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Minnesota's Bob Billiet weathers seasonal slowdowns, rocky economic times and changing customer demands to grow a business ... just as he's planning for retirement PAGE 12

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Never too Busy to Work Safely

The dirt is flying for onsite system installers trying to keep pace with a demanding work schedule. Pause and remember to follow best safety practices.

By Jim Kneiszel

I caught up with an installer in the Midwest the other day, and he was stressed out about falling behind in his work this summer due to increasing interest in construction. He said he had 47 – "No, make that 48" – onsite systems on order for the 2015 season and more calls coming every week.

Installers are facing unprecedented (in recent memory) workloads this year, with pent-up demand from the now-long-past economic slowdown and many systems being inspected and check-marked as "failed." When your crews are contracted out for several weeks and – at least up north – the end of the productive digging season is in sight, there are pressures to cut corners on safety.

Well, I guess we have to admit that contractors are always on customer-imposed deadlines of one sort or another, and the pressure is constant to hurry and get systems in the ground and functioning. "We need to move into the house in three weeks because that's when we have to leave our current house," one new-construction customer says. "We can't stand any more backups and family is coming to visit," says another who needs an aging system replaced.

This time of year, when installer crews are pushing to finish projects they've committed to, my thoughts often turn to safety and how important it is to follow work site rules set forth by the federal Occupational Safety and Health Administration and your own company guidelines.

TRAGEDY STRIKES

A recent story from a New Jersey construction site drives home the message that one brief instance of ignoring safety standards can lead to tragedy.

According to news accounts, a 58-year-old worker was delivering drywall to a high-rise commercial construction site when he stopped to talk to another worker in a pickup truck. At the same time, a worker on the 50th floor had a tape measure dislodge from his tool belt and fall. The tape measure struck a piece of equipment 10 to 15 feet off the ground, then ricocheted and hit the drywall worker in the head. He died an hour later.

It turns out the worker was not wearing a required hard hat, which he had left in the cab of his truck. If he'd put on the hard hat before leaving the truck, he might be alive today.

The story of that freak accident has stuck with me for months. First off, it may be rare for careful high-rise workers to have a tool fall from their belts. Further, the majority of times, a falling tool at a construction site hits the pavement below and everyone pauses briefly with relief and starts working again. Long odds against a tragic accident like this could prompt workers to let their guard down and say, "Ah, I don't need to wear my hard hat today. I'm only going to be out of the truck for a few minutes."

Those who take chances in the name of getting a job done faster are not thinking of the worst-case scenario. Yet many of the rules workers are required to follow were designed for the worst-case scenario. Most days, nothing bad happens on an installation site and everyone goes home to their families happy and healthy.

COMMON VIOLATIONS WE SEE

However, installers can't let an attitude of indifference to safety rules creep into their work crew culture. You need to constantly train workers about using the proper personal protective equipment (PPE) and best practices for working with and around excavation equipment. Unfortunately, I know not everyone in the installer community is following best safety practices all the time … even when our cameras are focused on some of the best workers in the industry.

We hire professional photographers to shoot work photos for our monthly Contractor Profile stories and we ask installers and system designers to shoot photos of projects for our monthly System Profile feature. In an effort to promote worker safety, several people in the COLE Publishing production chain examine these photos looking for OSHA violations. Regretfully, we find serious safety infractions more often than we'd like, even from companies that we know are preaching safety and professionalism.

Among the most common violations we see are:

- Workers standing directly below excavators without any form of PPE, including hard hats.
- Crews working near heavy equipment that's not parked on stable ground.
- Inadequate shoring of holes dug for tanks, lines and drainfields, and spoils piles that are sloped too steeply.

CHECK OUT THE OSHA WEBSITE

We reject photos showing safety violations. To do otherwise would go against our editorial commitment to promote safe working conditions.

Still, we're not perfect, and if we miss seeing a violation in a photo, it doesn't take long for an industry watchdog to call us out on it.

I've met a lot of installers over the years, and they are a conscientious group of professionals who want to emphasize safety on the work site. But in the busiest of times, anyone can benefit from a reminder about following best safety practices. One way to keep crews thinking about safety is to hold daily tailgate meetings to focus on common areas of concern.

In the course of organizing your safety training, you can tap into the vast resources found at the OSHA website, www.osha.gov. There you'll find complete construction safety regulations organized by the type of job including excavation, material handling, working with tools and PPE. They

(OSHA) reports that 4,585 workers were killed on the job in 2013, an average of 88 deaths per week and 12 deaths every day. Fatal work injuries involving contractors accounted for 16 percent of all fatal work injuries in the same year.

even have identified a list of the top 10 most accessed general industry standards for safety. Among those are PPE, guarding floor and wall openings and holes, and noise exposure, all situations you could encounter.

The OSHA site also gives some sobering statistics about workplace injuries and fatalities. The agency reports that 4,585 workers were killed on the job in 2013, an average of 88 deaths per week and 12 deaths every day. Fatal work injuries involving contractors accounted for 16 percent of all fatal work injuries in the same year.

And it lists the construction industry's "Fatal Four," all situations where installers could find themselves at risk during the workweek: falls (302 of 828 construction deaths in 2013), struck by object (84), electrocutions (71) and caught in-between (21).

As the 2015 construction season starts to wind down, please take a step back and talk to your crews about safety. I don't want to read any more headlines about senseless construction site accidents.

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ON THE JOB

Know Your ATUs

As a service provider, it's important to know what type of ATU you are dealing with. The various types of ATUs operate in slightly different ways so you need to be familiar with all varieties. Here our expert gives a rundown of unit types and what you need to recognize. **onsiteinstaller.com/featured**

PRETREATMENT 101

Intro to Media Filters

There's a lot to know about media filters. They cover a wide variety of technologies to provide pretreatment for septic tank influent. This introduction to media filter basics kicked off a five-part online series. Check out these tips from expert Jim Anderson.
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Overheard Online

"No matter how good the service you deliver, you'll still have problems caused by bad weather, equipment failure and human error. We can't control those things, but we can control what we say to customers when they happen."

- 10 Phrases to Avoid When Dealing with Customers
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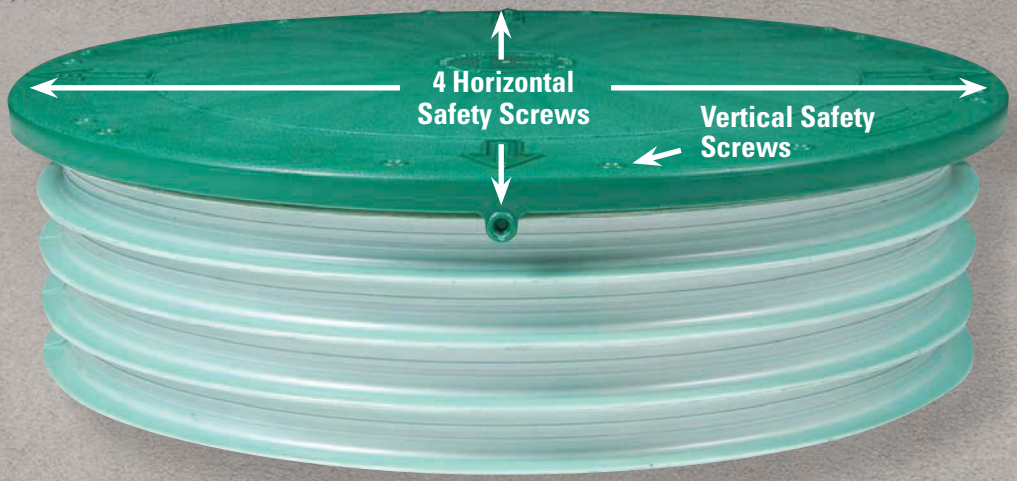

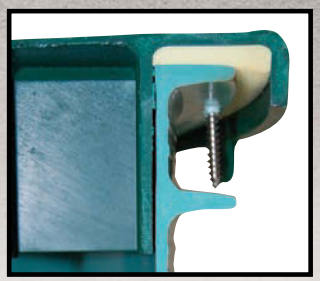

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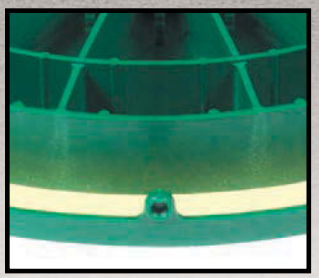

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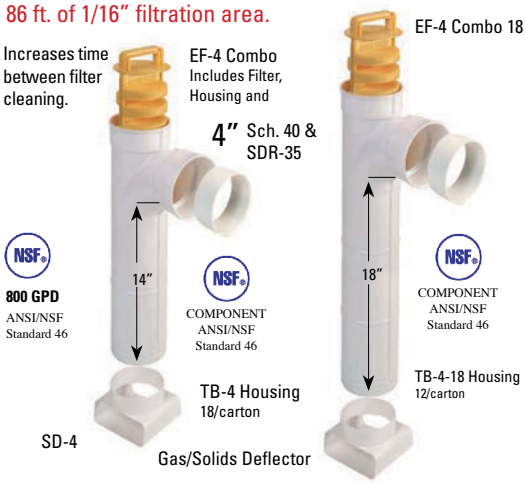

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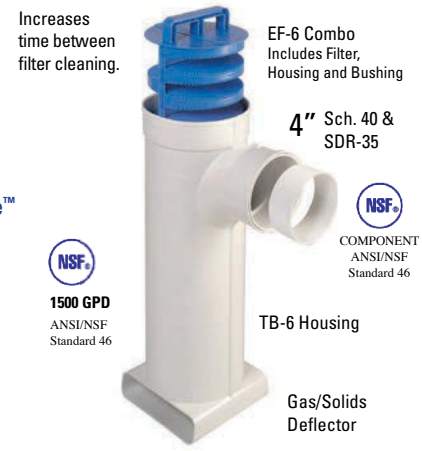

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It's time for greater government support of decentralized wastewater systems

To the editor:

You have hit a "home run" with the June Editor's Notebook story titled "Call Your Congressman." I am one of those 90 million taxpayers with an onsite system referenced by Eric Casey in this article.

The ugly truths shared about the disparity in funding for centralized systems over decentralized systems should be provided in the daily read file of every elected official in the country representing the 90 million taxpayers with onsite systems.

America's children and grandchildren will continue to face unhealthy blackwater in ditches and straight pipes carrying untreated sewage to our streams, and we now learn that the U.S. Environmental Protection Agency has just a one-person staff with an impossible task of oversight of Clean Water Act funding of onsite/decentralized systems for 50 states.

I live in north-central West Virginia and joined with four unincorporated communities that had many older onsite septic systems with problems. It was not the septic tanks failing as much as it was very small lots with failing drainfields that individual homeowners could not repair or replace under today's rules.

We began researching cluster drainfields and decentralized sewage systems in 2001, and it has been challenging and very frustrating to gain approval for a decentralized project, even with an incorporated onsite community wastewater cooperative responsible for the operation and maintenance required by an EPA Level 5 Responsible Management Entity. Yes, we could have already had public sewage had we not opposed and just went with an extension of centralized sewage.

There is great value in actual cost savings with decentralized operation and maintenance that would help cover long-term debt payments for the struggling ratepayers, but this seems to get shortchanged by many individuals at those government agencies favoring a centralized system. It sure seems reasonable to ask for the EPA and Congress to require more analysis than opinion before imposing higher costs to the ratepayers.

Community members can share and repeat the data from documented case studies on onsite/decentralized sustainability until we are blue. But after all these years, we wonder if the politicians and economic developers are listening. In comparison, professionals and public service providers with no experience with decentralized systems can say no and only support cookie-cutter planning for more of the same centralized sewer service and they seem to get the ears and the funds.

Onsite installers, sanitarians, manufacturers, elected officials and other professionals – please join in this discussion and debate.

Paul E. Hamrick
Clarksburg, West Virginia

Roll WITH IT

Minnesota's Bob Billiet weathers seasonal slowdowns, rocky economic times and changing customer demands to grow a business ... just as he's planning for retirement

By Scottie Dayton

Winter is more than a seasonal inconvenience for Bob Billiet, owner of Mid MN Septic Services in rural Hutchinson, Minnesota. It has influenced the course of his life.

"Typically, we have six or seven months to earn 90 percent of our income," says Billiet. "While thawing frozen onsite systems or pumping tanks puts some work on the service board in winter, it doesn't generate sufficient revenue for a small enterprise like ours to retain trained help."

Over the company's 23-year history, Billiet has earned every license necessary to help sustain or grow the business: designer, installer, pumper, inspector, maintenance provider, real estate broker and appraiser, and plumber.

Winter also gave the company a fluid profile, exacerbated by a sometimes unstable economy. The only constant has been Billiet's guiding presence, but that is about to change as he approaches retirement.

FINDING A NICHE

Early on, Billiet operated a real estate company, then worked as a real estate appraiser. That didn't make for steady work. "I was laid off whenever the market took a downturn. It happened frequently and I had a family to feed," he recalls.

Brother-in-law Dan Crotteau, who owned a local plumbing and heating company and was expanding into onsite installations, suggested Billiet design systems for him. Billiet took installer and design/inspection courses at the University of Minnesota, joining Crotteau in 1992.

> **"We often have to tie off the excavator so it doesn't roll into the lake, support it with another piece of equipment, then build a pad from which to dig the tank holes."**
> **Bob Billiet**

Soils in the area are wet loam, clay loam and clay with pockets of sand and loamy sand. "Then and now, 80 percent of new and replacement systems are mounds, with the remainder advanced treatment units or inground trenches with gravelless chambers," says Billiet. "Our niche is 450 to 600 gpd residential systems." The company's only commercial install was a winery.

The work suited Billiet. He bought out Crotteau in 1997 and registered the business as Mid MN Septic Services. With only two pumping companies

<< **OPPOSITE PAGE:** Customer Lori Cox discusses the installation of her new septic system with Bob Billiet, who is holding a Topcon laser level. Technician Dale Brenhaug uses a Kubota KX080-3 excavator to cover the septic tank.

>> **RIGHT:** Billiet and Dale Brenhaug (in the Kubota excavator) install chambers from Infiltrator Water Technologies in a new residential drainfield. (Photos by Brad Stauffer)

in a 20-mile radius, Billiet saw an opportunity to grow the business by becoming a septic first responder. "Many callers had sewage backing into their basements," he says. "We introduced ourselves through pumping, then offered a replacement system."

In 1998, Billiet purchased a 1993 Kenworth T600 chassis and added a 3,000-gallon Imperial steel tank and Masport W15X pump. Business boomed. He hired four employees and bought a pre-owned 2000 Sterling vacuum truck with 4,500-gallon steel tank and Wittig pump. Then winter would arrive.

THE COLD SNAP

Laying off workers and hoping they would return in spring didn't sit well with Billiet, since training replacements takes two years. "One winter I kept two salaried employees," he says. "There wasn't enough work and I had to borrow money to meet payroll." The decision also led to one of the company's worst periods.

Searching for ways to survive the lean months, Billiet branched into plumbing, purchased 20 Five Peaks portable restrooms and hired a master plumber to supervise the new divisions. Both of the new service areas stalled, and four years after opening the branches, he sold them.

By 2005-06, the company had recovered and saw its revenue peak. "We were averaging 10 new mound systems and 40 to 50 replacement systems annually," says Billiet. "For comparison, we installed two new systems and replaced 20 failed ones in 2014."

The low numbers reflect more than an economic backwater. Last May and June were some of the wettest on record, with rainfall totaling almost 13 inches. "We didn't install our first system until July 8," says Billiet.

Most replacements involve failed inground trenches or illegal tile field systems. Where possible, Billiet installs ATUs to rejuvenate drainfields. "When the Minnesota Pollution Control Agency approved Nayadic and Multi-Flo units from Consolidated Treatment Systems, we were one of the first in McLeod County to adopt the technology," he says. Today, Billiet is a Consolidated distributor in four counties and maintains 40 service contracts.

Mid MN Septic Services, Hutchinson, Minnesota

OWNER:	Bob Billiet
YEARS IN BUSINESS:	23
EMPLOYEES:	3 employees
SERVICES:	Septic system installation, repairs, pumping and inspection; directional boring
TERRITORY:	McLeod, Meeker, Wright, Renville, Sibley and Carver counties
WEBSITE:	www.midmnseptic.com

WORKING LAKE COUNTRY

While most replacement systems have challenging elements, lake lots with steep grades test the mettle of Billiet's crew and machines. Besides poor soils, setbacks often leave only 5 feet between houses and property lines. "Typically, we install an ATU in the front yard, which faces the lake, and pump to a new drainfield in the backyard," he says.

Another part of the problem began 30 to 40 years ago when developers filled all the ravines with fill soil, then built houses or cabins on them.

"By sitting on committees that drafted new legislation or revised it, I had some control over the direction of the industry and the survival of my company."
Bob Billiet

"Those are some of our most challenging sites," says Billiet. "The ravines still drain groundwater, and we never know what debris we'll hit during excavation."

Besides a 1992 John Deere 310D tractor/backhoe, Billiet has a 2014 Kubota SVC75 track loader, a 2013 Kubota KX080-3 excavator and a BX25 tractor/backhoe. The fleet also includes a 1986 Mack dump truck with a Brehmer box, a 1987 Ford dump truck, a 1999 Freightliner F70 dump truck, a Chevy express van, a Dodge pickup, two homemade open flatbed trailers, a 20,000-pound Ehrl open flatbed trailer, an Alra open flatbed trailer, and two enclosed trailers: one by Look Trailers and the other by Carry-On Trailer. Dale Brenhaug, full-time foreman, and a part-time summer laborer comprise the crew.

ABOVE: Billiet moves his Ditch Witch JT2020 directional boring machine in the company yard. In the background are two vacuum trucks, a Kenworth built by Imperial Industries with a Masport pump and a Sterling with a Wittig pump.

BELOW: Billiet catches up on paperwork at his office in Hutchinson, Minnesota.

"The small equipment works really well on these lots," says Billiet. "We often have to tie off the excavator so it doesn't roll into the lake, support it with another piece of equipment, then build a pad from which to dig the tank holes." He prefers Infiltrator Water Technologies tanks and chambers for such projects.

(continued)

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INSPECTOR CHALLENGES

When Billiet isn't designing or installing, he dons his onsite inspector and property transfer/point-of-sale inspector hats for Sibley County. He's done some 4,000 inspections and occasionally acts as the county's liaison if homeowners need help.

One case occurred last year when floods caused a 100-foot-long section of an onsite system to slough off 2 feet down a ravine. The exposed septic tank was still in place with the pipes connected.

"Someone had installed the 12-year-old system into a bluff along a creek," says Billiet. "The design should never have been permitted because Sibley County has a 75-foot setback to bluffs that wasn't met." Local septic ordinances vary from county to county.

For Billiet, bearing bad news is often the most difficult part of being an inspector. He's had more than his share since MPCA adopted the 2008 septic code. "In the mid- to late-1990s and depending on the county, certain contractors were installing trench systems instead of mounds," says Billiet. "Mounds were the correct technology, but they cost $2,000 to $3,000 more."

The 2008 code required verifying the limiting layer at the site for the depth to the periodically saturated soil. The rule eliminated most cheating. Then point-of-sale inspections became law, and homeowners learned their 10- or 15-year-old systems were noncompliant. "These people have little legal recourse," says Billiet.

Besides witnessing the fallout of such failures, Billiet also has had to worry about his safety. Feuding neighbors occasionally file invalid complaints about the other's septic system. Sibley County then asks the homeowners if Billiet may visit the properties to verify the situation. Several years ago, five citizens filed such complaints, and the county needed search warrants for three of them.

GOING UNDERGROUND

Billiet faced another calculated risk after the 2008 economic downturn. The company, which took the hit later than most, confronted uncertain days. For two years, Billiet and Brenhaug did everything. Then Dan Crotteau, now working for Plumbing and Heating by Craig, made a proposal.

Billiet maintains the beacon assembly on his Ditch Witch JT2020 directional boring machine, a unit that has helped him expand the business into installation of geothermal loops.

"Their geothermal heat pump installations were increasing, and they were contemplating buying directional boring equipment, backhoes and trucks," says Billiet. "Since I owned everything except the machine, Dan guaranteed a certain amount of work if I purchased it. I didn't have a clue how to operate one."

Billiet bought a 2006 JT2020 machine and mixing tanks from Ditch Witch of Minnesota. "On our first job, the territory manager showed us how to run the machine and use the different additives," says Billiet. "From then on, it was trial and error."

Mid MN Geothermal Services opened in 2010. The company focuses on installing geothermal loops and exchange piping, and 2-inch pressure lines for subdivision drainfields. "We will install electric, gas and waterlines for homeowners, but heavy competition makes vying for major utility or municipality contracts unrealistic," says Billiet.

KNOW THE GEOLOGY

Billiet quickly learned that running the machine was half the equation. One job involved boring septic lines through a golf course. The contractor assured him the soil was clay. "We began drilling and hit sand and gravel,"

Peer recognition

Membership in the Minnesota Onsite Wastewater Association (MOWA) has provided many benefits throughout Bob Billiet's career. "Being the first to know what is going on in the industry enabled us to adapt to changes quicker, which gave the company a competitive edge," he says. "By sitting on committees that drafted new legislation or revised it, I had some control over the direction of the industry and the survival of my company."

The proudest accomplishments for the owner of Mid MN Septic Services are serving on the MOWA board of directors for three terms and being elected its 2005-06 president. He also assisted the Minnesota Pollution Control Agency Subsurface Sewage Treatment Systems Committee in writing and updating training manuals and tests.

The project originated to raise the percentage of pumpers and maintenance providers who passed advanced certification exams. "The biggest problems with the original material were they suggested two ways to do something when only one was correct, and the language," says Billiet. "The engineers and academics who sat on the committee used their nomenclature. Changing the language to the industry's vernacular and eliminating redundancy produced the desired result."

Bob Billiet checks the air filter and oil on his Kubota BX25 tractor/backhoe at the company shop before heading out to a work site.

says Billiet. "Drill heads don't want to turn in that combination because it's too soft, too wet or so hard the drill head overheats." The bore took 40 percent longer than estimated.

Another project 60 miles from Hutchinson offered an opportunity to highlight the company. A local firm hired by an HVAC contractor to install geothermal piping had burst through the water and sewer lines of a million-dollar home.

"The contractor said the drilling was easy," says Billiet. "Just bore under the driveways, garages, landscaping and the basement floor to the other side of the house. Then he would cut a hole in the floor and make the connections."

Instead of clay, Billiet and his worker encountered rock. After advancing 300 feet over most of the day, they were forced to abandon the job 20 feet from the house or ruin the equipment. Since then, Billiet checks an area's geology before accepting large jobs or leaving town. He uses well drillers' public records, which show the location of gravel and bedrock.

While this year offers the promise of economic improvement, it also signals Billiet's transition to retirement. After selling the company, he plans to return as part-time manager until the new owner and Brenhaug earn the necessary licenses. Meanwhile, Billiet has signed another two-year contract with Sibley County and purchased a home in Arizona to escape the Minnesota winters.

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Pressure Distribution Finds a Niche

As installers and their customers get used to the idea of maintaining pumps and other components, pressurized dispersal is coming into wider use

By Jim Anderson and David Gustafson

When we think of pressure distribution, the first thing that comes to mind is the use of a series of pressurized laterals to distribute effluent over a rock bed and into the clean sand layer to distribute over the original soil surface. Use of these pressure distribution networks in mounds has been continuous since the early 1970s.

Today there are many more applications of pressure distribution networks – constructed directly in the soil in shallow drainfields, in the use of drip irrigation methods and in various media filters to provide pretreatment. Initially there was a lot of resistance to the use of pressure systems due to unfamiliarity with pumps and how they operate, and how to match the pump with the distribution network.

Using a timer eliminates variations in flow during the day, such as in the morning when everyone in the house is getting ready for school or work, and spreads it out more evenly.

Now if systems have media filters, there is often a pump supplying effluent to a pressure distribution system in the filter and another to the pressurized laterals in the final treatment and dispersal area. So there is a much higher comfort level using this technology, not to mention better pumps and other equipment. It is always good, though, to stop and think about why we're using pressure distribution and what is involved to avoid needless problems.

BUILDS FLEXIBILITY

Pressure is used to distribute effluent over the entire infiltrative surface, which can improve efficiencies of treatment in the soil, avoid being dependent on development of the biomat to provide treatment from day one of the operation, and give more flexibility in terms of when and in what quantities effluent is applied.

If the desire is to equalize the flow over both time and the area, a timer type of system is needed versus an on-demand system where the pump runs whenever a certain amount of effluent is generated. Using a timer eliminates variations in flow during the day, such as in the morning when everyone in the house is getting ready for school or work, and spreads it out more evenly. Of course, this requires some additional storage capacity, but eliminating large peaks and stresses on the soil treatment area helps systems last longer.

As mentioned earlier, dosing effluent can also increase treatment. A dosing cycle has four parts: when the pipes are filling; when they are full and effluent is discharging from all of the orifices; when the pump shuts off and the effluent drains out; and finally, the resting period between the doses where the effluent moves into and through the soil under unsaturated conditions to provide good treatment.

So think of the pump as acting like the biomat in a gravity system: It distributes the effluent over the entire area, and it provides unsaturated flow to allow oxygen to be in the soil to assist the aerobic soil organisms in treatment as well as breaking down the organic matter.

CHOOSE PUMPS WISELY

Discharge through the perforations is not equal until the entire network is pressurized. So the time spent under pressurized conditions should be longer than the filling and draining stages to make sure effluent is delivered evenly. A design figure often used and one that can be debated relative to treatment efficiencies is that the minimum dose volume should equal five times the volume of the distribution piping. Bottom line is the pump needs to be matched to the distribution system. Usually this is not a problem in new construction but something to be aware of when the pump needs replacement. Not just any old pump will do; it needs to deliver what is necessary for equal distribution.

In mound systems and most media filters, the pressure distribution network is laid out so the manifold and the laterals are level, which means they can be loaded from either end or in the middle depending on the type of system, the site, the elevation difference between the pump and the manifold, and other factors. In sloping sites, where the laterals are at different elevations, a shorter manifold is generally used, and it should be loaded from the top down to avoid excess water coming out of the orifices in the lower distribution laterals.

From an installation standpoint, a major decision is where the supply line from the pump will connect to the distribution manifold and laterals and how the line will be installed to avoid damaging the drainfield area.

UNIFORM DISTRIBUTION

One last general comment: Design of pressure systems is based on hydraulic and organic loading rates over the entire surface. But in practice, effluent spraying from the orifices will not cover the area uniformly. Typical low-pressure pipe configurations in mounds or shallow trenches have an orifice for every 6 to 10 square feet of surface area. The larger the surface area the more likely that there will be localized areas of saturated flow and even some biomat development, so numbers and spacing tied with the pump requirements becomes an important part of the design and performance of the system.

Pressure distribution uses a network of pipes, manifold and laterals loaded from a certain point with a specific set of orifices of a specific size to control the uniformity of distribution with respect to the area of the system. Dosing and resting cycles control the distribution of effluent over time. So that is why we say pressure distribution provides equal distribution over both time and space. How all these parts of the system match up with the hydraulic and organic loading rates will go a long way to determining system longevity and performance from a treatment standpoint.

Cramped Cottage Site

A small lot and numerous obstacles create challenges to an effective onsite upgrade on Georgia's Blackshear Lake

By David Steinkraus

When Matt Vinson was brought in to design a new system at Blackshear Lake in Georgia, the job requirements were clear although the system's history was not. "The health inspector had been there with a contractor, and they couldn't find the old drainfield. It could have been under the driveway, or it could have been the gravel pit they found near the end of the old septic tank," Vinson says.

As a former health inspector, Vinson understands the challenges of dealing with old systems and older properties. Many lakes in southern Georgia became sites for weekend homes in the 1950s and 1960s, and the basic systems of that era were never intended to handle the water flows of full-time occupancy with people taking regular showers and doing laundry often. This property near Cordele, about 150 miles south of Atlanta, was a part-time residence, but its system was past the end of its life.

"The original tank was in good shape. It was structurally sound, so we repurposed it. Anytime we can salvage and continue to use existing tankage the system is better off because there are more points to control and treat the flow of water," Vinson says.

SYSTEM PROFILE

Location:	Blackshear Lake, Cordele, Georgia
Facility served:	Single-family home
Designer:	Vinson Septic Solutions
Installer:	Ronnie Lewis of Warwick Septic
Type of system:	Low-pressure pipe bed
Site conditions:	Up to 3 percent slopes, clay soil
Hydraulic capacity:	300 gpd

<< OPPOSITE PAGE: An IHI compact excavator just fit into this space for removing soil at the home on Blackshear Lake in Georgia. Near the bucket is the home's old septic tank, which was retained as part of the new treatment system. A pipe from it now runs toward the left rear of the picture where an additional tank was installed beside the house. (Photos courtesy of Debbie Coarsey)

>> RIGHT: Workers set Infiltrator chambers into the drainfield at Blackshear Lake in Georgia. The public road can be seen in the background.

The property was tight: a narrow cottage lot with a circular drive, and about 20 feet from the front wall of the house to the lakeshore. The land is also sloped from the road down to the home on the shore. Vinson designed a solution that made the most of the land without creating unnecessary expense for the owner.

THE NEW SYSTEM

Wastewater runs a few feet away from the front wall of the house and empties into the old 750-gallon concrete septic tank. A 4-inch PVC pipe exits the tank and makes a sharp turn to avoid the concrete retaining wall about 20 feet from the front wall of the house. After a run of about 30 feet along the front of the house and past one corner, water flowing under gravity reaches a new 1,500-gallon concrete tank.

"The original tank was in good shape. It was structurally sound, so we repurposed it. Anytime we can salvage and continue to use existing tankage the system is better off because there are more points to control and treat the flow of water."
Matt Vinson

Workers clean up the area around the new treatment tank. Note the traffic-rated risers, used because the homeowner wanted the ability to drive on top of the tank.

This is a three-compartment tank, and the interconnections are at the tops of compartments so the tank can hold its full rated volume. In the first compartment is an Aquaworx Remediator to provide aerobic digestion of organic waste. Water then flows into the second compartment, which acts as a clarifier. The third compartment is a 500-gallon pump chamber.

A STA-RITE pump, controlled by an Aquaworx IPC control panel for time dosing, sends effluent through a 50-foot-long 2-inch pipe that rises about 30 feet to the drainfield. Fortunately, a previous owner had installed a sleeve beneath the driveway. The pipe went through the sleeve, eliminating the need for excavating or horizontal boring.

COMPACT DRAINFIELD

Vinson put the drainfield into a D-shaped space between the home's circular driveway and the public road. He could not use the entire space because the road right of way intruded into the area.

"We didn't want to go to the expense of digging up the asphalt. The homeowner had a limited area, and we didn't want vehicles driving over the drainfield and compacting the soil. That was basically the only place where

Workers set a new concrete tank, which was fitted with an Aquaworx Remediator for aerobic treatment. The home's original septic tank was retained for primary treatment.

we could have good, undisturbed soil," he says. "Part of the challenge here was the space was irregularly shaped."

In configuring low-pressure pipe systems, it's easier to make hydraulic load calculations if all laterals are the same length, Vinson says. But in this case, using different lateral lengths covered more soil area and allowed for more water absorption. Vinson settled on five laterals – a total of 144 linear feet composed of 1 1/4-inch pipe running inside Infiltrator chambers. Two of the laterals are 32 feet long, two are 28 feet and one is 24 feet. Orifices are spaced every 4 feet. "I would like them every 2 feet, but the hydraulics didn't work out because of the non-uniform shape of the bed," he says.

PIECE BY PIECE

The project went smoothly, but the real challenge was working in front of the house, says installer Ronnie Lewis. With his brother, Leon, he owns Warwick Septic Tank Inc. in Cordele. The company utilized an IHI compact excavator and Zaxis 35U mini excavator from Hitachi to do the digging work.

Workers use a Zaxis 35U mini excavator from Hitachi to finish installation of the new treatment tank. Effluent from the tank is pumped uphill to the drainfield.

"It was a real tight area," Lewis says. In front of the house was a retaining wall, and this left a space about 30 feet by 20 feet to work in. There was less when the crew finished excavating 100 to 150 cubic yards of dirt to gain access to the old septic tank and new outflow pipe that went to the new tank beside the house. "We had about a 4-foot area to get our mini excavator into."

Another notable feature of the job was the traffic-rated risers on the new tank beside the house. The crew handled the riser work themselves, Lewis says. Steel bases for the manholes were cast into the tank, then the crew built up the sidewalls using brick. On top are regular street-grade steel lids. There isn't much call for this type of construction on noncommercial jobs, but the owner wanted to be able to drive beside the house and on top of the new tank, Lewis says.

"The time-dosing system we put in there, it's really about one of the best systems we have on that lake," Lewis says. He should know. The business he and his brother run was started by their father in the late 1950s. They have worked on systems all around the area and have seen everything from 12-inch terra cotta drain tiles to modern Infiltrator systems. And there was the flood.

"The lake flooded in 1994. There were a lot of houses that were torn down, and the owners rebuilt with completely new construction. This home was an old cottage from the early 1900s. It was damaged in the flood, but the owner chose not to tear it down. Instead she did extensive remodeling to restore the home," he says.

With a new, advanced wastewater system in place, the Georgia lake home will be welcoming the owner and visitors for years to come.

MORE INFO:

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Wipes maker Nice-Pak agrees to stop marketing products as 'flushable'

By Doug Day

A manufacturer of wet wipes has agreed to stop promoting its product as flushable and will no longer claim they are safe for sewers and septic tanks until it can substantiate those claims. The proposed settlement between the Federal Trade Commission and Nice-Pak Products Inc. was finalized in June.

Jessica Rich, director of the FTC's Bureau of Consumer Protection, stated in a news release, "The evidence didn't back up Nice-Pak's claims that their wipes were safe to flush. If you claim a product is flushable, it needs to flush in the real world, without clogging household plumbing or sewer and septic systems." The company's testing did not reflect real conditions, the agency contended.

The FTC complaint said the company had violated the law by claiming that the wipes:

- Are safe for sewer systems
- Are safe for septic systems
- Break apart shortly after being flushed
- Are safe to flush

The company released a statement saying the products in question had been discontinued in 2014 and maintained that their claims were "fully substantiated." Nice-Pak produced the wipes for private labels marketed by Costco, CVS and Target.

The company is also named in a class-action lawsuit brought by the City of Wyoming, Minnesota, against six manufacturers of flushable wipes that alleges manufacturers knowingly marketed and distributed wipes as flushable, when in reality the wipes can cause severe problems to wastewater systems.

RHODE ISLAND

A state Senate committee has approved a cesspool bill that was pulled from a scheduled vote at the end of the legislative session last year. If passed, the law would require the replacement of all cesspools with approved septic systems or sewer connections when a property is sold or ownership changes. Waivers would be available for low-income property owners.

Rhode Island banned installation of new cesspools in 1968, but 25,000 of them are still in use. The cesspool act of 2007 required replacement of those within 200 feet of tidal waters, public wells and waters used for drinking supply intakes by January 2014.

PENNSYLVANIA

The U.S. District Court for eastern Pennsylvania is reviewing the dismissal of a lawsuit challenging a U.S. Environmental Protection Agency ruling that septic systems in the state do not require EPA review as long as they comply with state law. Several environmental groups have challenged the ruling saying the state's septic system law violates its anti-degradation policy and that the EPA should have reviewed and disapproved of the 2014 law. Two construction industry groups have joined the case as interveners. The National Association of Home Builders and the Pennsylvania Builders Association have taken the EPA's side in the case, claiming that the court ruling is correct and that the Clean Water Act does not require an EPA review of state statutes.

NORTH CAROLINA

Legislation would allow food stands to offer tables and chairs without having to worry about being classified as a restaurant. North Carolina state Sen. Jerry Tillman (R-Archdale) introduced the bill after visiting a country store where senior citizens have to stand as they socialize over biscuits warmed in a microwave oven. According to the *News & Observer* newspaper, state health rules forbid food stands from providing seating to make sure businesses have adequate septic systems to serve customers. The Division of Public Health says it does not oppose the measure, which would apply to permanent businesses but not food trucks.

RIDGID SR-24 adds smart device capability to popular locating tools

By Craig Mandli

Smartphones, tablets and GPS devices are becoming everyday tools in the workflow of onsite system installation professionals. With an understanding of this dynamic, RIDGID has integrated wireless and mapping functions into a new underground locator – the SR-24 – unveiled at the 2015 Water & Wastewater Equipment, Treatment & Transport (WWETT) Show.

The SR-24 essentially adds wireless and GPS features to the company's popular SR-20 utility locator. It uses wireless Bluetooth communication to connect to external devices such as GPS units, compatible signal transmitters and smartphones. The free RIDGIDtrax app makes most smartphones and tablets compatible, visually displaying GPS line traces in real time, according to Eric Huber, senior product manager for RIDGID.

"It was designed to easily replace inaccurate hand sketches and drawings, creating a digital representation of pointers underground," Huber says. "Not only does the system leverage tools that most professionals likely already have, it allows them to quickly share accurate information with customers."

The mapping features can be utilized in several ways. The SR-24 connects wirelessly to most high-accuracy sub-meter GPS hand-held devices with Bluetooth. In this mode, the GPS hand-held device is the primary data capture point to obtain the most accurate position information, obtaining depth and signal information wirelessly from the SR-24.

The unit has its own GPS antenna for applications that do not require detailed sub-meter position information. It has a nominal accuracy of less than 8 feet and gets more accurate with clear line of sight to GPS satellites overhead. This level of location resolution can be used to create reference maps of underground assets but not exact dig points. It records GPS and locating information on its onboard microSD card. The universal KML file created can be viewed on GIS mapping programs such as Google Earth.

"It enables the operator to go back to the exact spot they need to after mapping is complete," Huber says. "This system is going to appeal to utility and municipal excavators, utility locators, plumbers and even facility maintenance crews."

The RIDGIDtrax app enables operators to view positional information in real time to document underground assets. Select a utility type and record "digital yellow paint" as you walk the line. The finished KML map is easy to share by email for quick viewing, providing an easy way to document the layout and depth of underground lines.

"We did demos for RIDGIDtrax almost constantly at the WWETT Show this year," Huber says. "It was an extremely popular attraction for us, especially when people saw how it integrated with products such as the SR-24."

RIDGID territory manager Joe Borneman, left, explains the features of the SR-24 underground locator and RIDGIDtrax app to an attendee at WWETT 2015. The locating system offers compatibility with smart devices. (Photo by Craig Mandli)

The unit is also compatible with the ST-33Q+ signal transmitter, which can be controlled remotely from the SR-24 keypad up to 200 yards away. Eliminating the need to walk back to the transmitter to change frequencies and power settings saves time during difficult locates, a feature that Huber says came directly from customer feedback.

"Our goals attending shows like WWETT are not only to get our new product info out, but also to solve problems that techs deal with in the field," he says.

Huber was thrilled with the turnout at WWETT 2015 and promised RIDGID would be back with several new developments in 2016.

"This is really our target audience and core customer base," he says. "It's a huge date on our calendar." **800/769-7743; www.ridgid.com.**

A Clear View of the Road

Maintaining your wiper blades and keeping the washer reservoir full might not be high on your priority list, but you'll appreciate a clean, streak-free windshield the next time it rains or snows

By Ed Wodalski

Wiper blades are like a leaky roof – you don't think about them until it rains. Equally frustrating is having mud or winter slop splashed on your windshield and only hearing the hum of the pump when you press the washer button.

Keeping your wiper blades and washer fluid in tip-top condition might not be high on your maintenance list, but like that leaky roof, you'll appreciate a clean, streak-free windshield the next time it rains or snows.

To extend the life of your blades, wipe off the rubber element with a damp paper towel to clear away dirt or debris when you fill up your vehicle. It's also a good time to look for nicks or tears. In the winter, pull blades away from the windshield prior to a storm to prevent sticking and use an ice scraper or defroster, not your wipers, to de-ice the windshield. Wiper manufacturers recommend changing blades every six to 12 months and have adopted Groundhog Day as a reminder date.

When replacing blades, be sure to double-check for the correct size and connector system. A blade that is too short or improperly installed can lose its effectiveness and scratch your windshield. You can find the correct blades for your vehicle online or at your local auto parts store. You might also want to determine if a conventional, beam or hybrid blade is right for you.

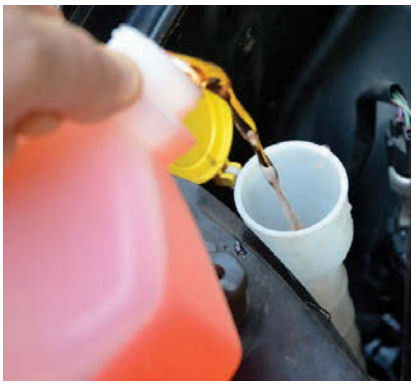
BLADE TECHNOLOGY

Conventional blades are best recognized by their skeletal framework and claw-like grips. The more aerodynamic beam blades feature a one-piece design. An encased spring allows the blade to conform to the curvature of the windshield. Small spoilers direct wind up and away from the windshield at highway speed. Beam blades, which have been on the market for about 10 years, are also less susceptible to snow and ice buildup.

Hybrid blades combine the aerodynamic features and all-weather performance of beam blades with the multiple pressure points provided by the best conventional, or bridge-style blades, says Kat Himaras, brand manager for ANCO wiper blades, Federal-Mogul Motorparts.

"As a result, you get strong, consistent blade-to-glass contact through the full range of wiper arm motion," she says.

Another option is to replace conventional blades with winter blades in the fall as part of your annual maintenance. Winter blades, designed for extreme weather, have a rubber cover over the frame to prevent slush from freezing joints.



TOP DOWN:

- Hybrid blades combine the aerodynamic technology of premium beam blades with the claw-like pressure points found on conventional or bridge-style blades. (Photo courtesy ANCO wiper blades, Federal-Mogul Motorparts)
- Blade manufacturers recommend replacing your blades every six to 12 months, depending on climate and driving conditions. (Photo by Ed Wodalski)
- Match washer fluid to the climate and keep the reservoir topped off to prevent de-icing agents from evaporating. (Photo by Ed Wodalski)

Rain-X features a change-blade indicator on its Quantum beam blade that turns yellow when it needs replacing. (Photo by Ed Wodalski)

"The worst thing on a wiper blade is ice," says Peter Bukaty, group brand manager for ITW Global Brands, maker of Rain-X products. "Ice has a jagged edge and it's hard. It can shear and cause nicks in the rubber. When you get nicks in the rubber, that part of the squeegee isn't touching the windshield. You're going to have a streak where that damage takes place."

And don't run wipers across a dry windshield unless your blade is a Rain-X Quantum. Quantum beam blades have a paste-like, semi-wet, water-repellant technology embedded in the lip of the squeegee. The blades also have an indicator dot at the tip that turns yellow, telling you it's time for a change.

"When original equipment manufacturers develop blades for a particular vehicle, they take the technology into account to make sure it's what will work best with that windshield."
Peter Bukaty

Squeegee blades are made from either natural rubber or a synthetic blend. While natural rubber provides good wiper quality, it will degrade over time, especially when exposed to UV rays. Most premium blades use a synthetic blend for greater durability.

CHOOSING A WIPER

So, how do you know which wiper blade is best for your vehicle?

"One thing is to copy what came on your vehicle," Bukaty says. "When original equipment manufacturers develop blades for a particular vehicle, they take the technology into account to make sure it's what will work best with that windshield."

Another determining factor can be price.

"Some people aren't willing to pay for a premium beam wiper blade that may cost $15 to $25. They may just want to pay $7 to $12 for a conventional blade," Bukaty says. "The hybrids are usually priced in the middle – $14 to $20."

Wiper blades used on commercial trucks are similar in technology to those used on autos or pickups.

"The sizing may be different, but it should work fine for either application," he says.

WASHER FLUIDS

When it comes to washer fluid, there are three basic formulas: summer blend, winter blend and all-season. Some fluids have a bug remover. Rain-X also adds a water-repellant to its products and offers an additive that can be mixed with other brands.

Ron Fausnight, ground technical manager for ITW, says the most important thing is to match the washer fluid to your climate. Summer fluids contain mostly water and detergent, while winter and all-season blends have methanol to prevent freezing. If you live where the temperature drops below freezing or drive from a warm to cold environment, Fausnight recommends using all-season or winter fluid year-round.

"The winter formulas work in the summer just fine," he says. "But the summer formulas do not work in the winter."

If you have summer fluid in your vehicle, you can gradually replace it with a winter blend as the weather turns colder, although it's recommended that you simply pump it out on the windshield in fall and refill your system with winter or all-season fluid.

A word of caution: Since most washer fluid contains methanol, it can irritate skin and burn the eyes. Ideally, gloves and safety glasses should be worn. If you do get some on your hands or splash it in your eyes, be sure to rinse the area with water. Methanol can be toxic if ingested in large amounts, so keep open containers away from pets and children. Methanol vapor is also flammable. If you have an open container or spill a large amount in a closed environment, it's best not to light a match or do grinding or welding until the vapor has dissipated.

A final tip: Keep your washer fluid reservoir full and tightly capped, especially in winter, to prevent the methanol from evaporating and reducing the fluid's effectiveness. ☐

Industry Band of Brothers

Adapting to new government regulations, coping with disposal issues draws wastewater professionals together at the Ontario Association of Sewage Industry Services

By Doug Day

Formed in October 1991, the Ontario Sewage and Liquid Waste Carriers Association was originally for pumpers and haulers in the Canadian province. In 1998, the group expanded its focus to include installers and the portable sanitation industry, changing its name to OASIS, the Ontario Association of Sewage Industry Services.

As OASIS celebrates its 25th anniversary at its annual conference in October, Chris Aitkin is just starting his second year as the group's president, carrying on the legacy of his family's business, Rankin's Septic Tank Pumping and Environment Services. His father, Jim, became involved in the group shortly after its inception and also served as president of the organization, which now has about 250 member companies. Chris joined the board in 2008 when his father became ill.

Chris Aitkin,
president of Ontario Association of Sewage Industry Services, at chrisaitkin0926@gmail.com or 905/979-1133
OASIS

How much has changed over the 25 years of OASIS?

Aitkin: Everything has changed, from equipment and insurance to how disposal is done and how the government runs things. We have built relationships with the ministries, providing advice and raising concerns where we see necessary. We're very excited about our 25th year. It's really a milestone for us.

> **"There are many instances of our members sending jobs to each other and working together in times of need. That's the kind of people we have as members and the camaraderie we have."**
> Chris Aitkin

You are in the midst of another big change. Tell us about OASIS and the Ontario Onsite Wastewater Association.

Aitkin: Our most recent important undertaking is the relationship we are building with OOWA. We are combining our conferences starting in 2017 to provide the entire industry with a one-stop shop once a year. It's been coming for a long time. Our members won't have to choose which conference to attend – many attend both – but they can support both organizations in a joint conference and trade show. It's going to be more cost-effective for the members and for OASIS and OOWA.

We have formed joint committees, so everything is going to be much neater, tighter and more organized because we're working with each other to reach common goals. When you have two associations that have the same interests, there are certain points where it just makes more sense to collaborate. When we talk to the government about something, they'll ask us what OOWA thinks or vice versa. Now it's going to be, "We both think this." Sitting at the table together brings that much more volume to our voice.

The working relationship will benefit both groups as we can stand united and carry forth the message far stronger than the individual organization can alone. This industry is still mostly small family businesses in some of the most remote communities in Ontario, so there is strength in numbers.

How close is this to being a merger?

Aitkin: The word merger has not entered anybody's vocabulary. We are strictly working on collaboration between two organizations that have the same goals that can achieve success better than one big organization.

Our memberships are different. Some overlap, but the majority of OASIS members are pumpers, haulers, the portable restroom people and some installers. The mainstay of OOWA is designers, installers, manufacturers, engineers, regulators and researchers. We have things we concentrate on like portable restrooms that have no relevance to them.

What are the biggest issues for OASIS right now?

Aitkin: We are working with the Ministry of Labour to define best practices for workers and suppliers around the rules and regulations for portable restrooms. We need a level playing field, for everything to be policed the same way with the same expectations. We want everybody to

have a better understanding of what is expected and are hosting information sessions with MOL and the Infrastructure Health and Safety Association.

We're always working with the Ministry of the Environment to improve disposal practices. With government, everything changes all the time. You have new people in place and we really have to keep our nose to the grindstone. It's all about that main goal, we want things to be environmentally clean and safe for everybody concerned.

Looking back at 25 years, what are some of the key accomplishments of OASIS?

Aitkin: We've done a lot of work with the government. When the province downloaded responsibility for septic systems to the municipalities in the mid '90s, we worked diligently to have our members certified under the new regulations and helped the process along. Portable restrooms in the construction industry have been at the forefront for many years. We were involved when the rules were revamped about 20 years ago.

The biggest benefit I see is the networking. If somebody needs help, I can pick up the phone and call someone in another part of the province. One of our director's sons was killed in an accident, a member's truck caught fire, another member's truck caved in, somebody broke their leg. There isn't a time that somebody didn't pick up the phone and ask what they could do to help.

The day after my father died in 2012, all the guys from my area and at least five from across the province contacted me and asked what I needed to get through the next couple of days. There are many instances of our members sending jobs to each other and working together in times of need. That's the kind of people we have as members and the camaraderie we have.

One of the most important things to OASIS is family. You can watch the generations change as the younger ones move up and start bearing the brunt of the workload, the fathers teaching their sons and daughters, and then the children teaching their parents new technologies and better ways.

What do you see as the big issues in the future?

Aitkin: With the provincial government, it's always been the goal to limit land application. Doing away with it is not a reality. We'd all love to dispose at a sewage treatment plant, but we don't all have access to one. There are some areas of the province where plants don't have the ability to take on that much sewage from septic tanks, so land application is the only alternative. Some people use lagoons; some have put in their own treatment facilities with reed beds or other technology.

We work with government to get receiving stations put in when they build new wastewater treatment plants. It's just a matter of finding that happy medium and what is feasible. It's the same as in the United States. Some areas are very good at disposal and they provide you a cost-effective way to dispose of the sewage. Some have outlawed land application, but if they provide me an economical way to dispose of it, I don't mind.

Disposal is always going to be an issue, always has been. It's why this organization was brought to life 25 years ago, and we keep plugging along and succeeding in keeping things moving and looking for better ways to do it.

Distribution Equipment and Systems

By Craig Mandli

Several onsite effluent distribution methods are available to create an efficient treatment system, regardless of environmental challenges. Here are distribution boxes, drainfield media, drip tubing, piping and pumps that provide options when designing systems:

DISTRIBUTION BOXES

Clarus Environmental Tru-Flow Splitter

The **Tru-Flow Splitter** distribution box from **Clarus Environmental** can accurately split wastewater effluent flows ranging from 1/10 to 30 gpm into two to five distribution lines. It's constructed of lightweight, non-corrodible materials for easy installation and durability. It consists of a diverter basin and cover, and the diverter. The bubble level design allows for simple post-construction adjustments, solving settling problems. The unit may settle as much as 15 degrees to the front or back, and/or 12 degrees to one side or other, and when adjusted will still evenly split effluent. With a 4- or 6-inch riser to the surface, the unit is easy to inspect, adjust and maintain. **800/928-7867; www.clarusenvironmental.com.**

Polylok distribution box

Distribution boxes from **Polylok** allow installers to choose the height of inlets and outlets. They come with a seal that accepts 2-, 3- or 4-inch and corrugated pipe (the 20-inch unit accepts 6-inch pipe). The 12-inch unit comes with stabilizing feet to anchor the box. **877/765-9565; www.polylok.com.**

Tuf-Tite distribution box

Distribution boxes from **Tuf-Tite** include a speed leveler in each outlet. They are available with four, six, seven or nine holes. Risers are available on the four- and seven-hole boxes. They come with a one-piece watertight seal that accepts 1.5-, 2-, 3- and 4-inch SDR35 or Schedule 40 pipe, including corrugated for ease of installation. **800/382-7009; www.tuf-tite.com.**

DRAINFIELD MEDIA

Anua Puraflo

The **Puraflo** peat fiber biofilter from **Anua** can be designed and installed as a combined treatment and effluent dispersal system. Treated effluent exits the modules via weep holes around the perimeter at the module base and flows into the dispersal system situated directly beneath the modules. System options include an inground or mounded pad. It provides passive treatment suitable for properties occupied full or part time. The peat media provides biological, physical and chemical treatment, with a high level of pathogen and nitrogen reduction, according to the maker. It has the ability to overcome site limitations such as a seasonal high water table, shallow soils or restrictive layers, and is suitable for environmentally sensitive sites, such as waterfront properties. Its timed dosing system provides siting flexibility. **336/547-9338; www.anuainternational.com.**

Bio-Microbics BioSTEP

The prescreening/pretreatment **BioSTEP** system from **Bio-Microbics** filters the solids down to 1/8 inch and transfers the screened liquids under pressure to the wastewater treatment system. The prepackaged system can be used in small-diameter, decentralized collection applications. All systems are available as individual components or preassembled in ready-to-install system packages. Filtered pump vaults incorporate a slotted filter screen with swabbing handles and integral ScumGuard to provide a submersible pump with protection from large solids and laden scum, allowing for clean-in-place maintenance and quick servicing. **800/753-3278; www.biomicrobics.com.**

Infiltrator Systems Quick 4 Plus Standard Chamber

The **Quick4 Plus Standard Chamber** from **Infiltrator Water Technologies** is designed to provide strength through two center structural columns and large storage volumes to accommodate peak flows. With a small footprint, the chamber provides installation flexibility. Fast and easy to install in a 36-inch trench, the 4-foot unit has contouring capability with its contour swivel connection, which permits turns up to 15 degrees right or left. The all-in-one 12 Endcap can be used at the end of the chamber row or installed mid-trench to allow for a center feed with side, end or top inlet pipe connections. For raised invert installations and 180-degree directional inletting, the all-in-one periscope is available. No stone or geotextile is required for installation. **800/221-4436; www.infiltratorwater.com.**

Norweco Hydro-Kinetic Bio-Film Reactor

The **Hydro-Kinetic Bio-Film Reactor** attached-growth filtration system from **Norweco** is designed to help reduce BOD and solids from wastewater effluent without using electricity. Installation between a treatment tank and disposal field helps extend the life of the field. Gravity flow through the reactor eliminates the need for a pump-dosed filter. The lightweight, rotationally molded polyethylene reactor treats up to 800 gpd. It is completely non-mechanical, user-friendly and easy to install and maintain, according to the maker. **800/667-9326; www.norweco.com.**

Sim/Tech Filter orifice shields

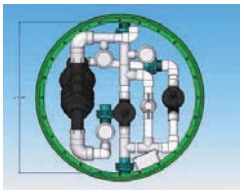
Orifice shields from **Sim/Tech Filter** are designed to help prevent drain media, such as stone, from blocking discharge holes so pressurized systems distribute effluent evenly. The shields firmly snap into place on laterals. The large amount of open area between the pipe and the shield allows for easy placement over the holes and reduces media clogging by debris. Two styles are available for top discharge distribution holes and bottom discharge holes. Shields are available to fit 3/4-, 1-, 1 1/4-, 1 1/2-, 2- or 3-inch pipe. **888/999-3290; www.simtechfilter.com.**

DRIP TUBING

Geoflow Wasteflow

The **Wasteflow** dripline irrigation system from **Geoflow** is placed directly into the soil at the plant's root zone, where effluent is released slowly and uniformly to be digested and absorbed safely. It can be used on difficult sites, including shallow soil profiles, steep slopes, limited setbacks or in areas with poor soils. Molded Rootguard in each emitter is designed to protect against root intrusion, while the Geoshield component protects against biological buildup. **800/828-3388; www.geoflow.com.**

Jet Inc. Drip Irrigation Headworks



The **Drip Irrigation Headworks** package from **Jet Inc.** is designed as a direct-mount device on an effluent pump tank that will filter effluent discharge while controlling pressure to the dripfield. It is available for auto or manual flush. The package contains a 1.5-inch vortex screen filter and preinstalled pressure gauges to monitor pressure drop across the filter component and regulate pressure to the dripfield. Designed for use with the drip system float tree, it mounts onto an existing 24-inch riser for easy access to the pump, float tree, integrated vortex filter and controls. The package is available as part of the Drip Disposal Field Package that complements the J-1500 Series Bat Media treatment system. An optional flowmeter package and pressure relief valve is available to meet site-specific and regulatory criteria. **800/321-6960; www.jetincorp.com.**

Netafim Bioline

Netafim Bioline is purple polyethylene, low-volume dripperline that is debris-resistant, continuous self-flushing and pressure compensating. It delivers a precise application rate into the soil over a broad pressure range, and has an antibacterial impregnated into it to prevent microbial slime buildup. It doesn't require special handling or storage, and no chemicals are required to protect against root intrusion. Available in three flow rates and several dripper spacings, it works in any type of soil and does not need special equipment to install. Its ability to precisely deliver effluent makes it suitable for environmentally sensitive areas, tight soils, slopes, odd-shaped areas and for those wishing to use the effluent for beneficial reuse. **888/638-2346; www.netafimusa.com.**

PIPING

Advanced Drainage Systems Septic Stack

Available in configurations of nine, 11 and 13 pipes, **Septic Stack** units from **Advanced Drainage Systems** allow for soil contact without the use of gravel. This pipe is engineered with holes and slots, allowing it to collect and disperse the effluent as it passes over the corrugations in the pipe. Using 4-inch HDPE pipe provides abrasion and corrosion resistance. Its 10-foot lengths and design flexibility help decrease installation time. They are lightweight and have a high storage volume with structural strengths that will support an H-10 load rating with 12 inches of settled cover. Applications include trench low-pressure piping, pressure distribution, and trench, mound, and bed configuration. **800/821-6710; www.ads-pipe.com.**

Plastic Tubing Industries Rockless MPS

The **Multi-Pipe (MPS) Rockless** drainfield system from **Plastic Tubing Industries** uses corrugated pipes to replace voided areas within a gravel system. It provides a reduced footprint, low profile and increased transpiration and evapotranspiration area. All configurations are constructed with recycled materials. **407/298-5121; www.pti-pipe.com.**

Glentronics PHCC Pro Series quick-connect pipe

The preassembled **PHCC Pro Series** quick-connect discharge pipe for sump pump installations from **Glentronics** includes a 1 1/2-inch rubber coupling and check valve, pre-cemented female adapter, pre-drilled weep hole to prevent air lock, discharge pipe and pre-cemented male adapter. **800/991-0466; www.stopflooding.com.**

PUMPS

Ashland Pump EP50

The **EP50** effluent pump from **Ashland Pump** has a continuous-duty rated, energy-efficient 1/2 hp PSC motor with performance reaching 105 gpm and 53 feet of head pressure. It is constructed of heavy-duty cast iron with a cast iron impeller capable of passing 3/4-inch solids. It is available in 115-volt with a wide-angle piggyback switch and also in 230-volt manual versions. **855/281-6830; www.ashlandpump.com.**

Environment One Corporation Upgrade

The **Upgrade** replacement grinder pump from **Environment One Corporation** is engineered to fit into virtually any grinder pump wet well. Universal design allows easy drop-in conversion, ready to connect. All solids including plastic, rubber, fiber and wood are ground into fine particles, allowing them to pass easily through the pump, check valve and small-diameter pipelines. The grinder is designed not to jam and for minimum wear to the grinding mechanism. It comes with a self-contained level control system, eliminating float switches. **518/346-6161; www.eone.com.**

Flygt - a Xylem Brand Advanced PSS Package

Advanced Pressure Sewage Systems (PSS) Packages from **Flygt - a Xylem Brand** include an energy-efficient Flygt Progressive Cavity Grinder Pump, fiberglass-reinforced polyester pump station and FGC211 intelligent pump controller. The pump is designed for long motor life and service intervals. It is quick to install and comes with user-friendly monitoring and control, trouble-free operation and municipal durability in a residential setting. **855/995-4261; www.flygtus.com.**

Franklin Electric FPS IGPH Series

The **FPS IGPH Series** of high-head grinder pumps from **Franklin Electric** slice through sewage at 414,000 cuts per minute. They can be used in high-head conditions found in many low-pressure sewage transfer applications. Available in an automatic or manual version, the pumps use a cutter system with tight clearances and incorporate two non-clogging impeller stages designed for efficient pumping of sewage slurries with a shut-off head of 200 feet. They run on 16 full-load amps at minimum head requirements of 100 feet, and are available in single- or three-phase versions. A 2 hp, 3,450 rpm motor powers the unit, which includes corrosion-resistant upper and lower brass impellers and built-in overload protection to prevent over-current/over-temperature damage. The automatic model has start/run components encased in an oil-free chamber that requires no control panel, while the manual model uses externally mounted start/run components. **800/701-7894; www.franklinengineered.com.**

Gorman-Rupp Company ReliaPrime

The **ReliaPrime** emergency bypass station from **Gorman-Rupp Company** has a 6-inch Super T Series pump capable of passing 3-inch spherical solids. A soundproof, lightweight aluminum enclosure has lockable door panels that can be removed for maintenance. The unit is a complete backup package, ready for hookup. **419/755-1011; www.grpumps.com.**

Goulds Water Technology e-HM

The **e-HM** horizontal multistage pump from **Goulds Water Technology - a xylem brand**, has a small motor and space-saving design that allows it to fit where needed, while delivering high-efficiency performance with full pressure-boosting capabilities. It has a thick pump body designed for durability and reliability. Its balanced impeller reduces axial thrust, extending motor-bearing life. With two designs, six models and modular construction, it is customizable. **866/325-4210; www.goulds.com.**

Grundfos Pumps Comfort PM Auto

Comfort PM Auto residential circulating pumps from **Grundfos Pumps** have an AUTOADAPT function that learns the household's consumption patterns and then adapts to it. When using the mode, average runtimes are three hours per day. The single-phase, 115-volt pump motor yields up to 6.5 gpm and uses two temperature sensors; one within the pump and another connected by a cable installed in the hot-water flow pipe. The variable-speed electronically commutated motor-based circulator uses an integrated logic algorithm to learn the varying energy-usage patterns of an application over time, enabling the software to automatically determine the lowest possible operating-efficiency point to meet demand. **800/921-7867; www.grundfos.us.**

Liberty Pumps ProVore

The **ProVore** grinder pump from **Liberty Pumps** is designed for use in residential applications where the addition of a bathroom or other fixtures below sewer lines requires pumping. It has the same V-Slice cutter technology used in Omnivore Series 2 hp grinder pumps. Powered by a 1 hp motor, it operates on a standard 115- or 230-volt circuit requiring a 20-amp breaker. No special wiring is needed. Compact factory-assembled systems are available in both simplex and duplex versions. **800/543-2550; www.libertypumps.com.**

Myers V2 Series

The **V2 Series** grinder from **Myers** has an axial cutter system made of 440 stainless steel hardened to 57Rc and is composed of two parts – the plate and the blade. The plate has 14 specialized cutting slots (12 for the high-head version), which when combined with the three-armed blade, achieves up to 248,000 cuts per minute. Designed with computational fluid dynamics software, the unit has a volute and impeller that allows shut-off heads up to 180 feet with a single-stage centrifugal pump. Changing between the standard and high-head flow design requires only swapping the impeller and cutter plate, simplifying maintenance and reducing service parts inventory. **419/289-1144; www.femyers.com.**

Orenco Systems Biotube ProPak

Biotube ProPak ready-to-install pump packages from **Orenco Systems** filter up to two-thirds of solids, and only liquid from the tank's clear zone is pumped. The filter is easy to remove and clean without pulling the pump vault. It is used for filtering and pumping effluent from single- or dual-compartment septic tanks to gravity or pressurized discharge points. Its pump vault eliminates the need for a separate dosing tank. All components are designed to be quickly installed and easily maintained. The PF-series high-head effluent pump is field serviceable and repairable, and pump controls are designed for the specific package purchases. Free ProPak Select software provides fast, error-free hydraulic calculations and generates system curves. **800/348-9843; www.orenco.com.**

Septic Services Bullet High Head Effluent Pump

The **Bullet High Head Effluent Pump** from **Septic Services** is a midsection double-screened pump for high-pressure applications, including pumping water or filtered effluent to an irrigation sprinkler or mound system at long distances. Constructed of a corrosion-resistant stainless steel outer shell, the 4-inch-diameter pump has a 1 1/4-inch NPT stainless steel discharge, 1/3 hp oil-filled, 120-volt, continuous-duty submersible motor and a 15-foot two-wire, one-phase ground cord. The BP-12 has an output of 12 gpm, and the BP-20 has an output of 20 gpm. **800/536-5564; www.septicserv.com/store.**

Webtrol Pumps MVPS-RE1

The **MVPS-RE1** drop-in package for existing progressive cavity systems from **Webtrol Pumps** is designed for reliable operation and nearly constant flow, adjustable for pressure variations in any system setting, according to the manufacturer. It is powered by a 1 1/2 hp, 1,750 rpm motor that provides grinding torque. All package parts are readily available and easily replaceable. **800/769-7867; www.webtrol.com.**

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AERATORS

We sell Flagg-Air 340, Secoh, Gast and Medo Linear, FPZ and Gast Regenerative, Thomas and Gast Rotary Vane aerators, rebuild kits and alarms at wholesale prices. Septic Services, Inc. www.septicserv.com. 1-800-536-5564 (IM)

Aerators: Multiflo alternative replacement $325 + shipping. Alternative replacement, NEW FILTER SOCKS, 30 per case $370 + shipping. Spring clips to hold filter socks in place, $3.86 per clip. **Alternative Jet Aerator** available $425. Call us at 800-717-8807 or email us at fabulousfungi@gmail.com. www.Roland-Turbo-Aerator.com. Multi-Flo® and NAYAD-IC® are registered trademarks of Consolidated Treatment Systems, Inc. used here for reference purposes only. (PBM)

BUSINESSES

Start your own septic tank business in FLORIDA. Call for more details. 931-248-1284 or 931-287-5413. (PBM)

Septic tank cleaning & inspection service business for sale in Central Maine. Profitable, turnkey business with a loyal customer base. Two pump-truck operation (1) 2000 GMC - 2,500-gallon capacity, 136,000 miles. (2) 2004 Peterbilt – 4,500-gallon capacity, 129,000 miles. Serious inquiries only! $257,000. Call 207-782-1620 or email septicbizsale@gmail.com (PBM)

HAND TOOLS

Crust Busters - Portable, lightweight machine guaranteed to mix up septic tanks and grease traps! Save time and money! 1-888-878-2296. **www.crustbusters.com** (IM)

PUMPS

Hydromatic, Zoeller, Liberty, ABS, Myers, grinder and effluent pumps. Lift station packages and high water alarms are also available. Septic Services, Inc. www.septicserv.com, 1-800-536-5564 (IM)

Honda model WP40X, 8 hp, 4" with hoses. Honda 4 hp, 2" pump with hoses. The Cable Center: 800-257-7209. (CBM)

industrynews

Manitou Americas expands dealer network

Manitou Americas added Modern Equipment & Supply to its dealer network, serving eastern Pennsylvania and New Jersey.

Ditch Witch launches interactive website

Ditch Witch, a Charles Machine Works company, launched a new website, www.ditchwitch.com. The site features a myDitchWitch customer portal that provides an access point to Parts Lookup, Quick Tools and HDD Advisor. It also enables customers to set their dealer preference and manage their account.

Grundfos names customer service director

Bill Crooks

Grundfos Pumps Corp. named Bill Crooks customer service center director. He will be responsible for overseeing customer service and applications engineering teams at the company's facility in Olathe, Kansas.

Pettibone/Traverse adds dealer

Pettibone/Traverse Lift added Leavitt Machinery to its dealer network for all material handling products in the provinces of Saskatchewan, Alberta and British Columbia in Canada and the state of Washington in the U.S.

Hyundai Construction names service, marketing managers

Hyundai Construction Equipment Americas named Ernesto Lopez service manager, construction equipment, and Corey Rogers marketing manager. Lopez will head the HCEA service, warranty and training teams that support the company's dealers and customers. Rogers will lead all brand, product marketing and communications for Hyundai's construction equipment and forklift product lines.

Private equity group acquires Anua

Charles Ray and Colin Bishop, industry entrepreneurs and veteran employees, acquired the Western Hemisphere assets and rights to Anua from Bord na Mona with support from Justin DaMore, an industry insider, and his private equity associates. Terms of the sale were not disclosed. The new company will continue using the trade name Anua. The purchase includes the assets, rights, trademarks and intellectual property to Anua, as well as Puraflo, Platinum, PuraMax, Compact Monafil and Compact Monashell technologies.

Joint wastewater association conference Nov. 3-6

The National Onsite Wastewater Recycling Association (NOWRA), along with the Virginia Onsite Wastewater Recycling Association (VOWRA), the State Onsite Regulators Alliance (SORA) and the National Association of Wastewater Technicians (NAWT), will hold a joint industry conference Nov. 3-6 at the Virginia Beach Conventional Center. The conference will serve as the annual meeting for NOWRA, VOWRA and SORA and NAWT's 2015 Treatment Symposium. For more information: www.nowra.org/2015mega.

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RIDGID motor-on-bottom, self-cleaning vacs

The Professional Line of wet/dry vacs from RIDGID ranges from the portable 4-gallon to the high-capacity 16-gallon model. The 1650RV motor-on-bottom delivers 24 percent more power than previous RIDGID models. The motor position creates a stable, low center of gravity while the foot-activated power switch allows for hands-free operation. The RV3410 Smart Pulse self-cleaning vac has two filters and an integrated sensor that continuously monitors suction efficiency. When the sensor detects a pressure difference, the vac automatically begins an alternating, pulsing cycle to push air through the filter, cleaning it of debris. **800/769-7743; www.ridgid.com.**

Water Cannon soft sprayer system

The 14C12 chlorine-resistant soft sprayer system from Water Cannon, powered by a Honda GX200 engine, features a 10 gpm at 300 psi Udor Zeta Series diaphragm pump, gear drive and 200-gallon polyurethane tank. The 65- by 49- by 40-inch-tall sprayer has a lightweight and rustproof skid-mounted frame, aluminum and stainless steel hose reel, adjustable spray gun, 400-foot by 3/8-inch chemical application hose and tankless Clean-N-Flush valve. **800/333-9274; www.watercannon.com.**

Komatsu intelligent machine control dozer

The D65PXi-18 dozer with intelligent machine control (IMC) system from Komatsu America Corp. allows automated operation, ranging from heavy dozing to fine grading. Powered by a 217 hp SA6D114E-6 EPA Tier 4 Final emissions certified engine, IMC eliminates blade-mounted sensors, antennas, cables and electrical connections. An automatic gearshift transmission and lock-up torque converter selects the optimal gear range, depending on job site conditions and load, for maximum efficiency. **847/437-5800; www.komatsuamerica.com.**

Grundfos pressure-boosting system

The Hydro MPC BoosterpaQ compact pressure-boosting system from Grundfos Pumps features multiple configurations for running up to six pumps in parallel. The CU 352 intuitive graphical interface controller ensures efficient operation. The controller communicates via common fieldbus protocols and has a built-in Ethernet connection for remote Web access. **800/921-7867; http://us.grundfos.com.**

John Deere L-Series tractor loaders

The L-Series 210L EP and 210L tractor loaders from John Deere have a four-speed PowerShift transmission for no-clutch, fingertip shifting and direction changes. The 210L is powered by a 93 hp Tier 4 Final/EU Stage IV PowerTech Plus diesel engine and the 210L EP is powered by a 70 hp certified Interim Tier 4/Stage III B PowerTech E engine. Depending on use, each model can be equipped with a canopy or optional four-season, air-conditioned/heated cab. **800/503-3373; www.johndeere.com.**

Advanced Drainage Systems design tool

The StormTech design tool from Advanced Drainage Systems enables engineers, owners and contractors to design customizable underground stormwater management systems. Available free at the company website, the tool can be accessed and used through multiple platforms, including smartphones, tablets and other mobile devices. Designs are produced in PDF and CAD formats with data that enables users to estimate total installed cost. **800/821-6710; www.ads-pipe.com.**

McLaren solid cushion backhoe tires

Nu-Air solid cushion front and rear backhoe tires from McLaren Industries feature deep tread lugs for solid grip on sand, rocks or mud. The zigzag tread pattern provides a smooth ride with less wear on asphalt, concrete and other hard surfaces. Flat-proof technology eliminates the need for tire protection. **800/836-0040; www.mclarenindustries.com.**

Franklin Electric high-head grinder pumps

The single- or three-phase FPS IGPH Series of high-head grinder pumps from Franklin Electric are designed for the demands of higher-head conditions found in low-pressure sewage transfer applications. Available in automatic or manual, the pumps are powered by a 2 hp, 3,450 rpm motor that delivers 414,000 cuts per minute and have two non-clogging impeller stages for pumping sewage slurries with a shut-off head of 200 feet. **800/701-7894; www.franklinengineered.com.**

KENCO concrete barrier lifter

The barrier lift from KENCO hooks with a sling and shackle to any type or model of machine with lifting capabilities. Handles on both sides allow personnel to safely guide the lifter into position. The lifter automatically grabs as it's lowered onto the wall and won't release until the wall has been firmly set into place. Pad angles swivel to match the slope of the wall to be lifted. Lifting capacities range from 1,500 to 40,000 pounds. Self-aligning guides are optional. **800/653-6069; www.kenco.com.**

casestudies

Distribution Equipment and Systems

By Craig Mandli

Energy-efficient system treats to NSF Standard 40

Problem: A homeowner building a new energy-efficient three-bedroom home in Riverton, Illinois, was looking for a low-maintenance, non-mechanical treatment solution that used little to no electricity. The homeowner wanted a treatment system that performed equally to proposed ATUs but matched the energy efficiency goal of the new home.

Solution: A gravity-fed **Eljen GSF Treatment System** was installed. The system is designed to passively treat wastewater to NSF Standard 40 requirements without using electricity or requiring costly maintenance programs. It was easily installed by Rick Maguire of Maguire Backhoe Co. of Virden, Illinois.

Result: The system gave the homeowner the affordable treatment and performance, without high energy costs. The system was installed in September 2014, and the owner moved into the energy-efficient home soon after. It has operated flawlessly since. 800/444-1359; **www.eljen.com**.

Gravity-dosing device saves existing system

Problem: In August 1992, Andover Elementary School in Connecticut had a serious problem with its septic system. The cast iron bell siphon rusted away. Rather than dosing, the chamber was passing effluent, only to have it trickle to the lowest lateral in one of two disposal fields. There was breakout, and it seemed a new system was in order.

Solution: Jim Richard of **Rissy Plastics** had recently invented a new non-siphon gravity-dosing device called the **Flout**. Richard was looking for a situation where the device could be tested and, with assistance from the state sanitarian, the Andover School was selected. Richard provided a 300-gallon precast concrete chamber and equipped it with a double-outlet Flout. The two outlets split the flow equally to the disposal fields.

Result: The chamber is inspected annually, and the Flout was working properly when visited in June 2015. Nearly 23 years later the fields show no evidence of breakout, and distribution was evident from the greener strips of grass above the laterals. No maintenance has been needed. The town saved a considerable sum of money by not resorting to disposal field or siphon replacement, or installation of complicated pumps and controls. 877/221-4426; **www.flout.net**.

If you would like your wastewater trade association added to this list, send contact information to editor@onsiteinstaller.com.

Serving the Industry

Visit your state and provincial trade associations

Alabama

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

Arizona

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

Arkansas

Arkansas Onsite Wastewater Association; www.arkowa.com

California

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

Colorado

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

Connecticut

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

Delaware

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

Florida

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

Georgia

Georgia Onsite Wastewater Association; www.onsitewastewater.org; 678/646-0379

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

Idaho

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

Illinois

Onsite Wastewater Professionals of Illinois; www.owpi.net

Indiana

Indiana Onsite Waste Water Professionals Association; www.iowpa.org; 317/889-2382

Iowa

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

Kansas

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

Kentucky

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

Maine

Maine Association of Site Evaluators; www.mainese.com

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

Maryland

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

Massachusetts

Massachusetts Association of Onsite Wastewater Professionals; www.maowp.org; 781/939-5710

Michigan

Michigan Onsite Wastewater Recycling Association; www.mowra.org

Michigan Septic Tank Association; www.msta.biz; 989/808-8648

Minnesota

Minnesota Onsite Wastewater Association; www.mowa-mn.com; 888/810-4178

Missouri

Missouri Smallflows Organization; www.mosmallflows.org; 417/739-4100

Nebraska

Nebraska On-site Waste Water Association; www.nowwa.org; 402/476-0162

New Hampshire

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

Granite State Designers and Installers Association; www.gsdia.org; 603/228-1231

New Mexico

Professional Onsite Wastewater Reuse Association of New Mexico; www.powranm.org; 505/989-7676

New York

Long Island Liquid Waste Association, Inc.; www.lilwa.org; 631/585-0448

North Carolina

North Carolina Septic Tank Association; www.ncsta.net; 336/416-3564

North Carolina Portable Toilet Group; www.ncportabletoiletgroup.org; 252/249-1097

North Carolina Pumper Group; www.ncpumpergroup.org; 252/249-1097

Ohio

Ohio Onsite Wastewater Association; www.ohioonsite.org; 866/843-4429

Oregon

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

Pennsylvania

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

Pennsylvania Onsite Wastewater Recycling Association;
www.powra.org

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

Tennessee

Tennessee Onsite Wastewater Association;
www.tnonsite.org

Texas

Texas On-Site Wastewater Association;
www.txowa.org; 888/398-7188

Virginia

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; 608/441-1436

Wisconsin Liquid Waste Carriers Association;
www.wlwca.com; 608/441-1436

NATIONAL

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

National Onsite Wastewater Recycling Association;
www.nowra.org; 800/966-2942

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

Canadian Regional

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

PL-250 6” Effluent Filter

POLYLOK™ Inc. BEST TECHNOLOGY ZABEL environmental technologies

The industry leader in effluent filter technology is pleased to introduce our latest effluent filter offering. The new PL-250 6” Effluent Filter is now available. This filter was designed using our more than 90 years of combined effluent filter experience. Our 6” filter offers greater surface area to handle more gallons per day while also extending the time between tank cleanings. The Pl-250 offers 250 linear feet of filtration. Like our other filters, installation is easy!

Polylok, Inc. is recognized as the industry leader in effluent filter technology. With our proven track record, you can’t go wrong. We offer three unique filter lines: Polylok, Zabel and Best. All of our filters are designed with functionality and longevity in mind. The PL-250 incorporates nearly a century of experience in its design.

FEATURES & BENEFITS

• Accepts 1” PVC handle • 250 linear feet of filtration • 6” diameter • Rated for 3,000 GPD
• 550 SQ.IN. of total surface area • “W” design prevents solids from settling • Can not be installed incorrectly


Polylok PL-68


Polylok PL-122


Polylok PL-525


Polylok PL-625


Zabel A1800


Zabel 8 Series A100/300/600


Zabel 12 Series A100/300/600


Best GF-10

1-800-701-3946 / www.polylok.com