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<b>Total First Year Depreciation</b> <small>(\$1,000,000 + 150,000 + 0)</small>	<b>\$1,150,000</b>
<b>Cash Savings</b> <small>(\$1,115,000 x 35% tax rate)</small>	<b>\$ 402,500</b>
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- Ted J. Rulseh

After a century of profitable septic system and grease trap service, a fourth generation of the Forest family is taking the reins in Des Moines, Iowa.

**ON THE COVER:** The Forest family is celebrating 100 years in the wastewater industry in Des Moines, Iowa. Tyler Forest, left, and brother Tory Forest represent the fourth generation in ownership. They are shown with their newest Freightliner built out by Pik Rite with a 4,700-gallon aluminum tank and National Vacuum Equipment blower. (Photo by Mark Hirsch)

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Contact Jim with your comments, questions and opinions at [editor@pumper.com](mailto:editor@pumper.com).

# Champion Athlete Joe Spooner Is a Grinder and a Pumper

When he thought his America's Cup career had come to an end, the New Zealander started a portable restroom business. But now at 44, it's back to the boat. **By Jim Kneiszel, Editor**

**P**rofessional sailor Joe Spooner holds the position of “grinder” during a big race. He’s among the biggest and brawniest guys on the boat — compared to an offensive lineman on a football team — who operate manual winches to raise and trim the sails and move the boom using brute strength.

Spooner is one of the best grinders in the world — winner of two America’s Cup championships and training to win a third for the New York Yacht Club American Magic team in 2021.

“Grinder” also seems a fitting description for Spooner’s other occupation, slinging portable restrooms and driving out of a vacuum truck all day long. With his wife, Melanie, Spooner started a portable sanitation company, Kiwi Flush, in Auckland more than a year ago. And as much as he loves traveling the world over as a sailor, he also loves his family’s new venture.

“Normally when we train with the Cup teams, we’re at the gym training at 6 a.m. anyway, so this is the same kind of thing,” Spooner says when reached by phone on a Saturday after delivering restrooms since the crack of dawn. “When I’m getting into training again, I’m delivering (the units) with water loaded and getting them off the truck on my own. You get a good sweat up.”

No kidding, carrying restrooms is part of the 6-foot, 3.5-inch, 230-pound Spooner’s weightlifting regimen for the next America’s Cup. “We thought about a lifting competition at work,” he says. “It’s all about who can do it better than the next guy. We’re a competitive group, but we all go out for beers on Friday night.”

## A PEOPLE PERSON

Spooner loves getting out on the truck and running routes. His father worked in the building trades, and Spooner finds it satisfying to provide a needed service to his hardworking neighbors, many who know him first as a sailor.

“I really enjoy meeting the people, and I don’t mind having a chat with someone,” he says. “It’s a damn good way to see the country and meet nice people. The past 18 months have been — and my wife would say the same — very enjoyable on the whole and we love it.”

It has been an interesting transition from a storied professional sports career to a portable restroom business. Spooner, 44, thought his professional sailing days were over when he, Melanie, and their children, Lucia, 11, and Ruben, 8, returned to his native New Zealand. So they moved on with a business idea that hatched years earlier.



While the family was living in San Francisco and Spooner was sailing with the famed Oracle Team USA that won the America’s Cup races in 2010 and 2013, they remodeled their home and were introduced to the American portable sanitation service.

Joe Spooner is shown with one of the Kiwi Flush service trucks. (Photo courtesy of Kiwi Flush)

“We had one in the yard, and it was quite nice,” Spooner recalls. “Then I would come (to New Zealand) to visit my mates (in the building trades) and they would say their (restrooms) were horrendous. We decided to seize an opportunity and have a crack at it.”

Melanie has a master’s degree in public health, so the couple built a brand around better hygiene.

“We see ourselves being more of a service-related business than a product-related business,” he says. “Linking better health and hygiene outcomes is important to us.” And to make the job more appealing to his crew of four, Spooner keeps the work trucks fresh and clean and stresses professionalism and quality customer service.

## LOVING THE WWETT SHOW

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 400 h.p., 10 spd., Low Miles

they found them of the highest quality. Restrooms are PolyJohn Fleet models, chemical products are from Walex Products, and units have J-Light solar lighting from J&J Chemical. Truck tanks come from U.S. suppliers, FlowMark Vacuum Trucks and Amthor International to this point, running Conde (Westmoor) pumps and placed on locally sourced Mazda, Hyundai and Isuzu trucks.

The company currently has three trucks with another one on the way and 330 restrooms, with Spooner projecting to reach 1,000 restrooms eventually. He sourced a lot of equipment on his first visit to the WWETT Show earlier this year and already had plans to return to Indianapolis for 2019.

"The WWETT Show is fantastic for getting a taste of what's out there. And since I've been in the truck, I have a better idea of what's necessary," he says. "The U.S. companies are so much easier to work with, and they lead the

way. The economy down here is booming, and it's so hard to get stuff made in a hurry."

Spooner will break away from America's Cup training for a few days to attend the 2019 WWETT Show with the company's new operations manager and his longtime friend, Allan Nicholas. Melanie will continue to run Kiwi Flush throughout the America's Cup run and visit Spooner with the kids during school breaks.

### ONE LAST RUN?

The restroom business has been a lot of fun, but Spooner couldn't resist answering the call for another shot at sailing's most prestigious prize.

"I didn't think we had another America's Cup in us. Then the opportunity arose and it was too good," he says. He received the blessing of his children to commit to the American Magic team and prepared to move to Newport, Rhode Island, to train. After a year of preparation and racing in the U.S., the team will travel to Europe and Asia to race and raise awareness for the 2021 Cup challenge, which will be back home in New Zealand.

Sailing is considered a major professional sport in many countries, including New Zealand. "Well and truly before you can drive a car, you can drive a boat," he says of youngsters from the island nation. Spooner guesses he's sailed tens of thousands of races to reach the pinnacle of the sport.

Professional sailing has gotten faster and more dangerous over the years, with the boats reaching speeds of 50 mph on open water.

"It doesn't sound fast unless you're on one. The inertial and G-forces when you're changing direction are hard, and we're wearing helmets, body armor and carrying oxygen. The danger is high, and that's why you generally want younger guys. Their reflexes are better," he explains.

Each team requires several grinders on the boat at any time, and Spooner will be training with many great sailors, including an Olympic medalist on the New York Yacht Club crew.

"Age hasn't caught up with me just yet anyway," he says. "There will be a lot of younger guys in the same position. I will be somewhat of a mentor to get them up to speed, but I'm definitely going to push them for their spots."

Boats in the recent past have been a multihull catamaran style, and now the designers are returning to single-hull designs. In both cases, when the boats pick up speed, the hulls rise out of the water and the sails are pushing only submerged T-foils.

Spooner is known for developing the "Spooner slide," in which he adapted a motion baseball runners use to slide in a way to more efficiently and safely move from one side of a catamaran to the other when the boat changes direction. He describes the move and the dangers of his job are demonstrated in this video: [www.youtube.com/watch?v=bhCnhPxeZuk](http://www.youtube.com/watch?v=bhCnhPxeZuk).

### BACK TO THE TRUCK

When he reaches the end of his sailing career, Spooner will be happy to return to Kiwi Flush and continue to build the family business he has grown to love.

A recent interview story by Newsroom, a New Zealand current affairs website, made a little fun of the America's Cup winner cleaning restrooms, saying he's comfortable "switching from affluence to effluent ... It may sound like Joe Spooner has fallen on hard times. On the contrary, the Kiwi sailor is flushed with success (pun intended)."

"I serviced one of the toilets in Castor Bay the other day and the people were like, 'Aren't you the guy who did the America's Cup?' It's a real leveler, cleaning toilets. But it's a great way to make a living and I get to drive trucks. It's fun," he tells Newsroom.

Keep grinding away, Spooner. And we'll see you back on the truck when you're ready to come ashore for good. ■



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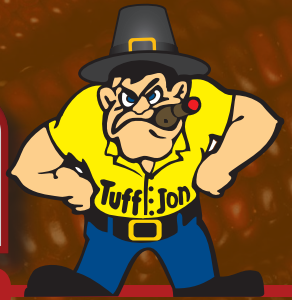
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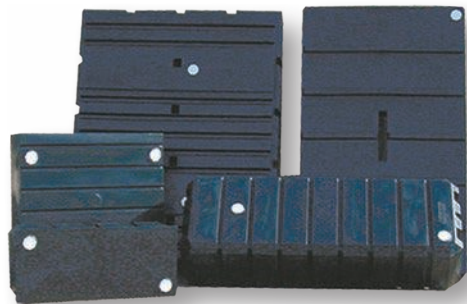
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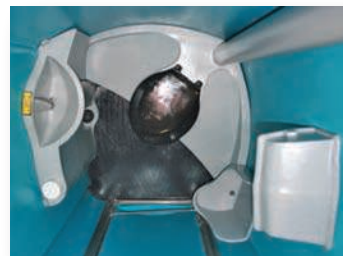
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ASSESSMENT AND REHABILITATION

## flooded systems

The Southeastern United States is facing the arduous task of recovery and rebuilding in the aftermath of hurricane season. Along with unexpected natural disaster, dealing with seasonal floods is also an issue in many parts of the country. Our experts, Jim Anderson and Sara Heger, frequently get asked about how to recover an onsite system that has been damaged by floodwaters, so we rounded up their best tips for dealing with flooded septic systems. [pumper.com/featured](http://pumper.com/featured)

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To comply with new weight-restriction laws, Fairway Utilities of Ancaster, Ontario, recently invested in a Transway Systems Terra-Vex 125 hydroexcavating truck. The feature that truly sold Fairway Utilities' management was the configuration of the truck's axles, which promotes weight compliance. Instead of pairing the two rear axles together in a conventional design, the forward axle sits more toward the middle of the truck, shortening the span between it and the front axles. [pumper.com/featured](http://pumper.com/featured)

“Those flushable units helped me locate a tank one homeowner had already had several companies come out and try to locate.”

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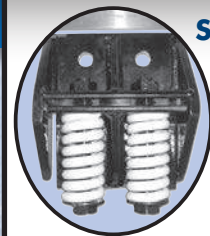
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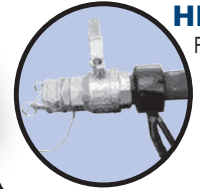
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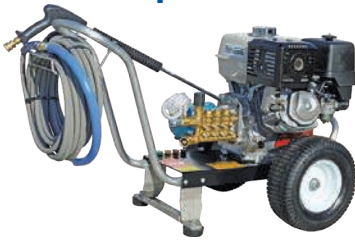
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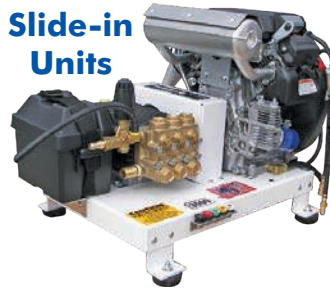
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# PUMP UP THE VOLUME

**Liquid Environmental Solutions recycles a whopping 400 million gallons of grease annually. But even smaller operators can glean helpful tips from the national service provider. By Ken Wysocky**

**P**umping companies looking to diversify services, as well as generate an additional revenue stream by collecting and recycling grease trap waste, may benefit from business-building strategies utilized by a giant in the commercial wastewater industry.

The lessons from Liquid Environmental Solutions include nurturing good employees, making smart investments in technology and equipment, emphasizing employee safety, and growing through acquisition; the company has added nearly two dozen companies in 16 years.

To grasp the size of the Dallas-based company, consider these figures: Nearly 400 million gallons of grease trap waste and roughly 100 million pounds of used cooking oil are collected and recycled annually. More than 3.6 million gallons of brown grease recovered annually from grease trap waste. Approximately 650 employees working at 52 different branch locations. Two dozen treatment facilities that handle everything from grease trap waste to grit from car-wash pits. In excess of \$150 million in annual gross revenue. And more than 500 pieces of rolling stock, including several hundred tanker trailers and vacuum trucks rolling across the nation's roads and highways.

Dana King, senior vice president, notes the company serves more than 20,000 clients at more than 65,000 locations. "We've grown at about a 10 percent clip every year," he says, "which has always been our target."

A giant monitor inside the company's Dallas operations center, which handles all service dispatching, graphically reveals the scope of the company's op-

*(continued)*

The Liquid Environmental Solutions executive team includes, from left, Peter Crane, vice president of customer solutions; Brian Bidelspach, vice president of expansion operations; Mike Urban, vice president of information technology; and Fin Neve, vice president of services and solutions. (Photos by Olivia Ogren-Hrejsa)

## Liquid Environmental Solutions Dallas, Texas

**PRINCIPAL OWNER:**

Audax Group  
(a private equity firm)

**FOUNDED:** 2002

**EMPLOYEES:** 650

**SERVICES:** Collection, treatment, and recycling of grease trap waste and used cooking oil; collection and treatment of car-wash pit waste; general nonhazardous waste collection and recovery/disposal

**SERVICE AREA:** United States

**WEBSITE:** [www.liquidenviro.com](http://www.liquidenviro.com)



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**Right:** Brian Bidelspach, left, vice president of expansion operations, and Mike Jones, transportation manager, stand in front of a new Vantage Trailers vacuum tanker in the transportation yard.

**Below:** Jason Jesmer, logistics manager, pointing, and Johathan Hanes, logistics analyst, reviewing the day's routing at a Liquid Environmental Solutions office.



erations. It displays a map of the United States that includes hundreds of color-coded dots — one color for grease-collection trucks, another for cooking oil-collection trucks, and so forth. It's part of a business-enterprise/management system custom-developed in-house, King notes.

"We can see our trucks running all over the country," he says of the central-dispatching monitor. "But we still give our local teams the ability to make their own (dispatching) decisions to best serve their customers in the most efficient way. We rely on strong analytical tools to make our business run well."

The central dispatch system in the company's 40,000-square-foot headquarters offers an apt metaphor for the firm's success: strong central management that still allows local units to operate with a certain degree of autonomy. "Part of the way we continue to grow — and grow successfully — is a strong management team," King explains. "But we also give employees and management staff the tools they need to get the job done and think outside the box when opportunities arise to better serve the customer and the environment."

## ROOTS IN TEXAS

The company is principally owned by the Audax Group. But it was originally established in 2002 when King, Alan Viterbi (now the Liquid Environmental Solutions chief executive officer), and two other now-retired partners — Rich Leib and Patrick Reilly — bought the Texas division of a liquid waste company called U.S. Liquids. At the time, Liquid Environmental Solutions served customers in Texas and northern Louisiana from six locations: Dallas, Houston, San Antonio, Austin, and Harlingen, Texas, plus Shreveport, Louisiana, King says.

Services at that point included treating industrial wastewater and

“ One reason our customers do business with us is because they see the results of the training and the programs to which our team adheres. They know that our team will not cut corners. ”

## DANA KING

pumping grease and grit traps. But as guidelines for collection and disposal of grease trap waste became more stringent — driven by sanitary sewer overflows caused by fats, oils and grease (FOG) — management decided an emphasis on grease presented the most-promising business opportunity.

"We felt the marketplace was going to need help complying with new government rules and regulations aimed at making sure grease traps and related infrastructure were well-maintained," King explains. "The No. 1 cause of sewer overflows back then was FOG. In essence, we looked at this in 2002 and decided to build a company to serve the needs of our customers — primarily restaurants and any other businesses that include food service in its mix, such as hotels, hospitals, prisons, schools, grocery stores, and so forth. In essence, any facility that has a kitchen with a grease trap."

Organic growth came quickly, boosted by a sales team that focused on national customers, such as restaurant chains. Acquisitions of companies that collect either grease or nonhazardous industrial waste also played a big role in company expansion, he says.

By 2007, the company had customers in five states. By 2010, the number mushroomed to 32 states. Today, it covers all 50 states, either through branch facilities or another critical growth component: preferred partners — waste-collection businesses that Liquid Environmental Solutions hires if they meet rigorous company standards, King says.

"FedEx did the same thing when it first started," he points out. "At first, it didn't have branches everywhere but still needed to deliver packages. So it hired agents to help out until the company was capable of doing it on its own."

"When you build a national company, the customers want you to be able to service certain markets," he adds. "And to build out that network, we relied on either acquisitions or our preferred-partner program. We still don't

(continued)



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## Stick to your focus

When Liquid Environmental Solutions was established in 2002, it didn't collect used cooking oil, generated by restaurant deep-fat fryers and griddles. But after repeated requests from customers, the company began providing such service in 2008, says Dana King, senior vice president of the Dallas-based company.

"We looked at the way this service was being provided and thought we could do it better," he says. "Now it's an important part of our service profile. ... That experience made us realize we can never have a static business model."

This move to diversify the company's primary grease-collection services offers an example of its business model in action. Management calls it the four pillars, which represent a strong commitment to the environment, customer service, safety and compliance, and continuous improvement, he says.

The focus points help ensure customers receive outstanding value and a well-maintained infrastructure, buttressed by technicians that follow the letter — as well as the spirit of — local, state, and national laws and regulations. In fact, the company keeps a complete database of compliance regulations for every jurisdiction in the country, King explains.

In another example, the company urges employees at the company's waste treatment facilities to always look for new ways to recycle and recover waste. That led one employee to develop a process for recycling the water used for treating brown grease, as well as turning the grease into a low-grade boiler fuel. The inspiration for the process came from the employee's prior experience in the rendering industry.

"Like many organizations, if we can avoid throwing something away, it's better for us, our customers, and the environment," King notes.

Company meetings begin with a topic related to one of the pillars. "We don't focus on all four every single time because then it would become almost rote," King explains. "But we cite an example or a message or a process related to one of the four." For commitment to the environment, for example, someone might start a meeting by noting how many gallons of grease the company has collected so far this year and what percentage of that was recycled. Or if the focus is customer service, someone might talk about a new service the company is providing.

"We want to keep everyone focused on our priorities," he continues.

have any trucks in Hawaii or Alaska and several other states, like Montana and North and South Dakota, where preferred partners service customers on our behalf."

### COLLECT, TREAT, REUSE

Today, the company's primary services center on collecting and treating grease trap waste, used cooking oil, and grit from car-wash pits. Grease is treated to remove water and solids (ranging from food and trash to utensils and broken glass) and the remaining product — brown grease — is sold as a low-grade fuel oil.

The same process is employed to treat used cooking oil. The end product "yellow grease" is sold to companies that make products such as animal feed, soap, cosmetics and renewable fuels. "In locations where we don't have our own treatment plants, we work with the nation's renderers,



providing them with our customers' used cooking oil, which they render into yellow grease," King explains.

Car-wash pit waste is treated to separate the water, grit and oils; the grit typically is landfilled and the oil is sold and used to make products such as asphalt. The food waste from grease traps and used cooking oil generally goes to municipalities for use in anaerobic digesters or to composting companies. The water left after treatment gets treated to conform with local requirements and then discharged into municipal wastewater systems for final treatment.

Of course, providing all these services on a national scale requires a huge fleet of equipment and vehicles. The company's entire fleet includes roughly 150 bobtail vacuum tankers and light-duty trucks (ranging from 300- to 4,000-gallon capacities); 150 tractor cabs; and 200 vacuum tanker trailers (ranging from 5,000- to 6,500-gallon capacities). In recent years, the company has invested primarily in Freightliner, International, and Volvo Construction Equipment trucks and tanker trailers made by Dragon Products, Longhorn Tank & Trailer, and Vantage Trailers.

Investing in new and reliable equipment definitely helps attract and retain good employees. The average age of the company's equipment is just under six years. "That makes a big difference in mission success," King points out. "Furthermore, we only buy vehicles with automatic transmissions ... which is a big plus for our drivers, as well as our younger drivers, who often are not trained in using standard transmissions."

“ But we still give our local teams the ability to make their own (dispatching) decisions to best serve their customers in the most efficient way. We rely on strong analytical tools to make our business run well. ”

DANA KING



**Above:** Jose Chavez operates an off-loading valve as he empties a tanker.

**Left:** Jackie Davis, plant manager, inspects oil that has gone through the recycling process.



## SAFETY MATTERS

A strong emphasis on safety training also spurred the company's growth, in terms of both employee and customer retention, and reduced insurance costs. While grease trap cleaning may seem like a relatively low-risk job, hazards lurk nonetheless, King observes.

"To begin a service, you have to pull the trap lid up and over to gain access to the interceptor," he explains. "In itself, this can be dangerous if you do not know the proper body mechanics, lifting strategies or tools to use. Pulling too hard on a lid can strain shoulders, arms and backs. Not using the right tool can cause smashed fingers or toes.

"Furthermore, operating the pumps and tank equipment also can be very dangerous," he continues. "Under pressure, hoses can whip and jump ... causing muscle strains. They also can rupture and release material that makes contact with eyes and skin, causing injury, infections, and illnesses. And removing a valve cap without making sure the tank is not pressurized is a good way to fracture ribs or suffer a laceration."

Employees receive initial as well as ongoing safety training provided primarily by staff and sometimes by outside consultants. This effort includes monthly nationwide training sessions for all employees, conducted live via Skype. "We see and hear them as they see and hear us," King says. "It gives us the ability to make sure the training topic and material is understood and to interact with the entire team by answering questions and provoking conversation."

Investments in safety programs and training are a significant incentive to employees' success and retention. "Pure and simple, our team members know that we want them to be safe for their interest as well as their family's interest," King says. "And one reason our customers do business with us is because they see the results of the training and the programs to which our team adheres. They know that our team will not cut corners or do anything that might negatively impact their business ... and that we follow regulations and take care of business in a professional and safe manner."

## MOVING FORWARD

Liquid Environmental Solutions typically prefers acquiring existing companies over starting from scratch because the latter takes more time to develop. Strong employees and a strategic location make for good candidates for acquisitions, King says. "We always need a reliable stream of grease trap waste, which is a high-energy commodity for anaerobic-digestion facilities owned by municipalities," he explains. "They need a reliable partner to deliver material so they can increase biomethane production."

Looking ahead, King expects continued growth for Liquid Environmental Solutions. He sees the company's primary mission as continuing development of new and better solutions for customers that protect the value of their wastewater infrastructure, ensures full compliance and confidence in their regulatory oversight, and maximizes the sustainability of their business.

"We will essentially continue to embrace ... a comprehensive management philosophy that builds value for our customers, our employee team members, and our shareholders," King says. ■

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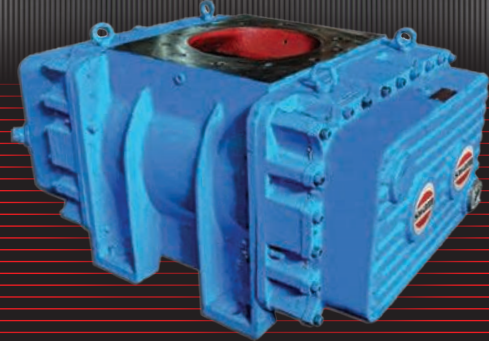
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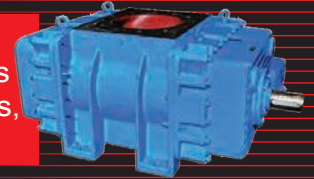
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Based in Racine, Wisconsin, Erik Gunn writes for magazines on business and other topics.

# Are You Paying Employees the Right Wages?

Finding the compensation sweet spot will retain great workers without breaking the bank. But getting there can be a major research challenge for small-business owners. **By Erik Gunn**

**Y**our business is growing and it's clear you'll need to hire another employee or two by next spring.

Have the wages you're offering kept up with what people expect? Or are you unwittingly paying a lot more than the market rate?

Knowing the appropriate pay rate for the people whose jobs are at the core of your business — truck drivers, septic pumpers, even the clerical staff who answer the phone, keep the books, and send out the bills — can be a significant challenge.

So how do you set pay rates? There are ways to arrive at the right answer systematically.

## PEOPLE PHILOSOPHY

Lisa Bazzoni is compensation director for MRA-The Management Association, an employers association based in Wisconsin and with offices in Illinois, Minnesota, and Iowa.

"The first thing a business owner needs to do is really determine what his or her people philosophy is," Bazzoni says. "A lot of people skip this step, but it really provides a lot of clarity for the rest of the process."

There's a range of such viewpoints. Some companies view workers as an expendable resource — the proverbial "warm body" who has a specific set of tasks to fulfill and can be replaced when necessary.

To be clear, Bazzoni isn't recommending that approach. But more than a few businesses operate just that way.

"At the other extreme," Bazzoni says, "there are employers who will say of their employees, 'This human being is an asset, and I want that asset to be with me for the long haul.'"

Whether you're trying to live by that approach, its opposite, or something in between, she says, "A lot of pay decisions — and a lot of other people decisions — are going to play into whatever the philosophy is."

Bazzoni continues: "If I am viewing my humans who are working for me as an asset, then maybe I'm going to pay a little higher than everyone else does, provide milestones for people and skill-based pay programs" that allow them to increase wages over time based on measurable and consistent metrics.

## GATHERING DATA

Figuring out those market rates — whether your aim is to match them or consciously exceed them — is the next step.

Sure, you can surf the internet and probably find a lot of isolated examples, not to mention every opinion under the sun, for free. Even at that

price, though, it's probably not worth what you're paying for it.

"It's not very reliable," Bazzoni warns. "Reliable data has a price tag on it." Reliable, she says, means "data that we can track to the source and verify its accuracy."

Most likely you will get the best information if you turn to a consulting firm or an employers group like MRA — and if the data you get is compiled from sound methodology. Typically it will be collected from highly detailed surveys, anonymous so the employers participating can provide more candid answers. Ideally they will be answered by those employers' human resources departments.

“ If I am viewing my humans who are working for me as an asset, then maybe I'm going to pay a little higher than everyone else does, provide milestones for people and skill-based pay programs.”

**Lisa Bazzoni**

Solid data will be validated to reflect geographic differences and also different ways companies may define particular jobs.

"Job titles can be meaningless," Bazzoni observes. Good research will drill down beyond those to enumerate the different skill sets and responsibilities employers may assign to a particular position "so that your 'computer operator' is the same as my 'computer operator.'"

## BY THE NUMBERS

In these days of low unemployment, such data is likely to change often. "We typically recommend businesses look at this data annually," she says. "When unemployment was higher, companies could get away with every three or four years."

If you're able to get solid data in hand, you need to look back where we began, with your fundamental human resources approach. "If the market says the going rate is \$20 an hour" for a particular job, Bazzoni explains, "what you're going to want to do is establish a range around that."

For instance, do you know you want to pay above market as part of a strategy that builds long-term loyalty and commitment to the business? Consider setting the wage in that context a few dollars an hour higher. Are you deliberately paying under market rates, knowing that you'll probably experience more turnover? Perhaps you'll go down to \$17.50 an hour.

And you'll probably want to structure more complex wage systems, with bands for various titles and skill levels and then metrics for choosing



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where a given worker fits in those bands.

So where do you find that kind of information? Searching for compensation consultants and making sure they're in your business field is one option. And employers associations are found in most parts of the country; consider checking out what they have to offer and whether it would benefit your business to join one.

Still, even the best quality sources can have some limitations. If you're in a rural area, the data is less rich because the labor pool is smaller, making it hard to establish the actual market price for particular skill sets.

And what if where you are there aren't any resources of that kind? Or what if the price tag is steeper than you feel you can afford? There are other options for information. Some may have drawbacks, but they might be better than nothing.

### SEEKING ALTERNATIVES

The U.S. Bureau of Labor Statistics publishes lists of occupations and their pay rates by regions. You can find it by starting here: [www.bls.gov/bls/blswage.htm](http://www.bls.gov/bls/blswage.htm). Then check listings by state or by metro area.

While reliable, it's also likely to be a year old or more because of the time that passes between when it's collected and when it is published. "Your labor market might have changed in that period of time," Bazzoni points out.

There might be some data closer to home than you are aware of. Check your local chamber of commerce to see if it has conducted a compensation survey of its members, for example.

Still another source may be public-sector pay scales for people in the trades you're employing. As public information, those should be relatively available. But they also come with limitations: government wages may be higher or lower than their private sector counterparts.

"I did a proposal for somebody who said, 'We don't want to compete with county employees — their salaries are very low and we're drawing our people from the private sector,'" Bazzoni recalls. In other geographic areas, the opposite may be true: that government scales are higher than private sector ones.

### EMPLOYER OF CHOICE

Sometimes businesses rely on wage data from other locations, then factor in local cost-of-living data to adjust their own pay rates. That can be tricky, though. "Cost-of-living and cost of labor are two different issues," she says. "For some jobs, you may have to pay more just to attract someone to your area."

Having established your basic structure, Bazzoni advises, "You really have to keep your ear to the ground." Casual employee chitchat, requests from job applicants for a particular pay level — none of these have the authority and reliability of a carefully conducted survey. But they do provide insight on people's expectations in your industry and geographic area.

To be sure, pay alone won't keep good workers or attract applicants, and pay alone might not be why people turn you down. Even if that's what they tell you.

"When people turn down your offer, they're always going to say it's about money," Bazzoni observes. And if they do — and if that happens repeatedly — take it seriously.

But be aware that might just be an excuse for something else, including a bad reputation as an employer for other reasons: management style, poor communication, a lack of opportunity for advancement and many others.

"Are you an employer of choice?" she asks. "If you're not training people well, if you're not treating them well, no amount of money is going to help you." ■

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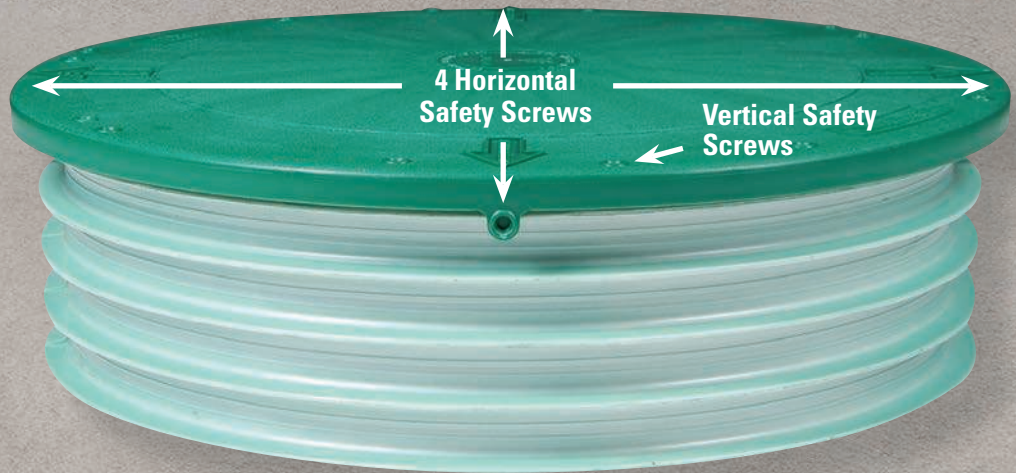
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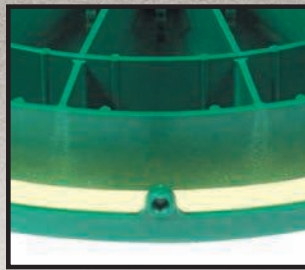
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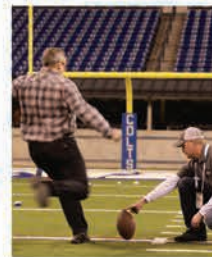
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# Rally the Troops to Boost Production, Raise Morale

Follow these 5 steps to get your crew invested in the success of your pumping company

By Walt Grassl

**M**ike worked for a medium-sized business and went to work every day happy to have a job. But he wasn't too enthused about his work environment. Employee morale was so-so because most longtime employees were merely going through the motions.

Greg was a friend of Mike's from school, and they ended up working in different industries. They stayed in touch on social media and decided to get together for lunch.

Mike picked Greg up at his workplace. He felt inspired when he entered Greg's building. There was an energy that was hard to describe. It was definitely not the same as at his company. He was warmly greeted by the receptionist and waited in the pristine lobby for Greg.

At lunch, Mike asked Greg about his job and what he liked about working there. Greg mentioned that the company has a management philosophy that every employee is important, like the links in a chain. They believe in sharing information that reinforces that message.

## WE ALL HAVE A PURPOSE

Every employee plays a role in the company's performance. It is important that they know their role. This gives them a sense of purpose. It answers the question: "Why does it matter?"

Some people always take great pride in their work. They know it reflects on them. Some people only push themselves when others are relying on them to do their part. Sharing the big picture helps to get the most out of these people. Getting the small things right leads to bigger success.

Here are five different strategies you as a small-business owner or manager can use to foster a workplace where every employee feels valued and can contribute to the overall vision of the company:

### 1. Include all employees in strategy meetings

To the extent possible, involve employees in strategy meetings. When you are contemplating a change in your company, modifying one or more processes or seeking new methods to improve service, involve the people who perform the tasks before decisions are finalized. They are liable to push back. When they do, use your wisdom and judgment to determine if the pushback is valid.

If it is valid, figure out a better path forward. This will prevent mistakes that save time and reduce waste. If the natural reaction is to resist change, deal with it now. You will avoid passive-aggressive behavior that will sabotage the path forward. Done right, you will earn the respect and buy-in of your workers. However, things like impending job actions (layoffs, promotions, transfers) must never be shared until it is time. When you are otherwise open, the need for discretion will be respected.

All the employees play a part in the success of the company. Good leaders praise the individuals and the teams, both in public and in private, for the significant contribution.

### 2. Stress the importance of every position

A good manager knows how every employee contributes to the performance of the company. Some employees interact with customers. Others work in the office. Drivers and technicians are your front-line service workers. All the employees play a part in the success of the company. Good leaders praise the individuals and the teams, both in public and in private, for the significant contribution. This is important. Over time, those who are not key service providers in the field may forget the significance of their role. They need to be reminded.

### 3. See the big picture

There is a common fallacy in the workplace that one job contributes more than others to the success of the project or company. It is a great thing when employees realize that what they do is important. It is not so good, however, when the needs of others in the workforce are discounted. Managers should step up and explain the big picture and recognize the important role played by everyone from the receptionist in the office to the equipment operator on the job location.

### 4. Your business story

The most powerful story for any business is the story of why the company exists. Who founded the company? What problem did the company originally solve? How did the company evolve into its current state? This works for businesses of all sizes. This is effective in external sales presentations. It is also effective in keeping employees motivated. When that story is known and repeated, employees will realize that they are part of growing or preserving a legacy.

### 5. Maintain an open-door policy

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ship by having an open-door policy. Set boundaries and let people know, but invite people to approach you with their concerns or questions. Maybe they come to you. Maybe you walk around and catch them doing things right.

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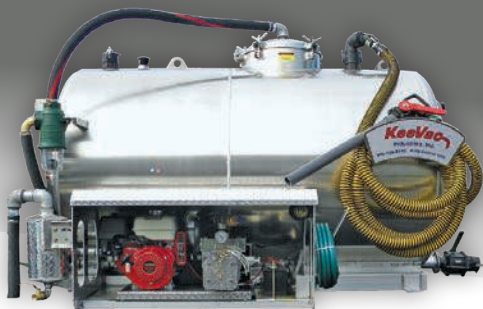
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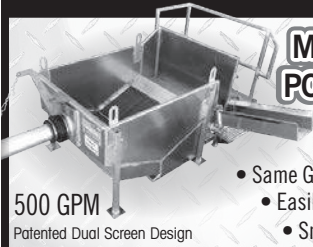
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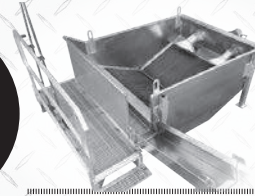
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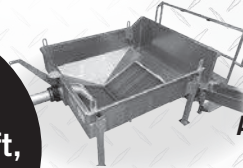
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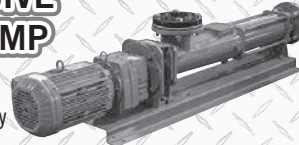


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The Forest family's wastewater services team includes (from front left) Tory Forest and his wife, Katelyn Forest; Tyler Forest; Tyler Forest's fiancé, Alynnia Freeburg; Jody Forest; Penny Forest; Dillon Downey; and Chuck Pallwitz. Jonathan Spencer is at the rear left. (Photos by Mark Hirsch)



# 100 YEARS AND COUNTING

**After a century of profitable septic system and grease trap service, a fourth generation of the Forest family is taking the reins in Des Moines, Iowa**

By Ted J. Rulseh

It's rare for a small family business to prosper into a fourth generation. That's a source of pride to Jody and Penny Forest, whose business marks its 100th anniversary this year, just as their two sons assume part ownership.

Tyler Forest, 31, is a partner with his parents in Forest Septic Environmental Services, based in Des Moines, Iowa. Tory Forest, 28, operates Forest Grease & Commercial, now a separate business serving restaurants and other establishments in and around Des Moines.

It was Jody Forest's idea to split the company and let each son run his own operation: Other successful pumpers had warned him about the conflicts often inherent in partnerships. "I want to set them up for success," Forest says. "I don't want to set them up for failure. We decided not to make them partners because they get along too well. Why ruin a good thing?"

Tyler and Tory Forest are pleased with the arrangement; both plan to expand their businesses while continuing the family tradition of hard work, fair dealing, quality service and personal connections with customers.

## Forest Septic Environmental Services

Des Moines, Iowa

**OWNERS:** Jody and Penny Forest with Tyler Forest as part owner

**YEARS IN BUSINESS:** 100

**EMPLOYEES:** 6

**SERVICES:** Septic system pumping, inspections and repairs

**SERVICE AREA:** 50-mile radius

**WEBSITE:** [www.forestseptic.com](http://www.forestseptic.com)



### IN THE BEGINNING

The family business was started by Robert Arthur "Babe" Forest in 1918. In those less enlightened days, he used a long-handled scoop to empty outhouse pits into barrels, then hauled the material to the Des Moines River and dumped it there. His son, the late George Forest (Jody Forest's father) helped with that work.

The business evolved into pumping septic systems; George Forest and his brother Bill took it over in the late 1940s. "They ran it for 40 years and never hired an employee," Jody Forest says. "My dad was in one truck and my uncle was in the other, and that's how they built our reputation, as owner-operators."

(continued)



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In the mid-1980s, George Forest bought his brother out, and Jody Forest went to work for him. He learned a key to success by watching how his father treated customers: “When my dad would go out to collect a bill, he’d always go into the house, and there I sat waiting in the truck for half an hour because the person was giving him pie or a cup of coffee. I couldn’t understand that because we had so much work to do, but now I find myself doing the same thing.

“I can’t tell you how many times when customers would call or when he would arrive at their homes, they would use his first name. That was it right there — getting to know them on a personal basis and building trust. That’s how my dad did it.”

### GENERATION THREE

When Jody Forest bought the company in 1988, it consisted of two older vacuum trucks and a large book of septic tank and grease trap pumping customers. To continue operations, Forest immediately had to build a new truck and hire an employee. “I put in some long days for a lot of years,” he says. “My body is telling me that now.”

He kept following his dad’s lead, building the customer base, making sure the phone was answered promptly, calling customers if arrival for service would be delayed, handling emergency calls with a sense of urgency, and eventually developing a customer education brochure that spells out the do’s and don’ts of septic system care.

Then came 2008, a landmark year. That’s when Forest formed what today is called Accurate Dewater-

ing Service and installed a septage dewatering system, designed by Therese Wheaton of Crystal Environmental. It dewateres 3 to 4 million gallons of septage per year using a 40-cubic-yard stainless steel box. Other area pumpers bring their septage there; Chris Mershon is the treatment plant operator.

One year later, two new laws gave the business extra shots of adrenaline. First, the City of Des Moines enacted a fats, oils, and grease ordinance that ordered quarterly pumping of restaurant grease traps and requires all grease to be delivered to the Des Moines Metropolitan Wastewater Reclamation Authority wastewater treatment plant, where it’s fed to the anaerobic digesters to produce biogas for power generation.

Forest Septic already serviced numerous grease traps, and through word-of-mouth, the phone started ringing. The grease business tripled in six months; Forest added a truck and full-time operator to meet the demand from independent and chain restaurants. “Most of the places are doing away with small grease traps,” Forest says. “They have 1,000- to 5,000-gallon grease interceptors that we pump.” The Des Moines plant accepts grease for just 2 cents per gallon, far less than at other plants in the area.

Also in 2009, the state adopted a law requiring septic system pumping and inspection at the time of home sales. Since then, Forest Septic has done more

*(continued)*

“I’m a lot like my dad, who always took pride in helping customers. We’re going to do everything we can to fix their issues and save them some money. Being a little personable can go a long way.”

**TYLER FOREST**



**Clockwise from top right:** Tyler Forest uses a hand-held remote control to engage the vacuum pump of the newest truck as he pumps a holding tank. The remote control hose reel is from Omega Liquid Waste Solutions. The company’s newest vacuum truck from Pik Rite with a National Vacuum Equipment blower has a rear hose reel with remote control from Omega Liquid Waste Solutions. Tyler Forest is shown returning hose to the truck after a pumping job; Tyler Forest lifts a concrete lid while preparing to pump a septic tank.

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Assembled restrooms	Global, Tufway, Axxis Vantage and Maxim	28	1 FREE (2 free on any additional truck loads)	1 FREE
Restroom Trucks	950 Gallon or larger	Any	\$600 OFF	\$300 OFF
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than 6,000 such inspections; Tyler and Tory Forest are certified to perform them. "Out of all the inspections we've done, we've never been taken to court or involved in litigation," Jody Forest says.

#### FOURTH GENERATION

Along the way, Tyler and Tory Forest began working in the business during summers. Tyler Forest attended Kirkwood Community College for liberal arts studies for two years and joined the company full-time in 2007. Tory Forest earned a bachelor's degree in psychology from Iowa State University, then entered the family business in 2011. Jody Forest believes that working long hours helped prepare the boys for the challenges of self-employment.

Last year, Jody and Penny Forest decided the time was right for an ownership transition. Tory Forest is buying the grease and commercial side of the company on a contract with plans to own it outright in 10 years. He personally services the restaurant and commercial accounts while his wife, Katelyn Forest, runs the office and handles scheduling and dispatching.

Tyler Forest has become part owner of the septic tank service side. Though he previously worked in the field on both sides of the business, he now works in the office. "He is very good with people, so we put him on the phones," Jody Forest says. "I decided to stay in the truck." Also in the field are service technicians Dillon Downey and Jonathan Spencer; Chuck Pallwitz is shop manager.

Penny Forest still runs the office, handling bookkeeping, billing, reminders and other functions. Tyler Forest's fiancé, Alynna Freeburg, is now assuming some of those duties and will develop the company's social media and other marketing initiatives.

#### BIG PLANS AHEAD

Tory and Tyler Forest have big plans for their businesses. Tory Forest, with a solid customer base in hand, was able to secure a credit union loan to buy a vacuum truck from his father — a 2015 Freightliner with a 4,000-gallon aluminum tank (Progress Tank) and a Wittig (Gardner Denver) 350 cfm vacuum pump. While he concentrates on the commercial side, he helps with septic tank pumping when that side sees an overload in demand.

"We all wracked our brains to figure out the best way to split up the business," he recalls. "This seemed like the best way to do it. I was more than willing to let Tyler take over the bigger portion. Our parents have been a huge help in the transition. My dad and grandfather both instilled a great work ethic in us. Dad always taught us just to be honest and respectful and super nice to customers.

"I'm blessed to take over a business that was already established. Right now, we're just a single truck, but over the next five years I plan on getting at least one more truck and one more employee. We're not sure how fast we're

going to grow, but that's the plan."

Likewise, Tyler Forest aspires to expand the business from three vacuum trucks to four and to exploring in-vessel composting of septage as an add-on to the Accurate Dewatering Service business.

After his community college studies, he had planned to take a year off to contemplate his future. One year with the family business has turned into 10 and an ownership stake.

"As a young kid, I always said there was no way I would be taking over this business," he says. "Now I take pride in it, and I can see that it had everything to do with everything we had while growing up. I'm a lot like my dad, who always took pride in helping customers. We're going to do everything we can to fix their issues and save them some money. Being a little personable can go a long way. We try to instill that in our employees, too."

For the moment, Tyler Forest handles scheduling and dispatching, interspersed with occasional fieldwork, such as installing risers on septic systems. "Dad always said that pumping septic tanks was our bread and butter," he observes. "There are enough septic tanks around. If we can keep four trucks busy here in central Iowa and work into composting, that's exciting."

Tory Forest hauls a hose used for grease trap service.

## Forest Grease & Commercial

Des Moines, Iowa

**OWNERS:** Tory and Katelyn Forest

**FOUNDED:** 2017

**EMPLOYEES:** 2

**SERVICES:** Grease trap pumping, commercial pit cleaning

**SERVICE AREA:** 50-mile radius

**WEBSITE:** [www.forestgrease.com](http://www.forestgrease.com)

Iowa



“I’m blessed to take over a business that was already established. Right now, we’re just a single truck, but over the next five years I plan on getting at least one more truck and one more employee.”

**TORY FOREST**





The Forest companies' fleet includes four Freightliners (from left) 2018 and 2017 models from Pik Rite with National Vacuum Equipment blowers, a 2015 with a tank from Progress Tank and Wittig (Gardner Denver) pump, and a 2011 from Advance Pump & Equipment with a National Vacuum Equipment blower.

## Making pumping easier

There are times Jody Forest feels his 57 years, especially when pumping septic tanks. "I've got arthritis in my wrists from doing so much probing," he says. "My body is telling me to stop; my mind wants to keep going."

And so he does, with help from a brand-new vacuum truck built by Pik Rite on a Freightliner chassis with a 4,700-gallon low-profile painted aluminum tank, a vacuum blower from National Vacuum Equipment, and heated valves. It includes a rear-mounted, swiveling hose reel from Omega Liquid Waste Solutions with 200-foot capacity and full remote control operation. Jody Forest saw a photo of a similar truck in *Pumper* magazine and knew he had to have one.

He took delivery in late 2017. "It's unbelievable," he says. "It's going to allow me to work out of a pump truck for a few more years, which I need to do. We can pump septic tanks from the road now — we don't necessarily have to back into people's driveways. I can grab the end of the hose at the reel and walk to where the septic tank is. Then I can operate everything from the septic tank and never have to go back to the truck."

The remote control has a 300-foot transmission range and handles all the functions necessary to pump, backflush, and empty the tank. "It's twice as fast. I don't have to lay the hoses out and make connections. When I'm done, I don't have to unhook the hoses. I cap the end of the hose, and that prevents any mess at all in the yard. I've got to feed the hose onto the reel manually, but that just means guiding it on, left to right. I put a ratchet strap on the hose to snug it down."

After working with the truck for two days, he decided to order another one to make life easier for his team members. Because the trucks are long, at 42 feet overall, he plans to add a backup camera to each one for safer maneuvering.

The Forest Septic Environmental Services side also operates a 2011 Freightliner carrying a 3,500-gallon steel tank with a full-opening rear door and National Vacuum Equipment blower pump designed and built by Advance Pump & Equipment. Crew members use a Takeuchi mini-excavator for inspections and to expose systems for service. It fits through a 32-inch gate and is very yard-friendly.

## PASSING THE TORCH ... AGAIN?

While their sons build their businesses, Jody and Penny Forest look forward to a new chapter in their lives. Jody Forest eventually will enjoy more hunting and fishing — his man cave hosts a collection of mounts of deer from Iowa and elk from out West. Penny Forest looks forward to more time for reading and taking in movies.

Both are proud of the businesses they've built and the sons who carry them on. "I think we raised our boys really well, and we believe they'll continue to do things the way we did, with honesty and integrity," Penny Forest says. "We get lots of compliments on their customer service. Their work ethic is good. There's no doubt in my mind that they'll do just fine."

Will there be a generation five for the Forest family businesses? With a first grandchild already on the way, no one should bet against it. ■

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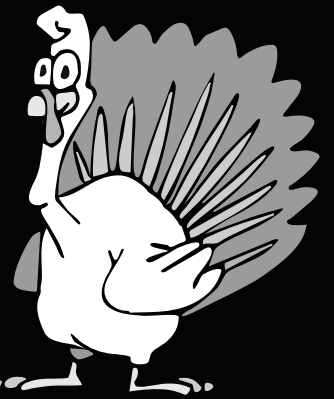
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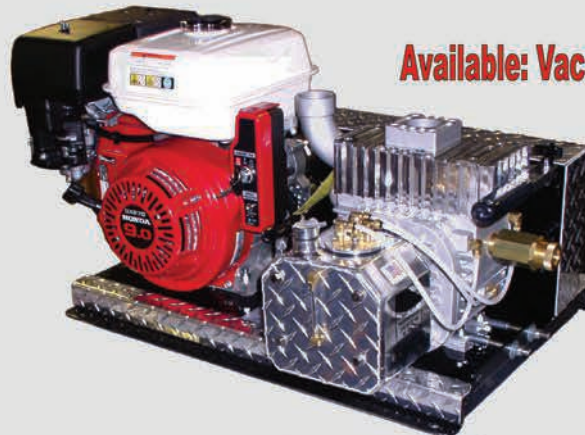


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# Lake George Water Quality Improves Through Septic System Upgrades

By David Steinkraus

**Y**ear after year, organizations fund grant programs to improve water quality by helping people repair or replace failing onsite systems, and a story from upstate New York shows such money isn't just being poured into holes in the ground.

*The Post-Star* of Glens Falls reports that in a small area of Lake George where septic systems have been replaced, the presence of algae fed by untreated wastewater is down 25 percent.

Lake George sits in the mountains of New York, about 200 miles north of New York City and only a couple of miles from the border with Vermont. The lake is about 31 miles long, up to 200 feet deep, and for decades has been noted for its clear water and natural beauty. For about the last decade, lake residents have been concerned about an algae problem.

In 2012, the annual meeting of the Dunhams Bay Association included a presentation with underwater photographs of algae blooms indicating fertilizer use or septic system failure. Blooms were present at 12 of the approximately 60 properties in the bay.

The FUND for Lake George offered help. Created in the 1980s to protect the lake, the fund also sponsors scientific research into various water issues. To help solve the algae problem, the fund provided matching grants of up to \$12,000 per property (later dropped to \$8,000) to encourage people to replace troubled onsite systems.

It wasn't as if people were thinking about their systems. Resident Alan Wrigley tells *The Post-Star* that he had his system pumped every few years but otherwise ignored it. When neighbors began talking about the algae problem, he reviewed his own conduct.

"I said, we'd better do something. I knew our system was old — it's probably the original, 70 years old," he tells the newspaper. He replaced the system in 2015 when the grant program began.

It turned out his old system used a metal tank, fortunately still intact and not leaking. Neighbor Len Simms found the same type of tank when his system was replaced, but in his case, only the top of the tank remained. The rest had decayed.

A presentation by Lake George waterkeeper Chris Navitsky in 2017 documented a creeping expansion of poor water quality. This was measured by checking the amount of chlorophyll, the molecule that plants use to absorb energy from the sun. Since the 1980s, chlorophyll has increased by 33 percent in the lake. The northern part of the lake has outstanding water quality. In the south, water quality is medium.

## Time of sale inspections mulled

Residents of Glen Lake in Queensbury are objecting to a proposed law that would have the town test septic systems when a property in the waterfront residential zone is sold.

The idea is that some proceeds from the sale would provide money to repair or replace a failing system, reports *The Post-Star* of Glens Falls. But residents tell town officials that when a property changes hands after a death, there is typically no exchange of money. Residents also worry that required repairs or installation of a new system would delay property sales.

A few lake residents spoke in favor of the proposed law with some suggesting all systems near the lake should be inspected regularly.

## Funds help replace New York systems

The Catskill Watershed Corp. removed the distance limit on funds to help homeowners and small businesses repair or replace failed septic systems. Previously a property had to be within 700 feet of a watercourse.

The residential program reimburses 100 percent of the cost of repair or replacement for permanent residents and 60 percent for part-time residents. Small businesses with 100 or fewer employees may receive 75 percent of cost.

The corporation began its septic repair program in 1995. To date, it has helped repair more than 5,000 failed systems.

## California

State government is pushing development of recycled wastewater as another source of water for the thirsty state, but not everyone is eager to pursue the option. In July the city of Ventura decided not to undertake direct potable reuse.

One reason, reports the *Ventura County Star*, is that no other city in the state is doing direct potable reuse. There is a bill in the legislature to spur development of direct potable reuse of water in onsite systems, and in the fall of 2017, Gov. Jerry Brown signed a bill ordering the state Water Resources Control Board to adopt regulations for augmenting raw water with recycled water.

The Ventura City Council said it was more comfortable pursuing indirect potable reuse in which treated wastewater is channeled to a basin from which it is drawn and treated again before being sent to customers. The city is under court order to reduce the amount of its discharge to 500,000 gallons per day. Ventura is on the Pacific coast, about 70 miles northwest of Los Angeles, and it was sued by several groups that say its large discharges — more than 6 million gpd — were harming habitat in the Santa Clara River estuary.

## Water Research Foundation Grants

After several months of preparation, the Water Research Foundation is accepting proposals to research water recycling. Money for the research is coming from a \$4.5 million grant from the California State Water Resources

Control Board. Some of the money will be used for research into potable uses and some for nonpotable uses.

Among the topics to be investigated are: developing monitoring systems for microorganisms in potable reuse operations, assembling evidence for pathogen reduction when recycled water is discharged into an aquifer, reviewing how industrial contaminants affect potable reuse, looking at the amount of wastewater available for recycling in California, studying the effects of recycled water irrigation of agricultural crops, and considering the potential for recycling water from oil fields.

### Florida

Recent news stories focused on the contribution that failing onsite systems make to algae blooms and how state government may have made the problem worse.

In 2010 the Legislature passed a law requiring inspections of onsite systems every five years. But citizens objected, and two years later the law was repealed after an effort led by former state Sen. Charlie Dean, R-Inverness. He tells the *Tampa Bay Times* he is now not sure that repeal was right.

“In my opinion, septic tanks are a major contributor,” Dean says in an interview. “If we repealed the wrong thing, then yes, it’s our fault.”

Gov. Rick Scott, who signed the repeal, disagrees. “It’s absurd to say that a bill that the Legislature passed with an overwhelming, bipartisan majority to save homeowners money six years ago has somehow caused the algal bloom problem that’s been plaguing the state for decades,” a spokesman tells the newspaper.

Scientists interviewed for the stories say agriculture is the primary cause of the blooms, but onsite systems contribute to the problem.

### Connecticut

The town of New Fairfield is considering regulations to govern Airbnb online home rentals. In New Fairfield, the draw is properties on Candlewood Lake, which has a long history of renting properties.

The problem for Evan White, the zoning officer in New Fairfield, is that some Airbnb rentals bring in so many people that it puts a strain on septic systems.

The audience at a public hearing was split between those who say online rentals have helped them keep or improve their homes, and those who object to large crowds that strain wastewater systems and disturb neighbors.

John Moran, who chairs the zoning commission, tells *The News-Times* of Danbury that commissioners will take a few months to decide what action would be appropriate.

### Oregon

The Eugene Water & Electric Board has restored funding for its septic system program in the McKenzie River watershed. The river is the only source of drinking water for the city of Eugene.

Money is available for cost sharing and zero-interest loans to help people maintain their systems or repair or replace failing systems.

Under cost sharing, homeowners upstream of the city’s drinking water intake may receive 50 percent of the cost of an inspection and pumpout, and 50 percent of minor repairs that cost up to \$300.

Zero-interest loans are available for significant repairs or system replacements. The maximum loan amount is \$10,000 with a maximum repayment term of 60 months.

### Prince Albert, Saskatchewan

The city of Prince Albert punished a pumping company for what it alleges was illegal dumping, but a judge quashed the punishment saying the process was unfair to the company.

After it hired a private investigator to look into charges against C & D Septic, the city denied the company access to the city wastewater plant to dump septage and to the city landfill to dispose of biosolids. In addition, it sent letters to 18 people who are not connected to the sewer system and informed them they would not be eligible for a 50 percent pumping cost reimbursement if they hired C & D Septic.

In his opinion, Court of Queen’s Bench Justice Gary Meschisnick says it was clear the city made decisions without notice to the company. Although there was no detailed evidence of financial harm, he says it was also clear the company had lost business as a result of the city action. He ordered the city to outline its concerns to the company and to specify the evidence it has. ■

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50	13.2	50.0	4350	300	1450	27.2	0.984	25	0.906	23

Max GPM.	Max. LMP	Max. PSI	Max. Bar	Max. RPM	Req. HP	Bore Dia. in.	Bore Dia. mm	Stroke in.	Stroke mm	RTX
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RTX	Max GPM.	Max. LMP	Max. PSI	Max. Bar	Max. RPM	Req. HP	Bore Dia. in.	Bore Dia. mm	Stroke in.	Stroke mm
70	18.5	70.0	3000	206	1450	25.4	1.181	30	0.906	23

Max GPM.	Max. LMP	Max. PSI	Max. Bar	Max. RPM	Req. HP	Bore Dia. in.	Bore Dia. mm	Stroke in.	Stroke mm	RTX
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RTX	Max GPM.	Max. LMP	Max. PSI	Max. Bar	Max. RPM	Req. HP	Bore Dia. in.	Bore Dia. mm	Stroke in.	Stroke mm
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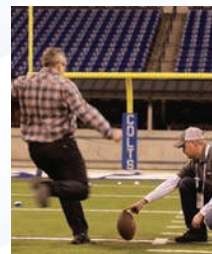


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# Student Engineers Learn the Value of Decentralized Wastewater Treatment

University of Iowa classmates help coordinate massive onsite system upgrade plan surrounding a lake threatened by the breach of a dam **By David Steinkraus**

**W**hen the dam failed at Lake Delhi in northeastern Iowa in 2010, the state agreed to help Delaware County and local property owners pay for a new one, but the state placed a condition on its aid: All onsite systems at the longtime lake community had to be working properly. With about 880 homes around the lake, it was a tall order. But it also became an opportunity for university students to help fix a real-world problem in a county with limited resources.

The dam failed following heavy rains. In less than 24 hours, the watershed received about 12 inches of rain, says Dennis Lyons, sanitarian for Delaware County where the lake is located. Lake Delhi is an impoundment on the Maquoketa River, and when the dam failed, it was as if someone pulled the plug in a bathtub, Lyons says.

Before the dam breach, there had already been meetings about improving onsite treatment and water quality in the lake. In 2005 the Eastern Iowa Regional Utility Service System (which helps counties and communities plan, finance, build, and operate essential services) met with a consultant about preparing a wastewater plan. The consultant proposed three centralized systems with an estimated cost of \$15 million.

“With the lay of the lake and everything, it was clear that \$15 million was not going to cover it, and at the time, funding was not available from the state,” Lyons says.

## SEEKING A SOLUTION

The only solution was improved decentralized treatment, and in 2017 that led Delaware County into a partnership with the University of Iowa to help formulate cost-effective answers for Lake Delhi property owners.

The project came to the university’s Iowa Initiative for Sustainable Communities. It has existed for nine years, and its mission is to link university resources with communities to help solve problems, says Travis Kraus, assistant director of the initiative.

“We like to hear about the challenges and what issues people are trying to solve, and then we think about what department can satisfy the need best. We put together the pieces and find the right people to help,” Kraus says.

Sometimes the initiative partners with a city or town, but for the last couple of years, partnerships have been with regional organizations. That allows small communities like Lake Delhi to take advantage of university expertise, he says, because such communities usually don’t have large enough budgets or staffs to support joint projects with the university. Cost is definitely an advantage for organizations that partner with the university.

“When we do something, it’s at a much lower cost than a consultant. We don’t think of ourselves as replacing consultants, but enhancing their ability because in many cases they use the student work as a starting point, which



**Above:** Students Brian Cummings (from left) and Jason Ruffatti talk with Dennis Lyons, Delaware County (Iowa) sanitarian, about onsite system upgrades at Lake Delhi. The topography of the area, visible in the background, presented a challenge for the engineering students examining wastewater solutions. (Photos courtesy University of Iowa)



**Left:** University of Iowa engineering students Brian Cummings (left), Jason Ruffatti (second from left), and Kelly Wolner (second from right) talk with Dennis Lyons (right), Delaware County (Iowa) sanitarian, about the onsite options for residents of Lake Delhi. After a dam breach in 2010, the state agreed to help fund a new dam on condition that onsite systems around the lake would be repaired or replaced to improve water quality. The county and local property owners paid for the remainder.



saves money. We feel many projects we're involved in wouldn't be done otherwise," Kraus says.

In this case, the project was referred to an environmental engineering class.

### SEWER VS. SEPTIC

For senior Jason Ruffatti, it was a very attractive project because it was so different.

"I've done a few internships, but I've never really done a project this involved," he says.

He had never been on a site visit nor had to contact a large number of people to gather information. Most student projects are set up so they are easily understood and solved, he says. "This one turned out to be more real than the others."

The environmental engineering class he was in focuses on municipal systems. Before the Lake Delhi project came along, Ruffatti had no acquaintance with onsite technology.

"The biggest design issue we had was dealing with the harsh topography at Lake Delhi. And with some of these homes, there's not a lot of space between them," Ruffatti says.

Terrain around the lake is hilly with steep slopes down to the water. The small lots made it almost impossible to fit onsite systems onto some properties and remain within the property boundaries, he says.

"In my opinion, putting in sewer systems would have been much easier than finding an individual spot for each system at each home. Of course, putting in a conventional system would have required dealing with the same topography," he says. "Onsite technology is very promising, I think, and it's cool what these little systems are able to achieve as far as removal."

What surprised him was how clean onsite effluent can be. When the students finished their calculations, they found some systems could discharge treated wastewater directly into the lake, no drainfield required.

The second biggest issue was not having much information on the existing systems. It was surprising that some homes are outfitted with AdvanTex systems (Orengo Systems), while others have systems installed in the 1960s and owners have no idea about how it functions, he says.

"I think students should absolutely do more of this kind of work because most real-world problems are extremely nuanced like this one," Ruffatti says.

### THREE SYSTEM OPTIONS

Student assistance was also valuable for the county.

"The way I looked at it, I just like to have an extra set of eyes looking.

*Kelly Wolner, left, and Jason Ruffatti, right, of the University of Iowa are interviewed about their role in wastewater system repairs at Lake Delhi. The story of how engineering students helped analyze options for lake property owners received wide coverage.*

I can't say they came up with anything I didn't look at before," Lyons says.

But the students could devote a larger block of time to the project than county staff, he says. They had time for a thorough analysis of the problem and time to prepare a good presentation about the solutions. Their report was 28 pages of history, satellite photos with color-coded boxes showing treatment sites, decision tables that scored alternatives on a variety of factors, and costs.

“Onsite technology is very promising, I think, and it's cool what these little systems are able to achieve as far as removal.”

— Jason Ruffatti

The options break down to three: an AdvanTex system, a Premier Tech Aqua Ecoflo system with a coco filter, or a holding tank. The tank is the last option on everyone's list, yet in one case the students overruled their own decision table and recommended a tank. The location was very near a well, Ruffatti says, and the students wanted to avoid any possibility of contamination.

A new Lake Delhi dam was dedicated in 2016. The students filed their final report in December 2017. What happens next is up to the landowners.

"I send a letter out every year to the people who do not have their systems checked out," Lyons says.

This year he is planning a meeting for early summer so residents can see some of the options available to them. About 156 homes still need upgrades, and there is a clock ticking. Originally the state allowed 10 years for onsite system upgrades around the lake. Five years remain. ■

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# ‘We Are All Conscientious of Protecting Our Environment for the Future’

Wisconsin wastewater professionals band together to network, improve business practices, and lobby for sensible and smart regulations

*In States Snapshot, we visit with a member of a state, provincial or national trade association in the decentralized wastewater industry. This time, we learn about a member of the Wisconsin Liquid Waste Carriers Association.*

**Name and title or job description:** John Bowen, president

**Business name and location:** Ken-Way Services of Rice Lake Inc., Rice Lake, Wisconsin

**Age:** 64

**Years in the industry:** 30

**Association involvement:** The Wisconsin Liquid Waste Carriers Association was established in 1972. I joined in 1987 and three years later became president and served four years. I’ve been on the board for 20 years and two years ago became president again.

**Benefits of belonging to the association:** I have very high regard for this association. It has helped me grow personally and has really helped our company grow into being a very respected professional business. There are many benefits. We have input on legislative rulings and code revisions involving our industry. We have upfront knowledge about what is in the works from the Wisconsin Department of Natural Resources and the U.S. Environmental Protection Agency. I feel we are more professional and profitable from the knowledge we gain from other pumpers. There are the friendships. Insurance is another thing — finding out where everyone is getting insurance. We have a couple conventions each year, which are well-attended. I cannot imagine not belonging to this association.

**Biggest issue facing your association right now:** The Wisconsin Liquid Waste Carriers Association is a strong group with 140 out of 404 registered liquid waste businesses, but with many older member companies retiring or merging with other companies, we are having some difficulties recruiting new members.

**Our crew includes:** My partner is my son, Cory. We have two full-time and two part-time office staff, eight full-time service technicians/drivers, and two part-time laborers.

**Typical day on the job:** I usually start my day around 4 or 5 a.m., before all the other crew members come in, by hauling industrial liquid waste out of landfills or industrial plants. I like to start early to get a load or two out before everyone comes in. I then return to the shop to see the service technicians/drivers begin their day. I check in with my office staff to see if telephone calls need to be returned or if they have questions that need my attention. I then go out on service calls, which may include any or all of the following: clearing, jetting, and/or televising lines; septic- and holding tank-



pumping; and portable toilet deliveries.

**Helping hands – Indispensable crew member:** All our employees are valuable.

There are two that stand out. One is my son, Cory, who grew up with the business and then after college graduation returned full time. I made him a partner so he can take over when I decide to retire. The other is our office manager, Cheryl Mlejnek, who has been with us for 18 years.

**The job I’ll never forget:** Believe it or not, I have a very weak stomach and have been known to lose my “cookies” on certain jobs. I have to keep reminding myself of my motto: It smells like money! But one job I will never forget is when I was at the home of an elderly woman unplugging the line from the lift pump to the main sewer line. I had unhooked the pipe from the lift pump and was clearing the line. The homeowner was very interested in seeing what I was doing, so she was bent over behind me. She accidentally hit the float for the lift pump and got sewage all over her. Her final comment was, “I should know better than to watch what you are doing.” We both laughed.

**My favorite piece of equipment:** Our five vacuum trucks because they are the bread and butter of our business — 2006 to 2017 Internationals with tanks ranging in size from 3,800 to 5,500 gallons from Imperial Industries (steel) and Advance Pump & Equipment (stainless steel), all with Wittig (Gardner Denver) pumps.

**Most challenging site I’ve worked on:** We dredge a lot of sludge ponds for municipalities where we are floating on a barge in the pond and trying to remove sludge from the bottom. The challenge is to not take any more water than we have to, so you’ve got to keep the barge moving and maximize the amount of sludge being loaded into the vacuum trucks.

John Bowen and 2017 International with an Advance Pump & Equipment 4,300-gallon stainless steel tank and Wittig (Gardner Denver) pump.

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**The craziest question I've been asked by a customer:** "Did you always dream of doing this job when you were growing up?" I have been asked that question by more than one customer.

**If I could change one industry regulation, it would be:** I would like to see the pumpers able to gain larger volume of storage for the waste. We need to be able to store more gallons. The big issue in Wisconsin is getting enough sites to field-apply on. A lot of farms are cash-cropping now, and during the summer or in real wet conditions, a lot of pumpers don't have a place to go. And especially in the northwest part of the state, the smaller pumpers don't have treatment plants that can accept it so sometimes they have to put business off until they can field-apply it. It doesn't make for a good relationship with their clients when they can't give them emergency service. We've been working on that for a few years with the DNR, trying to get them to lighten up a little bit. Right now they've got what they call small storage where we can go up to 25,000 gallons. We're trying to get that raised to a higher volume.

**Best piece of small-business advice I've heard:** Some bits of advice I have received from many seasoned business owners and would like to pass on are: Do what you say you are going to do. Show up to the job at the time you told the customer you would be there. Always be positive to customers; negativity gains nothing.

**If I wasn't working in the wastewater industry, I would:** After high school graduation, I operated heavy equipment, then owned my own solid waste company and now a liquid waste business. Any of the above.

**Crystal ball time - This is my outlook for the wastewater industry:** We have made big strides in attaining professionalism in our industry and I only see that continuing. We are all conscientious of protecting our environment for the future and I believe that will also continue. ■

- Compiled by Betty Dageforde



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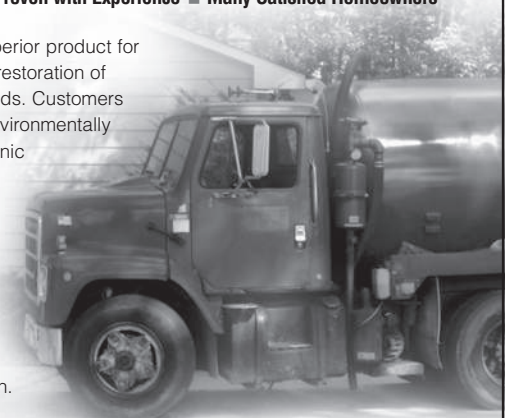
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Jim Anderson, Ph.D., is an emeritus professor at the University of Minnesota Department of Soil, Water and Climate and recipient of the pumping industry's Ralph Macchio Lifetime Achievement Award. Email Jim questions about septic system maintenance and operation at [editor@pumper.com](mailto:editor@pumper.com).

# Weather Trends Point to Need for More Septic System Insulation

Declining snow cover in many areas should push you to consider several options to protect pipes and tanks against disruptive and costly freezing situations **By Jim Anderson, Ph.D.**

**A**t the end of last winter season — which did not occur until after April 25 where I live, the last day we were able to ski and snowshoe — there were articles in papers and even television segments on how parts of Upper Michigan, Minnesota, and Wisconsin experienced more than the usual number of septic systems with freezing problems. This was attributed to the lack of continuous snow cover. Statistics were given indicating the trend has been for decreasing snow cover over the past 30 years.

The trend for the onsite industry means we need to question the need for insulating systems more than ever. During the years I worked in Minnesota, we relied on snow cover as a natural insulator to keep our “shallow” systems from having freezing problems. Now it may be prudent to consider insulating systems when they are installed to provide an extra measure of protection.

What needs to be insulated? Piping from the house to the tanks and from the tanks to the soil treatment area? The septic tank and risers?

## FOR THE PIPES

I have indicated here and elsewhere that the best way to prevent freezing in the piping is for it to be properly installed and bedded to eliminate bends or bellies where water can collect and freeze when pipes are installed above normal frost depth. In pressure systems, the piping from the pump tank to the treatment area should be installed so it will drain back empty after the pump shuts off. This means no check valves and a weep hole in the pipe inside the tank for the effluent to drain into the tank.

A practice with a dual purpose is to provide clean-outs for the piping. This provides access points to remove solids if they plug the piping and provide access outside the house to thaw piping when necessary. One of the biggest problems mentioned in some of the articles was the lack of a good access point to get at frozen areas. Having the homeowner wait until spring for the system to thaw is not a good option, and excavating pipe in the middle of the winter is no picnic. I have friends with a bar in northern Wisconsin who had to close for eight days while piping from the bar to the tank was excavated and thawed. This was very costly at one of the busiest times of the year.

There are four ways to provide insulated piping.

Pre-insulated pipe is available and can be purchased through your pipe supply company. It usually consists of a smaller-diameter pipe inside a larger pipe with foam insulation filling the void between the pipes. In the past, I have talked about using this pipe if the piping is to run under a driveway or other high-traffic surfaces.

In a similar way, a smaller pipe inside a larger pipe will provide a good air-insulation pocket. This may be effective in areas where frost depths are shallower and winter weather is less severe. It is not as effective in colder areas of the Upper Midwest.

Installing sheet insulation over the top of the piping and/or on the sides to form three sides of a box can be very effective. If the insulation is installed only over the top, it must extend far enough to the side to intersect with a line from the bottom of the pipe extending at a 45-degree angle. This prevents the frost from coming around the side of the pipe.

Flexible insulation used to wrap around pipes is easier to use than sheet insulation. In all cases, the insulating material should be rated for burial and resistant to uptake of moisture from soil. If not, it will become saturated with water and lose all insulating value.

## FOR THE TANK

For sewage tanks — including septic, pump and advanced pretreatment units — tank walls, lids, and risers may all require insulation.

In the past, a tank with a cover of at least 2 feet of soil was not thought to require insulation. In Minnesota, tanks with less than 2 feet of cover require insulation. This was based on data collected during winter months in Minnesota where the soil combined with snow cover help maintain tank temperatures necessary for biological activity (above 40 degrees F). The most critical time for the tank temperature was in the spring when the soil began to thaw and the snow was melting.

If there is less snow cover and melting occurs earlier during the winter, there can still be extended cold periods. Remember that it only has to be 32 degrees F for water to freeze. Additionally, for advanced pretreatment units to operate properly, the temperature must be higher than the biological minimum of 40 degrees F. So insulating tanks makes a lot sense in many situations.

To protect tanks, insulation board can be placed over the top and along the sides. Risers can be insulated by wrapping flexible insulation around the outside. If the riser is over a smaller opening in the tank, insulation can be placed inside the riser covering the smaller opening.

Available spray-on insulation materials can be applied during installation. These products have a secondary benefit in terms of providing additional sealant for any tank seams, either at the cover or at midtank. The tank must be properly sealed and watertight for the insulation to be effective. Just as with piping, this insulation must be suitable for burial. ■



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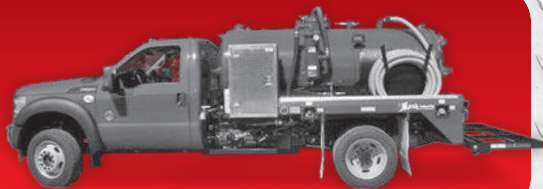
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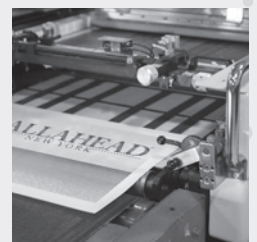
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### Cape Cod Biochemical DrainMaster

The **DrainMaster** system for automatic injection into restaurant grease waste systems from **Cape Cod Biochemical** is designed to take the guesswork out of applying a grease waste maintenance product in commercial applications. It uses a timed metering pump

that can be programmed to inject as much or as little solution as needed on a daily basis. Daily injections reduce the amount of product necessary, saving money on service intervals. **800-759-2257; www.septiconline.com.**



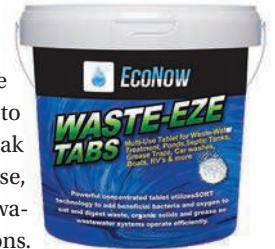
### Chempace Sewer Foam

**Sewer Foam** high-foaming sewer and drainline cleaner and degreaser from **Chempace** — when combined with the high-pressure water of a jet truck — is designed to clean all types of grease and organics. The foam incorporates a long-lasting bacterial treatment to assist in solids and odor reduction. It is noncaustic, concentrated at 2 ounces per gallon, and safe for all pipes and jet trucks. **800-423-5350; www.chempace.com.**



### Eco-logical Concepts Waste-Eze Tabs

**Waste-Eze Tabs** from **Eco-logical Concepts** use SORT (Selective Oxygen Release Tab) technology to provide oxygen and billions of safe bacteria to break down and digest organic solids, waste, and grease, while eliminating odors. They can be used in wastewater treatment facilities, as well as pump and lift stations. They are designed to help prevent hydrogen sulfide and other noxious odors, as well as potential corrosion issues. When hydrogen sulfide is trapped in an enclosed area, it can form sulfuric acid, which will corrode tank walls and pipes, eventually leading to system failure. The tabs help prevent the creation of hydrogen sulfide and other noxious odors or corrosion by adding oxygen. The byproduct of aerobic (with oxygen) degradation is carbon dioxide, a non-toxic odorless gas. **516-248-3553; www.econowcommercial.com.**



### Ecological Laboratories PRO-PUMP/DGTT

**PRO-PUMP/DGTT** (Drainline and Grease Trap Treatment) is a liquid, high-count culture consortium from **Ecological Laboratories** for commercial effluent drainlines and grease trap systems. It is pleasantly fragranced and designed to work on contact to degrade line and trap deposits as well as control odors. It can be applied manually through drains or using a pump dosing system. According to the maker, regular use can help eliminate odors, clean drainlines and benefit receiving wastewater systems. **800-326-7867; www.propump.com.**

### Green Way Products by PolyPortables EarthWorks Water Treat GT

**EarthWorks Water Treat GT** ready-to-use, all-purpose treatment from **Green Way Products by PolyPortables** is formulated to repair and maintain grease traps, septic systems, drainfields and wastewater holding tanks. It combines two natural technologies to control odor; reduce fats, oils, grease, and corrosion; and promote healthy wastewater containment systems. The primary active ingredient — an organic histosol — binds hydrogen sulfide, mercaptans and ammonia to reduce odor. Selective bacteria strains are added to reduce suspended solids and break down grease and waste. It will also condition the inside of a vacuum truck's holding tank during transport, reducing foul tank odors, according to the maker. It is available in mulberry and pine fresh fragrances and is offered in 1-, 5-, 7- and 55-gallon containers. **800-241-7951; www.polyportables.com.**



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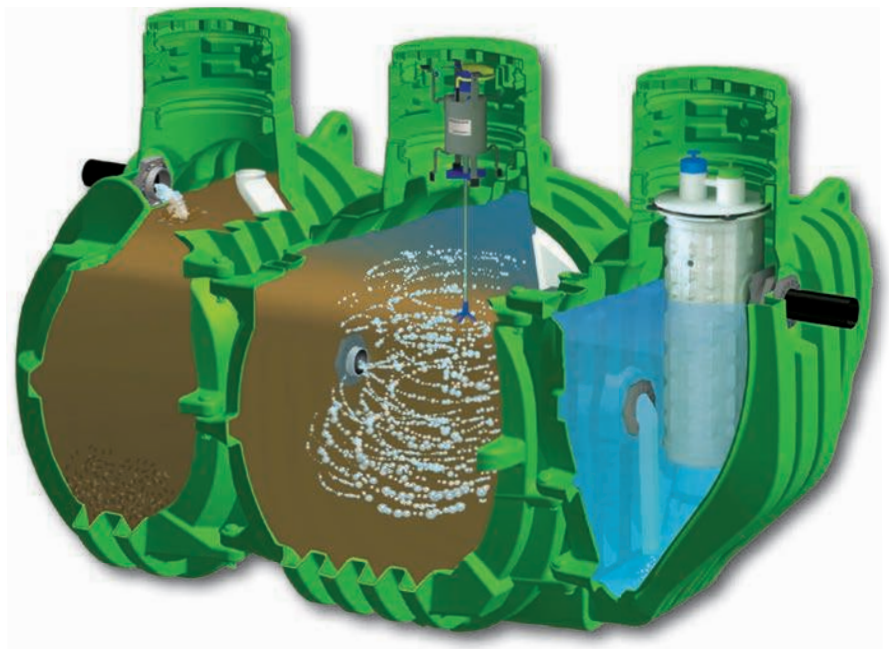
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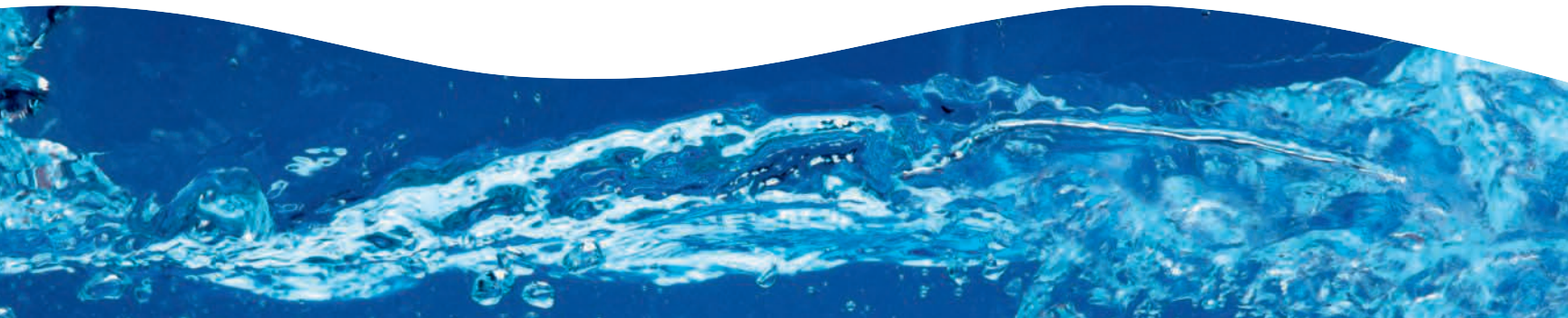


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### Jet Inc. BIO JET 7 Plus

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### Lenzyme Trap-Cleer

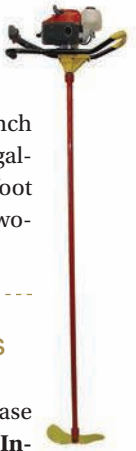
**Trap-Cleer** from **Lenzyme** is used as a biological grease and sewage-treating agent for industrial, commercial, and municipal installations, including grease traps, wastewater treatment plants, wastewater treatment ponds, lift stations, sewer lines and manholes, and pretreatment facilities. The bacterial cultures are of selected strains ideally suited to thrive in onsite sewage and wastewater management systems. It is approved by the U.S. Department of Agriculture for use in drainlines of official establishments operating under the federal meat, poultry and egg products inspection program. **800-223-3083; www.lenzyme.com.**



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### Imperial Industries grease units

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The horizontal biosolids dewatering system from **In The Round Dewatering** has a stainless steel drum with perforated plastic tile lining. The drum is mounted on a roll-off frame for easy transport and unloading. Water trays allow containment of discharge water. An 18,000- to 25,000-gallon batch is mixed with polymer before being filtered in the rotating drum, driven by a 1/2 hp variable-speed electric motor with a heavy-duty chain and sprocket. The turning eliminates crusting and wet pockets to produce uniform, consistent results. The dewatered material dumps easily, and the drum is self-cleaning. **317-539-7304; www.itrdewatering.com.**



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### Fiberglass grease interceptor offers university long-term solution for managing food waste

**Problem:** Michigan State University needed to replace deteriorating concrete grease interceptors. Their Snyder Phillips dining hall seats 600 and is one of the busiest on campus. Student food waste caused the interceptor system to plug, and it needed to be pumped out once or twice each week.

**Solution:** **ZCL | Xerxes** replaced the 2,500-gallon concrete interceptor with a corrosion-resistant, 20,000-gallon fiberglass grease interceptor. The project manager realized the best design would have a side discharge pipe rather than an end discharge pipe to eliminate 90-degree elbows. This reduced the potential for food, solids and grease to plug up the system.

**Result:** The university's mechanical team now specifies only fiberglass grease interceptors. The new interceptor is pumped out once every several weeks instead of weekly. They haul away the waste to be burned as biofuel. **952-887-1890; www.zcl.com.**



### RecoverE SingleSep

The **SingleSep** trap grease processor from **RecoverE** is designed for small-scale pumpers to handle grease, especially those with limited disposal options. The fully automated and instrumented unit accepts as-pumped grease and separates the brown grease (as a pasteurized, low-water biosolids) from the water and other solids, with no additives required. Only electricity and heat (electrical, gas or LP) are necessary for its energy-efficient GreaseBuster process. Optional abatement technology simplifies odor management. An optional headworks is also available. Among expected users of the one-tank design are smaller operations, processing 500 to 8,000 gpd. **269-271-4977; www.recovere.biz.**

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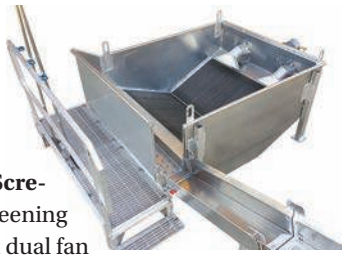
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## GREASE HANDLING EQUIPMENT

### ScreenCo Systems Mega Screen

The **Mega Screen** receiving station from **ScreenCo Systems** has 40.5 square feet of screening area and is fed through a 6-inch inlet with dual fan spreaders. The front screens are self-cleaning, processing up to 1,000 gpm. The dual screen design is nonmechanical and uses gravity to separate trash from the waste stream. The unit is constructed from aluminum and utilizes stainless steel 3/8-inch gapped bar screens at opposing angles, meeting the 503 regulations for septic screening. It can be set up with a single 6-inch inlet hose or two 4-inch inlet hoses capable of off-loading two trucks simultaneously. It will not plug with rags or hair, and simple raking to the trash drain tray with provided custom tools makes clean-out simple. Built-in forklift skids make it portable. An OSHA-compliant catwalk is included. **208-790-8770; www.screencosystems.com.**

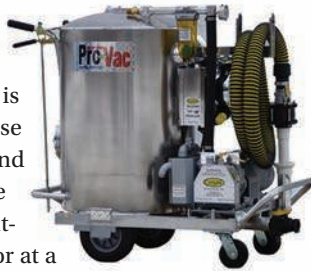


### Thriller Mfg.

**Thriller Mfg.** has established a process as to not cross-contaminate stainless steel products. By working with this established process, it makes the work building and the yard more organized. Minimizing mistakes and shortening the time employees spend locating an item means more time fitters and welders spend doing his or her job. **801-908-5565; www.thrillermfg.com.**

### Westmoor Conde ProVac

The **Conde ProVac** preassembled industrial liquid waste pumping system from **Westmoor** is designed to promote efficient pumping of grease traps. The unit is quiet and lightweight and pumps at 120 gpm. Flip a switch to start the unit in vacuum mode for pumping. The built-in exhaust deodorizer is designed to keep odor at a minimum. Flip the switch to pressure mode for off-loading. It can be used to service locations not suitable for large vacuum truck hoses, including indoor or remote difficult-to-access jobs. **800-367-0972; www.westmoorltd.com.**



## GREASE INTERCEPTORS

### ASHLAND PolyTraps 4800 Series

The polyethylene **4800 Series** grease interceptor from **ASHLAND PolyTraps** is an option when corrosion resistance is needed. The grease interceptor utilizes a hydromechanical process to prevent grease, fats and oil from entering sewage lines.

It comes standard with an external flow control to ensure the waste flow doesn't surpass gallons per minute recommendations. Units are tested and certified to PDI-G101 standards and are able to withstand continuous usage with temperatures up to 212 degrees F. Units have a smooth, nonstick surface for complete cleaning. Designed for flush-with-floor or on-the-floor installation, units are offered in a wide range of sizes from 4 gpm with a 2.3-gallon holding capacity, to 350 gpm with a 560-gallon holding capacity. **800-541-8004; www.ashlandpolytraps.com.**



### BioMicrobics FOGHog

The **FOGHog** grease trap from **BioMicrobics** is a simple, lightweight, durable, noncorrosive and efficient indoor device that's used to remove fats, oils and grease from high-BOD wastewater. It can be installed under a sink for single-point use or anywhere in the piping schematic prior to an onsite wastewater treatment system or sewer (ideally closer to the sink drain so FOG doesn't solidify in the pipe). Several options are available sized by flow from 20 to 100 gpm to help detain 95 percent of fats, oils and greases at the source of contamination. Grease traps should be properly cleaned, with disposal of FOG by a licensed hauler at least every three months, while clean-out frequency will vary. **800-753-3278; www.biomicrobics.com.**



### IPEX USA Endura XL

The **Endura XL** (75 and 100 gpm) from **IPEX USA** is a hydromechanical grease interceptor engineered with an easy-open baffle, three plumbed outlets and internal flow control. It is corrosion-resistant, with EZ-Open cover latches and removable baffles.



Two options provide a stand-alone installation as part of a new/existing plumbing system, or as a basket accessory that can be installed directly into the full height interceptor, saving significant footprint and offering a quick solution to kitchen drain challenges caused by solids accumulation. **800-463-9572; www.enduragrease.com.**

## GREASE TREATMENT

### NozzTeq Super Goblin Grease Eater

The **Super Goblin Grease Eater** from **NozzTeq** adds four additional front jets and 10 rear jets to the original Goblin design for clearing grease and general cleaning. It has smooth-walled inner chambers designed to preserve the powerful laminar water flow generated by a pump or jetting truck. Preserving smooth flow means it generates tightly focused, high-velocity jet streams that strip fats, oils and grease from pipe walls and move them efficiently downstream and out of sewers. It is a sturdy 12 pounds of stainless steel with replaceable jet orifices and is rated for 10,000 psi minimum burst. **866-620-5915; www.nozzteq.com.**



### Scotty's Recycling

**Scotty's Recycling** specializes in processing used cooking oils, specifically the emulsion/rag layer above the water and below the oil. Collecting and processing used oils by heating and settling the oil can lead to a significant amount of emulsion left over, which most companies pay



to dispose of. This layer contains 25 to 40 percent oil that the company uses its technology and processes to recover, leading to additional profits without any additional collection, as well as reduced disposal costs. It also allows clients to take in third-party emulsion at a tipping fee, further increasing profits and finished product. They provide the experience, know-how, training, and the equipment, bypassing the learning curve and allowing clients to instantly get up and running. **914-218-8888; www.scottysrecycling.com.**

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### Advance Pump & Equipment JT530

The gas engine-powered **JT530** toolbox jetter from **Advance Pump & Equipment** offers 5 gpm at 3,000 psi. It includes a polished aluminum toolbox, a General Pump water pump, pulsator and pressure-controlled engine throttle, electric-start 13 hp Honda engine, remote fuel tank bracket, electric rewind reel with 200 feet of 3/8-inch hose, chrome rollers, a washdown gun with four tips, Enz USA flushing nozzle, and a stainless steel tool rack with tools. **563-557-0957; www.advancepump.com.**



### Amazing Machinery BossJet Pro Box Jetter

The **BossJet Pro Box Jetter** from **Amazing Machinery** can be mounted in many configurations. It comes with a Honda or Kohler engine, a triplex plunger pump and a Hannay Reels electric hose reel. All units are encased in a high-density aluminum box frame with an access panel on the side for exhaust release and ease of service. It comes with 200 feet of 1/4-inch I.D. jetter hose and laser and spin jet nozzles. It is designed to clean and clear 2- to 6-inch pipes. Options include a foot pedal, trap kit, remote reel and port-a-potty head attachment for the smaller lines. All units include a washdown gun and wand, four pressure washer tips, and a chemical injector for easy cleanup. **800-504-7435; www.amazingmachinery.com.**



### Cam Spray MCB Series

**MCB Series** skid-mounted pressure washers from **Cam Spray** can be used with a flatbed truck, pickup or van — with or without an onboard water tank. They are available in operating pressures from 2,000 to 7,000 psi and don't require plugging into an electrical source. These machines use gasoline engines with a high-amp charging system. The engine provides power to drive the pump system and provide 12-volt DC power to keep the battery charged and operate the burner system. They include an industrial gas-powered engine; triplex plunger pump; chemical injection; 50-foot hose; and a trigger gun with 0-, 15-, 25- and 40-degree nozzles. The burner system includes a rust-free fuel tank and heavy-duty coil with stainless steel wrap, and is controlled by an adjustable thermostat. **800-648-5011; www.camspray.com.**



### Easy-Kleen Pressure Systems Grizzly Series

The **Grizzly Series** from **Easy-Kleen Pressure Systems** is designed to clear and clean grease traps and pipes, with a 25 hp Kohler or 24 hp Honda engine offering 8 gpm at 3,000 psi. It is compact and easily transported in a truck or trailer.

Its rugged, dependable design includes a fully welded, powder-coated, 1 1/2-inch bent steel cage with a 10-gallon gas tank and a 20-gallon oil tank. It includes a belt-driven General Pump with adjustable pressure regulator. Options include a steam kit, jetter kit, hose reels or a complete skid package. **800-315-5533; www.easykleen.com.**



### Water Cannon Inc. - MWBE pressure washers

Pressure washers from **Water Cannon Inc. - MWBE** feature a recirculation module that cools the water while the trigger gun is closed. The triplex ceramic plunger pump is designed for both commercial and professional daily use. To protect wear parts, it includes an overheat safety valve that will open and close automatically to allow the recirculating higher-temperature water to be released, allowing cool water to replace it. **800-333-9274; www.watercannon.com.**



## ROLL-OFF CONTAINERS

### AQUA-Zyme Disposal Systems ADS

The **ADS 30-yard open-top roll-off dewatering unit** from **AQUA-Zyme Disposal Systems** can be filled with 22,000 to 25,000 gallons of biosolids at 1 to 2 percent solids in about two hours. Sludge volume can be reduced by 80 percent with reductions to 98 percent in BOD, COD, FOG and TSS. Effluent is clear, the unit has few moving parts, and the size of filter media can be selected according to job requirements. Standard equipment includes a roll-over tarp system; side, floor and center screens; 1/4-inch floor plate; 7-gauge side plates; four door-binder ratchets; eight drain ports; two inlet ports; and a long-handle scraper. Units are also available in a 15-yard size. **979-245-5656; www.aqua-zyme.com.**



### Park Process Sludge King

The **Sludge King** dewatering container from **Park Process** includes radiused, edged filter screens providing extra filter area and eliminating 90-degree angles that can trap cake when dumping. Between the bottom ends of the wall filters and middle wall filters are installed Cake Away thick plastic panels that fill the void in the container bottom where water could collect. Two center-wall filter panels offer additional filter area, translating into drier cakes and faster dewatering times. The inlet manifold has individually controlled inlet ports for distributing the incoming flow equally to each side of the center wall filters. Units are offered in five capacities. **855-511-7275; www.parkprocess.com.**



### Pik Rite self-contained roll-off unit

**Pik Rite** self-contained roll-off units are fully operational at the pumping site without a chassis. The heavy-duty front platform holds the user's choice of pump and a Kohler 25 hp electric-start engine. The tank is set up with a level indicator, rear sight eyes, 36-inch top manway, 20-inch rear manway, 3-inch intake with an internal 3-inch standpipe, and a 4-inch discharge. The low-profile, 12-inch primary shut-off is paired with a 10-gallon secondary shut-off. Work lights and a safety beacon are mounted on the rear tank head and a ladder is mounted on the side. Polished aluminum hose trays and custom paint finish are standard. Other customizable options are available. **800-326-9763; www.pikrite.com. ■**





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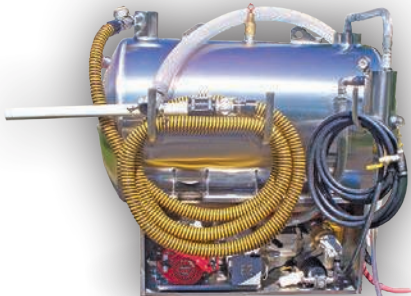


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## Arkansas

Arkansas Onsite Wastewater Association  
[www.arkowa.com](http://www.arkowa.com)

## California

California Onsite Wastewater Association  
[www.cowa.org](http://www.cowa.org); 530-513-6658

## Colorado

Colorado Professionals in Onsite Wastewater  
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## Connecticut

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## Delaware

Delaware On-Site Wastewater Recycling Association  
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## Florida

Florida Onsite Wastewater Association  
[www.fowaonsite.com](http://www.fowaonsite.com); 321-363-1590

## Georgia

Georgia Onsite Wastewater Association  
[www.onsitewastewater.org](http://www.onsitewastewater.org); 706-407-2552

Georgia F.O.G. Alliance  
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## Idaho

Onsite Wastewater Association of Idaho  
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## Illinois

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## Iowa

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## Kansas

Kansas Small Flows Association  
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## Kentucky

Kentucky Onsite Wastewater Association  
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Maine Association of Professional Soil Scientists  
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Michigan Septic Tank Association  
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## Minnesota

Minnesota Onsite Wastewater Association  
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## Mississippi

Mississippi Pumpers Association  
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## Missouri

Missouri Smallflows Organization  
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## Nebraska

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Granite State Designers and Installers Association  
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## New York

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## Ohio

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## Oregon

Oregon Onsite Wastewater Association  
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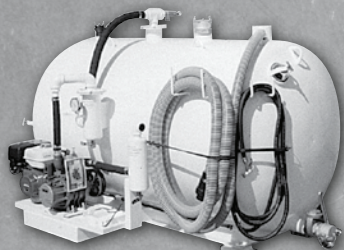
Pennsylvania Association of Sewage Enforcement Officers  
[www.pa-seo.org](http://www.pa-seo.org); 717-761-8648

Pennsylvania Onsite Wastewater Recycling Association  
[www.powra.org](http://www.powra.org)

Pennsylvania Septage Management Association  
[www.pasma.net](http://www.pasma.net); 717-763-7762

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### NATIONAL

Water Environment Federation  
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National Onsite Wastewater Recycling Association  
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National Association of Wastewater Technicians  
www.nawt.org; 800-236-6298

### CANADA

#### Alberta

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

#### British Columbia

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

British Columbia Onsite Sewage Association  
www.bcossa.org; 778-432-2120

#### Manitoba

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

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

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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

### Saskatchewan

Saskatchewan Onsite Wastewater  
Management Association  
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*in the*  
**SPOTLIGHT**  
By Craig Mandli

**WALEX PRODUCTS  
OVATION OFFERS  
VERSATILE ODOR CONTROL**



Combating foul odors can be a constant struggle for portable restroom operators. Heavy use and hot weather can add to the challenge. That's why air fresheners that are powerful and easy to place make sense. **Ovation** air fresheners from **Walex Products** answer those needs.

Ovation air fresheners contain odor control technology and freshening capabilities designed to last more than 30 days. The product can be used in portable restrooms, vehicles, homes, storage rooms, or anywhere a boost of fragrance is needed.

"We believe Ovation's commercial-strength odor control technology has set a new standard for portable air fresheners," says Michelle Howe, sales and marketing coordinator for Walex Products. "Its vibrant colors and convenient shape make it fun and easy to pin, hang or place anywhere."

Ovation is lightweight, 3.5 inches in diameter, and available in three fragrances and colors, including fresh/blue, citrus/orange, and lavender/purple. To pin or hang a disc, tear open and remove it from the package, and pin it or hang it anywhere. If being placed directly in contact with surfaces that can be damaged by fragrance, such as finished wood, polished surfaces, and certain plastics, packages should be torn open, and the disc left in the package to be placed near the source of the foul odor.

"Ovation automatically neutralizes airborne odors and continuously releases fragrance to freshen portable restrooms," Howe says. "It is powered by the same odor control technology we use in our Bravo urinal screen, but with the flexibility to be used anywhere. That makes it versatile enough for anywhere needing a boost of fragrance."

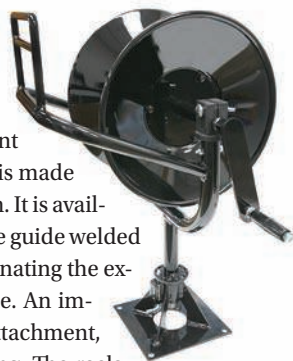
According to Howe, Ovation was researched and developed by the company's in-house chemists and released to the market in July of 2018.

"It's great for the industry because of its multiple uses for portable restroom operators, as they can use it in their trucks, offices, portable restrooms and trailers," she says. "The feedback from customers so far has been great. They're amazed by the quality and longevity of the product. They're using them on job sites, and many are so impressed that they are even taking them home to use."

800-338-3155; [www.walex.com](http://www.walex.com).

**WATER CANNON INC. - MWBE  
FLAT-SURFACE-MOUNT  
PRESSURE WASHER**

The 100- to 300-foot hose reel flat-surface-mount pressure washer from Water Cannon Inc. - MWBE is made from heavy gauge steel and has a powder-coat finish. It is available with several mounting options including a hose guide welded to the hose reel frame, making it stronger and eliminating the extra load to the bushings, decreasing wear over time. An improved hose coupling allows for straight in-hose attachment, removing difficult installations and possible kinking. The reels come assembled in the box. 800-333-9274; [www.watercannon.com](http://www.watercannon.com). ■



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- Stainless steel counter top
- Water saver faucets
- Low flush porcelain toilets
- FRP institutional interior surfaces
- More floor plans, plus shower stall options



Contractor 2-Unit

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8 Sink Unit

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Explorer improves transport safety by directly securing most sizes of toilet skid to the specially designed carrier slats on the trailer bed.



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We have your size...1-24

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<p><b>Island Johnny LLC.</b> Shelton, WA (360) 426-6697</p>	<p><b>Steve Baie Ent.</b> Apopka, FL (407) 709-8175</p>	<p><b>Ted Hoover</b> Crossfield, AB (866) 587-7262</p>	<p><b>Elton Tamplin</b> Mansfield, TX (254) 379-1384</p>

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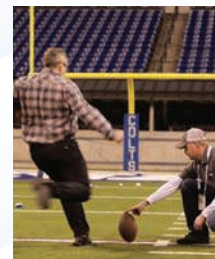
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- ✓ **Events** to network with your peers - or just kick back with friends.





Premier Tech Aqua opens new office in Pennsylvania

Premier Tech Aqua opened a new office in Quakertown, Pennsylvania. The company has 4,200 employees in 25 countries and 42 plants. "We have laid the groundwork for growth and expansion in the Northeastern, Central and Western U.S. We are creating more jobs and we look to fill them," says Eric Marceau, general manager.

Wastequip chief financial officer honored as CFO of the Year

Wastequip announced that Steve Klueg was awarded the 2018 CFO of the Year in the mid-sized private company category by the *Charlotte Business Journal*. The award highlights Klueg's role in significantly improving the company's financial position, culminating in its recent successful acquisition by H.I.G. Capital. Nominations were evaluated by an independent panel of judges, facilitated by researchers from Wake Forest University, who selected the finalists and winners of each category based on a variety of factors, including accomplishments, civic involvement, leadership, and contributions to corporate success. ■



Steve Klueg

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## BUSINESSES



**Well-established portable toilet company** for sale in east-central Wisconsin. Company has been in business for 15 years with a variety of customers. We service many municipalities, commercial construction, farms and many special events throughout the year. The company has approximately 250 Maxim 3000 Satellite portable toilets. Also for sale are 8 handicap toilets, 4 liftable toilets, 25 handwash sinks and 4 luxury portable toilets. This business comes with 4 service trucks in excellent mechanical condition; 2018 Ford F550 with Best 750/250/150, 2006 International with a 2017 custom tank 850/500 (this truck hauls 8 units), 2004 Dodge 3500 300/250 and 1990 International with 2004 T-Line 775/315 tank. There is also a 20-place and an 8-place transport trailer included in the sale. For more information please contact us at:

[mncp@lakefield.net](mailto:mncp@lakefield.net) P11

Owner retiring due to health. Septic tank and portable toilet business of 37 years w/same phone number for sale in central West Virginia. Approx. 350 toilets, 12 holding tanks, 16 handwash stations, 9 handicap units. 2012 F450, 250 water/600 waste, 2011 F450 250 water/400 waste, 2008 150 water/250 waste service trucks. All Masports and DC10s. 2014 International 3,000-gallon vac truck w/heated valves. 2002 2,500-gallon vac truck, both with water-cooled Masports. 4 trailers for delivering units. Lots of miscellaneous parts, paper chemicals, etc. WILL NOT PIECE OUT OR SELL SEPARATELY. DO NOT ASK. Serious inquiries only. Great family business opportunity! 304-613-6013 (P12)

**National Grease Recycling Inc.** Let us teach you how to recycle restaurant's waste, fryer grease and oil (yellow grease) only. Big \$. Over 30 years experience, will guide you through complete process from collection to processing to marketing to end users. Don't lose your trap business to competitors that offer both services. We also buy cooking oil, unprocessed, anywhere in the country. Call for information. References available - many success stories. Dewey Walker, 813-756-6121 or 813-758-2552. (PBM)

Septic tank and portable toilet business for sale, owners ready to retire. Highly reputable family business. Grease tank pumping contracts. 24 years of service with the same phone number included. We have a loyal customer base. Equipment included: 2017 Anderson 10-ton trailer with electric brakes; 2016 Isuzu toilet truck, automatic, 900-gallon waste, 400-gallon water; 2015 Caterpillar 305 mini-excavator; 2007 Mack Granite CT713 pumper truck, automatic, 4,200 gallons; 2007 International 4300 pumper truck, automatic, 2,500 gallons; 2004 Case 580M backhoe/loader; 2004 Interstate gooseneck trailer; 1997 Mack CH613, 5-speed set truck; (170) portable toilets of which (70) are new Satellite toilets; (2) new Satellite handwashing stations; (5) new Satellite handicap portable toilets. Option to lease property where business is located for 2 years. Office business line (850-994-4008) since 1994. Office fax line (850-994-0341) since 1994. Cellular number 850-516-9573. Business email [carterandsonseptic@gmail.com](mailto:carterandsonseptic@gmail.com). Business website <http://www.carterseptictank.com>. Panhandle of Florida. Endless potential. Serious inquiries only. Can be sold without portable toilet business. Please text/call 850-516-9573 or 850-698-8337. (P11)

For Sale - Full-service septic company, Citrus County, Florida. Includes 2008 International 4300, 2,500-gallon tank built in 2016. Built in 200-gallon water head, PTO-driven jetter 10gpm @ 4,000psi. 10 yrs. of receipts. Excellent residential and commercial base. Also office/living 1,300 sq. ft. 2 bdrm, bath, living room with wood fireplace, all appliances included. W/D. Beautiful private backyard with built-in pool 18 x 36. Real estate zoned commercial has billboard, excellent location. For details contact 888-401-6181 or [Clearflowtech@gmail.com](mailto:Clearflowtech@gmail.com) (P12)

Well-established SW Florida business for sale. 900+ units on the street, 15 ADA, 30+ sinks, 20+ holding tanks, 7 trucks, 2 trailers. Many longterm construction customers, year-round event customers. Documented yearly growth. Only serious buyers need to inquire. Email [office@ronsjons.com](mailto:office@ronsjons.com) or [portapottyrentals@yahoo.com](mailto:portapottyrentals@yahoo.com) (P11)

**www.RooterMan.com.** Franchises available with low flat fee. New concept. Visit website or call **1-800-700-8062**. (PBM)

If you're interested in selling your grease trap service, used cooking oil or other non-haz wastewater disposal business, we'd like to hear from you! Liquid Environmental Solutions is the nation's largest liquid waste management company - providing service across the USA. Sell your business and enjoy retirement or join us - we can always use great team members. Contact Brian Bidelspach: [brian.bidelspach@liquidenviro.com](mailto:brian.bidelspach@liquidenviro.com) or call 602-206-3636. (PBM)

**Septic Tank Service Business for Sale:** Owner wishes to retire. Located in Calhoun, FL (Nassau County) north of Jacksonville - fastest growing county in Florida. 33 years in operation with loyal customer base. Includes: **1996 International 4900** w/DT466E, 5-speed transmission, 2-speed axle. 2,500-gallon capacity truck. 302k miles, fresh in-frame, new transmission, excellent condition. **2000 Freightliner FL70** w/8.3 Cummins diesel, 6-speed transmission. 2,400-gallon capacity truck. 198k miles, excellent condition. **Also included:** Complete DEP-approved lime stabilization site and facility for land application. Owner will train and assist with licensing. For more information contact K.A. "Kenny" Farmer at 904-879-4701 or 904-545-0357; [farmer613259@aol.com](mailto:farmer613259@aol.com) (P11)

Septic pumping business for sale in Dutchess County, NY. Family-owned for 22 years. Computer-organized customer list. Business comes with phone number. Excellent opportunity to start your own business or grow an already existing business. Call 845-656-5572. (P11)

Septic business for sale, New York watershed. Includes trucks and equipment. 20+ years with same phone number. \$250,000. [hacksaw12481@gmail.com](mailto:hacksaw12481@gmail.com) (PBM)

## COMPUTER SOFTWARE

[FreeServiceReminderSoftware.com](http://FreeServiceReminderSoftware.com), [FreeServiceDispatchSoftware.com](http://FreeServiceDispatchSoftware.com), [FreeRouteManagementSoftware.com](http://FreeRouteManagementSoftware.com). (P11)

## DEWATERING

Portable septic and grease receiving stations, dual-screen design. Screens that really work - simple, non-mechanical. Set it up anywhere. 208-790-8770 [screencosystems.com](http://screencosystems.com) [sales@screencosystems.com](mailto:sales@screencosystems.com) (PBM)

**Surplus Equipment Sale:** Item 1: Mobile rotary sludge thickener, \$29,000. Item 2: Stainless steel 6,300-gallon thickened sludge land application tanker, \$17,000. Contact Mark Scott at [Mark@delta-pioneer.com](mailto:Mark@delta-pioneer.com) (P01)

2007 FloTrend SludgeMate 30-yard dewatering box is designed to dewater: grease trap waste, septic tank waste, digester sludge, alum sludge. Also includes Polymate polymer mixing and injection system. Serious inquiries only, please. \$28,900. Call Rite-Way Services: 606-877-2670 (P01)

HUBER Micro Strainer ROTAMAT Ro9. New, never used with control panel. \$55,000 or best offer. 570-840-5807 (P12)

**FOR SALE:** Two (2) Andritz 2.2-meter belt presses, unused after complete refurbishing to Andritz factory specifications throughout. Dyer Equipment Co. 970-454-3784, Ault, CO or [dyerequipment@aol.com](mailto:dyerequipment@aol.com) (P11)

## DRAIN/SEWER CLEANING EQUIPMENT



**2004 Vac-Con** sewer combination, International 7400 DT530, many new parts. 9-yard body, 3-stage fan. Garage kept. Ready to work. .... \$87,000

**Ken 410-984-0101, MD** P11  
[khatfield@hatfieldsequipt.com](mailto:khatfield@hatfieldsequipt.com)

## DRAINFIELD RESTORATION

New and used terralifts for sale starting at \$20,000 used and \$38,000 new. Financing available. Call John at AerraTech 413-298-4272. (PBM)

Terralifts - New and Used. Financing available for qualified buyers. For more information call Dick Crane 800-223-2256 or [aalco@tds.net](mailto:aalco@tds.net) for electronic brochure. [www.youtube.com/watch?v=t8ApRU0asNY](http://www.youtube.com/watch?v=t8ApRU0asNY) (PBM)

Terralift with 145 hours. 3 probes. 3 boxes of beads. Very good condition. Will send pics on request. \$12,000. 774-573-0530 (P11)

2017 Terralift. 33 hours. Comes with two probes and two boxes of beads. Like-new condition. \$29,500. Call for pictures. 804-814-3041 (P11)

1999 Terralift - includes trailer and 4 probes for rejuvenating pits as well. \$12,000. Located in California. 805-207-9566. Pictures available upon request. (P11)

## HAZARDOUS WASTE UNITS

2007 International Presvac. DOT-certified MC 412 carbon-steel, 3,500-gallon dumping door tank with a Hibon 1,400cfm blower and Presvac Peavy 750 vacuum pump. 72,000 miles. In excellent condition with Cummins 435 horsepower engine, pre-emission. KLM Companies 617-909-9044 (PBM)

1997 Ford LN9000 with Presvac 2,300-gallon DOT-certified tank. Tank in great shape. Cummins with Fuller transmission. Just inspected, runs excellent. \$25,500. KLM Companies 617-909-9044 (PBM)

1994 Volvo WG64 with Presvac 3,300-gallon, two-compartment, DOT-certified tank tank (2,300/1,000). Cat 3406, 400hp with Fruitland 1200 vacuum pump. \$27,500. KLM Companies 617-909-9044 (PBM)

1984 Mack R686ST with a 1999 Keith Huber Dominator 3,000-gallon carbon-steel, dump type, DOT, vacuum tank unit. (Stock# 1165C) [www.VacuumSalesInc.com](http://www.VacuumSalesInc.com) (888) **VAC-UNIT (822-8648)** (PBM)

1997 Ford cab and chassis with a 3,500 U.S. gallon, carbon steel, DOT-certified vacuum tank. Dump type with full-open rear door and a Masport HXL400WV vacuum-pressure pump. (Stock# 1829V) [www.VacuumSalesInc.com](http://www.VacuumSalesInc.com) (888) **VAC-UNIT (822-8648)** (PBM)

## JET VACS



**1995 Ford L8000 Vac-Con** combo unit, 4-stage fan. Working daily, great unit. 174k miles on chassis, 4,000 hours on pony motor. 9-yard tank. ... \$20,000  
**631-586-1200, NY** P12



**2006 Sterling Super Products Camel 200** dump body, Myers DP80 water pump, Roots 624 blower, extendable boom. Excellent condition. 41,500 miles. \$65,000  
**559-284-0401** P12

Jack Doheny Supplies Inc. offers a full range of late model combo units and DOT industrial vacuum loaders. Call us @1-800-3DOHENY. (PBM)

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[www.hotjetusa.com](http://www.hotjetusa.com) PBM

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**1984 Vactor 810** Diesel/Diesel aux. engine. Rebuilt water pump and tanks, jets great. Great spare machine. .... \$15,000

**Call 1-800-464-7001, MA** P11



**Miscellaneous jetter reels.** Five (5) reels, all in working condition with hydraulic motors. All with 200-500 feet of 3,000psi hose on each.

**717-866-8690, PA** P12

2004 Freightliner Vactor Ramjet. Myers DS-65 pump. Excellent condition. Pics upon request. \$30,000 OBO. Call Mily 786-379-6333 or email [allpumpingservices@gmail.com](mailto:allpumpingservices@gmail.com) (P11)

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## MISCELLANEOUS

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## PORTABLE RESTROOMS

4,000 used portable restrooms for sale. Updating our fleet to the new Zenith portable restrooms from Sansom Industries. Prices range from \$125 - \$325. Call Jim Reisinger @ 314-776-4000. (PBM)

PolyJohn P.J.N portable restrooms for sale. Tan in color. Minor repair/cleaning may be required on some, but units are in good working order and job-site ready. Can send sample photos of units upon request. \$200 per unit. Depending on location, may be able to deliver for additional fee. Contact Thomas at 228-493-7327 or by email at [tjphares@scenicgroup.com](mailto:tjphares@scenicgroup.com) (P11)

Construction units for sale. Good condition. \$120. Olympic fiberglass, \$150 Synergy. All have sanitizer dispensers. Call 203-748-6906. NY/CT line (P12)

(24) PolyJohn grey flushable units - \$300 each. (11) PolyPortables grey flushable units - \$300 each. (11) teal construction-grade poly toilets with no brand name on them - \$100 each. Please contact Aaron with any questions: 276-620-0533 or email [r\\_rseptic@yahoo.com](mailto:r_rseptic@yahoo.com) (P12)

Porta Potties for Sale: \$25 - \$200. Great for deer stands or camps. For more information please call Don Feger at 573-473-4093. (P11)

PolyJohn units in good condition for sale. 30 standard units. 4 flushing units. 2 ADA units. Asking \$7,000 for all. 424-394-9453 (P11)

## PORTABLE RESTROOM TRAILERS

2-stall NuConcepts VIP trailers (solar power) in working condition. Look nice. \$8,500 per trailer. Have 2 trailers left. Amazing deal! 424-394-9453 (P11)

Two (2) 8' Jag Porta-Lisa, one (1) 15' Jag 4-station, two (2) Jag 24' 8-station. All restroom trailers still in great rental condition. Call for more details and pricing. Pictures available upon request. Contact Bruce at 631-767-9404. (P01)

2 Decons, 28' Tonto, 18' Royal, 2001 ASCI, 16' Presidential, 26' Presidential, portable toilet hauler trailers. 315-437-1291, NY. (PBM)

## PORTABLE RESTROOM TRUCKS

1996 International 4700 T444-E portable toilet truck. 5-speed manual transmission. Satellite built truck, 700 waste/300 fresh. Frame is solid, tires have plenty of life on them. Truck runs good, only reason for selling is it isn't needed. \$12,500. Call 603-856-4456 or email [kevin@gosseseptic.com](mailto:kevin@gosseseptic.com) (P11)



**2015 Ford F550** crew cab, 4x4, automatic. Currently has 80k miles (truck remains in service). Price w/NEW 980-gallon steel tank: \$62,500. Price w/NEW 1,300-gallon aluminum tank: \$72,500. Imperial will build to suit your application, just let us know what size tank you would like quoted on this truck.

**Contact Tim 800-558-2945** P11



**Complete Portable Toilet service truck mount units** (turn-key), mounted on your truck or ours. Tool boxes, dual work stations, dc10 washdown pump, reversible vacuum pump, hose reel, set up complete, toilet racks available. 1100 waste/400 fresh: \$21,000, 1700 waste/600 fresh: \$23,500. Any custom options or sizes available!

**TexLa Services**  
**936-641-3938**  
**Check us out on Facebook!** P11



**2000 International 4700**, auto, Jurup pump, new motor. **2008 Ford F750**, auto, Masport pump, new turbo. Asking \$25,000 on each. More pictures upon request.

**704-252-7100, NC**  
**Jeff@charlottewaste.com** P12

2007 Isuzu, 950/325 aluminum tank, DC10 washdown pump, Masport HXL4 pump, dual side service, 285,000 miles. Upper-half engine rebuilt at 210,000 miles. \$24,000. Available 11/01/2018. Pics available. Jack 815-877-9770, [portajohn@portajohn1.com](mailto:portajohn@portajohn1.com) (P11)

2007 Isuzu with Progress slide-in 400/200, 160,421 miles. All service records from purchase date included. \$15,500. Please contact Ricky for more information: 208-949-0117; [ricky@portapros.com](mailto:ricky@portapros.com) (P12)

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## PORTABLE RESTROOM TRUCKS



**2000 Ford F550**, 7.3 diesel 4x2 portable toilet truck. Keith Huber 600/300. Location Bellefontaine, Ohio ..... \$7,500

**Call 937-935-4744** P11



**2003 International 4200 VT365**, 196,100 miles. 700-gallon waste, 300-gallon fresh. v365. .... \$22,500

**843-431-8643, SC** P11



**2009 International 4300**, 136,298 miles, MaxxForce 7 diesel engine. Allison automatic transmission. Wee Engineering 1,000-gallon steel tank (300 fresh/700 waste). MEC 5000 145cfm pump. 2-toilet carrier rack. \$35,000. Call or email for more pics and info.

**574-896-5424, IN**  
**orders@johnnypotty** P11



**2006 International 4300**, DT466, 220k miles. Best Enterprise 1,500-gallon stainless 2-compartment tank. Hydraulic-driven pump and power washer units. Automatic transmission, leaf suspension, air brakes. .... \$34,900

**Bruce 631-767-9404, NY** P11



**2009 Ford F750**, 199,418 miles, Cummins 6.7 diesel, 220hp. Progress aluminum tank, 600 fresh/1,600 waste. Dual service. Masport HXL75 230cfm pump. New tires. Clean. Runs daily. New truck on order. \$40,000 OBO. Call or email for more pics and information.

**574-896-5424, IN**  
**orders@johnnypotty.com** P11



**2016 Dodge Ram 5500 4x4**, 950/300 aluminium tank, 85,500 miles. \$63,500

**Rodney Lane**  
**270-832-3793** P11



**2015 International 4300** with 2,000-gallon Robinson aluminum vacuum tank. 1,500-gallon material and 500-gallon freshwater. Cummins engine 220hp with Allison automatic on a non-CDL chassis. Fruitland pump system. Less than 99,000 miles on the truck. Truck is road-ready, just need to add your hoses and it's ready to work. See more pictures on our website [www.tmitruck.com](http://www.tmitruck.com). .... Sale price \$72,995

**TMI Truck & Equipment**  
**Chesapeake, VA**  
**757-547-7151** P11

I have two identical International 4700 portable toilet trucks with Abernathy tanks. One is a 2000 and the other is a 1999. Both have DT466 engines and Allison automatic transmissions. Both show just over 200k miles. We got the trucks thinking we could use the tanks for another build but they are too big for what we run. Trucks do NOT have titles as of now but you can apply for them. We were told the trucks ran when parked a few years ago. Don't know much about them other than that. Make an offer! Call/text 478-955-6539. E-mail [sean@jtbholding.com](mailto:sean@jtbholding.com) (P11)



**Three (3) pumper trucks for sale w/ tanks:** 1990 International with straight-6 diesel and 150/300 tank, 165,000 miles. \$15,500. 1997 International diesel 4700 with 500/1,000 tank, 250,000 miles. \$26,500. 2007 Ford F450 with a 6.0 diesel and 200 fresh/350 waste tank, 130,000 miles. \$19,500. Call or email with any questions or for more info.

**217-344-5004, IL** P11  
**ipt-info@gullifordservices.com**

2007 GMC WorkMate 850, 117,000 miles. All service records from purchase date included. \$35,000. Contact Ricky for more information: 208-949-0117; [ricky@portapros.com](mailto:ricky@portapros.com) (P12)

2012 Ford F550 Best Enterprise built 800-gallon waste tank/300-gallon water tank. 2-unit carrier. 30 ft. Tiger Tail hose. 119,647 miles. Runs great. \$40,000 OBO. 608-835-3459; [sales@buckyspt.com](mailto:sales@buckyspt.com) (PBM)

2014 International pump truck, Flow-Mark aluminum 1,850-gallon tank, 62,000 miles, \$85,000; 2007 International 4300 1,350-gallon, 265,000 miles, \$37,500. 256-757-9900 or [www.pbsos.com](http://www.pbsos.com) (PBM)

2018 Hino 268A cab & chassis, 25,950 GVW with a new 1,600-gallon portable toilet service unit. (Stock# 13762) **www.vacuumsalesinc.com (888) VAC-UNIT (822-8648)** (PBM)

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Attention large outdoor events promoters and seasonal campgrounds requiring showers, sinks and hot water availability: **FOR SALE:** Two (2) 40-ft. shower containers. 14 shower heads per container, handicap accessible. Trailer and accessories included. For pictures go to [www.candsshowers.com](http://www.candsshowers.com). 712-428-6143 or cell 712-880-1250. (PBM)

12-stall American Shower trailer. 6 men/6 women split. Stainless steel interior. \$25,000. Located in Tonopah, NV. 775-482-6841 (P11)

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**www.lapinservices.com** P12

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## RENTAL EQUIPMENT

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2016 Acro Vacuum Trailer: Stainless steel 6,000 gallon, DOT certified double conical with air-ride suspension. Aluminum wheels all positions, full hose trays, OSHA walkways and railings. Vacuum pump option either hydraulic or self-contained. KLM Rentals, Inc. 617-909-9044 (PBM)

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2001 ESP Roll-off trailer: Two (2) container roll-off trailer good brakes, tires, frame. etc. KLM Companies 617-909-9044 (PBM)

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**2000 Sterling LT8500** with 4,500-gallon tank. 3126 Cat motor with 32,324 hours. Has new injectors. 8LL transmission. 20,000 lb. front tandem steering boxes. 40,000 lb. rear Turtrac. 12,350 lb. steerable drop. GVW 72,350 lbs. Tires are 75% or better. Cab has recently been painted. Tank was recently removed, blasted and painted. NVE-WPT 720 vacuum pump recently rebuilt. Aluminum wheels. .... \$32,500

**Eckmayer, Inc. 608-837-5297, WI**  
[eckmayer@frontier.com](mailto:eckmayer@frontier.com) P11



**2 Septic Trucks for sale:** 2009 Freightliner with a brand-new 3,000-gallon tank and pump, only 133,000 miles on Cummins. \$56,500. 2008 Sterling Acterra UNDER CDL with a brand-new 1,870-gallon tank and pump, 182,000 miles on Cummins. \$47,900. Located in Central Arkansas. Shipping and financing in the continental US. We have many trucks in stock and build more weekly! We have a truck that will work for you! More pics and info on request.

**Call Caleb @ 281-914-1192** P11



**3 Septic Trucks for sale.** All new tanks and pumps. 2009 FL-M2 tandem, 3,000-gallon tank, 133k miles on Cummins ISC. 2008 Sterling, 1,870-gallon tank, 182k miles on Cummins ISC. 2009 Hino 268, 181k miles, 2,300-gallon aluminum tank. Located in Arkansas.

**Call Caleb 281-914-1192** P11



**2006 International, 2,500-gallon tank,** Advanced pump, 200,000 miles, \$50,000

**734-735-3270, MI** P11



**1999 Mack CL713** triaxle septic truck. 20k front, 46k rears. 8 LL. 5,000-gallon Husky steel tank, heated gate valves, 5 site glasses, 1" - 6" gate valve, 2" - 4" gate valves. Newer 2018 Masport 420cfm pump. 414,000 miles. \$42,500

**Andrew 262-232-5963, WI** P12



**1988 International S1900 Series** septic pumping truck with a 2,200- to 2,500-gallon steel tank. Liquid-cooled Masport HXL15 pump. This truck has been used as a backup for the past ten years. .... \$25,000

**Ted Baxter 804-733-6519, VA**  
[gentrywell@aol.com](mailto:gentrywell@aol.com) P11



**2003 International 4200** septic truck. 2,500-gallon tank, 229,566 miles, automatic transmission. Jurop pump rebuilt in 2017. Trays and hose racks. 33,000 GVW. Ready to work. We have downsized to a smaller pump truck. Call or email for more information ..... \$45,000 OBO

**828-778-2425, NC** P11  
[septic@allaboutplumbingnc.com](mailto:septic@allaboutplumbingnc.com)



**1996 GMC TopKick, 3116 Cat, 5-speed,** 1,500-gallon steel tank. 307cfm Transway pump. Many new parts. Fresh paint. Over 100 ft. of 3" hose. Ready to pump. 350k miles on truck. Engine was replaced 5 yrs. ago (maybe 100k on engine). New clutch, king pins, brakes and drums, etc. Tires good. Over 15 yrs. of recorded maintenance and expense manifest. .... Asking \$17,500 OBO

**315-783-0803, NY** P11



**2000 Sterling, Detroit 60 Series** engine. New factory-rebuilt transmission, 3,500-gallon tank (just sandblasted the bottom), new valves, manway, sight glasses. Tires and breaks 70%. Fresh-water system. Very good truck in use daily. NE Ohio. .... \$48,000

**Call 440-998-7448 or call/text 440-812-0045** P11

For Sale: 1990 Mack vacuum truck, 3,500-gallon tank, Battioni pump. Also for sale: 1993 Shamrock SPT650 sewer jetter, tandem trailer with self-contained 600-gallon water tank. 500 ft. of 1" hose, 200 ft. of 1/2" hose. Diesel, Myers pump. Will sell together or separate. Located in Wyoming. Call 307-245-9224 or 307-275-5015. (P11)

## SEPTIC TRUCKS



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**802-899-3753, VT**  
**www.clarkstruckcenter.com** P11



**1999 GMC** with engine model 3126, 7.2 liters. 184,564 miles. 2,000-gallon steel tank. Challenger model 100-607-FD vacuum pump. \$11,500. For more information contact Cristina or Fernando @

**956-726-9999, TX** P12



**2000 Sterling** with 3,300-gallon steel tank. Jurop air-cooled vacuum pump. Meritor 10-speed manual transmission. Rebuilt Caterpillar C12 engine. Truck runs great and is road-ready. Just add hose and start pumping! ..... \$35,000

**360-852-0651, OR** P11



**2012 International 4300**, under CDL. DT466 diesel, auto., 94k miles. NEW 1,800-gallon tank and Fruitland pump.

**Call JR @ 720-253-8014, CO** PBM



**2004 Sterling LT8500** truck, LMT 4,000-gallon tank, Masport 400W pump, full rear discharge, hoist, heated valves. The chassis has a Cat 300hp, Fuller 8LL, 18k front axle and 40k rear axle. The truck has low, low miles with 98,000 being the total miles. One-owner truck that was very well cared for. Asking \$69,500. See website for more pictures:

**www.diamondtrailsales.com** P11



**1998 Peterbilt 379**, Cat C12 engine, 784,000 miles (total rebuild by Cat at 400,000 mi.) 8LL transmission, NVE vacuum pump, 5,500-gallon tank. Can email more pictures. .... \$47,000 OBO

**717-587-1006, PA** P11



**2012 Peterbilt 367** vacuum tank truck, Cummins ISX15 @ 500hp, 18-speed. 18/46 on Pete Air Trac. 4,650-gallon tank, Fruitland pump. .... \$115,500

**Premier Truck Sales & Rental, Inc.**  
**833-615-3400**  
**www.premiertrucksales.com** P11



**2005 Freightliner M2:** 330hp Mercedes, 8-speed manual transmission, 247,000 miles. Advance steel tank - new in 2011, NVE 607 vac pump. Tires and brakes 60%. 6" discharge rear, 4" in front. .... \$53,500

**608-778-0234, WI** P11



**1998 International 4900**, DT466E, 250+hp, 1,500-gallon Lely tank, Bationi oil-cooled pump. Tires 80%, air brakes. Cab & chassis former fire truck. Less than 50k miles - runs & drives great! Very strong! ..... \$22,000 OBO

**Darrell Pruett 828-507-6257, NC**  
**ddpruett1963@live.com** P11



**1990 International 4900** septic and toilet truck. 10,000 miles on total rebuild with receipts. 152,000 original miles. Runs perfect and would take it anywhere. 300 fresh/1,700 waste. Brand-new Masport pump. Has a rack to haul 2 toilets. New tires. Manual transmission. Rated UNDER CDL. .... \$18,000

**360-739-0570** P11



**2009 International 7500** tandem. 350hp, 10-speed transmission, 18k front, 40k rears. Air-ride, aluminum wheels, ready to go to work. Asking \$66,900. Call for your special deal!

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**www.clarkstruckcenter.com** P11



**2001 Ford F650**, 102,000 miles. 1,500-gallon tank, Masport pump. Tank lifts to facilitate unloading. Looks good, runs good! Call for more information

**330-327-2790, OH** P11



**2018 International 8600**, N-13 engine, 400hp, automatic, double frame. New 4,000-gallon carbon-steel tank, new Masport pump. New tires all around. Two (2) available - 5k miles and 30,000 miles. .... \$99,000

**Call Alan 786-908-5436** P11



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**1999 International 3300**, Intl. 6+ transmission, 220,000 miles. 2,500-gallon carbon-steel tank, water-cooled Masport H400W pump. Heated rear valve, front and rear unload, air-operated drop axle. DOT inspection good until April 2019. New oil cooler and one universal joint, new paint, hose trays line-xed. Tank and pump 9 years old. Panasonic radio. Has a/c but needs compressor. Heavy-duty hitch and wired for trailer, 60 in box, air-ride seat. Truck is in real good condition and ready to work - needed a bigger truck. Can text or email more pictures. Asking \$35,900.

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2010 Ford F750 with a Presvac 2,300-gallon c/s tank and Masport pump. (Stock# 0764C) [www.VacuumSalesInc.com](http://www.VacuumSalesInc.com) (888) **VAC-UNIT (822-8648)** (PBM)

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2004 Freightliner M2-106 with a Presvac 1,500-gallon carbon-steel vacuum tank and Masport HXL400WV pump. (Stock# 4468C) [www.VacuumSalesInc.com](http://www.VacuumSalesInc.com) (888) **VAC-UNIT (822-8648)** (PBM)

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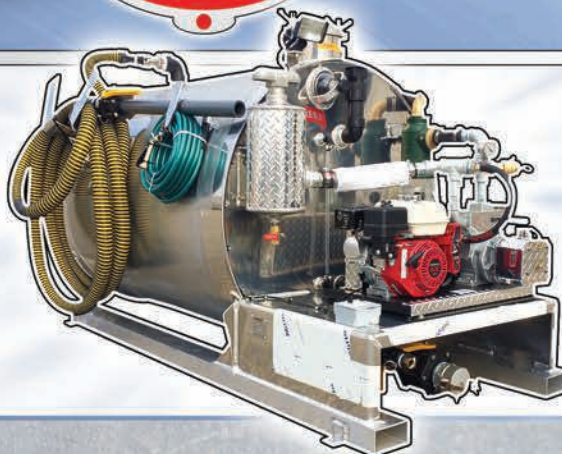
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