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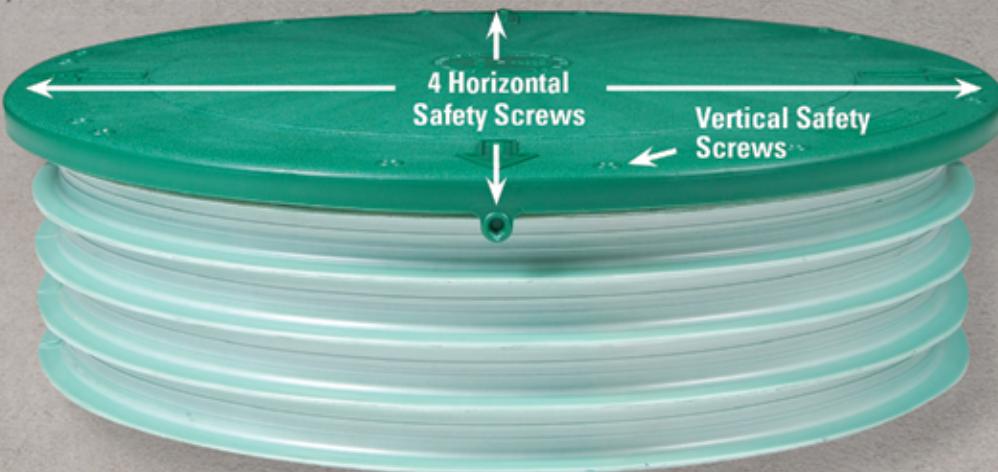
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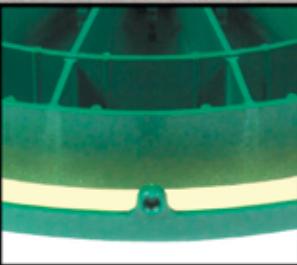
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SAFETY MATTERS

Who Is Your Competent Person?

Every person on a job site is responsible not only for his or her own safety but also the safety of those around them. Small companies in the onsite industry do not typically have an employee assigned specifically to oversee safety. That means that the supervisor or crew leader is often the competent person, according to OSHA standards. Check out this online article for tips on selecting and training your competent person. onsiteinstaller.com/featured



GOING 'GREEN' Choosing Electric Equipment



Whatever your reasons for investigating electric construction equipment, your time will be well spent because electric machines are going to be a big part of the future of construction. More than 128 countries around the world, including the United States, are committed to meeting a net-zero emissions target by 2050. These two experts on the leading edge of electric-powered construction equipment can help you navigate the decision. onsiteinstaller.com/featured

Overheard Online

"Most instances of quiet quitting can be attributable to poor management; specifically, a lack of clear expectations and a lack of opportunity for professional development."

– *Quiet Quitting: What Is It and What Does a Business Owner Need to Know?*
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THREE REQUIREMENTS

Proper Septic Pump Installation

Proper installation of a pump and discharge assembly requires three specific features to assure the pump will work properly and be serviceable. It must be accessible, replaceable and properly controlled.

This online article outlines how to meet these requirements to alleviate many problems that could be experienced with pump systems and to make the pumping system easier to maintain. onsiteinstaller.com/featured

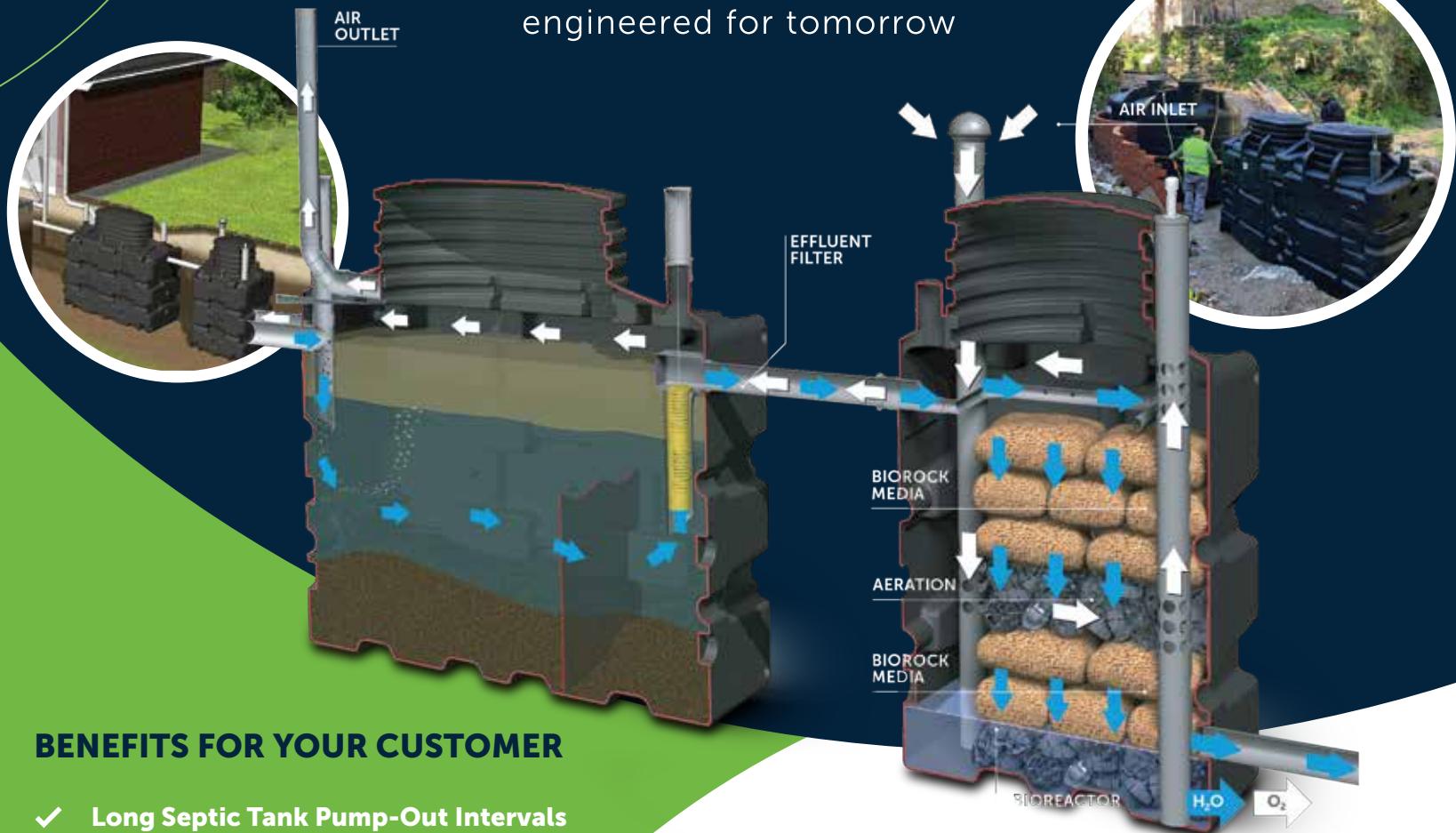
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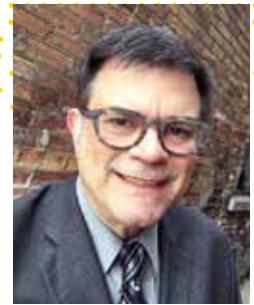
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Jim Kneiszel



You Have a Learner's Permit for the WWETT Show

The biggest show in wastewater includes a variety of great seminars to sharpen your skills and gain continuing education credits

Business will be booming at the WWETT Show this month as thousands in the wastewater industry converge on the nation's crossroads in Indianapolis. The conference runs Feb. 20-23 at the Indiana Convention Center, with exhibitors open for business Feb. 21-23.

Attendees will certainly be excited to see new products displayed in one of the biggest expo halls in the country. They will also revel in renewing acquaintances with other professionals during many planned and accidental networking opportunities. WWETT is *the* place to talk business with other contractors and manufacturer's reps on the show floor.



But the education sessions are what really stokes the fires for onsite installers during this midwinter extravaganza. For many, the industry gathering comes at a dormant time for your crews — when the frozen tundra back home keeps your earth-moving machines stalled and covered with snow in the yard. This is a time when you can study new onsite system products, refresh yourself on regulations, and gain all-important continuing education credits to keep your skills sharp and licenses up to date. When the WWETT Show class schedule is released, I like to review the offerings and make suggestions for seminars installers won't want to miss. Every year many topics are addressed by a roster of experts from across the country. It's almost paralyzing to look at the course schedule when you arrive and try to figure out which of the cavernous meeting rooms you want to enter.

Here are a smattering of the seminars I find most interesting:

Big Ideas, Little Tiny Space Design and Install Challenges

You've all seen it before. A client has great ideas for putting a large home on a small waterfront property. But how do you design a system that will satisfy the customer and overcome the challenges of extremely limited space or environmental restrictions? A panel discussion will feature Brian Corwin, director of Williamson County (Tennessee) Department of Sewage Disposal Management; Morris Smith, owner of Morris Smith Engineering; and Roxanne Groover, president of the Florida Onsite Wastewater Association. The group will provide real-life examples and offer creative design solutions.

Mound Design

As more stringent septic system design rules are implemented to protect the environment and precious water supplies, sand mounds or raised bed systems have become a popular upgrade from simple belowground trench drainfields. The mounds can be employed to overcome shallow groundwater, a shallow soil mantle, poor native soils or insufficient depth to limiting layers. Larry Stephens, president at Stephens Consulting Services, will help

◀◀ The ROE-D-HOE Championship is a popular attraction at the WWETT Show. (File photo)

This is a time when you can study new onsite system products, refresh yourself on regulations, and gain all-important continuing education credits to keep your skills sharp and licenses up to date.

participants recognize suitable sites for mound systems, how to place the mound for optimal drainage and review the benefits and limitations of mound systems.

Safety Concerns During the Installation of Onsite Sewage Systems

The construction-related trades, including onsite installing, are among the most dangerous occupations — presenting many potential hazards every day, including tasks such as trenching and excavation, confined-space entry, exposure to Occupational Safety and Health Administration Focus 4 hazards and infectious disease threats. Speaker Chuck Ahrens, executive director of the Washington On-Site Sewage Association, has developed safety training programs and will help installers identify potential safety hazards and talk about necessary personal protective equipment to prevent injuries on the job site.

Introduction to Nitrogen Removal

Nitrogen can be a dirty word in the world of onsite wastewater systems. Excess nitrogen poses many dangers when it leaches into our waterways, from sickening swimmers to promoting algal blooms that bring dissolved oxygen levels that kill fish and cover lakes with bright green scum layer. Presenter Allison Blodig, a wastewater treatment system specialist at Infiltrator Water Technologies, will cover the fundamentals of the nitrogen cycle, explain the difference between nitrification and denitrification, discuss at least two types of treatment systems used for nitrogen reduction and share troubleshooting options for these systems.

Starting an Apprenticeship Program for Your Installing Business

We're all aware of the shortage of qualified installers and the aging of the industry. So finding ways to encourage training programs for young people in the industry is a huge topic. Presenter Matthew Harrison, manager at Oregon's Scout Septic, will review how his company built an apprenticeship program and share the lessons he learned along the way. Topics will include systemizing the training program, creating recruitment and incentive benchmarks, and embracing regulators, manufacturers and distributors as part of the program.

Flow Equalization and Time Dosing

Balanced downstream distribution of effluent throughout the day is the goal to reduce stress and ensure proper operation of complex onsite systems.

Kevin Sherman, director of engineering and regulatory affairs at SeptiTech Inc., will lead the discussion. He will state the objectives of time-dosing, compare demand- and time-dosing, talk about situations where flow equalization will greatly improve system performance, and discuss if both methods of controlling flow can be used in the same system.

Septic Sleuth – Evaluating Those Rarities Found During an OWTS Inspection

A variety of inspection scenarios will be presented leading to an interactive discussion between presenter John Ferdetta, president of Quest 4 and Advanced Septic Pros, and the participants. The group will share their experiences with OWTS inspections and talk about solutions to common problems. The goal is to refine inspection protocols and improve evaluation skills for all in the industry.

Important Points for Inspecting Drip Irrigation

As more drip irrigation systems are put in the ground, it's important for onsite inspectors to gain more knowledge about their operation. Frank Parker, president of Parker Wastewater Consulting, will cover how the systems are designed and when designers will choose to use them. He will explain how to evaluate each component according to the proper inspection protocol. And he will stress why these systems should receive regular operations and maintenance service for long-lasting performance.

DON'T FORGET THE ROE-D-HOE

Sharpen your skills for the popular excavation skills competition, The ROE-D-HOE Championship, which returns to the WWETT Show this year. In the pre-COVID-19 days, hundreds of machine operators would enter the competition to face off with the best installer operators from across the country and beyond.

The popular event is back and will draw crowds of participants and spectators. WWETT Show attendees will join winners from state ROE-D-HOE competitions, all vying to wear the championship belt and take home cash prizes. The competition is a series of timed skills tests to move items with a mini-excavator or backhoe. Installers take a great deal of pride in efficient machine operation skills built up over years — and generations — of job site digging. Are you ready to compete?

Many of you have already made plans to attend the WWETT Show. Some of you may be reading this story after your arrival at the Indiana Convention Center. If you want to learn more about the 2023 event, go to www.wwettshow.com. □

Drop Us a Line

Have a comment about an article you've seen in *Onsite Installer*? An experience from a job that you'd like to share? *Onsite Installer* would love to hear from you. Email comments and photos to editor@onsiteinstaller.com

JUST ADD WATER

Joe Mayers has made a career of crossing lakes and climbing rough terrain with his equipment to build remote, island septic systems

By Scottie Dayton



A

ccepting a home inspector's challenge in 2000 to replace a failed septic system on an island in Highland Lakes unleashed unlimited business potential for Joe Mayers, owner of Septic Experts in Wantage, New Jersey.

When *Onsite Installer* wrote about Mayers in 2004, his custom quad-sectional barge was in demand to install onsite systems on lakefront and island homes between New York and Mayers' home state. As properties changed hands or became year-round residences, septic inspectors failed numerous systems.

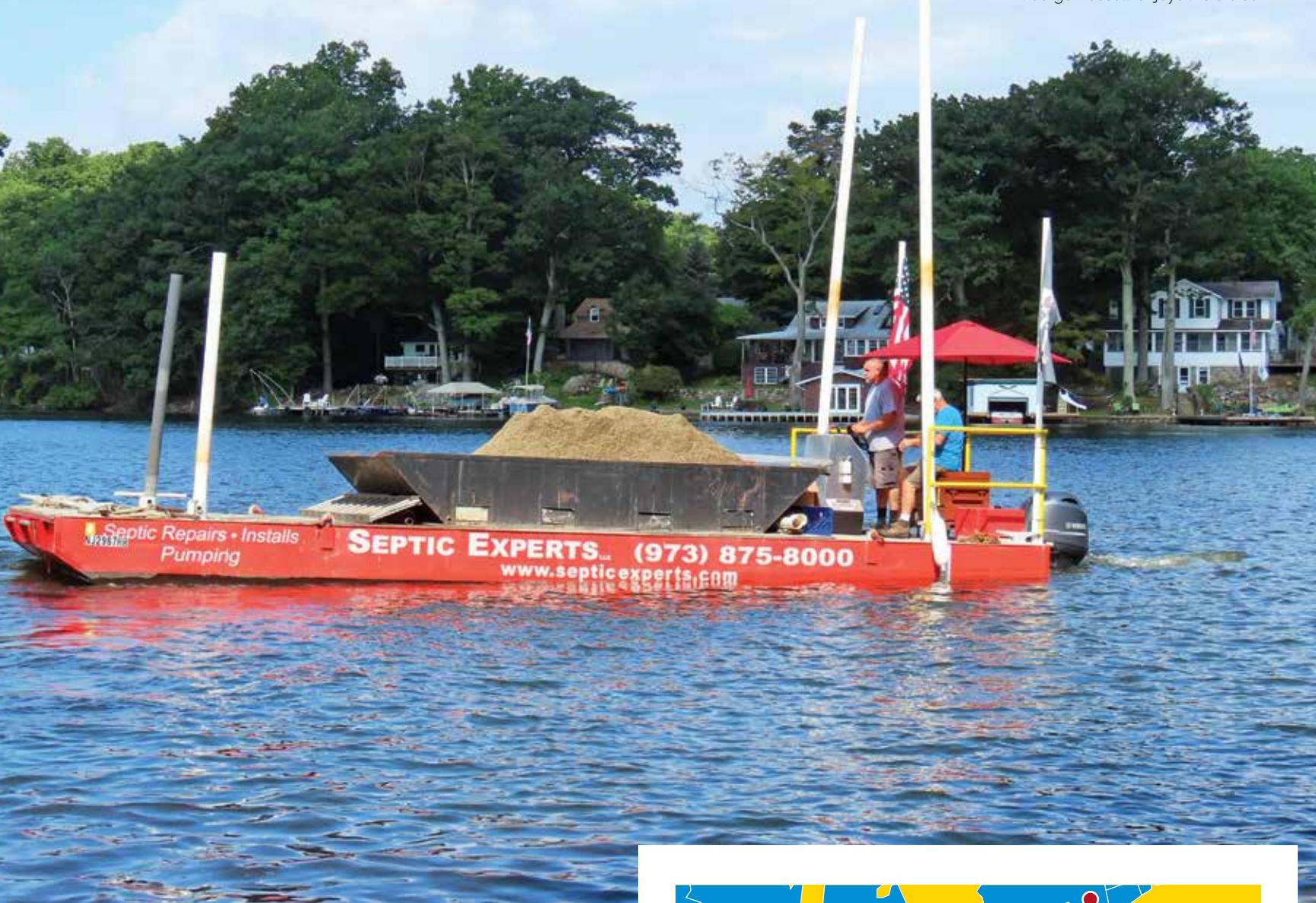
In the early 2010s, Mayers and a crew of three were on Beaver Lake installing 25 replacement systems over five years. "This isn't a case of floating up to the property, offloading equipment and materials, and popping in the components," he says. "It's a mountainous region with steep elevations and other obstacles. Just moving sand and gravel requires multiple steps."

Island installs can take two to three times longer than mainland jobs due to distances across water and handling materials multiple times. Mainland jobs often aren't much better, impeded by topography, site constraints, boulders and ledge rock, trees and retaining walls or seawalls. While overcoming them, Mayers found the company's niche as extreme site specialists. "We do the jobs other contractors won't because we go where no one else will," he says.

◀◀ Joe Mayers, owner of Septic Experts in Wantage, New Jersey, stands at the helm of his latest commercial transport barge with 115 hp Yamaha outboard motor. (Photos courtesy of Septic Experts)



▼ Bill Post at the helm of the 30-by-12-by-3-foot commercial transport barge while George Rosselli enjoys the cruise.



GEARING UP

Coping with severe conditions requires special, if not unique, equipment and Mayers recently upgraded all of it. After selling his sectional barge, he ordered a 12-by-30-by-3-foot commercial transport barge with 15-ton cargo capacity and a 115 hp Yamaha outboard motor from a Louisiana manufacturer. "It's faster and easier to put in the water and to offload machines, and it fits better between some docks," he says. A truck-mounted crane lifts the barge in and out of the water.

Originally, an 8-by-12-by-2-foot barge transported the 1,800-pound Kubota KH007 compact excavator to dig test pits, but in 2017 Mayers bought a 4,000-pound Kubota U17. To increase the barge's stability while transporting the machine, Mayers had Gus Schetting Welding in Sussex fabricate 2-foot-wide slide-on aluminum pontoons, which increased the craft's surface area to 12 by 12 feet. Also on call are a Kubota KX040-4, a KX057-4, two KX080-4s and a Komatsu PC200 excavator.

Other equipment includes two Yanmar rubber-tracked crawler carriers: a 1.15-cubic-yard C30R (5,512-pound payload) and a 3-cubic-yard C50R (8,380-pound payload). Both have articulated undercarriages to cross extremely uneven surfaces, traverse soft or swampy land with minimal



Septic Experts Wantage, New Jersey

Owner:	Joe Mayers
Founded:	1983
Employees:	12
Service area:	Several counties in New Jersey; parts of New York and Pennsylvania
Specialties:	Onsite installation, repairs, site preparation, pumping
Last Profiled in Onsite Installer:	September 2004
Website:	www.septicexperts.com



▲ Using a Kubota KX040-4 compact excavator, Bill Post offloads sand delivered by Ken Baadshaug Trucking into the containment pan for transport to a lakefront property. George Rosselli grabs an apple from his lunch.

damage to the terrain and reach places that otherwise would be inaccessible.

As luck would have it, barge work dried up around this time, but Mayers had ample projects to finance his new equipment. "We were always busy with mainland installs or system repairs," he says. "We're certified

"We do the jobs other contractors won't because we go where no one else will."

Joe Mayers

with Ecoflo, Puraflo, Fuji Clean USA, Norweco, Infiltrator Water Technologies, Hoot Systems and AquaKlear."

SNOWBALL EFFECT

Mayers also used the opportunity to increase his pumping business. Crews operate two identical custom Peterbilt 348 trucks with 3,600-gallon steel tanks and National Vacuum Equipment 4307 blowers from Pik Rite and a Peterbilt 379 with 5,000-gallon steel tank and NVE 4310 blower from Morocco Welding.

A contract to service numerous holding tanks on a major campground twice a week throughout the tourist season led Mayers to buy a Ford F-550 truck with portable 1,000-gallon aluminum tank, NVE 304 pump and Stellar hooklift hoist. Pik Rite built the 1,000-gallon tank to ride on the truck and barge. "The hoist enables us to swap out the tank with a (trash container)," says Mayers. "The truck is our Swiss Army knife on wheels because we also use it to cross lightweight bridges or pass through narrow tunnels and driveways to reach some homes."

MOTHER OF INVENTION

In 2000, necessity drove Joe Mayers to transport a 1,800-pound Kubota KH007 compact excavator on a 12-by-12-foot wooden dock. "It was my first attempt to replace a septic system on an island and I had no nautical experience," he says.

Modifying the dock into a makeshift barge involved adding foam-filled floats and an electric trolling motor. Nevertheless, the structure threatened to capsize as Mayers drove the machine up the ramps and onto it. He found the precise center of the dock and parked.

"I picked up a track with the bucket, slid out the ramp, stored it in the center of the dock, then spun around and repeated the process. If the machine moved an inch forward or backward, it would flip into the lake," says Mayers.

Still amazed at how he did it, Mayers headed across the lake to the island, accompanied by the design engineer, a health department official and an

employee in a rowboat. "They were laughing at me," he recalls, "because the dock was assuming the shape of a bowl as the screws pulled out from the strain."

When he reached the island, he grounded the dock on the shallow ledge and it stayed there for three months until the customer's well-worn three-piece sectional barge became available. After Mayers finished the install using the barge, the owner scrapped it.

"The dock gave me the idea for the 8-by-12-foot steel red barge," he says. "I read books on building ships and barges and searched online for articles on buoyancy, stabilization, center of gravity and the physics behind how vessels work in water. I also talked to contractors who used barges for different purposes and even an offshore driller."



▲ Employees George Rosselli (left) and Chris Chernes prepare to lash the septic tank and chambers to the 12-by-12-foot powered wooden dock.

▼ The 1,800-pound KH007 compact excavator (Kubota) is parked precisely in the center of the 12-by-12-foot powered wooden dock.





◀ The crane on a K&A Towing and Recovery truck prepares to set the 30-by-12-by-3-foot commercial transport barge in the water.

"Wherever we go, we've all gotten work just by wearing our company shirts."

Joe Mayers

Then a shadow from the past returned. When the 2008 housing bubble burst, the ripple from the crash left the area rife with foreclosed homes, many vacant for years. "New Jersey had some of the highest foreclosure rates in the nation," says Mayers.

As the pandemic hit, this client's story became typical as people from major New York and eastern New Jersey cities flooded the area to buy homes sight unseen in bidding wars. Usually sellers pay for the replacement system, but a father was willing to pay more for the home than the asking price and replace the system to ensure his wife and child were living in the mountains.

A BIGGER BOAT

Mayers' phone went crazy with service calls, and that's when he ordered the latest barge. After it was delivered in September 2021, Gus Schetting welded fittings to the spudwells to house the auxiliary ramp mounts. (Spudwells, vertical sleeves in the deck, hold the spuds, steel shafts that anchor the barge when lowered.) Schetting also fabricated a mount on the deck to secure the vacuum tank or container.

► Reed Ulmer pulls the hose from the 1,000-gallon Pik Rite aluminum vacuum tank on deck.

To power the pump on the vacuum tank, Pik Rite built a Power Pack, a Honda Model IGX800 24 hp fuel-injected engine with 20-gallon hydraulic oil tank. "The hydraulics run on food-grade oil and we put a label on the unit to advertise it," says Mayers.

The barge offers a big improvement: a helm with steering wheel and throttle. "The sectional barge had two 25 hp outboard motors

controlled by a tiller extension, and we knelt on a catwalk aft of the stern to use it," says Mayers. "Once underway, soil and sand in the containment pan would occasionally blow in our eyes, but not with the new setup."

SHOP TALK

While there is work, obtaining supplies remains a bugaboo as prices continue to escalate. Occasionally, chambers and PVC pipe are available only from out of state. To compensate for the fluctuating market and prices, Mayers' proposals are good for just 14 days. He also offers to buy materials immediately if given a deposit, then stores the goods until work commences.

Storage is no problem. In May 2020, Mayers bought the 3,000-square-foot building on 9.50 acres that he was renting. It has two service bays with an office above and a large yard.



► Austen Yanish navigates the 8-by-12-by-2-foot red barge with 15 hp Mercury outboard motor on Lake Gerard in Hardyston, New Jersey. Custom-built 2-foot-wide slide-on aluminum pontoons increase stability.

Like many contractors in the area, Septic Experts advertises in newspapers, online and through bulk mailings, but referrals and lettering on trucks and shirts produce the best results. "Wherever we go, we've all gotten work just by wearing our company shirts," says Mayers.

His barges and trucks are painted dark red with white, reflective block letters that are easy to read and increase visibility at night. They work so well that a driver heading east on a highway read the name and phone number on a distant pump truck as it approached from the west. He called for service.

LOOKING AHEAD

Mayers opened his septic and excavating business two years after graduating from high school in 1981. For most of the company's history, he has had three employees. Today, joining Mayers are Kim VanHouten, dispatcher/supervisor; Marissa Mayers, job coordinator/supervisor; Connie Bassani, bookkeeper; Bill Post, George Rosselli and Kenny Wojciechowski, machine operators; Austen Yanish, driver/laborer/operator; Don Card, driver; Reed Ulmer and Rob Nye, vacuum truck drivers; and Tyler Matthews, laborer/driver.

continued >>



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With a 500-gallon septic tank (Roth North America) strapped to the deck, Don Card (aft) maneuvers Mayers' first commercial barge toward shore. George Rosselli checks the water's depth. The 2-foot-wide slide-on aluminum pontoons increased the craft's surface area to 12 by 12 feet.

Return Engagement is an occasional feature where *Onsite Installer* visits a contractor featured in the past. If you have a company to suggest for a follow-up story, please send us a note at editor@onsiteinstaller.com.

Mayers turns 61 this year. Younger employees now do the groundwork as they learn how to install onsite systems. Mayers is training the pump truck drivers to work on the barge and also help with installations. His 29-year-old-daughter, Marissa, who was raised in the business, will take over when he is ready to step back a little.

"She will concentrate on growing small repairs, such as replacing tanks, lids and risers, and increasing pumping overall," says Mayers. "Marissa has a business degree and great people skills. She has taken this business to heart and made it her own."

According to Mayers, the company is in a good place. Every foreclosed house is occupied and almost all of them have onsite problems. "It's a unique situation," he says, "but I believe it's our proximity for inhabitants fleeing urban blight that has made more work for everybody." □

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Multi-Tank Precast System Overcomes On-Site Challenges

Challenge

A new temple and cultural center development in the Midwest needed an onsite treatment system, but the site posed challenges including limited access, confined drain field space and sensitive surrounding habitats.

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To meet the area's treatment needs and protect the adjacent wetlands, designers chose durable precast concrete tanks for the three-step advanced treatment system. The precaster designed the tanks to fit the site's small footprint and maximize the limited drain field space. The precaster also installed piping at the precast plant to save installers time on the jobsite.



Workers install 12,000-gallon precast concrete tanks for a development in the Midwest.



By installing air piping and discharge piping at the plant, installation time was greatly reduced.

Photos courtesy of Wieser Concrete Products Inc.

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PRECAST PROUD



Walk Away When the Soil Is Wet

Don't even start up your excavation equipment if the work site has been doused with water. Wait for dry weather.

By Jim Anderson and Dave Gustafson

We still receive numerous questions about "good" installation practices and their importance in the soil dispersal and treatment area. We will attempt to highlight a few thoughts on installation techniques and importance for different site and soil conditions.

If the system is being installed in areas with high water tables or in soils high in clay content, greater care must be taken to maintain the soil in as natural a condition as possible. Keeping and using natural soil to maintain the ability to accept and treat septic tank effluent is always important.

However, on wet sites where water is close to the surface or in high clay-content soils that maintain water for longer periods after rainfall, keeping it natural and avoiding problems is more difficult. Therefore, it is very important to protect the area from other construction activities. Way too often we have seen instances where the soil treatment area has been damaged by traffic over the site from delivery trucks or other contractors not realizing the site can be damaged.

Human foot traffic can cause significant compaction by multiple trips across the area. You have spent time and effort to protect the area from disturbance and problems; don't blow it by not being careful during the install.

Excavating or scarifying soil when it is too wet can cause compaction or smearing, reducing the ability of the soil to accept wastewater and making it difficult to predict the long-term acceptance rate. Compaction is the compression of soil particles, which closes or reduces pore space available for water movement. Smearing shuts off the soil pores from acceptance by spreading and smoothing soil particles by sliding pressure.

The result is reduced infiltration and acceptance and usually system failure if installation proceeds without fixing or mitigating the impacts. The effects of compaction and smearing in the soil can last for years

depending on the severity. This is why it is so critical not to excavate or scarify soil when it is too wet.

MOISTURE IS THE ENEMY

Excavation or working the soil should only be done if the soil moisture content is below its plastic limit and is dry enough to be worked. Obviously if the soil is too wet following precipitation events, it may take a day or more for the soil to dry sufficiently to avoid damage during installation.

There is a quick method to evaluate soil moisture content in the field. The soil tested should be taken from the depth of the infiltrative surface — where effluent will leave the media to enter the soil. At-grade or mound system soil should be tested at the surface to the depth of the scarification.

The test is conducted by taking a clump of soil and working it in the palm of your hands. If the sample can be rolled into a wire 1/8-inch in diameter, the moisture content is above the plastic limit and excavation should not occur. If the sample crumbles, the soil is below the limit and installation can proceed.

Once installation begins, the soil still needs to be protected from activities that could cause compaction or smearing. This means all traffic, including foot traffic, should be kept off the infiltrative surface. We often see installers walking back and forth along the bottom of trenches before the media is placed. Human foot traffic can cause significant compaction by multiple trips across the area. You have spent time and effort to protect the area from disturbance and problems; don't blow it by not being careful during the install.

It's important to keep an eye on the weather during installation. Any exposed areas should be covered to protect the infiltrative surface from direct rainfall. Rain itself can damage the soil structure at the infiltrative surface. If this happens, installation should not occur until it dries out. The surface may need to be re-prepared depending on the extent of the damage.

For good system installation the job should be finished before leaving the site. This means a final grade on the system is established so surface water will run off the system and the system area is protected from runoff over the system area. This may involve things such as redirecting runoff from downspouts or berms to direct water away from the system.

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PROCEED WITH CARE

Leave a minimum of 6 inches of suitable soil to establish a good vegetative cover over the system. The vegetation should be close-growing and vigorous. This keeps the soil in place during rainfall and in the winter, vegetation provides an insulating layer that will catch and hold snow in place. Avoid trees, shrubs and other and other vegetation with extensive deep root systems. Roots can cause problems with all system components.

Turf grasses, wildflowers and native grasses should be used to establish cover. Turf grasses have fibrous root systems that hold soil in place. They will need to be maintained by regular mowing. Wildflowers and native grasses with fibrous root systems may be preferred because they have the same root system benefits but require less maintenance.

Low maintenance does not mean no maintenance. It is important to keep native vegetation under control and any trees or shrubs that get started in the area should be removed before they become established. The area should continually be evaluated for the presence of burrowing animals such as gophers. These pests should be removed before they cause damage to the system.

Having "good installations" is not difficult; but it does require vigilance from start to finish on the installer's part. And remember, you are the first person someone will call if there is a problem, so doing it right can eliminate a lot of issues in the future. □

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SYSTEM PROFILE



The job site near Paw Paw, Michigan, needed a different approach because of proximity to the lakeshore and to a neighboring property. A SludgeHammer unit combined with a Geoflow dripfield solved the problem. (Photos courtesy Lucian Witmer, Dig-It Excavating)

A Day at the Beach

Tiny cottage lot with impossible setback issues spurs a training day featuring an aerobic treatment solution

By David Steinkraus

The homeowner on Lake Cora near Paw Paw, Michigan, was not in a good situation.

"He had been running quite a few years on holding tanks," says Dervin Witmer, owner of Dig-It Excavating in Cassopolis, Michigan, who was hired to create an onsite system for the house.

The owner had purchased the home and then realized frequent holding tank pumping was not what he wanted. Local health officials told him that was his only option, Witmer says. "According to code, that's all they could do because they were thinking traditional system."

Local code says an onsite system must be at least 50 feet from a lake and 10 feet from property lines, but on this parcel a new system would be 15 feet from the water and 3 feet from the boundary, he says. "Plus, he even had a well on the property, but thankfully the well was over in one corner, so he had a lot of beach area available."

The system

Installing the system consisted of refitting a pair of 1,000-gallon holding tanks to provide treatment and installing a drip system to disperse effluent.

Wastewater exits the house in a 4-inch PVC pipe and enters the first 1,000-gallon tank, which contains a SludgeHammer S46 aerobic treatment unit. A baffle and a short pipe connects the first tank to the second 1,000-gallon tank.

This second tank provides equalization and acts as a clarifier. On its outlet is a Sim/Tech pleated gravity filter. This protects the 1/3 horsepower Myers pump inside a 100-gallon fiberglass pump vault that was added to the train. A Sim/Tech pressure filter, with 600-micron sock after the pump, screens effluent heading to the dripfield.



◀ Dan Wickham, center, inventor of SludgeHammer, walks the dripfield during the educational outing for the Paw Paw job.

▼ James Sanders from Dig-It Excavating lowers the SludgeHammer unit into place during the educational outing at the Paw Paw job.

From the dosing tank, effluent flows to a 750-square-foot bed holding about 700 linear feet of Geoflow dripline. The L-shaped bed bends around the house. One section is about 60 feet long, the other is 30, and the bed is about 8 feet wide.

The Geoflow product is not the usual dripline for clear water but is designed to prevent fouling from bacterial growth, Witmer says. This product also has emitters engineered for effluent and has an herbicidal liner to discourage root intrusion.

An SJE Rhombus panel controls the system. Risers and lids were replaced with Dig-It's custom branded products from RomoTech.

To do the job, technicians used a 2020 Caterpillar 306CR mini-excavator fitted with an Engcon EC206 tiltrotator, a 2018 Cat 299D3 track loader and a Harley Rake to finish the topsoil.

Lobbying for technology

The first challenge in doing this project was using the SludgeHammer technology. Local health officials were unfamiliar with it, so Witmer says he turned the project into an educational demonstration.

Witmer knows the sanitarian who oversees the local health department. "I explained the SludgeHammer system to him and the idea that up north, around Traverse Bay and Traverse City (near SludgeHammer headquarters), they're permitting these a lot closer because the final effluent is so clean."

The official later called back and said he would allow SludgeHammer in the county, but not for the property Witmer was working at. The sanitarian said this project would have to go through a board of appeals because a code change was involved. A Zoom meeting was set up with the board of appeals bringing in system designer Justin Sorenson and Dan Wickham, the Ph.D. biologist who invented SludgeHammer. Wickham gave board members copies of the plan and test results from other systems.

"And I said, 'Hey, guys, listen. We're in the 21st century. People will continue to build houses on these lakes with small lots if they have options. We have dirty lakes. We want to clean up our lakes. The final effluent that we're putting on the ground is cleaner than most inland lakes,'" Witmer says.

The benefit of dripline is capillary action that pulls water in all directions, Witmer says. Water outflow around a dripline is spherical, not mostly down. "There were a few people on the board who were like, 'Hey, guys, listen. You and I both know how many 55-gallon drums there are sitting



System Profile

Location: Paw Paw, Michigan

Facility served: Single-family home

Designer: Sorenson Engineering, Traverse City, Michigan

Installer: Dig-It Excavating Inc., Cassopolis, Michigan

Type of system: SludgeHammer aerobic system with drip dispersal

Site conditions: High water, sand, limited space

Hydraulic capacity: 400 gpd

SYSTEM PROFILE



◀ Dervin Witmer, center, of Dig-It excavating, talks with a group of onsite professionals invited to look at the Paw Paw job. Because area sanitarians and others were not familiar with the SludgeHammer technology, Witmer created an educational outing when the system was in place.

▼ The Geoflow drip tubing used in the Paw Paw project is not the tubing used for clean water. Because effluent may still have some bacteria, this tubing has a lining that prevents bacterial growth, special emitters and an herbicidal liner to discourage root intrusion.



"If we would encourage alternative technologies like this, that have very clean effluent, **you're only going to come up with cleaner lakes as a result.**"

Dervin Witmer

around putting sewage right into lakes. This guy wants to do something that's environmentally responsible," Witmer recalls. Approval came the same day.

Working on the plan with Sorenson and the staff at SludgeHammer took a couple of months, and approval required about another month.

Onsite field day

After Witmer's crew installed the system, and before they covered it, he invited area sanitarians, designers and other interested people to learn about it during an education day at the Dig-It shop. Wickham gave a presentation on his aerobic bacterial generator systems, and then the group of about 20 went to the lake property to see the completed installation, Witmer says.

During installation, Witmer found someone had connected an overflow line from the holding tanks to a perimeter drain around the building. "His sump pumps were running every couple of minutes," Witmer says. "So I'm sure all the vegetation out there was caused from high bacterial levels." Sealing the overflow line will be a huge step in cleaning the lake, he adds.

The pump vault had to be anchored because it was about a foot into the water table, he says. The vault has lips on top and bottom, so his technicians put bags of Sakrete around the bottom and then backfilled.

The dripfield was about 3.5 feet above the water table, and code requires 2 feet, he says.

Performance

After three months of operation the system was producing effluent with:

- BOD of 9 mg/L (NSF-40 reduction standard is 25 mg/L or less).
- TSS of 26 mg/L (NSF is 30 mg/L or less).
- Total inorganic nitrogen of 3.04 mg/L (NSF is 30 mg/L or less).

The results were great, but not unexpected because other SludgeHammer systems show similar results, Witmer says.

The health department sanitarian was quite right in saying that a lot of contaminants are going into the lake, Witmer says. "If we would encourage alternative technologies like this, that have very clean effluent, you're only going to come up with cleaner lakes as a result." □

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7 Overlooked Job Site Safety Rules That Can Save a Life

To protect your crew, follow the Boy Scouts motto, "Be Prepared," as you head out to your next installing job
By Sara Heger

Your tailgate safety meetings probably focus mainly on the major hazards involved with onsite system installation work, like operating heavy equipment and trench shoring. But don't forget about these seven basic safety issues that are easily overlooked:

Ergonomics

Particular care should be taken when lifting heavy or awkward items. Tools and equipment to assist with lifting specific items are available, but the tools must be in good condition. The following steps should be practiced to avoid personal injury:

- Do not lift more than can be handled comfortably. (U.S. Occupational Safety and Health Administration standards set a limit of 50 pounds per person.)
- Store heavier objects at waist height rather than on the floor.
- Use the buddy system whenever possible.
- Establish a solid footing and good balance before lifting.
- Get as close to the load as possible when lifting or carrying.
- Keep the back straight, grip the object firmly and use the legs (not the back) to provide lift.
- Never carry a load that is too large to see over or around; use a hand-truck, cart or dolly instead.

Smartphones

Cellphones can be lifesavers in an emergency. However, casual use on the job site is a tremendous distraction. If a company has no official policy regarding cellphone use on the job, workers tend to make and receive calls without regard to consequences. This effectively becomes the policy and is a potential safety issue. Company policy should clearly indicate casual cellphone use is not approved during work time. The policy should also address earphones and personal music devices since use of these on the site is clearly inappropriate.

Terrain

Uneven surfaces, slopes and ditches are often the norm on sites where systems are being installed. Workers can trip and fall. Equipment can become unstable and tip over. Both the operator and other crew members working nearby must be aware of this and position themselves to avoid injuries. Open access ports should be taped off or barricaded to prevent falls.

Vegetation

Trees can also be a hazard. Branches can whip back and cause serious injury. Trees may fall, especially if vegetation near them was removed prior to construction. Look overhead for large dead limbs that could drop. Poisonous and rough vegetation are typically found in wooded areas but can be an issue on any site. Poison ivy, poison oak, berry bushes and thorny vines are examples. It is important to be able to identify plants that may pose hazards.

Insects and snakes

Look for biting or stinging insects such as bees, hornets, wasps, scorpions, black widow spiders, brown recluse spiders, mosquitoes, biting flies or fire ants. Insect repellent should be available to ward off mosquitoes that may carry infectious disease. If any employees are subject to anaphylactic shock as a result of a bee or hornet sting, this information should be common knowledge among crew members. Kits for administering this type of first aid should always be available and someone on site should be familiar with how to respond to such a situation.

Snakes, poisonous or not, may surprise employees and result in injuries. If an employee is bitten by a poisonous snake, prompt first aid should be administered followed by seeking professional medical attention.

Weather conditions

Excessive heat and cold cannot be ignored as they can cause severe illness or even death. Hydration is important no matter what the season and clean drinking water must be available at all times.

Excessively wet or dry soil conditions influence excavation activities because of their effect on soil stability. Heavy downpours that occur on the day of installation will obviously shut down the job, but a downpour that occurred the day before must also be considered. Cease working during electrical storms.

Crew health conditions

It is important that when working on job sites that supplies are available to assist with known health conditions. This could include having an EpiPen, or generically an epinephrine auto-injector for an employee allergic to bees or a high carbohydrate snack for someone with low blood sugar due to diabetes.



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North Dakota Expects a Long-Overdue Septic Code Rewrite

Wastewater professionals organized a trade association a few years ago, hoping to update onsite rules and protect the environment

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 North Dakota Onsite Wastewater Recycling Association.

Association involvement:

I was one of the founding members of the North Dakota Onsite Wastewater Recycling Association in 2019. I was appointed by the governor to serve as vice president. One of the reasons we formed was to help rewrite the septic code, which we're going through now and trying to update. It hasn't been updated since the 1990s. We want a uniform set of rules because the different health departments in the state all have different rules.

Benefits of belonging to the association:

Education and networking are the big ones, connecting with other contractors who have had similar problems as yours and hearing how they solved them.

Biggest issue facing your association right now:

Getting young contractors involved in the industry and the association has been a huge problem. We also need to educate the public and our customers about how our industry is changing and how regulations dictate what we can and cannot do. This used to be a wide-open state as far as rules and regulations, but there has been so much change in what I've seen happen, from all rock-and-pipe drainfields to chambers. And I was one of the hardest guys to get to change because none of us likes change. But the chambers are really a benefit to us all because you have no cleanup.

Our crew includes:

I am a self-employed sole operator. But I do hire a couple of part-time workers during the busy season. I used to have 24 men working with me when we did earth-moving. I'm not retired by any means, but I have scaled back. And it's been hard to get help.

Typical day on the job:

My day starts around 6 a.m. and I'm usually done around 8:30 at night. I probably spend 20 to 30 hours a week on bidding and paperwork, and then 40 to 50 hours in the field during the work season. Winters are brutal here so the season is short. It's nothing to put in 80, 90 hours because come winter, I'll be sitting in a rocking chair. I also do inspections if somebody has a problem with their system. I analyze it and let them know what I suspect is the problem.



Bruce Ellingson
owner

Business:
Ellingson Construction,
Park River, North Dakota

Age: 63
Services we offer: We do septic installations — a few mound systems but with our soils we can get by with conventional systems. We also do inspections and repairs.

Years in the industry: 46

The biggest problem with inspections is the system is underground and you really can't tell until you open it up — and then you might be opening up a can of worms.

The job I'll never forget:

I worked on a nearby [American Indian] reservation for a summer doing installations. I learned how different the soils can be over just a few miles' distance. An installation on one site would not work on another site. I learned that no two sites are the same and you always have to be ready to change and adapt.

My favorite piece of equipment:

I like my excavators and the small dozer. I have a Bobcat E50 mini and a Hitachi EX200 for bigger jobs, and a John Deere 650 dozer. The excavators are great because of the reach and the lifting capacity if you have the room to open it up. I like the dozer more than a skid-steer — probably because I'm used to it, and it can float better.

Most challenging site I've worked on:

I was working on a project in a farmyard. I dug three or four test holes and none of them worked. I took one last test in a spot where I said it would never

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work — and it worked perfectly. Just goes to show, you never know what's under the topsoil.

Oops, I wish I could take this one back:

On one of my first jobs, I listened to the customer who wanted it done their way. I knew it wasn't going to work and should have stuck to my guns but "the customer is always right." Well, he wasn't right so it froze up. It was too shallow, he didn't want to use enough overfill, it was too late in the day, too late in the year, he wouldn't let me put straw in the drainfield. It was a disaster waiting to happen. In January, he called and said, "Your system didn't work. Come out and fix it." So I went back and fixed it in -10 degree weather. We used to do all drainages eight or nine feet deep to stay out of the frost, but you were down there in the water so that wasn't working. On repairs, I found some people used straw as the drain material, and in one case I found a car. So, regulation is needed.

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

"Do I really need a drainfield when there are those trees right over there?"

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

I believe the water usage rate is set too high, so the sizing factor and footprint is too large. They've got it here at 150 gallons per day per bedroom and that is way too much. Sometimes when you go back and inspect a system after two or three years, some of the chambers are dry — never had fluid in them. It's a waste of money, a waste of footprint. I think the theory on doing it that way is they're thinking of weddings or graduations when you have 40 people at your house. But I think it's wrong.

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

I'd love to be working on a beach somewhere as an old lifeguard. But I've been in this industry all my life. It's been very good to me. I wish young people would be more interested in getting into it. It's hard work and long hours but it is rewarding and it's so needed. But, meanwhile, I got into something that's really kooky — goats. I've got about 40 of them. They're a lot of fun. I take them out to the woods where they can browse on the trees and it makes it look like a park when they're done. I raise them for meat and a lady milks them and makes cheese and soap.

Crystal ball time -

This is my outlook for the wastewater industry:

As all of us get educated, we'll see how very important this industry is. There are a lot of people in North Dakota on septic systems but we get very little funding, education or government support. But I see that changing — partly by keeping our association alive. □

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

Send your suggestions to Jim Kneiszel at editor@onsiteinstaller.com.

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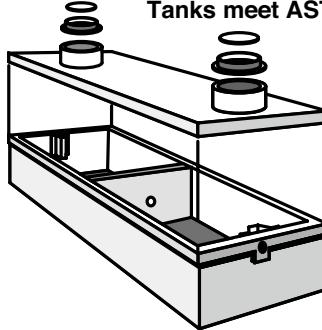
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Lawsuit Seeks to Suspend Onsite Permits in Florida to Save Manatees

By David Steinkraus

An environmental group is suing the state of Florida to stop it from issuing onsite permits. Nitrogen pollution from septic tanks is killing the seagrass that feeds manatees in the Indian River Lagoon, said the lawsuit filed in the Middle District of Florida.

The lawsuit was filed by Bear Warriors United Inc., which usually advocates for black bear protection. It accuses the state Department of Environmental Protection of failing to enforce water pollution laws, news reports said.

"They walk back on laws all the time," Lesley Blackner, the attorney for Bear Warriors, told *Florida Today*. "Most environmental laws are not enforced."

The lawsuit asks for a permanent injunction on permits to discharge nitrogen from septic tanks and wastewater plants into the northern part of the lagoon. The lagoon is formed by the mainland and barrier islands that stretch for about 115 miles along Florida's eastern shore. Bear Warriors also wants a declaration that the department violated the Endangered Species Act. Manatees are listed as a threatened species under the act.

Bear Warriors asked the court to order medical monitoring, veterinary care and proper food for manatees in the northern part of the lagoon until there is enough seagrass to sustain them. Last winter, wildlife workers fed lettuce to manatees in an attempt to keep them from starving.

Also known as sea cows, manatees are slow-moving mammals that can grow to 13 feet long and weigh up to 3,650 pounds.

Colorado

The Colorado Water Quality Control Commission has tentatively approved a rule opening the path to direct potable reuse of wastewater. Ohio, South Carolina and New Mexico also have regulations in place for reuse, and California and Florida are working on the idea, reported Fresh Water News.

"This is going to be a need in Colorado, and we want to be prepared," said Ron Falco, safe drinking water program manager for the Colorado Department of Public Health and Environment.

Under the regulation, water providers would have to show they have the resources, both technical and financial, needed to recycle wastewater. Communities would have to collect wastewater samples for a year to demonstrate treatment effectiveness.

A *Denver Post* opinion column supporting the rule noted that water has been recycled through the environment for almost 4 billion years. Colorado and other Western states have historically depended on winter snows for their water supply, the column says, but a warming climate is changing that. Snowpacks have decreased by 20% to 60% at monitoring sites in the Rocky Mountains.

Michigan

A Michigan lawmaker's attempt to create a statewide inspection rule for onsite systems appears doomed. State Rep. Jeff Yaroch, R-Richmond, sponsored HB 6101, which would require an onsite inspection when a property is transferred from one owner to another, reported the news site mlive.com.

The Michigan Realtors association said it strongly opposes the idea because its members don't want inspections tied to property sales, said Brad Ward, the group's vice president of public policy and legal affairs. Members want not just uniform definitions and rules but uniform inspections at regular intervals, he said.

"If the ideal thing is clean water in our rivers, lakes and streams, it makes sense that we should probably be testing everyone in a regular interval, rather than just when homes sell," he said. Houses not sold for decades would not be inspected, he said, whereas those sold often would be inspected many times in the course of a few years.

Yaroch called the opposition self-serving. "Fundamentally, what this is about is Realtors don't want to have this on their plate as part of the sale process, even though this is the most pragmatic time to do it," he said.

There has been one hearing on Yaroch's bill. Officials in the House of Representatives said no others are planned. Michigan remains the only state without a statewide code governing onsite systems.

California

The Santa Cruz County board of supervisors approved time-of-sale inspection rules for onsite systems.

The rules say property sellers must have their onsite systems professionally pumped and inspected before a sale. Sellers must provide buyers with a standard disclosure form containing information about the system, and must also provide buyers with copies of any annual service agreement, reported the *Santa Cruz Sentinel*.

Dozens of county residents at a public hearing on the rules said they were concerned that inspections could slow the sale process and push up its cost. Staff from the county's environmental health division said an advisory committee would consider comments and may recommend adjustments before the rules take effect in July.

Virginia

Faced with increased flooding from sea level rise and with more intense rains linked to climate change, the state of Virginia is looking at rewriting its onsite rules. Also factoring into the decision is the availability of more alternative treatment technologies, Lance Gregory, director of the state Division of Onsite Water and Wastewater Services, told *The Virginia Mercury*.

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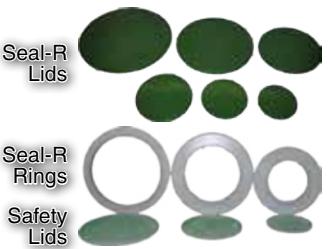
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"It's been 20 years since we've revised the regulations, so we're opening them wide open," Gregory said. Virginia has about 1.1 million onsite systems, and the majority are conventional septic systems.

New Hampshire

A judge sentenced Brian Jeffrey Strouth for violating the state's Consumer Protection Act for an onsite system installation that never happened.

Strouth, 51, of Pittsfield, New Hampshire, was sentenced to a 12-month suspended jail term, said a press release from the state attorney general. As a condition of the three-year suspension, the judge prohibited Strouth, or any business owned or operated by him, from performing any work requiring a professional license unless he first obtains such a license and obtains court approval. He is also prohibited from accepting prepayment for work. Strouth was fined \$1,000 and ordered to complete 40 hours of community service. When he was sentenced, Strouth paid \$4,000 in restitution.

In August 2019, Strouth convinced a customer to pay \$4,000 for installation of a septic system, said the press release. Strouth was not licensed to install onsite systems, made excuses for not doing the work, then forged a permit application and falsely told the customer it had been filed with the state. □

"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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PRODUCT NEWS

PRODUCT SPOTLIGHT

Product protects risers from frost issues

By Tim Dobbins

Freezing temperatures can be hard on septic systems. Damage to pumps and fittings inside of tanks are an all too common result when proper precautions aren't taken during the design and installation of systems.

The team at Alberta Wilbert Sales noticed that septic risers can be prone to frost-heaving, compromising connections and seals and leading to water infiltration into tanks during the spring thaw. As a solution, AWS developed the Riser Wrap, a product made from expanded polystyrene, a rigid closed-cell foam, to insulate risers against frost.

"When we designed the AWS Riser Wrap, we knew it had to be easy to install, and have a high insulating R-value," says Kory Read, commercial sales rep for AWS. The final product has an R-10 insulation rating.

Riser Wraps are molded with a tongue-and-groove system that joins halves with a tight, closed seam, securing the wrap around 24-inch ribbed PVC pipe. The foam is formed with interior ribs to fit snugly between the ribs of existing PVC.

Read says the design and rigidity of the foam does more than insulate.

"The structural integrity of the interlocking foam sections also greatly strengthens grade-ring and riser connections," he says. "In addition, the smooth outer wall of this product inhibits surrounding soils and frost from embedding into the pipe's grooves, which can lead to heaving of riser pipes."

Users install Riser Wrap by hand from the bottom up, making sure the top of the two halves align within the same riser rib. Then a ratchet strap is used to temporarily hold the halves together, with supplied nylon straps used to hold them in place permanently.

Sections measure 48-inches high, but are stackable to accommodate any riser pipe height and cutting. A handsaw or utility blade is used to customize them to accommodate splice boxes, pipes, and other riser protrusions.

"The ease of installation means there are no additional headaches to deal with on site, and the final product and its benefits provide peace of mind for installers and homeowners." **800-232-7385;** www.wilbert.ca □



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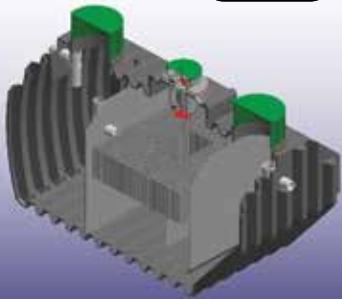
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INDUSTRY NEWS

NOWRA names new board members

The following have been elected to the National Onsite Wastewater Recycling Association board of directors and will serve through November 2025: Gary Hawkins, Georgia; Jerry Stonebridge, Washington state; Robert Sweeney, Oregon; and David Price, Texas. Board members whose terms recently ended are: Chris LeClair, Minnesota; Morris Smith, Florida; Tom Schimelfenig, North Dakota.

2025 Onsite Wastewater Mega-Conference Announced

NOWRA announced the 2025 Onsite Wastewater Mega-Conference will be held Oct. 19-22 at the Kalahari Resort and Conventions in Sandusky, Ohio. For more on the conference announcement, visit www.nowra.org.

James Bell wins NOWRA industry achievement award

The 2022 Richard J. Otis Industry Achievement Award was given to former NOWRA President James Bell at the 2022 Onsite Wastewater Mega-Conference. The award, named after NOWRA past president Richard Otis, is presented annually to an individual who has made outstanding contributions to both NOWRA and the onsite industry. Bell served as president of NOWRA in 2017 and 2018 was integral in establishing NOWRA's online learning. □

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 U M Y B P A F Z S A S A C F Y O N W U Y I Z Y I B I X Y Q L
 T D L R O E W S T T W U L O X N O L O N T S X L I Z B T F A
 N I Q I K M A W I M B N V E O W B Q V C E P E Y O S T A F P
 P O B T E P T V C E V G M D U S S P L S Q V A R E K P P I K
 B Z J I F R E U E N L P A Z I U O R Y U W X W M S Y L N V I
 L Y L R F L R T L T N R R Q F S E P T I C D M N A D E R K Q
 A O H B L Q T S G O I E H O Y Y I M S H R H A I E A A B U H
 Y T R S U F I K Q V Z S X Z F C O N E L Z V P K O M C D A C
 B X I I E E G G S E K S Z B Y E D G F Z A B E L V L H F I M
 K Z R H N A H B O G A U F O F C S S X E M M A O M H F P P O
 Z P D G T U T U O H H R K B D X I S I N C W B C T E I G N A
 I X Z V S A K X R C C E K X A I M Y I E M T W C Y H E A L J
 V W U B C C Q E Z R B F N I D D V D R O H N I X J C L Q A T
 E N Y P U M P E R S U I S K O O V L X T N K I O Z N D H C Q
 C O R Y Z K R M K A K L F M G R M A H R D A U S N S B I X W
 R T P H Y B I J Z E G T G O Y V H V N C E M L O P Q E I X T
 I N S T A L L E R S N E B J H W Y D O C M H Q G Q E P M B L
 X P K L R L O B P Q O R E L O D E U W W E G B C A E I U X G
 G J J B V J D S H W Z D S A I W P N W Z U D M H U A V K I E
 T T W E A S P I N S G R T E D R G F V B B T D S W Q H A S O

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