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SHOW ISSUE

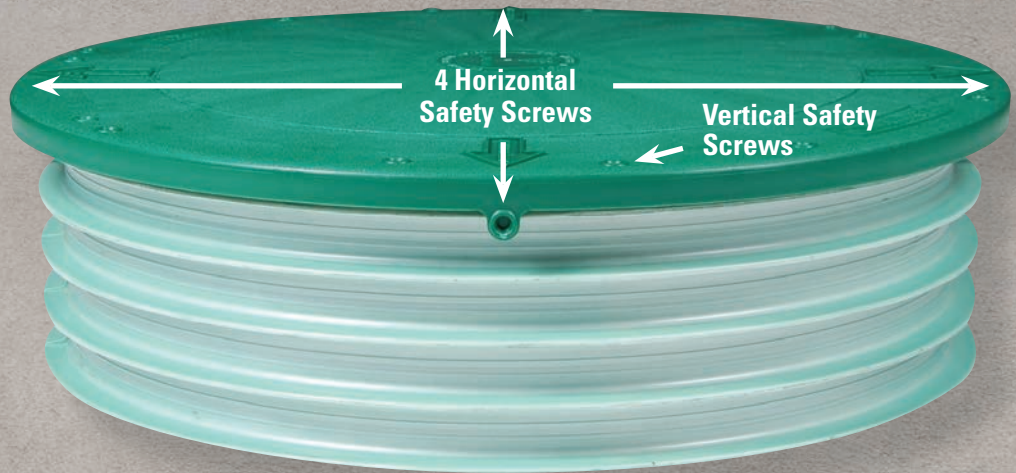
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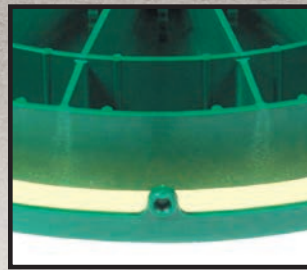
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INSTALLER PROFILE:

A Job Well Done

By David Steinkraus

ON THE COVER:

Florida's Martin Septic Service right-sizes a hardworking family operation to focus on quality installs and customer care. Owners Martin and Cindy Guffey are shown at a work site with a Kubota excavator in the background. (Photo by Heidi Kurpiela)

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Enjoy this issue!

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.

WWETT Your Appetite for the Biggest Show in Wastewater

Top tips for building your business by attending the WWETT Show; it's all about the equipment and the education opportunities

The deep winter is a great time for most installers to address two things that are set aside during the busy season: fix the equipment and feed the mind.

Sure, some installers are still putting in long hours in the field due to the strong economy, but many are enjoying a winter lull as the phone isn't ringing with potential customers or the ground is frozen solid, preventing any progress.

I'm sure you are already addressing equipment maintenance — changing hoses and belts, and cleaning and tuning up the excavators and backhoes that work so hard the rest of the year. Now it's time to invest in yourself and your crew, enriching your knowledge of the industry and collecting necessary continuing education credits. And one of the best journeys on the road to self-improvement starts with a visit to the Water & Wastewater

Equipment, Treatment & Transport (WWETT) Show in Indianapolis.

The biggest show in wastewater will be held Feb. 17-20 at the Indiana Convention Center. It will feature 600 exhibitors showcasing the latest in equipment, including many companies serving installers. The show also includes more than 100 education seminars, many that qualify for required state continuing education credits. For an overview of the show, you can visit the website, www.wwettshow.com.

But I also like to take some time to research the WWETT Show and help installers home in on some of the best ways they can spend their time while in Indy. And I'm not talking about the hundreds of restaurants, brewpubs and other great attractions the Crossroads of America city has to offer. The 2020 WWETT Show is rich with equipment and education experiences to help you build a successful wastewater business.

Here are a few suggestions:

Find a new technology to promote back home

I'm told that health and environment officials in many states are behind the times when it comes to accepting new onsite technologies. Change is difficult, and these departments are sometimes overworked and understaffed, they suffer turnover like any business does, and it's just easier to stick to a few tried-and-true onsite treatment solutions. The WWETT Show affords installers the chance to see all the latest and greatest treatment systems in person and get the lowdown on performance from the vendors who know the technology best.

This is why I'm forever preaching that the exhibit floor gives folks in our industry a great opportunity to focus on new products that promise to work well in each unique region across North America. Learn all you can about systems yet to be approved by your local regulators, and be prepared to present your



findings when you return from the show. Work with decision-makers and maybe you can create a partnership to start testing a wider variety of treatment options that will better serve your onsite customers. As we evolve and grow, we show decentralized wastewater treatment is a viable solution for more and more homeowners and businesses.

Show off your mad excavator skills

Watching the best machine operators in the nation work their way through excavator challenges during the annual Roe-D-Hoe competition is mesmerizing. The event, held in Lucas Oil Stadium, home of the Indianapolis Colts, has to be a WWETT Show highlight for spectators and participants alike. And what's coolest is that for \$5, anyone can get behind the controls of a machine and prove he or she has the chops to win the championship belt. The event is put on by the National Onsite Wastewater Recycling Association and is sponsored by SALCOR.

Entrants, including winners of state Roe-D-Hoe competitions, are timed in several exercises, maneuvering small objects on the end of a machine bucket. Preliminaries will be held on Feb. 18 and 19, with finalists going head-to-head on the afternoon of Feb. 19. Top finishers win \$1,000 in cash and Roe-D-Hoe belt buckles. Just to recap the 2019 competition, the top finishers were (first place) John Moore of A&J Services, Zanesville, Ohio; Paul Willis of White Wolf Trucking and Excavating, Washington, Massachusetts; and Albert Breech of Breech's Septic & Excavating, Lucasville, Ohio.

Attend three education tracks aimed at installers

Many states offer continuing education credits for wastewater professionals who attend education tracks at the WWETT Show. This year, three tracks should be attractive to installers. Here's a brief rundown of each group of seminars with descriptions provided by the trade groups that organize them:

NOWRA

- Design for Pressure Distribution

Low-pressure pipe systems use a pump to move effluent to an infiltrative surface under pressure. The goal of this approach is to uniformly dose and then rest this surface multiple times per day. Special areas of concern, such as designs on sloping lots and in freezing conditions, will be discussed.

- Introduction to Key Soil Properties for Design

Soil is an integral component of onsite wastewater systems. Discussion of fundamental soil properties such as texture, clay mineralogy, color and soil structure of the internal soil profile will be presented along with soil landscape characteristics. Information about soil properties, landscape position and geometry, which influence treatment and dispersal of effluent, will be provided.

- Making Infiltrative Decisions During Design

The design of onsite systems is often very prescriptive; codes dictate many aspects of the design. However, the design of the infiltrative surface is one variable that designers are expected to be able to make decisions on. Soil depth, type, siting location, wastewater characteristics and many other variables need to be well understood to provide a system that will have good longevity and, more important, protect public health.

Watching the best machine operators in the nation work their way through excavator challenges during the annual Roe-D-Hoe competition is mesmerizing. ... And what's coolest is that for \$5, anyone can get behind the controls of a machine and prove he or she has the chops to win the championship belt.

- Principles of Water Movement in Soil Treatment Systems

The movement of water in soils is complex and multifaceted. Essentially water moves as saturated flow or unsaturated flow. The role of gravity and pressure dosing of effluent for dispersal will be discussed relative to the influence of water and effluent movement in soil treatment areas.

- The Essentials of Septic Tank Design

The design of the septic tank is key to the effectiveness of the entire onsite system. The course will examine how tank designs have evolved and what are the essential key aspects for an effective septic tank, going beyond conventional tanks and discussing newer technologies that can be incorporated into the septic tank to increase its effectiveness and expand its capacities.

National Association of Wastewater Technicians (NAWT)

- Installing a System That "Needs a Lift"

This session will discuss correctly installing an onsite system with a pump. Learn about the different types of pumps, how they are sized and how to manage the dose volumes to ensure a successful pump system installation.

- Installing Effective Technology Components

Discuss what the installer will need to know about installing different technologies, understanding the many choices for technologies and methods used to ensure a successful install, and the differing fundamentals for aerobic treatment units, media filters and soil replacement systems.

- Introduction to the Art of Installation

The installer needs to have a complete understanding of all aspects of an onsite wastewater treatment system, from design to operation — including the concepts, regulations, designs, maintenance, operations and use of the system. The installer has experience with regulators, system designs, local soil conditions, approved technologies and system performance.

- Soils and the Installer – What You Need to Know

The installer gets the best information once they start digging regarding what the entire site actually consists of for soils. Being able to quickly and confidently identify discrepancies in the soils and communicate concerns back to the designer and regulators can save everyone time, money and future failures.

continued >>

- **What Are the Soils Telling Us?**

More complex ideas will be discussed in detail: how to interpret the soils with your hands, understanding the plastic limit in the soil, how to run a correct and effective percolation test, how to calculate the percentage of rock in the soil, and understanding what elevations mean and how to measure and apply them correctly.

Wastewater Education 501c3 Onsite Wastewater Inspection

- **Legality, Liability, Professional Ethics and Common Sense Best Practices**

A system inspection can be triggered by several events. Why and who has requested the inspection has a direct bearing on who gets the final report. Learn the who, what, where and when of inspections and be provided with the legal lessons of how to avoid a costly mistake.

- **Step-by-Step Guide to Locating and Recording the Condition of Treatment Field and Treatment Components**

Detailed look at the techniques and safety issues involved with inspecting treatment fields and components utilizing video and virtual reality, focusing on difficult sites and difficult situations, cold-weather inspections, clay soils, and overgrown and damaged sites.

- **Step-by-Step Guide to Locating and Recording the Condition of All System Components**

How do you conduct an inspection in winter? What if the property has sat unoccupied for an extended period? What if there's been a fire, a flood? What if there has been illegal activity on the site? Attendees follow an actual inspection from start to finish.

Quick picks: Three intriguing seminars for installers

I like to scan the WWETT Show's more than 100 seminars, looking for unusual choices for installers in attendance. This year a few business-building seminars caught my eye, specifically classes aimed at attracting more young people to this vital profession and developing them to take over for an aging group of installers. This is one of the biggest challenges we will face in the coming decade. Check out these three quick picks you might otherwise not notice:

- **Creating Great Techs From the Younger Workforce**

Speakers Al Levi, CEO, and Jim Criniti, president, of Zoom Drain in Norristown, Pennsylvania, promise to unlock the keys to attracting millennial workers, those between ages 20 and 40, as wastewater industry technicians. They will explain how to recognize top talent within your company and exceptional new hires, follow best hiring practices to land good workers, and create a company culture that will make them want to stay.

- **Quality of Life: The New Employee Retention Model**

Presenter Rodney Koop, founder of The New Flat Rate, will focus on successful recruitment and retention tactics to hire good workers when there is a shortage of candidates. Among other principles, he will explain why "throwing money at employees" is not a good idea and how to adopt powerful retention methods.

- **The Fortune Is the Follow-Up**

Kerry Heaps, president of Pitch Like a B*tch Media, Port St. John, Florida, will give an overview of successful techniques to follow up with customers after making an initial contact. She will explain common follow-up mistakes, when that next contact should be made, and create a follow-up plan for each potential customer and a follow-up system for internal use. □

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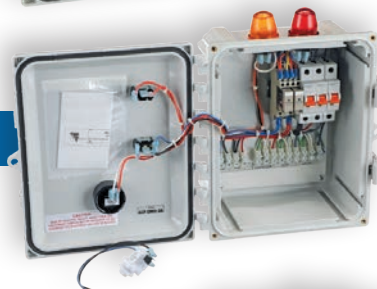
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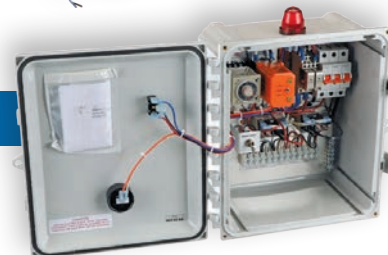
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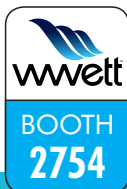
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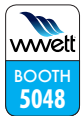


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SHARING KNOWLEDGE

Installer Tips and Tricks

When Joe Karthein started installing septic systems, he took courses, read magazines, and asked his mentors every question he could think of. But he still wished there was one comprehensive list of tips he could learn from. To help others in the same position, he wrote up some of his best tips and tricks for installation and excavating. onsiteinstaller.com/featured



Overheard Online

“My relationship with Realtors has achieved outstanding results. Today, we do three or four inspections a week, and half the systems need something fixed.”

– 3 Ways for Installers to Build Better Professional Relationships
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WATERTIGHT TANKS

Joining Seams

Many tanks are constructed in two pieces that are joined either before the tank is delivered or after it arrives at the site. Whether it's a top-seam or midseam tank, concrete or fiberglass-reinforced plastic, the seam must be rendered watertight for proper septic system function. Here's what you need to know. onsiteinstaller.com/featured



SMALL AND SPECIALIZED

Right-Sizing the Business

For Martin and Cindy Guffey, bigger isn't always better. The owners of Martin Septic Service, featured in this month's issue, had a much larger company at one point. Read this exclusive online story about how depending on one industry both grew and hurt the company, and why they stay small today. onsiteinstaller.com/featured

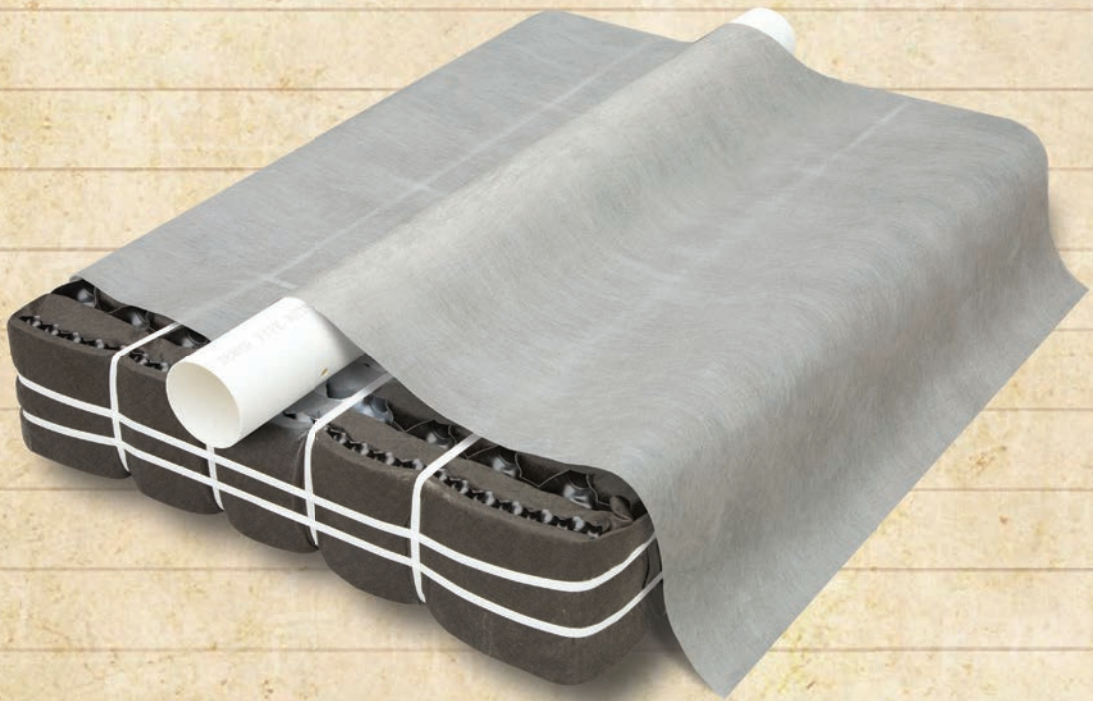
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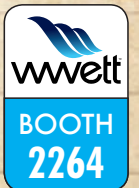
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—Albert Einstein



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◀ Martin and Cindy Guffey
(Photos by Heidi Kurpiela and
Martin Septic Service)

A JOB WELL DONE

The business became more rewarding when Martin and Cindy Guffey trimmed their staff and narrowed their focus to onsite work

By David Steinkraus

A decade ago, Martin Septic Service was a large and diverse wastewater services provider. Through circumstances and choice, it's now much smaller. But now it's also just the right size for its market and workload. And it's specialized enough so competition isn't a large problem.

It's taken Martin and Cindy Guffey many years to get the business to this point, and what they found is a sweet spot that enables them to be happy, do good work and understand what they don't want to do. Before the 2008 recession, the company had 63 employees and was heavily involved in

the homebuilding boom that was concentrated in part around North Port, Florida. Now Martin Septic is down to 15 people.

GRAVITY RULES

The majority of systems Martin Septic installs in its five-county territory around North Port are standard septic systems, says Cindy Guffey, vice president and co-owner of the company. "This year, because of the building boom, we've installed quite a few more ATUs than in the last seven years."

Yet overall, only 10% of the systems installed by the company use aerobic treatment. Technicians put in quite a few drip irrigation systems, but that is about as advanced as this part of Florida gets, she says. Concerns about algae blooms and water pollution will probably make nitrogen-reducing ATUs the technology of choice in southwestern Florida, she says, but she doesn't see that happening for about 10 years.

"We do a lot of installations on waterfront property, even in the incorporated area of Port Charlotte," she says. The street she and her husband live on in nearby Punta Gorda has municipal sewer, but the five streets beyond theirs are all served by onsite systems.

Because of a change in Florida's code, installers know what kind of system a house needs depending on when it was built. Before 1983, Guffey says, homes could be built at ground level. Those lots typically require a lift station and a mound system because they otherwise cannot meet the minimum 12-inch separation between the bottom of a drainfield and seasonal high-water table.

After 1983, homes could be raised above the natural grade. You can see that driving around the area, Guffey says. An older house is at natural grade, but the house next to it is sitting on top of 4 or 5 feet of fill.

Waterfront properties are another challenge. Many were created during the construction of canals, Guffey says. Builders dumped their dredge spoils right beside the canals to create lots, so the soils are variable. (And this happens on lots away from the waterfront, too.)

"We run into some big boulders," she says. Because the soil is typically poor, these installations require a lot of sand: about seven loads to build a bed and another two or three loads for cover.

Installations and service account for about 65% of the business, and pumping is about 35%. Technicians install about 11 systems per week, 65% of those for new homes and 35% for repairs or replacements.

ATU owners also must have maintenance contracts. Three full-time techs handle the 1,600 contracts Martin Septic has, and they also maintain lift stations, Guffey says.

Florida's rains, and high-water table, provide their own challenge. In August 2018, one of the company's technicians made the usual rounds with a load of water to fill tanks after the day's installations.

"We had a 1,500-gallon concrete tank that floated because of the water table," Guffey says. "You would naturally think, with the weight, there's no way it would pop out of the ground. But it did." In the process, it made a hole almost large enough for a shed to fall into.

WHO NEEDS AN AD?

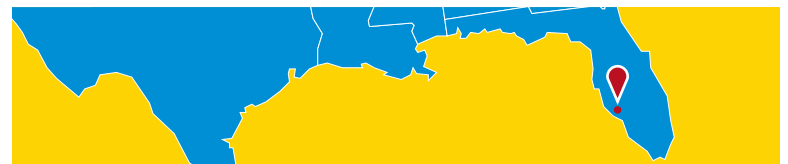
Like many established companies with good reputations, Martin Septic does little marketing.

"We had a 1,500-gallon concrete tank that floated because of the water table. You would naturally think, with the weight, there's no way it would pop out of the ground. But it did."

Cindy Guffey



▲ Zach Grantham uses a Kobelco excavator to create a drainfield bed. The project featured products from Infiltrator Water Technologies.



Martin Septic Service North Port, Florida

- Owners:** Martin and Cindy Guffey
- Founded:** 1986
- Employees:** 15
- Service area:** Five counties in southwestern Florida
- Services:** New installations, replacements, pumping, lift station maintenance and installation, aerobic system installation and service
- Affiliations:** Florida Onsite Wastewater Association, National Onsite Wastewater Recycling Association
- Website:** www.martinseptic.com



▲ From left, Chase Myers of Martin Septic Service photographs Woody Woodward and Greg Harris of Infiltrator Water Technologies preparing an excavated area of a drainfield installation on a Habitat for Humanity build site.

▶▶ The crew from Martin Septic Service is shown working on a Habitat for Humanity home build. On the machine is Zach Grantham. Left to right in the foreground are Frank Gatto, Daniel Romer and Ike Hutchingson.



“We have not advertised in the Yellow Pages for many years,” Guffey says. There is the company website, and there are referrals. These come mainly from local building contractors and Martin Septic’s repeat customers.

Another way to put the company’s name in front of the public is through sponsorships such as youth football and basketball. They also donate \$3,000 for the Martin Septic Scholarship at the local high school. It’s money for college with no strings attached. Applicants write essays explaining why they want the money, and the company picks the recipients.

EQUIPMENT CORNER

Running this business takes a fair amount of equipment. At Martin Septic, the list includes:

- Three vacuum trucks: a 2006 Peterbilt from Keith Huber with a 4,000-gallon steel tank and Becker pump and a 2006 Peterbilt from Iron-Vac Truck Sales with a 2,450-gallon steel tank and Jurop/Chandler pump. The third rig is a 1983 military surplus truck retrofitted with a 2,500-gallon steel tank from Specialty B Sales and Masport pump. It was built out by Martin Septic and Southwest Mobile Mechanic; it’s kept at a local marina where there is a barge that hauls it to barrier islands along the coast.
- Three dump trucks: a 2006 Peterbilt, 2005 Peterbilt and 2002 Peterbilt. All have Warren dump bodies.

- Four excavators: a Kobelco 75, Kobelco 135, Kobelco 140 and Kobelco 160.
- A Kubota SVL95 skid-steer.
- A 721 Case loader.
- A Powerscreen screening machine: Old drainfield material is limed and run through the screener to separate plastic, wood and concrete debris from soil. Debris goes to a local landfill or recycling facility, and the soil is stockpiled for 30 days and then sold as fill.
- Two 2016 Mercedes Sprinter vans for the service techs. They’re very tall, Guffey says, and were bought for volume. It allows plenty of shelving and also allows techs to stand up inside so they can see everything and quickly locate what they need.
- A 2019 Chevy Silverado flatbed dual-wheel that can haul the skid-steer or the Kubota 75.
- A 2014 GMC 1500 four-door Denali service truck, plus a 2015 2500 GMC Denali and a 2016 2500 GMC Denali.
- A 1989 Mack Hydrobrute with a Del Zotto lifting rail to set tanks: Precast suppliers are 90 minutes to three hours away from North Port, Guffey says. Instead of ordering individual deliveries for each project, Martin Septic orders a semi load of tanks — five fit on a trailer — and stores them in the yard until they’re wanted.
- Three Globe trailers to move the excavators around.

HELPING PEOPLE TO HELP THEMSELVES

For 15 years, Martin Septic Service has been giving a hand to people willing to help themselves. The company does this through Habitat for Humanity, which builds homes for people without the means to buy them. Martin donates onsite systems and the labor to install them.

"Habitat, to me, it's not just somebody giving you something. I feel it teaches people responsibility," says Cindy Guffey, the company's vice president and co-owner. "And the sweat equity — I love the sweat equity. It gives the owners a sense of what it takes to own a home, as well as some pride in their home."

People who receive a Habitat house agree to pay a mortgage of some amount and must invest hundreds of hours of their own time in helping to build the house. That doesn't include onsite work because of the special skills involved. Instead, Habitat families work on painting and framing their homes, Guffey says.

All the Habitat work around Charlotte and North Port, Florida, is new construction. In 2018 the Charlotte County Habitat chapter built 35 homes; in 2019 it was 36, Guffey says. Martin Septic donated five systems to the 2019 work.

The company has also donated land for Habitat homes. As the house-construction industry collapsed during the recession, Guffey says, contractors who owed money to Martin sometimes signed over lots as payment. She and her husband couldn't see paying taxes on a bunch of vacant lots, so they donated them to Habitat.

In 2018, Martin's work gained another advantage: Infiltrator Water Technologies became a partner and is providing tanks and chambers at no cost, Guffey says. "We provide the sand and labor, all the miscellaneous fittings — which is great because with Infiltrator contributing, we've been able to give more."

▼ Zach Grantham, Martin Septic Service technician, checks the level in a drainfield bed at the Habitat for Humanity build.



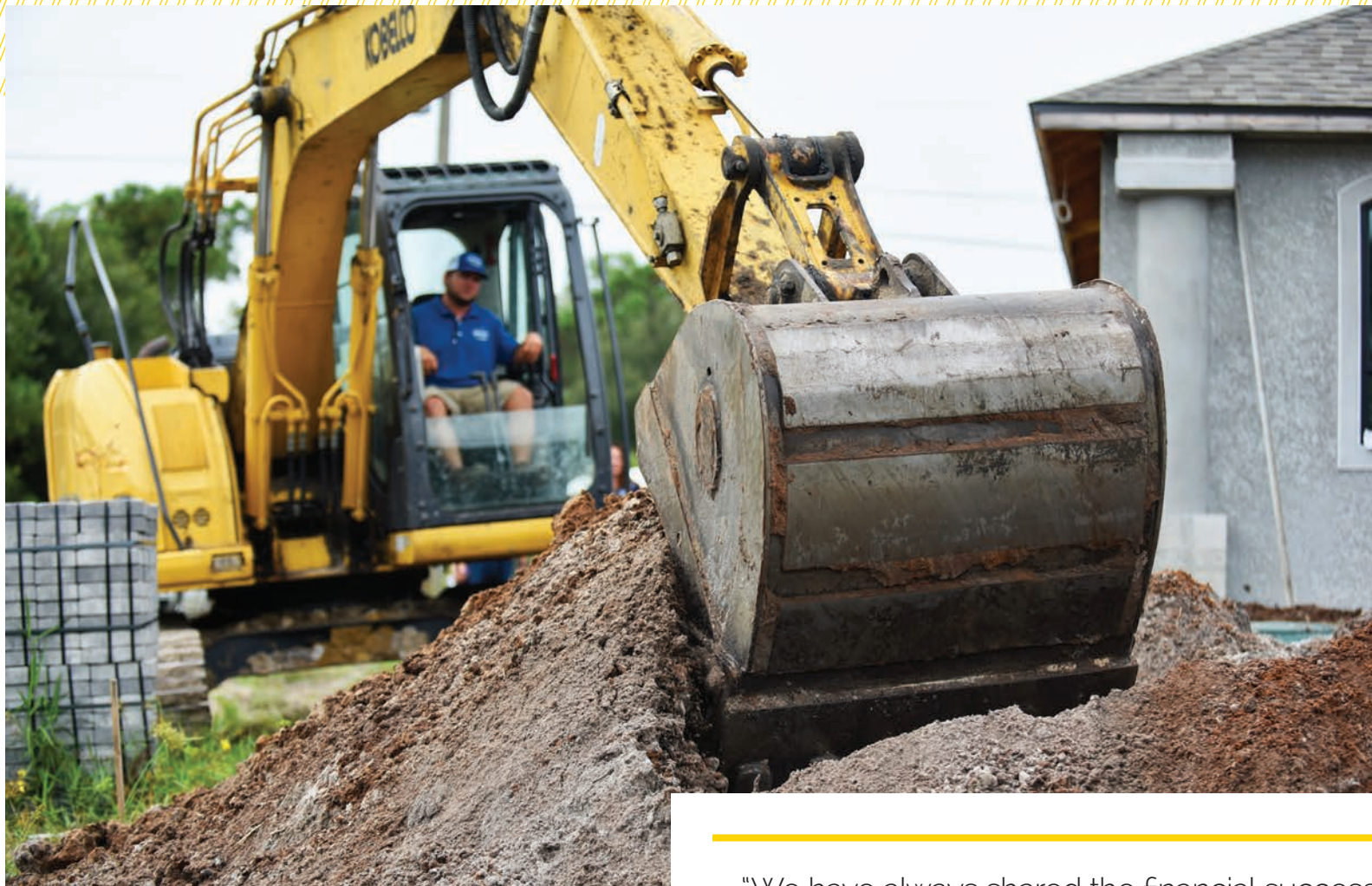
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▲ Installer Zachary Guffey uses a Kobelco excavator to move a spoils pile during an installation project.

▼ Frank Gatto and Chase Myers of Martin Septic Service volunteer on a Habitat for Humanity project.



“We have always shared the financial success of our company with our employees in more than just a paycheck. That’s why our turnover is very low.”

Cindy Guffey

BENEFITS TO EMPLOYEES

This month, look for the Martin Septic crew at the Water & Wastewater Equipment, Treatment & Transport (WWETT) Show in Indianapolis. The Guffeys plan to bring five people to the show, a typical group for the trade shows they attend, she says. The reason for coming is simple: “It’s knowledge,” she says. “The key to our success has always been our employees.”

Technicians at a show learn about new equipment, new methods of working and new products that solve problems or increase productivity. Educating employees at the WWETT Show is only part of how the company creates success through the people it employs.

Also important is what else the company does for workers. It has a group health insurance plan and pays 100% of premiums. It pays year-end bonuses and has provided down payments for employees’ homes.

“We have always shared the financial success of our company with our employees in more than just a paycheck,” Guffey says. “That’s why our turnover is very low.”

In 2018 one person moved away, and the company hired two people. Last year the company hired a third service technician to handle the expanding workload.

continued >>

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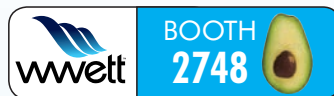
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» The management team at Martin Septic Service confer about a project during installation. They are (from left) Jeremy Felty, director of operations; Zachary Guffey, lead installer; Cindy Guffey, vice president; and Martin Guffey, president.



People come in to fill out applications, but most hiring is done by word-of-mouth, Guffey says. For example, the company's operations manager, Jeremy Felty, has been with Martin Septic for nine years. When he and his family moved back to the area from northeastern Florida, Guffey knew about it.

"His aunt I've known since I was 16 years old," Guffey says. "I knew him since he was a young boy. I knew his work ethic as an adult. Jeremy is an enormous asset to Martin Septic, and we are extremely happy to have him on our team."

FOUND THEIR NICHE

Right-sizing their business took time. The Guffeys have found their niche, and they like it. They're as happy with \$4 million annual revenue as they were with \$12 million, but there's less stress, Guffey says. Having a smaller company is also a good choice for their stage of life.

"We're tired," she says. Her husband is partly retired. He started the company, she says: "He built it, he worked it, he ran it — now he's ready to do what he wants to, when he wants to." He remains active, but his rewards now come from helping neighbors and the community.

Guffey will follow her husband into retirement in a few years, but the next generation is in line to take over. Son Zachary Guffey is a lead installer for the company.

With the energy, skills and ideas of a new generation in the mix, Martin Septic is ready to adapt to whatever the future brings. □



▲ Daniel Romer is at the controls of a Kubota skid-steer, covering a drainfield at the Habitat for Humanity site. Martin Septic Service has volunteered at Habitat home projects for 15 years.

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Exploring Hydraulic vs. Organic Loading in Residential Systems

As we see wastewater flows diminish, there will be some justified calls for changes in size requirements for soil treatment and dispersal components

By Jim Anderson and David Gustafson

Up until now, wastewater quantity (flow), expressed as gallons per day, along with soil characteristics reflected in the long-term acceptance rate, expressed in gallons per day per square foot, was used to determine the size of residential systems. Septic systems are designed to accept and treat a finite amount of water, and if that amount is consistently exceeded, the system will eventually fail.

Last month we discussed a study showing a significant 22% reduction in average household water use. Overall water use is declining, primarily due to installation of low water-use fixtures and devices such as toilets and washing machines. The general assumption is that system sizing will or should change over time; at least sizing tables in our state and local codes should change along with these reductions.

While we support continually evaluating our codes to keep them up to date with technology and use changes, we want to throw out a caution: When changing sizing requirements, we need to factor organic loading to the system into the process.

All wastewater has two major components: a hydraulic or quantity component and an organic component. For our industry, reflected in state codes, the organic component is usually expressed as milligrams per liter of biological oxygen demand. Current LTAR's are based on septic tank effluent with a BOD value of 170 mg/L.

CONCENTRATED FLOWS

Without getting too deep into the math involved, a maximum value for the mass loading to the soil treatment area can be determined and expressed in pounds per day per square foot of infiltrative surface, as indicated above on the average daily sewage flow and the BOD concentration of the septic tank effluent.

While flows (hydraulic) decrease, the amount of organic material in the wastewater does not. Concentrations of BOD in the effluent will likely increase. We do not know exactly how much the concentration will rise/change as flows are reduced; because with lower flows and similarly sized septic tanks, retention time in the tanks will increase, which may lead to some increased treatment.

To illustrate the potential problem, if concentration increases by approximately 20% while flow is reduced by 20% and the required infiltrative area is reduced at the bottom of the trench by 20%, the pounds per square foot of organic loading actually increases.

Since organic material in the wastewater is part of the formation of the

As we look toward the future, we will probably continue to see reductions in hydraulic loading in our systems. ...

While some reduction (in system requirements) may be justified, it should not be done without considering both the hydraulic and organic loading parts of wastewater.

biomat, which is factored into our estimated LTARs, any increase in organic loading at the infiltrative surface will result in a more resistant biomat and a reduced flow rate into the soil, affecting the capacity of the soil to hydraulically accept effluent. If this condition occurs continuously, the system will hydraulically fail.

The importance of both the hydraulic load and organic load to the system has been recognized for some time in the industry. It is the reason commercial establishments are treated differently than residences in terms of system treatment requirements.

A study of restaurants in Texas showed that the median concentration of BOD in septic tanks was about 1,500 mg/L versus our desired 170 mg/L for residential systems. A residential system with an estimated sewage flow of 600 gallons/day in a silt loam soil would require about 1,500 square feet of trench-bottom area. For a restaurant with an estimated sewage flow of 600 gallons/day and the 1,500 mg/L BOD, the area required to have a similar organic load to the infiltrative surface would be over 10,000 square feet.

GATHER PEAK FLOW INFO

This is the reason treatment systems for different commercial establishments have special considerations regarding pretreatment requirements and system sizing. Each type of business requires its own way of estimating both the hydraulic flow and the strength of the wastewater. Using average numbers from other parts of the country is useful, but not as useful as data collected on similar establishments in the area or, better yet, data collected from the system itself.

Organic load of wastewater is an important consideration when designing a commercial operation because the wastewater strength is usually greater

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than residential. The type of additional pretreatment before dispersal in the soil is dependent not only on the total flow, but also on the type of establishment and the water use patterns. The more information gathered about peak flow times, the better for selecting whether a media filter or aerobic treatment unit is the best choice. The goal is to reduce the organic loading to below residential strength.

As we look toward the future, we will probably continue to see reductions in hydraulic loading in our systems, not due to behavior change but merely because there will be increased use of water conserving devices. As this continues, there will be pressure to change the size requirements for the soil treatment and dispersal parts of our systems. While some reduction may be justified, it should not be done without considering both the hydraulic and organic loading parts of wastewater. □

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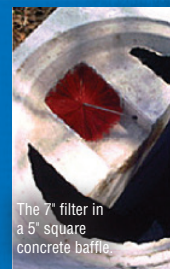
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Florida Moving Toward Overhaul of Water Laws, May Bring Back Septic Inspections

By David Steinkraus

It looks as if the Florida Legislature will take action to improve water quality after all.

Several years ago, legislators repealed a state law requiring septic system inspections. Since then, the state has been plagued with algae blooms, public concern about water quality has grown and many experts pointed to leaking septic systems as part of the problem. Last spring, Gov. Ron DeSantis created the Blue-Green Algae Task Force to study water-quality problems and recommend solutions that could be written into law. In October, the panel issued its first set of recommendations.

Inspections are something the task force wants back, news reports say. It also wants limits on where septic tanks can be installed, and it suggests moving oversight of onsite wastewater from the state Department of Health to the Department of Environmental Protection. DeSantis announced plans for legislation that would mostly follow the task force recommendations, which also include proposals about biosolids and agriculture.

Draft bills may be considered during the current legislative session, which ends March 13. Of course legislation may still be added to another bill as an amendment, says Roxanne Groover, executive director of the Florida Onsite Wastewater Association.

Task force reports were scheduled to be formally heard in legislative committee, and once that is done, there will probably be more action on legislation. "I think we'll see a lot of it in Sen. Mayfield's bill."

Sen. Debbie Mayfield, R-Melbourne, has a district that includes the Indian River along Florida's eastern coast. The river was in the news several times in past years because of severe algae blooms. Groover says she has worked on water issues with Mayfield.

Shifting oversight of onsite systems from the Health Department to the Department of Environmental Protection will probably happen, Groover says. Mayfield wants a two-year study period for this, and the idea is to allow the departments to work out the fine points, Groover says. That does not mean it would be an easy transition, she says. "I think if everyone sits down and has an honest discussion, without assigning blame, then this can be a positive."

Some people think the Environmental Protection Agency is the right agency for oversight because wastewater is an environmental issue, and others believe the Health Department may be taking too long to approve new onsite technologies, she says.

Groups concerned about onsite systems generally seem to be coming together and taking ownership of the solutions to water-quality problems, Groover says. And what she is seeing from these groups is good: a

recognition that there should be a mix of conventional and nitrogen-reducing systems where there is sufficient land, plus the need to convert some areas from onsite systems to municipal sewer.

Groover says she is more optimistic than in the past about visibility for the onsite industry and the perception that it has something to offer. Last summer she talked with a number of groups and legislators and their staffs. "We have more people who realize the onsite industry has options now," she says. And staff members of the House and Senate have been referring people to the Florida Onsite Wastewater Association as a resource for information.

Hawaii

The U.S. Supreme Court heard arguments in a case asking whether the Clean Water Act should be expanded to cover pollution moving through groundwater from a pipe. The case involves deep injection wells that Maui County has used for years to dispose of treated wastewater. Pollution from the wells was found to be seeping into the Pacific Ocean, and the Hawaii Wildlife Fund and other groups sued to say this violated the Clean Water Act. Yet the case was on the verge of going nowhere just before the justices met.

Last fall, the Maui County Council voted to settle the case. When a case is settled before a court hearing, it is withdrawn from the court's calendar. But Maui Mayor Mike Victorino says he didn't want to settle. That produced a debate over which branch of Maui government had the final authority, and it produced dueling letters to the court. The first came from the chair of the County Council and asked the court to either dismiss the case or delay it until county officials could resolve their differences. The second letter came from the corporation counsel, the county's top lawyer, and says the county *was not* asking for any delay or dismissal.

Victorino, in a column for *The Maui News*, says the case should proceed because it would clarify the issue once and for all. Lack of clarity, and uncertainty about permit requirements, could impair the county's water recycling efforts, he writes.

Although the case involves a municipal wastewater plant, the justices in November recognized and discussed an issue important to the onsite industry: whether septic tank owners could suddenly find themselves liable for pollution because water from their systems was leaking into some other body of navigable water and they didn't have a permit.

The court does not have a set timetable for issuing decisions. An audio recording of the oral arguments and a transcript are available here: www.supremecourt.gov/oral_arguments/audio/2019/18-260.

Michigan

The topic of a statewide sanitary code is back on the table for some people in the state. A summit in Traverse City in early November was sold out, yet participants were not in agreement about the need for a comprehensive statewide code.

Michigan is the only state without a set of statewide rules, reports the *Traverse City Record-Eagle*. People at the summit agreed that because of the threat to human health, septic systems in rural Michigan should not be left alone to decay. But some summit participants say locally drawn rules would be better able to account for local geology and protect water quality. Others say the state should set minimums, and municipalities should have the option of setting stricter standards.

The last attempt at a statewide code failed in the Legislature in December 2018. That bill drew widespread opposition from local health departments and governments who complained that it was drafted behind closed doors and with minimal input from local officials.

Also in Michigan, Kalkaska County will not be allowed to drop its point-of-sale septic inspection rule as officials had planned. The county, in the northwestern part of the Lower Peninsula and near Lake Michigan, had adopted the inspection program through District Health Department No. 10. Because of that, the other counties in the district had to give permission for Kalkaska County to leave the program. Last fall, commissioners in nearby Manistee County voted 5-1 to deny permission.

Kalkaska County had debated leaving the inspection program for months, and the decision of Manistee County did not go down well. “Kalkaska will not be held hostage,” says county commissioner David Comai, according to the statewide news website *MLive*. County leaders vowed to challenge the decision in some way.

Jeff Dontz, chair of the Manistee County Board, says commissioners felt justified in their decision because it protects water quality for county residents. He says he had received more comments on this issue, from people in both counties, than on any other issue during his 13 years as a commissioner.

MLive notes that Kalkaska County is at the headwaters of the Manistee River, a noted trout fishery that runs through Manistee County before emptying into Lake Michigan at the city of Manistee.

North Dakota

State onsite organizations are calling on the Legislature to create a new agency that would develop statewide codes and licensing procedures for onsite work.

As it stands, wastewater professionals must be licensed by each county where they work, reports West Dakota Fox television in Bismarck.

“You have customers in those areas that you service, but then you don’t get those calls from your customers. And afterward they’ll come and talk to you and say, ‘Why wasn’t your name on the list? We would’ve called you to do this,’” says Tom Schimelfenig of the North Dakota Onsite Wastewater Recycling Association, according to the station.

The new agency would become part of the Department of Environmental Quality.

New Hampshire

Last summer, the state adopted tough standards for the presence of per- and polyfluoroalkyl substances (PFAS) chemicals in water supplies. Later, the chemical company 3M — which developed PFAS — and local stakeholders went to court asking for an injunction to stop the rules. An attorney for 3M argues the state did not allow enough public input on its standards and did not fully examine the cost to water utilities, reports New Hampshire Public Radio. The state is also suing 3M for causing PFAS contamination.

PFAS have been made since the 1940s and are used in a wide variety of products including carpet, fabric, paper packaging and some firefighting foams. Although research on the effects of PFAS is not complete, results so far suggest that high concentrations in humans may increase cholesterol levels, decrease response to vaccines, increase risk of thyroid disease, decrease fertility in women and increase the risk of high blood pressure or preeclampsia in pregnant women.

The PFAS issue also extends to the onsite industry. Last summer, the state notified Biological Recycling Co., which processes septage and land-spreads sludge, that it is the likely source of PFAS contamination in wells on neighboring properties.

Delaware

An ordinance introduced in New Castle County would make permanent a one-year moratorium on large developments using septic systems.

The current, temporary moratorium was passed last February to provide time for creation of a master plan for the southern end of the county, reports Delaware Public Media. New Castle County occupies the western shore of the Delaware River, the upper portion of Delaware Bay, and includes the city of Wilmington. Smaller subdivisions using septic systems are still allowed under the moratorium.

Landowners and farmers says a permanent moratorium would significantly reduce the value of their land. Delaware Public Media quotes Gary Warren, who owns 134 acres of farmland. “Right now, I can build up to 160, 180 units on my farm with sewer,” he says. “With septic, I can probably build close to 100. If this goes into effect, I can build four.” ▣

“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.

» On the Fayetteville, Arkansas, project, the team from BBB Septic encountered Enders soil, a clay that comes from shale or a combination of shale and sandstone. (Photos courtesy of BBB Septic)



It's All Uphill for an Arkansas Replacement System

When suitable soils eluded BBB Septic designer Piper Satterfield, pumping effluent to higher elevation was the only answer for a conventional replacement system

By David Steinkraus



» Aside from all the other challenges on the site, the Fayetteville, Arkansas, project required the BBB Septic team to deal with rocks and roots. That's Brook Cannedy, senior installer for BBB, in the cab of a Bobcat mini-excavator.

The owner of a rental house had a failing onsite system, and untreated wastewater was flowing downhill toward a creek. But when a crew from BBB Septic of Bentonville, Arkansas, replaced the old tank, it was clear a new tank would not solve the problem because the drainfield was also failing.

The house was probably built in the 1950s and had a septic tank with cement block walls and a concrete slab for a bottom, says Piper Satterfield, septic system design specialist with BBB. It's another version of a cesspool, she says. "I don't know about the rest of the country, but back in the '50s, Arkansas didn't really have any codes. So it's not uncommon."

Soil downhill from the house was unsuitable, so her solution to this problem involved pushing water uphill to a new system.



◀ Craig Mummert, left, and Brook Cannedy, senior installer for BBB Septic, hook up the Clarus Environmental spider valve assembly, enclosed by a 24-inch Polylok riser and lid.

▼ Technician Mummert lays Infiltrator Water Technologies Quick4 Equalizer 24 chambers at the site of a system replacement project in Fayetteville, Arkansas.

"As soon as we dug the first pit, it was pretty obvious it wasn't going to work. ... Aside from the high clay, water was shooting into the hole as we dug those first three pits. So we started digging uphill, and we got better soil, still not good soil, but it was fairly suitable for a standard system."

Piper Satterfield

Plastic tanks

Wastewater leaves the house in a 4-inch Schedule 40 pipe, and it travels about 10 feet before it enters the septic tank. (That's the minimum distance from any structure under Arkansas code.)

The tank is a 1,000-gallon poly tank from Norwesco that was installed before the failing drainfield was discovered. Technicians removed the walls of the original tank and set the new septic tank on the old slab, which was still level. A WW1 filter from Clarus Environmental is on the outlet, and the owner intends to clean it himself.

Water flows by gravity to a 300-gallon Norwesco spherical pump tank set next to the septic tank. Because the site was so tight, a standard concrete tank delivered by crane would not have worked, Satterfield says. The same reasoning applies to use of the poly tank for the septic treatment.

A Zoeller 151 pump moves water from the pump tank through a 1 1/2-inch Schedule 40 pipe for about 100 feet and 12 feet uphill to the drainfield. A Clarus Environmental spider valve splits the flow between laterals, two 100-foot lines and one 75-foot line. (In Arkansas a distribution box is prohibited for unequal length lines. The options are a diversion-valve system or a spider valve.) A Zoeller panel controls the pumping.

"And we had to do that last line of unequal length because we had a shed that we were getting a little bit too close to," she says. In any case, she says, the spider valve provides better distribution.

The laterals are inside Quick4 Equalizer 24 chambers from Infiltrator Water Technologies installed 18 inches deep and 18 inches on center.



System Profile

Location: Fayetteville, Arkansas
Facility served: Rental house
Designer and Installer: BBB Septic, Bentonville
Type of system: Septic with pump tank
Site conditions: Clay
Hydraulic capacity: 150 gpd

SYSTEM PROFILE

➤ It wasn't just rock in the way of the BBB Septic team, but also roots. Technician Randall Burk, left, applies a saw to the problem while Craig Mummert places Infiltrator Water Technologies Quick4 Equalizer 24 chambers in the background.

To do the job, the BBB crew used muscle, hand tools and a Bobcat E50 excavator.

Clay everywhere

The soil on the property is called Enders soil. It's a clay formed from sandstone, and it is not good for absorption. There was clay near the surface, but in some places, soil was still good enough to take a conventional system, Satterfield says.

"Fortunately it was just a one-bedroom home. If it had been any bigger, we'd have a different situation," she says.

The owner hoped to sell the home as a two-bedroom property, but there isn't enough space for a drainfield of that size, she says.

There was no perc test for the site. What's required in Arkansas is a soil morphology test, Satterfield says. Instead of watching water drain in a hole, designers must dig a 4-foot-deep pit and look at the soil in detail. The state learned long ago that any test hole anywhere will perc during the drought months of July and August, she says. In the rainy season, it's a different story.

"I look for different features in the soil that will tell me how water will move and how water is there on seasonal basis," she says. "These features we look for take years and decades to form, so it's a better view of the long-term history of the soil versus what's going on with the weather at that point." The goal is to provide enough storage in the soil so heavy rains will not overwhelm a system.

When she started the project, Satterfield first looked downhill from the house for a drainfield site. "As soon as we dug the first pit, it was pretty obvious it wasn't going to work," she says. The soil was more than 50% clay, and other test holes looked the same.

"Aside from the high clay, water was shooting into the hole as we dug those first three pits," she says. "So we started digging uphill, and we got better soil, still not good soil, but it was fairly suitable for a standard system."

Water woes

The client's house is located on a flat spot of a long downhill slope. Because of the state's heavy seasonal rains, and because the large percentage of clay makes it more likely the drainfield could be overwhelmed, Satterfield says she talked to the owner about the possibility of adding a curtain drain if he has problems in the future. The drain would be a 24-inch-wide trench about 3 feet deep and lined with plastic on the downhill side to stop water from reaching the drainfield. Gravel would fill the trench, and a perforated pipe would redirect water to the ends of the trench and away from the drainfield.

A well on the property had to be abandoned because the only soil for the drainfield was within the state's required 100-foot setback. Fortunately, she says, the house was already being served by municipal water.

During installation, technicians didn't walk in the trenches, and they raked the bottoms and sides to make sure the clay was broken up and would allow water to pass through, she says. Weather was also a factor.



"We were hard-pressed to find a couple of days' dry weather to even install this, because we were kind of in the Arkansas monsoon season," Satterfield says.

But the biggest challenge for the installation crew were the big rocks scattered across the site. Brook Cannedy, the company's senior installer, says they made for ugly trenches, too, because he could not get the sidewalls to be smooth and straight. □

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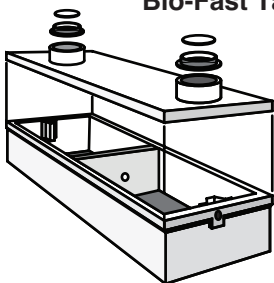
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For Mike Capra, Job No. 1 Is Satisfying and Educating the Customer

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Compiled by Betty Dageforde

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



Mike and Kris Capra

Mike Capra

owner

Business: Capra's Utilities, White Bear Lake, Minnesota

Age: 43

Years in the industry: 26. We are a second-generation family-owned business celebrating 30 years in business this year.

Association involvement:

Member of the Minnesota Onsite Wastewater Association for about five years. I am currently the president and was a board member for two years.

Benefits of belonging to the association:

The opportunity to network with other individuals who work in our industry is a big benefit. We can bounce ideas off each other and gain insight into other ways of performing the same type of work. We also work collaboratively to influence rule changes. And the Minnesota Onsite Wastewater Association provides great educational opportunities. We do

a lot of training, both in the summer and winter. There are several educational tracks with various sessions at our conferences that allow you to pick what you want to learn or what's most applicable to your work. Most of the sessions allow for audience participation so you can help educate and learn from others.

Biggest issue facing your association right now:

Membership is our biggest issue — getting people who are not members to see the value. Since joining, I've gone to every seminar that the Minnesota Onsite Wastewater Association puts on and feel it's a great learning experience. Typically when people join, they'll go to the education and training forums at least once a year, even though we're only required to do that every three years. They find value in it. But getting the word out is the challenge.

Our crew includes: We have two site foremen:

John Handrahan, my cousin, who has been with us 22 years and Nick Fox who has been with us five years. Several people work in the field with them (one is John's son, Joe), and two guys work part time in our shop (one is my father-in-law, Dave Closmore). My wife, Kris Capra, and I work in the office.

Services we offer:

We do septic installation and repair, as well as sewer and water installation and repair. We don't typically do designs in-house but John and I are licensed designers, and Nick is in the process of becoming licensed. Being licensed gives us the ability to make adjustments to a design that may better fit the site needs when we are in the bidding process or when we are on site for the installation.

Typical day on the job:

I start my day at 5 a.m. I get all our documents prepared to let the crews know where they are going and what they are doing for the day. At 6 a.m. the guys come in and we have a morning meeting. We go over the jobs and talk about safety things to look for: What trench boxes to load, do they need barricades for road closures, are we doing a confined space entry? I also reiterate to the whole crew any specific customer requests. I spend the rest of the day scheduling and bidding jobs and answering field calls.

The job I'll never forget:

We were called to repair a sewer that had been backing up in the basement of a house for several months. It was a rental property, and the

➤ John Handrahan, foreman; Mike Capra, owner; and Nick Fox, foreman, in front of a Peterbilt flatbed truck used to haul trench boxes and equipment.

▼ The fleet of service trucks at Capra Utilities is ready to respond to another install project.



owners were trying to get the tenants out before the sewer was repaired. When we arrived, there was about 3 feet of raw sewage in the basement, which was basically acting like one huge holding tank. When I did the estimate, I indicated we would install a “clean-out” when we did the repair. The owner assumed that meant we would be cleaning out his basement for him, which was not the case. However, we did send a pump truck to pump out several thousand gallons of raw sewage. The rest of the “cleaning” was left to the homeowner.

My favorite piece of equipment:

Over 30 years, we’ve learned it’s really just having the right equipment for the job. We run all Case equipment and typically upgrade our backhoes every five years and our skid-steers every three years so we don’t have any downtime and very little maintenance. We also upgraded our semitrucks this year. One thing we’ve used this year is swamp pads, which helped us get into a lot of sites we wouldn’t have been able to because we’ve had so much rain.

Most challenging site I’ve worked on:

A couple years ago, we worked at a turn-of-the-century house on the bluffs of the St. Croix River. It was built like a castle, with a carriage house and stone walls all the way around it. It was a single-family residential septic system replacement that cost around \$140,000. We had to crane the excavator over the surrounding stone walls to get it onto the terrace. We directional drilled almost 1,000 feet of solid rock. The system was about 1,000 feet away from the house. We had three lift stations. One was inside the house. We had to core-drill through some stone walls to get the pipes out of the house. We put the lift station at the lowest level and that pumped up to the terrace. From there, another lift station pumped up to the septic system. The carriage house had another lift station that connected to the main supply pipe.

Oops, I wish I could take this one back:

Last year we put in a gravity system. There was a designer involved and the city had signed off on the permit, but we found out they had not

verified soils and we had not double-checked the soils. The area we were working in looked pretty good, but below the drainfield we dug down and the soil was awful. Thank goodness it happened while the house was still being built. We made the decision that we weren’t going to fight it or argue it. We moved it to another location and didn’t charge the owner. The last thing we wanted was a bad name for a job that didn’t go right that we didn’t correct and take care of. So, the one thing I would say is double-check the designer’s work or make sure you’ve verified the soils personally before you put a system in. Every job we do, even if it doesn’t go as planned, we take it as a great learning opportunity. We always find the silver lining.

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

I have a great relationship with designers and pumpers so I really wouldn’t want to expand into those areas, but I would like to add more staff to keep up with the workload.

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

I would like to see a statewide exemption on weight restrictions for septic service vehicles. In the spring, we get a lot of failing or freezing systems with no reasonable way to get access to the houses without an exemption to road restrictions. Large fees for a permit for vehicles to perform this work during the time of road restrictions get passed on to the resident who’s already having huge issues. The last several years, we’ve been able to get an exemption from the governor, but it’s always been at the last minute after we go to the Legislature and fight to get it.

Best piece of small-business advice I’ve heard:

I’ve read in a couple business books that you should hire people based on their attitudes and whose core values align with yours versus hiring just based on experience. You can hire a guy with the most experience in the world, but if he’s got a sour attitude and bringing everybody else down, that doesn’t benefit the team.

continued >>

STATES SNAPSHOT

Planning for the future:

My dad, Ernie, started this business in 1989, and it was a business where, if he wasn't there, there was no business. And when I took it over, for many years it was the same. So we have created policies and procedures to make it a sustainable business where somebody could take it over in the future. We continue to work toward that every day. The biggest thing is getting things out of my head and onto paper so everybody knows what to do with the information. It has actually been a hard thing for me to learn and adjust to, but I want everybody to be successful even if I'm not here.

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

I have done this type of work my whole life, so I can't imagine not doing it. My wife and I also build and operate commercial real estate properties and rent to small businesses.

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

I see it as becoming much more professional than it has been in years past. I really like the regulations that get everybody on the same page and hold everybody to the same standard. You don't have as many people installing systems who don't know what they're doing. I feel like we're on a really good track for having people who are truly professionals. □

INDUSTRY NEWS

Eljen receives US HIRE Vets award

Eljen, based in Windsor, Connecticut, received the Platinum Award from the U.S. Department of Labor HIRE Vets program. Eljen is the first small business in Connecticut to receive the award. Jim King, company president and retired army officer, accepted the award along with Mark Bram, principal, during a ceremony last fall.

WWETT Show slated for Indianapolis in February

The Water & Wastewater Equipment, Treatment & Transport Show will take place Feb. 17-20 at the Indiana Convention Center. With new dates for 2020, the trade show has over 100 education sessions and also offers business opportunities, collaboration with industry professionals, a slate of live demonstrations, exposure to cutting-edge technology trends, and the latest product launches across multiple industry segments. □

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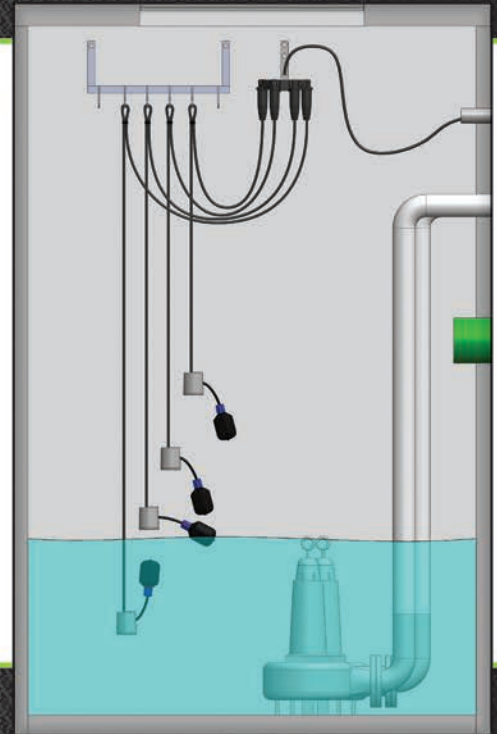
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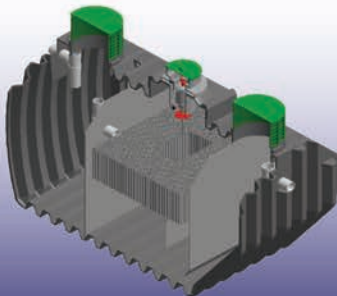
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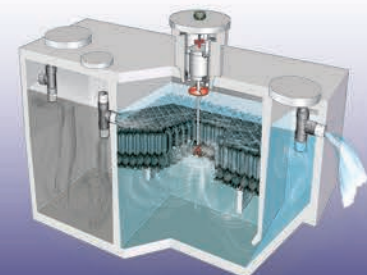


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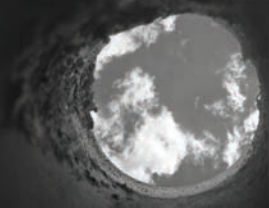
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