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EDITOR'S NOTEBOOK:
Alabama teen
earns certification p. 6

THE ONSITE INTERPRETER

Georgia's Harold Kilgore seeks to be the expert go-between helping homeowners and regulators solve septic system challenges p. 10

BASIC TRAINING:
Using
recirculating
media filters
p. 18

SYSTEM PROFILE
A 5,500 gpd
solution p. 20



PRODUCT FOCUS

System Maintenance, Inspection
and Installation Tools p. 36

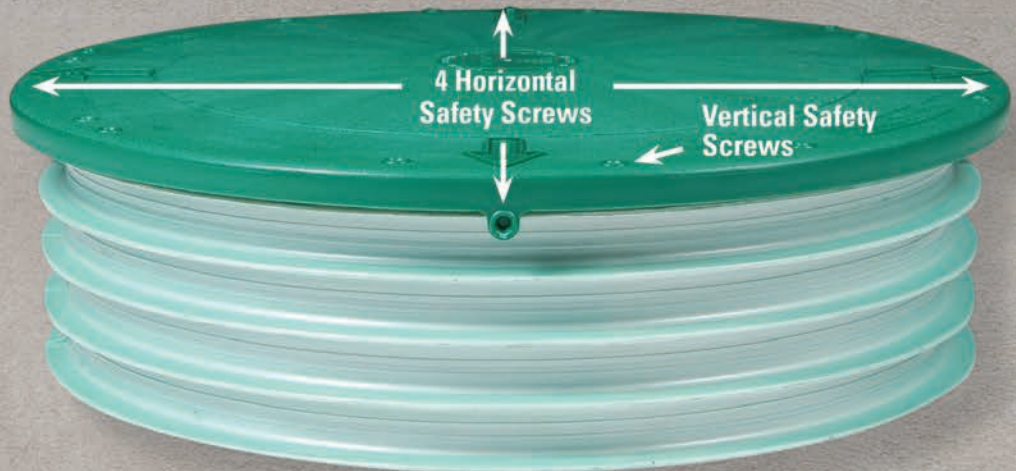


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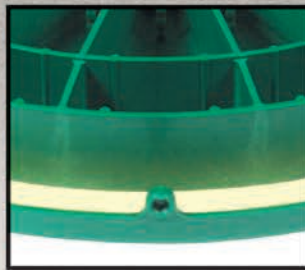
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INSTALLER PROFILE: The Onsite Interpreter

By Scottie Dayton

ON THE COVER:

Georgia's On-Site Wastewater Consultants acts as a go-between for homeowners and regulators to solve septic system challenges. Harold Kilgore, center, discusses a project with customer Harold Trip, left, and former On-Site partner Steve James. (Photo by Kaylenn Gilstrap)

6 Editor's Notebook:

Let's Officially Welcome C.J. Gulley Into the Fraternity of Installers

Alabama high schooler, 16, obtains his first-tier installer certification and aims to help with a family business succession plan.

By Jim Kneiszel

8 @onsiteinstaller.com

Be sure to check out our exclusive online content.

18 Basic Training:

Know When and How to Employ a Recirculating Media Filter

Additional effluent filtering can be a key component to successful treatment in difficult site conditions.

By Jim Anderson and Dave Gustafson

20 System Profile:

Engineering a Wastewater Solution to Serve 250 Workers

A new Indiana RV factory with serious flow requirements called for aerobic bacterial generators, large tanks and a significant drainfield area.

By Scottie Dayton

24 Rules and Regs:

Federal Infrastructure Law Dedicates Billions To Onsite Wastewater Projects

By David Steinkraus

26 Snapshot:

So Many Installers and Pumpers are Retiring. Who's Going To Step Up?

Missouri reflects the dismal manpower shortages found throughout North America. Young wastewater technicians are desperately needed.

32 Associations List

34 Product News

Product Spotlight: Foam media biofilter designed as an economical alternative

By Tim Dobbins

36 Product Focus:

System Maintenance, Inspection and Installation Tools

By Craig Mandli

Coming Next Month

ISSUE FOCUS: Special Section - Onsite Innovations

Basic Training: Erosion control tips

Snapshot: Colorado installers are overwhelmed

ONSITE installer™

Published monthly by

 COLE publishing

P.O. Box 220,
Three Lakes, WI 54562

Call toll free 800-257-7222;
7:30 a.m.-5 p.m. Central time, Mon.-Fri.

Website: www.onsiteinstaller.com

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CONTROLLED CIRCULATION: 18,500 per month

This figure includes both U.S. and International distribution.

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ADVERTISER INDEX

November 2022

Alberta Wilbert Sales Ltd.....	19
 ALTA	
Alita Industries, Inc.....	28
 BIO MICROBICS	
BioMicrobics, Inc.....	29
 BIOROCK	
BIOROCK.....	13
 BrenLin	
BrenLin Company, Inc.....	16
CREST Precast, Inc.	
Crest Precast, Inc.....	31
 eljen	
Eljen Corporation.....	9
Fuji Clean USA.....	15
 INFILTRATOR	
Infiltrator Water Technologies, LLC.....	3
 Jet	
Jet, Inc.....	27
Kistner Concrete Products, Inc.....	29

 NPCA	
National Precast Concrete Association.....	39
 norweco	
Norweco, Inc.....	17
 POLYLOK	
Polylok, Inc.....	40
 PEI	
Presby Environmental.....	5
 Roth	
Roth North America.....	29
 SIM/TECH FILTER	
Sim/Tech Filter Inc.....	8
 Simple Solutions	
Simple Solutions Distributing LLC.....	38
 SJE RHOMBUS	
SJE Rhombus®.....	25
SludgeHammer Group, Ltd.....	49

 SPI	
SPI, Inc.....	31
 T&T TOOLS	
T&T Tools, Inc.....	31
 THE DIRTY BIRD	
The Dirty Bird.....	38
The Shaddix Company, Inc.....	38
 TUF-TITE	
TUF-TITE, Inc.....	2
 Wholesale Septic Supply	
Wholesale Septic Supply.....	23
 WIESER CONCRETE	
Wieser Concrete.....	25
WWETT Show.....	35
Classifieds.....	33

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



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

Let's Officially Welcome C.J. Gulley Into the Fraternity of Installers

Alabama high schooler, 16, obtains his first-tier installer certification and aims to help with a family business succession plan

As the average age of installers across the country creeps higher, many contractors face the prospect of creating a complex succession plan to either make sure their family business is seamlessly passed on or maintains value to sell to a new owner. Chris Gulley, owner of Gulley Construction in Bridgeport, Alabama, identified a serious shortcoming in his own succession plan recently — the fact that he was the only installer license holder for his business.

In Alabama, the individual holds the license, not the company, so licensing isn't passed along with the business or to other family members when

"Alabama has some of the toughest onsite laws and rules in the nation, which is a good thing. ... This four-day course and then passing an exam for licensing is taking steps to professionalize the industry."

Chris Gulley

someone dies. Gaining all the necessary installer licensing to work on a variety of septic systems takes time, and if your lone certified installer is out of commission or passes away, the machines stop running and the income stops coming. So Chris sent his wife, Alyson, and his son, C.J., to the University of West Alabama to start the five-year process to obtain the highest level of installing licensure recognized by the state. They went through the four-day training for the basic installer certification and then passed the exam at the state licensing office in Montgomery. As a result, C.J. at age 16 became the youngest licensed installer in Alabama, according to Chris.

GAINING PERSPECTIVE

Chris is fortunate that he learned all the nuances of the licensing program as a member of the Alabama Onsite Wastewater Board for three years, currently serving as its chairman. He also serves as District 2 director for the Alabama Onsite Wastewater Association, representing installer members in the northeast corner of the state.

"If I were to die right now, holding the Advanced 2 license, there would be no way for anyone in the family to carry on with anything but the basic license," Chris explained. "Our money is not in basic systems. Our money is in alternative systems."

◀◀ Melissa Hines of the Alabama Onsite Wastewater Board, presents C.J. Gulley with his basic installer certificate of license. (Photos courtesy of Chris Gulley)



That would leave the company allowed to install only low-flow conventional tank and drainfield septic systems, while more complex systems pushing larger flows are Gulley Construction's bread and butter. As Chris explained it, basic systems cost \$5,000 to \$7,000, while he concentrates on more lucrative projects with a price tag of \$20,000 to \$200,000.

His demise could be financially devastating for the company — not to mention the many years of expertise that would be lost.

With their basic licenses in hand, Alyson and C.J. must put in five basic systems over a two-year period to reach eligibility to take the Advanced Level 1 course. That license allows the installer to oversee advanced system installs up to 1,800 gpd flow. In two years, the license holder must install five advanced systems to qualify for Advanced Level 2 training, which adds large projects like schools, neighborhood systems into the mix. Chris is one of about 100 Alabama installers with the most advanced license. "Advanced Level 1 is the sweet spot," Chris said, explaining that most new and replacement systems fall under this category of certification. If all goes to plan, Gulley Construction will have licensure to continue handling the most complex system installs for many years to come. And there's a feeling of security in that, Chris explained.

TOUGH REGULATIONS

"Several people wanting to retire have come to the AOWB to ask for a variance to waive the time required for their children to be able to test," Chris recalled. That threw up a red flag for members of the board, who are now looking for a way to help these installers smooth the certification process. "The board is actually working on developing a family succession plan, a way for their immediate family heirs to fast-track to get the licenses they need to keep going."

These rules aren't in place to trip anyone up. Rather, the process is a way to make sure installers are qualified and have enough training to ensure the work is done properly and customers receive a consistently good product.

"Alabama has some of the toughest onsite laws and rules in the nation, which is a good thing," Chris said. "Most other states just go through a 2-3 hour course. This four-day course and then passing an exam for licensing is taking steps to professionalize the industry."

It also discourages fly-by-night contractors.

Chris holds a variety of plumbing and construction certifications because his company provides many related services. Some trades, plumbing for instance, require lengthy apprenticeships to ensure a well-trained workforce, and Chris believes the onsite industry in general should trend more in that direction.



▲ In the trench shooting grades is one of C.J. Gulley's favorite places to be at an installation work site.

LOFTY GOALS

Chris couldn't be more proud of the accomplishment of his can-do son, who is already working in the trenches with him as a high school junior. He has hopes for C.J. that include attending Auburn University and taking classes that would allow him to become a soil evaluator for the company down the road. For his part, the younger Gulley seems well on his way to shepherding the family enterprise for many years to come.

C.J. will continue on the certification path, but he is also working toward other lofty goals while attending North Jackson High School. He's playing three sports, holding down first or third base on the baseball team, defensive nose guard and right tackle on the football team, and center on the basketball team. He's hunting for a scholarship to play football for Auburn and to pursue a business degree.

But family comes first.

"My whole goal is to make my dad happy. I want to get to the point where my dad can just sit at home and when he retires, he won't have to worry about the business," he said. "He has worked so hard for me, and given me everything I needed to be successful in this world. I don't know how I can thank him for it."

C.J.'s earliest memory of working with his father was at about age 6, eating breakfast in the work truck and Chris calling him out to hold some pipe he was installing. And it hasn't stopped since then; now he is frequently found standing in trenches shooting grade while his father is working the excavator. Between sports practices and working as a lifeguard, he's also found time to learn how to operate every piece of equipment Gulley Construction uses.

A BRIGHT FUTURE

C.J. said the basic installer coursework and exam were challenging, but he was thankful to the other adult installers in the class who helped him through the process. He realizes few younger people want to enter the wastewater industry. The work is hard and most kids don't want to get dirty, he says. But he sees a lot of potential ahead for installers.

"The sky's the limit. I just try to push myself and go as far as I can," he said. □

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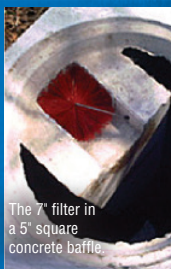
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100 FOOT RULE

How Long Can a Gravity Trench Be?

Many regulations across the U.S. and Canada limit gravity trench lengths to 100 feet. Is this length justified in science or practices? This online article from Sara Heeger takes a look at the history, science and practicality behind this rule, and whether it still holds true. onsiteinstaller.com/featured

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SCAN ME

A VISIT FROM OSHA Stay Prepared for Unexpected Site Visits

OSHA doesn't wait for an accident to make site visits. It's important to remain calm and not be caught off guard when your safety practices get put under a microscope. This article outlines the training your staff should receive, tips for choosing and training your designated competent person, and how to handle surprise visits from an OSHA representative. onsiteinstaller.com/featured

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Job seekers have a lot of options these days. Encourage your crew to share their workplace experiences — both good and bad — to give an authentic picture of your company. Any sniff of a toxic workplace, a lack of support or inauthentic promises can mean disaster for your talent attraction and retention efforts. Here are six ways to get real with your employer branding (if you care about things like retaining your top people and attracting more). onsiteinstaller.com/featured



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THE ONSITE INTERPRETER

Georgia's Harold Kilgore seeks to be the expert go-between helping homeowners and regulators solve septic system challenges

By Scottie Dayton

Harold Kilgore watched his plans for Gravelator Systems unravel over recent years. The small family-run business in Gainesville, Georgia, opened in 1997 and specialized in designing and installing onsite systems for lots classified as unbuildable.

In late 2018, Kilgore's nephew, Justin Kilgore, left the company and returned to school to become a surgical nurse. In May 2021, laborer David Thompson was diagnosed with emphysema and quit.

That left Harold's son, Heath Kilgore. "He'd worked beside me for 20 years and, as Gravelator's project manager, had assumed field responsibilities," says Harold. "In late November 2021, Heath moved on to try different occupations."

To recover from the setback, Kilgore, 59, and Sharon, his wife of 40 years, are transitioning to fewer installations and more consulting and training classes through his second company, On-site Wastewater Consultants. It opened in May 2019 in Carnesville, Georgia.

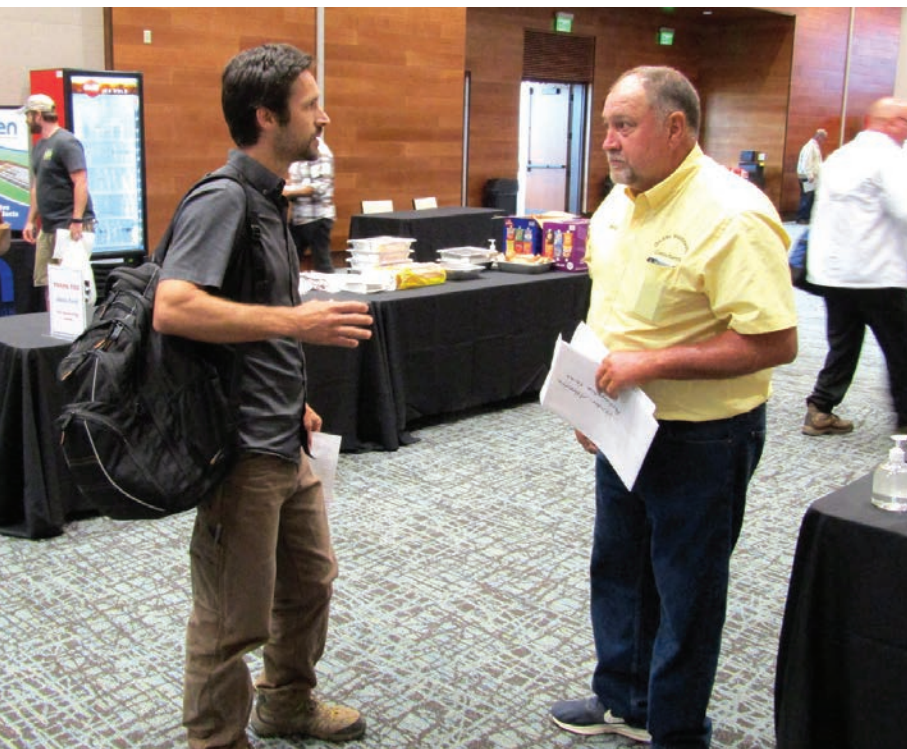
"When state officials refuse building or septic applications, many people don't understand why," says Kilgore. "I saw a huge demand for someone who could translate regulatory language into layman's terms." He functions as a mediator and watchdog, ensuring that regulations work for everyone and payees receive their money's worth.

The Kilgores are pleased with the new company's direction. "The challenges made us move forward, grasping and using every resource at hand to the fullest extent," says Harold.

REGULATORY PITFALLS

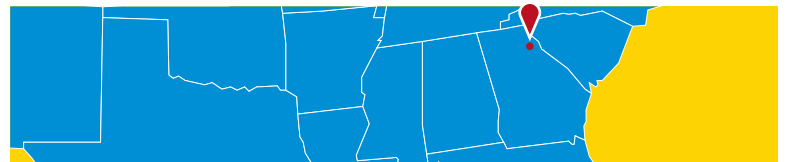
In 2021, the business had 100 residential and four commercial clients, but the numbers don't reflect the time involved. Almost all calls began with, "Why won't the county let me do what I want with my property?"

◀◀ Harold Kilgore talks to an installer at a regional onsite trade show where he was a program speaker. (Photo courtesy of Harold Kilgore)





◀ Harold Kilgore is at the controls of a Takeuchi excavator during a challenging installation on a sloped property. (Photo courtesy of Harold Kilgore)



On-site Wastewater Consultants

Carnesville, Georgia

- Owner:** Harold Kilgore
- Founded:** 2019
- Employees:** 3
- Service area:** Georgia
- Services:** Septic system consulting, planning, development, design, regulations, permits, education and training
- Website:** www.onsite-wastewater.com



“My job is to make sure he hears the whole story, not just the regulatory side. I want him to have a real world open-the-door-and-feel-the-dirt experience.”

Harold Kilgore

Kilgore spends the first consulting hour listening to the concerns of potential clients. “If we can help, we’ll establish a \$100 to \$1,000 budget to examine building or septic plans, test the soil, maybe meet with county officials to determine what else might be necessary and establish the project’s actual cost,” he says. “Most clients are willing to do this for a definitive answer to whether they’ll have a one- or five-bedroom home.”

However, county laws occasionally slip a wrench into the gears. For example, the state septic code specifies 50-foot setbacks from water bodies, so Kilgore was surprised when a client said Hall County officials had rejected a septic application late last year. He learned that the county had added 25 feet to the state setback, labeled the area an impervious buffer zone to mitigate runoff, and prohibited septic tanks and drainfields from being installed in those zones.

Kilgore asked some county commissioners how pervious onsite systems became part of the impervious buffer zone regulation and they didn’t know. “The Zoning and Planning rule allows underground utilities

▲ Harold Kilgore, right, reviews site plans with former managing partner Steve James during a residential install project. (Photos by Kaylenn Gilstrap)

and other service lines to pass through, over, and around the impervious area, so why not septic?” he says.

To date, state and county officials have always worked with Kilgore toward the common goal of a septic permit. “Sometimes we don’t agree, but they are always willing to listen and discuss how to apply regulations to what is needed,” he says. “This conversation is just beginning. Once the commission board shares its data, I may agree with the reasoning behind the rule.”

EDUCATION OPPORTUNITIES

While members of county commission boards and boards of health form a crucial part of regulatory compliance and rule adoption, Kilgore believes many don’t fully understand how onsite systems work because they are appointed or elected to their positions. For example, the president of the Hall County Board of Health works in the medical field and relies on health department inspectors and regulatory people to guide his decisions.

“My job is to make sure he hears the whole story, not just the regulatory side,” says Kilgore. “I want him to have a real world open-the-door-and-feel-the-dirt experience.”

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DIAGNOSING SYSTEM FAILURE

Installing and maintaining onsite systems for 40 years gave Harold Kilgore a tremendous opportunity to investigate discrepancies. As owner of Gravelator Systems and On-Site Wastewater Consultants, there aren't many conditions he hasn't seen.

"Finding the cause of septic failures became my holy grail," he says. "Whenever we did repairs or responded to problems, we'd investigate to learn what happened." Finding some answers took years.

For example, in the mid-2000s crews began seeing thicker, faster growing biomats in the first and second trenches. As they worked backward seeking the cause, they found effluent filters clogging before their time and solids accumulating in both tank chambers.

"Why this happened seems straightforward now, but it wasn't then because the failures were sporadic," says Kilgore. "However, it appeared as if the two-compartment tanks with filter weren't putting out clean enough effluent."

It took 17 years to process their findings. The issue began when the state introduced the two-compartment septic tank by inserting a baffle into the original single-compartment tank. "The baffle decreased the tank's working capacity, increased the depth of the scum and sludge layers, and pushed more suspended solids to the clarifying side," says Kilgore.

Many factors, such as serial fed, short drainfield lines, and certain soil conditions contributed to why the crews saw biomats growing faster than normal. However, they noticed that single-compartment tank systems appeared to fail less frequently.

Kilgore and son Heath saw the need for a septic tank that mimicked the single-compartment tank's length, incorporated a baffle and filter, but didn't develop quicker, thicker scum and sludge layers. The answer was their Serpentine double-pass tank.

"We lowered the profile, increased the length of runs, and still meet the 2/3 to 1/3 classification of compartmental tanks," says Kilgore. The state approved the design and seven tanks were installed as pilot projects throughout 2020-21. To date, the data collected for analysis shows the tanks appear to produce quality effluent.



▲ During a system install, Harold Kilgore smooths sand in a trench as technician David Thompson looks on.

After some educational enlightenment, members often thank Kilgore for explaining the situation. "How you present yourself and how you deliver your findings determine if you have a legitimate claim or if you are barking just to see who is the loudest dog," he says.

The keys to Kilgore's success are respecting people, treating them with dignity, and listening. "Potential clients want you to understand their concerns," he says. "They've met with other professionals who immediately wanted a target start date and down payment. After an hour of listening to them gratis, I have gained their trust."

Effective listening is learned, and Kilgore took a business class in 1989 with an instructor who taught how to listen, understand and work diligently as a team to achieve success. "I wouldn't be where I am

today if I didn't have a life partner who committed to everything I wanted to do, then we did it together," says Kilgore. "Whether it's marriage or business, you have to be all in or you'll fail."

A HELPING HAND

When large projects arise or issues require a stream of communications with state and county regulators, Kilgore relies on his managing partner, Steve James. Before retiring in 2017, James had been a Rabun County Environmental Health Department manager and onsite inspector for 31 years.

During that time, the men had developed a rapport based on similar thoughts. They believed regulations occasionally worked against consumers by increasing the state's enforcement powers instead of benefitting all concerned parties. "One day I invited

Steve to a consulting meeting and he was a natural,” says Kilgore. James also liked the fit, and On-site Wastewater Consultants was born two years later.

Besides consulting, the company specializes in planning and development, education and training, regulations and permits, and designing. Kilgore designs eight to 10 system per year for complex lots, and 30 to 40 less demanding systems based on the house location.

“We’re a one-stop shop,” says Kilgore. “It’s not unusual to work for people who have hired a septic contractor. These clients want someone who can consult with the installer, address issues that may arise and ensure they are getting what they paid for.” Kilgore’s ultimate goal is to form a relationship with an installation company, then refer them to clients looking for a contractor.

To date, the most interesting, tedious, time-consuming consultation job was a lakeside property in Gainesville. “Obtaining the septic permit took 15 months and involved legal issues, challenging the state’s definition of an onsite system, and satisfying numerous regulatory agencies,” says Kilgore. “Although stressful, it taught us so much about other government departments and people.”

LAYING GROUNDWORK

Whether enlightening homeowners and regulators or mentoring

“We have some 3,000 contractors in the state and many have technical schools nearby. Our goal is to offer training through all of them.”

Harold Kilgore

young installers, Kilgore has always been adamant about education. Twice a year, he does a two-hour, call-in radio show about onsite systems and related topics, such as how toilet paper is made. He’s always helped installers and answered their questions, but wasn’t involved in a continuing education program until contractors began expressing concerns about classes offered by the state.

Kilgore and James spoke to contractors who said they’d attend their classes provided they had comfortable chairs, a pleasant environment and proper meals. In 2019, they held their first onsite training class with 70 registrants.

In 2021, Tim McDonald, president of Lanier Technical Colleges, offered Hall Campus in Gainesville for the first of four separate sessions, which attracted 40 to 60 registrants each. Virgil Fancher, state CEU program manager, attended the first class and certified Kilgore’s program.



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➤ Harold Kilgore, right, and technician David Thompson roll geotextile fabric included in a system using Eljen A42 modules.



Assisted by McDonald, the 2021 venues expanded to include Chattahoochee Technical College and facilities at the Economic Development Center of Blairsville. "We have some 3,000 contractors in the state and many have technical schools nearby," says Kilgore. "Our goal is to offer training through all of them."

BRIGHT FUTURE

Looking ahead to 2023, Kilgore retained Natalie Connell, a former events coordinator for the Utah Building Trades. As part of promoting the friendly environment theme, they lowered enrollment fees, eliminated vendor fees and asked major corporations like Bobcat of Atlanta and local businesses for sponsorships. The responses have been positive.

Focusing on the future, the Kilgores concluded that now was the time to phase out hard physical labor and enjoy more of life. "We want to spend

time with our two grandchildren and travel a bit," says Kilgore, "but I'll always be dedicated to helping young installers learn the trade."



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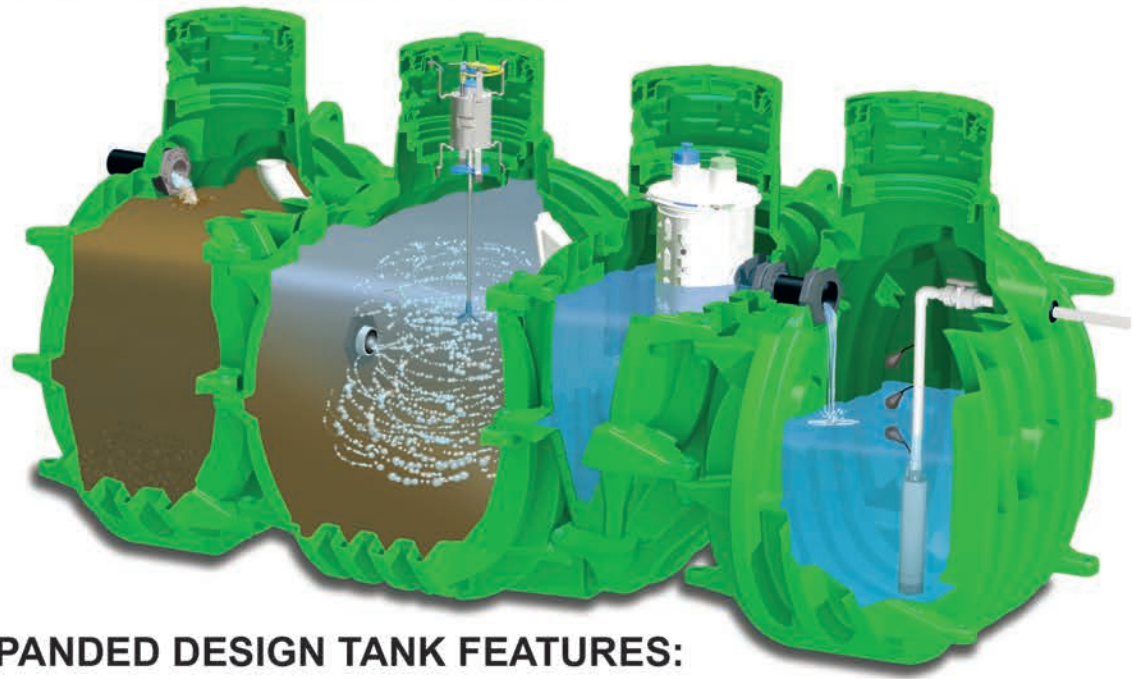
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Know When and How To Employ a Recirculating Media Filter

Additional effluent filtering can be a key component to successful treatment in difficult site conditions

By Jim Anderson and Dave Gustafson

We have had a couple of questions recently asking why recirculating media filters are used and where they are an appropriate choice for additional pretreatment of septic tank effluent. These questions have come from environmentally sensitive areas where additional treatment is being required for onsite systems. We thought it would be a good time to discuss recirculating filters, where they are most useful, and some considerations for installation.

As the name suggests, the system component recirculates septic tank effluent through a media filter several times before discharging to a final soil treatment and dispersal area. In the past, media in the filter was primarily sand and gravel. Now filter media may be sand, peat, textile sheets and a variety of other artificial products. Many of the textile, peat and other materials are proprietary products and must be installed and serviced by company-approved and trained personnel.

Landscaping should divert surface water away from the filter. Any amount of surface runoff entering the system could hydraulically overload the system.

A treatment train including an RMF would be water from the house into a septic tank where the septic tank allows solids to settle and some organic matter is decomposed resulting in biochemical oxygen demand of 170 mg/L and total suspended solids 60 mg/L. Effluent from the septic tank moves — usually by gravity — to the recirculation tank. Here the incoming septic tank effluent mixes with water that has been recirculated through the filter.

RECIRCULATING RATIO

Effluent from the recirculating tank is pumped repeatedly through a pressure distribution network in the lined, contained filter. Treated effluent is collected at the bottom of the filter and delivered back to the recirculation tank. The desired ratio is usually 5 treated to 1 septic tank effluent. When the liquid level in the recirculating tank reaches the full level, it is delivered by pump or gravity to the final soil treatment and dispersal area.

Additional treatment of the septic tank effluent occurs in the media filter. BOD and TSS are reduced to 20 mg/L for each. This is a significant improvement. In addition, there are other treatment advantages. Fecal coliform bacteria in the effluent is reduced from millions to 5,000 to 100,000. There is a 30 to 70% reduction in nitrogen levels and 10 to 30% reduction in phosphorus.

These bacteria and nutrient reduction numbers are why RMFs are sometimes required in environmentally sensitive areas such as shallow to bedrock or seasonally high-water tables near lakes, rivers, estuaries, groundwater recharge areas and wellhead protection areas. The reduced BOD and TSS levels make these components ideal for small lot areas, restaurants and other establishments. Also, RMFs have been successfully used to help recover drainfields that have failed due to excessive organic loading.

These systems are often used where nitrogen contamination is a problem. As the anaerobic septic tank effluent moves through the media filter, it becomes oxygenated and the ammonia in the effluent is changed to the nitrate form of nitrogen. When sent back to the recirculation tank, which is low in oxygen, the nitrates are broken down and nitrogen is released to the atmosphere, a process called denitrification.

MUST DRAIN FREELY

The filter itself is housed in a watertight container or liner. The proprietary products are contained in a tank or series of tanks, generally plastic. Concrete tanks are also used but these are usually constructed in place. If the filter is constructed in a lined excavation, it is typically made of 30 mil polyvinyl chloride. The filter is composed of 12 inches of drainfield rock where the pressure distribution system is located, 12-24 inches of drainage media (sand, or other media) and 12-18 inches of gravel at the bottom with the outlet piping.

Outflow from the filter constructed onsite is provided by a 4-inch pipe surrounded by drainfield rock. Proprietary products have their individual ways of providing the outflow drainage. It is important that effluent must drain freely out of the filter to maintain oxygen levels in the filter. If effluent backs up into the filter, the filter's effectiveness is reduced.

Filters constructed on site include a layer of landscape rock over the top, which helps keep the filter aerated. Site flexibility is one major advantage of these systems. They can be located in a relatively small area and the soil it is placed in doesn't matter as much since the filter is watertight. It can be put in disturbed or compacted areas, preserving better soil areas

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for final treatment and dispersal. Landscaping should divert surface water away from the filter. Any amount of surface runoff entering the system could hydraulically overload the system.

RMFs in general require more maintenance than conventional septic tank-drainfield systems. Maintenance includes inspecting flowmeters and the pump, recirculation tank, recirculation pump, distribution system in the filter, media and effluent quality. Tanks and piping will need to be periodically inspected — yearly at a minimum — to make sure the distribution system is working properly. The flowmeter should be read systematically to make sure the application rate is within design limits.

REPLACEMENT NEEDED?

Over time, the media in the filter may become plugged with solids or a buildup of organic matter. When this happens, the upper layer of media or perhaps the whole layer will need to be replaced with new media. Manufactured products will have specifications on when this should happen. For constructed-in-place filters, if the surface is growing a biomat, loading rates and septic tank effluent quality should be checked to see if it's within normal limits. If the amount of water delivered exceeds design specifications, water use must be cut back or the system enlarged. If everything is normal the media should be replaced.

For environmentally sensitive areas and problem sites, recirculating filters may be part of the solution for onsite waste treatment. □



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Engineering a Wastewater Solution to Serve 250 Workers

A new Indiana RV factory with serious flow requirements called for aerobic bacterial generators, large tanks and a significant drainfield area

By Scottie Dayton

An RV manufacturer needed an approved onsite design before constructing a new factory in Middlebury, Indiana. The architect and engineering firm hired Stuart Meade, owner of Meade Septic Design in nearby Goshen for the project.

Based on 250 employees, the state Department of Health estimated a design flow of 5,500 gpd. Meade's challenge was to design a system that maximized the undisturbed 22-acre lot for storing chassis, finished RVs and supplies.

The department allows a 33% reduction in the size of the drainfield if final effluent strength meets NSF 40 Standards. "I'm not a fan of reduction unless the proposed secondary treatment has proven to reduce the strength of wastewater," says Meade, who specified aerobic bacterial generators from SludgeHammer Group. Other challenges were the size of the system, the

factory's 5-foot-deep gravity sewers, and a three-day retention time for treatment. Meade's design included a lift station, dual treatment trains, dose tank and three zones of trenches using river-run stone. "It's still the gold standard for drainfields in this part of Indiana," he says.

Upon completion of the onsite system, the factory opened as scheduled.

Site conditions

Soils are loamy sand and sandy loam with a loading rate of 0.6 gpd per square foot.

System components

- 48-inch-diameter precast manhole with duplex 2 hp Omnivore grinder pumps (Liberty). Concrete products from Farmer Tank Precast.

◀◀ Based on the height of the two TUF-TITE risers, installer Kevin Miller of Quality Excavating trimmed the Polylok risers to within a half inch of grade. The custom riser on the dose tank was precast to match the height of the TUF-TITE risers. (Photos courtesy of Stuart Meade)



◀◀ Will Stoddard (center), of SludgeHammer, instructs Miller (left) and operator Luke Mullet of Quality Excavating how to install the aerobic bacterial generators.

✔ Two hose clamps secure the air hose to the nipple on the aeration pump and the extension at the base of the 1/2-inch 90-degree side outlet elbow. The black knob is the air pressure sensor.



System Profile

Location: Middlebury, Indiana

Facility served: RV factory

Designer: Stuart Meade, Meade Septic Design, Goshen, Indiana

Installer: Kevin Miller, Quality Excavating, Goshen, Indiana

Type of system: Gravity-flow stone and pipe

Site conditions: Loamy sand, sandy loam, loading rate 0.6 gpd per square foot

Hydraulic capacity: 5,550 gpd

- IFS triplex control panel (SJE Rhombus)
- Two 2,000-gallon dual-compartment concrete trash tanks with risers (TUF-TITE).
- Six 2,000-gallon concrete treatment tanks, each with two SludgeHammer S-600 aerobic bacterial generators. Remaining risers from Polylok.
- 13 HPL-80 linear air pumps (HiBlow USA)
- Two 2,000-gallon concrete clarifier/recirculation tanks, each with a PL525 effluent filter (Polylok)
- Two RCP-1FC pneumatic recirculation pumps (SludgeHammer Group)
- 2,000-gallon concrete equalization tank
- 2,000-gallon concrete dose tank with triplex 1/2 hp high-head effluent pumps (Zoeller Pump Co.)
- Effluent filter alarm and panel (Polylok)

System operation

Piping is 4-inch PVC Schedule 40 unless indicated otherwise.

Wastewater flows 24 feet from the factory's west gravity sewer and 88 feet from the east gravity sewer to the manhole. Automatic alternating pumps deliver a 47-gallon dose 560 feet through each 2-inch force main to the trash tanks at the head of the treatment trains.

Trash tank effluent gravity flows to the first of three treatment tanks, each with an aerobic bacterial generator at both ends of the tank. At the base of the treatment columns, air from a double-stake micro fine-bubble diffuser oxygenates and recirculates effluent while a proprietary blend of bacteria breaks down organic matter and accelerates digestion.

The recirculation pumps in the clarifiers continuously return 2 gpm through a 1-inch line to the first treatment tank. "The return rate averages 2,750 gpd, meaning 100% of the flow travels twice through the treatment train," says Meade. "Effluent entering the dose tank is well below the NSF 40 levels of BOD5 <25 mg/L, TSS 30 mg/L and pH 6-8."

Running the recirculation pumps 24/7 also eliminated the required time-dosed surge tank with duplex pumps on rails and a programmable

SYSTEM PROFILE



◀◀ Kevin Miller of Quality Excavating tests the latch release mechanism on the dose tank's access door with orange protective grating (Halliday Products).

▼ An electrician from Moyer Electric wires the duplex control panel, while Miller attaches an air line and Luke Mullet and Will Stoddard work on installing two air pumps per basin.



“(River-run stone is) still the gold standard for drainfields in this part of Indiana.”

Stuart Meade

logic controller and override. “Our solution saved the customer at least \$12,000,” says Meade.

Effluent from both treatment trains flow to the equalization tank, which connects to the dose tank with a 4-inch pipe 6 inches above the floor. “We did this to increase the dose tank’s capacity, and accommodate the required drainfield dose of one-third the design daily flow,” says Meade.

On-demand triplex pumps send the 1,857-gallon dose through 2-inch force mains to concrete distribution boxes supplying three zones. Each header line feeds seven 100-foot-long 4-inch perforated pipes on washed stone in 36-inch-wide trenches.

Installation

Kevin Miller, co-owner of Quality Excavating Corp. in Goshen, and operator Luke Mullet installed the system. “The real push in April was to finish work on the factory’s parking lot and traffic areas so the contractor could pave them,” says Miller.

The team used John Deere excavators. The 135G operator worked on trenches, header lines and distribution boxes. Miller used a Rugby 320SG laser and Depthmaster MC200 (Leica Geosystems) to control the grade as he dug a 6-foot-wide and 6-foot-deep trench for the parallel mains. The 60G with an Allied Ho-Pac and Sd40D roller (Ingersol Rand) fit inside the trench to compact the backfill under paved areas.

The 380G operator set the lift station, ran force mains, and set and backfilled tanks. The 650K bulldozer operator graded the area, and a Takeuchi TL12 V2 tracked loader dumped stone and fill.

Connecting the factory’s sewers to the 13-foot-high lift station and installing the mains took a little more than three days. Miller’s biggest challenge was finding enough pipe, which came from three suppliers.

Farmer Tank delivered four tank halves the first day, and eight tank halves on the second. “We dug and set a pair at a time,” says Miller. “Bedding wasn’t necessary as the site had beautiful sand, enabling us to finish in two and a half days.”

In June, the team installed the 21 trenches, header lines and force mains from the distribution boxes to the dose tank. Working in oppressive heat and tropical dew points, they completed a zone per day by rotating who operated the air-conditioned machines. The trenches used 378 tons of stone, 6 inches under the pipes and 2 inches covering them.

Part of the rapid turnaround was due to Miller’s 32-year relationship with Bill Hartsuff, environmental health supervisor at the Elkhart County Health Department. He allowed Miller to cover everything in the trenches except the heads, toes and a little of the middle sections for inspection.

In early August, Miller spent half a day installing risers. Using the 24-inch-diameter, 3-foot-tall TUF-TITE risers to establish grade, he trimmed the Polylok risers to within a half inch of it. Then Farmer Tank poured a 36-inch-tall riser for the dose tank and Miller attached the access door (Halliday Products).

Elkhart County requires an effluent filter with SmartFilter alarm switch in recirculation tanks, but Miller had a problem. Previously, the coupled wires corroded, triggering false alarms. Miller found the solution by buying heat-shrink butt connectors and Certi-Seal gel-filled coax service wire closures from TE Connectivity (CommScope). “Now I couple the round alarm wire in the closure with the flat low-voltage landscape wire and they stay sealed,” he says. The landscape wire sends a signal back to the alarm.

In preparation for the aerobic bacterial generators, Miller glued solid construction blocks to the top of the tank lids, then glued the air pump

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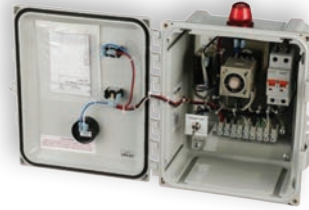
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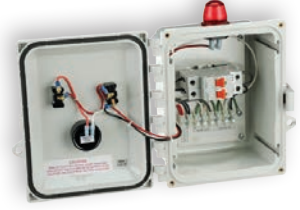
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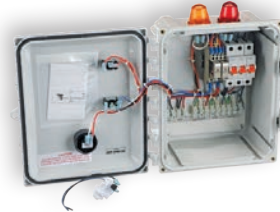
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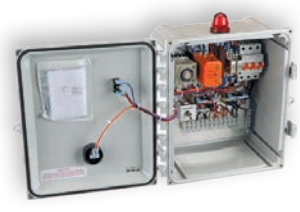
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basins to the blocks. To ensure they wouldn't move during backfilling, he put two masonry screw anchors (Tapcon) in the bottom of the basins.

Will Stoddard, vice president of SludgeHammer, arrived from Michigan to help Miller, as this was his first experience with them. "It was simple and we finished the first install in 50 minutes," says Miller.

Stoddard, Meade, and his worker, Kevin Hinkle, installed two air pumps per basin while Miller attached the 1/2-inch air lines. To expedite the procedure, he fabricated a service-friendly fitting, but only after spending several hours in a hardware store combining pipe fittings.

His foundation was an L-union and 1/2-inch 90-degree side outlet elbow. Two hose clamps secured the air hose, which slipped over an extension at the base of the outlet elbow and the nipple on the aeration pump. Then Miller worked backward from the union drilling holes in the basins. "There were no consistent measurements," he says. "I went from Point A to Point B 12 times, but each was a little different." The blowers were wired to one pneumatic alarm instead of a dozen.

Over the next two days, Miller and Mullet installed the rails and pumps for the lift station and dose tank, and ran wires to the triplex control panel. They final-graded them with native stone to keep out lawn mowers. "I didn't lay fabric under the stone because it's a nuisance if you later have to dig up something," says Miller.

Maintenance

Dervin Witmer, owner of Dig-It Excavating, holds the service agreement. □

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Federal Infrastructure Law Dedicates Billions To Onsite Wastewater Projects

By David Steinkraus

The Biden Administration has launched a pilot program to help communities improve their onsite infrastructure.

The program is a joint project of the U.S. Department of Agriculture and the Environmental Protection Agency, and money will come from the Bipartisan Infrastructure Law. It allocated \$55 billion for water projects including \$23 billion for the drinking water and clean water state revolving funds, \$7.1 billion for Western water (which includes water recycling and reuse), and \$1.8 billion for the Indian Health Service water and sewer program to fund domestic and community sanitation.

Eleven rural communities across the country will be sites for the pilot project: Lowndes and Greene counties in Alabama; Harlan County, Kentucky; Halifax and Duplin counties in North Carolina; Raleigh and McDowell counties in West Virginia; San Carlos Apache Tribe in Arizona; Doña Ana County and Santo Domingo Pueblo in New Mexico; and Bolivar County, Mississippi. People in these places lack basic wastewater management, news reports said.

Communities and tribes in the program will have help in solving their wastewater problems through creation of community solution plans, technical engineering support, and aid in pursuing funding.

Funding isn't enough to solve the problems, Sherry Bradley, director of the Alabama Bureau of Environmental Services, told CNN. Installers must know what they're doing, she said. "I've seen a lot of onsite failures because someone's brother or neighbor installed a system. Constant training of the homeowner is also needed."

New Hampshire

Homeowners will no longer be able to design their own septic systems under a law recently signed by Gov. Chris Sununu. Previously homeowners could do design work without a permit if they provided a reason why they were eligible to do so.

The new law also has two other provisions. One, state officials must formulate rules for the design of complex systems by professional engineers. Two, the law sets a deadline for state approval of onsite applications. Within 15 days of receiving onsite plans and application fees, the state must either approve the plans or send a notice requesting additional information. If the state doesn't send the notice in that time frame, plans will be considered approved. When the state receives any additional information it requested, it will have 15 days to approve or deny plans.

Oregon

The state Department of Environmental Quality will provide up to \$15 million in funds from the American Rescue Plan Act to help wildfire victims whose onsite systems were damaged.

Craft3, a community lender, launched a program that offers grant and loan programs, reported KTVZ news. DEQ provided \$2.1 million to Craft3 and will provide money to other aid organizations.

"This one-time funding is a real game-changer to assist rural property owners with the cost of repairing or replacing septic systems," said Deb Mailander, onsite program manager for DEQ. "The long-term environmental, public health and economic benefits from installing new septic systems and technologies is significant."

Virginia

As of July, the state Department of Health had budgeted nearly half of its funding for a program that helps low-income families repair failing wells and onsite systems.

Lance Gregory, director of water and wastewater services, said a surge of applications reflects the degree of need across the state, reported the *Virginia Mercury*. Assistance has been limited in the past, and although the state approves about 2,000 repair permits annually, he said, many people don't report failing systems.

The Virginia General Assembly allocated \$11.5 million in federal rescue funding for onsite and well work beginning early this year. Within the first four and a half months, the department received 192 applications for 202 well and septic projects, which are expected to cost roughly \$4.6 million.

Massachusetts

People around Buzzards Bay are now eligible for low-interest loans to upgrade onsite systems to nitrogen-reducing systems. Eligibility comes from language in the new state budget, reported the *Cape Cod Times*.

State residents were previously eligible for such loans only when their onsite systems were failing. Loans are available through local boards of health. Interest rates vary from zero to 5%, and loans can be repaid over the course of several years.

Hawaii

J. Kalani English, 55, former majority leader of the state Senate, was scheduled to start a 40-month prison term in August after being convicted in a corruption case related to wastewater legislation.

Federal prosecutors said that between 2014 and 2021, English (D-Hana) accepted \$18,305 in cash from Milton J. Choy, president of H2O Process Systems, an industrial cleaning company. English admitted to managing legislation about the state's cesspool replacement program so it would benefit Choy's company. He also provided intelligence to the company, reported the *Honolulu Star-Advertiser*.

English must forfeit \$13,305 in bribes. He had already turned over

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\$5,000. U.S. District Judge Susan Oki Mollway fined English \$100,000 during his sentencing hearing.

“Kalani English sold the power and prestige of his position as majority leader of the Hawaii state Senate and betrayed his oath as an elected representative of the people of Hawaii,” U.S. Attorney Ken Sorenson told Mollway. “We submit this betrayal has caused an even greater crisis in confidence in our elected officials.”

Choy is tangled in a separate federal corruption case and helped FBI agents with the arrest of English. Also caught in the wastewater corruption case was former state Rep. Ty Cullen (D-Waipahu), 41, once chairman of the House Committee on Finance.

Oklahoma

Improper installation of aerobic onsite systems led to the suspension of an installer’s license by the state Department of Environmental Quality.

Garrison Shann installed at least 70 systems incorrectly in Payne and Noble counties, news reports said. Of those systems, 15 were determined to pose an immediate threat to public health and were part of an emergency order. DEQ ordered Shann to stop installing systems, to bring the 15 systems into compliance, and to pay a \$31,500 penalty plus past due permit fees.

Records show Shann agreed in 2017 to purchase Aerobic Systems of Stillwater but since May has not made payments for the business, reported public radio station KOSU.


DEQ said its investigation into Shann was continuing. □

“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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So Many Installers and Pumpers are Retiring. Who's Going To Step Up?

Missouri reflects the dismal manpower shortages found throughout North America. Young wastewater technicians are desperately needed.

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 Missouri Smallflows Organization.

Mike Lile
general manager

Business: Reed's Plumbing and Excavating,
Springfield, Missouri

Age: 43

Services we offer: For septic systems, we do pumping, servicing, installation and maintenance. We also service grease traps and handle anything related to plumbing.

Years in the industry: 25

Association involvement:

I've been a member of the Missouri Smallflows Organization since 2007.

Benefits of belonging to the association:

It helps keep you up to date with the new rules, regulations and technology. It keeps you in the loop with the manufacturers and what's available as far as products and materials. There's also the training and educational seminars. It provides you with a lot of information.

Biggest issue facing your association right now:

Finding and keeping qualified help to provide the services is the biggest issue facing our members these days.

Our crew includes:

Shannon Crane and Kendall San Paolo are installers and Robbie Wyrick is our pumper.

Typical day on the job:

I'm generally meeting with customers on wastewater issues and excavation work. I oversee the office personnel and the managers of our three departments — excavation (which includes anything from installing risers to putting a



▲ General manager Mike Lile is flanked by installers Shannon Crane (left) and Kendall San Paolo (right). (Photo courtesy of Reed's Plumbing and Excavating)

septic system in), plumbing service work and new construction/commercial plumbing. I also fill in wherever needed to see that the jobs get done.

The job I'll never forget:

We worked on a property once that had a natural spring on it and it was set between two creeks. So, it gave me a real small area to put the septic system in. I managed to get it in there and meet all the setbacks with six inches to spare between both creeks — the spring setback, the well setback and the setback to the foundation of the home. It took a lot of planning.

Other unforgettable jobs have involved systems that were not installed by us but we got called to figure out reasonable solutions to problems that

developed rather than having to replace the systems. It's usually groundwater issues or poor craftsmanship on the installation. For example, on some step-down systems we were able to put a drop box or D-box in to take some of the stress off the one or two lateral lines doing most of the work to where it was distributing over the whole lateral field equally. I probably get five to eight of those a year.

My favorite piece of equipment:

Skid-steers and mini-excavators are really versatile, low impact and easy to haul. We used to use backhoes but the mini-excavator has taken over. If you add the cost of buying a skid-steer and a mini-excavator, it is more expensive than purchasing a backhoe, but you can make that up on the installation time and labor. And it does a neater job, a cleaner job on the backfill and cleanup side of the project. We've got four Caterpillar skid-steers and one CASE and four Caterpillar mini-excavators.

Most challenging site I've worked on:

On one project I had to deal with a lot of excess runoff surface water and groundwater. There was absolutely nowhere else to install the two tanks. We could get the lateral field up out of the drainage area but not the tanks. That posed a problem because with that came the risk of losing the tanks from being watertight. It was a pump-to-gravity system. It had a conventional

lateral field but pumped up to them. When it flooded, it would get extremely close to those tanks. The first part of the solution was to get a good quality tank, which we got through Stewart Concrete. Then we spent a lot of time ensuring the risers and electrical conduit were watertight.

Oops, I wish I could take this one back:

The way I look at it, there's never really a mistake. It's all in how you take it. If it's not a profitable job, you have to look at it from a different perspective — what you learned from it and the experience you got which helps you make better decisions in the future. And it helps you figure out what's going on with somebody who's having issues with a system. Somehow, some way it benefits you, even if it wasn't financially.

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

The most common question we get is, "Is this covered under insurance?" In one case it was. There was an old house. Lightning hit a tree, went down the roots that had grown in the septic tank, went up the pipe and then blew the toilet off the floor. It happened in the middle of the night. Insurance covered it. They put a whole new septic system in.

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

One regulation that we don't have that we should is that homeowners and

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SNAPSHOT

commercial property owners should have to prove they're maintaining their septic systems. In the long run, it benefits the homeowner and the general public.

Best piece of small business advice I've heard:

Good communication with the customer is critical. I've learned that over the years.

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

My interests have changed a lot over the years but right now I'd say it would be doing some kind of financial investment work — real estate, stock market, finance.

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

There's always going to be a need for this industry. It's essential for public health. But right now there's not a lot of interest by the younger generation to fill in those positions being vacated by retirees or to handle the growth in the industry. On the bright side, with the lack of water and drought conditions in the western half of the United States, I wouldn't be surprised if technology — sooner rather than later — would arise where wastewater is recycled and reused instead of letting it out in the environment and returning it to rivers and lakes. □



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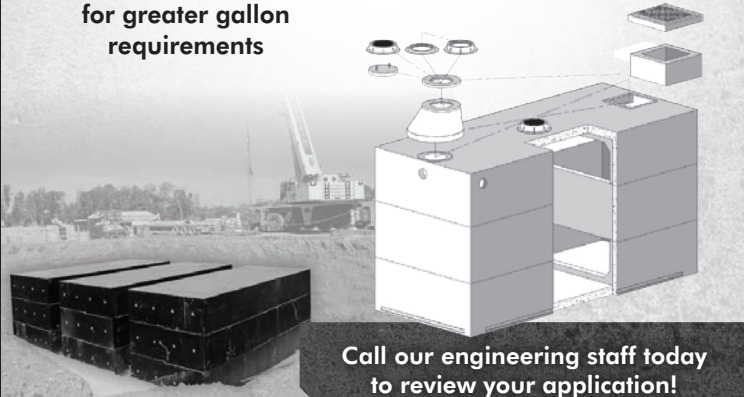
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Cyclone Septics
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Shades of Sherwood Campground in Zumbota, MN

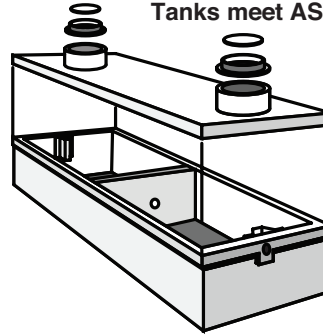
2- 38,000 gallon septic tanks, 20,000 gallon pump tank,
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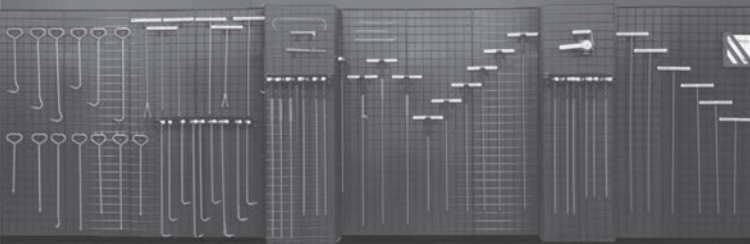


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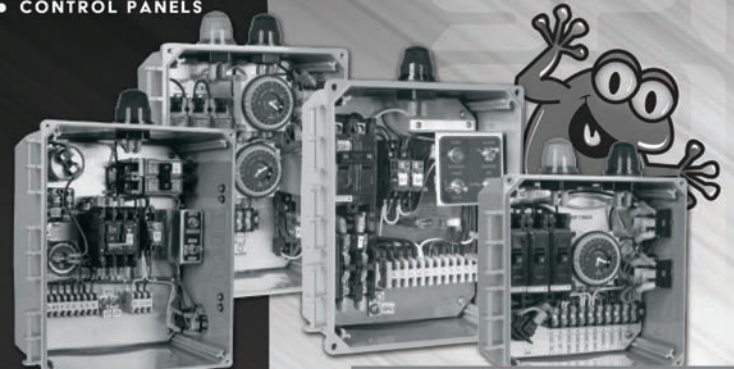
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IOWA

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

KANSAS

Kansas Small Flows Association;
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Kentucky Onsite Wastewater Association;
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MAINE

Maine Association of Site Evaluators;
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Granite State Onsite Wastewater Association;
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NEW MEXICO

Professional Onsite Wastewater Reuse Association of New Mexico;
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Long Island Liquid Waste Association, Inc.;
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OREGON

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www.o2wa.org; 541-389-6692

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Pennsylvania Association of Sewage Enforcement Officers;
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Pennsylvania Onsite Wastewater Recycling Association;
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British Columbia Onsite Wastewater Association;
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WCOWMA Onsite Wastewater Management of B.C.;
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Manitoba Onsite Wastewater Management Association;
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NEW BRUNSWICK

New Brunswick Association of Onsite Wastewater Professionals;
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NOVA SCOTIA

Waste Water Nova Scotia;
www.wwns.ca; 902-246-2131

ONTARIO

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

Ontario Association of Sewage Industry Services;
www.oasisontario.on.ca; 877-202-0082

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Saskatchewan Onsite Wastewater Management Association;
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PRODUCT NEWS

PRODUCT SPOTLIGHT

Foam media biofilter designed as an economical alternative

By Tim Dobbins



For more than two decades, Anua AeroCell Open Cell Foam Biofilters have been utilized in residential and commercial septic situations requiring enhanced nitrogen removal. The new A400 Series pod follows suit, remaining efficient and effective.

“The foam media provides a highly porous structure to support oxygen transfer and microbial attachment,” says Colin Bishop, CEO of Anua.

The synthetic media is designed to allow free air flow and water movement by providing large, open surface area, which the company claims creates an environment where diverse microorganisms can flourish, generating better treatment under passive conditions.

The system begins with pretreatment of domestic sewage using a septic tank equipped with an effluent filter that utilizes a 1/32-inch filtration on the outlet. The primary treated effluent then moves into a dosing tank where a pump doses the screened effluent to the treatment pod. The effluent dosing occurs in short, frequent durations over a 24-hour period, utilizing a control panel with a repeat cycle timer.

“Once sprayed, the effluent moves via gravity down through the open cell foam media where natural microbiological processes occur that provide high level treatment,” Bishop says. “After passing through the full depth of media, the effluent travels to the bottom of the pod and the flow is split with 80% back into the treatment stream and 20% to the final dispersal point.”

An A400 pod measures just over 7-feet long by 4 1/2-feet wide by 2 1/2-feet tall. They are designed to handle a typical flow of 400 gpd and a peak flow of 600 gpd.

Other configurations and sizes of the A400 series are available for greater capacity and higher flow needs with the largest residential configuration containing three A400 pods in a series, capable of handling peak flow of 1,800 gpd.

The versatility in size and arrangement make them suitable for a wide range of uses including, single- or multi-family homes, small commercial operations, churches, schools and intermittent uses such as vacation homes and campgrounds.

Bishop says customers have responded well to the product. “Installers really like that the pods are preassembled, low profile and lightweight. It makes them easy to ship, easy to install, and easy to maintain,” he says. 336-547-9338; www.anuainternational.com

Little Giant next gen 5-MSP submersible utility pump

Franklin Electric launched the next generation of Little Giant 5-MSP compact submersible utility pump. The new pump offers the same compact size yet features a new motor designed to boost the pump’s overall performance and efficiency. The 5-MSP, launched in 1980, is utilized for water circulation in ponds, fountains, water displays and hydroponics. A permanent split capacitor motor operates without oil, creating a more environmentally stable unit that is better suited for outdoor living applications. It also runs more efficiently, delivering the same or better pumping capacity than the original 5-MSP, but at greater depths, and provides continuous-duty rated operation. 800-701-7894; www.littlegiant.com



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By Craig Mandli

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Ditch Witch RT70

The Ditch Witch RT70 ride-on trencher is equipped with features that increase operator comfort and visibility, helping to boost efficiency on the job site. 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. 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. Powered by a 72 hp Yanmar Tier 4 Stage V-compliant diesel engine and built with a narrow footprint of 73 inches wide, the rubber-tire trencher can handle heavy-duty jobs and maneuver in tight sites often found on septic system installation jobs. 580-336-4402; www.ditchwitch.com



John Deere 350 and 380 P-Tier

The 350 P-Tier and 380 P-Tier mid-sized excavators from John Deere offer SmartGrade technology as a factory option and field upgrade kits, and the user can choose from 2D or 3D guidance, or 2D or 3D SmartGrade Ready Control.

Overdig protect limits the bucket's cutting edge from going below the target design surface. Visibility around the machines has been improved with the option of a right, rear and left camera system with LED surround lighting that provides 270-degree visibility and is integrated into the cab's primary display. In an effort to lower daily operating costs, the machines' fuel economy is up 7% compared to previous models via electric on-demand cooling fans that reduce engine load, in-line after treatment for less restriction and system complexity, and increased front piping diameter to cut down hydraulic restriction. 800-503-3373; www.johndeere.com

Kobelco Construction Machinery USA SK75SR-7

The SK75SR-7 from Kobelco Construction Machinery USA has power, fuel economy and features to tackle jobs in tight spaces. With a dynamic digging force of 15,900 pounds and a 37% increase in digging speed, it delivers continuous operation and reduces cycle times. The unit maintains productivity and efficiency while working at high power levels, lifting heavy loads and traveling on steep grades. It includes an optimized control layout with a jog dial and 10-inch color monitor, built-in rear-, left- and right-side cameras with a customizable split-screen display function to enhance operator awareness and job site safety, and a standard ergonomic lever and air ride suspension seat to reduce operating force and fatigue by 25%. Enhanced multi-function capabilities include an attachment selection system with adjustable flow-rate presets for the bucket, breaker, nibbler and thumb, allowing the operator to change between tools quickly and easily. 281-888-8430; www.kobelco-usa.com





Volvo Construction Equipment EWR130E

The Volvo Construction Equipment EWR130E mid-sized wheeled excavator provides a short front and rear swing radius without compromising on lifting performance or digging force, according to Volvo. The rear swing is 5 feet 1 inch and a

front swing of 5 feet 11 inches. Coupled with new four-wheel steering and in-line outrigger options, the machine is easy to control and stable, Volvo reports. Its uses include urban jobs where frequent roading is required, and confined job sites or roads where traffic safety is paramount. The inline outriggers help position and stabilize the machine in tight spaces. A divided blade option provides additional leveling on uneven ground or around curbs. The standard two-piece boom enables lifting up to 9,480 pounds at a 19.7-foot reach. 828-650-2000; www.volvo.com/constructionequipment

HAND TOOL

T&T Tools Mighty Probe

The Mighty Probe from T&T Tools has a 3/8-inch hex rod (approximately 20% stiffer than a round rod) or a 7/16-inch hex rod (approximately twice as stiff as the standard round rod). Stiffer hex rods bend less to make the probe easier to push into the ground, especially when probing at deeper depths. Lengths are available from 36 to 78 inches in 6-inch increments. When the probe is combined with a slide adapter, an integrated mini slide-hammer probe is created, allowing technicians to pound through difficult spots. 800-521-6893; www.mightyprobe.com



INSPECTION EQUIPMENT

Milwaukee Tool M18 Modular Pipeline Inspection System

The Milwaukee Tool M18 Modular Pipeline Inspection System is built around the M18 500 GB Control Hub, which powers the reels and easily swaps between the reels for added versatility.



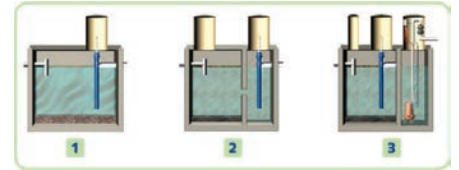
Available in 120- and 200-foot mid-stiff, and 200- and 325-foot stiff reels, technicians can inspect 2- to 10-inch sewer and drainlines on one system. Each reel features a high resolution camera, and the 1080p HD self-leveling camera head features high-intensity LEDs for better visibility down the line. The push cable is built to withstand harsh conditions when navigating through cast iron, clay and PVC pipes. Technicians can digitally pan and zoom up to 4X, making it easier to narrow in on the point of interest. View, record, edit and share HD images and video recordings from the wireless monitor or the free Milwaukee Pipeline Inspection app on a mobile device. 800-729-3878; www.milwaukeetool.com

SEPTIC FILTERS

BioMicrobics SaniTEE

The SaniTEE from BioMicrobics is designed to be an efficient, nonclog effluent screen that deflects solids

back into a tank while simultaneously attenuating surge flow. It drops into a standard 4-inch septic tank (for new builds or retrofitted) outlet tee. It is easily cleaned with the clean-in-place swab handle with a Buna-N disk fastened to the shaft. Move the swab handle up and down to pass the swab through the center several times to act as a reverse pump to dislodge any debris in the filter or angled slots. No removal or running water is necessary. Solids touching the vertical surface of the screen tend to slough off and fall back into the septic tank. In this way, the device is somewhat self-cleaning. In general, the 4-, 8- and 16-inch device should be for use on conventional and advanced septic systems; and is suitable for all types of commercial (high-strength) wastewater treatment systems. 800-753-3278; www.biomicrobics.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 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

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PRODUCT FOCUS

Watercore C4C

C4C effluent filters from Watercore can be cleaned without removal from their housing, eliminating mess and contact with effluent. The filter utilizes an internal wheel design featuring multiple blades that protrude through each vertical filtering slot. The wheel is attached to a hollow tube that extends out the top of the filter and has a handle attached. Simply moving the handle up and down moves the blades through the slots, cleaning the filter. In addition, a garden hose can be attached directly to the handle, allowing water to flow through an internal perforated tube and spray through the filtering slot to further rinse the filter if needed. They can handle 800 gpd with a 1/16-inch filtration. The outlet port on the tee baffle accepts 3- and 4-inch Schedule 40 PVC and 4-inch SDR with no adapters needed. Filters can be purchased as a complete unit or components can be bought separately. 812-493-4550; www.watercorefilter.com



SEPTIC TANK AGITATOR

Crust Busters agitator

The handheld power agitator from Crust Busters has an 80-inch shaft and two- or three-blade propeller designed to mix a 1,000-gallon septic tank in five minutes. Options include 2-, 4-, 6- and 9-foot extensions and a short three-blade shaft that adapts to the two-blade unit. 763-878-2296; www.crustbusters.com



SLUDGE SAMPLING EQUIPMENT

Sim/Tech Filter TruCore

The TruCore from Sim/Tech Filter is a large-diameter, accurate, user-friendly sludge sampler designed for sludge common to septic tanks. It allows samples to be taken quickly without creating excessive turbulence, as there are no restrictions caused by valves, stoppers or flaps. With a 1 3/8-inch I.D., the capacity per foot is almost 10 ounces. The straight-through design allows sample to be effortlessly returned to the tank. The unit is made of a polycarbonate sampling tube (marked every foot) and PVC fittings. It comes as a single-piece, 8-foot unit or as two 4-foot units that slip together. Custom sizes and configurations are available. A simple and customizable extension kit is available for deeply buried tanks. 888-999-3290; www.simtechfilter.com



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Precast Tanks Provide Complete Home Water Solution

Challenge: A rural, mountainous area in Colorado requires a septic system, fire suppression tank and potable water tank to be installed on each property with new home construction.

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Photo courtesy SI Precast Concrete

Quality-Engineered: Precast tanks are designed and engineered to the latest industry standards, use quality raw materials and are manufactured in accordance with strict QA/QC programs, providing strong and durable solutions that stand the test of time.

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