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INSPECTOR GENERAL

An educated, professional team and a burgeoning real estate market spell success for Tim Shotzberger and Home Land Septic Consulting PAGE 10

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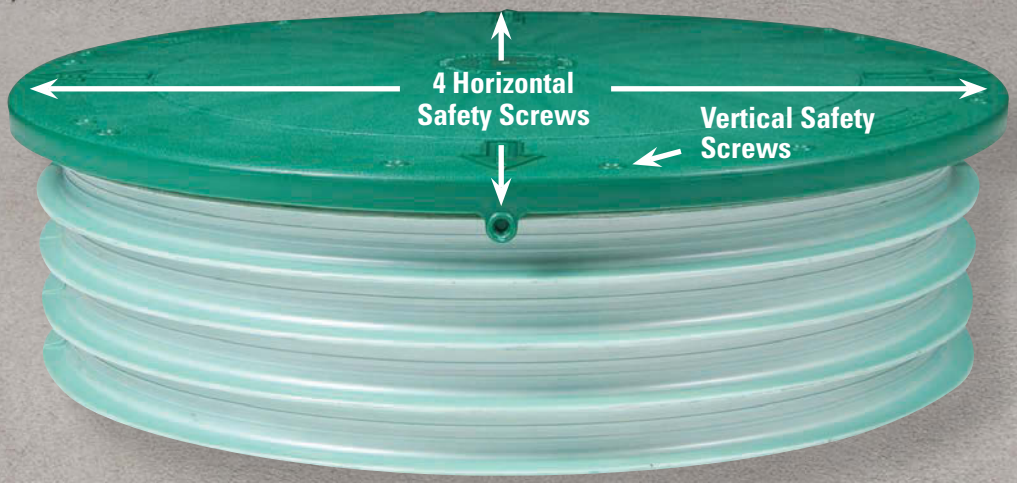

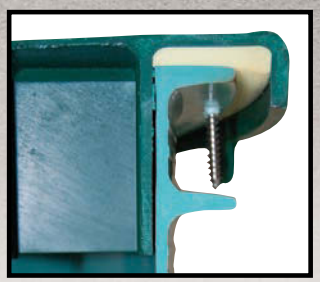

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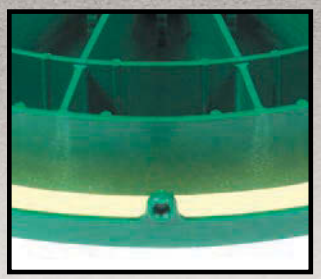

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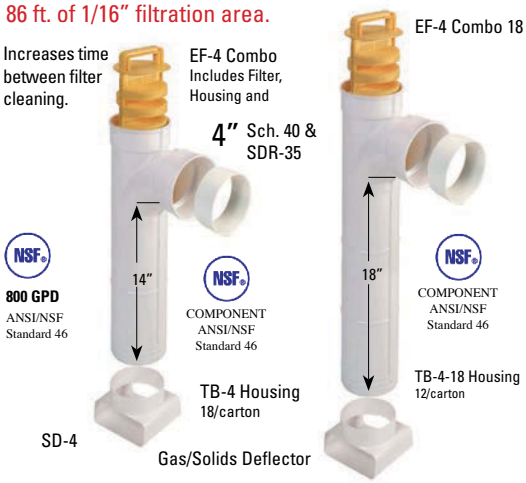

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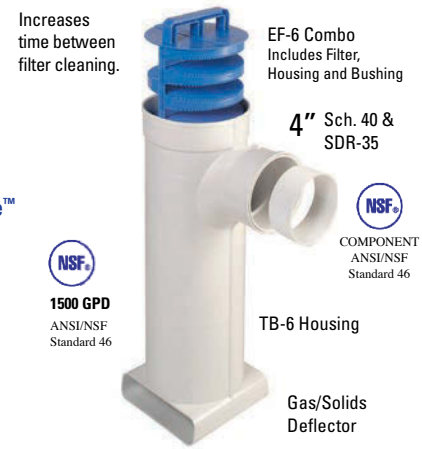

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ONSITE installer

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

Call toll free 800-257-7222;
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7:30 a.m.-5 p.m. Central time, Mon.-Fri.
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EDITORIAL CORRESPONDENCE
Send to Editor, *Onsite Installer,* P.O. Box 220, Three Lakes, WI, 54562 or email editor@onsiteinstaller.com.

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CIRCULATION
Circulation averages 21,954 copies per month. This figure includes both U.S. and International distribution.

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Hiring Tips to Build a New Installer Crew

Now's the time to identify another crew chief and add technicians who will help you keep pace with growing demand

By Jim Kneiszel

Where I live in Wisconsin, there's enough frost in the ground by now to bring most onsite work to a halt. When I call installers this month, the chances are pretty good I'll reach them in the office rather than in the seat of a mini-excavator digging a trench.

But that wasn't the case a few months ago. Here's how many phone conversations with installers went right up through the early fall:

Me: How's your summer going, Bill?

Bill: It's been crazy around here. I've been pulling 14-hour days and I just can't catch up. I have 30 jobs on a waiting list and I hope I can get all the work done before the snow flies. And the phone keeps ringing.

Me: Why haven't you added another crew to address the growing demand?

Bill: That's easier said than done. I've got to find people I can trust; workers with the skills to do the job right for my customers. And where am I going to find the time to look?

Me: Hmmm. Let me think about that. In the meantime, I better hang up the phone so you can get back on the excavator.

Bill: Thanks. Come up with some answers and give me a call in January. We'll catch up before the WWETT Show.

I've been thinking about the hiring challenges faced by Bill and other installers. There is intense competition for young workers cut out to be installers. It's physical – and sometimes dirty – work, it requires folks who can be motivated to work independently, and good candidates have to be willing to learn and adapt to new technologies all the time.

JOIN THE RECOVERY

Some installers feel like they can't trust anyone else to do the job right, so they try to take on everything themselves. That's a lot of pressure, and it only builds in a recovering economy where more customers are calling to repair or replace older systems or to work on new construction. You don't want to turn down work orders, but you also feel trepidation about hiring new employees.

But maybe this full-throttle schedule during the busy season has gone on long enough. Perhaps you're not spending enough time with your family during the summer. It could be that your current crew is experiencing the same problem and getting frustrated about working 60-plus hours a week.

It doesn't seem like it was so long ago that you were cutting back on employees after the collapse of the real estate market. But that was seven years ago, and the construction industry dynamic is much different today. New development is on the rise, and homeowners have been nursing along older systems for many years. It's time for an upgrade.

If you're considering adding a new crew for 2016, here are a few ways to put your best foot forward:

Some installers feel like they can't trust anyone else to do the job right, so they try to take on everything themselves. That's a lot of pressure, and it only builds in a recovering economy where more customers are calling to repair or replace older systems or to work on new construction.

Find a new crew leader

Review the skills and temperament of your current workers and identify a person you think could lead a new crew. Look for a responsible employee with potential leadership skills, someone who values your company and has a passion and excitement for onsite work. Ask that worker to take charge of a new crew and involve him or her in the employee recruitment process. That includes posting job ads, interviewing candidates and making hires. Share the burden and empower your new leader to train and supervise their helpers.

Reach out to educators

The onsite industry plays a critically important – but not widely understood – role in the construction and infrastructure trades. As such, student advisers at two-year technical colleges and high schools may not realize the great opportunities available to students who pursue careers in wastewater treatment. Installers can help raise awareness about these job opportunities and perhaps land a few qualified employees at the same time.

How can you help? Approach schools and offer to talk to students studying construction trades and tell them about the growing demand for

the work you do. Partner with your state onsite trade association to inform the public about the important environmental role onsite installers play in the community. Consider offering student internships or job shadowing experiences to anyone who takes an interest in onsite work.

Take a fresh look at pay and benefits

As you advertise jobs to bolster your crew, take a realistic look at what you pay for workers compared to similar construction-related positions in your region. Is your wage and benefits package commensurate with what other employers are paying in areas like HVAC, plumbing, excavating or construction? Given all the new technologies to learn and the environmental impact of onsite work, should you be paying workers more than many of the construction trades?

What can you offer a field of potential employees to stand apart from these other trades? Maybe it's a clear path to professional training and advancement. Or bonuses based on successful job completions. Or liberal family-friendly perks such as paid paternity leave or offseason flex time. People entering the workforce today want to know you care about their life beyond the work site and will value these efforts.

Provide training now

Use the winter season to train your team on best safety practices, how to use new tools and how to employ new onsite technologies. Be sure to take care of all required continuing education credits in the next few months so you're not forced to pull technicians off the job next summer to sit in a classroom. Take your employees to the WWETT Show Feb. 17-20 in Indianapolis. The Indiana Convention Center will be filled with exhibitors showing all the latest onsite technologies, and a slate of Education Day seminars and presentations throughout the week will help prepare your crews for the coming busy season. The more knowledge they gain now, the better they will be able to tackle onsite challenges come June.

START MAKING PLANS

This is the time to start looking forward to next spring and figure out how to address growing demand for your services. Customers will be calling sooner than you think to schedule work. If you have more hiring ideas to share with fellow installers, drop me a line at editor@onsiteinstaller.com or simply go online and start a conversation at the *Onsite Installer* forums. Together we can crack the code to finding more quality front-line workers.

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SIGNS OF TROUBLE

Reading Concrete

Concrete tanks are a standard in the wastewater industry, but when you confront one in the field, how do you know if it has a problem? Fortunately, they're pretty easy to spot, says one industry expert. And if you do find a problem, odds are you won't have to replace the tank. Concrete tanks are no longer simple things, if they ever were, but this article gives you guidance.

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MISSION: POSSIBLE

Team Players

Employees need to know what the mission is, what they're working toward. Everyone needs to be on the same page. This can be difficult, but if employees feel respected and like they are part of the process, they will fix problems they find along the way. Read up on how to work with your employees, particularly the managers, to discover the reasons why change (and teamwork) is necessary and beneficial.

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Overheard Online

"It's important to be mindful and consistent in your approach to employee vacation scheduling, which can save you from getting into trouble – especially during the summer, the Christmas season and other peak vacation times."

- Prevent Employee Vacation Scheduling Nightmares

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Simple Septic Math

How's your septic math? There are a couple basic tank characteristics that are necessary to know when maintaining septic and pump tanks. To determine them in the field requires the use of some basic math to determine areas and volumes. Check out an example of those basic calculations and what can be determined once those values are known. It might be time to study up!

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INSPECTOR GENERAL

An educated, professional team and a burgeoning real estate market spell success for Tim Shotzberger and Home Land Septic Consulting

By Ted J. Rulseh | Photos by Bob Stockfield

Tim Shotzberger started his septic system and well inspection company in Essex, Maryland, believing he could succeed by doing it better than anyone else.

He struggled for the first few years but managed to grow through the 2008 recession and aftermath. Then the company hit its stride. For the past few years, Home Land Septic Consulting has grown by about 40 percent annually and now has 10 employees who performed some 1,400 septic system inspections and 1,100 well tests in 2014, the vast majority connected with property sales.

A revived real estate market has certainly helped, but Home Land Septic thrives in large part by delivering high-quality inspections and detailed reports, and by providing the high level of service and communication required by the real estate agents who recommend the company to homebuyers.

Credit for that, in turn, goes to the field and office staff members, mostly college graduates, meticulously trained and well compensated. "We love talking up our employees," says Shotzberger. "We have their pictures, titles and short resumes on our website. The field guys have degrees in areas like chemistry and environmental science. We look for people with science backgrounds. It isn't always easy because it's hard to find smart young people who are also willing to go out and dig holes every day."

BUSINESS TRAINING

Shotzberger grew up in Lancaster County, Pennsylvania, and in 2000 earned degrees in economics and finance from Salisbury University in Maryland. His second job out of college was with Clear Creek Environmental in Annapolis, a sister company of Wind River Environmental.

Home Land Septic Consulting, LLC, Essex, Maryland

FOUNDED:	2004
OWNER:	Tim Shotzberger
SERVICE AREA:	14 Maryland counties
EMPLOYEES:	10
SPECIALTIES:	Septic system inspections, well testing and chlorination
AFFILIATIONS:	Maryland Onsite Wastewater Professionals Association (treasurer)
WEBSITE:	www.homelandseptic.com

<<LEFT: Michel Higgs, left, and Eric Garrett operate a RIDGID SeeSnake camera looking for potential problems like root infiltration, dips or breaks in the lines.

>>RIGHT: Scott Thompson (left) and Michael Higgs use a Sludge Judge (Cole-Parmer) to check the waste level. The lid shown is from Fergus Power Pump, Inc.

"I was an acquisitions analyst," says Shotzberger. "They were looking to purchase smaller pump truck companies and roll them into something bigger. I was the financial guy who would go in, look at the numbers and interview the owners about their practices."

After about a year, Wind River bought out Clear Creek, and Shotzberger continued in an acquisitions role, evaluating companies in Maryland, Connecticut, Rhode Island, Massachusetts and New York. Later, he was made a branch manager for a division in Sterling, Virginia; then he was transferred to Sykesville, Maryland, and that part of the business was sold to Fogle's Septic Service.

"We look for people with science backgrounds. It isn't always easy because it's hard to find smart young people who are also willing to go out and dig holes every day."
Tim Shotzberger

"I worked for them for a year and a half, and that's when I started my business," Shotzberger recalls. Short on cash for a startup, he concentrated on an area of wastewater services with a low threshold to entry and a perceived upside looking to the future: inspections.

"Inspections didn't require a lot of equipment, and it correlated with the training I'd had at Fogle's – I did a lot of inspections for them," he explains.

DEMAND GROWS

The Maryland Department of Environment (MDE) has a septic system inspection policy but no regulation requiring inspection for real estate sales. On the other hand, most homebuyers get inspections because mortgage lenders require them. "That definitely helps us," says Shotzberger. "Without that requirement, this business wouldn't be nearly as productive."

Shotzberger took the inspection certification class that MDE requires. Since then, the Maryland Onsite Wastewater Professionals Association (MOWPA) has taken over the course and teaches it under MDE auspices. Shotzberger is a fill-in instructor and MOWPA treasurer.

David Vincent pulls a septic tank lid in preparation for an inspection.

It took time to get the business on sound footing. Shotzberger hit the pavement, visiting real estate agents to give them business cards and information. "It's hard to get business as someone new because this is a very important job," he says. "Nobody wants to hire you for a septic inspection unless you have a reputation and are qualified."

To supplement his income in the early years, he at various times operated a lawn care business, worked as an employment recruiter (headhunter), and delivered pizzas. He also tried unsuccessfully to take on a partner and offer well pumps and water conditioning.

Dave Bancewicz inspects an observation port on a residential septic system.

WE HAVE LIFTOFF

His big break came when he joined the Greater Baltimore Board of Realtors: "They give you marketing opportunities. Realtors belong to the board, and affiliates like Home Land Septic can sponsor events and get their name out.

"They were kind enough to let me teach an Introduction to Septic Systems continuing education class. I've done that for the past several years. It gets me in front of Realtors, and more importantly, teaching classes gives me credibility. I can just talk to the people, relate to them, give them answers and shoot straight. People trust me after I teach the class."

Shotzberger has branched out by building connections with county Boards of Realtors. "Starting in 2012, post-recession, it's really in the last 3 1/2 years that we've really started to gel. It's a really good real estate market. Interest rates are low, there's inventory, there are buyers and sellers. It's not just about our company doing an excellent job. It's also us riding on the back of the real estate industry."

"We brag about not doing repairs — if we find a problem, we're not going to replace your drainfield. That gives us a lot of credibility."
Tim Shotzberger

His team members help keep the momentum going. Eric Garrett, field manager, leads the crew of inspectors, which includes Jon Blevins, Dave Bancewicz, David Vincent, Scott Thompson and Michel Higgs. Working the office are Erin Moffett, office manager; Amy Pletz, marketing director; Jessica Harrington, human resources manager; and Holly Dennis, administrator.

WORKING WITH REALTORS

A professional staff is key to catering to the real estate industry, Shotzberger says. The agents are the gatekeepers for most inspections, and Shotzberger concentrates on his staff's relationship with them.

"Realtors expect a very high level of service," Shotzberger says. "You got to be there when the phone rings. We have four office staff members – it takes that level of staffing to communicate with the Realtors, answer their questions, talk to underwriters and make sure the reports are accurate. In addition, our field team members are well-educated guys who can communicate, write well and speak well."

New team members take the MDE-required inspector certification course but get most of their training in the field. Typically, a new person travels with an experienced inspector for three months and must pass a company-created exam before doing inspections independently. Office staff members travel with inspectors for at least one day. "If they're going to explain things to customers over the phone, they need to go out and see things for themselves."

Although MDE has an inspection form that it recommends using, Home Land Septic created its own form. "What MDE wants us to do is something more

(continued)

Recruiting challenges

It's fine to want college graduates in the sciences to work in a well and septic system inspection business. But how do you recruit them when they have so many other options? It's not easy, but Home Land Septic Consulting has a plan.

"Jessica Harrington, our human resources manager, doubles as a recruiter," says owner Tim Shotzberger. "She'll go to the local colleges and hand out information. One of the events we attend is a career fair for the math and science majors at the University of Maryland. Jessica has spent about a year recruiting and has found two good candidates in all that time, both of whom we were able to hire. She has talked to hundreds and hundreds of people to get those leads.

"We tried using a headhunter, but there just aren't any out there who can find people this specific – guys who can do blue-collar work but also have college degrees and can write and communicate well." Four of the company's five inspectors are college graduates, as are all four office team members.

"We hire people who are motivated by money," Shotzberger says. "The inspectors are paid based on commission, and they make a very good income. They get full health insurance and a match on a 401(k). We provide short-term disability coverage. We treat them well because we expect a lot from them. The people who have joined our team have thrived, financially and professionally."

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than homebuyers want to pay for." It's mainly a checklist, although it has spaces for comments and descriptions of issues. There's also room to draw a map of the system.

Aerobic treatment units are increasingly common. Company inspectors have encountered several models and received training from the manufacturers in how to educate buyers to move forward with operations and maintenance. "The manufacturers actually frown upon us doing any type of inspection," Shotzberger says. "We pull records from the county and the manufacturer, make general notes about the aerobic treatment unit in question, and suggest the owner contact the appropriate operations and maintenance person."

"It's a really good real estate market. Interest rates are low, there's inventory, there are buyers and sellers. It's not just about our company doing an excellent job. It's also us riding on the back of the real estate industry."

Tim Shotzberger

ABOVE: The work crew at Home Land Septic includes, from left, Scott Thompson, Jon Blevins, Dave Bancewicz, Eric Garrett, David Vincent and Michel Higgs.

BELOW: The office staff at Home Land Septic includes, from left, Emily Harris, Amy Pletz, Holly Dennis, Tim Shotzberger, Jessica Harrington and Erin Moffett.

STEP BY STEP

The first inspection step is to find and expose the septic tank. While in most cases there is an access at grade, many tanks must be located and dug up. Each inspector carries probes (T&T Tools) and a metal detector (CST/berger) that can pick up tank rebar at depths of 3 feet. For looking inside tanks, they carry a mirror and a powerful flashlight; they use a Sludge Judge tool (Cole-Parmer) to measure the solids level.

They inspect the distribution box, if that is accessible, and perform a hydraulic load test, running water through the system in an amount based on a formula that includes the number of bedrooms in the home. The most important part of the process is probing the drainfield. Because few systems they encounter have inspection ports, inspectors use a 3-pound hammer to drive in sections of electrical ground rod. They pull the rod back and get a reading on whether the stone is wet or dry or has heavy biomat.

"We type up our report, which is a two-page Word document template," Shotzberger says. "We fill in the address, the date and time, the weather conditions, the size and type of septic tank, and write comments to describe the system and its condition. We want somebody to be able to come behind us and do exactly what we did, so we have a lot of detail in our reports. We email them out to our clients within 24 hours."

The reports stick to observations about the system and do not make predictions, such as how long a system might last. "You can have a great-looking system in July, and once the wet season comes around in December, it could fail," Shotzberger says. "We can't measure the water table and what the groundwater does. On the other hand, if we see a system that is backing up, that is concrete proof there's a problem, and we will use stronger words. We actually label it unsatisfactory."

Inspectors don't get involved in negotiations between buyers and sellers but do answer questions about how septic systems work and how to maintain them. "We pride ourselves on being a third-party inspector," Shotzberger says. "We brag about not doing repairs – if we find a problem, we're not going to replace your drainfield. That gives us a lot of credibility." As a shield against liability, the company carries errors and omissions insurance.

Dave Bancewicz assembles a pole and mirror to get a closer look inside a septic tank.

THE RIGHT TOOLS

A custom software tool called Jolene, created by a local developer, Jeremiah Seitz, helps the office team book appointments and track revenue. "We have three people who answer the phones, so it's tough to use a simple spreadsheet the way we used to," says Shotzberger. "With the software, all the office people can book jobs at the same time without stepping on each other's toes. Once a job gets booked, all the person has to do is mark the date and time down in Jolene. It's impossible for them to double-book a job."

The company markets almost exclusively through real estate channels. "That's our bread and butter, and that's where we spend at least 90 percent of our marketing dollars. Our website is new as of last year, and we love it. We try to drive people there. It has great information that helps us build business. People can book a job through the website by sending us an email."

The field equipment inventory is growing. The company aims to buy an excavator soon to limit manual digging and to access tanks buried deeper than 3 feet – beyond which Shotzberger will not ask his people to dig with shovels.

The company recently bought a SeeSnake push camera and an SR-20 locator (both from RIDGID). "That helps us find tanks and distribution boxes," Shotzberger says. "With that equipment we can offer a higher-priced inspection. We can stick that camera in the drainfield lines and get a visual look at the pipe. We can put on paper to scale exactly how long the front line is, how long the back line is and how long the drainfield trenches are."

The camera and locator may enable the company to expand into lateral inspections on homes connected to municipal sewers, another service referred by real estate agents. "Plumbing in the Baltimore area is old and bad, and there is a pretty big demand for sewer inspections."

A BRIGHT FUTURE

Right now, Shotzberger's biggest problem (a good one to have) is keeping up with growth. "It's tough because you can't plan for 40 percent growth, and yet if you don't plan for it, you're under capacity," he says. Last summer, the company was typically backed up two weeks with work.

The team helps hold it all together. Once on board, people have tended to stay; turnover has been limited to one inspector and two office employees.

"We're trying to create a family atmosphere," Shotzberger says. "Just recently we had a happy hour at my house, where everybody came with their families. We really enjoyed ourselves. They're good people, and when you have good people they tend to stick around."

MORE INFO:

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www.coleparmer.com

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www.cstberger.us

Fergus Power Pump, Inc.
218/736-6772
www.ferguspowerpump.com
(See ad page 29)

RIDGID
800/769-7743
www.ridgid.com

T&T Tools, Inc.
800/521-6893
www.mightyprobe.com
(See ad page 19)

Contractor Uses WWETT Show to Help Attract Franchisees

By Craig Mandli

With its creative name and Freddie, a playful bright-blue frog as a brand ambassador, bluefrog Plumbing + Drain created a buzz at the 2015 Water & Wastewater Equipment, Treatment & Transport (WWETT) Show. The company used WWETT to introduce attendees to the company and seek new franchisees.

The plumbing and drain cleaning service, repair and replacement franchise is backed by a national franchise system with more than three decades of experience. Home Brands Group, the parent company of Re-Bath and 5 Day Kitchens, seeks to move its brands forward and build systems to help them sustain long-term growth.

"We are aiming for independent company operators that utilize one to four trucks in their business," says Jeremiah Cundiff, the company's franchise development director. "Under our plan, the independent contractor would convert to our franchise, with the goal of growing the business into six or more trucks."

According to Cundiff, bluefrog Plumbing + Drain focuses on providing consumers with five attributes, including timeliness, safety, professionalism, consideration and a transparent value.

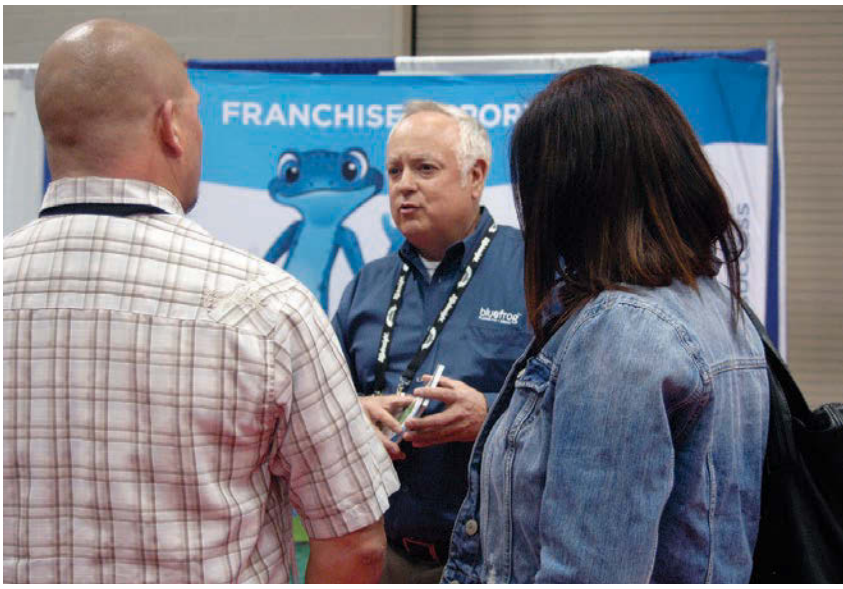
The brand is easily marketable, and franchisees are required to stay open 24/7, 365 days a year, with no extra charges for nights, weekends or holiday calls, he explains. Service technicians give each client a courtesy call while on their way with the projected arrival time, and for security purposes can email a photo of themselves to the client prior to arrival at their home.

"We train our franchisees on a different way of operating a business," he says. "Our system shifts away from price to a value-based service. Instead of offering the lowest price, our intent is to offer the best service and increase the value for the client."

To handle increased business, the company provides education on how small businesses can add valuable employees to their teams. The idea focuses on helping the owner of the franchise leverage their trade knowledge by getting them out of the truck and into a managerial role.

"One of the biggest reasons small companies struggle with increased business is that typically the owner is a plumber that's still running service calls every day instead of taking the time to build and oversee his team," says Cundiff. "We help that owner find the right technicians to field his service calls and positively represent his business. We want technicians that understand the importance of a positive customer experience."

The new franchise opportunity adds an additional revenue stream that's relevant to existing septic service and installation businesses. For instance, Cundiff says that several franchise partners are composed of independent system installers looking to expand their service offerings, as well as independent plumbers who are looking to apply the proven system. That idea appealed to several WWETT attendees.



Jeff Moody, middle, vice president of operations for bluefrog Plumbing + Drain, discusses franchisee opportunities with two attendees at the 2015 WWETT Show. The company is aimed at wastewater service professionals looking to increase service offerings. (Photo by Craig Mandli)

"Many of the treatment system installers I've spoken with at this show are already master plumbers, so this is a great opportunity for them to leverage that to great additional revenue opportunities," says Cundiff. "Coming in to this show, our goal was to leave with three or four strong franchise partner leads. We had 22 strong leads just the first day. We couldn't be happier with the response."

At the 2016 show, bluefrog Plumbing + Drain will again be looking to add trustworthy, independent contractors who have an entrepreneurial drive to its franchise system. The ideal prospect is an established independent plumber or septic service technician who is bottom-line driven, customer-service oriented, and has a passion for community involvement.

"The great thing about this show in particular is the varied locations of the attendees," says Cundiff. "I have talked with people from all around the country and Canada. A big goal of ours is expanding the company's reach, so our opportunity at WWETT is great." **844/260-3764; www.whateveryplumbermustknow.com.**

"Rules and Regs" is a monthly feature in *Onsite Installer*™. We welcome information about state or local regulations of potential broad interest to onsite contractors. Send ideas to editor@onsiteinstaller.com.

North Dakota Judge Blocks Clean Water Act Updates

By Doug Day

The U.S. Environmental Protection Agency's new Clean Water Act rules were blocked in August by a federal judge in North Dakota. The EPA says the temporary injunction from U.S. District Judge Ralph Erickson applies only to North Dakota and 12 other states (Alaska, Arizona, Arkansas, Colorado, Idaho, Missouri, Montana, Nebraska, Nevada, New Mexico, South Dakota and Wyoming). The EPA says it will continue to enforce the rule in the rest of the country. The North Dakota case is one of 10 cases pending across the country affecting a total of 29 states.

Designed to clear up confusion over various court rulings on challenges to the 1972 Clean Water Act that put into doubt what waters were under jurisdiction of the law, the revisions seemed to increase the uncertainty. Opponents of the rule, on their "Ditch the Rule" website, call it a federal land grab that would "immensely" expand the EPA's jurisdiction and cover puddles, ponds, ditches, dry streams, groundwater and isolated wetlands. In response, the EPA started its own "Ditch the Myth" website saying the rule reduces the scope of waters under its jurisdiction, "does not protect any waters that have not historically been covered under the Clean Water Act," and "protects fewer waters" than before.

The judge ruled the EPA exceeded its authority in its update to the Clean Water Act, which has been opposed by agricultural, business, energy, housing development and other groups. A federal judge in West Virginia declined to block the rule in August.

OHIO

The Ohio Environmental Protection Agency has released up to $5 million for low-income homeowners to repair and replace failing onsite wastewater treatment systems. The Water Pollution Control Loan Fund provides the principal-forgiveness loans through local health districts, with each district eligible for a maximum of $300,000 in 2016. Local districts must nominate projects, which are then selected based on state EPA criteria. The program has been revived after being phased out two years ago. Another $18.5 million is available to communities to correct combined sewer overflows or to provide sanitary sewer for unserved areas.

ALABAMA

A state circuit court judge has issued a final ruling that requires remaining structures in a mobile home park and marina to be removed. Septic tank failures and graywater discharge problems resulted in a notice of violation to the property owner, Alabama Power Company, which leased the 37 acres to Lake Martin's Pleasure Point Park and Marina. The company was cited in 2013 for 19 violations, including unpermitted and illegal septic systems and graywater discharges from the mobile homes, resulting in cancellation of the lease. Residents had reported problems to the operator of the mobile home park but say she did nothing to remedy the situation. About 80 families had to relocate their mobile homes. Alabama Power said it could cost up to $1 million to remove all illegal systems and clean up the property. Fewer than 30 structures remained on the land at the time of the final court ruling.

ARKANSAS

A lawsuit filed against the operator of a large onsite wastewater system alleges a decade of violations and overflows. The Arkansas Department of Environmental Quality filed the suit in August against Property Owners Improvement District Number 5, which provides onsite wastewater treatment for more than 400 homes in a subdivision near Farmington, Arkansas. ADEQ seeks $420,000 in penalties and proof that the operator can run the system properly.

Inspections found overflows from an aeration pond and manhole, along with solid waste on the ground and in a tributary of the Illinois River more than a mile away. An emergency order required the district to stop the discharges and to make repairs. The department says similar incidents occurred in 2007, 2008, and yearly since 2012. The Improvement District was fined $2,150 in 2014. According to the *Northwest Arkansas Democrat Gazette* newspaper, the operator claims the system is oversized, built for three times the number of homes it serves, so the wastewater levels don't get high enough to move waste to the next stages of treatment.

WISCONSIN

Amish families in Wisconsin will now be able to get a waiver from state plumbing, electrical and building codes that violate their religious beliefs. The exemption was included in this year's state budget and is available to members of all established religious sects. The state has about 17,000 Amish, ranking it fourth in the nation, and some have been fined or evicted for violating codes. Under the waivers, the Amish will not have to install smoke or carbon monoxide detectors or follow electrical or plumbing codes of the state or local community that violate their religion. David Mortimor of the National Committee for Amish Religious Freedom says the law could be a model for other states.

DELAWARE

An effort to reduce nitrogen from septic tank effluent in the Chesapeake Bay watershed is running behind schedule. The Chesapeake Bay Foundation reports that reduction efforts are more than 10 percent behind schedule for the 2017 goals. Septic systems contribute 3 percent of the nitrogen in Delaware's watershed, and 7 percent in Maryland. The two states require the use of the best available technology for new or replaced systems near the bay. That covers about 1,500 lots in Delaware and 52,000 in Maryland. ☐

Go-To Educators

Even without state training requirements, the Kansas Small Flows Association seeks to raise the professionalism of its membership

By Doug Day

The Kansas Small Flows Association (KSFA) has one prime objective for onsite professionals in the Sunflower State: providing education and training. With no state requirements for licensing or continuing education, KSFA works to keep contractors and regulators up to date and promote the proper use and installation of septic systems.

Executive Director Charlene Weiss has been involved with the group since it formed in 1997, serving time on the board of directors and terms as president, vice president, secretary and treasurer. After 25 years as a regulator at the county level, Weiss became executive director of KSFA in 2013. Jessi Woods is a board member and past president.

What do you offer in the way of training?

Weiss: We try to be the educational source in Kansas. It's a hard thing to do when you don't have regulations that require regulators, much less installers, to attend classes. We have 85 members; it has been as high as 110. It's almost 50-50 between contractors, a couple who are both installers and pumpers, and regulators, with some manufacturers and engineers.

We have 14 courses. In the past, we've offered them when counties ask us to do training for their contractors. We have talked about changing that a little bit.

"I'd like to see our association double in size. When you see states that require contractors to have licenses and continuing education, it seems like it helps the state associations."
Charlene Weiss

In October 2014, we received a $43,500 grant from the U.S. Environmental Protection Agency 319 fund through the Kansas Department of Health and Environment to educate regulators. We've trained about 35, including a two-day soils workshop, the National Onsite Wastewater Recycling Association (NOWRA) conference, and regulators could get scholarships to attend educational sessions at our annual conference. We'll be doing another soils workshop and have one additional class to set up.

Charlene Weiss
executive director of Kansas Small Flows Association, 913/594-1472 or kansassmallflows@ksfa.org
KSFA

Woods: The two-day training materials were provided by NOWRA. In January 2015, we paid for five contractors to attend Certified Installers of Onsite Wastewater Treatment Systems (CIOWTS) training and sit for the exam provided by the National Environmental Health Association. Four of them passed the test that was conducted at our annual conference in February.

We are hoping counties will adopt CIOWTS as a form of licensing and would allow our educational programs to be continuing education for that.

Where does the regulatory power reside in Kansas?

Weiss: With the counties. The state has minimum standards, Bulletin 4-2, from the early 1980s. Most counties have their own codes that refer to Bulletin 4-2, which has not been revised since 1997. There is one county and several cities that have no local regulations. The state regulates those entities as necessary.

The counties I worked in were fairly active and more advanced as far as not being afraid to look at alternative systems. Several years ago I was on a committee to rewrite the Kansas Environmental Health Handbook. We tried to cover everything from the original EPA manual from 1980 and update it to add alternative and advanced treatment systems.

Does it work?

Weiss: That's a good question. In many counties, the population is so sparse that it's not critical. The counties that have codes, a lot of them read the same. That makes it more consistent. Contractors have a harder time than anyone. They may work in four or five counties and something might be a little bit different in each.

I'd guess that about 25 percent of counties require some type of licensing or permitting for contractors, but not many require continuing education. It's hard to get the word out to contractors about KSFA when you have county-

by-county regulations, and we have to rely on counties for names and addresses. If they don't license them, they may not even have that information.

In the counties where I worked, we'd have 50-some licensed installers, but there were maybe 10 or 12 who did most of the work. It's hard to require continuing education and things like that for people who very seldom put in a system.

There has been a loss of some funding for counties. Is that having an effect?

Weiss: There had been funding from 1990 until 2011 for the Local Environmental Protection Program. (LEPP provided grants to local governments for regulating wastewater and water systems. It was cut in 2011 through a budget veto by Gov. Sam Brownback.) The money received was based on population, so some counties only received $7,000 a year but that was enough for them to at least have one sanitarian to administer the code.

To get the funding the code had to meet Bulletin 4-2, and to keep the funding you had to have someone administering the code. At one time, 100 percent of the counties had some kind of code. With the loss of those funds, there may still be an existing code in a county, but it may not be administered.

That's one reason why KSFA was interested in NOWRA's lobbying efforts last year and even contributed to it in hopes of some federal monies coming our way through the state.

What would be your ultimate goal?

Woods: We've always wanted some sort of a common state-licensing program. We realized after a couple of years of trying to get there, because of the way things are set up, that was not going to be a very effective way to get it done. That's when we started going county by county, connecting with the bigger counties first, trying to get them on board with our educational programs and CIOWTS certification and hoping they would adopt our programs and it would trickle down.

Weiss: There are installers that are very active in our association, and I think that is a key. We need more of them to be active. They can help spread the word.

Kansas provided guidance last year for local governments covering graywater reuse for single-family homes. What has been the reaction?

Weiss: I served on the state committee to get feedback from regulators and help write the specifications. They are fairly restrictive. Kansas has been very conservative. I don't know that there's anybody who has used them yet.

It will be a long time before you see a sprinkler system for graywater that you may have in other states. Everything still has to be subsurface, so really about the only way you can do anything is with drip irrigation. That's pretty difficult. There are also only certain times of year you can do it, not when the ground is frozen, so you'd have to have a storage tank to be able to hold the graywater.

But at least we have something that we didn't have before. A separate graywater system for watering your landscape, even though it's subsurface, would not have even been discussed, probably. All of us on the committee felt it would be so much easier if you were building a new house. It would be really difficult to try to meet the specifications with an existing home.

Looking out a few years, what would you like to see?

Weiss: I'd like to see our association double in size. When you see states that require contractors to have licenses and continuing education, it seems like it helps the state associations. But even if the counties required it, that would be a big boost to our association and allow us to offer a lot more training and have a crowd where we have to turn people away. That would be awesome.

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Education Day Sessions

Wednesday, February 17, 2016

NAWT
National Association of Wastewater Technicians
Rooms 234-236

8 a.m.	Basics of Septic System Control Panels
9:30 a.m.	Using Septic Control Panels to Troubleshoot Systems
11 a.m.	Inspecting Concrete Sewage Tanks
1:30 p.m.	An Exercise in Septic System Troubleshooting
3 p.m.	The Basics of Inspecting Drip Systems
4:30 p.m.	NAWT Ask the Experts Panel Discussion

SSPMA
Sump and Sewage Pump Manufacturers Association
Rooms 133-135

8 a.m.	Understanding Pumps and Common Pumping Issues
9:30 a.m.	Evaluation and Installation of Backup Pump Systems
11 a.m.	Best Installation Practices for Trouble-Free Pump Controls
1:30 p.m.	Troubleshooting Pumps, Panels and Switches with Digital Multimeters
3 p.m.	Sizing Guidelines for Sump, Sewage and Grinder Pumps
4:30 p.m.	SSPMA Ask the Experts Panel Discussion

Business Strategies
Rooms 140-142

8 a.m.	How Much Should I Charge?
9:30 a.m.	Business Game Changers: Top 5 Secret Strategies for Massive Growth in Your Service Business
11 a.m.	The Un-Business Plan – Making Your Business Less Complicated But More Profitable
1:30 p.m.	How to Use Superior Customer Service to Increase Sales
3 p.m.	Reward the Right Stuff: Finding, Training and Keeping Great Team Members
4:30 p.m.	Is Your Business Prepared for a Crisis?

Industry Safety
Rooms 237-239

8 a.m.	Pre-Engineered Shoring Systems for Cross-Trench Utility Challenges
9:30 a.m.	Excavation Safety
11 a.m.	OSHA Confined Space, Air Monitoring and Fall Protection Explained

SSCSC
Southern Section Collection Systems Committee
Rooms 231-233

8 a.m.	Positioning Yourself for Promotion and Succession Planning
9:30 a.m.	Step Up Your Game! Taking Current CCTV Inspection Technology to the Next Level
11 a.m.	Trailer Jetting – Getting the Most Out of Your Equipment
1:30 p.m.	Vacuuming: the Other Half of the Combination Unit
3 p.m.	Sewer System Maintenance – Challenges and Solutions
4:30 p.m.	SSCSC Ask the Experts Panel Discussion

NOWRA
National Onsite Wastewater Recycling Association
Rooms 240-242

8 a.m.	Introduction to Soils
9:30 a.m.	Onsite Septic System Loading Rates and Site Layout
11 a.m.	Making Infiltration Decisions – Understanding Soil Surface Design
1:30 p.m.	Soil Dispersal Comparison
3 p.m.	Introduction to the Elements of Onsite System Design and Regulations
4:30 p.m.	Onsite Septic System Hydraulics and Pump Design

Portable Sanitation
Rooms 136-138

1:30 p.m.	Marketing Basics: How to Effectively and Efficiently Grow Your Portable Sanitation Sales
3 p.m.	Trust – How to Build it and Use it to Grow Your Portable Sanitation Business
4:30 p.m.	Portable Sanitation Forum: Current and Future Critical Issues Affecting the Industry Discussion

NASSCO
National Association of Sewer Service Companies
Rooms 130-132

8 a.m.	Cleaning Nozzle Technology
9:30 a.m.	Large vs. Small-Diameter Pipe Cleaning
11 a.m.	The Lower Lateral – The New Frontier in Sewer Rehab
1:30 p.m.	Chemical Grouting Technologies
3 p.m.	The Growth of the UV Cured CIPP Process
4:30 p.m.	NASSCO Ask the Experts Panel Discussion

Treatment Plant Operator
Rooms 243-245

8 a.m.	Effective Strategies for Collections System Management
9:30 a.m.	Sustainable Innovation in Biosolids Management
11 a.m.	Pretreatment and Wastewater Lagoon Management
1:30 p.m.	Septage Collection and Treatment
3 p.m.	Large Scale FOG/Septage Receiving Station – Lantern Environmental Project Case History
4:30 p.m.	Progress in Electrochemical Water Treatment in Last Century

WJTA-IMCA
Water Jet Technology Assoc. - Industrial Municipal Cleaning Assoc.
Rooms 237-239

1:30 p.m.	Proper Industrial Truck Maintenance Can More Than Pay for Itself in Productivity and Safety
3 p.m.	Air Conveyance Through an Industrial Vacuum Truck
4:30 p.m.	Vacuum Excavation Applications and Opportunities

Women in Business
Rooms 136-138

8 a.m.	Marketing to Women
9:30 a.m.	Women of Wastewater: Building a Community of Allies
11 a.m.	Women in Wastewater Roundtable

Vacuum Truck Equipment and Operation Training
presented by NAWT National Association of Wastewater Technicians
Rooms 109-110 **8 a.m. - 5 p.m.**

This day-long session will discuss in detail the equipment on vacuum trucks and how to operate them. Pumping terms will be covered, as will safety principles, materials often encountered on the job and government regulations.

Feb. 17-20, 2016
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WWETT Education Sessions

Thursday, February 18, 2016

Liquid Waste Treatment & Disposal
Rooms 130-132

8 a.m.	Analysis of Drainfield Failures and Restoration Methods
9:30 a.m.	Cash In on Community System Operations and Maintenance
11 a.m.	Ultra-Efficient Inspection Technique to Locate Leaks on Septic Systems

SSCSC Sewer & Drain Cleaning Course
Rooms 231-233

8 a.m.	Hands-On Nozzle Technology
10 a.m.	Hands-On Jetter Hose Maintenance – Care and Repair

Sewer & Pipe Rehabilitation, Relining & Repair
Rooms 234-236

8 a.m.	Take Control of Inflow and Infiltration in Manholes
9:30 a.m.	When Things Go Wrong on a Lining Job
11 a.m.	Taking Small-Diameter Drain Lining Inside Infrastructure

Sewer & Drain Cleaning, Inspection & Repair
Rooms 133-135

8 a.m.	Using the Clean Water Act to Grow Profits
9:30 a.m.	Winning Trench Warfare – Finding Profitability in Sewer/Septic Work
11 a.m.	Your Best Shot at Sewer Success – How to Get the Most From Inspection Technology

Onsite Septic Installation, Repair & Design
Rooms 237-239

8 a.m.	Overview of Application, Design, Installation and Operation of Drip Dispersal Systems
9:30 a.m.	Onsite System Pump Design Made Easy
11 a.m.	The Onsite Wastewater Industry and Our Carbon Footprint

Treatment Plant Operator
Rooms 243-245

8 a.m.	Smart Water Technology in Theory and Practice
9:30 a.m.	Dissolved Ozone in Municipal Collection, Treatment and Disposal
11 a.m.	Municipal Biological Waste Treatment

Business Strategies
Rooms 136-138

8 a.m.	How Self-Employed People Can Make More Money
9:30 a.m.	Growing Your Business in a Tough Economy
11 a.m.	Staying in Front of Your Customer

NOWRA Design Course
Rooms 240-242

8 a.m.	Mound and At-Grade Design
9:30 a.m.	Low-Pressure Pipe in Drainfield Distribution
11 a.m.	Subsurface Drip Irrigation

Municipal Sewer & Water
Rooms 140-142

8 a.m.	How to Recover Non-Revenue Water
9:30 a.m.	Phased Assessment Strategy for Sewers - Understanding Sewer Condition Quicker with Fewer Resources
11 a.m.	The Science of Pipe Cleaning – Flow and Pressure

Many states approve WWETT education sessions toward fulfilling required certified education units or professional development hours.

See wwettshow.com for a list of approved states and courses.

Friday, February 19, 2016

Liquid Waste Treatment & Disposal
Rooms 130-132

8 a.m.	Fact vs. Fiction: The Top Ten Septic Myths
9:30 a.m.	All About Facultative Bacteria
11 a.m.	Brown Grease Recovery From Grease Trap Waste: Science and Economics

Industry Safety
Rooms 140-142

8 a.m.	Identifying and Managing Risk in a Septic or Sewer Business
9:30 a.m.	How Well Do You Know Your Cleaning Hose?
11 a.m.	Pathogen Exposures to Workers in the Onsite Industry

Business Strategies
Rooms 240-242

8 a.m.	Creating a Data-Driven Strategic Marketing Plan
9:30 a.m.	What Every Sewer and Drain Contractor Needs to Know About Asset Protection, Tax Reduction and Estate Planning

Municipal Sewer & Water
Rooms 240-242

11 a.m.	GIS: Empowering Water, Wastewater and Waste Removal Organizations

Sewer & Drain Cleaning, Inspection & Repair
Rooms 133-135

8 a.m.	Advanced Pipe Bursting
9:30 a.m.	Low-Latency, High-Definition Video Over Coaxial Cable for Remote Inspection
11 a.m.	Plumbers vs. Technicians: The Slow Decline of the Tradesman

Municipal Sewer & Water
Rooms 231-233

8 a.m.	Using Acoustic Inspection to Prioritize Sewer Cleaning
9:30 a.m.	Evaluation of Automatic Filters for Nozzle Protection in Recycled Water Applications
11 a.m.	Flow Monitoring – How to Make Your Program Successful

Treatment Plant Operator
Rooms 243-245

8 a.m.	Insights into Ozone Water Treatment Plants
9:30 a.m.	Wastewater Microbiology
11 a.m.	How to Ensure Gold is the Result – Choosing the Right Dewatering Equipment

ONSITE installer CERTIFIED PROFESSIONAL

Business Software & Technology
Rooms 136-138

8 a.m.	Know the State of Your Business Using Business Charts and Reports
9:30 a.m.	Using Software to Save Time and Increase Profits
11 a.m.	Using Mobile Devices for Business

Sewer & Pipe Rehabilitation, Relining & Repair
Rooms 234-236

8 a.m.	Buying Back Capacity
9:30 a.m.	Successful Reduction of I&I Using the Holistic Approach to Sewer Rehabilitation
11 a.m.	Large Scale Centrifugally Cast Concrete Pipe Culvert Rehab in CO Dept. of Transportation Region 1

COLE Publishing's Onsite Installer Course
Rooms 237-239 8 a.m. - 5 p.m.

This day-long session will walk professionals through an introduction to proper installation practices for the sustainable use of onsite treatment systems

Detailed session information available at:
www.wwettshow.com

Wastewater Treatment on a Craggy Rock in the Ocean

A lighthouse island off Maine's wild coastline was a forbidding setting to provide an effective onsite system for a bed-and-breakfast inn

By David Steinkraus

A single entry on the permit form summed up the challenge of the project — Type replaced: Overboard discharge. Year installed: 1892.

Things have changed between 1892 and now. Modern codes would not allow a pipe to dump untreated wastewater into the Atlantic Ocean for a new bed-and-breakfast operation built in a renovated lighthouse along the coast of Maine. Yet a creative group of wastewater professionals developed a solution that enabled the business to proceed while containing and treating all the wastewater on what is little more than a rock table sticking out of the ocean.

REUSING HISTORY

The lighthouse was built on the Cuckolds Islands, about 1/2 mile offshore from Boothbay Harbor, which is itself about 30 miles up the coast from Maine's largest city, Portland. A fog station has been here since 1892, and the lighthouse since 1907. Both warned ships away from a pair of rock ledges that would rip open hulls. In 2006 ownership of the lighthouse was transferred to the private group Cuckolds Fog Signal & Light Station Council, which began restoration.

When the plan for a bed-and-breakfast came up, wastewater disposal was a major question. Because the island is bedrock with a thin covering of soil in some places, there was not enough treatment capacity for the planned use. The first proposed solution was to pump wastewater through a 1.5-mile pipe on the ocean bed and up the coast of the mainland. There it would come ashore, go beneath a small freshwater pond and an asphalt road, and end on a parcel of land where it would be treated. This proposal ran into opposition from the U.S. Army Corps of Engineers and state regulators who were concerned about the potential for underwater leaks and other harm to the environment.

A TOTAL ONSITE SOLUTION

Engineers from the Knickerbocker Group assembled a team that included environmental consultant and system designer Albert Frick of

<< Opposite Page: White bags hold dirt ready to be spread across the rocky island where the Cuckolds Islands lighthouse sits off the coast of Maine. The shed at left was a boathouse and was repurposed to hold the BUSSE membrane bioreactors.

BELOW: A boat hauls supplies to the Cuckolds Islands project off the coast of Maine. This was a calm day, but wind and waves sometimes prevented work.

>> RIGHT: David Potts (left) and Dan Borkowski (center) build the absorption field at the Cuckolds Islands lighthouse. Wastewater comes from the shed in the background that holds the BUSSE membrane bioreactors. (Photos courtesy of Albert Frick)

Albert Frick Associates, David Potts of Geomatrix Systems LLC, and Ingo Schaefer of BUSSE GT.

The BUSSE system uses aerobic digestion paired with microfiltration membranes to treat wastewater to rainwater quality, meaning less than 5 mg/L of BOD and TSS, and less than one fecal coliform. Then the SoilAir and Geomatrix system takes over. It pumps wastewater and air to the distribution field where Geomatrix GeoMat fabric helps disperse the water. Thus the system tackles treatment with aerobic digestion in two ways, Frick says. One is in the membrane bioreactor, and the other is at the soil-water interface.

"When you look at this project, what we essentially did was put a wastewater system on top of a boulder sitting in the water. We are now at a point with technology where you can have both development and sustainability."
Albert Frick

SYSTEM PROFILE

Location:	Cuckolds Islands, Maine
Facility served:	Bed-and-breakfast inn at Cuckolds Lighthouse
Designer:	Albert Frick Associates Inc., Gorham, Maine
Installer:	Albert Frick Associates; BUSSE GT of Oak Park, Illinois; and Geomatrix Systems LLC of Old Saybrook, Connecticut
Type of system:	BUSSE membrane bioreactor with SoilAir/ Geomatrix dispersal
Site conditions:	Loamy gravel and gravelly sand
Hydraulic capacity:	450 gpd

From the lighthouse building where the bed-and-breakfast is, wastewater flows by gravity through a 4-inch pipe to an older plastic septic tank repurposed as a settling and pump tank. A 1/2 hp solids pump pushes wastewater through a 2-inch line to a four-tank BUSSE model 500 housed in what was once a boathouse. The first of the four tanks is for settling. Then there is an aerated mixing tank, and finally two aerated tanks equipped with membrane filtration.

From the BUSSE tanks, effluent moves through 1/2-inch tubes to a 275-gallon plastic tank holding a pair of Goulds 1/3 hp pumps. These alternately send effluent through about 50 feet of 2-inch Schedule 40 pipe to the manifold. A pair of SoilAir blowers push air through the pipes and into the soil. This also blows particulate matter and water out of the orifices to prevent the accumulation of slime and to minimize the need to brush or jet laterals. A custom Geomatrix control panel runs the system. It is time-dosed unless the flow is heavy, in which case a float shifts the system to pump on demand.

The absorption field consists of 470 feet of 1-inch pressure pipe divided into three zones to match the contours of the bedrock. Lateral lengths range from 9 to 21 feet, and laterals were spaced 16 inches on center. Orifices are 5/32-inch diameter, drilled 3 feet on center, and covered with GeoMat orifice shields equipped with a pin to keep the shields aligned over the orifices. Laterals are covered with GeoMat fabric. It attracts water (hydrophilic) to create a more even distribution across the absorption field. The field is set on 3 inches of pea gravel spread on the bedrock and topped with 12 inches of gravelly coarse sand. On top of that is another 4 inches of gravelly coarse sand, and 4 inches of loam on top of that provides a base for a lawn.

When the system is winterized, another part of the system comes into play. All remaining effluent is pumped to the absorption field. Residual

<< LEFT: The BUSSE membrane bioreactor system is housed in a shed that used to be a boathouse for the Cuckolds Islands lighthouse.

ABOVE: David Potts (left) and Dan Borkowski of SoilAir and Geomatrix build the absorption field for the Cuckolds Islands lighthouse project off the coast of Maine. The field was split into three zones to more closely match the contours of the rocky islands.

>>RIGHT: Albert Frick drills a hole in what will become the pump tank to move water from the BUSSE units to the absorption field.

solids, maybe 25 to 75 gallons per year, are moved from the BUSSE tanks to a 125-gallon Infiltrator chamber. A third SoilAir blower supplies oxygen to this chamber so the solids decompose just like a compost pile. This eliminates the need to bring a pump truck out to the island or arrange the logistics of moving solids to the mainland.

CHALLENGES

This system presented several major challenges.

First was working on an island. Even though it is only about 1/2 mile offshore, at times the wind, waves and tide made it hard to off-load equipment and supplies. On the final day of work for Potts, environmental scientist and president of Geomatrix and SoilAir Systems, the weather shifted and prevented him and engineer Dan Borkowski from reaching the island. Because of the logistical difficulties, they took a large inventory of specialty parts, including items they didn't think they would need. Common items were sourced from local stores because the nearest supply house was a 90-minute round trip.

Equipment and people were moved to and from the island with a combination of private boats and a contracted barge.

Soil to backfill the installation site was brought out in bags. The advanced treatment also helped keep this cost down because it did not require a large absorption field. "The cost of backfill on the mainland might be $15 per cubic yard, but when you barge it out and handle it in bags, and drop it off at the dock, and spread it around, the cost of the fill may approach $50 to $100 a yard in labor and logistics," Frick says.

When they headed for the island, they didn't know exactly what they would find. On shore you know the contour of the land. That wasn't the case on Cuckolds Islands, Frick says. "They basically stripped all the soil — which is a glacial till sandy loam — saw where the bedrock was, and then chipped away at some of the peaks to get the best fit." The bedrock is a metamorphic rock, like a schist, and the chipping was done with a hydraulic hammer attached to a mini-excavator.

Normally he and his staff only consult on systems, Potts says. But in this case, with the topography unknown, it made sense to design and build at the same time. When the soil came off, workers found a deep pocket in the bedrock that no one knew about. This became the site for the absorption field because it provided the greatest depth of soil for tertiary treatment and absorption. As a result, the absorption field changed. The shape remained roughly the same, but Potts and Borkowski decided to break it into three zones so each could be at a different height and conform closely to the contours of the rock.

NATURAL WATER FLOW

When the system is done treating wastewater, it will flow through the soil and into the ocean as it does naturally when the shallow soils of the island become saturated, Frick says. Quite a bit will be taken up by the soil and the grass in the ceremonial lawn atop the absorption field.

The use of technology may be advanced, but this is not an uncommon project along the coast of Maine where the use of GPS navigation technology has made lighthouses almost obsolete, Frick says. New construction would not be allowed because of modern standards, but Maine grandfathered these sites and requires owners to use the best treatment they can while giving regulators latitude to determine what is acceptable. In the case of Cuckolds Islands, the high quality of effluent coming out of the system convinced regulators to reduce the setback from the ocean, Frick says.

"When you look at this project, what we essentially did was put a wastewater system on top of a boulder sitting in the water. We are now at a point with technology where you can have both development and sustainability," Frick says.

MORE INFO:

BUSSE GT
708/204-3504
www.busse-gt.com

Geomatrix Systems, LLC
888/764-5247
www.geomatrixsystems.com

Goulds Water Technology - a xylem brand
866/325-4210
www.goulds.com

Infiltrator Water Technologies, LLC
800/221-4436
www.infiltratorwater.com
(See ad page 3)

SoilAir Systems
860/510-0730
www.soilair.com

Jim Anderson, Ph.D., and David Gustafson, P.E., are connected with the University of Minnesota onsite wastewater treatment education program. Dave is Extension Onsite Sewage Treatment Educator. Jim is former director of the university's Water Resources Center and is now an emeritus professor, and works with the National Association of Wastewater Technicians education committee. Readers are welcome to submit questions or article suggestions to Jim and Dave. Write to ander045@umn.edu.

Be a Floodplain Detective

Look for obvious and telltale signs that your proposed site for an onsite system is likely to be underwater at some point in the future

By Jim Anderson and David Gustafson

From time to time, people ask us about systems installed in floodplains and other areas subject to ponding. They ask how to determine if an area is subject to flooding.

As we view it, there are at least two types of situations an installer may face relative to systems that could flood. The first is the scenario most people think about: building a system in the 100-year floodplain. The second is in areas where temporary ponding occurs from snowmelt or runoff. Both of these situations need to be considered when designing and installing a system.

MAPS WILL HELP

Flooding – for the regulatory purpose of establishing a floodplain – is the temporary covering of the soil surface by flowing water from streams overflowing their banks, runoff from surrounding slopes or any combination of sources. This is distinguished from the temporary ponding of water over a system due to snowmelt or rainfall runoff. From our perspective, though, both situations can negatively impact the long-term performance of onsite systems.

A designated floodplain consists of the *floodway* and the *flood fringe*. The floodway is the area directly adjacent to the channel of a stream and conducts water during a flood. The flood fringe is the remainder of the floodplain where the water is shallow and slow moving. Installation of systems in the floodway is usually not allowed, although in our home state of Minnesota there are systems that have been "grandfathered," so they do exist in these areas.

Maps and boundaries for the established 100-year floodplains for insurance and land-use regulation purposes are available from federal and state agencies, counties and local municipalities. These maps can provide information on the boundaries and elevations of designated floodplains.

Each area has (tree) species that can withstand partial or total submersion during the growing season, while there are others that are intolerant and will not survive. A local biologist or forester can help identify species that indicate wet or flood-prone areas.

County soil survey information easily accessed through the Web soil survey will indicate soils and areas that are prone to flooding or ponding due to landscape position, as well as indicate drainageways or intermittent streams in a given area. Some states we have worked with, including Arizona and New Mexico, have provisions where intermittent streams, drainageways, washes or arroyos are present and typically have 25- to 50-foot minimum setbacks from the edges of these features. In semiarid climates, water may very seldom run in these features, but when it does run the flow is usually significant.

LANDSCAPE FEATURES

Here are a few keys to identifying areas that may be prone to flooding or ponding. First, use of landscape features. During site evaluations it is important to look beyond the site proposed for the system and recognize where it fits in the bigger picture of the area around it. From a flooding standpoint, features associated with past and present flooding include former river channels, natural levees and terraces oxbows, meander channels, and other similar features. These are usually easily identified and are also captured on the soil survey. For the temporary ponding situation, location at the foot of slopes or in depressions on the landscape would be telling features.

Vegetation can also be a key to identifying flood-prone areas. Survival of different tree species in the area can be telling. Each area has species that can withstand partial or total submersion during the growing season, while there are others that are intolerant and will not survive. A local biologist or forester can help identify species that indicate wet or flood-prone areas. In terms of temporary ponding, if there are grasses and small shrubs and the inundation exceeds a couple of weeks, you may see areas of dead vegetation. You may see a change in plant species from the surrounding areas, reflecting the presence of water.

Evaluation of soil pits can also identify areas subject to flooding. A thin strata of material at the surface different in color and texture from a deeper area would be a good indicator. For instance, a horizon of dark, rich organic matter under a layer of brown material indicates the original soil surface was covered by a more recent deposit. Or a series of soil layers with abrupt boundaries of contrasting materials, say sand and gravel over finer-textured

materials, indicates materials were laid down suddenly at different times from different sources. This is something we see often in the Southwest.

WHEN TO AVOID AN AREA

Follow a few specific design guidelines if a system will be placed in a floodplain. First, of course, is avoiding the area if possible. This is probably more relevant for the ponding situation. Moving the location within the lot can usually avoid the problem. But if not, the onsite system should be located on the highest portion of the lot and should have preference over all other improvements other than the well.

There should not be inspection ports or other connections installed to the surface and open to the distribution media or other parts of the system. If a pump is employed in the system, there needs to be a way to make sure it does not run during times of flooding. If time permits, the best approach would be to pull the pump out.

As always, an installer should be familiar with the state and local rules and regulations covering flooded systems in their area.

Could a Cargo Van Be in Your Future?

Fuel economy, organized storage, access to equipment, and shelter from the weather present advantages when making late-night emergency calls

By Ed Wodalski

Yes, that sporty pickup truck is fun to drive and carries most of what you need. And a trailer adds lockable security. But what about those late-night or weekend calls when a septic overflows? You rush to the job, only to find you need a special fitting, pump or switch. It's pouring rain, freezing sleet. You know that part is somewhere in your truck – but where?

Ronnie Tamez, 40, owner of First Call Septic Services in Battle Ground, Washington, says he wouldn't think of leaving the yard without Hanz or Franz, the 2006 Freightliner 2500 Sprinter vans he has outfitted for every possible emergency.

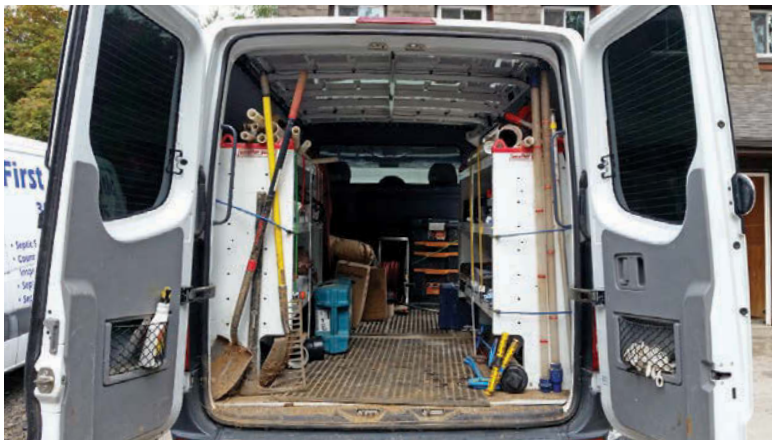
You might wonder why someone who services septic systems needs a cargo van. It's a question Tamez gets asked a lot by pumpers and onsite installers.

"Well, I have to show up for an alarm call," he says. "A high-water alarm or a low-air alarm; a UV light went out. I'm not going to show up in a vacuum truck that gets 2 miles to the gallon. You can't carry a $150 light bulb in a vacuum truck, you'll break it."

Tamez says he looked at other vans before purchasing the two used Sprinters powered by Mercedes-Benz turbo-diesel V6 engines, but they didn't have the features he was most interested in.

FUEL EFFICIENCY

"I wanted to be sure the truck was going to last, but also get really good mileage," he says. "We own a Mercedes-Benz R350 with the same engine,



ABOVE: The walk-through interior provides room for larger equipment.

>>RIGHT: Plastic tubs help organize fittings and couplings. (Photos courtesy Ronnie Tamez)

<< OPPOSITE PAGE: Cargo vans can serve as traveling billboards.

>> RIGHT: Side-door access adds convenience.

so I already know how to work on it."

That's quite a stretch from the Honda Accord Tamez first used to make calls.

"I had to fold the seat down, put parts down. Every night when I got home I'd back up to the garage, pull everything out and it was back to the family car," he says.

That was about 10 years ago.

Tamez also had a Chevy 1-ton, but while the Honda got 26 mpg, the Chevy pickup with 454 engine got about 6 to 9 miles a gallon, even when it was empty. In his quest for better fuel mileage, Tamez purchased a Saturn station wagon, which he ran for two years. Needing more room for inventory, Tamez added a Ford F-250 pickup with canopy topper, which he still owns.

ACCESS TO PARTS AND EQUIPMENT

"Everything was organized," he says. "I knew where everything was in the back of the pickup, but I always seemed to need the piece of equipment that was all the way in the back, like the jetting equipment or something. I'd have to empty out half my tools. Or my control switches that were in the far left corner – I was always lying on top of my tools to get the control switches out."

Two years of hunting and pecking along with hiring his first employee convinced Tamez that a better solution was needed.

"For me to go through the tools is one thing, but it's another thing to have an employee do it," says Tamez, who now has two technicians and a third in training. "In 2013, we went out and bought the first Sprinter van to see how we liked it."

Tamez had RC Display Vans in Portland, Oregon, install three rows of 7-foot-long by 1 1/2-foot-deep Weather Guard shelving and LED lights in the rear for night work.

ORGANIZATION IS EVERYTHING

Ronnie Tamez, owner of First Call Septic Services in Battle Ground, Washington, has two rules for maximizing van efficiency:

1. Supplies must be restocked at the end of the day and inventory replenished and rotated to ensure it doesn't age on the shelf.

2. Every piece of equipment must have a designated place and be returned after it's used.

"If I get a call at 2 in the morning, I'm assuming the van is ready to go and tools are put back where they belong," he says. "That way, I'm not fumbling around trying to find a tool that a driver decided to put someplace else."

"If I get a call at 2 in the morning, I'm assuming the van is ready to go and tools are put back where they belong. That way, I'm not fumbling around trying to find a tool that a driver decided to put someplace else."
Ronnie Tamez

One set of shelves is designated for fittings, bushings and adapters. Tamez also carries check valves, check gates, ultraviolet disinfection devices, indoor and outdoor alarm panels, control panels, blowers, and pumps common to the area. Strapped inside is a 3-foot-tall toolbox fitted with screwdrivers, volt meters, drill bits, large wrenches, fuses and light bulbs that can be rolled where needed.

WEATHER PROTECTION

Living in the Northwest, rain can be a daily occurrence. Working out of a pickup, Tamez would put his rain suit on outdoors, finish the job, throw it in the back of the pickup and run to the cab.

"Your suit wouldn't really dry out until summer," he says. "Now I can hang it up."

Tamez also looked at mechanics trucks, but like the pickup, equipment was susceptible to weather. He also appreciates the organization the van provides.

"I figure when we pull up people don't want to be paying me to move tools around. Just like if you took your car to a mechanic – if you're going to pay the guy $120 an hour, you don't want him looking for a screwdriver; he needs to walk right up and grab it."

Tamez also has a 24-foot trailer, but says it's too big for most jobs.

Looking back, Tamez says if he had to do it over, he would buy a 1-ton van with a longer bed.

"It's a little cramped in there," he says. "I've added a lot of stuff since we bought the vans. We have the jetting equipment back there. This summer I got tired of swinging pig bars and pickaxes and bought a Makita jackhammer. That's a big piece of equipment. So we're starting to outgrow the vans a little bit."

Business Diversification — Pumping and System Maintenance

By Craig Mandli

ACCESSORIES

Cougar Vibration DC Truck Vibrator

The **Cougar DC Truck Vibrator** from **Cougar Vibration, a div. of Martin Engineering**, is designed to improve the speed and efficiency of unloading vacuum trucks and other mobile equipment. Vibration helps achieve more payload per cycle and fewer cycles per job. The small, lightweight unit requires minimal space and uses a high-speed, low-amp 12- or 24-volt electric motor. Its weatherproof aluminum housing provides a high output-to-weight ratio. It is sealed against dirt, dust and water for long life in extreme conditions, and shielded, oversized, permanently lubricated ball bearings ensure reliable service life. It provides up to 3,200 pounds of vibratory force to improve the unloading of wet, sticky, fibrous or even frozen material. It is supplied with mounting hardware and electrical connections. **800/544-2947; www.martin-eng.com.**

Crescent Tank Mfg. Flat Vacuum Tank

The **Flat Vacuum Tank** from **Crescent Tank Mfg.** can make a truck into a vacuum service and pickup and delivery truck. It allows the operator to tow a trailer and plow snow. It is sized from 300 to 1,000 gallons, and can carry up to 10 portable units and equipment needed for the job on the bed. Waste is held inside the truck bed. Freshwater is held in the poly tank. The vacuum tank is constructed from 1/4-inch mild steel. Larger tanks come standard with Masport pumps. **585/657-4104; www.crescenttank.com.**

LMT VAXTEEL ST

The **VAXTEEL ST Series** of steel vacuum tanks from **LMT** come in preconfigured sizes with standard options, or can be custom-configured to meet specific needs. These vacuum truck bodies can be shipped for installation or custom-installed by LMT on a chassis of choice. Standard tanks have full-length mounting rails, full-length hose trays, primary shut-off, top and rear manways, and load and discharge ports. Options include full-opening rear door and hydraulic hoist for easier unloading. Standard bright-white industrial finish coat is included in every package, with custom colors and full graphic design and application available. Tank Size Wizard at LMT's website assists in the design of custom vacuum tanks, providing a dynamic graphic view of the tank design, including capacity and weight distribution. **800/545-0174; www.vaxteel.com.**

Marengo Fabricated Steel Tank-Intel

Tank-Intel smart remote tank monitoring systems from **Marengo Fabricated Steel** are a hardware- and software-based solution that works on any tank. It is composed of dual level-sensing equipment with smart technology, allowing the operator to read two liquid levels on any tank from a smartphone, PC or tablet. The equipment enables precise and reliable continuous level measurement in almost every liquid and most bulk solids, independent of process conditions. Changes in the chemical and physical properties of the measured substance do not affect the sensor. It has very few installation restrictions as its coaxial tube probe is unaffected by nearby obstacles, and it can be mounted in high and narrow openings. It is usable in extreme temperatures and is customizable. **800/919-2652; www.mfsltd.com.**

Mid-State Tank septic truck tank

Aluminum and stainless steel tanks for septic trucks from **Mid-State Tank** are available in capacities up to 5,500 gallons. They come standard with a 20-inch top manhole, 20-inch rear manhole, primary, three 5-inch sight eyes, pressure-relief valve, 4-inch inlet, 6-inch discharge, full hose trays, hose support at rear, ladder to the top manhole, LED lights and wiring, work lights at the rear, a full mounting kit and heavy-duty rear bumper. The facility where they are manufactured is DOT and ISO 9001-2008 QMS registered. **800/722-8384; www.midstatetank.com.**

Pik Rite 5,300-gallon aluminum tank

The 5,300-gallon aluminum tank from **Pik Rite** is split into three compartments, with the capacity for 300 gallons of freshwater, 3,800 gallons of wastewater and 1,200 gallons of graywater. The vacuum pump is a National Vacuum Equipment 4310 blower system. Four-way valves for the inlets with pneumatic actuators allow the operator to switch between tank compartments while pumping. The jetter system is mounted in a heated toolbox for cold-weather operation. It has a large rotating vacuum hose storage reel and a digital level indicator, and a remote control system for the vacuum pump, jetter, pneumatic valves and hose reel. It comes with polished aluminum hose trays, a heavy-duty rear bumper with toolboxes and drip pan, an LED running light kit, work lights and safety beacon. **800/326-9763; www.pikrite.com.**

Southland Tool Safety Shutter Vacuum Nozzle

The **Safety Shutter Vacuum Nozzle** from **Southland Tool** puts the vacuum control into the hands of the operator at the end of the hose. It is designed to instantly release vacuum with the push of a lever. A detachable tripod design lets it stand on its own, granting hands-free operation. The shutter design allows the operator to regulate airflow as needed. It is designed for 4- and 6-inch flex hose. **714/632-8198; www.southlandtool.com.**

Thaw Tech industrial valve and scrubber heaters

Industrial valve and scrubber heaters from **Thaw Tech** are 450-watt, 110-volt and can be used in both stationary and mobile applications. Made of 6061 aluminum, the heaters are explosion-proof and provide direct contact with the fluid. Valve heaters install between the flanges behind the butterfly valve, while scrubber heaters are threaded and screw onto the drain outlet of the scrubber unit. **888/570-1376; www.thawtech.com.**

Water Cannon RKV Series

RKV Series contractor-duty pressure washer replacement pumps from **Water Cannon** can be viewed online in a 360-degree rotating view. Replacement pump packages are available for consumer, professional, contractor and industrial-duty applications. This model delivers 5.5 gpm and 4,200 psi. **800/333-9274; www.watercannon.com.**

Westmoor Conde Flush Kit

The **Conde Flush Kit** from **Westmoor Ltd.** is designed to ease the process of periodic flushing to extend pump life. The unit is made of durable aluminum, and is activated by simply turning on the pump and opening the ball valve. Instructions are found on the side of the pump. It can be mounted in any convenient location. **800/367-0972; www.westmoorltd.com.**

HOSE

Armstrong Equipment ProClipse

ProClipse hose from **Armstrong Equipment** is formulated with a chemical- and grease-resistant liner to increase hose life. By making it crush-proof and resistant to abrasion, it provides a longer life out of each length. It has a bend radius equal to 2x the internal diameter and temperature resistance from minus 40 to 180 degrees F, meaning it can be used in the used-cooking-grease industry and can be rolled tightly to accommodate limited space. Precut lengths of 25, 35 and 50 feet in 2- and 3-inch widths with poly-welded cuffs mean faster build time and a secure cam fitting. Its smooth bore and liner construction leads to less separation. **800/699-7557; www.vacpump.biz.**

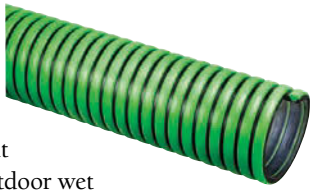
Continental ContiTech Velocity

Velocity Water Transfer hose from **Continental ContiTech** is a tough, clear PVC hose that lets the operator see the water in motion, even in demanding applications. It is effective for full suction or transfer, with eight diameter-width options ranging from 1.5 inches (110 psi) to 8 inches (60 psi). Its corrugated outer PVC helix and synthetic braid reinforcement are designed to stand up to the rough terrain of job sites, with a smooth inner bore that keeps water moving. **800/235-4632; www.contitech.us.**

Joe Johnson Equipment Vacuum Truck Hoses

Vacuum Truck Hoses from **Joe Johnson Equipment** have an abrasive-resistant liner with a smooth bore and corrugated cover for increased flexibility, while their soft cuffs allow for easy installation. The 8-inch-diameter cuffed hoses are available with top hats and clamps custom-made for a tight fit and optimal connection. **866/648-7257; www.jjei.com.**

Kuriyama of America Tigerflex Tiger Green



Tigerflex Tiger Green from **Kuriyama of America** is a black, flexible, lightweight EPDM rubber suction hose with a bright green polyethylene helix construction for outdoor wet or dry applications. It is made with EPDM compounds for superior chemical resistance, flexibility and durability. Abrasion-resistant green helix is designed to slide easily over rough surfaces and around objects, making hose easier to handle and work with. **847/755-0360; www.kuriyama.com.**

Texcel SIGMA ULTRAVAC

SIGMA ULTRAVAC industrial vacuum hose from **Texcel** is a heavy-duty, abrasion-resistant polyurethane suction hose for use in a variety of wet and dry industrial vacuum applications. It can handle a range of materials, such as crushed rock, sand, pea gravel, dry cement, grains and slurries. It is made with a permanently conductive lightweight tube that remains flexible at low temperatures for ease of handling. **800/231-7116; www.texcelrubber.com.**

VACUUM PUMPS

A.R. North America RTP30.60

The **RTP30.60** triplex plunger pump from **A.R. North America** delivers consistent high pressure and flow. Its wet end has hardened, heat-treated SST plungers with a long-life coating, a forged brass manifold providing a better flow performance strength and no porosity, a triple-staged sealing system, and newly designed valves. The drive end has a vibration-resistant cast iron crankcase, forged crankshaft, bronze connecting rods, oversized taper roller bearings and dual-lip plunger rod oil seals. Multiple mounting holes offer a retrofit to many pump models. Performance is up to 7.9 gpm and 8,700 psi. **763/398-2008; www.arnorthamerica.com.**

Fruitland Manufacturing RCF 870

The **RCF 870** vacuum pump from **Fruitland Manufacturing** is fully automatic with no adjustment necessary, and is environmentally friendly when used with Fruitland biodegradable oil. It offers free airflow of 500 cfm, a maximum vacuum of 28.5 inches Hg, 4-inch hoses, an operating speed of 1,400 rpm, eight Kevlar vanes, and an approximate net weight of 575 pounds. **800/663-9003; www.fruitlandmanufacturing.com.**

Goulds Water Technology 3SD

The **3SD** sewage pump from **Goulds Water Technology - a xylem brand** combines dual hard-face mechanical seals with a 300 Series stainless steel keyed shaft motor for defense against harsh environmental conditions. It is designed for continuous operation in commercial, industrial and residential applications. It has cast iron two-vane semi-open non-clog impellers with pumpout vanes for mechanical seal protection, and comes in single- and three-phase options with a 1.5 to 5 hp range. It's balanced for smooth operation and capable of running dry without damaging the inner components. It supports a variety of hydraulic requirements and is certified by Underwriters Laboratories and the Canadian Standards Association. **866/325-4210; www.goulds.com.**

Jurop/Chandler Equipment pump package

Pump packages from **Jurop/Chandler** incorporate Jurop vacuum pumps and blowers. They are designed for maximum use of available space and ease of installation. Available in both hydraulic and gearbox configurations, the Razor-Pak, Juro-Pak, Muffler-Pak and Right-Angle Drive Paks are engineered and constructed to withstand tough conditions. Diesel- or gasoline-engine-driven Jurop pump packages are available and designed with the same construction and engineering standards. The availability of pump packages containing either dual fan, liquid or ballast port cooling technology provides multiple choices and configurations to meet all requirements and applications. **800/342-0887; www.chandlerequipment.com.**

Moro USA PM110W

The **PM110W** vacuum pump from **Moro USA** is a commercial-grade vacuum pump designed for tough industrial-duty applications. The liquid-cooled pump has Kevlar vanes, visual inspection ports and a cantered rotor. It can be cooled by water or other liquids. It has Viton oil seals, direct-feed oil-injected lubrication and sealed or oil-injected bearings that eliminate grease points. It includes an integrated check valve, changeover valve and automatic oiling system, which along with low-speed rotation helps extend pump life under rigorous conditions. It weighs 645 pounds, has 29 psi positive-pressure capability, 630 cfm free airflow, can run at 24 inches Hg continuous (28 inches Hg max intermittent), and a suggested tank size between 2,000 to 6,000 gallons. It is available in right-angle and engine-drive packages. **800/383-6304; www.morousa.com.**

Pentair HPE Series

HPE Series oil-cooled, premium efficient submersible solids-handling pumps from **Pentair** are designed for long motor life and low maintenance cost. Premium efficient motors provide wire-to-water efficiencies resulting in energy savings. The pumps' Hydromatic seal leak probes provide early warning moisture detection to minimize unplanned maintenance costs. A shaft-grounding ring protects against variable-frequency drive-induced currents to prevent premature bearing failure. They have quick-disconnect cables, cartridge seals and terminal blocks, and permanently lubricated bearings, all designed to simplify maintenance and reduce downtime. **419/289-1144; www.hydromatic.com.**

Presvac PV750

The **PV750** rotary vane pump from **Presvac** is designed for continuous full vacuum operation in extreme conditions. It offers 400 cfm free airflow, 350 cfm at 15 inches Hg, maximum vacuum of 27 inches Hg, and maximum pressure of 35 psi. Dual fans and twin ballast ports efficiently cool the pump. The solid housing with deep cooling ribs allows for heat transfer from the vacuum chamber. Aluminum fans and shrouding work like a heat exchanger to further aid in heat reduction. Multiple manifold and drive options are available. **800/387-7763; www.presvac.com.**

Wallenstein Vacuum Pumps 753 Series

The **753 Series** vacuum pump from **Wallenstein Vacuum Pumps** incorporates extra-wide vanes that allow up to an inch of wear, designed for longer service life and lower maintenance costs. It provides 422 cfm airflow at 1,200 rpm and is precision-machined to provide for vacuum levels up to 28 inches Hg. Options include air, liquid or dual cooling systems where air injection is combined with liquid cooling. A pump-flushing port is included on the top valve for convenient routine maintenance. The quick-access housing end plate allows for easy internal inspection with no bearings to pull. Oil lubrication is via a mechanical piston pump driven by shaft rotation or available with a sight feed valve oil regulator system using vacuum/pressure to draw oil with no moving parts. **800/801-6663; www.wallenstein.com.**

VACUUM TRUCKS

Curry Supply vacuum truck

Curry Supply vacuum trucks are designed for rugged conditions. The American Society of Mechanical Engineers (ASME) has authorized the company to build pressure vessels in accordance with the requirements of the ASME Boiler and Pressure Vessel Code. Tanks are made with 1/4-inch steel, available in 3,360, 4,200 or 4,620 gallons, and are Federal Bridge Law compliant. Tanks are designed with a stress-free mounting system for increased truck life. Units include 4-inch unloading ports, 36-inch rear manway, and a 6-inch push bumper. There's a driver-side ladder added for convenience. Tanks have a ball float level indicator, full-length fenders and storage trays. All tanks are blasted, prepped and painted using Axalta Coatings for corrosion resistance. Units are available in kit form for easy self-assembly. **800/345-2829; www.currysupply.com.**

FlowMark 2500 VAC

The **2500 VAC** aluminum vacuum tank from **FlowMark** comes mounted on an International 4400 with an N9 engine and Allison automatic transmission. The unit has a National Vacuum Equipment 607 vacuum pump, 4-inch inlet and 6-inch discharge, and an aluminum toolbox for storage. **855/805-7183; www.flowmark.com.**

Guzzler Manufacturing Predator

The **Predator** vacuum tanker from **Guzzler Manufacturing** is designed for handling bulk liquids, sludge and semisolid waste in industrial applications. The 3,000-gallon payload capacity tanker has a standard vacuum pump capable of suction pressures up to 27 to 29 inches Hg, maximum airflow of more than 400 cfm, and more than 300 cfm at 18 inches Hg. Alternate pump sizes are available. The single compartment tank is constructed with carbon steel and rated for continuous maximum vacuum operation and 15 psi working pressure. The tank is ASME Section VIII boiler code- and DOT 412-compliant for hauling hazardous materials on the highway. **815/672-3171; www.guzzler.com.**

Hino Trucks 338

The **Hino Trucks 338** model is suited for septic/vacuum tank applications at 33,000 GVW (Class 7). It has a Hino 8L J08 engine rated at 260 hp and 660 ft-lbs of torque. It has an 80,000 psi standard frame, with an optional 120,000 psi frame. It comes standard with an Allison 2500 RDS transmission with Shift Energy Management; an Allison 3000/3500 RDS is optional. Other options include differential lock with controls, a Hendrickson severe-duty 23,000-pound suspension, and power-heated driver and passenger side mirrors. All models have INSIGHT 2.0 powered by Telogis, Hino's cloud-based location and telematics solution. **248/699-9300; www.hino.com.**

Imperial Industries VAC3000

VAC3000 Series trucks from **Imperial Industries** are ASME-certified 407/412 steel DOT units with capacities of 3,200 and 3,600 gallons. Choose either a blower system (National Vacuum Equipment 4310 or the Hibon 820) or a vacuum system (Fruitland, Moro or Wittig). The units feature three rollover bars, bolt-on aluminum hose trays, 4-inch riser intake, 6-inch discharge, full-opening rear door, three-stage hoist assembly and a complete hydraulically controlled system. **800/558-2945; www.imperialind.com.**

Keith Huber Dominator

The **Dominator** vacuum truck from **Keith Huber Corp.** has a 3,300-gallon-capacity steel tank with 5/16-inch shell, a 20-inch top manway, hydraulic tank lift and full-opening rear door, a PTO-driven hydraulic vacuum/pressure system, a liquid-cooled high-performance pump, full-length hose trays, a 4-inch inlet with internal standpipe for easy decanting, a 6-inch discharge valve for direct pressurized or gravity unloading, rear work lights and LED running lights, a backup alarm, and grounding reel. Options include multiple compartments, ASME/DOT 412 certification, stainless steel tank with wetted stainless steel parts, high-pressure jetting systems with integral water compartment, an auxiliary transfer pump, and a top-mounted hydraulic 4-inch boom. **800/334-8237; www.keithhuber.com.**

Robinson Vacuum Tanks septic truck

Septic trucks built by **Robinson Vacuum Tanks** are available in polished aluminum and carbon steel, and can be built as large as 5,500 gallons. They come with full-length 3/16-inch polished aluminum hose trays with hose protectors along the tank, 20-inch top and rear manways, three 5-inch sight glasses, rear inlet and discharge with brass lever valves, low-profile primary, heavy-duty bumper, LED DOT lights and work lights, large hose hooks and anti-surge baffles. Options include the choice of vacuum pump or blower, toolboxes, front hoist, a full rear-open door, multiple valve options including heat options, additional inlets and/or outlets, digital capacity readout, jetters and hose reels. **844/393-1871; www.robinsontanks.com.**

SchellVac Equipment septic vacuum truck

The 2,150-gallon septic vacuum tank from **SchellVac Equipment** is constructed using 1/4-inch steel, 1/4-inch flanged and dished dome ends welded inside and out to tank shell, a full-length tank frame, one baffle, 12-inch low profile primary shut-off, 5-gallon heated secondary moisture trap, and pressure- and vacuum-relief valves. It has four sight eyes (three rear and one front), full-length aluminum diamond plate hose trays, 21-inch rear door, heated 4-inch intake and 6-inch discharge, and an LED light package. Various pump models are available. **877/336-0081; www.schellvacequipment.com.**

Vacutrux Limited SepticTrux

SepticTrux from **Vacutrux Limited** are available on chassis from 33,000 to 86,000 GVWR single axle, tandem or tri, with tank sizes from 1,800 to 5,400 gallons. Vacuum systems are powered by Wallenstein vacuum pumps. **800/305-4305; www.vacutrux.com.**

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Pathogen protection system designed for jet truck operators

Problem: Colorado Springs Utilities (CSU) became aware of new and dangerous pathogens found in wastewater in a study published in *m-Bio* magazine by the American Society of Microbiologists. Sewer maintenance crews also expressed concern over growing reports of antibiotic-resistant bacteria and viruses they may come in contact with and the potential health consequences to themselves, their families and citizens in the community.

Solution: Utility management decided to employ the **Vanguard Pathogen Protection System**, which is designed to substantially reduce contaminants in sewage from reaching equipment operators. An independent environmental company was contracted to field test the system with a CSU crew during standard sewer maintenance operations. Cultures taken from the field showed a reduction of bacteria colony counts by up to 98 percent. The system is simple and convenient to use right from the operator control panel. It comes with a hand-held antibacterial spray gun with 50 feet of retractable hose to clean boots, gloves, crawlers, tools, vacuum tubes and the work area. OEM and retrofit systems for jet, combo and CCTV units are available.

Result: By taking a proactive stance for the health and safety of its team, CSU saw increased worker confidence and morale while working in a known hazardous environment. Reduction in worker sick days and insurance costs are currently being assessed. 800/781-3164; www.hydro-products.com.

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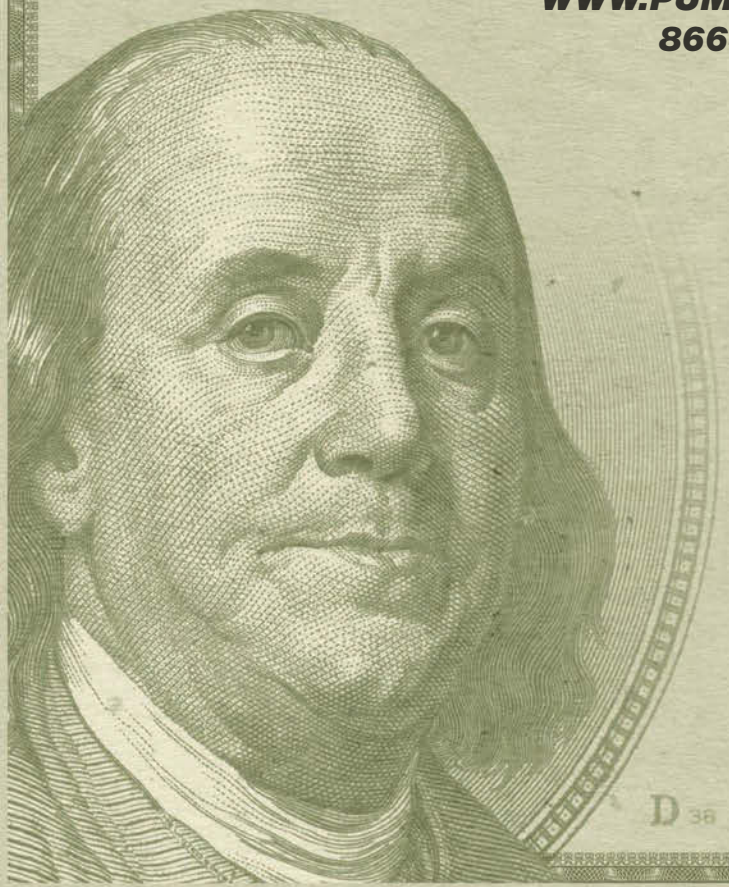

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industrynews

Researcher Receives ADS Achievement Award

Rafael Munoz-Carpena of the University of Florida-Gainesville received the American Society of Agricultural and Biological Engineers (ASABE) 2015 Advanced Drainage Systems Soil and Water Engineering Award. The ADS-sponsored award recognizes Munoz-Carpena for his research, methodology and educational contributions in the development and advancement of integrated hydrologic and water-quality modeling.

productnews

Komatsu Tier 4 Final wheel loader

The WA380-8 wheel loader from Komatsu features a 6.69-liter, 191 hp Komatsu SAA6D107E-3 variable-geometry turbocharged and after-cooled Tier 4 Final diesel engine that uses 6 percent less fuel than its interim predecessor. SmartLoader logic software combines with a lockup torque converter that activates in second, third and fourth gears. Together, the system provides optimal engine torque for improved acceleration, hill climbing, higher top speed and fuel savings. **847/437-5800; www.komatsuamerica.com.**

Water Cannon pressure washer/jetter

The 17HJ39 pressure washer/jetter package from Water Cannon has a Honda GX 630 electric-start engine with battery and 15-gallon fuel tank. Roll-cage protected, it features V-belt drive, General HP Series triplex plunger pump (5.5 gpm, 3,500 psi), jetter/pulse valve on demand, 350-foot, 3/8-inch capacity hose reel, ball valve, hose, wand and four nozzles. **800/333-9274; www.watercannon.com.**

KOHLER mobile paralleling box

The mobile paralleling box from KOHLER Power Systems enables users to combine different size generators with different fuel types. Designed for use with KOHLER's LP or natural gas and diesel mobile generator line, four boxes can be used to parallel up to eight generators. The KOHLER Decision-Maker 3500 digital controller, standard on all KOHLER LP or natural gas and Tier 4 Final diesel mobile generators, provides the paralleling intelligence and network communications. **800/544-2444; www.kohlerpower.com.**

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

Arkansas

Arkansas Onsite Wastewater Association; www.arkowa.com

California

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

Colorado

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

Connecticut

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

Delaware

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

Florida

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

Georgia

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

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

Idaho

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

Illinois

Onsite Wastewater Professionals of Illinois; www.owpi.net

Indiana

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

Iowa

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

Kansas

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

Kentucky

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

Maine

Maine Association of Site Evaluators; www.mainese.com

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

Maryland

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

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

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Michigan Onsite Wastewater Recycling Association; www.mowra.org

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

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

Missouri

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

Nebraska

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

New Hampshire

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

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

New Mexico

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

New York

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

North Carolina

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

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

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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

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Saskatchewan Onsite Wastewater Management Association;
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