specifying approximately when the technician will arrive, and another alert when the technician is en route. The technician can photograph anything broken, and, most importantly, will photograph the system’s maintenance tag.

“That’s a huge thing. If the maintenance doesn’t get marked, you were never there,” she says. Each maintenance tag photo carries a time and date stamp and the customer’s name and GPS location. “And then we can send that photo to the county proving we were there, and we can send that photo to the homeowner proving we were there.”

Because it’s all online, there is no danger of losing records to a crash, she adds.

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▼ South Texas Aerobics rented a Volvo tracked excavator to speed up the installation of a multi-tank system at an executive retreat. Eric is shown with a shovel.



“Aerobic systems, even though they’ve been around for 35 years or more, they still freak a lot of people out because they have a red light and an alarm.”

Sissy Bob

COVID also temporarily made it almost impossible to dump septage. City wastewater plants cut the number of people on shifts, she says. Plants ran with one person, or maybe no people, and there was a very narrow window when haulers could dump.

“Which means no transporters could bring in their sewage and dump. It literally shut down the pumping industry,” Sissy says.

A friend, whose entire business consisted of pumping eight to 10 tanks per day had a two-week backlog of pumping customers, in some cases systems with pumps that needed replacing, she says. Because treatment plants weren’t accepting wastewater, it was running over the ground at some sites.

Sissy says she called a county commissioner whom she has worked with and told him of the environmental danger from untreated wastewater. And it was summer, she adds, and in summer rural kids look for a river or creek to jump in. She explained that kids would be downstream of overflowing systems. “The very next day he calls me, ‘Wastewater treatment plants are open for all transporters. Please let them know.’”

ZERO MARKETING

South Texas Aerobics doesn’t need to advertise, Sissy says, and Al is known as a person who can solve the worst problems. The company pumps its own customers’ tanks, but they have enough of that work, too, so they won’t accept cold calls for pumping service unless it’s a referral from a current customer.

Over the years, the Bobs have established relationships with other pumpers who will do the job well. She refers cold calls to these other companies. In all the years of referring business to other pumpers, she adds, she’s never had someone call back to complain of poor quality work. In return, if the other pumpers spot a problem, they refer work back to South Texas Aerobics.

Like other installers over the age of 50, the Bobs have begun talking about their future and the future of their business. They’re debating their choices: letting their son take over the company or selling it. Daughter Megan is 24 with her own career, Sissy explains, and while she helps out, she has no interest in being a partner.

Son Eric is 22 and just received his installer’s license. “He’s trying to decide whether this is an industry he wants to be in,” she says. “It’s a very hot, physical job doing installs. It’s also a hot job doing repairs and maintenance.” He is the company’s primary repair and maintenance person.

DIVE RIGHT IN

If they retire, when they retire, they could spend more time scuba diving. It’s a family pastime.

Al and Eric are certified advanced divers. Sissy is a certified instructor. Megan is also an instructor and works full time at a dive shop. For their pleasure diving they travel — to Roatan, Honduras; Cozumel, Mexico; the Bahamas; and other Caribbean destinations. But they never travel all together because Al or Eric has to stay home and mind the business.

“I can do most of my job from my phone and my computer that go everywhere with me,” Sissy says. She carries an internet hotspot connector that works on cellphone networks, too. And with online software, she can even issue work orders for whomever has stayed behind, she says.

“We do enjoy the business that we’re in,” Sissy says. And she knows very well what the industry means, even if many people don’t. “We help protect the environment, and since we’re divers, we’re all about protecting that ocean.” □

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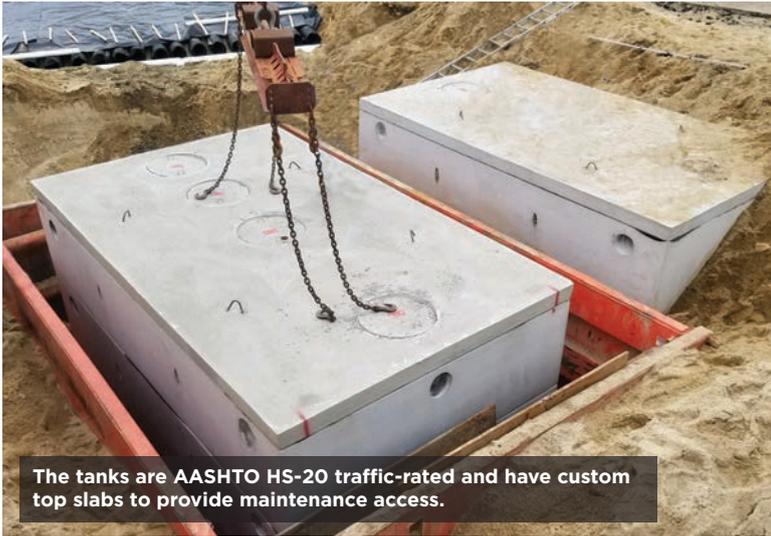
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Photos courtesy of Shea Concrete Products Inc.

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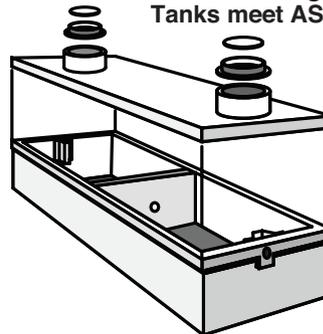
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SYSTEM PROFILE



◀ The crew from A-1 Septic Systems checks elevations in a trench where Eljen GSF modules are laid out. Bruce Collins is in the trench and Doug Keintz, left, and Greg Golden are observing. (Photos courtesy of First Supply and A-1 Septic Service)

The decades-old septic system had failed at a property on Crescent Lake near the city of Rhinelander in north-central Wisconsin.

Effluent from a steel septic tank was pumped uphill to a stone bed that had become root-bound and no longer allowed the water to percolate. As a result, there were backups into the three-bedroom seasonal cottage if the owners used large volumes of water, such as for showers. The steel tank had corroded so that wastewater was able to leak into the groundwater and ultimately contribute to pollution in the 616-acre lake.

The property owner turned to A-1 Septic Service & Installation to create a new onsite system. Owner Tom Arts called on Dale Schlieve of Conscientious Effective Consulting to design a solution for the challenging property.

Schlieve collaborated with Mark Prevost, fluid handling technical service manager with First Supply of Eau Claire, Wisconsin, on a system with a drainfield using compact treatment modules. The configuration made it possible to install a drainfield roughly half the conventional size required to treat the wastewater flow from the cottage.

Site conditions

The pie-shaped lot of slightly less than one acre, with 175 feet of lake frontage, had significant areas of impermeable blue clay, unsuitable for a conventional drainfield, in the level area near the cabin. This made it necessary to locate the drainfield on higher ground farther from the lake, between the slanting driveway and the town road.

Fitting a Lot, Protecting a Lake

A drainfield with compact treatment modules provides a sound replacement for a failed conventional septic system on a challenging lakefront lot in northern Wisconsin

By Ted J. Rulseh



▲ This is what is left of the rusted steel septic tank unearthed at the Crescent Lake site.



◀ Greg Golden distributes sand over the top of fabric protecting the Eljen GSF treatment modules. Observation vent pipes are shown in the background.

System Profile

- Location:** Rhinelander, Wisconsin
- Facility served:** Lakeside cabin
- Designer:** Conscientious Effective Consulting, Rhinelander
- Installer:** Tom Arts, A-1 Septic Service & Installation, Rhinelander
- Type of system:** Compact system with septic tank effluent pumped up to gravity-flow drainfield with GSF treatment modules (Eljen Corp.)
- Site conditions:** Compact lot with abundant blue clay limiting infiltration
- Hydraulic capacity:** 450 gpd

System components

Schlieve designed the system to handle 450 gpd. Major components are:

- 1,000-gallon single-compartment, self-healing septic tank and 650-gallon pump tank, both precast concrete from Concrete Products, Rhinelander
- Goulds WE0311 1/3 hp submersible effluent pump
- JB Plugger dual-float control (SJE Rhombus)
- 4-inch Biotube Junior effluent screen (Orenco)
- Three 24-inch-diameter plastic risers (Infiltrator Water Technologies)
- Plastic distribution box (Polylok)
- 16 B43 GSF treatment modules (Eljen Corp.)

Installation

The soil conditions and small space available on the site dictated the choice of the treatment modules. Schlieve conducted a soil test to identify the depth at which the drainfield soils had a long-term acceptance rate of 1.6 g/ft² as required to allow the smaller drainfield.

“On many lake lots, there is just no area,” Arts observes. “The Eljen material is another tool in the box that sometimes gives us enough space to get a system in.” The drainfield is 33 feet long and 10 feet wide. Arts notes that a conventional drainfield likely would have been 65 feet long by 9 feet wide.

The property owner wished to preserve as many trees as possible; even with judicious cutting, some 20 trees had to be removed to make space for the system. The excavations were done with a John Deere 410 rubber-tired backhoe and backfilled with a Caterpillar compact track loader.

The A-1 team removed the old septic tank and pump tank. In the new tank excavation they encountered extremely heavy clay soil with extensive mottling but no significant water. Nevertheless they used “wet prep” tanks impregnated with a chemical that will mend and seal cracks that may eventually appear.



▲ Dustin Augustine installs a JB Plugger dual-float control from SJE Rhombus. The riser and lid are from Infiltrator Water Technologies.

SYSTEM PROFILE



The drainfield area was excavated to one foot below the specified system elevation; that foot was then filled with ASTM C33 mound sand and leveled manually. There must be at least two feet of suitable soil beneath the sand layer. Two rows of B43 GSF modules, two feet apart, were then placed on the sand, eight modules per row. Next, 4-inch perforated pipe was laid on top of modules.

One foot of sand was placed along the sides of the module rows and six inches of sand at each end. The entire installation was then covered with high-tensile fabric that allows air and water to penetrate but excludes sand that could clog the treatment units. The system was then backfilled with ASTM 33 sand followed by 12 inches of clean and porous fill.

System operation

Wastewater from the cottage flows by gravity to the septic tank; effluent discharges to the pump tank where the level is regulated by dual floats. The upper float serves as a failsafe, triggering an alarm inside the cottage in case of high water indicating a pump failure.

The pump sends effluent through a 2-inch force main up to the drainfield. The section of force main under the driveway is encased by 2 inches of solid insulation to prevent freezing where the soil has been compacted by traffic.

◀◀ The new Concrete Products septic and pump tanks are installed behind the cabin at Crescent Lake in Rhinelander, Wisconsin. Risers and lids are from Infiltrator Water Technologies.

“On many lake lots, there is just no area.
The Eljen material is another tool in the box that sometimes gives us enough space to get a system in.”

Tom Arts

About 2 feet ahead of the distribution box at the head of the drainfield, the force main diameter widens to 4 inches to slow the flow. The water then makes a 90-degree bend down into the distribution box, which sends wastewater equally via the perforated pipe to the two rows of treatment modules. At the end of each pipe is an inspection port.

Each GSF module is made up of geotextile fabric and a plastic core; the two work together to provide vertical surface area and oxygen transfer for treatment. The secondary-treated effluent leaving the GSF modules is further treated in the soil. This cleaner effluent enables an increase in the soil's long-term acceptance rate, leading to a reduction in drainfield size.

Maintenance

Maintenance is the same as for a conventional in-ground except that the pump amperage needs to be checked periodically to make sure it is not wearing or starting to clog. The septic tank needs to be pumped every three years and the effluent filter cleaned every year. The distribution box should be checked to make sure the flow remains evenly distributed to the rows of treatment modules, or speed levelers can be installed to equalize the flow.



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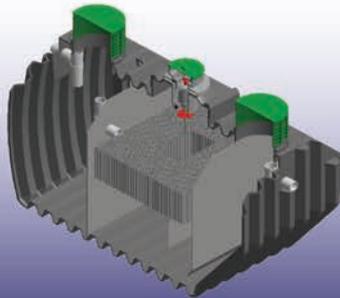


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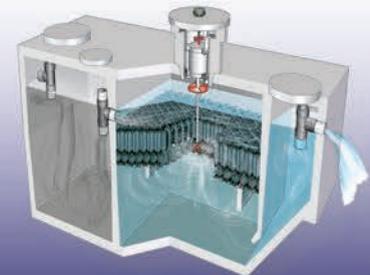
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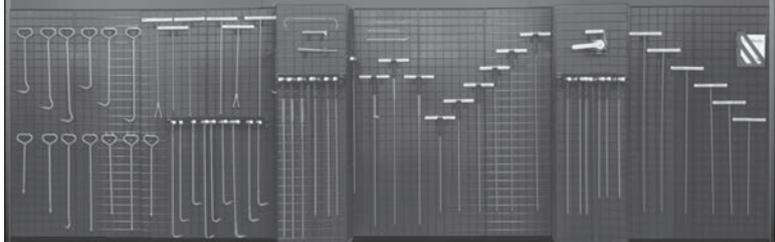


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We're Behind the Times in Oklahoma ... And We Need to Catch Up

"We really have to change the mindset regarding education, licensing and professionalism in the industry."

Compiled by Betty Dageforde

In 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 Oklahoma Onsite Wastewater Association.

Jason Birdsong

owner along with wife, Erin

Business: JT Septic Co., Claremore, Oklahoma

Age: 39

Services we offer: Installations, repairs, pumping, inspections, tank locating services

Years in the industry: 14

Association involvement:

Member of the Oklahoma Onsite Wastewater Association since 2014. I am currently the president and have also served as vice president.

Benefits of belonging to the association:

First and foremost are the relationships developed with the members, the board and the Oklahoma Department of Environmental Quality staff. We have been able to make strides in getting rules changed for the better. For example, when a law was changed to increase the number of sprinkler heads required for (irrigating with effluent from) aerobic systems in eastern Oklahoma, we helped get that reversed. It was very hard to fit more sprinkler heads onto small lots with big houses, and we could find no science to back up that requirement.

Our crew includes:

Erin Birdsong, office manager; Greg Moore, outside supervisor/operator/installer; Michael Appleby, licensed installer/operator/pumper; Trey Dunlap, outside sales; Doug Chance, inside sales/customer relations; Michael Lewis, lead service technician/certified inspector; Tim Gramly, service technician; Justin Rhodes, installer technician; Devin Ellis, installer technician; Billy Duty, delivery driver; Michael Panther, ground support; Zachary Longnecker, pump truck assistant; Richard Sellers, mechanic;



▲ Jason Birdsong and his mother Charlotte Stein, accounting; daughter Delila Birdsong, office helper; and wife Erin Birdsong, co-owner and office manager.

Brittany Welch, office support; Jae Chastain, office support; Dinah Thomas, office team leader/septic specialist; Charlotte Stein, accountant/controller.

Typical day on the job:

Mainly I'm overseeing everything, making sure everything's scheduled and going out the door, getting people directed in the morning. I fill in where needed, do paperwork and figure out where savings and efficiency can help us grow.

The job I'll never forget:

We put in an aerobic treatment system on a lake property with a hill down to the water. We had to install a tank prior to the house being built. We used a large excavator to hold onto the truck as we went down the hill. The excavator tracks were tracking fast in the opposite direction and the truck was just dragging the excavator.



◀◀ 2017 Freightliner built out by Ameripump Manufacturing with a 2,500-gallon steel tank and a National Vacuum Equipment 500 blower.

▼ Michael Panther laying pipe for a Clearstream Wastewater Systems aerobic system, 2012 Ford F-250 service truck; two Bobcat E55 excavators and a Bobcat stand-on skid-steer.

My favorite piece of equipment:

Our CASE 580L backhoe was one of the first big machines I bought. It's hard to find someone who can run it these days, so if it goes to a job, I have to go with it. It mostly just sits in the barn as we have gone to mini excavators and skid-steers. But I love to get it out and play every now and then.

Most challenging site I've worked on:

We like the jobs people can't figure out. We just took over the maintenance of the onsite system at our local airport and it's a mess. A lot of people have had their hands in this project, it was undersized when installed, and there have been changes made to it since. So it's been a challenge. We're slowly working through it but it's going to take some time and money to get it right. They're already looking at growth and I'm telling them they've got to fix what they have first.



Oops, I wish I could take this one back:

I lost a conventional lateral line job. I went the wrong way with the laser, I read it wrong. It was a simple mistake but it wound up costing me the job — or even jobs because I think there were other jobs behind that one.

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

It's not really a question but a situation we came across. We showed up to pump a tank and it was full of large fish heads. Apparently the husband cleaned fish and the wife didn't know what to do with them so she opened the tank and threw them in.

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

The biggest issue we're facing in Oklahoma is that anyone can install a septic system, and it only costs them \$100 more for a permit and a state inspection than a licensed installer. This devalues our licensing and industry professionalism. The installer's license I have in my wallet should mean to me what a license means to an electrician, plumber or HVAC tradesman. There's also a huge problem with bootlegging where systems are being put in by people who don't get a permit and there's no inspection. These people haven't gone to school to know what they're doing. When systems fail and sewage starts surfacing and running into water impoundments leading into drinking water, that's a huge issue.

Best piece of small business advice I've heard:

I've had two major mentors for this occupation. My friend, Brian Gates of Gates Septic and Excavation, laid out a cellphone and said, "How many

options does a customer have in purchasing that cellphone?" I said, "One." He said, "No, there are two — they can purchase the cellphone or choose not to buy from you." Then he laid out two cellphones. "How many options do they have now? They have four — they can buy either one, buy both, or none at all." This helps me every day — to offer multiple options to my customers. Another mentor, Kevin Ruark of Red Dirt Septic, told me that my mindset of, "I don't want to grow any more with any more employees," restricts our ability to grow financially.

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

Probably still be a repo man. I used to repossess cars and it just got too dangerous. When I got into the septic industry, I had a wife and a new daughter. They are the reason I get up every day and I don't want them to have to do anything without me.

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

In Oklahoma we really have to change the mindset regarding education, licensing and professionalism in the industry. I love this state, I love my community, but we are behind the times and as president of the association I'm going to strive that we get caught up with other states on these issues. □

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.

Washington State considers new rules for reuse of nonpotable water

By David Steinkraus

The state of Washington is nearing adoption of new risk-based rules governing nonpotable onsite water systems. The rules would apply to multifamily, commercial and mixed-use buildings and would govern the treatment and use of water for nonpotable applications, according to the state Health Department. Included would be collection of water from sources such as showers, sinks, toilets, dishwashers, rain and air conditioners.

Among topics to be covered by the rule are treatment, quality monitoring requirements, reporting requirements, permitting and waivers for upgrading existing systems.

Rule-making began last year and included two public meetings, says the state website. Once the rule is drafted, there will be a public comment period.

The department has a deadline of July 1 to adopt the new rules.

Kansas

With most of the state in moderate to extreme drought, the legislature is considering creation of a new cabinet-level water agency that would combine offices from existing state departments. The goal is to better organize and direct work on conservation, water quality and policy planning, reported the *Topeka Capital-Journal*.

Part of the legislature's work would include a dedicated funding source for conservation. The proposal is a bipartisan project and has support from Gov. Laura Kelly. Agricultural groups are worried about the effect of fees on farmers and ranchers, and they argue lawmakers should ask for solutions from people living on the land.

Research shows the Ogallala Aquifer, which covers parts of eight states in the Great Plains, could run dry in some Kansas counties in the next decade.

"Water is so important to our state. We do not want to be in the same situation that Nevada and California are in," said Rep. Ron Highland, R-Wamego, chair of the House Water Committee, according to the *Capital-Journal*.

Alabama

The International Water, Sanitation and Hygiene Foundation is launching a program in Alabama to help people who need onsite system upgrades. A pilot project is expected to provide repairs and upgrades for five homes in Lowndes County, reported the *Daily Commercial News* in Markham, Ontario.

Lowndes County is one of about 17 counties in the Black Belt region, named for rich black clay soils that mitigate infiltration.

Partners in the project are the Black Belt Unincorporated Wastewater Program, Alabama Department of Public Health, and water technology company LIXIL. Equipment donations came from LIXIL and Fuji Clean USA.

Louisiana

Concordia Parish updated its ordinances to fine people who dump untreated household wastewater into ditches, lakes and bayous. Violators may be fined up to \$100 per day per instance, reported *The Concordia Sentinel*.

"The reason we did this was, we were seeing a lot of raw sewage in our ditches and water systems," said Police Jury President Collin Edwards. "It is the same ordinance as the state code."

Police jury is the name for the elected governing body of a parish.

The previous ordinance covered only subdivisions and multifamily dwellings. The updated ordinance also covers the placement and size of septic tanks.

New York

The Nassau County Legislature passed a supplemental appropriation of \$2 million to help fund onsite system replacement grants. That sum was matched with another \$2 million from the American Rescue Plan, reported *LongIsland.com*.

Homeowners or small businesses may apply for grants to replace their failing cesspools or onsite systems with modern nitrogen-reducing technology. Grants will provide 50% of the cost of a system replacement up to a maximum of \$20,000. Eligible properties must have a design flow of no more than 1,000 gpd.

Nassau County is next to New York City on Long Island and like neighboring Suffolk County has thousands of properties served by cesspools. Nitrogen pollution of nearshore waters by onsite systems has become an issue on the island in the past few years.

Vermont

The state Agency of Natural Resources is using \$1 million from the American Rescue Plan to help low- and moderate-income state residents repair or replace failing onsite systems. Additional money is expected in future fiscal years, according to the state.

Grants are available to people who own and live at a single-family property, or to owner-occupied multifamily homes with up to four units. Households with incomes up to \$120,000 may receive grants. □

"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.

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Choosing the Right Trench Cover to Halt Migration of Fines

Through the years, best practices have changed for protecting aggregate

By Jim Anderson and Dave Gustafson

An installer asked: *Do you know of any studies comparing use of straw/hay, building paper and geotextile fabrics in terms of their ability to prevent fine solid migration into a sewage treatment trench?* At the date of this writing, we have not found a reference that provides any direct comparison of these common materials when doing the final cover over sewage treatment trenches or beds. Perhaps one of our readers can point us to such a study done locally through a university, government or private entity.

Even though we have been somewhat stumped, we thought it would be a good idea to write about the final cover over sewage treatment trenches; what our goals are and how we can accomplish them or potentially cause some problems.

Everyone should be aware of the general profile of sewage treatment trench, whether it is fed by gravity or pressure distribution. The trench is excavated 1 to 4 feet wide (anything wider is defined as a bed); the most common width is 3 feet, but the excavation width is usually determined by the bucket size used on the backhoe unless there is a specific specification for a specific application.

Some type of media is placed in the trench. The function of the media is to maintain the structure of the trench; in some cases provide potential storage space for effluent; and protect the infiltrative surface of the soil for acceptance and treatment. There is distribution piping; typically 4-inch-diameter PVC sewage pipe for gravity or 1- to 2-inch-diameter for pressure distribution. The piping is covered and protected by the media. A cover material is placed over the trench before backfilling, followed by soil and topsoil backfill to establish vegetation.

THE RIGHT ROCK

The question from the installer related specifically to cover over an aggregate, or as we would refer to a rock-filled trench. Over the past 50 years, cover material and the type of media available for us in trenches has changed. We have moved from only or primarily aggregate to chambers, gravelless pipe, PVC pipe wrapped in Styrofoam peanuts to numerous other materials. They can be used as long as they fulfill the functions of maintaining trench stability, storage area and protection.

The rock would be $\frac{3}{4}$ - to 2 $\frac{1}{2}$ -inch in size so it can be easily worked, leveled off and moved around in the trench. The rock needs to be of durable material; a rock that would break down or slake when water is added would not be suitable. An example of unsuitable material would be lime-

It is always interesting to go back to some of the early design manuals to see what they have to say about different aspects of installation procedures and note how things have changed over time.

stone rock. As water is added, the rock dissolves, moves to the bottom of the trench and effectively seals it off.

The question relates directly to the cover provided over the top of the trench media. The primary purpose of this cover material is to prevent soil particles associated with the trench backfill from filtering into the aggregate or other media. This would potentially move downward to the soil surface, effectively clogging both the media and the soil we are depending on to accept the effluent.

It is always interesting to go back to some of the early design manuals to see what they have to say about different aspects of installation procedures and note how things have changed over time.

Here is a quote from a 1981 Minnesota Design manual: "Over the top of the rock place a 4-6-inch layer of marsh hay or straw, and then a layer of untreated building paper or newspapers, or other permeable material." Wow! Who reading this would like to spread out newspapers as the cover material today? Some who had read this may have actually done it, but we are sure no one wants to go back to those days, and it was only 40 years ago. Jim was doing education sessions at that time advocating such a practice; Dave was still about a decade away and things had already changed.

If you go back a little further in design manuals to the early '70s or '60s, there is no mention of building paper as a cover addition. The building paper was added because there were observations that straw or hay was not always doing an adequate job of keeping fine soil particles from migrating downward.

THE RIGHT FABRICS

The introduction of geotextile fabrics eliminated a messy and time-consuming activity of installation by replacing straw and building paper. All very good except there was a learning curve for installers relative to the

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fabrics. They are not all created for the same purposes. Some of them used in road construction are purposely weaved to prevent moisture movement. We do not want to use these types of fabrics with our systems.

We want to take advantage of any positives associated with evapotranspiration from our trenches. Our permeable fabric should allow passage of moisture both ways while eliminating migration of the soil fines.

A final note, we have seen numerous systems over the last few decades where straw was used and there was no evidence of soil migrating into the trenches. Conversely, we have seen trenches that have been totally sealed off; so is that a product of the straw itself or was it just bad practice on the part of the installer? Maybe some of both; but use of geotextiles has simplified trench installation. □

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Septic Tanks and Components

By Craig Mandli

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Infiltrator Water Technologies CM-1060

The Infiltrator Water Technologies CM-1060 septic tank is compression-molded and manufactured using recycled polypropylene. It is the first in a new line of CM Series tanks, and is similar in design to the IM-1060 septic tank introduced in 2010. It offers strength, efficient installation and easier assembly than its predecessor. Like the IM-1060, the CM-1060 is a two-piece tank for shipping and storage efficiency. 800-221-4436; www.infiltratorwater.com



Kistner Concrete Products precast concrete septic tanks

Precast concrete septic tanks from Kistner Concrete Products are available in 300- to 26,000-gallon sizes. They are designed and tested for structural capacity and vacuum tested for water tightness. All tanks are manufactured under the Green Tag Quality Standard Certification Program. The manufacturing plant is on the PCANY (Precast Concrete Association of New York) Green Tag Tank Listing and NPCA (National Precast Concrete Association) certified. 716-508-5550; www.kistner.com



Roth North America MultiTank

The MultiTank from Roth North America can be used for water cistern, pump, holding, rainwater or septic tank applications. This is possible due to its inner layer of FDA-approved virgin HDPE, two inside layers of polyethylene for improved stability, plus one outer layer of black and UV-stabilized polyethylene. Features include CSA, NSF and IAPMO certification, a COEX-4 multilayer co-extrusion process, a low-profile design that means less digging and avoidance of a high water table, lightweight construction, a multipoint inlet/outlet that's convenient for field piping, the ability to enter and exit the tank on the ends or sides, two 24-inch manways to provide easy access for maintenance and service, a cylindrical shape that requires no water for backfill, a threaded riser system and watertight, seamless construction. 866-943-7256; www.rothmultitank.com



SEPTIC COMPONENTS

Advanced Drainage Systems Arc

Arc septic leaching chambers from Advanced Drainage Systems are sturdy, lightweight plastic units that come in five sizes to meet leachfield application needs. They combine infiltrative surface area and storage capacity with a structural design to handle most conventional leachfield system challenges. The corrugated chamber design eliminates flat surfaces to provide increased trench load bearing capability. A "Lock and Drop" joint provides a positive connection during installation and backfill. They are 5 feet in length for easy handling, and have a diamond-plate texture to increase slip resistance during installation. They utilize a 20-degree integral articulating joint so they can be installed in either straight or contoured leachfield applications. Universal inlet/outlet end caps are available, as well as side port couplers, which snap in place to allow side entry at any of the trench line's joints. 800-821-6710; www.adspipe.com



Fluid Dynamic Siphons

Automatic **Fluid Dynamic Siphons** are designed for dosing leachfields and other soil absorption fields. The siphons have no moving parts and require no electricity. They provide an efficient way to increase the life and effectiveness of onsite wastewater treatment systems, according to the maker. Effluent is collected in a dosing tank until the predetermined high-water line is reached, then the siphon activates and rapidly drains the tank until the low-water line is reached. The siphon then shuts off until the next cycle. 800-888-5653; www.siphons.com



EFFLUENT FILTERS

Anua BioCoir

The **BioCoir** recirculating media biofilter from **Anua** is designed to be simple to install and easy to operate. It provides stable treatment across a broad range of applications with no constantly running noisy blowers or motors, according to the maker. It uses coconut coir media housed in a preassembled pod. Coir refers to the fibers that make up the thick husk of a coconut. The coconut fiber is low cost, an upcycled resource and high in lignin content, which results in a durable material. Pre-treated effluent is time-dosed over the media using helical spray nozzles to provide uniform distribution. Treatment is optimized by recirculating effluent through the media multiple times. It is certified to NSF/ANSI Standard 40, Class I and third-party tested to reduce nitrogen by more than 50%. Residential and commercial configurations are available. 336-547-9338; www.anuainternational.com



Eljen Geotextile Sand Filter

The **GSF**, or **Geotextile Sand Filter**, advanced wastewater treatment and dispersal system from **Eljen** is designed to provide treatment and dispersal in the same footprint, easy installations and minimal maintenance. This product is used for both commercial and residential applications. Utilizing a two-stage pretreatment process, the geotextile modules apply filtered septic tank effluent to the soil and increase the long-term acceptance rate. Open-air channels within the module support aerobic bacterial growth on the module's geotextile fabric, surpassing the surface area required for traditional absorption systems. The system is tested and certified by NSF to NSF/ANSI Standard 40. 800-444-1359; www.eljen.com



Polylok PL-250

The **PL-250** effluent filter from **Polylok** is designed to handle up to 3,000 gpd with 250 linear feet 1/16-inch linear filtration. It is easy to install and are designed for functionality and longevity, according to the maker. The cartridge cannot be installed incorrectly, with no direct bypass, and will fit any standard 6-inch tee. Its W design prevents solids from settling. 877-765-9565; www.polylok.com



SeptiTech STAAR filter systems

SeptiTech STAAR (Smart Trickling Anaerobic/Aerobic Recirculating) filter systems are designed for residential and commercial properties with minimal operator oversight, while delivering consistent treatment during peak, low or intermittent flows. Using an unsaturated, engineered textile media to treat wastewater that meets strict permit limits, the commercial filter system provides a simple, automatic equalization and clarification process for 500- to more than 150,000-gpd flows, according to the maker. The biological trickling filter technology also maintains low levels of Nitrate-N, with all below-grade components that fit in watertight concrete, plastic or fiberglass tanks. Smart technology allows the system to go into sleep mode to achieve lower operating costs and power requirements. Systems are ETV-EPA verified and NSF/ANSI Standard 40/245 certified. 800-753-3278; www.septitech.com



Sim/Tech Filter STF-100A2

The **STF-100A2** pressure filter from **Sim/Tech Filter** helps maintain proper and efficient year-round operation of mounds, sand filters and other pressurized distribution systems. The low head-loss (0.21 psi) pressure filter mounts on the discharge side of an effluent pump to prevent plugged holes and reduce effluent TSS. This mounting location also extends the time between servicing. The vortex action created by the pump scrubs the screen and the backflow through the filter after the pump shuts off, washing debris out. A single 2-inch filter can handle flow rates up to 83.8 gpm. It can be designed to handle almost any flow rate or load, according to the maker. Larger 3- and 4-inch filters are available. The standard screen filters to 1/16 inch, and optional socks allow for additional filtration to .024, .007 or .004 inch. 888-999-3290; www.simtechfilter.com



LID

BrenLin Seal-R

Seal-R septic tank lids from BrenLin create a strong seal between the septic tank and the riser, eliminating water infiltration between the tank and riser. They are made of durable materials, range from 12 to 42 inches and can be personalized with a service provider's company information. The 42-inch lid meets growing demand for bigger risers to accommodate new technology. 888-606-1998; www.seal-r.com



ONSITE SEPTIC SYSTEMS

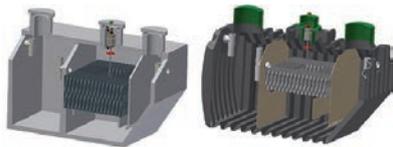
BioMicrobics RetroFAST

Both the RetroFAST and RetroFITT-ee (energy efficient) units from BioMicrobics are designed to be a simple upgrade to enhance a conventional septic system or renovate a biologically failed septic system. A unit can be installed inside an 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 deliver high levels of treatment to help ensure clogging layers don't form. 800-753-3278; www.biomicrobics.com



Jet Inc. BAT Media Plants

Jet Inc. BAT Media Plants offer variable capacity in an NSF 40 and 245 listed treatment system. The precast concrete J-1500 Series provides complete effluent treatment from 500 to 1,500 gpd with the convenient option of a fully integrated pump tank. The 500 and 800 gpd PLT Series tanks are the lightweight, rotational molded alternative to the concrete J-1500 Series. The seamless polyethylene tanks are easy to transport and install in the most difficult site conditions. 800-321-6960; www.jetincorp.com



NextGen Septic technology

Treated water exiting NextGen Septic technology meets higher water quality standards than treated water leaving a typical centralized wastewater treatment plant. The system is suitable for sites traditionally requiring costly drainfield construction due to size restrictions and/or hilly, rocky, clay or sandy soil conditions. It is approved for surface discharge in Kentucky, and it uses a combination of anoxic treatment of the raw



wastewater followed by aerobic degradation of the contaminants. An ultra-filtration membrane further treats the water before being disinfected using ozone. Treated water has less than 15 mg/L of BOD₅, less than 2 mg/L ammonia, less than 1 mg/L phosphorus and no TSS. Ozone decomposes to oxygen, which increases the dissolved oxygen level in the discharged water. This treated water can be used for irrigation or to resurrect a clogged leachfield. 513-673-3583; www.nextgenseptic.com

Norweco Singulair Green R3

The Singulair Green R3 water reuse system from Norweco is designed to reduce water consumption, reuses treated effluent and recycles water to conserve and recharge water resources.



It provides a solution to chronic water shortages and reduces energy costs associated with water and wastewater treatment. The system quietly, efficiently and automatically treats all incoming wastewater to the highest level for restricted indoor and unrestricted outdoor use, according to the maker. The system exceeds the effluent requirements of NSF/ANSI Standards 40, 245 and 350. It qualifies for green building credits under both the LEED rating system and the NAHB ICC 700 National Green Building Standard. 800-667-9326; www.norweco.com

Orenco Systems Prelos Processor

The Prelos Processor from Orenco Systems is the core of a Prelos Sewer, a pressurized liquid-only collection system in which solids are treated onsite while liquids are pumped through small-diameter, shallow-bury sewer lines. It is a complete, high-quality package of compatible, long life span components that are easy to maintain and use very little power. This package includes a meander tank with a longer flow path to maximize solids settling, a lightweight effluent pump that can last more than 25 years with minimal or no maintenance, and a passively self-cleaning effluent filter. 800-348-9843; www.orenco.com



RISER

TUF-TITE tank risers

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 necessary mounting hardware, including safety screws. 800-382-7009; www.tuf-tite.com



VENT PIPE FILTERS

Industrial Odor Control, a Simple Solutions Company, Heavy Duty

Industrial Odor Control, a Simple Solutions Company, has made an improvement to the Heavy Duty filter with an end-of-service life indicator, a qualitative (yes/no) colorimetric indicator for the end-of-service life of carbon adsorbers and filters. It is designed to provide real-time indication of the breakthrough of hydrogen sulfide gas, allowing the customer to order replacement carbon before the odor returns. It is located on the side of the filter and is easily viewable from the ground, allowing the homeowner to know when the carbon is becoming saturated without climbing on the roof or waiting until an odor breakthrough. The indicator is waterproof. Filters come complete with their first charge of carbon, Norit Darco's H₂S Sulfursorb Plus. This carbon has been engineered to work efficiently in high-humidity conditions. The filter housings are manufactured from heavy-duty schedule 40 PVC. 866-667-8465; www.industrialodorcontrol.com



Pagoda Vent

Vent pipe filters from Pagoda Vent provide septic field microbes with the oxygen needed to thrive. They give concrete tanks gas release to mitigate microbial-induced corrosion and provide pressure relief for pumps. They provide proper ventilation, while remaining inconspicuous and attractive in the landscape. The units are durable, lightweight and will not rust. An optional odor filter cartridge using a specialized concentrated media offers years of odor control and fits concealed in the device, according to the maker. 888-864-1468; www.pagodavent.com



The Dirty Bird septic vent

The Dirty Bird provides an alternative to the standard septic vent required by many municipalities for new residential and commercial construction. It is an easy-to-install septic vent shaped like a birdbath. Meeting U.S. Environmental Protection Agency septic venting regulations, it controls odors through a replaceable charcoal filter and vents gases through holes at the bottom of the pedestal so nothing enters the septic system. Fade-resistant (UV stabilized), lightweight and recyclable, it is available in granite, sandstone and terra cotta colors. It is constructed of 100 percent low-density polyethylene and stainless hardware. It is 32 inches high with a basin width of 23 inches and footprint of 12 1/4 inches. 866-968-9668; www.thedirtybird.com □



CASE STUDY

Septic Tanks and Components

By Craig Mandli

Pretreating high-strength waste for orchard and winery



Problem: After one year of careful monitoring by the local county health department and the State Department of Health, it was determined in 2017 that the waste strength loading at Huber's Orchard and Winery, located in Starlight, Indiana, was too high for the new mound system. An additional pretreatment system was needed to lower the waste strength prior to discharge to the mounds.

Solution: Zoeller Pump Company offered design assistance and components for a new mound system to treat waste from numerous structures. They recommended a recirculating media filter treatment system to be installed between the existing septic tanks and the mound system. The treatment systems are similar to recirculating sand filters, with the main difference being the size of the treatment media, which is typically 3/8-inch diameter pea gravel instead of sand media. Zoeller found after many years of use that 3/8-inch pea gravel does not plug. A local engineer designed the new RMF at 4,000 gpd using a waste strength of approximately 700 mg/L BOD₅, which required a 30-by-30-foot RMF. Commissioning of the RMF was done in October 2019.

Result: After one month, the new RMF was treating wastewater efficiently, meeting the objective of effectively pretreating effluent prior to discharge to the mound system. Samples collected averaged 10.5 mg/L BOD₅ and 2.3 mg/L TSS. 800-928-7867; www.zoeller.com □

Serving the Industry

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ALABAMA

Alabama Onsite Wastewater Association;
www.aowainfo.org; 334-396-3434

ARIZONA

Arizona Onsite Wastewater Reclamation Association;
www.azowra.org; 928-443-0333

ARKANSAS

Arkansas Onsite Wastewater Association;
www.arkowa.com

CALIFORNIA

California Onsite Wastewater Association;
www.cowa.org; 530-513-6658

COLORADO

Colorado Professionals in Onsite Wastewater;
www.cpow.net; 720-626-8989

CONNECTICUT

Connecticut Onsite Wastewater Recycling Association;
www.cowra-online.org; 860-267-1057

DELAWARE

Delaware On-Site Wastewater Recycling Association;
www.dowra.org

FLORIDA

Florida Onsite Wastewater Association;
www.fowaonsite.com; 321-363-1590

GEORGIA

Georgia Onsite Wastewater Association;
www.georgiaonsitewastewater.com;
706-407-2552

GEORGIA

F.O.G. Alliance;
www.georgiafog.com

IDAHO

Onsite Wastewater Association of Idaho;
www.owaidaho.org; 208-664-2133

ILLINOIS

Onsite Wastewater Professionals of Illinois;
www.owpi.org

INDIANA

Indiana Onsite Waste Water Professionals Association;
www.iowpa.org; 317-965-1859

IOWA

Iowa Onsite Waste Water Association;
www.iowwa.com; 515-225-1051

KANSAS

Kansas Small Flows Association;
www.ksfa.org; 913-594-1472

KENTUCKY

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

MAINE

Maine Association of Site Evaluators;
www.maine-se.com

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

MARYLAND

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

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 ENGLAND

Yankee Onsite Wastewater Association;
(Massachusetts, Connecticut, Maine, New Hampshire, Rhode Island and Vermont)
www.yankeonsite.org; 781-939-5710

NEW HAMPSHIRE

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

Granite State Onsite Wastewater 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

OHIO

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

OKLAHOMA

Oklahoma Onsite Wastewater Association;
918-727-7113

OREGON

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

PENNSYLVANIA

Pennsylvania Association of Sewage Enforcement Officers;
www.pa-seo.org; 717-761-8648

Pennsylvania Onsite Wastewater Recycling Association;
www.powra.org

Pennsylvania Septage Management Association;
www.pasma.net; 717-763-7762

TENNESSEE

Tennessee Onsite Wastewater Association;
www.tnonsite.org

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Education 4 Onsite Wastewater Management;
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WASHINGTON

Washington On-Site Sewage Association;
www.wossa.org; 253-770-6594

WISCONSIN

Wisconsin Onsite Water Recycling Association;
www.wowra.com; 888-782-6815

Wisconsin Liquid Waste Carriers Association;
www.wlwca.com; 888-782-6815

NATIONAL

Water Environment Federation;
www.wef.org; 800-666-0206

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Waste Water Nova Scotia;
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ONTARIO

Ontario Onsite Wastewater Association;
www.oowa.org; 855-905-6692

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SASKATCHEWAN

Saskatchewan Onsite Wastewater
Management Association;
www.sowma.ca; 877-489-7471

CANADIAN REGIONAL

Western Canada Onsite Wastewater
Management Association;
www.wcowma.com; 877-489-7471 □

CAST Environmental acquires Geoflow

CAST Environmental Holdings acquired all assets of Geoflow. Geoflow will continue to operate as usual. Key staff is being retained, including former Geoflow partner Karen Ruskin Ferguson in a new long-term consultant role. David Morgan will remain as business development and engineering manager, and Jarek Tatarek will continue as warehouse manager.

NOWRA board of directors updates

The NOWRA board of directors thanked outgoing secretary/treasurer Curtis Moore of M&M Soil Consultants, Fredericksburg, Virginia, for his service to the executive committee and the board of directors, a role he has held since 2016. Jim King of Eljen transitioned into the role of secretary/treasurer on April 1. Ed Schloss of Jet Inc. has been appointed to complete King's term on the board as a supplier/manufacturer representative.

Kenworth opens new dealership in Wisconsin

Wisconsin Kenworth opened a new 24,000-square-foot truck dealership in North Fond du Lac, Wisconsin. The company, a subsidiary of CSM Companies, also has Wisconsin locations in Madison, Green Bay, Menomonie, Milwaukee, Wausau and La Crosse. The new facility brings the CSM Companies' Kenworth dealerships to 22 total nationwide. □

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PRODUCT NEWS

PRODUCT SPOTLIGHT

Trencher designed to operate in tight spaces

By Craig Mandli

To enhance the operator experience, while tackling tough jobs on tight schedules, Ditch Witch has introduced the RT70 ride-on trencher. The trencher is equipped with features that increase operator comfort and visibility, helping to boost efficiency on the job site.

“At Ditch Witch, we understand the challenges that utility contractors face daily,” says Steve Seabolt, product manager, ride-on tractors, Ditch Witch Organization. “The RT70 is compact and maneuverable, yet powerful. This new unit, with its unique features, will allow the operator to tackle tough jobs in tight conditions.”

The ergonomic operator station features an open layout with a 90-degree swivel seat, ample leg room and intuitive controls. Enhanced visibility gives operators a full view of the machine — from front tire to back tire and the attachment — helping operators of any experience level increase productivity. It also includes a cooling fan to reduce temperature levels in the operator station by moving exhaust out of the side of the machine rather than toward the operator. This helps keep workers safer and more comfortable during long days.

Powered by a 72 hp Yanmar Tier 4 Stage V-compliant diesel engine, and built with a narrow footprint of 73 inches wide, the RT70 rubber-tire trencher can handle heavy-duty jobs and still maneuver around the tight job sites that are often found on septic system installation jobs. According to Seabolt, it is the only ride-on trencher available with crab and coordinated steering modes, which allows operators to turn the machine with a steering wheel instead of using two separate levers. “This makes it easier to use and frees them up to focus on other parts of the job,” he says.

The unit’s modular design features a single base with the option to move from tires to tracks. Multiple attachments and a variety of optional add-ons allow operators to reconfigure the machine throughout its lifecycle to customize it for specific job site needs. It is built to increase operator productivity with daily maintenance points in one easy-to-access location and a single-piece, easy-open hood.

“Fast and simple maintenance means that operators can spend their valuable time where it matters most — on the job site,” says Seabolt. 580-336-4402; www.ditchwitch.com



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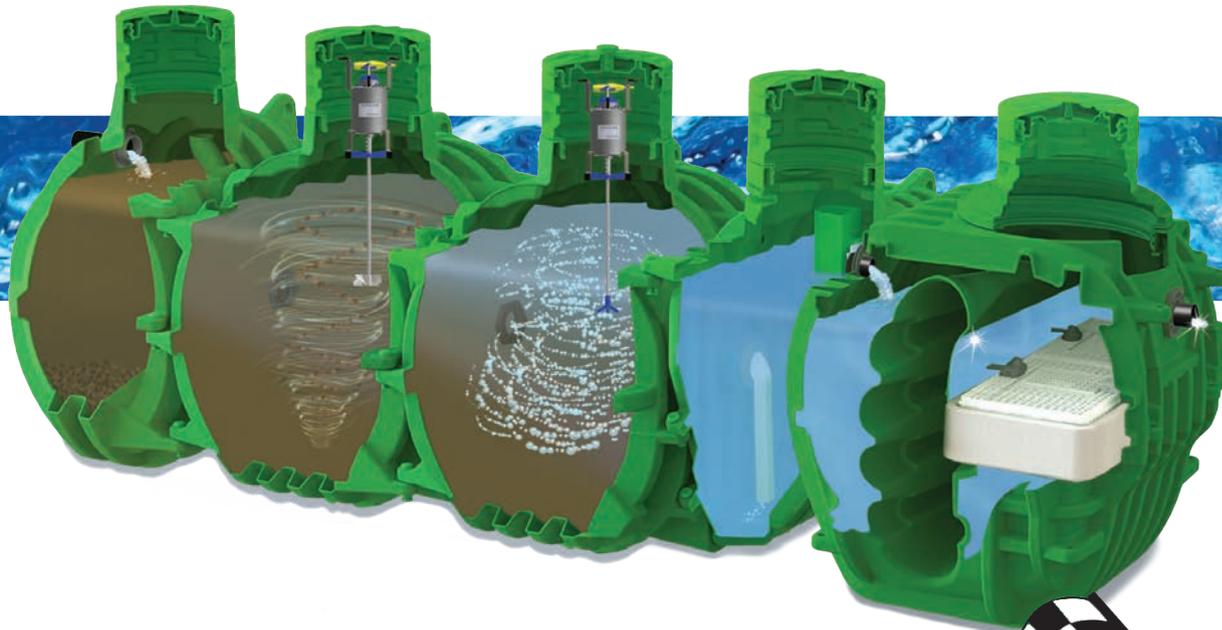
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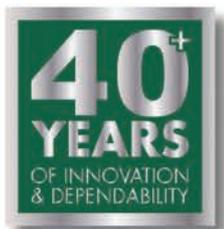


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