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ONSITE INSIGHTS:
What about a cluster system?
p. 20

**EDITOR'S
NOTEBOOK:**
Michigan needs
a septic code
p. 10

SECOND ACT SUCCESS

He used to serve up frosty desserts, but Tom Prudum now designs septic systems for a living — and he loves it p. 12

SYSTEM PROFILE

Heavy tankage
at hotel complex
p. 22



PRODUCT FOCUS

System Maintenance, Inspection
and Installation Tools p. 28

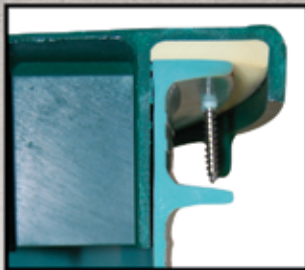
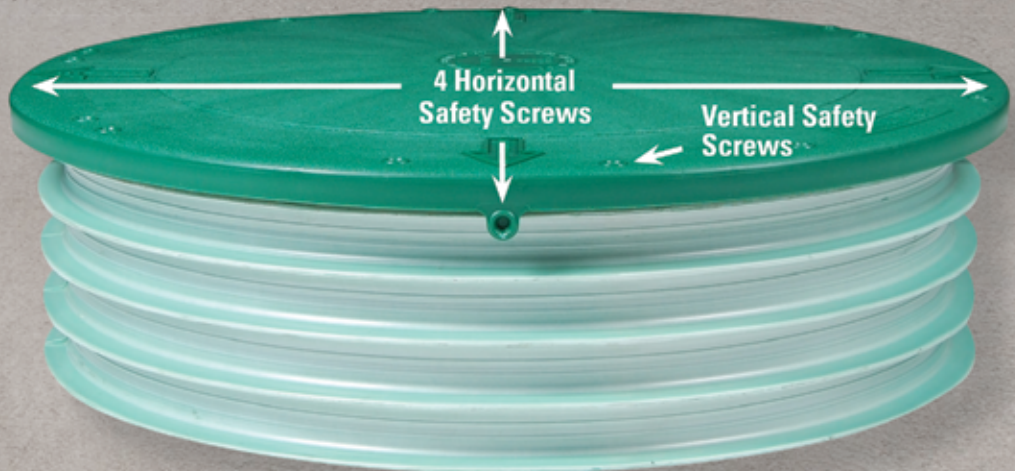


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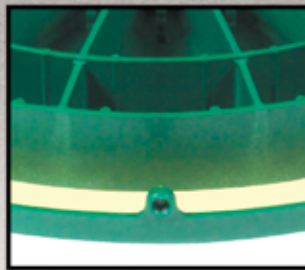
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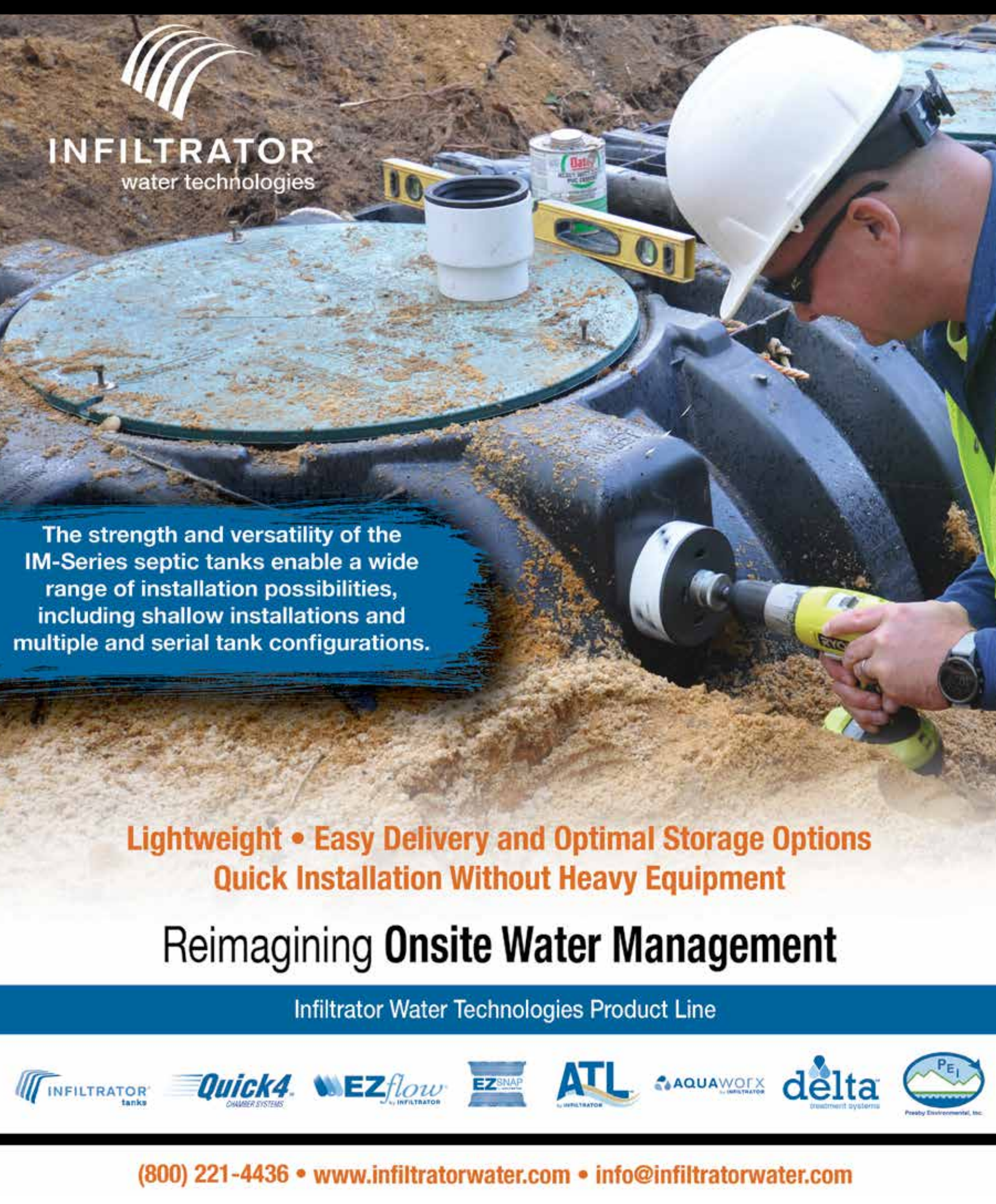
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INSTALLER PROFILE:

Second Act Success

By Tim Dobbins

ON THE COVER:

American Septic Design in Wauna, Washington, faces many challenges working in the environmentally sensitive Puget Sound region. Owner Tom Purdum is shown at an install site with a Kubota KX018-4 excavator. (Photo by Stephen Brashear)

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10 Editor's Notebook:

Get With It, Michigan! Adopt a Septic Code.

Onsite rules would benefit Michigan homeowners, wastewater professionals and the environment — just like they do in the other 49 states.

By Jim Kneiszel

20 Onsite Insights:

When Is a Cluster System the Go-To Wastewater Solution?

Planning for a shared treatment system can be complex business, but it can be a great answer for the right parcel or small community.

By Sara Heger

22 System Profile:

Big System on Small Site Is a Coastal Conundrum

Waterfront North Carolina hotel/condo/eatery complex requires heavy tankage and creative effluent dispersal to handle huge flows.

By Tim Dobbins

28 Product Focus:

System Maintenance, Inspection and Installation Tools

By Craig Mandli

30 Rules and Regs:

New North Carolina Law Pushes Onsite Technologies

By David Steinkraus

32 Snapshot:

Treat Customers Right and Enjoy Success For Generations

“If this industry is truly about protecting the environment, why do we have to wait so long to put in technology that allows us to clean things up to the clean-water standards?”

36 Associations List

38 Product Spotlight:

Media accelerates treatment in poor soil conditions

By Tim Dobbins

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ADVERTISER INDEX

November 2023

Alita Industries, Inc.	29	FujiClean USA	11	Simple Solutions Distributing LLC	38
BioMicrobics, Inc.	19	Infiltrator Water Technologies, LLC	3	SJE Rhombus®	17
BIOROCK	39	Jet Inc.	25	SPI, Inc.	19
BrenLin Company, Inc.	31	Kistner Concrete Products, Inc.	33	T&T Tools, Inc.	34
CREST Precast, Inc.	15	National Precast Concrete Association	9	The Shaddix Company, Inc.	38
Delta Treatment Systems, LLC	6	Norweco, Inc.	5	TUF-TITE, Inc.	2
E-Z Treat Corp.	15	Polylok, Inc.	40	Wholesale Septic Supply	24
Eljen Corporation	7	Roth North America	26	WIESER CONCRETE	37
		Sim/Tech Filter Inc.	8	WWETT Show	35
				Classifieds	38

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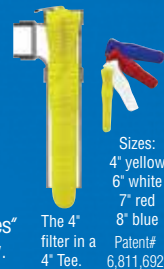
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STOP CHASING ZERO ERRORS

Building Resiliency

Decades of experience have shown that the crusade to eliminate every error is both impractical and unwise. Instead, high-reliability work teams operate so that errors and surprises don't disable them. These teams seek to build resilience. There is no single playbook or procedure that guarantees success, but this article provides three time-tested strategies you can implement to strengthen your team. onsiteinstaller.com/featured



ALLEVIATE CUSTOMERS' FRUSTRATIONS

Stop Recurring Sewer Backups

Sewer line cleaning without an inspection camera is like a surgeon or dentist not using MRIs or X-rays and just kind of winging it. If a drain cleaner or onsite service provider is not using an inspection camera as part of their typical method, there is a lot they are going to miss. So after multiple recurring backups, if you're called in to save the day, an inspection should be your first step. Here are five main causes of recurring sewer backups that are missed when not using a sewer camera. onsiteinstaller.com/featured



INFLUENCE AND RESPECT

How to Pick Team Leaders

Picking great team leaders can be a somewhat arbitrary and nebulous process — more art than science. Sure, managers can use metrics like seniority, experience and levels of technical expertise as criteria, but none of those guarantee how effectively people work together as a team. So how are business owners supposed to divine who's a great leader and who's not? New research shows there actually is a key trait managers can home in on. Learn more in this exclusive online article. onsiteinstaller.com/featured

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Get With It, Michigan! Adopt a Septic Code.

Onsite rules would benefit Michigan homeowners, wastewater professionals and the environment — just like they do in the other 49 states

I live in Wisconsin and own a vacation home on a small lake. Our cottage and all of our neighbors' homes utilize septic systems to treat our wastewater. Stringent statewide regulations monitor the maintenance we provide for our onsite systems next to the waterways we enjoy swimming in and fishing from. We are accustomed to fulfilling a mandate to inspect these systems every three years and take care of pumping and repairs as needed.

Several years ago, after my mother passed away but before her estate was settled, our family missed the deadline for a required inspection and pumping service. I was summoned to court and eventually had to pay a fine because we were tardy. I explained the estate was in flux at that point and a warning letter was not received by me, but that excuse didn't fly.

We understood the reasons for a statewide septic code and the county enforcement of these rules because they are ultimately about protecting the environment so future generations can enjoy lake life the way we have for three generations.

So with that personal experience, I am mystified over what's going on in neighboring Michigan, an hour from our vacation property, where elected leaders object to similar septic system monitoring. With an estimated 1.4 million private onsite systems, Michigan is the only state without a statewide septic code — despite a 2015 university study that determined failing systems are causing pollution in waterways.

EVERY FIVE YEARS

In the latest move to set minimum statewide onsite requirements, a bill was introduced in the state House and Senate which, among other measures, would require septic inspections every five years. Opponents have quickly sprung up to try and kill the bills. They say it is in part because of \$1,000 fines for those who ignore the required inspections or necessary repair or replacement of failing systems. The law would also require a \$3,000 fee to build a system for a new home or replace an existing one.

Setting aside the fines and fees, the arguments against periodic inspections and maintenance mystify me from my home across the state border. Consider the knee-jerk reaction from Republican State Rep. Dave Prestin of Michigan's Upper Peninsula, as reported in the *Menominee Eagle Herald*.

"If this passes and is implemented in the way that I feel it's going to be intended, it will be one of the largest depopulation events in rural Michigan. Up here in the U.P., we would be hit incredibly hard," Prestin said. "There are

a lot of statewide stakeholders that are against this as well. ... This is a big old breach. This will devastate the U.P."

I'm sitting on my dock enjoying a beer and scratching my head over Prestin's reaction. How can routine septic inspections be a widely accepted reality over here in Wisconsin — and neighboring Minnesota, for that matter — and be considered the end of the world as they know it in Michigan?

Prestin and other opponents to a septic code argue that expenses for inspections (projected to cost \$115 to \$245), as well as repair and replacement of septic systems, would be onerous to property owners. They also argue that Michigan — with large swaths of rural areas — would not be equipped to perform the inspections.

Let's unpack these two arguments.

First, we'll assume an inspection is on the high end of the estimated cost. Conducted every three years, that's \$81 and change to professionally monitor a decentralized wastewater system. Weigh that against the cost of a potential repair or replacement which is a more likely result if system maintenance is ignored over many years.

By the opponents' own loose estimates, a gravity system would cost less than \$10,000 and a mound system more than \$10,000. As a homeowner, wouldn't you invest \$245 every three years to ensure a system is working properly? I contend this is money well spent.

DO THE MATH

And what about rural areas not being able to support inspections? The two U.P. counties mentioned have about 12,000 septic systems, so something above 2,000 inspections a year. The county where our cottage is located has 21,000 homes served by septic systems, meaning there must be about 7,000 inspections conducted annually. When I do the simple math, I figure there has to be a practical way to conduct inspections in Michigan.

The issue was raised that there may not be enough qualified persons to meet demand created by the proposed Michigan regulations, which say the inspections must be performed by a local health department, state department or registered inspector. I invite the folks in Michigan to visit here in Wisconsin where this has not been an issue.

In the case of government inspectors, the fees should be designed to cover the cost of added personnel. Or as it seems to work where we live, inspection requirements encouraged the free enterprise system to kick in, with private

qualified onsite inspectors emerging to handle the greater demand. In my case, my trusted local pumper is happy to come out every three years because, well, it provides a consistent revenue stream for him, and he knows regular inspections will help him avoid emergency calls due to overloaded tanks or failed systems.

Opponents to a Michigan septic code conveniently forget to mention two key benefits of strengthened onsite system regulations:

1. They protect homeowners.

The beauty of private wastewater systems is their value. As long as a septic system is maintained properly, it can provide a reliable and more economical solution over municipal sewer service. When I compare our family's cost for installing and maintaining the cabin septic system against what I pay for municipal wastewater treatment at my year-round home, the septic wins hands-down. Our annual costs for inspections and pumping comes out to roughly \$100 at the lake house and about \$1,000 at our main residence.

The proposed Michigan code would ensure all septic systems are kept in good working order and pumped when necessary. This will extend the life of septic systems and save homeowners from the expense of early system failures. Opposing legislators are actually showing little regard for homeowners' pocketbooks — all while they say they are fighting to cut taxpayer expenses.

2. They keep our recreational and drinking waters clean.

I look out from my dock and see the same clear, clean lake I visited with

I don't see new onsite regulations as a dangerous government intrusion.

I see these rules as a way to encourage personal responsibility for me and my neighbors on the lake. We all want a lake untainted by failing septic systems.

my parents long ago and my children in more recent years. I want my kids' kids to have the same experience. And I recognize not everyone is so lucky — the incidence of pollution-caused blue-green algae and fish kills is common in many parts of the country that lack adequate onsite regulations, turning once-cherished waterways into unappealing environmental dead zones.

GET IT DONE

So I don't see new onsite regulations as a dangerous government intrusion. I see these rules as a way to encourage personal responsibility for me and my neighbors on the lake. We all want a lake untainted by failing septic systems and the required periodic inspections simply hold us up to that ideal.

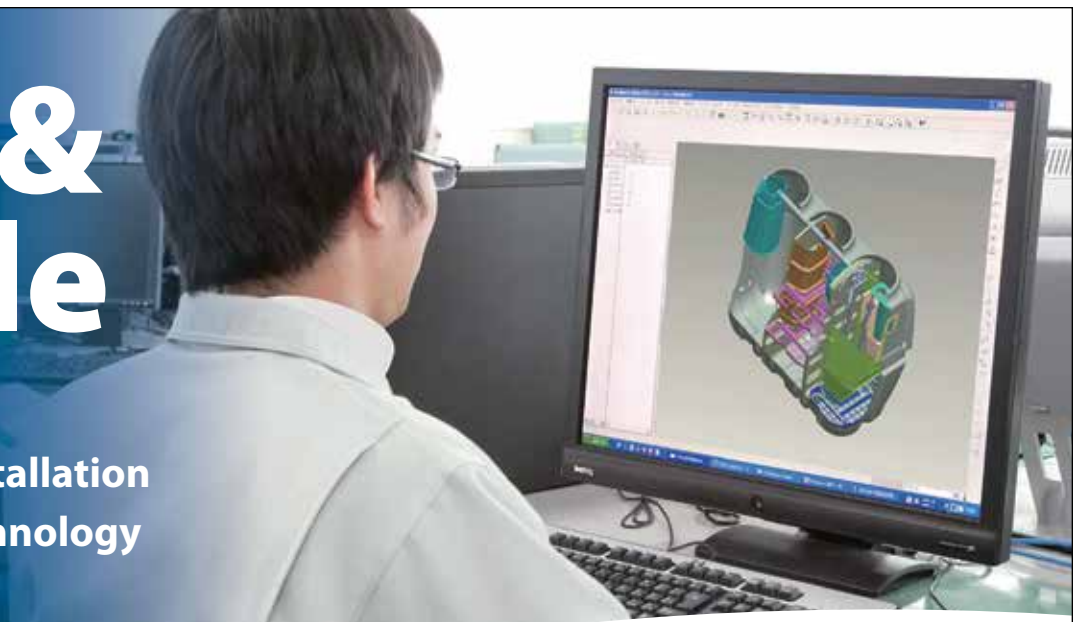
I think most regular folks in Michigan feel the same way I do. It's just the legislators who should be ashamed of themselves for being the last state in the country with no statewide code of standards for decentralized wastewater treatment. □

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SECOND ACT SUCCESS

He used to serve up frosty desserts, but Tom Prudum now designs septic systems for a living — and he loves it

By Tim Dobbins



▲ Prudum, left, consults with homeowner Bill Gagnon, during an installation in Edgewood, Washington. (Photos by Stephen Brashear)

It turns out it is possible to have too much ice cream. At least that was the case for Tom Prudum.

Prior to joining the onsite wastewater industry, Prudum owned a small-batch ice cream company, operating two stores and an ice cream truck. It was a suggestion from his brother that led him to put down the scoop and pick up a career in septic design.

Prudum's brother was already a designer and offered to teach him the ropes. "I got burnt out of the ice cream business and thought it was time for a change," Prudum says. "So, I told my brother I was in."

Prudum sold his house in Spokane in eastern Washington, and moved west to the Puget Sound area near Gig Harbor, where he apprenticed for four years under his brother. "He actually brought me in as a partner in his business which was very generous, and I got an excellent education," Prudum recalls.

After completing the apprenticeship and a few years in business together, they went their separate business ways and Prudum started American Septic Design in 2022. Operating as a one-man show, Prudum is on track to design roughly 120 systems per year in the Seattle area.

WATER EVERYWHERE

As a new designer, Prudum says he doesn't yet have the name recognition and word of mouth referrals to depend on. Because of this, he expands his service area to cover primarily Pierce, Kitsap, Mason and a little bit in Thurston and King counties. It's a territory that includes many communities within the Puget Sound watershed.

"Everywhere you go here is a shoreline almost," he says. "And it's not only shorelines, it's just wetlands everywhere."

The wetlands create some variations in county codes, and Prudum says counties with the most wetlands and critical areas tend to tighten up regulations quite a bit. "Washington septic designers are licensed to work anywhere in the state," Prudum says. "But every county has its own additions to the state code. Some counties are more lax on wetland regulations while others, like Pierce County, are very stringent. Learning each county is challenging to say the least."

Though wetlands are prevalent, the area presents a variety of site conditions. “The terrain here is varied,” Purdum says. “Just outside of Gig Harbor and the Key Peninsula area, it’s very wooded and has some decent elevation in the terrain. And then when you get into East Pierce County, it’s flat farmland.”

For the most part, Purdum is working with what the state calls Type 4 soils, which is loamy fine sand or fine sand. “There are also some areas that have a medium sand which we love to find, and a few locations with coarse sand,” he says.

PACKED TIGHT

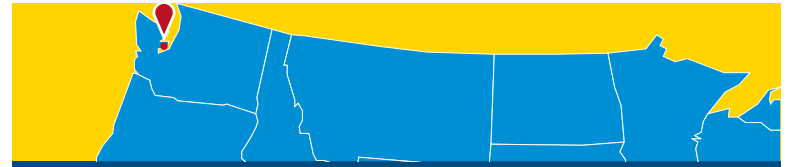
To Purdum, wet terrain is not the most challenging part of designing in the area. Property size is.

“The biggest issue we come up against is lot size,” Purdum says. “There are a lot of small lots that don’t meet the minimum lot size for Washington state that was created after a lot of these lots were put in, and that can create some problems.”

Anderson Island is a great example and located in the heart of Purdum’s coverage area. There is a plot on the island called the Riviera, which is made up of lots from 8,000 to 10,000 square feet, while the minimum lot size now for the state is 12,500 square feet.

“So what that means is, you can have a 9,000-square-foot lot and you can still put a septic on it as long as we can get something to fit,” Purdum says. “However, we can’t ask for any sort of waivers or variances from the code.” Washington state code says variances can be requested for lots over 12,500 square feet.

“I had a waterfront lot project where someone had cut a driveway through the lot at an angle and really destroyed the usable drainfield area



American Septic Design Wauna, Washington

- Owner:** Tom Purdum
- Founded:** 2022
- Employees:** 1
- Service area:** Seattle area, including Pierce, Kitsap, Mason, Thurston and King counties
- Services:** Septic design, soil evaluations, septic repair, well site selection and permitting
- Website:** www.americansepticdesign.com

▼ Tom Purdum uses a Kubota KX018-4 excavator during a site evaluation before designing a system for the vacant lot.





◀ Lewis Gregg, of A-Bell Excavation, installs a riser for an OSCAR system designed by Tom Purdum, of American Septic Design.

▼ Purdum tests the sandy soil during a site evaluation on Fox Island, Washington. Much of Purdum's design work is done for environmentally sensitive waterfront property.

"There's plenty of work for everybody. I don't see other designers as competition. We are all in this community together. ... **We try to elevate the design community and work together as much as possible.**"

Tom Purdum

for a three-bedroom home," Purdam says. "I had to fill out a waiver with the county to reduce it to a two-bedroom drainfield and that was acceptable because we had enough square footage in the lot. If it had been under 12,500 square feet, that driveway could have potentially made that lot unbuildable."

With the number of small lots he works on, multiple design options are a luxury Purdum often doesn't have. "A lot of times I don't have any flexibility," he says. "There is only one spot a drainfield can go, so I dig the test holes and go from there."

USEFUL TECHNOLOGIES

The abundance of high water tables and small properties has led Purdum to rely on a few specific system designs and products, which for the most part, he sources locally.

He commonly uses precast concrete tanks made by either Hagerman Pre-Cast out of Poulsbo, Washington, or Evergreen Pre-Cast located in Sumner, Washington. When a job calls for something else, Purdum also relies on Infiltrator and Roth tanks.

Another tool in his belt for wetland design is OSCAR systems, a short-sand mound and coil distribution system from Lowridge Onsite



Technologies, another Washington-based company.

"They are a great alternative to regular mound systems," Purdum says. "It's six inches of C-33 sand with drip irrigation tubing arranged in a coil system on top of the sand. Multiple coils are arranged in groups to form a lateral, and six more inches of sand is put on top of the coils making a sort of trapezoidal mound."

To provide the treatment, Purdum says really any ATU system that meets the requirements of the OSCAR systems works fine and the end result is a low mound that can be feathered into the landscape.

"You hardly even know they are there," Purdum says. "And the nice thing about them is you can configure them really any way you need to. You can bend them around corners, put them around trees and as long as you stay level with the topography you're fine."

Water Tight Structures

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Bio-Fast Tanks - Nibbler Tanks



Shades of Sherwood Campground in Zumbota, MN

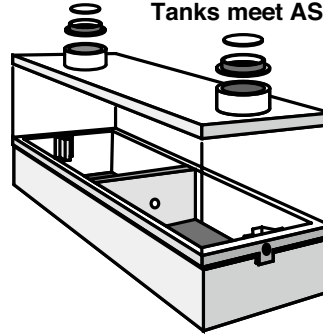
2- 38,000 gallon septic tanks, 20,000 gallon pump tank,
 5 each 20,000 gallon recirculation tanks
 and 3 each 7,700 gallon pump tanks were installed

2 Compartment

Commercial Sizes - Gallons

2,000 - 3,000 - 5,000 - 6,000 - 8,000
 10,000 - 12,000 - 15,000 - 18,000
 20,000 - 25,000 - 30,000 - 38,000 - 40,000

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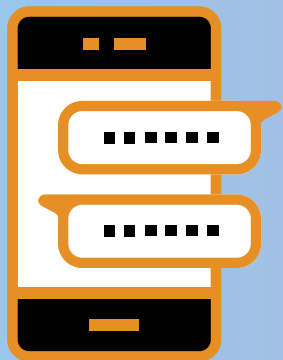
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DRONES FOR SEPTIC DESIGN AND MAPPING

Tom Purdum uses a variety of tools for accurately mapping the various sites he deals with in the Seattle area, which is filled with shoreline, wetlands and extremely small lots.

Aside from his Topcon Total Level Station, he has found it valuable to utilize a drone. He got the idea after overhearing people discussing drones at a septic trade show and he pondered how he could use them to better serve customers.

"I use the drone as a backup for site mapping," Purdum says. "I'll go shoot a site with my Total Station and dig my test holes or inspect an installation, but then before I wrap up I have a VS-17 panel (Velocity Systems) I put on the ground and send my drone up to do a mapping mission."

The VS-17 panel is nylon military tool used to identify friendly forces, personnel and equipment. It's fluorescent orange on one side and fluorescent pink on the other, making it highly visible from the air.

"I measured the panel and when I import the finished aerial map, I just scale the image based off the panel dimensions," Purdum says. "It works really well." He then imports the image into his CAD software and drafts off of that if needed.

"In the past I would take ground-level photos of the installations for reference later when doing the as-built," he says. "Now, with this technology, not only can I create a scaled version of the entire installation, I can create a map of the parcel with my soil logs and site features before doing any design work. It's been a game-changer."

Usage depends on the lot, but more often than not, Purdum deploys the technology. "On nice, clear and open lots it gets used 90% of the time," he says. "Lots with more tree cover, probably 50% of the time. It just all depends on what the drone can see and if it will be useful in the design phase."

The base image also creates an excellent image to share with customers, something Purdum regularly does. He even occasionally shares the design overlaid on the image as a tool to illustrate how the design impacts their property.

It doesn't have to be a substantial investment either. "I use a DJI Mavic Mini," Purdum says. "It's about the most basic there is. I think it was \$300 at Costco a couple years ago. A larger drone with a better GPS and a better camera shutter would yield better topography and faster flight time." Knowing that, he does plan to upgrade at the end of the year.



▲ Purdum consults the design for an OSCAR septic system, a short-sand mound and coil distribution system from Lowridge Onsite Technologies, at an installation location in Edgewood, Washington.

Orenco pumps and SJE Rhombus control panels are commonly incorporated into his designs as well.

BACKYARD DWELLINGS

The need for more housing due to the rising population and shortages of places to live has had a large impact on the way Purdum designs.

The idea of accessory dwelling units isn't new, but encouragement from the local government to build them is. "A lot of municipalities are pushing for high-density housing and where ADUs used to be frowned upon a while ago, now we're seeing a nudge for them," he says.

An ADU is a smaller, independent dwelling located on the same lot as another residence, often used as a guest house or rental unit, and something that changes the amount of wastewater flow on a property. Accounting for these trending additions is now standard procedure for Purdum, whether doing repairs or designing from scratch.

"The biggest thing is education to the homeowners because a lot of people think they'll just put an ADU on their property and hook it into their existing septic system and everything is fine," Purdum says. "And that's just not the case. My job is to educate and guide clients through the whole process."

When working with clients that have bare ground and building new, he will always ask about future plans and if they considered adding an ADU sometime down the road.

"Three-bedroom homes are very popular around here, and ADUs by most county definitions need two-bedrooms worth of flow assigned to



them,” he says. “So, now we need a five-bedroom system on the property and a lot of people don’t realize that.”

Other issues may arise if they are on public water like a shared well or municipal water system. Many counties want those to have two separate water meters, one for the primary residence and one for the ADU.

“A lot of people will convert a garage or storage building to living quarters and bootleg it into their septic system,” Purdum says. “Then it comes time to sell the property and we have this illegal ADU that we now have to try and justify. It creates a mess.”

Despite the chaos they can create, Purdum welcomes ADUs with open arms. “From my business perspective, it’s a great source of revenue,” Purdum says. “All these people with established homes want to add ADUs and that creates a whole new stream of income and work for me.”

If people approach him with a three-bedroom house design, he’ll often discuss the advantages of planning for a larger footprint with the client.

“You get to go out on a property and beat your way through the trees with an excavator to dig test holes and that’s just plain fun. **And repairs are like a puzzle. I just really enjoy both sides.**”

Tom Purdum

“I let them know if they put a five-bedroom septic in, the cost goes up a little bit, but now you’re ready for a future ADU,” he says. “So, if they decide they want one someday, all they have to do is build it. I also make it known that the resale value increases having that added capacity.”

MACHINE MATTERS

Purdum relies heavily on a Topcon Total Station for his site work along with a few vital tools and equipment.

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“The biggest thing is education to the homeowners because a lot of people think they’ll just put an [accessory dwelling unit] on their property and hook it into their existing septic system and everything is fine. And that’s just not the case.”

Tom Purdum

“Of course, I can’t get by without my trusty dig bar and post-hole digger,” Purdum says. He also relies on a 2023 Kubota KX018 compact excavator. “It’s a great little machine,” he says. “For 95% of the jobs I work on it’s adequate. One of the biggest advantages is that the tracks can retract a little bit, so I can actually fit it through a standard backyard gate for repair work or anything like that on the tight lots.”

Another advantage for Purdum is the fact he can pull the smaller machine with his half-ton Toyota Tundra. “Before buying this, I was using other installers to dig my test holes,” he says. “But the problem there is scheduling.”

He still gets a few jobs that require calling in someone with a bigger machine, which Purdum has no problem doing as he says it’s a great way to form relationships with installers that come in handy down the road.

Installer relationships are mutually beneficial. Purdum uses those who have proven themselves as top-notch workers and does what he can to get these proven installers on his projects. He says it goes the other way around too, and installers that he frequently recommends do the same for him. “If they are good installers and they are sending me work, I’m going to send it right back to them.”

A BRIGHT FUTURE

Between the influx of ADUs, repair work and general new-system work, American Septic Design keeps a full plate. The majority of his work currently is made up of repairs and remodels, but he says new construction is picking up.

“New construction is a fun challenge,” Purdum says. “You get to go out on a property and beat your way through the trees with an excavator to dig test holes and that’s just plain fun. And repairs are like a puzzle. I just really enjoy both sides.”

Currently, Purdum is taking on as many jobs as he wants to and there’s more to be had in the area. “There’s plenty of work for everybody,” Purdum says. “I don’t see other designers as competition. We are all in this community together.”



▲ Tom Purdum oversees an OSCAR septic installation he designed in Edgewood, Washington. The installer is Lewis Gregg of A-Bell Excavating of Puyallup, Washington.

Purdum says he’s not afraid to call other designers to ask questions and learn from them, and he’s had the same happen to him. “We try to elevate the design community and work together as much as possible,” he says. “Like they say, you’re never too old to learn something new.”

To Purdum, success in septic design is about talking and execution. “Take the time to listen to the client’s needs and follow through on what you are promising,” he says. “Delivering designs in a timely manner and helping the process, whether it’s new construction or a repair situation, go smoothly. Communication is everything.” □

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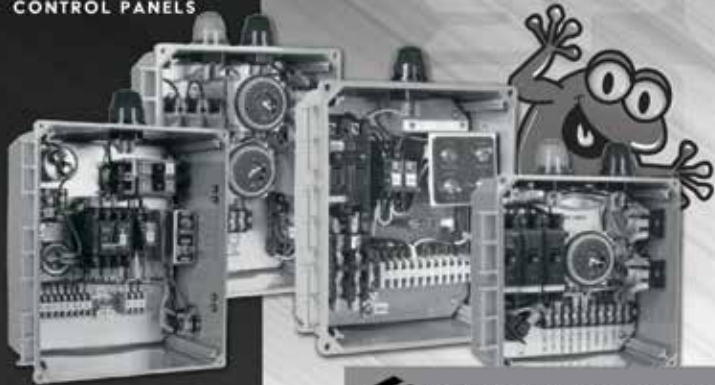
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When Is a Cluster System the Go-To Wastewater Solution?

Planning for a shared treatment system can be complex business, but it can be a great answer for the right parcel or small community

By Sara Heger

A cluster septic system is defined as a wastewater treatment system designed to serve two or more sewage-generating dwellings or facilities with multiple owners. They can be privately or publicly owned and managed. Cluster systems are commonly utilized to solve an existing problem in a community or in a new development to preserve open space, wildlife habitat and to simplify management.

With cluster systems, sewage collection and treatment for a group of homes and businesses occurs at a single facility with community-level collection, treatment and dispersal, as opposed to each dwelling where treatment and dispersal is on each lot. Many options are available to treat wastewater from a cluster of homes and businesses through the design of a septic system. The options are scalable to collect, pretreat and disperse the effluent back into the watershed.

The advantages of cluster systems include:

- One location for most management functions for service providers and tracking of performance through regulatory programs.
- More consistent flow rates can improve performance particularly with advanced technology.
- The ability to solve challenges associated with small lots, areas of problematic soil conditions or sensitive environments.
- Can be scaled up in new development as community grows.
- Can be designed to be connected to larger treatment system in the future.
- Typically, more cost effective than regionalization or building of a new wastewater treatment plant.

Cluster solutions are not for every project as there are challenges as well:

- Typically requires an engineer to design the system.
- Land must be acquired or set aside for the initial and replacement system.
- Permitting is often done at the state level and as flows increase the design standards often increase as well adding additional requirements.
- As system size increases, operation and maintenance costs can increase as well — particularly with advanced treatment.
- Forming of management structure may take additional time and resources.

Solving Problems

There are many situations where an existing property does not have the



▲ Workers install a series of septic tanks to handle a peak daily flow of 55,000 gallons at the front end of a cluster system in Sara Heger's community of Afton, Minnesota. (Photos by Sara Heger)

room to locate a new septic system. For many of these parcels, the only solution on their property is a holding tank, which is undesirable to many property owners due to associated maintenance activities and costs. A cluster septic system can be utilized if nearby land can be found to handle wastewater generated by multiple homes.

An example of this is near my home in Afton, Minnesota. This community has 77 residential homes and 25 businesses with a combined peak flow of over 50,000 gpd. Afton is a river town where flooding of septic systems has commonly occurred since the community was settled. A community treatment site was located and a treatment system was installed. It included community septic tanks, flow equalization, secondary treatment with nitrogen reduction (recirculating gravel filter followed by an anoxic denitrification unit) and tertiary treatment including disinfection and a polishing ATU followed by final soil treatment. The solution was not simple but was

» This complex cluster system under construction now provides suitable treatment for about 100 dwellings and businesses in Afton, Minnesota.

required due to the scale and to assure protection of ground and surface waters.

New Development

Typical zoning practices establish minimum lot sizes, setbacks and widths that developers must follow when they design subdivisions. This leads to developments that maximize the number of lots based on the total acreage of a parcel. For instance, if the code requires a minimum lot size of 2.5 acres and the developer has a 40-acre parcel, the site will be developed with 16 residential units unless there are major site limitations.

Cluster development protects open space by establishing the number of units allowed for a parcel completely independent of any minimum lot size. The open space can then be used by residents, to preserve agricultural land, or to protect wildlife habitat. Clustered septic systems for new developments can be located in the best location to maximize treatment and therefore reduce environmental impact.

Variations in Clusters

There are many variations in the design and installation of cluster systems. One of the biggest considerations with cluster systems is how the wastewater will be collected and where primary treatment will occur.

1. Gravity – If topography allows wastewater may be able to reach the treatment site by gravity but often lift stations will be needed. Traditional gravity sewer is prone to infiltration due to the need for manholes and lift stations and often can get expensive due to the depth of installation. Gravity collection can be used to transport raw wastewater or wastewater that has undergone primary treatment with a septic tank at each structure generating sewage. The diameter of gravity collection tends to be larger than pressure but is dependent upon the flow from the community.

2. Pressure – With pressure sewer collection, individual dwellings and businesses discharge into a small diameter collection pipe under pressure which discharges into a common septic tank(s) or a stilling tank at the treatment site. If each structure has a septic tank this can be done with an effluent pump but if it is done with raw sewage, a grinder or ejector pump is needed. Pressure sewers are less likely to have infiltration and tend to be installed shallower than gravity collection.

Once at the treatment site, many options are available to treat wastewater from a cluster of homes. Most technology utilized on individual properties can be scaled up but must be done so carefully to assure the system is not either over- or underdesigned.



Cluster development protects open space by establishing the number of units allowed for a parcel completely independent of any minimum lot size. **The open space can then be used by residents, to preserve agricultural land, or to protect wildlife habitat.**

Management

Community owned and/or managed wastewater treatment systems are infrastructure, as are roads, power lines and other components of a community. An organized community structure should be responsible for operating, monitoring, maintaining and paying for these infrastructures. Typically, communities requesting public funding must have a legal entity in place that can levy funds and own or hold permanent access easement rights before they are eligible for funding.

In most rural areas, the manager for an individual system is the homeowner. For cluster systems and some individual systems in designated areas, a responsible management entity with legal authority and administrative capabilities is needed to provide the necessary services and be accountable. These RME form the “community structure” for the systems. Homeowner associations are frequently created when parcels of land are subdivided or parceled out and can potentially serve as an RME but may lack long-term accounting and management abilities and skills and can have difficulty with fee collection. □



Big System on Small Site Is a Coastal Conundrum

▲ Jon Harris backfills a 10,000-gallon septic tank after installation using a Hitachi 350 excavator. (Photos courtesy of H&H Land Development)

Waterfront North Carolina hotel/condo/eatery complex requires heavy tankage and creative effluent dispersal to handle huge flows

By Tim Dobbins

An oceanfront resort complex consisting of hotels, condominiums, a restaurant and pool house had a 50-year-old septic system that was showing signs it had run its course.

David Christiansen of DPM Partners, who manages the property, brought in Gary MacConnell, owner of MacConnell & Associates to engineer a new system for the Sea Ranch Resort. Located on the Outer Banks of North Carolina, in Kill Devil Hills, the tight quarters and proximity to the ocean required a design with low-pressure pipe distribution and TS-II pretreatment, which would allow for a 50% reduction in the drainfield size compared to the existing field. Due to the seasonal nature of the resort, the project team had only six months to design, permit, construct and place into operation the onsite system.

Reducing the footprint while improving the effectiveness was challenging enough. Pair that with installing the new system while keeping the resort up and running and you have exactly what installer Jon Harris,

owner of HHL D (dba H&H Land Development) and his crew did.

“It was important with this project to keep as much of the hotel, restaurant, pool house and everything else going, so the whole business wasn’t shut down all at once,” Harris says. “We had to tackle this one in stages.” To make it happen, Harris used pieces of the existing system combined with newly installed tanks and temporary plumbing.

Once all phases of the job were complete, a web of wastewater flow from numerous buildings met in a system that achieved the objective treatment.

Effluent flow

The resort consists of multiple buildings — an oceanfront, two-story hotel with 24 rooms, an oceanfront, five-story structure with 28, two-bedroom condominiums, a non-oceanfront hotel with 26 hotel rooms, a restaurant and a pool house.



◀◀ Jon Harris and Wieser Concrete field crews make sure the tank halves are lined up and in the proper position.

✔ Kaz Romancyk, Johnnie Basinger and Shane Doherty make sure the site is level and ready for operators bringing in E-Z Treat Model 4-L treatment units.

Wastewater exiting the five-story, oceanfront condominium first enters a series of four 2,500-gallon precast concrete septic tanks plumbed in a series connected by 6-inch PVC pipe. The tanks are traffic rated with 8-inch walls due to their placement under the resort's parking lot. At the discharge end of each tank are Polylok PL-525 effluent filters.

Effluent leaving these septic tanks gravity flows to another series of traffic-rated septic tanks also positioned under the parking lot — two 10,000-gallon tanks plumbed in-line, each containing three Polylok PL-525 filters at the exit.

It's in these tanks that effluent exiting the oceanfront, two-story hotel enters the system and starts treatment. Wastewater leaving the non-oceanfront hotel also enters the system here after passing through an existing 3,000-gallon precast concrete septic tank.

The now-combined wastewater from the hotels and condominiums travels through the 10,000-gallon septic tanks before entering a 10,000-gallon traffic-rated flow equalization tank where it is discharged using a pair of Pentair Myers ME45 effluent pumps. Effluent is pumped through 2-inch PVC into a series of two 10,000-gallon, traffic-rated recirculation tanks.

"The recirculation chambers serve as holding tanks for both the septic tank effluent and E-Z Treat treatment unit effluent," MacConnell explains.

Inside each recirculation tank are eight Pentair STEP50 effluent pumps that move water from the recirculation tanks to eight E-Z Treat Model 4-L treatment units, where the wastewater undergoes treatment to further remove BOD and suspended solids and before returning to the recirculation tanks.

"An E-Z Treat effluent bypass valve located in the recirculation chambers will separate the flow once the unit is dosed," MacConnell says. "Effluent will be recirculated through the E-Z Treat treatment units until additional septic tank effluent enters the recirculation tank, causing the bypass valve to close. Then excess effluent flows through the bypass valve to the second recirculation tank or field dosing chamber."



System Profile

- Location:** Kill Devil Hills, North Carolina
- Facility served:** Sea Ranch Resort
- Management company:** DMP Partners - David Christiansen
- Designer/engineer firm:** Gary MacConnell of MacConnell & Associates
- Installer:** HHLD LLC
- Type of system:** Precast concrete septic tanks with E-Z Treat treatment units, LLP gravel bed drainfield
- Site conditions:** Sandy with high water table, located on coastline
- Hydraulic capacity:** 18,000 gpd

SYSTEM PROFILE

"It was important with this project to keep as much of the hotel, restaurant, pool house and everything else going, so the whole business wasn't shut down all at once. **We had to tackle this one in stages.**"

Jon Harris

The field dosing tank is also a 10,000-gallon traffic rated tank. "Effluent from the second recirculation tank is disinfected by ultraviolet light prior to entering the field dosing tank to be irrigated," MacConnell says. Four E-Z Treat Model UV 404 units are being used.

Within the dosing tank, two Myers ME3 pumps push water through 1 1/4-inch PVC back in the system flow to the second 10,000-gallon septic tank for further denitrification, while two Pentair STEP30 pumps route water to an EZ-Treat Model 600 calcite treatment unit. This filter provides alkalinity to assist with nitrogen removal. Water that enters the treatment tank gravity drains through 4-inch PVC and reenters the system in the recirculation tanks.

High quality effluent exiting the field dosing tank is moved by means of two Barnes Model 3SE-DS, 3 hp pumps (Crane Pumps & Systems)



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◀◀ With treatment unit and tanks set, HHLD technician Shane Doherty routes the flow, plumbing PVC pipe and fittings between tanks.

▶▶ Gary MacConnell takes a close look as Jon Harris and HHLD's team buttons things up after septic tanks and plumbing have been backfilled.

through a 2-inch force main en route to the drainfield located across the street.

The drainfield is an LPP bed measuring 100 feet by 100 feet. To plumb the 2-inch force main PVC that supplies the drainfield, horizontal directional drilling was needed to bore 5 feet under the existing street. The bed is made up of 2,000 feet of LLP plumbing broken down into 20 100-foot lines dispersed every 5 feet on center. Piping used is 1-1/2-inch PVC plumbed inside 4-inch HDPE perforated pipe installed in a 12-inch-deep bed of washed No. 67 stone.

The entire system, rated for 18,000 gpd, is controlled by a Duplex Demand Dose Control Panel Model 122 by SJE Rhombus.



Separate flows

The resort's restaurant required its own septic system. Wastewater exiting the kitchen enters an existing 2,000-gallon grease trap before making its way to a newly installed TOPP Industries FB60X120 fiberglass

duplex pump station measuring 10 feet deep by 6 feet in diameter.

From the pump station, effluent is transferred using a pair of Myers ME45 effluent pumps into a 3,160-gallon precast concrete, traffic-rated

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SYSTEM PROFILE

septic tank containing a Model 300 VBT aeration unit from Advanced Aeration to reduce BOD, TSS and FOG. It then flows into a 3,600-gallon traffic-rated pump tank installed directly next to the septic tank.

Effluent is dosed from the pump tank into a separate, LPP gravel bed drainfield approximately 69 feet long by 25 feet wide, located on the property next to the hotel and restaurant.

Equipment

A lot of machinery was brought in for this project, and all but the rented cranes are owned by HHL. The majority of work was done using the following equipment:

- 2016 LC350 Hitachi excavator
- 2014 Hitachi ZX 135 excavator
- 2005 Takeuchi TB 135 mini-excavator
- 2014 John Deere 650J bulldozer
- 262B CAT skid-steer
- Kubota 6800 tractor

Installation challenges

A lot had to fall into place for the installations to go smoothly, and it did, a credit to the design and project coordination from Christiansen, MacConnell, Harris and E-Z Treat's Mike Stidham.

"The 10,000-gallon tanks were delivered here from Wieser Concrete in Wisconsin, with one half of each tank per trailer," Harris says. "In total, 25 trailers came to the site making deliveries from Wisconsin."

Harris's crew cut asphalt out of the parking lot before the tanks arrived and organized the rental of a 300- and 120-ton crane for setting the tanks. "Each half of the 10,000-gallon tanks weighed 45,000 pounds," Harris says. "So we brought in cranes and operators from Rose Crane Service out of Columbia, North Carolina, to move and set them."

Weight wasn't the only complication Harris and his crew had to deal with when setting the massive tanks. "We also had to dewater this project," he says. "Being right here on the ocean, we hit the water table around four feet down and we had to set these tanks 18 feet deep."

The solution was dewatering, and to do so they used roughly 50 wellpoints, two 6-inch water pumps and several hundred feet of header pipe. "There was nowhere to discharge water onsite at the time either," Harris says. "We had to bore under the highway with a temporary 6-inch pipe and run the discharge around houses to get to a storm box to dewater this thing."

The pumps ran for seven days to get the water table to a level where Harris and his crew could install the tanks. They were filled with water immediately as another precaution after installation to avoid flotation.

Utilizing old tanks and plumbing for temporary reroutes to keep the resort running, demolishing old tanks to make room for new ones, heavy tanks, coordination of deliveries, a high water table and a compact site sum up the many challenges the installers and engineer had to work with for this project.

Despite the long list of obstacles, the Sea Ranch Resort's effluent treatment has a major facelift and is equipped to handle its regular high-volume of guests. □



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System Maintenance, Inspection and Installation Tools

By Craig Mandli

EXCAVATION EQUIPMENT

Ditch Witch MT164

Built to help power and fiber-optic contractors easily create a clean, narrow trench in one pass, the **Ditch Witch MT164** microtrencher attachment offers maximum compact cable installation performance. Equipped with a standard hydraulic plunge and option to offset the frame, the MT164 provides variable depth control and allows contractors to cut right up next to a curb. It can trench up to 2 inches wide by 16 inches deep to cut deep enough to get through a standard-sized curb. It can also be set up for a push or pull application depending on the job site. The microtrencher's compact footprint provides increased flexibility with minimal disruption to surrounding infrastructure in urban areas. **580-336-4402; www.ditchwitch.com**



EarthBuster

The **EarthBuster** provides a repair/maintenance alternative to replacing septic fields. The deep soil decompactor mounts to skid-steers, tractors and mini-excavators and uses a probe to inject compressed air into the ground at depths up to 6 feet. It breaks up the biomat, loosens soil for better absorption, and provides oxygen access to the effluent treatment soil. One or two operators can complete a field in two to three hours with long-lasting results, according to the manufacturer. **406-670-8318; www.earthbuster.com**



Hall's Gradeblade

Hall's Gradeblades are backhoe or excavator bucket blades that mount in minutes. Simply slip one over the bucket teeth and chain-bind it to the provided weld-on tab on the back of the bucket. They are available in two models – the Crumbing Blade, which is the same width as the bucket for top grading or smoothing the



bottom of a trench; or the Squeegee Blade, which is wider than the bucket, with angled wings for greater surface grading. They help reduce backfill time, leaving no teeth marks, eliminating the need to rake, shovel, spread or compact. They are available for buckets 12 to 36 inches. **800-214-1649; www.gradeblade.com**

Takeuchi TB350R Series 3



Takeuchi's TB350R Series 3 compact excavator has a short tail-swing design for working in tight or confined spaces. Inside the cab a 7-inch, multifunction color monitor with touchscreen displays a wide range of functions. A dedicated coupler circuit on cab models allows for the quick and easy exchange of various hydraulically driven attachments. A jog dial controls throttle position and

multiple machine functions. It also offers greater working ranges, including a dig depth of 11 feet 8 inches, maximum reach of 19 feet, 10.8 inches and maximum dump height of 12 feet 11.3 inches. Thanks to its high-flow primary auxiliary circuit, it is ideal for multiple applications, including demolition, land/vegetation management, general contracting, landscaping, hardscaping, rental and residential and commercial construction. **706-693-3600; www.takeuchi-us.com**

HAND TOOL

T&T Tools Mighty Probe



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

LASER LEVEL

Milwaukee Tool M18 Red Exterior Rotary Laser Level

The Milwaukee Tool M18 Red Exterior Rotary Laser Level with receiver has impact protection and a simplified setup for the septic installer. It has an IP66 rating and can withstand up to a 1 1/2-meter drop and a 2-meter tripod tip. It is reliable in all weather conditions, delivering 3/32-inch accuracy at 100 feet. Featuring built-in manual masking shutters, the laser can be blocked in any direction on the job site and prevent interference with other lasers. A one-button setup allows for easy application for installers. The receiver will detect the laser up to 2,000 feet and has built-in strobe light protection, reducing interference and downtime on the job site. **800-729-3878; www.milwaukeetool.com**



INSPECTION EQUIPMENT

Cherne Multi-Size Big Mouth Plugs

Cherne Multi-Size Big-Mouth Plugs are suitable for gravity bypassing or bypass pumping. A removable tire valve allows for easy replacement, with an optional quick disconnect. They offer a greater expansion range, with five variations ranging from 6 to 10 inches with a 4-inch bypass to 12 to 18 inches with 6-inch bypass plugs. **800-843-7584; www.cherneind.com**



SEPTIC FILTER

Polylok PL-250

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



SEPTIC TANK AGITATOR

Crust Busters agitator

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



SLUDGE SAMPLING EQUIPMENT

Sim/Tech Filter TruCore

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



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New North Carolina Law Pushes Onsite Technologies

By David Steinkraus

Legislators have signed a new set of rules to keep pace with one of the nation's fastest growing states.

North Carolina Gov. Roy Cooper has signed HB 627 and 628, which implements regulations for onsite work and amends the statutes governing onsite wastewater. There are provisions for setbacks and for second dwellings on the same property, but the biggest change is about permits and new technologies.

Under the new law, any professional engineer may approve the use of any pretreatment technology, even if it hasn't been approved by the state, as long as the engineer's report includes specifications for the technology and the manufacturer's approval for use in conditions at the site.

North Carolina has not been quick to approve new onsite technologies, said Doug Lassiter, executive director and lobbyist for the North Carolina Septic Tank Association. "With those delays, we might get the third or fourth generation of a technology approved." Limited installations made it difficult for manufacturers to gather the performance data they need to have a technology approved, he said. This provision also means engineers assume both the responsibility and liability for their work, he added.

In addition to allowing authorizations from professional engineers, the new rules and laws allow limited approvals from an "authorized onsite wastewater evaluator." This person must be a licensed soil scientist with five years of experience in onsite wastewater and may design systems that the law does not require a professional engineer to design. Authorized evaluators are certified by the North Carolina Onsite Wastewater Contractors and Inspectors Certification Board, Lassiter said, adding that all installers and time-of-sale inspectors must also be certified by the board.

This new law will help alleviate the state's backlog of onsite permits, Lassiter said.

North Carolina has been a fast-growing state for years. Its population increased 12.2% from 2010 to 2022, according to the U.S. Census Bureau. *U.S. News & World Report* ranks the state 14th overall in growth, with job growth of 1.2% versus 0.2% nationally, and with migrants comprising 0.8% of the state population versus 0.1% nationally.

All those people need housing, and 40% of the state's single-family homes use onsite systems, Lassiter said. Staff shortages in all government offices slowed the issuing of permits, he said. For large systems that require approval by state engineers, he added, the wait for a permit could last years.

This was the fourth attempt to modernize onsite rules, Lassiter said. This time around, he said, a broad-based advisory committee that included industry representatives came to an agreement with help from onsite people at the state Health Department.

The state Commission for Public Health must still undertake a formal rule-making process. Until the commission adopts permanent rules,

temporary rules must follow the legislation. Lassiter said he doesn't expect any difficulty during rule making.

A comprehensive review of the legislation and its impact is planned for the association's 34th annual convention in January 2024.

Minnesota

The state Court of Appeals sided with a group of Amish people in the latest chapter of a multiyear dispute about using septic tanks to handle graywater. A three-judge panel of the court has ruled that the government could not order the Amish to use septic tanks for graywater because there was no justification for ignoring their religious beliefs, news reports said.

Starting in 2018, members of the Schwarzenruber community in Filmore County — in southeastern Minnesota on the Iowa border — were told to install septic systems to handle graywater from their homes. That graywater could contain human pathogens and put the health of others at risk, the county asserted. The Amish said using septic tanks would violate their religious beliefs. They use outhouses for human waste, a practice allowed under Minnesota law.

In making its ruling, the state court applied a recent standard from the U.S. Supreme Court. In 2021, the state appeals court ruled in favor of the county's order for septic tanks, and the Minnesota Supreme Court declined to review the case. The Amish appealed to the U.S. Supreme Court, which voided the state court decision. It said the state and county had to show a compelling interest to override religious beliefs, sending the matter back to Minnesota for further action. Writing for the U.S. Supreme Court, Justice Neil Gorsuch noted that other groups are exempt from Minnesota's graywater rule. Owners of hunting cabins and campers, for example, may dump graywater directly on the soil if the water is carried by hand.

The publication *Minnesota Lawyer* quoted attorney Brian Lipford, of Southern Minnesota Legal Services, as saying he hopes the state will now decide to work with the Amish. Brett Corson, attorney for Filmore County, told *Minnesota Lawyer* that the county had not yet decided how to proceed. "The Amish are our friends and neighbors. We always want to work with them," he said.

Michigan

Torch Lake Township passed a time-of-sale law requiring inspections of onsite systems before a property may be sold. The township occupies an isthmus between the water body Torch Lake and Lake Michigan.

If there is no record of a septic permit for a property, the ordinance requires a one-time baseline inspection within three years after the owner is notified by the township. In addition, all properties within 500 feet of the ordinary high-water mark of Lake Michigan, and of the water's edge of an

inland body of water, must have an onsite inspection within three years of being notified by the township, says the ordinance.

South Carolina

Greenville County is considering limiting onsite systems as a way to control growth.

"We're at a crossroads in Greenville County," said Ennis Fant, chairman of the county's planning and development committee, according to the *Greenville Journal*. "What we can't do is what we've been doing."

His committee recommended an ordinance banning cluster systems. The state defines those as systems with a capacity of more than 1,500 gpd.

Fant said such a limit will help protect the region's waterways and the health of all the people downstream. Greenville County is in the northwestern part of the state in the Appalachian foothills.

According to the U.S. Census Bureau, from 2010 to 2022 the county's population increased 21.4%, to 547,950.

Virginia

People in parts of Middlesex, Mathews and Gloucester counties are eligible for grants to help repair, inspect or replace onsite systems to protect water quality in the Piankatank River.

Grant money comes from the state Department of Environmental Quality and is administered by the Middle Peninsula Planning District

Commission, said a press release from the commission. Property owners may apply for reimbursement of up to 50% of the cost of a pumpout; for the inspection, maintenance and replacement of a conventional system; or for the replacement of an alternative system.

The three counties are on the edge of Chesapeake Bay and occupy a peninsula between the Rappahannock and York Rivers.

Rhode Island

North Kingstown and Glocester will receive \$915,000 for wastewater upgrades. Money comes from the U.S. Environmental Protection Agency. Glocester will receive \$465,000 for the installation of innovative onsite upgrades, reported the *Providence Business News*. North Kingstown will receive \$450,000 to improve onsite systems and provide financial assistance in coastal neighborhoods.

New York

At a work session, the Town Board on Shelter Island agreed to increase grants for the installation of nitrogen-reducing onsite systems. Town supervisors at the meeting said increased installation costs merited an increase in grants to \$12,000. Previous recipients had grants of \$6,000, said the Shelter Island Reporter. Money for the grants comes from the transfer tax paid by buyers of properties on the island. Shelter Island is on the eastern end of Long Island. □



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"If this industry is truly about protecting the environment, why do we have to wait so long to put in technology that allows us to clean things up to the clean-water standards?"

Compiled by Betty Dageforde

Dan Micsky supervisor

Business: Micsky Excavating and Septic Systems, LLC,
Greenville, Pennsylvania

Age: 57

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Years in the industry: My dad and uncle started in the plumbing business in the 1960s. In 1964 my father started L.V. Micsky Excavating. They did what they had to do to survive — put in drive-ways, foundations, utility work, septic systems, land clearing. When regulations became more stringent for onsite systems, it opened the door for specializing in septic systems to the point that we are now almost exclusively an onsite systems business. I joke that I've been in business since I was born. I heard about it around the dinner table and have worked since I could pick up a shovel. By 1988, I was a full-time employee of my dad.

Association involvement:

Our company has been a member of the Pennsylvania Land Improvement Contractors of America since 1985. I stepped up as an active member in 2003 and have served as vice president, president, and am currently chairman of the board. I'm also chairman of the onsite waste committee at the national level (LICA). My father has also served as vice president, president and chairman of the board. And my wife Joanie Micsky is currently the executive director.

Benefits of belonging to the association:

The exchange of information among contractors is one of the biggest benefits. We are a diverse group across the country and the rules for each state are different. Although the process for handling onsite waste is pretty much the same biologically, there are different approaches to setting up and laying out systems and we share that information. Another benefit is that it gives us a voice at the legislative level. And there are financial benefits, as well, such as discounts on insurance plans and various products, help with legacy planning and time-tracking tools.

Biggest issue facing your association right now:

With modern technology, younger contractors tend to go to Google for everything. They don't join associations. As a result, they don't get the social interaction and discussions with fellow contractors that could help them resolve issues. It's also a challenge to get members to attend classes and meetings. But we have found that if we can get them to come to the annual convention and see all that is offered over the course of two days, they continue to attend year after year and become more engaged in the association. We allow new members to attend their first convention free of charge as an added incentive to join PALICA.

Our crew includes:

My father, Lawrence Micsky, just turned 86 and is still the No. 1 decision-maker. His brother, Paul Micsky, used to be one of the best machine operators in the country but at 81 now jumps in a ditch and works as a laborer. My brother Joe Micsky does most of the design and pricing of jobs and runs the service and maintenance programs. Brian Smith leads the installation crew and is a great operator and forward thinker for seeing and fixing problems that arise in the field. Rick Miklos came to us as a laborer and has developed into an asset in all aspects of the business. Joe's son Cole Micsky is studying business management at college but does service calls around his schedule and is growing into the business from the ground up. We hired Coltin Hoover, 17, in 2022 to help me out as a pumper and service assistant and he's taken to it quite well. Our secretary/office manager is Joe's wife Dedra Micsky who fields calls, schedules pumping work and does the bookkeeping. If a customer is having an emergency, she'll let us know right away and we try to get them serviced the same day.

Typical day on the job:

I wake up at 5:30 a.m. and get to the office by 7:45 a.m. I look at the calls that came in and put the schedule together (which often gets changed as emergency calls come in). Coltin and I typically pump four to six systems a day. I try to be done by 5 p.m. but there are days I may not get home until 7:30 or 8 p.m.

The job I'll never forget:

We spent two years working with an engineer developing a septic system for a tavern/restaurant. The state said it needed to be a 30,000 gpd system because of the size of the building. We were able to get it down to 8,000 gallons based on comparative businesses and similar flows. It was

➤ Front row, from left, Rick Miklos, Cole Micsky and Brian Smith; back row, Joe Micsky, Paul Micsky, Dan Micsky, Lawrence Micsky and Coltin Hoover.



memorable because of the size and what we learned in working through the design process.

My favorite piece of equipment:

My pump truck — a 2007 International 7600 with a 3,100-gallon Amthor International steel tank and a Battioni 720 pump. I've done things with that truck it was never designed to do, like sucking out sewer lines when I didn't have a snake, or vacuuming lateral lines.

Most challenging site I've worked on:

That would be the tavern project — it was the wettest site I'd ever seen. It became a discharge system because there was less than 10 inches of permeable soil, which made it unsuitable for any conventional onsite system. We used our track truck (Morooka 1500) to haul materials to place the sand and gravel in the alternating sand filters and ended up ripping the track off of it because it tore in half. We were able to wire it back together to finish the job and then had to buy new tracks.

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

"Why do I need to pump my septic tank when I went 40 years without any issues?" I explain to people how a septic tank works and why they need to pump it every two to five years, depending on usage. Generally, they seem to understand what I'm saying. I compare pumping a tank to changing the oil in your car — you've got to get rid of the old oil and the sludge. I think one of the most important aspects of this job is educating the public, which I end up doing nearly every day.

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SNAPSHOT

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

The biggest obstacle in Pennsylvania is the bureaucracy to get permits. We used to be able to dig soil profiles, do a perc test to size the system and design the system, all within two weeks. Today, we wait months for permitting. If this industry is truly about protecting the environment, why do we have to wait so long to put in technology that allows us to clean things up to the clean-water standards?

Best piece of small business advice I've heard:

Ever since I was little I've seen my dad do extra things for customers that I knew he wasn't going to charge for. One day I asked him why he did that because he couldn't make money if he didn't charge people, and I've never forgotten what he said. "It isn't always about the money. People don't forget the small things you do for them, especially in a small town. I do it so there will still be a business for you to run in 50 years." And here we are, 50 years later, and I'm glad my dad is still around to see that I believe in and live by those words, as well.

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

Be a soil scientist. I like predicting how soils are going to work and then seeing that play out.

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

It appears the federal and state governments have realized the onsite and wastewater industry is here to stay — that big pipes aren't going to go to every corner of the country. They consider it "infrastructure" and are now considering funding onsite systems as well as municipal systems. Technology has evolved exponentially over the years and continues to do so. If you're willing to evolve with it you will be very successful and have a thriving business. I predict maintenance agreements will become a nationwide trend required by local municipalities to ensure systems are functioning properly and being replaced/repared as needed. □

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

IOWA

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

KANSAS

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

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

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Maine Association of Site Evaluators;
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Professional Onsite Wastewater Reuse Association of New Mexico;
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NEW YORK

Long Island Liquid Waste Association, Inc.;
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North Carolina Septic Tank Association;
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Oregon Onsite Wastewater Association;
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Pennsylvania Association of Sewage Enforcement Officers;
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Virginia Onsite Wastewater Recycling Association;
www.vowra.org; 540-377-9830

WASHINGTON

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

WISCONSIN

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

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

NATIONAL

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

National Onsite Wastewater Recycling Association;
www.nowra.org; 978-496-1800

National Association of Wastewater Technicians;
www.nawt.org; 800-236-6298

CANADA

ALBERTA
Alberta Onsite Wastewater Management Association;
www.aowma.com; 877-489-7471

BRITISH COLUMBIA
British Columbia Onsite Wastewater Association;
www.bcossa.org; 778-432-2120

WCOWMA Onsite Wastewater Management of B.C.;
www.wcowma-bc.com; 877-489-7471

MANITOBA
Manitoba Onsite Wastewater Management Association;
www.mowma.org; 877-489-7471

Onsite Wastewater Systems Installers of Manitoba, Inc.;
www.owsim.com; 204-771-0455

NEW BRUNSWICK
New Brunswick Association of Onsite Wastewater Professionals;
www.nbaowp.ca; 506-455-5477

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

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

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

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

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Western Canada Onsite Wastewater Management Association;
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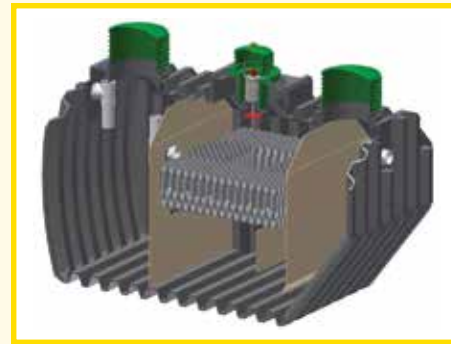
PRODUCT NEWS

PRODUCT SPOTLIGHT

Media accelerates treatment in poor soil conditions

By Tim Dobbins

When soils are degraded or not suitable for adequate drainage and treatment, an extra boost is needed from the septic system. Inside every Jet Inc. residential treatment system is Jet Inc. BAT Media, which stands for Biologically Accelerated Treatment.



Almost 70 years ago, Jet Inc. noticed an explosion of suburban homebuilding, and many properties being developed had less-than-perfect soil. The realization allowed them to see that aerobic treatment of effluent from a septic tank would preserve the soil structure and allow for increased life of the drainfield.

“The Jet Inc. BAT Media systems reduce waste strength, BOD, TSS and TN allowing for the installation of systems where the soils are marginal or lot size is smaller,” says Ed Schloss, sales manager for Jet Inc.

The Jet Inc. BAT Media is located in the center of every residential treatment system Jet Inc. offers. The system’s pretreatment compartment allows for initial settling and treatment by an anaerobic process.

“The partially treated influent passes into the treatment compartment where the Jet aerator hydraulically mixes the mixed liquor with high levels of dissolved oxygen,” Schloss says. “The complex biofilms on the BAT Media filter digest and convert the TN to nitrogen gas. The treated effluent then exits through an up flow design clarifier for its final treatment.”

According to Schloss, the end result is effluent that is up to 98% cleaner than when it came in and the reduction of TN is over 65%.

“The system utilizes a hollow shaft motor with specially designed aspirator tip to deliver oxygen by vacuum that allows for biofilm to develop,” Schloss says. “Their unique hydraulic circulation of the mixed liquor through the media provides filtration, digestion and conversion of TN to nitrogen gas.”

Jet’s smallest system with integral pretreatment compartment will treat up to 500 gpd and the 1,500 gpd system with a separate, two compartment tank preceding it is ideal for the largest homes or small commercial applications. “The larger systems can also be combined to create a hybrid system,” Schloss says.

Other options include 750, 1,000 and 1,250 gpd systems. According to Schloss, installers appreciate the simplicity of the system, reporting that the Jet BAT Media system is easy to install, easy to maintain and produces high-quality effluent. **800-321-6960; www.jetincorp.com** □

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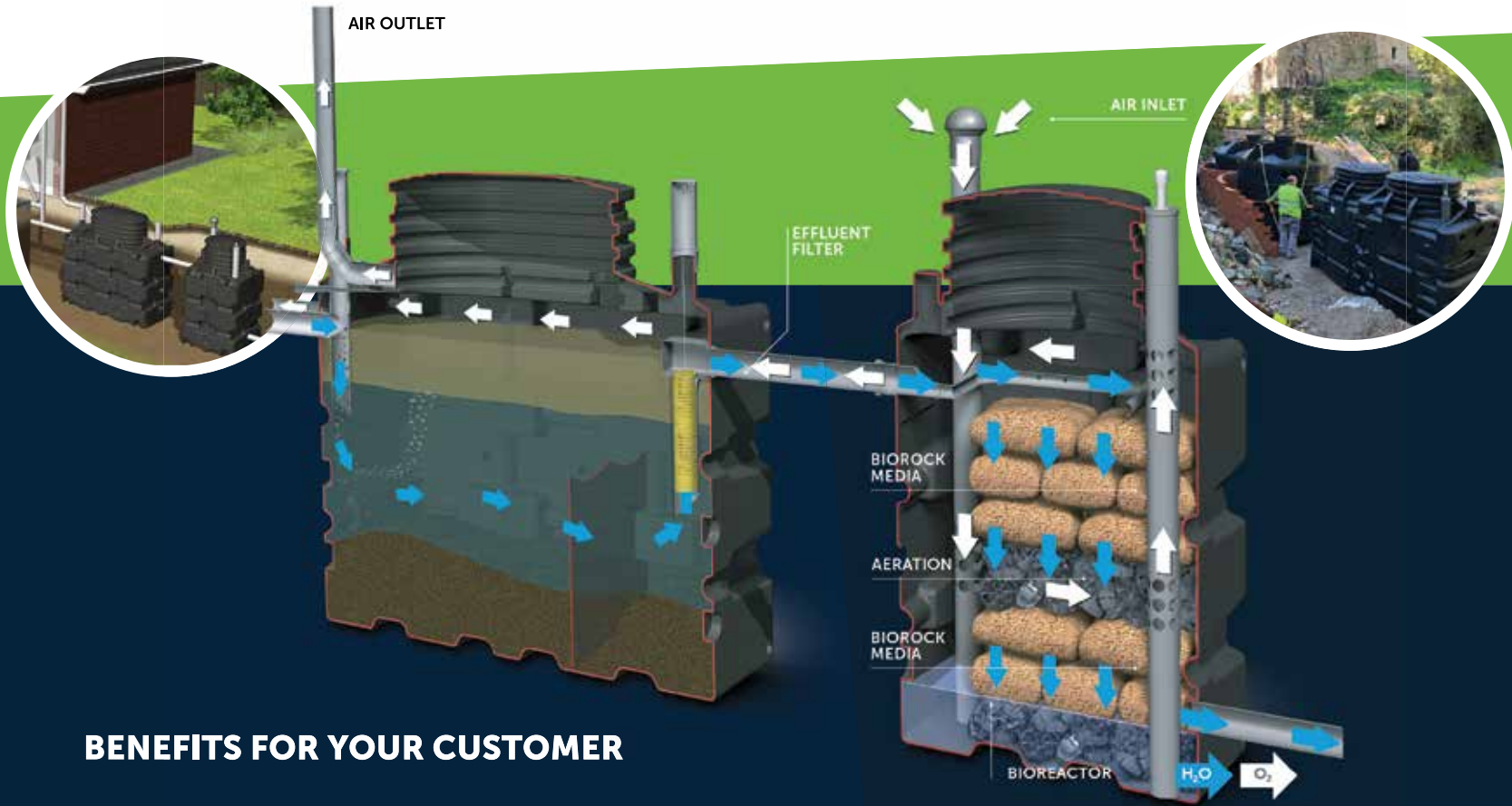
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