October
2016

ONSITE installer™

PROMOTING WASTEWATER TREATMENT QUALITY AND PROFESSIONAL EXCELLENCE www.onsiteinstaller.com

EDITOR'S COLUMN

Help with safety compliance
PAGE 6

RETOOLED FOR SUCCESS

A new generation of owners at an established installing company streamlined and modernized their way to higher profits PAGE 12

HAVING A BLAST

A mixed-use development onsite project requires explosives PAGE 22

TUF-TITE®

For a Complete Catalog and Pricing
Call 1-800-382-7009

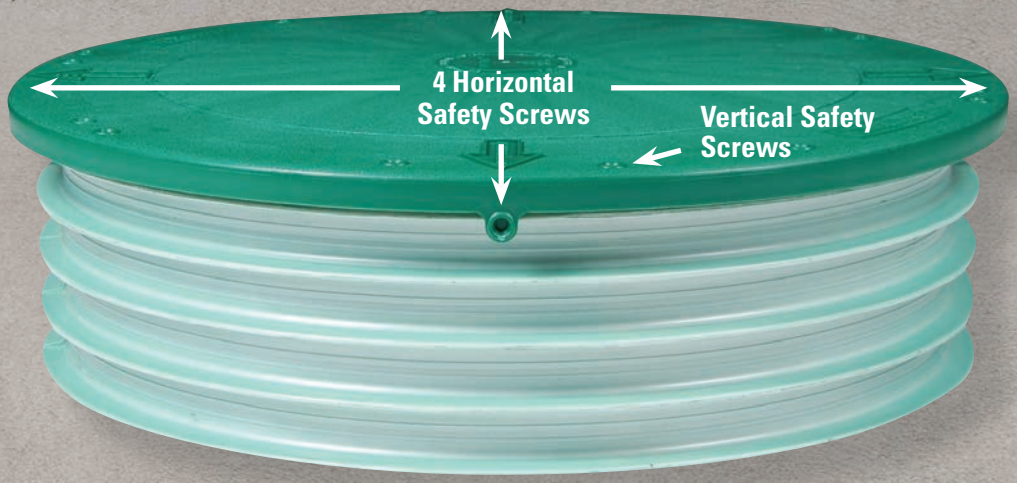
24" HEAVY DUTY MULTI-PURPOSE FLAT RISER LID

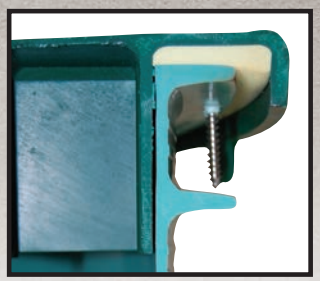
FREE FREIGHT on Full Cartons!

Fits most commercially available:

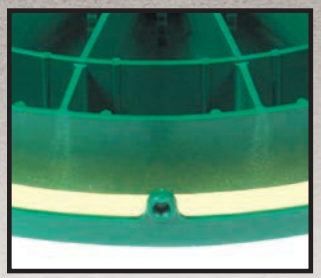
- Risers
- IPEX PVC Ribbed Pipe
- Corrugated Pipe

LID MAY BE USED WITH OR WITHOUT CONCRETE CENTER





Secured by 6 Vertical and 4 Horizontal Safety Screws. Screws Included.



Foamed-in Permanent Polyurethane Gasket.

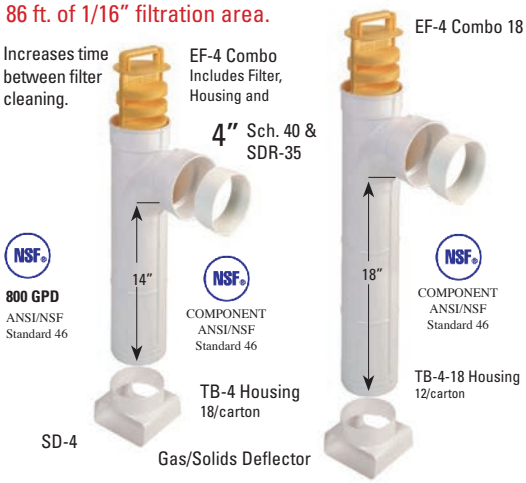
Holds up to 70 lbs of Concrete for Added Safety.

Water-**TITE**™ Joint

Vertical and Horizontal Safety Screws

4" Effluent Filter and 4" T-Baffle™

86 ft. of 1/16" filtration area.



4" Effluent Filter EF-4

One-piece effluent filter fits in 4" Sanitary Tee.

- Injection molded PolyPro
- Simple to install - Easy to clean

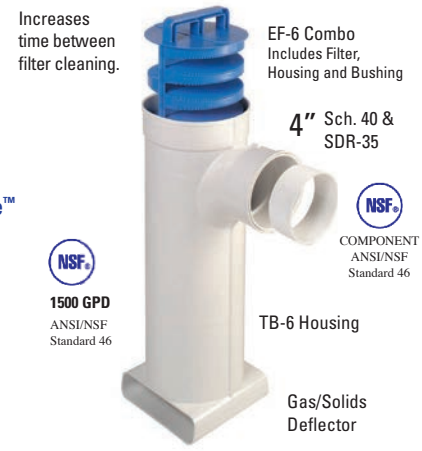
4" Sanitary Inlet/Outlet T-Baffle™

Injection molded T-Baffle™.

- Injection molded T-Baffle
- Fits 4" Sch. 40 and SDR-35 pipe
- Simple to install
- May also be used as Inlet & Outlet Tee

6" Effluent Filter and 6" T-Baffle™

244 ft. of 1/16" filtration area.



6" Effluent Filter EF-6

One-piece effluent filter fits in 6" T-Baffle™.

- Injection molded PolyPro
- Simple to install
- Easy to clean

6" Sanitary T-Baffle™

Injection molded T-Baffle™.

- Injection molded
- Fits 4" Sch. 40 and SDR-35 pipe
- Simple to install
- May also be used as Outlet Tee with Solids Deflector

TUF-TITE®

Tuf-Tite®, Inc. 1200 Flex Court, Lake Zurich, IL 60047

www.tuf-tite.com | 800-382-7009

"The cost is right, the efficiency is there, and the outcome is to our high standards."

"We switched from concrete and drainrock right away when the tanks and chambers were offered because it gave us the opportunity to control our install times and scheduling a lot better with more cost savings to everyone (us and the customer)."

– Brandon Thompson
Bay Shore Construction, Olympia WA · www.bayshoreconstructionoly.com

INFILTRATOR®
water technologies

800-221-4436 • www.infiltratorwater.com

contents

October 2016

COVER STORY

Coming Next Month: November 2016

ISSUE FOCUS: New Technology/Installation Tools

- **Basic Training:** Avoid the nightmare of frozen pipes
- **Contractor Profile:** Seeking onsite solutions in California

onsite installer

Published monthly by
COLEpublishing
1720 Maple Lake Dam Rd. • PO Box 220
Three Lakes, WI 54562

Call toll free 800-257-7222;
outside of U.S. or Canada call 715-546-3346
7:30 a.m.-5 p.m. Central time, Mon.-Fri.
Website: www.onsiteinstaller.com
Email: info@onsiteinstaller.com • Fax: 715-546-3786

SUBSCRIPTIONS
A one year (12 issue) subscription to *Onsite Installer*™ in the United States, Canada or Mexico are free to qualified subscribers. A qualified subscriber is any individual or company in the United States, Canada or Mexico that partakes in the installation, design, maintenance, manufacture, treatment, consulting or sale of onsite wastewater treatment systems or supplies. Non-qualified subscriptions are available at a cost of $60 per year in the United States and $120 per year outside of the United States. To subscribe please visit onsiteinstaller.com or send company name, mailing address, phone number and check or money order (U.S. funds payable to COLE Publishing Inc.) to the address above. MasterCard, VISA, Discover and American Express are also accepted. Supply credit card information with your subscription order.

Our subscriber list is occasionally made available to carefully selected companies whose products or services may be of interest to you. Your privacy is important to us. If you prefer not to be a part of these lists, please contact Nicole at nicole.labeau@colepublishing.com.

CLASSIFIED ADVERTISING
Submit classified ads online at www.onsiteinstaller.com/classifieds/place_ad. Minimum rate of $25 for 20 words; $1 per each additional word. All classified advertising must be paid in advance. DEADLINE: Classified ads must be received by the first of the month for insertion in the next month's edition. PHONE-IN ADS ARE NOT ACCEPTED. **Fax** to 715-546-3786 only if charging to MasterCard, VISA, Discover or AmEx. Include all credit card information and your phone number (with area code). **Mail** with check payable to COLE Publishing Inc. to the address above. CLASSIFIED ADVERTISING APPEARS NATIONWIDE AND ON THE INTERNET. Not responsible for errors beyond first insertion.

DISPLAY ADVERTISING
Contact Winnie May at 800-994-7990. Publisher reserves the right to reject advertising which in its opinion is misleading, unfair or incompatible with the character of the publication.


Winnie May

EDITORIAL CORRESPONDENCE
Send to Editor, *Onsite Installer,* P.O. Box 220, Three Lakes, WI, 54562 or email editor@onsiteinstaller.com.

REPRINTS AND BACK ISSUES
Visit www.onsiteinstaller.com for options and pricing. To order reprints, call Jeff Lane at 800-257-7222 (715-546-3346) or email jeff.lane@colepublishing.com. To order back issues, call Nicole at 800-257-7222 (715-546-3346) or email nicole.labeau@colepublishing.com.

CIRCULATION
Circulation averages 20,842 copies per month. This figure includes both U.S. and International distribution.

Get Social with *Onsite Installer*

www.facebook.com/OnsiteInstaller
www.twitter.com/OnsiteInstaller
www.plus.google.com
www.youtube.com/OnsiteInstaller
www.linkedin.com/company/onsite-installer-magazine

advertiserindex

OCTOBER 2016

Feedback
Onsite Installer™ welcomes your comments, ideas and suggestions on how we can serve you better. Call 800/257-7222; fax 715/546-3786; or email editor@onsiteinstaller.com.

No More Snapshots Showing Safety Violations, Please

Wastewater industry companies can take advantage of a free consulting program to protect workers and their bottom line

By Jim Kneiszel

In my position as editor of *Onsite Installer*, it's critical to be vigilant in looking out for how the work of our contractors is portrayed in published stories and photos. A group of COLE Publishing staffers examines each work photo before it's included in a layout. Safety is of utmost importance, and one of our duties is to make sure technicians are following best practices in our story/photo packages and especially the cover of the magazine every month.

We can't catch everything, but we try. And when we don't red-flag a photo showing a safety violation, I can assure you we hear about it from our eagle-eye readers.

I will tell you I'm surprised — and disappointed — to see occasional safety infractions in the dozens of work photos we receive for every project we feature. Among the most common issues we see are: a lack of appropriate shoring for workers positioned in the bottom of an excavation and failure to utilize common personal protection equipment, or PPE, including hard hats, reflective vests, safety glasses and gloves.

"These services are all free and designed to help small- and medium-sized companies that don't have the resources a lot of the bigger companies have. ... Employers want to do the right thing. This way they have the resources without the cost."
Doug Kalinowski

HOW LOW CAN YOU GO?

In one extreme case, the owner of a small pumping company was shown performing every part of his job — including holding the end of the hose at the septic tank opening — without wearing gloves or eye protection. I called him to ask why he wasn't wearing gloves and asked to set up a photo reshoot. To my surprise, he refused to wear PPE or meet again with the photographer.

"I never wear gloves while I'm working and I won't wear them for your photographer. That would be dishonest," he told me. The contractor insisted he's never gotten sick from contact with a dirty hose and so he doesn't believe he needs to wear gloves. "I take a lunch break and I don't wash my hands. And I go right back to work after eating a sandwich," he said defiantly.

Do you ever have a conversation so bizarre that you hang up the phone and wonder what just happened? That's how I felt after talking to this contractor (who shall remain nameless) about his views on safety. While this was a disturbing exchange, I could take comfort in only one thing: that he was a sole proprietor with no employees. He would be the only person suffering from his ignorance.

I believe this particular contractor is an outlier. The vast majority of people in our industry takes safety seriously and always want to follow best practices while working around pathogens or using heavy equipment. Many of you hold occasional safety meetings to review procedures with your crews. Also, many installers attend training where safety issues are emphasized — for instance, the many seminars at the Water & Wastewater Equipment Treatment & Transport Show every February.

HELP FOR SMALL BUSINESSES

Still, most of our installing companies would be considered small- or medium-sized businesses, and it can be a challenge to stay on top of every safety issue. Most of you don't have a safety trainer or employee dedicated to monitoring how your crews are complying with safety regulations in the field. That's where the On-Site Consultation Program coordinated through OSHA (the federal Occupational Safety and Health Administration) might help.

Available since 1975, the On-Site Consultation Program aims to provide proactive safety guidance to smaller businesses. The voluntary program provides about 30,000 safety evaluations for small companies across 50 states every year. A relatively small number — less then 500 between 2013 and 2015 — involve wastewater industry companies.

That doesn't mean installers and pumpers wouldn't benefit from a safety evaluation.

"These services are all free and designed to help small- and medium-sized companies that don't have the resources a lot of the bigger companies have," says Doug Kalinowski, director of OSHA's Directorate of Cooperative and State Programs. The U.S. Congress earmarks $57 million for the program annually, matched with 10 percent funding from the states, to help small businesses.

"Employers want to do the right thing. This way they have the resources without the cost," Kalinowski says.

On-site consultations are typically up to a day long with the requesting company setting the areas to be covered and the goals for the visit. It starts with an opening conference, follows with a workplace walk-through and — in the case of an installing company — visits to work sites if requested by the company. A closing conference reviews the findings of the consultant and a written report follows.

The consultations are performed by state or university employees and are not part of OSHA's enforcement program. The findings are kept confidential and not shared with OSHA unless they are released by the business that initiated the consultation. Kalinowski is well aware that many business owners are wary of encounters with the federal agency, so he assures this program is not used to target enforcement efforts.

"The message is that they have nothing to fear with enforcement if they ask for a consultation," Kalinowski says.

MANY BENEFITS

In almost all cases, Kalinowski says the business owner and consultant work together to correct safety issues without incident and that employees are better protected because of it. He says on average the consultants find four to five safety violations and the range is typically two to 20 violations. Most are common-sense situations — like the pumper failing to wear gloves. Only a few extreme cases are referred to OSHA when a company doesn't address a dangerous situation or a worker faces imminent harm.

According to OSHA, small businesses benefit from the On-Site Consultation Program by:

- Lowering injury and illness rates
- Decreasing workers' compensation costs
- Reducing lost workdays
- Limiting equipment damage and product losses

"If somebody breaks their arm, workers' compensation and medical costs can be significant. If your profit margin is 3 percent, think of how much money the employer has to earn to make up that cost," Kalinowski says. "If you get rid of the hazards, people don't get hurt, and that's more important than anything."

Kalinowski says a goal is to encourage small-business owners and crew leaders to be on the lookout for safety violations and stop them.

"A consultant can help management learn to identify the hazards themselves. The ultimate goal is for employers to become self-sufficient and identify and deal with hazards themselves," he says.

ONE SAFETY TOOL

The On-Site Consulting Program seems like another tool you can use to protect your crews and the business you've worked so hard to build.

For many installers, workers are like family and you want to do anything you can to ensure they go home safe and happy at the end of the day. And as for your business, remaining profitable is a constant challenge. You don't want to let workplace injuries and medical costs threaten a healthy bottom line.

And as for me, I would like to see fewer and fewer photos showing unsafe practices on the job site. I'm for any safety training that will improve the overall safety picture for the wastewater industry.

>> Installers interested in a free safety evaluation from the On-Site Consultation Program in each state can find more information by calling 800/321-6742, or going to www.osha.gov/consultation.

Beware of Wide Beds in Mound Systems

To the editor:

I have noticed in a number of recent articles that the onsite sewage treatment industry is moving toward very wide beds in mounds and other wide systems with a series of beds. I am concerned that this is a very dangerous trend and I predict hydraulic failure of these wide mounds when flows are near or at design values.

Mounds designed for single-family residences have been used successfully for years when the rock layer width does not exceed 10 feet. For a mound to work properly it is important that effluent is distributed through the clean sand layer to the underlying soil. As the effluent moves downward through the rock layer and into the clean sand layer, it flows sideways into the lesser permeable soil underneath the mound.

If the rock layer width is increased, a greater width of the lesser permeable soil must be available under the mound for the mound to operate successfully, because flow per lineal foot of bed is more concentrated. This creates a situation where anaerobic conditions occur at the sand-soil interface, restricting flow and resulting in further restricted flow through the less permeable material. These conditions can then result in effluent mounding in the sand layer underneath the rock bed, ultimately causing hydraulic failure. The wide mound will fail to accept the design effluent flow and hydraulic failure will take place.

The University of Wisconsin Small-Scale Waste Management Project discovered the flow problems into the underlying soils of wide mounds in an experimental mound installed at Westboro, Wisconsin, many years ago. The failure of that wide mound and the results of that study were published as a technical paper by the American Society of Agricultural Engineers.

The designers of every very wide mound should be accurately evaluating the fluid flow pattern in the soil layers under the mound. That evaluation must use the permeability of the various underlying soil layers to determine the liquid flow pattern.

A mass failure of the wide mounds or beds now being installed will be extremely harmful to the future of the onsite sewage treatment industry. The advocates of the "big pipe" approach will certainly welcome the news of any such failures and use that information when new onsite collector systems are proposed.

Roger E. Machmeier, Ph.D.
Professor Emeritus, University of Minnesota

VORACIOUS

With its unique patented V-Slice® cutter technology, the Omnivore® literally devastates anything unfortunate enough to enter into its vicious vortex.

Omnivore® Grinders

Liberty Pumps®

800-543-2550

www.libertypumps.com

U.S. Patent No. 7159806

@onsiteinstaller.com

Visit the site daily for new, exclusive content. Read our blogs, find resources and get the most out of *Onsite Installer* magazine.

ROI ANALYSIS

Before You Buy

The right tools and equipment can be a game-changer for job efficiency. But to really make the right call for your business, you need to know whether it makes sense to rent or buy all that equipment. Calculating your return on investment can be tricky, but here are some questions to ask yourself when figuring it out. **onsiteinstaller.com/featured**

A HELPING HAND

Giving Back

This month's cover star, George Sam, enjoys using his expertise to work with an organization that provides critical home repairs for veterans and low-income homeowners. Check out this exclusive online story that details three tricky projects he took on while volunteering with Rebuilding Together Litchfield County. **onsiteinstaller.com/featured**

Overheard Online

"If you're not honest in the appraisal you give — if you pull your punches in order to avoid confrontation — you're essentially just wasting everyone's time."

- 4 Ways to Get the Most Out of Employee Reviews
onsiteinstaller.com/featured

DIGITAL TRANSITION

Cut the Paperwork

Pumpers deal with a lot of paperwork, from inspection reports to service agreements. To save time and space – and protect your sanity – you may want to go 100 percent digital. That may sound like a daunting transition but these tips will help you through it. **onsiteinstaller.com/featured**

EMAILS AND ALERTS

Visit OnsiteInstaller.com and sign up for newsletters and alerts. You'll get exclusive content delivered right to your inbox, and you'll stay in the loop on topics important to you!

CONNECT WITH US

Find us on Facebook at facebook.com/OnsiteInstaller
or Twitter at twitter.com/OnsiteInstaller

FIRST SUPPLY®

HVAC | BUILDER | PLUMBING | WATERWORKS | INDUSTRIAL PVF | PUMP/WELL & SEPTIC

Simple • High-Performance • Wastewater System

Eljen GSF … Your Affordable Treatment Solution For Today's Wastewater Challenges!

- Product Performance Compliant with NSF/ANSI Standard 40 Protocol.
- Dual filtration process provides the performance you require.
- Non-mechanical design means little to no maintenance.
- The most treatment area per foot in the industry.




NEW Product Line to the First Supply Offerings.

eljen CORPORATION

Innovative Environmental Products and Solutions Since 1970

27 Upper Midwest Locations

APPLETON (920) 739-3136
BRAINERD (218) 829-6910
BROOKFIELD (262) 783-0500
CEDAR RAPIDS (319) 294-5332
DELAVAN (262) 740-9151
DUBUQUE (563) 582-1895
EAU CLAIRE (715) 832-6638
FREEPORT (815) 232-6000
GREEN BAY (920) 337-9004
JANESVILLE (608) 314-1079
KENOSHA (262) 657-3131
LA CROSSE (608) 784-3839
MADISON (608) 222-7799
OAK CREEK (414) 764-6900
OSHKOSH (920) 231-3860
OWATONNA (507) 455-2148
PLATTEVILLE (608) 348-4005
PLOVER (715) 254-0371
RACINE (262) 633-8289
RHINELANDER (715) 362-7824
ROCHESTER (507) 287-0202
ROCKFORD (815) 654-5381
SHEBOYGAN (920) 457-3646
TOMAH (608) 372-3778
TWIN CITIES (651) 636-1240
WEST BEND (262) 365-0430
WINONA (507) 452-5402

www.1supply.com

The New Milford Septic crew includes, from left, George Sam, Adam Barchie, Roberto Alvarez, Cameron Cunningham, Tyler Fairchild, Chris Sam and Benny Smith. They are shown with a Peterbilt vacuum truck from Presvac Systems.

RETOOLED FOR SUCCESS

A new generation of owners at an established installing company streamlined and modernized their way to higher profits

By Scottie Dayton | Photos by Steven Frischling

Striving to achieve simplicity governs George Sam's life. As a police officer in New Milford, Connecticut, Sam's ability to reduce complicated situations to their lowest common denominators often defused volatile situations. Later, after he left law enforcement for the onsite industry, it helped him eliminate unnecessary complexities and overcome his greatest professional challenges.

In the mid-1990s, as his father-in-law slowly retired from his company, New Milford Septic Services, Sam and his wife, Heather, progressively assumed more responsibilities. They took over in 2000.

"The business model hadn't changed since my wife's grandfather opened the doors in 1940," says Sam. "We still had 12 employees comprising five septic pumping crews and two full-time installation crews from when work peaked in the 1980s."

To compensate for intense competition shrinking their customer base, Sam streamlined the company until he found its perfect operating size. It took five years. When the economy collapsed in 2008, New Milford Septic rolled on, unaffected and prosperous.

UPDATING THE BUSINESS

Sam's four-phase reconstruction plan involved modernizing the fleet, evaluating how they did business, building a new shop, and updating recordkeeping methods.

New Milford Septic Services
New Milford, Connecticut

OWNERS:	George and Heather Sam
YEARS IN BUSINESS:	76
EMPLOYEES:	5 to 9 (seasonal)
SERVICES:	Septic system design, installation, repair, inspections, soil testing and troubleshooting, pumping
TERRITORY:	Litchfield and Fairfield Counties
ASSOCIATION:	National Association of Wastewater Technicians
WEBSITE:	www.newmilfordseptic.com

"When I climb on a machine, it should run," says Sam, 46. "Keeping equipment until the last bolt falls out is counterproductive." He sold all the old heavy equipment except the Caterpillar 311 CU excavator, then purchased a Caterpillar 307 CU mini-excavator, Kubota KX161 and U-25 compact excavators, a Bobcat T-630 compact track loader, and a Komatsu WA-200 wheel loader.

Appraising how the business functioned changed its course 180 degrees. "At our height, we installed or repaired 250 stone trench systems with 4-inch perforated pipes per year, and bid on large installation projects that took two to three weeks to complete," says Sam. "By 2000, 25 contractors in our 25-square-mile service radius had made being a professional estimator impractical."

Instead, brother Chris, age 48, and Roberto Alvarez concentrated on little repair jobs previously rejected by the company. They replaced baffles, risers, tank lids, sewage pumps, piping and distribution boxes. "By close of our first year, revenue had increased dramatically," says Sam.

Today, their profit margin holds at 30 to 40 percent, with 75 percent of the work residential and 25 percent commercial. Pumping 2 to 3 million gallons per year generates 60 percent of revenue, and installing or repairing onsite systems produces the rest. Septage is off-loaded at four local municipal wastewater treatment plants.

INVENTORY CONTROL

To make repair items readily available, the brothers bought 2 1/2 acres in 2006 and built a 3,500-square-foot shop with office, two service bays and a storage yard. They purchased sewage pumps from Liberty Pumps, Tuf-Tite baffles, and Polylok Inc./ Zabel effluent filters from HD Supply.

"I also saw the housing market heating up and knew earth products would soon sell at premium prices," says Sam. "A storage yard allowed me to buy cover fill, topsoil and septic sand in bulk. Now we load the trucks with what we need and go."

Digitizing recordkeeping became everyone's task, not just the responsibility of part-time office manager Lorie McMullin and marketing director/office assistant Heather Detrick. "We tested various bookkeeping applications, but they were too complicated," says Sam. "We settled on QuickBooks (Intuit), QuickBooks Customer Manager and Google Calendar. They are simple to use and easily tailored to our needs."

"Soil identification remains the biggest reason our systems work better. We know where to put the drainfields."

George Sam

Recordkeeping is based on property addresses, and Sam wants a digital profile for each one. To that end, customer tickets have a place for drawing a map of every point technicians may need to reference in the future. Then the ticket is scanned and saved.

Part of modernizing the company involved streamlining the payroll. It

The New Milford Septic crew overcomes obstacles in terrain to move sand for a new installation. Using a Kubota mini-excavator, Chris Sam passes a load of sand to a Bobcat operated by George Sam.

Cameron Cunningham and Adam Barchie, of New Milford Septic, measure a bed of select fill septic sand that will be the base to support an Eljen Corp. Mantis system on a lakefront property. One of the Eljen units is shown resting atop a Roth Industries septic tank used for this installation.

'I DIDN'T THINK I'D COME HOME'

Replacing a corroded 500-gallon metal septic tank at the bottom of a 70-degree slope abutting Candlewood Lake was the ultimate challenge for George Sam of New Milford Septic Services. "No one wanted the job because it was dangerous," he says. "However, the homeowner pleaded and I finally agreed."

The 8-foot-wide access road was almost too narrow for the Peterbilt vacuum truck. The road also dipped and turned, making it impossible for drivers to see what was coming over the crests. To avoid an accident, a worker walked ahead of the truck as a guide.

Tyler Fairchild grasped trees and vegetation to maintain his balance as he and the hoses careened down the slope. Ascending was a hand-over-hand battle against gravity.

Sam hired a tow truck to lower his new Kubota U-25 excavator to the shore. "We hitched the boom winch cable to the machine, then I rode it down with my heart in my throat." After removing the existing tank, the crew installed a 1,000-gallon polyethylene septic tank (Roth Industries), plumbed it, and backfilled.

Walking the excavator up the grade with the tank remains chained behind was the most terrifying. "At the crest, the terrain switched from soft earth to hard asphalt," says Sam. "If the sharp change snapped the cable, everything would go back down with no way to recover. That was the day I didn't think I'd come home."

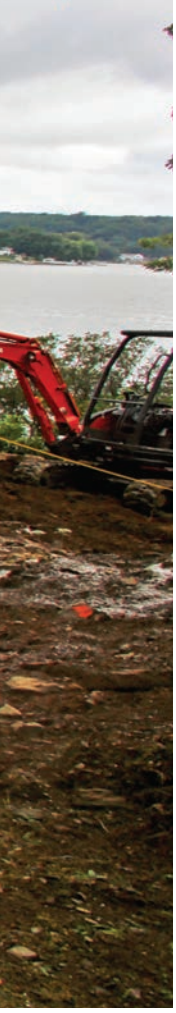
evolved to two pumping crews, one installation crew, and one service and inspection crew.

Tyler Fairchild and Benny Smith comprise the main septic service crew. They drive a 2008 Peterbilt 340 vacuum truck with 3,250-gallon Presvac Systems steel tank and Challenger 367 (National Vacuum Equipment). Tom Nelson operates the 2006 Freightliner M2-106 vacuum truck with 2,600-gallon Imperial Industries steel tank and Jurop/Chandler PN84 pump. Nelson collects overflows from the main truck, handles emergency pumpouts, cleans decommissioned septic tanks, and often works on the installation crew manned by the brothers and Alvarez. Chris Sam and Alvarez also double as the service and inspection crew.

COMPREHENSIVE INSPECTION

The company has mapped out a 20-point system inspection during pumpouts. It also locates old concrete septic tanks with structural deficiencies. "We replace 25 such tanks per year and install 50 systems," says George Sam. "Because the state Department of Public Health doesn't allow advanced treatment units, we're restricted to stone and pipe trenches, leaching chambers and proprietary leaching products."

System inspections always include a visual examination of the tank baffles, sidewalls and lid. If applicable, technicians lower an iPhone on a selfie stick and video the interior. They survey the yard for blowouts, soft or wet spots, green grass, and anomalies such as trees planted near systems or structures built over tanks. They also record if driveways are sloped or flat, if they are accessible by truck in the winter, and how many lengths of hose are needed to reach the tank. Inspection forms are digitized and become part of the customer's record.



The region's low mountains and small lots often necessitate installing replacement drainfields in the original's footprint. When the state approved preassembled leaching products such as the Mantis system (Eljen Corp.) and S-Box (Geomatrix Systems), the brothers saw another opportunity to advance their professionalism. They turned to Spencer Myles, a soil scientist at Arthur H. Howland & Associates, for help.

"Myles taught us about soil methodology, microbiology, long-term acceptance rates, and how to marry replacement systems to the soil," says Sam. "Soil identification remains the biggest reason our systems work better. We know where to put the drainfields. We also excavate contaminated absorption beds, then build up the proper vertical separation with septic sand."

TOUGH CHALLENGE

Sam educates people — especially those looking at only price points — about the varying levels of quality in a service industry. "Education ensures the best outcome for both sides," he says. "We build customer confidence through the care we give them and their systems. In return, repeat customers drive our business."

Earning trust is seldom easy and often involves unique projects such as replacing a failed system on Candlewood Lake. A power company owns the hydro reservoir and all the shoreline up to the 440-foot elevation line. As the topographical line follows the lake, it undulates through roads and people's property.

"Education ensures the best outcome for both sides. We build customer confidence through the care we give them and their systems. In return, repeat customers drive our business."

George Sam

"The customer owned lots 8 and 10, separated by 300 feet of projecting shoreland," says Sam. "His house, built on a ledge, had no replacement area. Lot 10 did."

Sam obtained an easement to run a force main across the shoreland. The 900 gpd system he designed included:

- 1,000-gallon polyethylene septic tank with 500-gallon pump chamber (Roth Global Plastics)
- Two alternating 1/2 hp Liberty sewage pumps
- 18 Recharger 280 chambers (CULTEC Inc.)
- Duplex control panel (SJE-Rhombus)

The original septic tank alongside the house was 12 inches from the property line. "This job was variance heaven," says Sam. "Forget about setbacks."

The 5-foot-deep trench across the shoreland was below the frost line and water table. As the crew dug, the trench filled immediately with water, restricting progress to feet at a time.

WORKING CAREFULLY

Chris Sam and Alvarez glued two 40-foot sticks of 4-inch SDR 35 sewer pipe together as George Sam excavated with the KX161. They tied a rope to

LEFT: Cameron Cunningham, left, and Roberto Alvarez, of New Milford Septic, work on a bed of select fill that will hold a row of 10 Eljen Corp. Mantis units.

BELOW: The New Milford Septic fleet includes, from left, 2001 Peterbilt dump truck with a Beau-Roc body, a 2008 Peterbilt 340 with 3,250-gallon Presvac Systems steel tank and Challenger 367 pump, 2006 Chevy 5500 six-wheel dump truck with 5-cubic-yard Beau-Roc box, 1999 Sterling LT 9500 tri-axle dump truck with 18-cubic-yard Beau-Roc box, and a 2006 Freightliner M2-106 with 2,600-gallon Imperial Industries steel tank and Jurop/Chandler pump.

a bolt in the lead pipe and the other end to the excavator bucket, pulled in the sleeve, and backfilled immediately to prevent a cave-in. They repeated the process until reaching their destination. The vacuum truck sucked the water from the sleeve.

"We couldn't risk anything breaking on the power company's property," says George Sam. "That's why we sleeved the 2-inch force main tubing. The 300-foot-long coil fought us every inch of the way."

Then the crew constructed a 10-foot-wide gravel road 100 feet up a 15 percent grade to the drainfield. They cut 5 feet from the high side of the hill and filled 3 feet on the low side to create a flat road. The 1999 Sterling LT 9500 tri-axle dump truck with 18-cubic-yard Beau-Roc box stockpiled materials, and the 2006 Chevy 5500 six-wheel dump truck with 5-cubic-yard Beau-Roc box moved them up the hill as needed. The company also runs a 2001 Peterbilt dump truck with a Beau-Roc body.

Sam scooped out the 80- by 109-foot-wide drainfield at the end of the road, then used the bucket to position materials. "We bedded with 2 inches of crushed stone, then lay two 75-foot-long rows of chambers on 5-foot centers," he says. "It took 50 cubic yards of septic sand and 100 cubic yards of clean cover fill to blend the drainfield into the hill." Before leaving, they restored all properties to their original condition.

WHERE CREDIT IS DUE

Sam gives the credit to New Milford Septic employees for successful completion of tough jobs. He says he gives them autonomy to handle the work at hand, and hopes some day they will purchase the company from him.

"I credit them for where we are today," he says. "The work is hard and unglamorous, yet they pull together with a will to overcome all obstacles. They never stop trying to do their best." ◻

featured products

CULTEC, Inc.
800/428-5832
www.cultec.com

Eljen Corporation
800/444-1359
www.eljen.com
(See ad page 25)

Geomatrix Systems, LLC
860/510-0730
www.geomatrixsystems.com

HD Supply Waterworks, Ltd.
www.hdswaterworks.com

Imperial Industries, Inc.
800/558-2945
www.imperialind.com

Jurop/Chandler
800/342-0887
www.chandlerequipment.com

Liberty Pumps
800/543-2550
www.libertypumps.com
(See ad page 9)

National Vacuum Equipment, Inc.
800/253-5500
www.natvac.com

Polylok, Inc. / Zabel
877/765-9565
(See ad page 44)

Presvac Systems
800/387-7763
www.presvac.com

Roth Global Plastics
866/943-7256
www.rothmultitank.com

SJE-Rhombus
888/342-5753
www.sjerhombus.com
(See ad page 39)

Tuf-Tite, Inc.
800/382-7009
www.tuf-tite.com
(See ad page 2)

Utilizing the Section 179 Deduction

Now that a strong federal tax benefit for equipment purchases is permanent, it's time to think more strategically about keeping up with your machinery needs

By Erik Gunn

There's some good news on the tax front for small companies that spend big bucks on equipment.

After more than a decade of year-to-year uncertainty, an important federal tax deduction on equipment purchases has been made permanent — part of the big federal tax and spending measure that Congress passed and the president signed late in 2015. The deduction is found in Section 179 of the U.S. tax code, and it lets small businesses take an immediate federal tax deduction on the price of certain kinds of new equipment in the year it's purchased.

YEARLY CLIFFHANGER

Back in the 20th century, Section 179 was a pretty small deal — you could only take it for equipment costing less than $25,000, and you could only take the full deduction for a total of $125,000 worth of equipment purchases in a year.

In the economic slump that followed the 9/11 attacks, Congress gave Section 179 a temporary big boost, setting the cap at $500,000 for individual pieces of equipment that can be expensed in the year it's placed in service. Congress also raised the cap for all equipment purchases in a year that would qualify for the full deduction to $2 million. In the 15 years since then, the higher limits have been renewed every time they were about to expire. That's been an annual ritual for several years now.

The latest spending plan ends that annual ritual by making those higher limits permanent (or at least as permanent as anything gets in Washington). No more late-December cliffhangers about the future of Section 179.

"This is something truly directed at small businesses," says Patricia Hintz, who practices tax law at the Milwaukee law firm of Quarles & Brady.

Here's how it works in practice:

Suppose in 2015 you bought a new specialized truck or machine for $100,000. Traditionally, a purchase like that has to be depreciated over a fixed period of time. That means you can't deduct the full cost the year you buy the vehicle — instead, you deduct a portion of the cost over several years, using a formula that also reflects its depreciating value.

FINANCIAL FLEXIBILITY

(Depending on a lot of factors, you might even want to stick with that approach. That's way beyond the scope of this column, though — and what we say here is no substitute for what your professional legal and financial advisers who know the details of your business circumstances can tell you.)

Section 179 allows you to take the full deduction in year one for that $100,000 piece of equipment. By the way, you can take it no matter whether you're paying in full when you buy equipment, or whether you finance the purchase so you're paying for it over several years. On the tax forms, the Section 179 deduction, if you take it, is for the full $100,000.

"What is the return on investment and payback period of the asset to be purchased? ... There may be a startup period where the machine is slowly eased into service over a period of months. As more clients discover your new equipment is available, the more the equipment will earn its keep."

Randall Turner

That $100,000 comes off the total taxable income of your business — or your own taxable income if your business, like most smaller firms, is organized as an S corporation of a limited liability corporation, with the income passing straight through to the owner.

"It takes your income down dollar for dollar," Hintz says. "The actual effect to your taxes depends on what bracket you're in."

To someone for whom the marginal tax bracket is 30 percent, "an additional $100,000 deduction will reduce your tax bill by $30,000," she explains.

LIMITS AND COMPLICATIONS

If you spend more than $2 million a year on equipment that qualifies for the Section 179 treatment, the tax break starts to phase out.

And the provision only applies to equipment; other kinds of expenses — such as real estate — don't qualify for the immediate deduction it offers.

There are some other wrinkles. First, you don't have to take the Section 179 deduction for the entire cost; if it's to your financial advantage to take only part of it and depreciate the rest of the cost over the next several years, you have that choice. Second, you *can't* benefit from the full deduction if

your business reports a net loss for the year — or would if the full deduction was counted. But you can carry forward the deduction to future years so long as you claim it to start with.

But complexities like those are yet another reason you must work with your professional adviser before making any decision of this sort. (And if you're losing money or close to it, you have problems a whole lot bigger than how to best deduct the cost of a new truck on your taxes!)

STRATEGIC THINKING

With or without Section 179, there's another important lesson: Having the robust benefit can unquestionably provide a great help to your bottom line. But it's *never the reason* to make that purchase. You really need to take stock of what the purchase is going to be worth to your business, says Randall Turner, a financial consultant based in Bradford, Pennsylvania, with extensive experience in equipment-heavy industries.

Business owners will — and should — weigh several factors before buying a large asset, Turner explains: what they need vs. what they want, whether to buy new or used, how much they can afford, how they'll pay for it and whether it's the best use of their money.

But then there's "the most unexplored question that really should be the first question," he adds: "What is the return on investment and payback period of the asset to be purchased?"

That requires carefully considering what the real revenue of the new machinery will be — and what it really costs to run it.

"There may be a startup period where the machine is slowly eased into service over a period of months," Turner says. "As more clients discover your new equipment is available, the more the equipment will earn its keep." Or on the flip side, the equipment might go into use at a time of rapidly expanding demand and get put to use overtime right away — only to suddenly go unused after the initial burst of excitement, once pent-up demand is exhausted.

So consider the full cost over time — payments, fuel and maintenance, and labor to operate the machine in your ROI calculation.

"Then the simple test is to compare the expected ROI with how much return you'd expect to get in an alternative investment with similar risk," Turner says. You need to consider the cash-flow payback over time to see when you start breaking even.

Subtracting costs from the annual revenue, then multiplying by 100, will give you an ROI as a percentage. And you'll need to chart that year to year to determine when you'll break even and start profiting from the machine.

CHANGING TIMES

The world is changing too fast to simply assume a perpetual status quo, Turner points out. "Everyone thinks the world's going to stay like it is," says Turner. "How stable is your market?"

He's seeing banks close their fists now — "looking for excuses not to loan money." That means any purchase should be accompanied by a solid financial prospectus for the acquisition.

And for that reason, even just relying on a standard replacement cycle isn't necessarily the right move. Instead of planning a replacement cycle of five or seven years, "I would look at it every year because every year your environment changes," Turner says.

So where does that leave you? The bottom line is you now have a reliable, robust tax break to count on when buying new equipment. But more than ever, changing circumstances will require you to undertake a careful analysis of equipment needs and your ability to support the purchase for the long term.

And that will be worth a lot more than any tax break, no matter how generous. ☐

Dwindling Dump Sites Are Troubling in New Hampshire

Pumpers and installers in the Granite State worry as growth in housing stock outstrips wastewater capacity at municipal treatment plants

By Doug Day

The issues haven't changed much since the New Hampshire Association of Septage Haulers (NHASH) was formed in 1981: disposal options, fees, and the rules that regulate the onsite wastewater industry. Industry concerns about those topics prompted the state Department of Environmental Services (DES) to help pumpers form a group to influence the things that matter to them.

"That's the kind of cooperative spirit we've had right along," says Bill Gosse, former NHASH vice president and currently a member of the legislative liaison committee. "It's pretty good to be part of that." The group has about 45 members, mainly pumpers and portable restroom operators, with many also installing onsite systems.

NHASH started because of the state?

Gosse: Some of the pumpers apparently went to Dick Flanders of DES saying what the state was doing wasn't right. He was the catalyst to contact pumpers and get the association started to work on the issues they brought up. Dick has long since retired but is well remembered by all of us.

A lot of our members are also members of Granite State Designers and Installers (featured in June 2014). That affiliation has helped us because there is strength in numbers; we communicate constantly. We also work with the North-East Biosolids and Residuals Association (NEBRA). It's just one big alliance.

"The volume of septage is growing, but our disposal options are not. ... We don't have any new wastewater treatment plants being built, yet we have new homes being built so there's always more septage."
Bill Gosse

Are there any hot issues right now?

Gosse: It's fairly quiet, and I credit that to the groundwork we've laid. If you don't do anything else, get to know your legislators and regulators. Our ability to make a phone call and go meet with those people has been crucial. We have a lot of access to regulators and work with them on pretty much a daily basis. The Legislature has also been very supportive.

We do have one issue coming up. There's going to be a study of land application and generally when you have a study like that, someone is looking at some type of regulation, so we're a little concerned about that.

About eight years ago, we were able to convince DES to form a task force for the purpose of studying septage. At the time, septage was tied directly to the sludge industry so we fell under their rules, which were very stringent and didn't apply to us. As a result, the rules were rewritten and we got our own set of rules that are very specific to our industry.

Is disposal an important issue in New Hampshire?

Gosse: It is our biggest concern. The volume of septage is growing, but our disposal options are not. We've gone from 78 million gallons in 2009 to 97 million last year. Land application accounts for 7 million gallons. We don't have any new wastewater treatment plants being built, yet we have new homes being built so there's always more septage.

In some cases, pumpers are driving 40 miles to a disposal site. As part of the task force eight years ago, we got legislation for a septage coordinator at the state level. The primary job of that individual, Ray Gordon, is to be the liaison between treatment plants and the haulers. He does an excellent job and has had some success in getting plants to accept more septage.

We still have plants that accept no septage at all. There is a law on the books that each town and city must provide a septage disposal site. It's a fairly weak law that says they have to provide access to a facility; it does not have to be local. There's one plant that has 21 towns and cities signed up and, until a few years ago, only accepted 5,000 gallons a day. But that met the letter of the law. We keep trying to get it changed but there's been some resistance.

Also, of the 97 million gallons, 21 million goes out of state. So if an out-of-state plant decides they're not going to accept New Hampshire waste anymore, we'll have a problem.

What's another initiative you're working on?

Gosse: A piece of legislation is spring highway weight limits that are needed to prevent damage to roads during the thawing process. We have not been an exempt industry like the fuel oil industry, dairy and agriculture. We're trying to get our legislative group to understand that we're dealing with a health issue.

In most cases, roads are posted for a 5-ton gross weight limit for four to six weeks in spring. Our trucks weigh well over that, so we can't take our

trucks out to pump a tank that needs it. Obviously, you have to use common sense. You don't go out with a full truck and pick up another 1,000 gallons. You run with the lightest truck you can and go out early in the morning when the ground is hard. We're really trying to deal with emergencies, not day-to-day activities.

In my area of central New Hampshire, the road agents are very good about it. If you call them and explain the situation, more often than not they'll give you permission. But that can be a hassle, especially on weekends. We've already testified at one hearing and the committee understood our issue and seemed favorable.

Beyond regulatory and legislative work, what does NHASH offer members?

Gosse: We sponsor a fair amount of training. When we do, we invite non-members to join us because we want them educated so they're not making mistakes that reflect badly on all of us. It's also an attempt to get them to join us.

We do two or three educational sessions a year on topics as they come up, and invite the employees of our members. At one of our meetings, an insurance company affiliate member mentioned that septic tank covers are getting pretty heavy. So they brought in some of their loss-prevention people to talk about how to properly lift them and what kinds of weights you should be picking up.

We've done confined-space entry training. We've worked with the New Hampshire Department of Safety on truck and highway issues; every year or two we'll have a couple of state troopers come in and talk about new regulations and what they're looking for when they stop our trucks. That's a pretty informative evening.

We had a session on promoting our businesses on social media. Most of us are older and not really in tune with social media. And we did a session on how to value your business if you're going to sell it.

Our scholarship program is available to anybody who is related to a member of the association or in environmental studies. For the public, we offer town meetings to talk about how to take care of a septic system.

Do you do any continuing education?

Gosse: There's no requirement for licensing or continuing education in New Hampshire. We have brought it up in the past and the state has brought it up. But at this point, if you have your pump truck inspected by DES, you're in the pumping industry. I think licensing and continuing education is a good idea, but it's probably going to be a long way down the road.

Reach Bill Gosse at bill@gosseseptic.com or 603/269-3441.

Having a Blast

A mixed-use development in a Wisconsin tourist region requires explosives to install an onsite system ready-built for many different purposes

By David Steinkraus

A business project in northeastern Wisconsin required a wastewater system to suit not only immediate needs, but for potential uses the owner was not sure would come to pass. Combine that with difficult local geology, and there were many uncertainties. Four companies teamed up to meet the challenge.

Jandu Petroleum intended to establish a new business along a main road carrying tourists from Chicago, Milwaukee and elsewhere to Wisconsin's Door County recreation area. The site's location between two small communities is a natural for a convenience store providing gasoline, snacks and other goods to travelers.

In addition to the gas station and convenience store on the 28-acre site, the building included an empty 1,000-square-foot space that was just the size for a fast food restaurant, or perhaps for a retail store. There could be a car wash, too, or not. In addition, the site has sufficient space for a second building for a future undetermined business that might also be connected to the wastewater system serving the primary building.

"When we designed the system, we assumed the maximum possible load. If that 1,000 square feet eventually becomes a retail store and not a restaurant, it will mean we greatly overestimated the daily flow into the system," says engineer Pete Hurth, of Baudhuin Inc. in nearby Sturgeon

SYSTEM PROFILE

Location:	Egg Harbor, Wisconsin
Facility served:	Jandu Petroleum
Designer:	Pete Hurth, Baudhuin Inc., Sturgeon Bay, Wisconsin
Installer:	Petersen Onsite, Fredonia, Wisconsin; Soil Specialists, Sturgeon Bay; Eagle Mechanical, Sturgeon Bay
Type of system:	Bio-Microbics FAST system, EZflow drainfield
Site conditions:	Primarily loam, but only a few inches to bedrock in most places
Hydraulic capacity:	3,000 gpd

<<OPPOSITE PAGE: Risers and a board for the control panel mark the wastewater system for Jandu Petroleum in Wisconsin. The drainfield is about 500 feet away. (Photos courtesy of Pete Hurth, Baudhuin Inc.)

>>RIGHT: The almost-complete drainfield at Jandu Petroleum is split down the center by distribution lines. To the left and right, white pipes mark the 65-foot-long laterals. Valves are covered by round NDS boxes and covers.

BELOW: Nick Follen, rear, and Quin Lutze, front, set bundles of EZflow in one of the 65-foot-long laterals for the drainfield at Jandu Petroleum.

Bay, Wisconsin. "But not having a restaurant may allow a car wash to be added, provided there would also be a grit settling tank and some pretreatment." A state permit would still be necessary because of the strength of the wastewater.

The future on this corner lot depends on the actual amount and strength of wastewater coming into the system, and that is to be monitored this year. If the flow is less than the designed 3,000 gpd and 9 pounds of BOD per day, the system could accommodate other connections. Hurth says he is not an expert on car washes but understands they use about 65 gallons per wash, which can drop to about 20 gallons with recycling.

SYSTEM COMPONENTS

- 1,000-gallon tank from Wieser Concrete for grease interception
- Three 3,000-gallon Wieser tanks
- 5,000-gallon Wieser tank
- Polylok Inc. / Zabel 525 filter
- Four Red Jacket 1 hp pumps
- 1/2 hp Red Jacket effluent pump
- Bio-Microbics HighStrengthFAST 4.5 unit
- 1,560 linear feet of EZflow by Infiltrator
- Orenco Systems control panel

Wastewater emerges from the building through a 6-inch Schedule 40 PVC pipe and runs about 100 feet to the first of the Wieser 3,000-gallon tanks, which serves as a settling tank. A separate 20-foot-long run of Schedule 40 pipe has been laid from the drain in what may become the fast food restaurant kitchen to the 1,000-gallon grease tank. A 13-foot run of Schedule 40 pipe will join this flow to the 6-inch line.

"Blasting is common in this part of the world because of all the rock. The limestone up here fractures easily, so the largest chunks are at most 4 feet wide and light enough so two guys can lift one."
Pete Hurth

From the settling tank, water flows through the Polylok filter and about 4 feet through Schedule 80 pipe and into a 3,000-gallon equalization tank. Here the 1/2 hp effluent pump doses the Bio-Microbics unit in the 5,000-gallon tank through 5 feet of Schedule 80 pipe. The last tank, another 3,000-gallon, is the dosing tank where the four 1 hp pumps send water through 3-inch force mains varying in length from 511 feet to 592 feet.

At the other end is the drainfield, consisting of four zones, each comprised of three 133-foot-long trenches. Distribution lines cut through the middle of the zones and feed 65-foot-long laterals of EZflow on each side. Valves splitting the laterals are covered by inspection boxes and covers from NDS.

SITE RESTRICTIONS

Those long runs to the drainfield were necessary because of the site's geology. The field consumed the single high spot with adequate soil depth. Elsewhere the subsurface consists of soil over bedrock, in some places as little as 12 inches of soil.

"All the laterals leading to the tanks, the holes for the tanks, and about 50 feet of trenches past the tank were all blasted through bedrock," says Greg Chaudoir of Soil Specialists, the installing company out of Sturgeon Bay. "That's hired out because it's such a specialty. The blasting was complete before anybody was there, even before the building was started."

"Blasting is common in this part of the world because of all the rock," Hurth says. The broken rock was left in place. "The limestone up here fractures easily, so the largest chunks are at most 4 feet wide and light enough so two guys can lift one."

"We used it all on the site," Chaudoir says. "We used it to fill in around the building and to fill the parking lot."

<<LEFT: With the bundles of EZflow wrapped in TYPAR Geosynthetics geotextile fabric and flush valve pipes in place, one trench of the Jandu Petroleum drainfield is almost complete.

BELOW: Tony Birrittieri, left, and Chet Sowin, right, of Petersen Onsite install the air pipe that the Bio-Microbics unit housed in a 5,000-gallon concrete tank at Jandu Petroleum.

"When we designed the system, we assumed the maximum possible load. If that 1,000 square feet eventually becomes a retail store and not a restaurant, it will mean we greatly overestimated the daily flow into the system."
Pete Hurth

He used 3/4-inch clear stone around the tanks and lines to support them and prevent settling. All his equipment for the job was John Deere: a compact 210 track loader, a 333 track loader and a 650 bulldozer.

"It went in real slick," says Jim Beagnall, of Eagle Mechanical in Sturgeon Bay, whose company did the plumbing work.

"One reason we use Wieser is they do a great job of delivering and setting tanks. All of those went in over the course of a single day," Beagnall says.

"I was concerned about the wind. We had a whole semi load of EZflow sitting out there so we tied it to a utility pole, and it didn't move despite a few days when the winds were faster than 20 mph."

TECHNOLOGY TO CUT COSTS

Gathering information from the system is done wirelessly. A Cradlepoint IBR650-VZ modem works through the cellular phone system and allows a technician to dial in and download data, says Tony Birrittieri of Petersen Onsite, Fredonia, Wisconsin. His company supplied components for the Jandu system and helped with installation.

Of course the modem alerts technicians about a malfunction, but the software also allows full control: overriding floats, changing dosing or other operating parameters, turning pumps on and off, and turning the blower on and off. "All communications are dialed back to 1G cellphone speed. There are no big graphics or large amounts of data being transferred. It's all small bits of text. Because the cost to move these small amounts of information is so low, we can build it into the price of the panel so the owner has no monthly operating fee and saves money in the long run," Birrittieri says. "When you consider the cost of driving to a site to retrieve information or change a system's operation, the cost of the panel and data service is minute," he says.

If it turns out that the large system isn't needed, Hurth says, operators can ease the soil loading by keeping two zones dry for a while and then activating them while idling the other two.

Whatever the ultimate shape of the business, the site will be ready for any future thanks to the wastewater professionals hired for the project. ☐

featured products

Bio-Microbics, Inc.
800/753-3278
www.biomicrobics.com
(See ad on page 7)

EZflow by Infiltrator
800/221-4436
www.infiltratorwater.com
(See ad on page 3)

Orenco Systems, Inc.
541/459-4449
www.orenco.com

Polylok, Inc. / Zabel
877/765-9565
www.polylok.com
(See ad on page 44)

TYPAR Geosynthetics - Polymer Group, Inc.
877/642-9929
www.typargeosynthetics.com

Wieser Concrete
715/647-2311
www.wieserconcrete.com
(See ad on page 17)

Few Take Advantage of Cesspool Replacement Tax Credits in Hawaii

By Doug Day

Only 11 applications were received by the Hawaii Department of Health in the first two months of a tax credit program to encourage people to replace cesspools with a modern wastewater system. Hawaii became the last state to ban new cesspool construction in March. It had been approving about 800 a year and there are 90,000 in operation across the islands. The law provides up to $10,000 in tax credits to replace cesspools within 200 feet of the ocean, streams, or a source of drinking water. Owners have until 2020 to apply.

FLORIDA

With land application of septage banned in Florida as of June 30, the Department of Health and Department of Environmental Protection offered temporary variances to pumpers who need time to find alternative disposal methods. Variance applications were due in September, and are good until July 1, 2017. With land application no longer allowed, septage must be taken to a wastewater treatment plant, biosolids treatment facility or septage management plant, or dewatered with solids disposed of in a landfill.

The variance also allows those who used land application to become a DEP-regulated septage management facility, which would allow them to land-spread resulting biosolids, but not septage, on a permitted site. The $1,200 permit review fee has been waived because of the situation.

The additional time provided by the variance will allow the DOH, DEP and the Florida Onsite Wastewater Association to address rule language changes necessary to properly regulate the smaller septage management facilities that have neither the large flows nor the additional constituent streams associated with currently regulated DEP facilities, according to FOWA executive director Roxanne Groover.

COLORADO

In June, Arapahoe County banned application of septage on agricultural land, following the lead of two nearby counties. Instead, septage must be disposed of at a site approved by the county or the Tri-County Health Department, which serves all three counties. The application of biosolids from wastewater treatment plants is still allowed.

IDAHO

The Idaho Department of Environmental Quality is considering changes to its technical guidance manual for the design, construction and operation of onsite wastewater systems. The revisions involve in-trench sand filter descriptions, drip distribution, extended treatment package systems, managed operation, maintenance and monitoring of alternative treatment systems, incinerator toilets, sand mound approval conditions, and the letter of intended use and empirical wastewater flow data. The proposed revisions are available at www.deq.idaho.gov/water-quality/wastewater/septic-systems/technical-guidance-manual/.

MINNESOTA

Recent testing of hundreds of lakes and rivers in northern Minnesota showed no signs of contamination from septic systems. The Minnesota Pollution Control Agency continues working to identify the effects of failing systems across the state. The agency says there are about 500,000 septic systems, with 100,000 being too old or too close to the water table, and about 25,000 that have degraded to the point of being an immediate threat to human health.

INSIGHTS FOR INSTALLERS

PRECAST PROUD

Precast concrete tanks and grease interceptors are **locally made** with thorough quality control by skilled workers.

You can count on precast concrete tanks for unmatched strength and durability. They sit firmly in the excavation and won't buckle. Count on precast tanks for many years of **watertight** service.

It's our reputation on the line and we're **precast proud**.

NPCA

Meet your local precaster today at
precast.org/onsite

EnviroFin from Presby Environmental Provides a Solution for Treatment on Small Lots

By Craig Mandli

The typical septic system drainfield for a three-bedroom home measures more than 800 square feet. For various reasons, whether it's a small lot size or environmental concerns, adequate space isn't always available to onsite system installers. That's where the EnviroFin — introduced by Presby Environmental at the 2016 Water & Wastewater Equipment, Treatment & Transport Show — can enter the design process.

The EnviroFin is a passive onsite wastewater treatment and dispersal system designed to take up a footprint approximately eight times smaller than a typical conventional drainfield — just over 93 square feet for a three-bedroom home, using two units installed in sequence and treating 450 gpd. According to Lee Rashkin, Presby Environmental vice president, the product is an expansion on the company's Advanced Enviro-Septic drainfield technology.

"We've had the AES on the market for 20 years, and it has been a terrific product for us," he says. "The main need globally, though, has been creating large treatment capability in a smaller footprint."

Lee Rashkin, center, vice president of Presby Environmental, discusses the compact EnviroFin treatment system with attendees at the 2016 WWETT Show. The passive onsite wastewater treatment and dispersal system is designed to take up far less space than a conventional drainfield. (Photo by Craig Mandli)

The EnviroFin exceeds NSF/ANSI Standard 40 treatment. Single units are shipped in a 2- by 2- by 4-foot box weighing 50 pounds for convenient shipping worldwide. The unit is designed for high treatment capacity in a small footprint by utilizing spider-like perforated pipe fins with a large surface area for bacterial growth.

After leaving the septic tank, warm effluent enters the centralized fin distribution unit, and is cooled to ground temperature, separating large solids from the cooled liquid effluent. Skimmers further capture grease and suspended solids from the existing effluent in the distribution unit. The effluent seeps through perforations in the distribution unit and into eight treatment fins containing a dense mass of coarse, randomly oriented fibers to separate more suspended solids from the effluent.

An air duct pipe at the top of each fin allows air to flow along its length and into the fibers and system sand to promote bacterial growth and treatment of the effluent. The pipe also serves as a conduit for removal of waste gases at a different point in the cycle. Effluent then passes into geotextile fabrics and grows a protected bacterial surface. Sand then wicks liquid from the geotextile fabrics, enabling air to transfer to the bacterial surfaces while attaining less than 10 mg/l BOD and TSS as well as a reduction of other wastewater constituents. The clean effluent is then ready for release.

"This unit can be used in many types of soil conditions, and its small size gives homeowners so much more flexibility over where they want the drainfield located," says Rashkin. The EnviroFin will be used primarily for the residential and commercial applications.

Presby Environmental is a longtime exhibitor at the WWETT Show, but thanks to the excitement created by the EnviroFin, Rashkin says the 2016 show was the company's best.

"The reaction has exceeded our expectations. The installers I've talked with are genuinely excited to get them and start installing them for their clients," Rashkin says. **800/473-5298; www.presbyeco.com.**

wwett17

IT'S THE INDUSTRY EVENT OF THE YEAR

The WWETT Show - Water & Wastewater Equipment, Treatment & Transport - is the world's largest annual trade show for environmental service professionals. Over 12,000 people will gather from across the U.S. and beyond to see the latest in equipment and technology in the expo hall, participate in over 110 education sessions, and network with industry peers.

Conference:
February 22-24, 2017

Exhibits:
February 23-25, 2017

Indiana Convention Center, Indianapolis, IN

Register today at **www.wwettshow.com**

Are You Getting the Most Out of Equipment Warranties?

Proper maintenance, including fluid analysis, can reduce the chance of unexpected and potentially costly repairs

By Ed Wodalski

Proper operating practices and techniques also impact warranty coverage as well as component wear. (Photo courtesy Case)

You do a good job of maintaining your equipment. But what happens when something breaks? Fortunately, it's under warranty. But is it?

Let's look at the three basic warranties: factory, emissions and extended service.

Terms of a factory warranty are typically outlined in a document issued by the manufacturer referred to as the Warranty and Limitations of Liability. Generally considered a legal document, it outlines the responsibilities of the manufacturer, dealer and customer.

Federally mandated emissions control warranties are intended to ensure equipment meets federal emission standards for a given period of time. Federal emissions guidelines are two years or 1,500 hours of operation (whichever comes first) for engines less than 19 kW/25 hp or five years/3,000 hours of operation for engines greater than or equal to 19 kW/25 hp.

Extended service or third-party warranties typically don't cover the same components and materials as a factory warranty, and allow purchasers to choose what is and is not covered. An extended warranty might be a consideration if you don't rotate equipment every two years.

So, who's responsible when something goes wrong? The quick answer is: It depends.

COVERAGE QUESTIONS

Factory warranties cover defects in material and/or workmanship. Generally, these defects appear in the first year of use. Factory warranties do not cover failures caused by poor or improper maintenance.

With advances made in equipment manufacturing and customer expectations, companies such as Case have increased their length of coverage with ProCare to three years/3,000 hours. This trend of extending the factory warranty means maintenance becomes a critical factor in determining whether the failure is warrantable or not.

"If you're sitting at 2 1/2 years and you have a component failure, such as a hydraulic pump or rear axle, I assure you there's going to be a look-see at the maintenance that was done," says Bruce Reader, regional product support manager for Case.

Key contributors in the changing dynamics of vehicle responsibility include fault codes, error codes and telematics.

"Any time you have an ECU (electronics control module), VCM (vehicle control module), TCM (transmission control module), CCM (chassis control module), there's almost always a built-in fault code history," Reader says.

Telematics simply makes it easier to see what happened to components over the lifetime of the equipment: How many times did an engine lose oil pressure because it was working on an incline? How many times did the transmission overheat? How many times did the engine restriction light come on because the air filter wasn't properly maintained?

FLUID ANALYSIS

Reader says to get the most out of equipment warranties, be sure to incorporate fluid analysis — engine oil, hydraulics, transmission and fuel — in your maintenance program.

"I'm going to go out on a limb, I don't have any data on this, but if you do find people who have a pretty good fluid analysis program, I bet fuel is not part of it," he says. "I think it's probably one of the most neglected. With all the additives, Tier 3 and Tier 4 and the cost of components on fuel systems now, fuel needs to be part of that fluid analysis program."

"If a fuel system goes down because of contamination, that's not a warrantable failure. That doesn't even qualify for an emissions warranty failure because a failure due to the contamination of fuel is not a defect in material or workmanship. It's a failure on the customer's end."

Bruce Reader

With the advent of Tier 4 and high-pressure, common-rail, direct fuel injection, failures brought on by contaminated fuel — fuel from a dirty can — are not cheap.

Take an injector. In the 1970s, a mechanical injector was about $75. Today, an electronic injector can cost $2,000 — with four or six in an engine.

"If a fuel system goes down because of contamination, that's not a warrantable failure," Reader says. "That doesn't even qualify for an emissions warranty failure because a failure due to the contamination of fuel is not a defect in material or workmanship. It's a failure on the customer's end. From the standpoint of protecting your warranty, I think customers today need to be ever-vigilant about their fuel and their fuel practice."

Be sure to follow all manufacturer recommendations for fluids and filters. As equipment becomes more technically advanced, machine tolerances have drastically changed. Many components, such as axles with limited slip and transmissions with different clutch pack material, require tight fluid specifications to run properly.

GO BEYOND MANUAL

The operator's manual is your guide for maintenance intervals and requirements, but it might not be enough.

"Sometimes you have to do more than what's in the operator's manual," Reader says. "For example, if you are operating in an environment in which there are extremely high amounts of dust, that air filter probably won't make the first interval in the manual that says to replace the air filter. One must have 'situational awareness' with respect to their job site conditions and adjust accordingly.

Keep in mind that some modifications will void a factory warranty — especially when the modification requires any type of welding involving structural integrity. This could include modifying a bucket for increased capacity or utilizing attachments, such as thumbs, that are not suited for the size or type of machine. And be aware of your environment. When working around septic systems and drainfields, be cautious about acids from waste that can harm wiring harnesses and other components.

"You have to be cognizant of the application and adjust your maintenance accordingly," Reader says.

Proper operating practices and techniques also impact warranty coverage as well as component wear. The advancement of telematics and electronic diagnostics can tell the difference between a smooth operator and a "bucking bronco."

Operators need to be properly trained and well informed about maintenance requirements for most new Tier 4 machines and have an understanding of the different types of after-treatment systems associated with them.

LIMIT DOWNTIME

To get the most out of your warranty, you'll also want to limit downtime. Excessive idling not only wastes fuel, it also adds wear and wastes warranty hours — 30 percent idling over a 3,000-hour warranty adds up to 900 operating hours lost.

"I have this little saying: The best warranty is the one you never have to use," Reader says. "But, when you do have to use it, you want to make sure you have done all your due diligence and it doesn't come back on you that the failure was the result of you not taking the appropriate maintenance measures." ☐

Jim Anderson, Ph.D., and David Gustafson, P.E., are connected with the University of Minnesota onsite wastewater treatment education program. David is extension onsite sewage treatment educator. Jim is former director of the university's Water Resources Center and is now an emeritus professor. Readers are welcome to submit questions or article suggestions to Jim and David. Write to ander045@umn.edu.

Look Before You Leap Into a Trench Excavation

Before that first bucket of soil is removed on a sloped lot, be sure you understand site conditions and the lay of the land so your system will fit and work properly

By Jim Anderson and David Gustafson

During one of our workshops, an installer asked about the layout of trenches loaded by gravity and placed on a sloping lot. It was a good question, and reminded us to emphasize basic aspects of installation along with some of the more complicated issues. So here's a refresher course on the trench installation that may get lost among the more complex topics we address when class is in session.

Drainfield trenches should be used because they provide the most adequate treatment of septic tank effluent when installed in good soil conditions. Those conditions include a permeable soil that will accept a daily loading rate of greater than 0.2 gallons per square foot and less than 1.2 gallons per square foot as determined by soil analysis. Some areas still use a percolation rate to set this threshold, so the numbers are typically between five minutes per inch and 60 minutes per inch. In addition, there needs to be no limiting soil condition such as bedrock, high water table or dense, slowly permeable soil within the required separation distance from the bottom of the trench to ensure treatment occurs.

Wider spacing is preferable where space allows for better effluent dispersal. This is helpful from a treatment standpoint and it may also provide extra area if the system needs an addition or replacement in the future.

These requirements will often restrict the depth trenches can be installed. Our Minnesota code specifies a maximum excavation depth of 48 inches to ensure the trenches are kept shallow to avoid potential limiting conditions and to utilize what is usually the most permeable and biologically active part of the soil for treatment. Regardless of whether your code has such a limit, keeping trenches shallow is in general better than deeper.

An excavation is considered a trench instead of a bed when it is less than 4 feet wide and should not be wider than 36 inches. Actual trench width is determined by the width of the backhoe bucket used. Bucket widths vary from 18 inches to 36 inches with the majority of trenches 3 feet wide. Narrow 18-inch buckets can be used but will usually increase the length of trench and take longer to excavate. There may be cases where a narrower, deeper trench will help fit the system on a small lot. Part of the reason not to go narrower is to allow more space for the installer to work within the trench.

Trenches should be laid out so they follow the contour of the land with the bottom of the trench level throughout the length of the trench. The proper length of trenches is determined by the estimated daily sewage flow, soil loading rate and width of trenches.

Most state codes limit the length of a single trench to no more than 100 feet. There should be at least two trenches unless the total required trench length is less than 50 feet. The thinking behind this is not to put "all the eggs in one basket," so to speak, and rely on a single trench to accept all of the effluent. We think another factor is concern over keeping the bottom of the trench level for a run of more than 100 feet, particularly in sloping areas. With the technology available today, keeping a trench level is not a concern.

Spacing is important when multiple trenches are excavated. To allow room for operating equipment, there needs to be a minimum spacing of 7 1/2 to 8 feet on center. Wider spacing is preferable where space allows for better effluent dispersal. This is helpful from a treatment standpoint and it may also provide extra area if the system needs an addition or replacement in the future.

After the total length of drainfield trench is determined, topography dictates the choice of layout and distribution of effluent. In our view, drop boxes are the most desirable and flexible method to distribute effluent. They present a number of advantages on sloping sites, although they can be used on level sites as well.

Installation is simple: Trenches can easily be added to the sequence in the future if water use increases, as long as there is adequate good soil. Trenches do not all have to be the same length. Only the portion of the system needed to treat the effluent is actually used. Drop boxes provide an access point that allows for management by either the homeowner or a service provider.

One example of drop box utility is where a limiting soil or bedrock layer limits how far downslope trenches can be excavated. Placing a drop box between two 100-foot trenches along a single contour effectively provides 200 lineal feet of trench along that contour. Of course, this is dependent on having a lot size and shape that allows this, but it could mean the difference between being able to install trenches instead of an at-grade or mound system.

Distribution boxes have limited utility in sloped areas. Each trench is connected back to the box and the theory is that all outlet pipes are at the same elevation and will deliver the same amount of effluent to each trench. This also means each trench is expected to accept the same amount of effluent, which requires they have the same length as well as the same soils throughout. The likelihood of both these conditions being met is very small.

In addition, the installer needs to make sure the ground surface elevation at the lowest trench is at least 1 foot above the outlet elevations of the distribution box. If not, there is the potential for the final trench to receive most of the effluent, resulting in sewage coming to the surface.

All of these are reasons why we say that before the first backhoe bucket of soil is removed, the entire system should be staked and laid out to make sure it fits in the space available and meets all requirements.

Systems Repair/Drainfield Rejuvenation

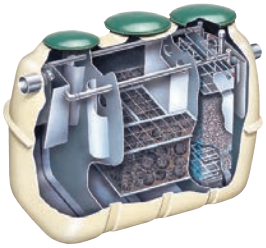
By Craig Mandli

ATUs

Anua PuraSys SBR

The **PuraSys** sequencing batch reactor from **Anua** batches treatment in cycles, including aerobic and anaerobic steps, to clean water and reduce total nitrogen. It allows nitrification and denitrification to occur in the same chamber, saving space. The smart controls adjust aeration for varying flows, eliminating excessive air that can lead to system failure through sludge bulking. Flexible tank configurations include the retrofit of existing tanks. The system can reduce BOD5 and TSS to less than 10 mg/L and provide greater than 50 percent total nitrogen reduction, according to the manufacturer. It can be scaled up for commercial applications. **336/547-9338; www.anuainternational.com.**

Clarus Environmental Products Fusion Series



Fusion Series treatment systems from **Clarus Environmental Products** are drop-in wastewater treatment units designed for decentralized applications where effluent quality needs to meet or exceed secondary treatment standards. Units are designed for residential, commercial and small-community applications. They are available in treatment capacities from 450 to 4,000 gpd and can be installed without a pretreatment tank. Effluent disposal options include conventional trenches, dosed systems, drip irrigation or disinfection with direct discharge. **800/928-7867; www.clarusenvironmental.com.**

Norweco Singulair Green

The **Singulair Green** ATU from **Norweco** replaces failing septic systems with an advanced wastewater treatment solution. The easily installed tank helps reduce all household wastewater to a clear, odorless liquid in 24 hours. Treatment performance meets or exceeds the strictest state and county requirements and is certified to NSF Standards 40 and 245. It offers single-tank convenience and contains pretreatment, aeration, clarification, filtration, flow equalization, and optional disinfection and dechlorination. **800/667-9326; www.norweco.com.**

Premier Tech Aqua Ecoflo Biofilter

The **Ecoflo Biofilter** from **Premier Tech Aqua** is now offered as a nitrogen removal unit, utilizing a new add-on kit. Integrating a pressurized flow divider to recirculate a fraction of the water back to the primary tank, all records and management of the dosing pump's cycles are monitored by a Simplex control panel. Available in ready-to-use rotomolded units or concrete units integrated into existing tanks made by local precasters, the 40 percent increased hydraulic load of the coco media has also allowed the development of the Ecoflo PACK, an all-in-one treatment system integrating the biofilter and primary tank delivered to sites in a single monobloc configuration, reducing both wait and installation time. **604/346-8199; www.premiertechaqua.com.**

SeptiTech STAAR

STAAR residential trickling filter systems from **SeptiTech** are NSF/ANSI Standard 40, Class I and NSF/ANSI Standard 245 (nitrogen removal) certified. The clean effluent prevents biomat formation and leachfield clogging. They are compatible with shallow drip, direct discharge, pressure distribution, spray irrigation and conventional leachfields. Utilizing an enhanced, biological, unsaturated media filter process, they are ETV-U.S. Environmental Protection Agency verified and NSF/ANSI Standard 40/245 certified. With an optional UV disinfection system, the systems are designed for direct discharge or water reuse and engineered to fit most typical small-flow residential and commercial applications. **800/318-7967; www.septitech.com.**

BIO/ENZYME ADDITIVES

Arcan Enterprises Septic-Scrub

Septic-Scrub chemical additive from **Arcan Enterprises** helps remove the sludge that builds up and sticks to the stone in a drainfield, pit or sand mound, helping rejuvenate the drainfield. According to the maker, it works in the first 24 hours after application. It can serve as part of a maintenance program. It works with all types of systems, is safe to handle and is environmentally friendly. **888/352-7226; www.arcan.com.**

Bionetix International Bio-Tab 1T

Bio-Tab 1T from **Bionetix International** can be used to treat undigested sludge to help keep septic systems healthy and functioning, according to the maker. Each tab contains a 1 trillion count of bacteria as well as enzymes effective in aerobic and anaerobic conditions. Biological nutrients and stimulants enhance the water biology in the tank by aiding bacteria to biodegrade organic material composed of proteins, fats, carbohydrates and toilet paper. It is designed to be efficient following toxic shock, such as the use of strong harmful chemicals like bleach or root killers. Two tabs are added to the tank in the first month, followed by one tab every month for maintenance as well as one tab after any toxic treatment. 514/457-2914; **www.bionetix-international.com**.

BioStim Septic Saver

Septic Saver from **BioStim** is a multi-strain microbial additive designed to prevent foul odors, slow drains, seep-hole blockages and excessive septic tank pumping. Regular use can help keep the septic system free-flowing by digesting fats, oil, grease, soaps and other organic household waste to prolong the life of the entire system. It is safe for plumbing systems in homes, RVs, portable toilets and sewer lines. It contains no caustic or corrosive chemicals, free enzymes, emulsifiers or surfactants, and does not cause grease to pass through to the leachfield where it can resolidify and cause a septic field failure. It is applied by pouring into the toilet. 800/338-8812; **www.biostim.com**.

Cape Cod Biochemical Company AfterShock

AfterShock soil absorption restorative from **Cape Cod Biochemical Company** is designed to restore drainage to clogged and sluggish drainfields and drainage structures by biologically digesting the solid material that normally clogs soil absorption areas. It contains naturally occurring, USDA-approved multi-strain bacteria, as well as a bacteria-friendly, time-released oxygen source that accelerates the bacterial metabolism. It is nonhazardous, nontoxic, contains no U.S. EPA Priority Pollutants, and it is safe for the environment. It can be used in residential and commercial drainfields, cesspools and seepage pits, and in conjunction with high-pressure waterjetting and soil fracturing equipment. Its consortium of bacteria and oxidizer can be applied at the same time, eliminating the need to keep the system exposed for repeated site visits. 800/343-8007; **www.septiconline.com**.

Ecological Laboratories PRO-PUMP/HC

PRO-PUMP/HC liquid live bacteria from **Ecological Laboratories** is a blend of more than 30 microorganisms selected for broad-spectrum application in industrial and wastewater treatment. It is designed to provide rapid breakdown and removal of fats, oils and greases that build up in septic tanks and absorption fields. It is a consortium of vegetative non-spore-forming bacteria that exhibits performance in low-oxygen facultative anaerobic environments. Regular treatment can help reduce surface solids, bottom solids and odor, satisfying customers and making pumpouts more cost-effective, according to the maker. 800/326-7867; **www.propump.com**.

Jet Inc. Bio Jet 7 Series

The **Bio Jet 7 Series** of bacterial supplements from **Jet Inc.** is designed to accelerate degradation of fats, oils and grease; proteins; tissues; soap scum; and other organics. Nonhazardous and nontoxic, it is a blend formulated to assist biological activity in septic systems, aerobic wastewater treatment systems, lift stations, lagoons and retention ponds. According to the maker, the supplements are effective for difficult startups, daily maintenance to meet system discharge requirements, or when a system becomes unstable due to changes in flow, chemicals or increased organics. Continuous use can lead to a significant decrease in odor, maintenance and emergency line blockages. It is available as ready-to-use, quick-dissolving, flushable dry packs packaged as a one-year supply in a recyclable plastic canister, or in 1-, 5- and 55-gallon containers. 800/321-6960; **www.jetincorp.com**.

RCS II Septic Drainer

Septic Drainer drainfield restorative from **RCS II** is designed to repair the soil in a septic drainfield damaged by hardpan soil issues. Due to restricted airflow, this hardpan soil layer causes aerobic bacteria to die off. Only anaerobic bacteria can survive without air. Anaerobic bacteria produce a waste product called biomat, which compounds drainfield failure. The solution is designed to remove the bond between sodium and the soil, which creates hardpan. The manufacturer recommends using it first to solve underlying hardpan issues, then adding an oxygenator or aerobic bacteria to speed up the restoration process. 518/812-0000; **www.septicdrainer.com**.

Scienco/FAST Mighty Mike U & F-BOOST!

Mighty Mike U & F-BOOST! (Billion Onsite Organisms Sewage Treatment) tablets from **Scienco/FAST** use a special formulation of over 25-billion-per-gram active, robust Class 1 organisms to consume organic waste and break down fat naturally. Once introduced into the waste stream, the water-soluble tablet immediately activates and feeds on the surrounding waste to provide a healthy population in the system. No premixing, premeasuring or presoaking is necessary. 800/652-4539; **www.sciencofast.com**.

DRAINFIELD RESTORATION

Aquaworx by Infiltrator Remediator

The **Remediator** from **Aquaworx by Infiltrator** is an easy-to-install septic system remediation technology that can rejuvenate failing septic drainfields with minimal landscape disruption, according to the maker. Inserted into the tank, the system includes a fine-bubble air diffuser to aid bacteria growth and reduce biological clogging in the drainfield. It requires nominal operation and maintenance cost. Under normal operation, a septic system builds up a biomat that over time can become restrictive, resulting in clogged soil pores and system malfunction. The unit introduces oxygen into a bacterial growth media

column, allowing bacteria to thrive and consume organic matter. These bacteria combine with the oxygen-rich effluent in the tank and move to the drainfield, reducing the clogging layer and the associated odors and wet areas in the yard. **800/221-4436; www.infiltratorwater.com.**

Bio-Microbics RetroFAST

The **RetroFAST** or RetroFITT-ee (energy-efficient version) unit from **Bio-Microbics** is designed as a simple upgrade to enhance a conventional septic system or renovate a biologically failed septic system. It installs directly in the existing tank to create an optimized treatment environment using submerged, fixed-film media for microbial growth with an energy-efficient aeration system. It constantly sends effluent rich in dissolved oxygen to the drainfield. Where sites and regulations allow, it can be used in new installations. It is designed to immediately deliver high levels of treatment to help ensure that clogging layers never form. **800/753-3278; www.biomicrobics.com.**

ClearPod

ClearPod units from **Clear Pod Inc.** are installed in the pump chamber to help remove nitrogen and phosphorus from effluent before it's pumped to the sand filter bed. Coupled with a time-dosed flow, the system maximizes the sand filter treatment capacity, helping restore failing systems, remove odor and reduce groundwater contamination. **902/361-2085; www.clearpodwater.com.**

EarthBuster

The **EarthBuster** helps return soil conditions to preconstruction status. Smearing and compaction from construction equipment can leave soil in a drainfield with less-than-ideal absorption properties. The unit can be mounted on skid-steers, mini-excavators and loader tractors. The process uses compressed air, and when used properly, is environmentally safe, according to the maker. **406/670-8318; www.earthbuster.com.**

JETTING

Amazing Machinery BossJet Max

BossJet Max jetters from **Amazing Machinery** offer versatile hose reel configurations, with the choice of no reels, a fixed reel, or a 360-degree stainless steel pivoting reel, and with a mounting bracket for an optional remote hose reel for indoor jetting. They come with Honda, Kohler, Yanmar or Vanguard engines, with or without electric start. Pump options include CAT, A/R and General, with pressures up to 4,200 psi and flow rates up to 5.5 gpm. The frame is powder-coated 1.5-inch tubular steel, which wraps around the engine and pump for protection. Each unit comes with a laser nozzle and washdown accessories with 50 feet of leader hose. **800/504-7435; www.amazingmachinery.com.**

American Jetter 58 Series Hot Jet

The **58 Series Hot Jet** from **American Jetter** offers increased cleaning power for grease cutting and deicing by heating the water up to 190 degrees. Consistent power is provided by a 32.5 or 37 hp Kohler gasoline engine with flows of 8.5 and 11 gpm to 4,000 psi. The rear electric speed control reel provides precise cleaning speeds and easy access to the jet hose with the included hose guide. Low-water shut-off prevents pump damage if the 200-gallon tank runs low. The optional 1-mile open-range wireless remote allows for water ON/OFF, engine shutdown and hose reel control. The heavy-duty square tubing trailer offers a 2-inch ball coupler and standard electric brakes. **866/944-3569; www.americanjetter.com.**

Electric Eel Eel Jet EJ3000

The **Eel Jet EJ3000** high-pressure jetter from **Electric Eel** cleans 2- to 8-inch-diameter drainlines for a fast blast through clogs including sludge, ice, grease, sand, soap, dirt and debris. It comes with steel nozzles to penetrate and clean tough problems from pipe walls with a variety of spray angles. It can be used to clean lines up to 300 feet, and offers 3,000 psi at 4.7 gpm, a 13 hp overhead valve engine for smooth running and dependable operation with electric start available, a 2-1 gear-reduced triplex pump with pulsation for longer life, a 300-foot-capacity hose reel, a throttle-back control that automatically adjusts engine speed, and a low-tone muffler for quiet operation. It uses 1/4- and 3/8-inch-diameter jet hose. It has 12-inch pneumatic tires for easy maneuverability on a rugged steel base with front bar for motor protection. **800/833-1212; www.electriceel.com.**

Gorlitz Sewer & Drain Model GO 1500A Series

The **Model GO 1500A Series** jetter from **Gorlitz Sewer & Drain** has a functional frame construction with a carrying handle, reel accessory tube, retractable pull handle and phenolic 4-inch wheels for easy transportation to the job site. All models come with a custom-built, dual-capacitor 2 hp electric motor drawing 19.8 amps at full load. The duplex ceramic plunger pump with dual pulsation will generate more than 1,500 psi at 2.1 gph to clear tough stoppages or open frozen pipes. The unit is supplied with one 1/8-inch by 50-foot-long trap hose to clear drainlines from 1 1/2 to 3 inches in diameter. The hose and reel connections are provided with quick-disconnect fittings to simplify operation. The reel accessory tube accepts an optional hose reel for compact hose storage and operation. **562/944-3060; www.gorlitz.com.**

Hot Jet USA Vac 'N Jet Series

The **Vac 'N Jet Series** of drainline jetters from **Hot Jet USA** is available with the choice of hot- or cold-water operation, 13 to 35 hp engines with electric start, a 12-gallon gas tank, 24-gallon diesel tank, full variable pressure and rear throttle control. General Emperor Series pumps supply outputs of 10 gpm at 4,000 psi. Vacuum systems consist of an all-steel 300- to 800-gallon spoil tank, Gardner Denver vac/blower, a Colt 4-ton hydraulic dump, Centri-Clean filter system and a 24-inch fully opening rear hatch. With a 200-gallon water tank, the tandem-axle trailer with a steel diamond plate deck is rated with two 5,000-pound-capacity axles and

electric brakes. The unit comes with a variety of jetting and power-wash accessories. 800/624-8186; www.hotjetusa.com.

Hydra-Flex Ripsaw Rotating Turbo Nozzle

The **Ripsaw Rotating Turbo Nozzle** from **Hydra-Flex** has a cone-shaped flow pattern ideal for potholing applications. It blasts a 0-degree water stream at up to 3,200 psi while rotating at a high speed to provide an 18-degree cone of coverage. These heavy-duty, high-impact nozzles are constructed with a stainless steel housing and tungsten carbide wear surfaces to withstand harsh environments and provide long life. Repair kits are available for extended life and lower operating costs. The non-conductive urethane coating on the nozzle body protects the operator and sensitive underground utilities. It offers greater impingement, allowing the technician to use a smaller nozzle size while getting the same impact as nozzles with higher flow rates. 952/808-3640; www.hydraflexinc.com.

RIDGID KJ-3100

The **KJ-3100** portable water jetter from **RIDGID** offers 3,000 psi of working pressure and 5.5 gpm of flow for fast, effective cleaning of large lines. The jetter propels a flexible and lightweight hose through 2- to 10-inch lines, blasting through sludge, soap, grease and sediment blockages. As the hose is pulled back, it power scrubs the line, flushing debris away and restoring drainlines to their full, free-flowing capacity. Pulse action allows for easy negotiation of difficult bends and traps. It has a removable hose reel and triplex pump with corrosion-resistant, forged brass head, and comes on a two-wheeled cart that fits through standard-size doors and negotiates tight turns. 800/769-7743; www.ridgid.com.

US Jetting 4018

The **4018** trailer jetter from **US Jetting** is available with powder-coated or galvanized frames, as well as aluminum components such as fenders, toolboxes, antifreeze tanks and fuel tanks. The 4,000 psi at 18 gpm unit has a true run-dry pump with a stainless steel fluid end and triplex plungers that are easy to maintain and service. A HATZ Tier 4 Final four-cylinder diesel engine is fuel-efficient, lightweight and generates a high amount of power. 800/538-8464; www.usjetting.com.

PRESSURE WASHERS/SPRAYERS

Water Cannon SH265

The 3,300 psi Kohler-powered **SH265** pressure washer from **Water Cannon** has a 4PPX Series CAT triplex plunger pump, a Kohler SH265 engine, hose, trigger gun, wand, chemical injector and color-coded quick-connect nozzles. It is assembled in the U.S. and is offered with a 25- or 50-foot hose kit. A front handle is included. 800/333-9274; www.watercannon.com.

System Repair/Drainfield Rejuvenation

By Craig Mandli

Treatment system installed on space-confined island

Problem: A residence on Johns Island in Maine required a sewage treatment system that could fit into a tight area, yet meet strict outflow requirements.

Solution: **BUSSE Green Technologies** installed a small-size **BusseGT** sewage treatment system. It was shipped and then set up in one day. Its small size reduced the needed leachfield by about 90 percent. The system uses membrane bioreactor technology and has a capacity of 1,000 gpd. Domestic wastewater is treated to reuseable non-potable water, guaranteeing hygienically safe outflow free of floating matter, with high COD and BOD5 degradation rates. High organic matter degradation rates of 99 percent also characterize the filtrate.

Result: The system was installed in May 2016, and has operated properly since. **708/204-3504; www.busse-gt.com.**

Compact, lightweight jetter saves contractor time, trouble and money

Problem: Craig Casteen of Casteen Plumbing & Repair in North Carolina faced working in a residential crawl space that didn't allow much room to maneuver. He needed a jetting unit compact enough to get into tight areas, and powerful enough to dislodge blockages from small lines.

Solution: Casteen chose the **JM-1000 Mini-Jet** from **General Pipe Cleaners**. The compact, lightweight, electric-powered unit lets him clear grease, sand and ice from small, 1 1/2- to 3-inch lines up to 50 feet long. It provides 1,500 psi of cleaning power. Pulse technology helps slide the hose around tight bends and down lines. It breaks the initial tension between the hose surface and pipe walls, increasing cleaning power. The JM-1000 weighs 23 pounds for easy carrying and is convenient for jobs completed by one person.

Result: Casteen used the unit in the crawl space to quickly clear the blockage. **800/245-6200; www.drainbrain.com.**

Compact jetter helps company overcome the hassle of city parking

Problem: Bob Oates Plumbing, Sewer and Rooter, located in Seattle, Washington, had regular issues working in urban areas with limited parking space.

Solution: The company began using the **Brute Jetting System** from **JETTERS NORTHWEST** to augment a fleet of larger trailer jetters. "The Brute Jetting System allows me to pull up with one vehicle and eliminates the need to disconnect a trailer and park the service van elsewhere," says Bob Oates. The unit may be mounted in a truck or van and produces 12 gpm at 3,000 psi.

Result: Oates is now able to "save on the initial costs of building a custom skid-mounted jetter and time on the job site." **877/901-1936; www.jettersnorthwest.com.**

Advanced treatment system fit into tight area

Problem: Proposed renovations of a beachside home on deep sandy soils in Tasmania, Australia, faced a council requirement to replace the existing undersized 1990s-era septic tank system. The site has been almost completely developed with buildings and other impervious surfaces, leaving little space for a wastewater land application area. A conventional septic tank absorption trench system would be a difficult fit.

Solution: With limited space available on the site and the client's expressed desire for a passive, low-maintenance, septic-tank-based system, an **Advanced Enviro-Septic** system from **Presby Environmental** was proposed. The bed was designed to fit into the L-shaped paved area. The AES system produces secondary treated wastewater and can therefore be shoehorned into a tighter area. It requires only 40 percent of the area needed for a conventional in-ground absorption bed.

Result: The system was installed and has performed as expected. **800/473-5298; www.presbyeco.com.** ☐

productnews

Goulds Water Technology pump controller

The Aquavar e-ABII pump controller from Goulds Water Technology, a Xylem brand, is designed for municipal and private water systems with low water pressure. As water use increases, the pump controller changes pump speed to deliver continuous water pressure. Units are available with a range of flow rates to handle residential or commercial applications. 866/325-4210; www.goulds.com.

industrynews

COLE Publishing Editor Ed Wodalski Passes Away

Ed Wodalski

Ed Wodalski, longtime contributor and editor with COLE Publishing, passed away suddenly on Sept. 21. He was 64. In addition to his writing contributions, Ed held many roles at COLE, including primary proofreading and coordinating national photo shoots and assignments. Most recently, he was the print and digital editor for *Plumber* magazine, and also oversaw the product and industry news for nine COLE publications. "Ed was not only a loyal contributor to the COLE team, but a mentor, family man and friend. He will be deeply missed," said Jeff Bruss, president of COLE Publishing. Ed is survived by his wife, Dawn; son, Michael; daughter, Nicole; and three grandchildren.

IPEX announces $55 million expansion

IPEX unveiled its $55 million Edmonton plant expansion to stakeholders and guests at a reception in June. The 17,245-square-foot expansion brings the production of large-diameter PVCO and PVC pressure and sewer piping to the North American and Canadian markets.

Jesus Rodriguez

JWC Environmental names business development manager

JWC Environmental named Jesus Rodriguez as business development manager for Monster Screening Systems products. Rodriguez will be responsible for expanding the company's wastewater screening products, including in-channel headworks screens, rotary drum screens, drum sludge thickeners and Screenings Washer Monsters.

CHECK OUT PRODUCT & CONTRACTOR VIDEOS ONLINE!
www.onsiteinstaller.com/video

ONSITE installer classifieds

Place your ad online at: www.onsiteinstaller.com

BUSINESSES

BIG PIPE GOT ME! Septic business equipment for sale: 2000 Western Star tri-axle dump truck with aluminum bed & wheels — less than 100,000 miles; 20-ton Birmingham trailer with air brakes; 2000 GMC 3500 4-door pickup service truck; 1988 International service truck - (welder/air compressor/fuel/grease attached for field work); 3500 Ditch Witch trencher; 1998 410E John Deere backhoe w/extend a hoe; 2007 410J enclosed cab backhoe with 3-way front bucket plumbed for hammer/auger/extension hoe; 1996 GMC TopKick with Del Zotto Hydra Brute rail bed 14,000 lb. with manual swing out uprights; Del Zotto multi-form 300/900/1050/1200 gallon; Norweco multi-form 500/750/1000/1250/1500 gallon; Jet commercial form converted to make a filter media tank; Concrete vibrators. $150,000 FIRM package price. Call Doug 305-872-8130. (i10)

Looking to start your own septic tank business in Florida? I can help. Have license, will sponsor. Call 931-277-5541 or 931-248-1284. (iM)

EXCAVATING ATTACHMENTS

Hall's GradeBlades: Convert your toothed bucket to toothless in 60 seconds. No tools required. Fits all mini-excavators, rubber-tired backhoes, and large excavators. Call 319-470-3033; bhall@gradeblade.com www.gradeblade.com (iM)

PRESSURE WASHERS

Industrial Pressure Washer - New w/warranty $9,500. 2,000psi, 18gpm. 999cc Kohler & AR pump. Will deliver. 321-800-5763 (iM)

Honda horizontal GX engines, new in-the-box w/warranty. GX200QX - $399; GX-270QAG - $579; GX390QA - $599 delivered price. 800-363-9855 or GXParts.com (iM)

SEPTIC TANK FORMS

Del Zotto used concrete molds: 24" eccentric cone form; bottom female pallet 48" x 48" barrel form, top male pallet, bottom female pallet 48" x 48" extended base form, top male pallet 12" tall flat lid form cone wire gig. Selling for 50% of new price. Call 618-228-7702 (i11)

SOLD

Sell your equipment in *Onsite Installer* classifieds

Reach over 21,000 potential buyers each month when you list your equipment in the classified section. Plus, your listing is placed automatically online at the *Onsite Installer* website. That's two ways to move your equipment out of the yard!

Why wait?

Go to onsiteinstaller.com/classifieds/place_ad

Scan the code with your smartphone.

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.org

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; 417/631-4027

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

POLYLOK™ Inc.

Innovations in Precast, Drainage & Wastewater Products

Zabel® A Division of Polylok Inc.

THE PERFECT FIT EVERY TIME!

We heard you! Polylok now offers risers in 2" and 3" heights. Whether you are working with a septic tank, distribution box or drainage box, stacking these new heights with our existing series of 6" and 12" risers will enable you to get **the perfect fit every time!**

Worried about safety? We are too! That's why you can install a concrete plug in our 20" and 24" riser pans. Additionally, we offer 12", 20" and 24" riser safety screens that provide a secondary layer of protection.

RISER SAFETY ACCESSORIES

Safety Screens
(12") 3017-SS
(20") 3009-SS
(24") 3008-SS

Lid-Lok Safety Device
(20") 3009-LOK
(24") 3008-LOK

24" Dual Safety Cover
3009-KYDC

NEW

24" x 2" Riser
3008-GR2

20" x 2" Riser
3009-GR2

20" x 3" Riser / Riser Pan
3009-LPRP

OTHER SIZES AVAILABLE

- **24" x 3" Riser / Riser Pan -** 3008-RP
- **24" x 6" Riser -** 3008
- **24" x 12" Riser -** 3008-R12
- **20" x 6" Riser -** 3009
- **20" x 12" Riser -** 3009-R12
- **20" Riser Pan -** 3009-RP
- **12" x 6" Riser -** 3017-R

1-877-959-7751 / www.polylok.com

For more information call or visit our website today!