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THE GIFT *Of Clean Water*

Eric Murdock designs onsite systems for sensitive sites and helps small communities explore the benefits of alternatives to big-pipe sewer systems

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Proud to Serve You

The industry changes, but our mission remains to promote professionalism and serve the installer community

By Jim Kneiszel



About 10 years ago, I talked to installer Rusty Luzell about the importance of routine maintenance of the septic systems he was installing around his home base in Industry, Pa. With his family celebrating 50 years in business at the time, Luzell stressed proper care for systems and staying on top of technology advances in the industry.

"There's a whole range of things that are going to require some attention and maintenance. It's so important when we put these systems in that we make sure people are aware you have to take care of them as time goes by," Rusty told me. "We feel a measure of responsibility for our customers to take care of what we put in."

I recall learning a lot about the onsite wastewater industry from Luzell, and how installers cared not just about collecting a check for their work, but how they have a bedrock concern for their professional reputations and the environment as well.

New Duties

"Cutting edge technology and professional installation mean a safer, cleaner environment," he told me. "We've lived in this area for 100 years. Perhaps my family will live here for years to come. Why not do whatever is necessary to ensure that our water – one of our most tremendous resources – is taken care of?"

Little did I know when I was interviewing Luzell for my first story in *Onsite Installer* that I would one day become editor of the magazine, and charged with making sure the professional values of this contractor and many others continue to reach an audience. At the time I was just learning the difference between a drainfield and an outlet baffle, and Luzell was among the contractors who showed great patience helping me learn the ropes.

Fast forward to today, as I assume the responsibility for this magazine and renew my request of all of you to show patience when I ask a question or seek to learn more about new technologies in the field. I am taking over for Ted Rulseh, *Installer's* first editor, who casts a long shadow in the wastewater trade publishing world.

Over several years, Rulseh laid the editorial groundwork for several new COLE Publishing magazines, and has served as editor of many COLE titles at some point. He was once editor of *Pumper* and *Cleaner* magazines, the company's flagships, and remains editor of *Treatment Plant Operator* and *Water System Operator*. As Rulseh announced last month, he recently turned 60 and decided to cut back on his workload a little bit so he could enjoy his family more and spend time at his cherished lake cottage in Northern Wisconsin. Who could blame him for that?

In the last decade, Rulseh set a high standard for *Installer*, one I hope to uphold. You deserve compelling profile stories, information-packed system profiles and detailed stories about new equipment and techniques. I'll do my best to make sure you continue to get content of value, and I welcome your feedback, suggestions for stories, ideas for small business building columns, comments and questions about what you see in the magazine.

Glad To Know You

Many of you know Rulseh, who has been a fixture at the *Pumper & Cleaner Environmental Expo International* over the years. I'd like to tell you a little about my background in the wastewater industry.

After a stint as a freelance writer for *Installer*, I took over the editor's duties of *Portable Restroom Operator* magazine for COLE in 2004. I added *Pumper* magazine the following year, and have edited two other magazines for COLE. I'm also a photographer, and over the years I've been fortunate to

I see hopeful signs of better days ahead. After years of a damper on the market, it seems like construction is enjoying a resurgence of sorts. Expo attendees in recent years have been more upbeat about the future and looking to replace aging equipment.

shoot photos for several *Installer* stories featuring contractors near my Northern Wisconsin home.

During my tenure at *Pumper*, I've noticed a growing interest in the operation and maintenance of onsite systems among the pumping contractors we've featured. An emphasis on enhanced routine care of these systems among pumpers seems like a natural progression as the systems become more complex, environmental regulations become a bigger priority, and homeowners seek to make these valuable systems last longer.



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I've had the privilege of talking to many installers while working at the Pumper & Cleaner Expo. We've sat together during Education Day programs with Jim Anderson and Dave Gustafson. During many an Expo lunch break, I've been able to pick the brains of installers and learn about the challenges they face back home.

I am well aware that the last several years have been a rollercoaster ride of ups and downs for many contractors who rely on home construction and excavation work to earn a living. Some contractors had to sharpen their pencils on expenses just to stay in business as the housing market ground to a stop in late 2008 and 2009. Some have had to switch the focus of their businesses from digging new systems to maintaining older systems. Some have had to sell off equipment and trim their staffs to make it through lean times.

But I see hopeful signs of better days ahead. After years of a damper on the market, it seems like construction is enjoying a resurgence of sorts. Expo attendees in recent years have been more upbeat about the future and looking to replace aging equipment. An improving business climate is inevitable as housing stock becomes older and people have put off construction and system replacements for a long time.

Let's Grow Together

If you're enjoying renewed success in your business, I want to hear from you. Let's share in the good news as you add employees, install new and exciting systems, or discover new ways to market your services. My email address is published on this page every month. Drop me a line and I promise to respond promptly. By sharing success stories, you're serving to build the professionalism of the entire industry. And that's what *Installer* is all about.



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Eric Murdock inspects a dispersal field at a new onsite system installation. He works with local installers to build effective systems on challenging sites. (Photos by Amelia Beamish)

THE GIFT *Of Clean Water*

Eric Murdock designs onsite systems for sensitive sites and helps small communities explore the benefits of alternatives to big-pipe sewer systems

By Ted J. Rulseh

It's a gift to experience firsthand how wastewater treatment can help a body of water. Eric Murdock received that gift in his pre-teen years.

In 1980, when Murdock was 10 years old, his family moved to a home on Goodyear Lake near Cooperstown, N.Y., at the headwaters on the Susquehanna River. Back then, there were direct sewer discharges into the river upstream of the 3-mile-long lake.

"There were floatables in the lake," recalls Murdock, now owner of Onsite Engineering in Syracuse. "You didn't want to go swimming. It was a nuisance. It was an eyesore. But in the first couple of years we lived there, a political movement was underway to eliminate those discharges.

"As a result, as a very young person, I got to witness the benefits of protecting the environment. The lake water turned over fairly quickly, and within a few years, the water quality was vastly improved. That was an early influence that got me thinking that I wanted to pursue environmental sciences as a career."

Today, Murdock protects lakes in the Syracuse area and elsewhere in his state by designing onsite treatment solutions for severely challenging waterfront properties. He collaborates with other engineers on system designs, sells advanced treatment units, supervises installations, and handles ongoing system operations and maintenance.

In the bigger picture, he helps small communities evaluate onsite solutions as cost-effective alternatives to big-pipe centralized sewer systems.

(continued)

Onsite Engineering, Syracuse, N.Y.

OWNER: Eric Murdock, P.E.

YEARS IN BUSINESS: 6

EMPLOYEES: 2

MARKET AREA: New York State

SPECIALTY: Challenging sites where conventional systems are not viable; engineering for small community systems

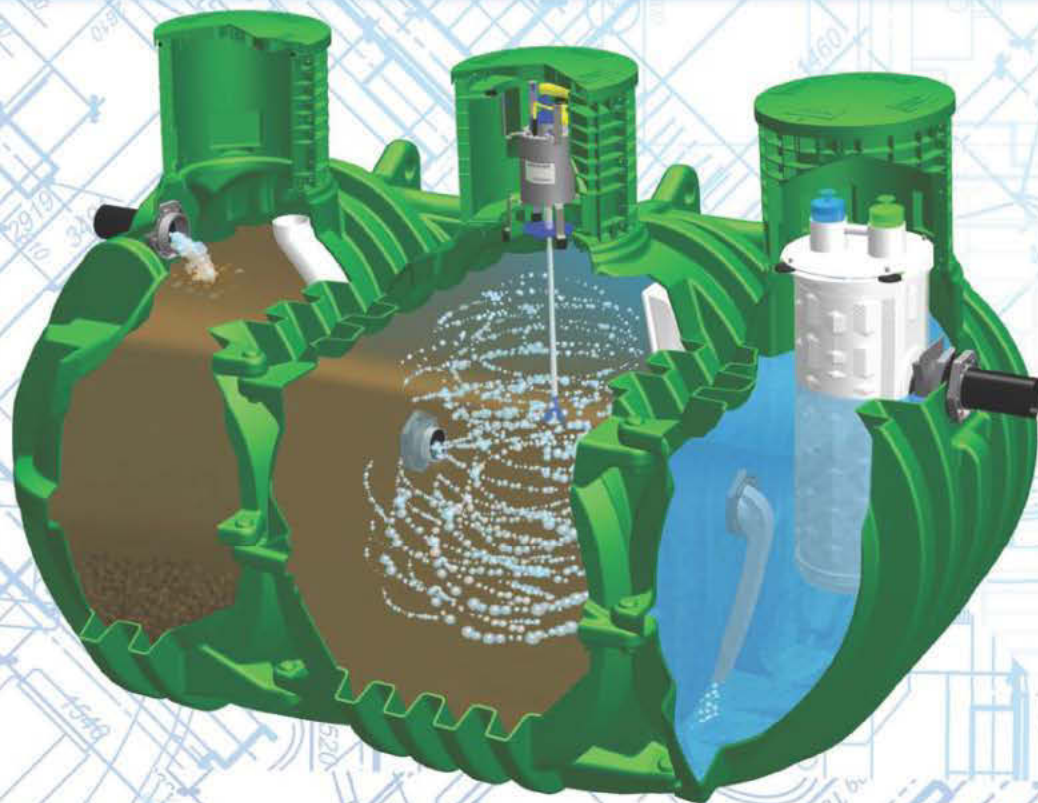
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Turn toward onsite

Murdock earned an engineering degree in environmental resource management in 1993 from the College of Environmental Science and Forestry at State University of New York in Syracuse. After college, he worked for a utility company's hydroelectric department on renewable energy projects, for an engineering firm doing work around removing sources of clear water from municipal sewer systems, and for one of the world's largest engineering firms supporting environmental projects.

He made a change in direction in 2002, joining the U.S. Environmental Protection Agency as project manager for the Skaneateles Lake Demonstration Project, which tested a variety of advanced onsite treatment systems on properties around the 13.6-square-mile, 16-mile-long Finger Lake that is the unfiltered source of drinking water for the City of Syracuse.

"As a very young person, I got to witness the benefits of protecting the environment ... That was an early influence that got me thinking that I wanted to pursue environmental sciences as a career."

Eric Murdock

During seven years in that capacity, he formed a technical committee of state and county health department officials that researched alternative onsite treatment technologies and ultimately deployed 19 different systems on Skaneateles Lake lots – properties unsuited for conventional septic systems for lack of space, impermeable soils, and high bedrock or groundwater.

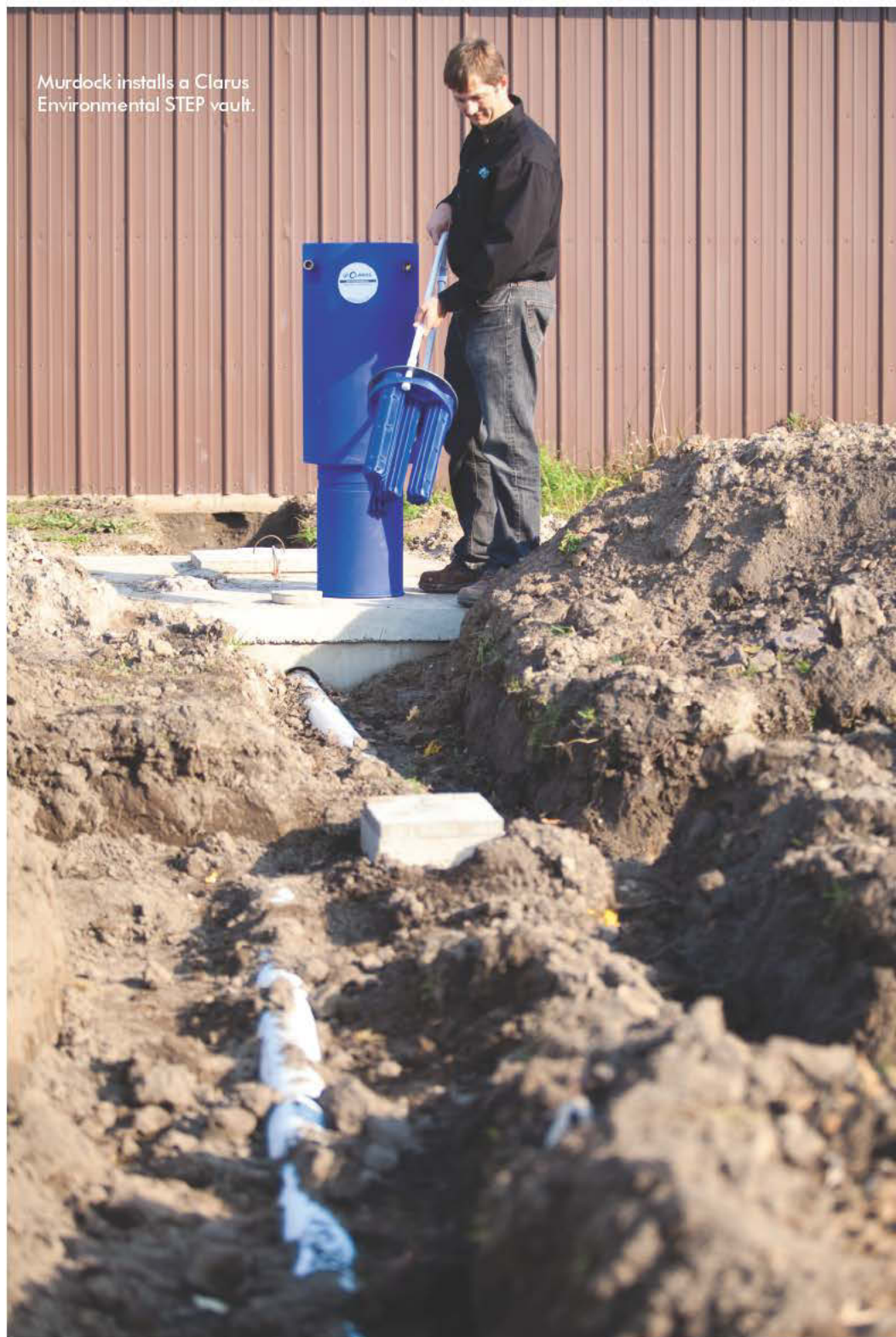
"We had a budget to attend conferences and seminars," Murdock recalls. "The whole focus of our job was to research and bring together, in one location, what we believed were the technologies best suited to solve the problems of challenging lakefront properties. As the lead on the project, I was able to select the equipment we would showcase."

"We emphasized working with manufacturers that had established track records, that were interested in setting up distribution networks, that had design programs for engineers – basically companies that seemed committed to the long term. One big point of emphasis was that we did not put in mound systems. We were trying to prove the science of treating wastewater and distributing treated water into the soil. We wanted to break it down and put in only the size systems that were actually needed."

As effluent sampling and analysis consistently documented that the treatment units worked, regulators grew comfortable with the technologies. The result is that advanced treatment units are required at sites that cannot meet new-construction standards.

Spreading the word

The demonstration project also included training sessions for educators, health department regulators and engineers, all in cooperation with the



Murdock installs a Clarus Environmental STEP vault.

nonprofit New York State Onsite Training Network (OTN). Training included classroom study and hands-on instruction on systems in the field.

Murdock continues to host that training under the banner of Onsite Engineering with coordination by the OTN and participation from leading treatment system manufacturers. Meanwhile, the state health department and the DEC have invited Murdock to review and comment on updates to onsite treatment regulations and guidance documents. "The project also gave me a unique opportunity to meet the founders and leaders of the most respected companies in onsite wastewater," Murdock adds.

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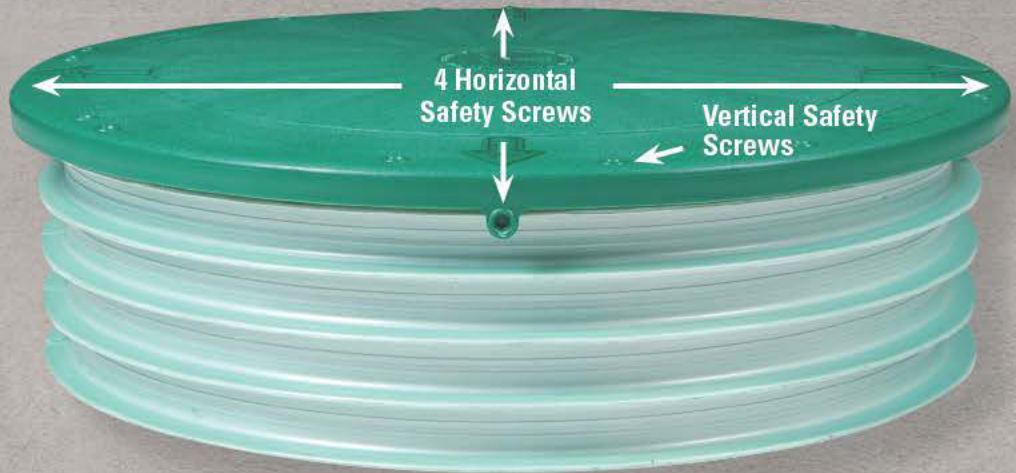
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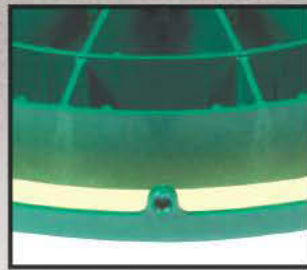
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- Injection molded PolyPro
- Simple to install
- Easy to clean

6" Sanitary T-Baffle™

- Injection molded
- Fits 4" Sch. 40 and SDR-35 pipe
- Simple to install

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ABOVE: Murdock inspects a distribution box made by Sunnycrest Precast in Auburn, N.Y., at a newly installed onsite system. RIGHT: Craig Hurd from Finger Lakes Recycling (left) and Murdock review a letter from a local health department approving a system design.



The demonstration project led directly to the kind of work that is now a stock-in-trade of Onsite Engineering, founded in 2007. “After I started doing the training, regulators began calling me for help with sites that looked completely impossible,” Murdock recalls. “On probably the first two dozen jobs I did, I was the second or third engineer who had taken on the project. I’ve been the fourth engineer on at least half a dozen jobs and the third engineer on dozens of jobs.”

“Many of these were jobs that very competent engineers with track records longer than mine had looked at. They were like the square peg in the round hole – the jobs didn’t fit anything they had done before. With my expertise from the Skaneateles project, they were a natural fit. Jobs otherwise seen as impossible, for me were just another job.”

“On probably the first two dozen jobs I did, I was the second or third engineer who had taken on the project. I’ve been the fourth engineer on at least half a dozen jobs and the third engineer on dozens of jobs.”

Eric Murdock

One such project involved a lot where essentially the entire space was occupied by the house and an unpaved driveway, and the former treatment system was a dry well two feet from the lake. The solution: Put the drainfield under the driveway. In that case, the biggest challenge was getting regulators’ approval for something that hadn’t been tried.

“I do the same basic scenario every time,” says Murdock. “Pretreat the effluent, use time dosing, move the dispersal field as far away from the lake as possible, and spread it out over the largest possible surface area. It has worked very well. Sometimes the driveway is the farthest location away from the water, and it’s the only space available. If you design it so the piping can handle the traffic load, and if you pretreat the water so there isn’t

going to be a biomat in the trenches, it’s a workable solution.”

Some of Murdock’s designs include both an aerobic treatment unit and a tertiary sand filter. For drainfields within 100 feet of a lake, he prefers to use disinfection – generally with a Salcor UV light system. In the past few years, Murdock has been involved in a variety of ways with about 60 systems per year.

Making Customers ‘Ecstatic’

Eric Murdock recently launched a third company, Onsite Installation. It’s for clients who prefer to deal with just one person throughout their project – not with both an engineer and an installer.

Murdock doesn’t compete with local installers – he hires them, then supervises the installation, and takes a markup on the installer’s work. “Because I am the equipment supplier and need to do the startup, it’s in my best interests that the system be put in right,” he says. “I haven’t pushed doing it this way only because I don’t want to alienate local installers. I’m not *trying* to do everything. I’m just *prepared* to do everything.

“I prefer to work with the smallest number of installers possible. I put on my engineering drawings that I have final say in who gets hired for the installation. The installer has to be approved by the engineer, and as part of the interview I have with installers, I ask them if they have been to the Pumper & Cleaner Expo.

“If they shake their heads and have no idea what I’m talking about, I say to myself, ‘Maybe this isn’t a person who is dedicated to becoming an expert at the top of his game.’ I only want to work with contractors who are committed to doing exceptional work. The theory here is that if the customer is ecstatic with the way the installation looks, they’ll give a referral. If they’re not ecstatic, they won’t give a referral. I don’t just want happy customers. I want ecstatic customers.”

Equipment business

As Murdock's reputation grew, he began getting inquiries from other engineers. "I had trained many engineers, but there was still a learning curve with the advanced onsite systems," Murdock says. "Some engineers found it easier to pass referrals to me to take the job altogether. Then they could shadow me and watch how I did it, so the next time they could use the same techniques on their own."

It soon became clear that a natural step was to become an equipment distributor. Murdock had specified and sold about a dozen types of treatment units and had experience as a manufacturer-trained installer and service provider. So in 2009, he started a new business, Onsite Sales and Service. The company serves as master agent in New York for Clarus Environmental and its Fusion series aerobic treatment units.

"I'm a big fan of the Fusion," says Murdock. "The fact that there are 9 million of these systems in Japan exemplifies that they are very efficient. They work very well, and we've had tremendous success with them." Besides Fusion systems for single-family homes, he offers Clarus recirculating gravel filters in capacities up to 25,000 gpd.

As an equipment supplier, he also supervises installations on behalf of engineers. "The design engineers can simply finish their drawings, submit them to the health department, get approval, and have Onsite Engineering do the construction observation," Murdock says. "Onsite Sales and Service then does the startup and the long-term maintenance."

"We've actually been hired by the state Cooperative Extension to prepare an analysis of half a dozen different communities, comparing the big-pipe approach to an onsite approach."

Eric Murdock

"So the design engineer avoids holding the liability for construction observation. I've found that engineers are happy to be relieved of that. They're also more willing to try a system with which they have no experience, knowing that somebody who has that experience is going to supervise and sign off on it. I'm trying not to compete with engineers but rather help them. The way to build business volume is by working with a lot of engineers."

The Onsite Engineering team includes a mapping and computer-aided design (CAD) specialist and Bob Eichinger, who has varied responsibilities. Eichinger is located in the Hudson River Valley, four hours from the home office, giving the company access to another large geographic market. "Bob has lived extensively on Long Island and in the Hudson Valley," says Murdock. "He has been involved in many aspects of the onsite world, and that includes owning an installation company. His main function is to serve as an advisor to municipal and commercial clients."

Keeping it simple

While the sites Murdock deals with require engineering solutions, he is not a fan of overly complex designs – he prefers to keep them as simple as possible: "Why spec out a system that's very elaborate when the very simple system that was in the ground appears to have worked well for many years?" he asks.

His systems typically involve pressure distribution, or pump-assisted distribution where septic tank effluent is lifted to a distribution box and flows by gravity from there. He's a believer in the septic tank effluent pump



Murdock uses a Nikon NPL-332 Prismless Total Station for surveying to verify grades.

(STEP) vault (Clarus Environmental), both for individual onsite systems and for communities seeking alternatives to the big pipe.

"A lot of small communities on septic systems are hearing the big-pipe engineers say, 'You're going to need a central collection and treatment system,' " Murdock says. "The middle-of-the-road solution is to convert the existing system. That means using the septic tanks for primary settling at the house, retrofitting STEP vaults, and then pumping the septic tank effluent to a common treatment and dispersal field. I think that's going to be a much more common scenario into the future."

"In recent years, I have focused on bridging the gap between the big engineering companies that have a long history of using the big pipe, and communities that are under financial distress and have concluded that they can't afford the big pipe. I want to introduce alternative wastewater treatment systems, including STEP systems, and other approaches using different collection, treatment and dispersal options in an onsite setting."

"A lot of communities in New York State are faced with the problem of aging infrastructure," he continues. "They need to keep taxes down, yet still expand and grow. We've actually been hired by the state Cooperative Extension to prepare an analysis of half a dozen different communities, comparing the big-pipe approach to an onsite approach."

"Half of those communities have selected the big pipe, despite the efforts of Onsite Engineering to educate them on what their decentralized options are. It appears as though the big engineering firms will continue to do what they always do, and that's the big pipe. They're experts at that, and it's very hard for a small company to compete with a big-pipe engineer."

"In this next phase of the game, we'll be trying to bridge the gap between the big engineering companies and the small communities' needs. That is, providing the technical expertise to help the big engineering companies design the onsite solution."

"That's really what our focus is going forward." □

MORE INFO:

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

Site Evaluation: The First Steps

A methodical approach from the outset helps lay the groundwork for a correct system selection and a successful installation

By Jim Anderson, Ph.D., and Dave Gustafson, P.E.

This month and next, we'll look at proper site evaluation procedures and techniques. While it's not necessarily part of an installer's responsibility to conduct the site evaluation, it is the installer's job to understand the evaluation and to recognize any problems or discrepancies. We covered this material as a part of an installer workshop we conducted at the Pumper and Cleaner Environmental Expo last February in Indianapolis.

In these discussions, we highlight that you need to follow any local and state codes. Those codes or rules have specific requirements covering site evaluation practices, including such things as minimum setback distances and the number of potential soil treatment sites to be identified and evaluated on each lot. Knowing the requirements and having a preliminary discussion with the planning and zoning personnel can save a lot of time and effort. Here is some practical advice.



Look for site limitations, such as road easements and where excess water will collect, that can impact the viability of a proposed system.



Fitting the system to site can result in a system that meets all the setbacks.

Get complete information

As we travel, we see more permitting authorities requiring the identification of at least two suitable soil treatment sites on new lots. For each, a site evaluation needs to be conducted to identify both surface and subsurface conditions a designer can use to locate the system and provide a detailed design. Record information on the appropriate state or local forms, and provide a detailed, to-scale site map, locating all required information to be used in design.

Information captured and reported starts with the site location. This means identifying the property by township, range and section or other unique identifiers, as required by the local unit of government. Property owners also should be identified.

If the site is within a special management area, such as a wellhead protection area or nutrient management zone, that should be noted. If the property is in such a zone, there usually are special design requirements. As part of the

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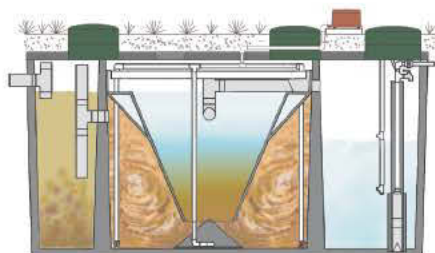


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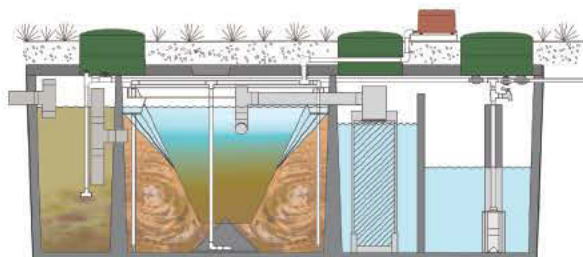
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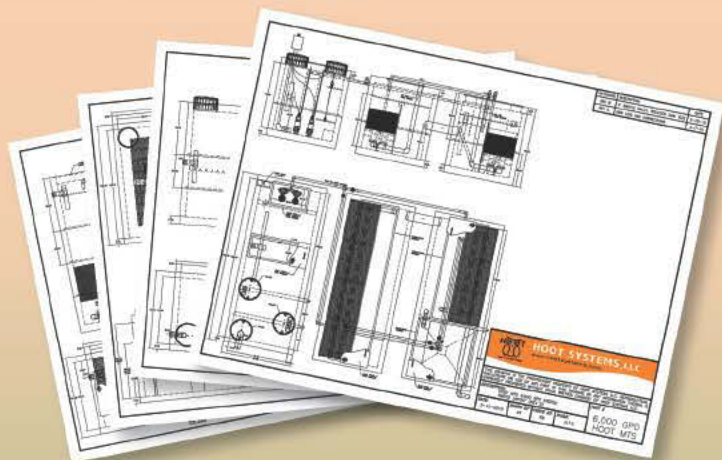
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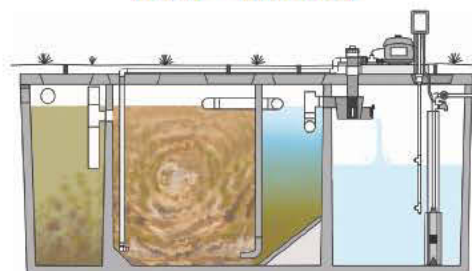


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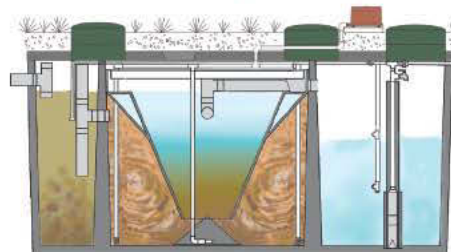


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site evaluation, note these requirements and take them into account in the design process.

Estimating flow

Gather information on the size and type of residence or other establishment the system is being designed for. This information will help determine estimated daily sewage flows, which will then dictate septic tank size and soil treatment area requirements.

For residences, flow is often estimated based on the number of bedrooms – the typical volume is 150 gallons per day per bedroom. These estimates vary by jurisdiction, and we see many places requiring a per-fixtured estimate, as well. This reflects changing water use habits that may significantly affect flow from a household.

It is also important to discuss other issues that might affect flow. For example, if the owner plans to run a day care center, photography studio or hair styling shop from the home, that should be factored into the flow estimates. Also identify and locate on the plan any other



Gathering preliminary site information is critical to completing a proper evaluation for a small lot.

Local and state codes ... contain specific requirements covering site evaluation practices, including such things as minimum setback distances and the number of potential soil treatment sites to be identified and evaluated on each lot.

planned buildings or amenities. Include decks, patios, swimming pools and hot tubs, as well as outbuildings like garages, workshops and gazebos.

Identify and locate any potential surface limiting conditions. These include slopes, drainageways or washes. Measure all appropriate setbacks and remove areas within those setbacks from consideration for system location. Major features requiring setbacks include property lines, water supply wells, public water supplies, existing or planned buildings or improvements, and any existing drainage or utility easements.

Indicate any floodplain designations or elevations from published flood data or from other sources, or from estimates accepted by the permitting authority. In the Midwest where we are from, these conditions are well-documented. In areas of the Southwest, you'll need to identify setbacks from the highest point on the banks of washes or arroyos.



Be sure to identify lot lines accurately and know the limits of your work area.

It is also important to identify the location of the proposed site on the landscape if natural drainage will affect the system. If the system will lie where excess water might run onto the site, make note of it and adjust the site or deal with the water as part of the design. One mistake we often see is locating systems in areas that naturally collect water. Any water beyond the sewage to be put into the system is detrimental to proper operation.

Check the soils

From initial site observations and from existing soil surveys, obtain and record the soil characteristics at the proposed soil treatment areas. Essential items include the soil map, the soil mapping units, landscape position, parent material, and flooding or ponding potential.

Identify landscape characteristics, such as slope range and depth, to limiting conditions as identified in the soil survey. These include soil texture, periodically saturated depths, bedrock depth, soil color, depth to redoximorphic features, and soil structure and consistence. You'll compare this information to data collected in the field portion of the site evaluation.

The system selected to serve the site needs to fit the information collected and some other considerations. So, water use, type of house or other establishment, area available, and depth to potential limiting conditions will affect the kind of system selected: conventional, pump to pressure distribution, or use of newer pretreatment technologies.

Now is not too early in the process to also consider the long-term maintenance and management issues. Think about future access to the system needs. Is it possible to get to the site to maintain the system components? For instance, if the septic tank is located more than 100 feet horizontal and 25 feet vertical from the point where a pump truck can park, it will be very difficult to clean the septic tank properly.

There are a whole host of other access problems to consider, such as whether any proposed amenities are in the way, and whether trees planted or other vegetation to be planted will interfere. Next month, we'll look at other site evaluation procedures. □

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Leading-Edge Maintenance

Software solutions and information technology can help improve machine maintenance and streamline related operations

By Jim Edmondson

In a competitive world, successful contractors are turning to information technology (IT) solutions to optimize systems and procedures, including machine productivity and profitability.

Today, leading-edge IT tools are more than just computers and spreadsheets. Specialized software, smartphone apps and the Internet all help in collecting and sharing information managers and owners can use to stay ahead of the pack and in the black. A surprising range of options and practical applications are available today for operations of all sizes.

In fact, given the sheer number of construction-related software products and services, you might need a guide to point you in the right direction – and there are resources for that, too. Sheldon Needle (www.ctsguides.com) is one. An independent consultant for 25 years, Needle helps connect contractors with the right software vendors for their needs. (Those vendors, not contractors, pay his fees.)

He recognizes that some owners simply determine success by money in the bank at the end of the year, while others want the benefits of applied IT solutions. “Some applications require an investment in installation and training,” Needle says. “Contractors making those purchases are willing to experience some of that ‘pain’ in return for greater proficiency in managing equipment and machinery for profitability.”

As you might expect, the investment in installation and training varies with the depth and sophistication of the software. However, there are many inexpensive and easy-to-use apps available for machinery management.

Some even let you create your own forms and upload real-time, in-the-field data, so the office staff can access and apply the information on the spot.

What’s the advantage? How about getting real costs applied immediately to project cost accounting, like machinery cost, payroll cost, or time and materials? Or, how about getting rid of hand-scribbled reports that no one can decipher, not to mention all those lost notes with important specs from the job site. And what about generating an accurate invoice as the equipment rolls away from a job?

“Three to four years ago, there was very little interest in cloud applications. Now it is much more prevalent for capturing real-time information from on-site issues, events or observations.”

Sheldon Needle

Want to optimize equipment investments? How about automated notices for machine maintenance – and escalating notices if a procedure is neglected? And wouldn’t you like to know the real cost of ownership versus rental so your job estimates could be more accurate and profitable? Would automated reports on repair time and material costs prove insightful?

While machinery management is just one part of the business efficiency equation, it is integral to the whole operation. When looking at software and IT solutions, consider integrated options as well as vertical applications. Here are some functions to consider:

- Automating preventive maintenance alerts and scheduling
- Tracking maintenance: service descriptions, parts, estimated hours, by machine or by component (tracks, tires, hydraulics)
- Tagging vendor information to work orders or parts to simplify parts ordering
- Capturing mechanic time by equipment or by component
- Calculating mechanic labor on an exact basis or by percentage of labor
- Identifying frequently used parts and consumables (oil, filters, and others)
- Automating alerts for machines or components still under warranty
- Tracking equipment location

GETTING STARTED

To search for software or IT solutions on the Internet, try keywords such as “machine maintenance software” and “construction equipment maintenance software,” or “apps for machinery maintenance.”

You’ll likely find www.capterra.com, a site that lists lots of equipment maintenance software products with website links.

On the smartphone side, there’s www.gocanvas.com, a cloud-based resource that facilitates the use and access of forms such as work orders, inspection checklists, repair reports and the like, using existing or custom forms. This company will create new forms for \$0.50 each (the first one is free) with an annual cloud service fee as little as \$210.

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- Recording employee training descriptions, dates and related information

Internet access is a necessity for machine management solutions driven by real-time data. While laptops are still a primary tool for mobile access, smartphones are becoming more practical as more apps become available. According to Needle, this is one of the big changes in machinery management.

"Technicians can more easily record service time and materials whether they are in the shop or the field," Needle says. "A lot of owners want real-time data from the field to finalize job costing. In any case, there's no waiting for paper forms to be collected or data to be entered to know how today's events will affect tomorrow's work."

Cloud technology, Microsoft's online computing and data sharing solution, is also becoming popular: "Three to four years ago, there was very little interest in cloud applications. Now more contractors are open to it as a way of capturing real-time information from remote locations," he says.

The more solution providers apply cloud technology, the easier it can be for contractors to buy into the software without having to invest in new servers or a network administrator. As such, some software apps are not installed on the contractor's computers, but instead run over the Internet from any computer or smartphone.

The tools to enhance and streamline machine management are many. And, the technology keeps changing. There's no better time than now to explore and apply productivity solutions, so you benefit from the time and money you'll inevitably save. It might not be as painful as you think. It could also help drive future profits. And that's a smart decision. □

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Michigan

According to the Michigan Appeals Court, the state's constitution does not protect townships from being held responsible for failed private septic systems. The Michigan Supreme Court ruled that Worth Township could be held responsible for failed systems that had leaked into Lake Huron. The township argued that it was immune because of a law that prevents local governments from being forced to pay for state projects. Both courts disagreed, ruling that the law on state projects did not apply to the situation, and that the town was required to follow environmental laws.

Maryland

Rules for Maryland's new water pollution offsets law designed to limit the use of septic systems won't be done until the end of 2013; it was supposed to be complete by the end of 2012. The Baltimore Sun reported that environment secretary Robert Summers says details remain to be worked out. Under the law, developers will be required to purchase offsets for large housing subdivisions that use septic systems. The rules are expected to be issued for public comment in October 2013.

California

The California Onsite Wastewater Association has become a partner in implementing the state's new rules for onsite wastewater systems. COWA will be involved in training state and regional staff and developing Local Agency Management Plans and public education workshops, along with its professional training. After years of delay, the new rules were officially adopted in November 2012. Full compliance with the law is required by 2017. www.cowa.org.

Delaware

The state Department of Natural Resources and Environmental Control proposed a plan requiring Sussex County residents living within a quarter mile of water bodies to upgrade their onsite systems. Homeowners would need to purchase nitrogen removal technology, have a service contract for the life of the system, have the system inspected every six months, and submit an annual written report by a qualified maintenance provider. □



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AERO-TECH 2900 Gary Dr. Plymouth, IN 46563 574-935-0908 Fax: 574-935-0910 aero-tech@embarqmail.com www.aerotech-atu.com	AERO-TECH	500 to 1,500 Cluster Systems		The AT Series Aerobic Treatment Plant is an extended aeration, activated sludge process. Wastewater enters the 4-inch inlet pipe and is then infused with air from the submersible aerator pump at the bottom of the aerobic treatment plant. This powerful, highly effective pump creates venturis that pull fresh air from the atmosphere and mixes it with the effluent in the bottom of the tank. The finely diffused air bubbles are pumped through the exhaust ports creating a swirling motion. This keeps the sludge in a constant state of suspension. As new wastewater enters the mixing chamber, it hydraulically displaces the mixed liquor into the clarifying cone. In the clarifying chamber, the liquid is suspended in the quiet zone, allowing the remaining suspended solids to settle back into the mixing chamber to be further treated. The clear water in the upper clarifying chamber is then discharged through the surge resistant pick up into the disposal system of your choice.	
Anua PO Box 77457 Greensboro, NC 27417 800-787-2356 336-547-9338 Fax: 336-547-8559 info@anua-us.com www.anua-us.com 	Platinum SAF	480 to 955	2011	Platinum Submerged Aerated Filter (SAF) gives owners flexible and economical choices for protecting critical water resources. Key product benefits include: Strong fiberglass tank for underground installation (including blower and low-profile access covers), submerged aerated filter with high surface area and no bypass of media, integrated biomass return from clarifier to primary tank and small footprint for an environmentally sensitive installation in residential, small neighborhood and commercial applications. Platinum's unique design and three-step treatment system features a submerged aerated filter that reduces the level of BOD and TSS in the effluent to secondary standards. Platinum also provides nitrogen reduction exceeding 50 percent.	Most States and Canada
Bio-Microbics, Inc. 8450 Cole Parkway Shawnee, KS 66227 800-753-3278 (FAST) 913-422-0707 Fax: 913-422-0808 jcisneros@biomicrobics.com www.biomicrobics.com 	MicroFAST	500 to 9,000	1996	Simple-to-install and maintain, the Fixed Integrated Treatment Technology (FITT) of the MicroFAST systems allow for robust, aerobic treatment inside the tank. These systems create an optimized environment with consistent aeration and mixing throughout the media for maximum biomass generation to withstand periods of high and low input. These residential onsite wastewater treatment systems meet most state requirements and provide advanced wastewater treatment options. Technology certifications include NSF Std 40 class 1 and 245 (nitrogen reduction). The FAST technology received Frost & Sullivan Technology Innovation Awards in 2010 and 2011 for commercial applications. Larger systems available for multi-family and commercial applications.	All US States, Canada, Mexico and 60+ Countries Worldwide
BIO-MICROBICS See ad page 25	RetroFAST	150 to 375	2000	Easily installs in new or existing tanks, requires minimal cost to operate/maintain, and avoid digging up your yard, the RetroFAST is offered for the S.O.S. -Save Our Septic Remediation Program (with Homeowner's Warranty). With "Fixed Integrated Technology" (FITT), the RetroFAST systems allow for robust, aerobic treatment inside the tank to deliver high levels of treatment! Certifications include: EPA ETV, EPA's approved system for project sites, and "2009 EPA: Reduction of Nitrogen in Domestic Wastewater from Individual Residential Homes." The RetroFAST also exceeded U.S. EPA's "Economic Analysis of Final Water Quality Standards for Nutrients for Lakes & Flowing Waters in Florida."	
	BioBarrier 0.5, 1.0 & 1.5	500 to 1,500	2007	Ideal for even direct discharge with no additional disinfection, the BioBarrier MBR and HSMBR (1,500-9,000+ gpd) technology can make the most difficult sites usable: BOD <2 mg/L, TSS <2, Ammonia <1, and reduces Fecal Coliform & E. Coli: <10 cfu (colony forming units). As the first system to achieve NSF/ANSI Std 350 (Water Reuse), the BioBarrier system met Water Quality Standards for interior water usage or above surface discharge. Technology certifications include NSF Std 40 class 1, 245 (nitrogen reduction), and the only system certified NSF Std 350 (Water Reuse). Larger systems available for multi-family and commercial applications.	
Clarus Environmental 3649 Cane Run Rd. Louisville, KY 40211 800-928-7867 502-778-2731 Fax: 877-414-4316 wesc@zoeller.com www.clarusenvironmental.com 	Fusion Series	450 to 800	2006	Fusion Series Treatment Systems combine both anaerobic and aerobic treatment processes in one small tank utilizing plastic media to culture large populations of bacteria to enhance treatment. Treated effluent is recirculated back to the first chamber which reduces total nitrogen through the process of denitrification. Automatic backwashing of the aerobic media and sludge return reduces excess biofilms and accumulated sludges, which are returned to the first chamber for redigestion. One small linear air pump utilizing 60 watts of power controls all treatment, backwash, and sludge return processes.	AL, AR, HI, IA, IN, KY, MD, MI, NY, OH, VA, WA, WI, WV
Delta Environmental 8263 Florida Blvd. Denham Springs, LA 70726 800-219-9183 225-665-6162 Fax: 225-664-9467 www.deltaenvironmental.com	DF Series	500 to 1,500	1993	The process occurs entirely within the self-contained treatment unit which is comprised of outer mixing tank and a cone-shaped settling chamber. Raw, unsettled domestic wastewater enters directly into the mixing tank where mixing occurs through an air distribution system. The mixed liquid then enters the settling chamber from the bottom. The settling chamber maintains a quiet condition which allows solids to settle down and re-enter the mixing chamber for more processing. The liquid is hydraulically displaced upward and is discharged as a clear, odorless treated water which meets or exceeds state water quality standards.	AL, AK, AZ, BC, BWI, CA, CO, FL, GA, HI, ID, IL, IN, IA, KY, LA, ME, MI, MD, MN, MS, MO, MT, NV,

Manufacturer	Brand	GPD	Released	Description	Distributors In
Delta Environmental <i>continued</i> 	Ecopod-N Series	500 to 1,500	2006	Wastewater enters a pretreatment/settling tank similar to conventional septic tanks. In this tank, debris and settleable solids settle to the bottom and are decomposed by anaerobic bacteria. The effluent leaves the pretreatment tank and enters the Ecopod-N Fixed Film Wastewater Treatment System reactor tank, where it is introduced to an oxygen-rich environment. In this oxygen-rich environment, a colony of bacteria, called the biomass, develops and is capable of digesting biodegradable waste into carbon dioxide and water.	NM, NY, NC, OH, ON, OK, OR, TN, TX, UT, VA, WA, WV, WI
	Enviro-Aire Series	500 to 1,500	2005	The plant achieves treatment by a flow through process. Raw sewage enters a primary chamber, which has a hydraulic capacity of 346 gallons, providing a retention time of 16.6 hours. This chamber provides for separation of heavy, easily settled solids as well as floatable materials such as grease. Settleable solids accumulate on the bottom and floatable solids accumulate on the surface. Effluent from the clear layer flows into an aeration/mixing chamber with a 28-hr retention time. An aeration system provides for oxygenation of the primary effluent with the wastewater in the aeration/mixing chamber. Air is introduced by passing from the air pump to the air drop-line located in the chamber. The mixed liquor enters the settling chamber at the bottom and travels upward toward the discharge pipe. The quiet condition allows solids to settle down and re-enter the mixing chamber.	LA, MS, TX, IL
	UC Series	500 to 1,500	2001		
Eliminite, Inc. PO Box 359 Belgrade, MT 59714 888-406-2289 406-581-1613 Fax: 406-581-1613 tjkc@eliminite.com www.eliminite.com 	Eliminite	300 to 50,000+	1994	<p>Eliminite, Inc. manufactures patented engineered biological wastewater treatment technologies for decentralized residential, resort, commercial and industrial land use projects, with concentrated emphasis on projects where water quality preservation and natural resource protection are predominant development considerations.</p> <p>While a variety of standard pre-packaged Eliminite models are available, our engineering staff works closely with owners, contractors and design engineers to adapt each system to meet project-specific demands, particularly on high strength waste applications associated with energy development, highway rest areas, restaurants, RV parks, state and national parks, ski and golf resorts, and other projects presenting larger flows or challenging site constraints.</p> <p>The Eliminite system is an ideal choice for colder climates, high-altitude developments and seasonal-use applications. Its patented lightweight treatment medium—MetaRocks—provides stable, hospitable conditions for the specific biological processes necessary to achieve high-level treatment results (especially Total Nitrogen removal), even under extreme conditions.</p>	Western US, Seeking Distributors
Eljen Corporation 125 McKee St. East Hartford, CT 06108 800-444-1359 Fax: 860-610-0427 info@eljen.com www.eljen.com  See ad page 27	GSF	Scalable	1986	The Geotextile Sand Filter (GSF) product from Eljen Corporation is an advanced wastewater treatment and dispersal technology. The Eljen GSFs unique design provides treatment and dispersal in the same footprint while keeping installations easy and maintenance minimal. Independent testing has shown that the Eljen GSFs performance is compliant with NSF/ANSI Standard 40 Protocol and provides advanced treatment of septic tank effluent to better than secondary levels.	US and Canada
Hoot Systems, LLC 2885 Highway 14 E Lake Charles, LA 70607 888-878-4668 337-474-2804 Fax: 337-477-7904 questions@hootsystems.com www.hootsystems.com  See ad page 15	LA-Hoot	500 to 1,000	1986	LA-Hoot is an improved version from the original Hoot Treatment System introduced in 1984. Results are better than 10/10 mg/L on CBOD and TSS, with more than a 95% reduction of the wastewater influent. Two-year warranty/NSF Standard 40 certified.	AL, AZ, CA, CO, FL, KS, LA, MA, MN, NJ, OH, OK, PA, TX, VA, WI
	H-Series	500 to 1,000	1995	Five-stage, one piece system with a pretreatment tank, aeration chamber, final clarifier, optional disinfection device and a pump tank. Results are better than 5/5 mg/L on CBOD/TSS. A 99 percent reduction on CBOD and TSS. Three-year warranty/NSF Standard 40 certified.	
	ANR	450	2007	Adds Biological Nutrient Reduction to the Hoot System. Results of 5.8 mg/L on TN, better than 10/10/10 mg/L on CBOD/TSS and Total Nitrogen. Areas where 10 mg/L is the discharge limit for Total Nitrogen, the federal level for drinking water. Three-year warranty/NSF Standard 40 and 245 certified.	
Hydro-Action Mfg. PO Box 640 Plymouth, IN 46563 800-370-3749 574-936-2542 Fax: 574-936-2298 info@hydro-action.com www.hydro-action.com 	AP Series	500 to 1,500	1999	Manufacturing a full line of residential and commercial onsite wastewater treatment plants, NSF Standard 40 and 245 certified. From our 52-inch-tall low-profile system to our nitrogen reduction models and with a best in the industry 5-year warranty.	US and International
Jet, Inc. 750 Alpha Dr. Highland Heights, OH 44143 800-321-6960 440-461-2000 Fax: 440-442-9008 email@jetincorp.com www.jetincorp.com  See ad page 20	J-1500 BAT Media Series	500 to 1,500	1993	Jet's residential wastewater treatment plants employ the JET BAT Process Media which provides the ideal environment for nature's own bacteria to thrive and grow. Great numbers of these living microorganisms attach themselves to this submerged structure to create a "biomass" that rapidly treats wastewater. The JET 700LL Aerator provides the mixing and fresh oxygen the microorganisms require to live while the JET BAT Process Media provides the environment to support the microorganisms that allow natural filtration and biological reduction to take place. Available in concrete and plastic.	US and International

Manufacturer	Brand	GPD	Released	Description	Distributors In
MST Manufacturing, LLC/ MicroSepTec 23362 Madero, Ste. C Mission Viejo, CA 92691 877-473-7842 949-297-4590 Fax: 949-916-2093 microseptec@microseptec.com www.microseptec.com 	EnviroServer	600 to 2,500	1998	The EnviroServer ES is a combination of primary treatment, flow equalization, and secondary treatment by both fixed-growth and suspended-growth aerobic processes. The system consists of five chambers in one compact pre-engineered unit. The first chamber is a primary clarifier, the second chamber is the first aeration zone, the third chamber is the second aeration zone, the fourth chamber is the final clarifier, and the fifth chamber is the effluent chamber where an optional pump(s) and disinfection device may be installed.	AZ, CA, DC, DE, MD, NJ, NV, PA, VA
Norweco, Inc. 220 Republic St. Norwalk, OH 44857 800-667-9326 (NORWECO) 419-668-4471 Fax: 419-663-5440 email@norweco.com www.norweco.com  See ad page 9	Singulair Green, Singulair Green TNT, Singulair 960, Singulair TNT	500 to 1,500		Employing the extended aeration process, the Singulair system provides pretreatment, aeration, filtration, flow equalization and optional disinfection and dechlorination within a single tank; optional external UV disinfection. Available in high density polyethylene and precast concrete.	North America, Africa and Middle East
Orenco Systems, Inc. 814 Airway Ave. Sutherlin, OR 97479 800-348-9843 541-459-4449 Fax: 541-459-2884 www.orenco.com  See ad page 3	AdvanTex AX20 Series, AdvanTex AXRT Series	500 to 1,500	2000	Fiberglass basin filled with engineered textile material that operates in recirculating mode. Packed bed filter that treats domestic strength wastewater to advanced treatment standards, including nitrogen reduction, while electricity is less than \$3/month. Reliable even with intermittent, seasonal, or peak flows. Little maintenance required.	US, Canada, Mexico, Australia, New Zealand, Europe and Greece
Premier Tech Aqua 1 avenue Premier Riviere-du-Loup, PQ G5R 6C1 Canada 800-632-6356 418-867-8883 Fax: 418-862-6642 pta@premiertech.com www.premiertechaqua.com  See ad page 7	Ecoflo	460 to 690	1995	Ecoflo is a wastewater treatment system that can be installed in different site conditions. It features a fiberglass, concrete or polyethylene tank, high-resistance plastic distribution system and integrated pump vault (when the treated effluent has to be pumped out to a surface disposal). It uses a patented quality-controlled filtering media to treat wastewater coming from the septic tank. No electric power is required to achieve treatment which exceeds standards. Filtering media and mechanical components are accessible for routine maintenance and verifications. Compact and modular, Ecoflo can be used for residential, commercial and small community projects.	US and Canada
Presby Environmental 143 Airport Rd. Whitefield, NH 03598 800-473-5298 603-837-3826 Fax: 603-837-9864 info@presbyeco.com www.presbyenvironmental.com  See ad page 5	Advanced Enviro-Septic	Varies		Advanced Enviro-Septic is the only Passive Treatment and Dispersal product of its kind that has earned third-party certification from NSF Class 1, Cebedeau, and BNQ. AES is designed for residential, commercial and community use, and proven to remove up to 99 percent of wastewater contaminants without use of electricity or replacement media. Advanced Enviro-Septic quickly and naturally establishes an ecosystem that breaks down and digests wastewater contaminants leaving the septic tank. The system discharges highly purified wastewater, preventing groundwater contamination and soil clogging.	US, Canada, France, Belgium, Australia
Quanics Inc. PO Box 1520, Crestwood, KY 40014 877-QUANICS 502-992-8239 Fax: 502-992-8249 info@quanics.net www.quanics.net	AeroCell	200 to 100,000	1998	The AeroCell utilizes a patented synthetic open-cell foam media for treatment. The media's high porosity, large surface area, and ease of microbial attachment allows for loading rates of up to 10 times that of other fixed-film systems. The open-cell form media has a 15-year track record for effectively treating wastewater to the highest of standards.	US, Canada, Australia, Caribbean
SludgeHammer Group, Ltd. 336 S Division Rd. Petoskey, MI 49770 800-426-3349 231-348-5866 Fax: 720-834-3102 kbeer@sludgehammer.net www.sludgehammer.net	S-400, S-600	400 to 600	2009	Models S-400 and S-600 are the only NSF certified Advanced Treatment Units that fit directly inside a septic tank and digest solids as well as soluble waste with only 80 watts of power. The technology is an Aerobic Bacterial Generator for leachfield remediation by IAPMO under IGC180-2003 standard and it is certified by Lloyd's Register under the International Maritime Organization MEPC 55-180 Standard.	Global
Waterloo Biofilter Systems Inc. PO Box 400 Rockwood, ON N0B 2K0 Canada 519-856-0757 Fax: 519-856-0759 info@waterloo-biofilter.com www.waterloo-biofilter.com  See ad page 32	Waterloo Biofilter	300 to 50,000	1994	The Waterloo Biofilter is an efficient, low-maintenance trickle filter for treating residential and commercial wastewater. There is no aerobic sludge management issue and very low power consumption. Due to our substantial field experience since 1994, the patented absorbent filter medium now has a 20-year warranty. We offer a variety of small to large plug-and-play configurations for ease of installation. This includes attractive self-contained modules in 5,000 and 10,000 gpd ISO shipping container units, and remote camp units transportable by helicopter. During the latest term at an example school, our new WaterNOx denitrification system removed 95 percent TN with CBOD & TSS <5 mg/L. Tested under the stringent NSF-EPA Environmental Technology Verification Program and proven in Canada's harsh environment with thousands of systems operating.	MA, MD, MI and Canada

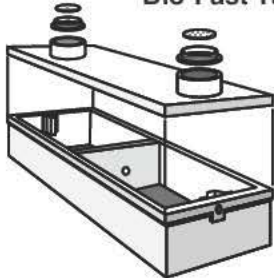
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Making Camp

An installation for an RV resort in Illinois meets challenges posed by poor soils by deploying an ATU with a pressure-dosed drainfield

By **Scottie Dayton**

Membership was increasing at Leisure Lakes Resort in Joliet, Ill., and the owners wanted to treat the park's wastewater rather than store it in concrete holding tanks, one for each of three recreational vehicle campsites.

Of the 235 pads, 163 discharged to three holding tanks in series: capacities 6,000 gallons, 3,000 gallons, and 1,500 gallons. Zeiter's Septics Unlimited in Morris pumped the tanks weekly from April to December. Since the company also designed and installed onsite systems, the resort owners hired president David Zeiter to find a solution.

"Initially, we thought a conventional system could treat the waste," says Zeiter. "But once we saw the soil loading rate and the design and holiday flows, we switched to an aerobic unit that allowed us to reduce the drainfield from 10,500 to 7,000 linear feet." The only area for the system was more than 1,000 feet from the holding tanks between two gas lines and a forest.

While state code specified a 11,250 gpd aerobic treatment unit (ATU) to treat the expected peak flow, Zeiter's design specified a 9,000 gpd unit and received approval from the county after hiring Huff & Huff Engineering in Oak Brook and having a licensed engineer stamp the plans. Despite the presence of water mains, power lines, and the 24- and 36-inch gas mains in their path, the four-member crew installed the system without damaging any utilities.

Site conditions

Soils were fill material and orthents (well-drained soil of medium to fine texture, usually above shallow bedrock and lacking evidence of horizonation). The loading rate was 0.27 gpd per square foot, and the water table lay 60 inches below grade. The DuPage River forms the west property boundary.

System components

Zeiter designed the system to treat a peak in-season flow of 11,250 gpd. Major components were:

- Existing holding tanks, each with duplex 2-inch sewage pumps (Goulds Water Technology)

(continued)



Matt Moser (foreground) and Ben Hoffman lay 550 feet of 1.5-inch PVC Schedule 40 low-pressure pipe as Jim Koltunchik uses a Komatsu excavator with 12-inch bucket to trench from a holding tank to the septic tank. (Photos courtesy of Zeiter's Septics Unlimited, Morris, Ill.)

SYSTEM PROFILE

Location:	Joliet, Ill.
Facility served:	Leisure Lakes Resort
Designer/installer:	David Zeiter, Zeiter's Septics Unlimited, Morris, Ill.
Site conditions:	Fill material and orthents with 0.27 gpd per square foot loading rate; water table 60 inches below grade
Type of system:	MicroFAST ATU (Bio-Microbics), Arc 24 chambers (Advanced Drainage Systems)
Hydraulic capacity:	11,250 gpd peak

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Ben Hoffman (left) and Jim Koltun-chik convert the 3,000-gallon holding tank at one campsite to a dose tank.

From the treatment unit, effluent flows to the dose tank, where alternating pumps send 2,000 gallons to each of five zones in sequence. “During high flows, the control panel will activate a second, third or all the pumps as needed,” says Zeiter. “In the real world, five running at once should never happen.” The flow scours the piping, making backflushing unnecessary.

Installation

“I was very concerned with locating all the utilities,” says Zeiter. “The two men in charge of the facility knew where most of them crossed our path, but we still

needed a locate – call before you dig – to help with the power lines.” Workers also charged some water pipes and traced them using RD400 locators (Radiodetection). They hand-dug to verify utility locations, including the two gas lines separated by 18 inches.

While waiting for the tanks to arrive, the crew laid out the grid for the drainfield and shot grades with lasers (Leica Geosystems). The serial system dropped 3.5 feet from the beginning of the first zone to the end of the last zone. A Depthmaster MC200 laser alignment tool (Leica) on the Komatsu excavator helped keep the trenches level.

Workers installed a header manifold down the center of each zone with 29 laterals running 100 feet on 9-foot centers on both sides. “We laid out four 290- by 210-foot zones before running out of room because of the sheer drop off and river 200 feet away,” says Zeiter. “The fifth zone was 10 feet to the south with 14 100-foot laterals.”

(continued)

- 3,000-gallon single-compartment concrete septic tank with SaniTEE wastewater screen (Bio-Microbics). All tanks from Wieser Concrete, Maiden Rock, Wis.
- 10,000-gallon concrete tank with MicroFAST 9.0 treatment system (Bio-Microbics)
- 3,000-gallon, single-compartment, concrete dose tank with five 1/2 hp effluent pumps (Liberty Pumps)
- Arc 24 chambers (Advanced Drainage Systems) in a 290- by 310-foot drainfield
- Custom-built control panels from Ohio Electric Control, Ashland

System operation

Wastewater flows through 4-inch laterals and sanitary mains, one per holding tank. On-demand alternating pumps in the tanks send 75 to 100 gallons to the septic tank. An 8-inch SDR-35 PVC pipe in the tank outlet connects to the ATU. Liquid passes through the filter in the pipe before entering the treatment tank.

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Workers from subcontractor Camco Construction use a horizontal directional drill (Vermeer Corp.) to bore 600 feet of 1.5-inch HDPE pipe under two acres of dense woods from a holding tank to the septic tank.



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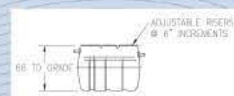
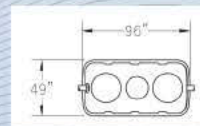
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Workers prepare to set the bottom half of the aerobic treatment unit in its concrete tank.

The crew left one-third of the drainfield unfinished, enabling the crane and delivery truck to reach the tank excavations. Without existing plumbing to dictate the depth of the tanks, Zeiter set them as shallow as possible.

The tanks arrived in halves with TW-Risers by Infiltrator cast into the lids and 1.5-inch rubber boots in the ends to accept piping. The precaster also mounted the ATU to the bottom of its tank. Workers set that tank 12 inches above grade, then used its elevation to determine the depth of the septic and dose tanks. They bedded the excavations with 6 inches of 3/4-inch stone.

"We installed a union on the 3-inch air line that enables us to remove the blower at the end of the season and store it in a heated shop until spring," says Zeiter.

While his crew set and assembled the tanks, subcontractor Camco Construction used a horizontal directional drill (Vermeer Corp.) to bore 600 feet of 1.5-inch HDPE pipe under two acres of dense woods from the 3,000-gallon holding tank to the septic tank. The next day, they bored 1,400 feet to connect the 6,000-gallon holding tank to the septic tank.

Meanwhile, Zeiter's team used a 12-inch bucket to trench 550 feet from the 1,500-gallon holding tank and around some woods to the septic tank. Then they laid 1.5-inch PVC Schedule 40 pipe. "We didn't enjoy digging near the gas lines, and a gas company representative was constantly looking over our shoulder," says Zeiter. "Our patience and due diligence paid off, and there were no close calls."

"We laid out four 290- by 210-foot zones before running out of room because of the sheer drop off and river 200 feet away. The fifth zone was 10 feet to the south with 14 100-foot laterals."

David Zeiter

All piping was buried 4 feet deep to prevent freezing. Camco butt-fused Schedule 40 pressure fittings to the HDPE pipe, enabling Zeiter's team to glue PVC pipe to them. With the system inspected, the crew backfilled to the top of the ATU and tapered the soil over the septic and dose tanks. "The hardest elements were figuring out the components and how we were going to miss all those utilities," says Zeiter. "The easy part was putting it in the ground."

Maintenance

Zeiter's Septics Unlimited has the maintenance contract. During the season, workers pump the tanks once and check the blower, pumps and control panels. After the park closes, they pump and drain all the tanks. "The pumps have embedded trace macrocell counters that tell the duration and frequency of runs," says Zeiter. "That enables us to calculate actual flow and adjust the system as park membership increases." □

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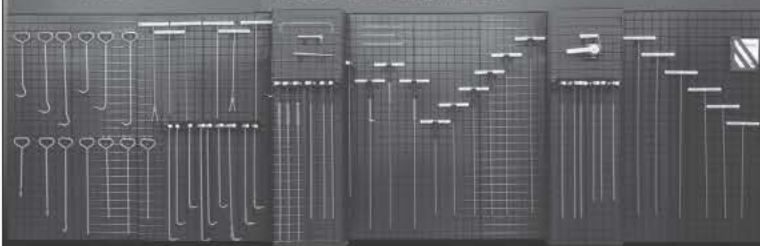


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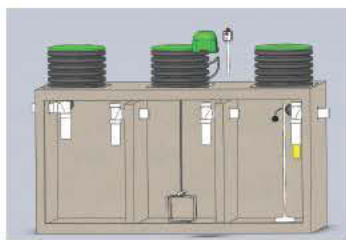
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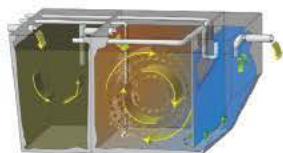
Submerged Aerated Filter

The Platinum Submerged Aerated Filter from Anua is a three-step treatment system that reduces BOD and TSS in effluent to secondary standards, and nitrogen by more than 50 percent. Benefits include a strong fiberglass tank for underground installation (including blower and low-profile access covers), submerged aerated filter with high surface area and no bypass of media, integrated biomass return from clarifier to primary tank, and a small footprint for environmentally sensitive installation in residential, small neighborhood and commercial applications. It also includes a single or two-stage primary settlement tank. 336/547-9338; www.anua-us.com.



Nitrogen Reduction System

The AK6S245 nitrogen reduction system from AquaKlear has been certified to NSF Standard 245. It doesn't utilize any additives or require an additional mechanical return pump. Nitrogen is reduced through an expanding skimming action that returns to the anaerobic zone located in the trash tank. The design diminishes necessary routine maintenance and increases the dependability of the process. It



is available in fiberglass and concrete, in sizes ranging from 600 to 1,500 gpd. 877/936-7711; www.aquaklear.com.

Septic System Enhancement

EPA/ETV-tested RetroFAST Septic System Enhancement from Bio-Microbics is designed to rehabilitate a biologically failed septic system. The company's S.O.S. (SAVE OUR SEPTIC) Program backs up the enhancement; if after one year from the date of installation the failed system is not remediated, the owner is entitled to a refund. The system produces a clean effluent with dissolved oxygen to bring back a failed drainfield using Fixed Integrated Treatment Technology that easily installs in the existing septic tank. 800/753-3278; www.biomicrobics.com.



Onsite Treatment System

The Bionest Technologies advanced onsite wastewater treatment system includes a septic tank with an effluent filter, followed by a reactor. The biological process uses microbial culture, which attaches to a synthetic media. The reactor's first compartment is filled with media and continuously aerated with an air pump and fine-bubble air diffusers. The second compartment is non-aerated and also filled with media. Part of the treated effluent is redirected to the septic tank through a recirculation pump. Only the septic tank needs to be emptied. Final discharge is directed to a polishing field; surface discharge is also possible. An audible and visual alarm alerts to a malfunction of the system's electrical components. 866/538-5662; www.bionest-tech.com.



Recirculating Media Filters

Recirculating media filters from Clarus Environmental are an alternative treatment option designed for use in decentralized wastewater treatment applications where



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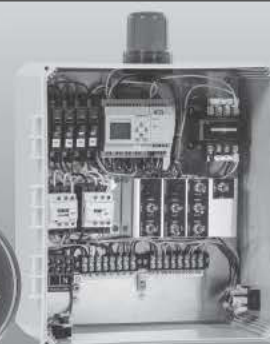
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effluent quality is treated to better than secondary treatment standards of < 30 mg/L BOD5 and < 30 mg/L TSS. Treatment occurs below grade as the fluid trickles down through pore spaces, where aerobic organisms feed on the nutrients. Effluent leaves the system through an outlet pipe in the bottom of the filter. Multiple filters can be used together when greater capacities are needed. Effluent can be discharged above or below grade. The size can be adapted to site-specific organic and hydraulic loads. 800/928-7867; www.clarusenvironmental.com.

SBR Treatment System

The sybr-AER advanced wastewater treatment system from Consolidated Treatment Systems is based on Sequential Batch Reactor technology, which allows the entire treatment process to happen in a single, locally secured tank. The system ships pre-assembled, factory-direct and ready for installation. The package also includes a preprogrammed control featuring an internal logic module with battery backup. All components are easily serviceable and utilize quick-release connectors. It is ANSI/NSF Standard 40-approved and is available in 500, 600, 800, 1,000 and 1,500 gpd systems. 800/503-0163; www.consolidatedtreatment.com.



Fiberglass Treatment Unit

The Aqua Safe 500 "L" TRIO from Ecological Tanks is an all-in-one fiberglass treatment unit, 60 inches tall and with attached pre-tank, aerobic and pump tank. The unit makes digging less of an issue, especially in rock. Individual tanks are laminated together with side panels for durability. It is available in 300-, 500-, 750- or 1,000-gallon pre and pump tanks. Components can be remote-mounted up to 100 feet from the installed unit, and 20-inch poly risers are located for easy accessibility into each compartment. 800/277-8149; www.etiaquasafe.com.



Compact System

The Envirocycle G7-Series 1200 gpd treatment system from Envirocycle USA exceeds ANSI/NSF 40/245/350 performance requirements with no extra trash or dose tanks needed. The system requires no preventive maintenance and is safe for drip tube dispersal. Lightweight and compact, the system can be airlifted to remote sites. Full remote monitoring and control is standard. 530/888-6480; <http://cole.thesepticexperts.com>.



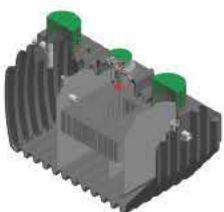
Aerobic Treatment Unit

Hydro-Action's aerobic treatment unit is NSF 245 certified at 400 and 500 gpd. It uses suspended aeration and activated sewage design in conjunction with engineered recirculation rates to achieve consistent denitrification without media filters or carbon additives. 800/370-3749; www.hydro-action.com.



Chemical-Free Treatment System

The 1500 Series BAT Media Plant from Jet Inc. is a natural, organic, chemical-free system that uses nature's own resources to reduce wastewater to a clear, odorless liquid in 24 hours. It is available in seven sizes from 500 to 1,500 gpd. The unit uses Jet's Biologically Accelerated Treatment process, in which millions of microorganisms attach themselves to the media. An aerator supplies the oxygen utilized by the microorganisms to convert the waste to colorless, odorless liquids and gases. 800/321-6960; www.jetincorp.com.



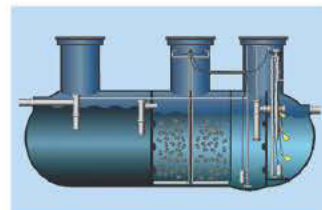
Microbial Inoculator Generator

The White Knight Microbial Inoculator Generator from Knight Treatment Systems is an aerobic treatment technology that introduces, cultivates and releases task-specific selected microorganisms for the enhanced biological augmentation of onsite treatment systems. The device is designed to provide aggressive nonpathogenic bacteria to wastewater applications to assist in the metabolism of waste. Initially developed for the rehabilitation of organically clogged septic absorption systems, it can also be used to retrofit outdated ATUs and package treatment plants. 800/560-2454; www.knighttreatmentsystems.com.



Aeration Treatment System

The EnviroServer ES from MicroSepTec is a hybrid, fixed-film, suspended-growth, extended aeration wastewater treatment system with an adjustable two-stage biological process to optimize denitrification. A single five-compartment fiberglass tank incorporates a primary settling/septic chamber, two aerobic chambers, a final settling chamber, and an effluent chamber to house optional disinfection units and/or effluent pumps. The single-tank design means one excavation so it can be installed in small or sloped lots. While heavy-duty, the tank is light enough to be transported and easily maneuvered with typical installation equipment. For ease of maintenance, components are accessible at grade. It is available in three residential sizes: ES6 (600 gpd), ES12 (1,200 gpd) and ES25 (2,500 gpd). 877/473-7842; www.microsepte.com.



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Nitrogen Reduction System

The Singulair Model TNT (Total Nitrogen Treatment) wastewater treatment system from Norweco biologically oxidizes nitrogen compounds to accomplish nitrification and denitrification. The average effluent produced contains 7 mg/L nitrate, 12 mg/L total nitrogen, 4 mg/L CBOD5 and 9 mg/L total suspended solids. It reduces total nitrogen by more than 68 percent. Featuring flow equalization, effluent filtration and low electrical usage, this unit is designed for easy installation, operation and maintenance. All treatment is efficiently accomplished within the tank. 800/667-9326; www.norweco.com.



Dual-Pass UV Disinfection Unit

The PL-UVI UV disinfection unit from Polylok reduces bacteria levels from secondary effluent to achieve strict water quality standards. The unit features gravity flow of 100 to 8,640 gpd, providing a UV dose greater than 40,000 microwatt-secs per square cm at 254 nanometers. The system provides a transmissivity quality of 65 percent, with no chemical residual or harmful byproducts. It has weatherproof electrical components, a dual pass design and a long-life UV bulb. The unit is inexpensive to install and operate. 877/765-9565; www.polylok.com.



Biofilter Treatment System

The Concrete Ecoflo Biofilter from Premier Tech Aqua is a wastewater treatment system that can be installed where the soil is limited by impermeable subsoil or high groundwater. It features a watertight-bottom reinforced concrete shell (rated to 5,000 psi), integrated pump vault, high-resistance plastic components, and uses a natural filtering media to treat wastewater coming from the septic tank. No electric power is required to achieve treatment, which exceeds standards. Filtering media and mechanical components are accessible for routine maintenance and verifications. The system can be used for permanent, secondary and seasonal dwellings, as well as commercial and small community projects. 800/632-6356; www.premiertechaqua.com.



Treatment and Dispersal System

Advanced Enviro-Septic from Presby Environmental is designed for residential, commercial and community use, and removes up to 99 percent of wastewater contaminants without use of electricity or replacement media. The system quickly and naturally establishes multiple bacterial treatment environments that break down and digest wastewater contaminants leaving the septic tank. The system discharges highly purified



wastewater, preventing soil clogging and groundwater contamination. It has third-party certifications from NSF Class 1, Cebadeau and BNQ. 800/473-5298; www.PresbyEnvironmental.com.

Underground UV Disinfection Unit

The 3G ultraviolet onsite wastewater disinfection unit from Salcor is a UL (U.S. & Canada) certified, NEMA 6P (Standard 979) unit for treating onsite residential, commercial and municipal effluent. The unit has demonstrated outstanding pathogen kill in NSF/ANSI Standard 40 testing in 19 treatment units, and has excelled in several university-sanctioned tests. It features a fouling-resistant Teflon lamp covering, enabling easy annual maintenance. Other features include a warranted 2-year lamp, a heavy-clad conformal-coated circuit board, surge/lightning protection and noise elimination. The completely underground unit eliminates the need for an above-ground control box/panel. Electric components, mounted on the underside of the enclosure's top cover, avoid liquid condensation and provide user-friendly access. 760/731-0745.



Pressure Filter

The STF-100A2 pressure filter from Sim/Tech Filter helps maintain proper and efficient year-round operation of mounds, sand filters and other pressurized distribution systems. The filter can also be used as pre-filtration for drip irrigation systems to reduce maintenance needed for spin-clean and disc filters. The low head loss (0.21 psi) pressure filter mounts on the discharge side of an effluent pump, preventing plugged holes and reducing effluent TSS. The vortex action created by the pump scrubs the screen, and the backflow through the filter after the pump shuts off washes debris back out of the filter. A single 2-inch filter can handle flow rates up to 83.8 gpm. Larger 3- and 4-inch filters are also available. 888/999-3290; www.simtechfilter.com.



Aerobic Bacterial Generators

S-400 and S-600 aerobic bacterial generators from SludgeHammer are certified by the International Association of Plumbing and Mechanical Officials Research and Testing Inc. and to NSF/ANSI Standard 40 as advanced treatment systems for residential wastewater. The models are approved in all states. Most units are engineered for subsurface drip disposal. The generators use microbes to process waste in the septic tank. Then the organisms migrate to and remediate clogged leachfields. Digestion of effluent is so complete that nothing remains to create a biomat. The units are designed as cost-effective options when repairing or replacing failed absorption beds. 800/426-3349; www.sludgehammer.net. □





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Advanced Treatment Units

By Craig Mandli

Treatment system needed for space-limited lakeside site

Problem

A homeowner's existing system on Bear Lake in Michigan was showing the initial signs of failure. Due to the proximity of the lake and site constraints, a compact treatment system was required.

Solution

Erin Parker, an engineer from Parker Engineering in Lake Ann, Mich., specified the GSF system from Eljen Corporation. The system passively treats and disposes of effluent in the same footprint. In this case, a lift pump to gravity distribution was required to achieve the desired drainfield location.

Result

The installation on the slope was permitted by District No. 10 HD, supplied by Harbor Pipe and Supply Co., and installed by Belanger's Excavating. The installation went quickly, allowing the family to get back to enjoying Bear Lake. 800/444-1359; www.eljen.com.



Steep slopes make onsite installation difficult in subdivision

Problem

A 68-lot residential subdivision in Montana with steep slopes and numerous bedrock outcroppings made it difficult to install conventional onsite systems with subsurface drainfields. The state's Department of Environmental Quality required a minimum 60 percent influent nitrogen reduction prior to disposal.

Solution

Despite utilizing state-approved treatment systems, sampling from several homes showed discharge nitrogen limits at the central dosing tank in excess of permit limits, resulting in ongoing violations. The developer saw success after installing Eliminite nitrogen-removing treatment systems and now requires the systems for all future construction.

Result

The subdivision has been in compliance with nitrogen discharge limits since requiring Eliminite systems. The most recent sample data collected from the central dosing tank shows a total nitrogen concentration of 9.8 mg/L, approximately an 86 percent removal of nitrogen. 406/581-1613; www.eliminite.com.



Septic adjustments needed to expand rental property

Problem

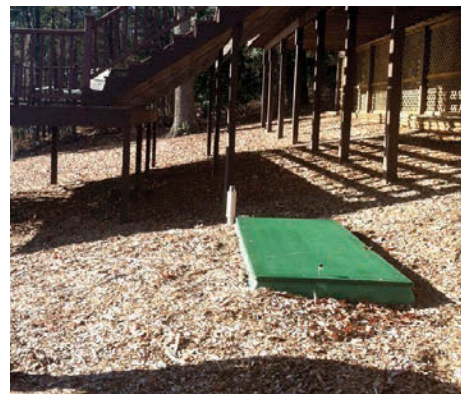
A property owner in Smith Mountain Lake, Va., wanted to expand his existing three-bedroom water-front rental property. The county health department's guidelines required adding a 50 percent reserve to the drainfield's capacity before renovation could be approved.

Solution

The homeowner approached Hubert Ayers of Septic System Services, who had assisted a neighbor during a similar expansion project. Ayers asked Ben Shrader, of Shrader Engineering & Land Surveying, Inc., to first conduct a Ksat soil test to determine an accurate perc rate. A wastewater system upgrade was designed using an Orenco AdvanTex AX-25RT treatment system. The system features a small footprint, large reserve capacity, and the ability to meet permit limits of BOD/TSS 10/10 mg/L.

Result

With the addition of the unit and correct perc rate, the 50 percent reserve capacity was no longer necessary, and the county approved the plans. The property now has a five-bedroom rental home, increasing revenue for the owner while meeting the stringent requirements of this environmentally sensitive community. The increased capacity allows the homeowner to use half the drainfield each year, extending the life of the system. 800/348-9843; www.orenco.com.



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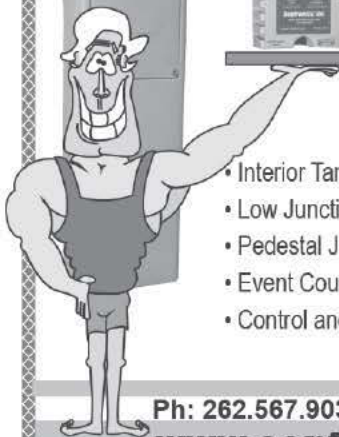


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Replacement needed for failing sand filter system

Problem

The sand filter at Hutchens Elementary in West Mobile County, Ala., served the school and an adjacent 160-lot residential development. It served well, but time and increased wastewater load led to a failure of the filter. Mobile Area Water and Sewer decided to replace it.

Solution

The utility wanted to utilize the two existing 30,000-gallon Xerxes tanks that were used to dose the sand filter. Wastewater from the school and the subdivision is pumped to the existing recirculation tanks. The pumps in the existing tank were replaced with six Quanics turbine effluent pump packages. Six ATS-16-AC AeroCell modules were then installed in the footprint of each of the two existing sand filters. After passing through the open cell foam media, 80 percent of the effluent is routed back to the recirculation tanks for further treatment. The remaining 20 percent is discharged to a subsurface chamber system.



Result

J. H. Wright and Associates of Daphne, Ala., coordinated the project with design engineer Harold Barker of Volkert Engineering in Mobile, Ala. System startup occurred in fall 2008, and the site was immediately fully operational. 502/992-8216; www.quanics.net. □

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Father-son teams dominate the national Roe-D-Hoe competition

By Eric Casey

It was a family affair two times over at the 2013 National Backhoe Roe-D-Hoe sponsored by the National Onsite Wastewater Recycling Association, as two sets of fathers and sons took four of the five top places.

Darren Flygare of Flygare Excavating of Annandale, Minn., was crowned the 2013 champion after successfully negotiating the excavator skills competition faster than the other 14 event finalists. Darren, who collected a \$1,000 cash prize, finished four spots ahead of his father, Dean, who ended up in fifth place. Earlier this year, Dean was the winner of the Minnesota Onsite Wastewater Association's Roe-D-Hoe competition.

In a similar fashion, Josh Reading of M & J Excavating in Monee, Ill., took second place in the contest, while his father, Mike, took the fourth spot. This is the second time in three years that Josh has finished in the money at the national Roe-D-Hoe.

Bryan White of C. White & Sons, Seaford, Del., the Delaware Onsite Wastewater Recycling Association Roe-D-Hoe champion, took third place.

More than 150 machine operators participated in this year's Roe-D-Hoe across two days of open competition at the 2013 Pumper & Cleaner Environmental Expo International in Indianapolis. Contestants squared off to see who could navigate the three skills games – basketball, golf and bowling – to total the fastest combined time for all three events. Those with the 10 fastest times in the open competition joined with the five state Roe-D-Hoe champions for the finals on the third day of the Roe-D-Hoe.

Darren Flygare took home the \$1,000 cash prize, while Reading and White received \$250 and \$100, respectively.

The rest of the top 15 finishers were:

Avery Zahn, Infra Track, Worthing, S.D.
 Bob Tiedt, Tiedt Drainage, Inc., Waverly, Iowa
 Mike Dorrell, Utilities Excavating, Inc., Paola, Kan.
 Bryon Strawberry, Beckley Sanitary Board, Beckley, W.Va.
 Jeremy Yates, Sure-Flow Plumbing, Lenexa, Kan.
 Tim Boswell, Stewarts Septic, Inwood, W.Va.
 Paul Debolt, Midstate, Champaign, Ill.
 Mark Shepard, Utilities Excavating, Inc., Overland Park, Kan.
 Phil Sloan, BCEO, Middletown, Ohio
 Vince Sullivan, All American Wastewater, Austin, Texas ■



Representatives from Roe-D-Hoe sponsor companies stand with 2013 champion Darren Flygare: (left to right) Greg Graves of Norweco, Loretta Andersen of Bio-Microbics, Flygare, Carl Thompson of Infiltrator Systems and Chris Mandich of Jet Inc.



The top five finishers in the Roe-D-Hoe at the Pumper & Cleaner Environmental Expo International were (left to right, standing) Mike Reading, Bryan White, Josh Reading, Dean Flygare and (kneeling) Darren Flygare.

Bio-Microbics' Blodig receives STEP Award

Allison Blodig, director of regulatory affairs for Bio-Microbics, received the Women in Manufacturing STEP (science, technology, engineering and production) Award, presented by the Manufacturing Institute, the Society of Manufacturing Engineers, University of Phoenix and Deloitte. A registered environmental health specialist and former board member of the Kansas Small Flows Association, Blodig was among 122 women recognized for excellence in manufacturing.



Allison Blodig

Advanced Drainage acquires Flexstorm

Advanced Drainage Systems (ADS) acquired Inlet & Pipe Protection, manufacturer of Flexstorm stormwater inlet filters. Products will be marketed under the ADS Flexstorm brand.

Admirals Bank introduces septic financing program

Admirals Bank introduced a residential septic financing program that provides homeowners with up to \$25,000 to upgrade, repair or replace their septic or public wastewater system.

Vermeer names leadership team

Vermeer named Jason Andringa president, forage and environmental solutions, and Doug Hundt president, underground and specialty excavation solutions. Andringa and Hundt will co-chair the executive team. Tony Briggs was named vice president, sales and distribution. □



Jason Andringa



Doug Hundt



Tony Briggs

Gehl compact excavators

The five new models of compact excavators from Gehl feature Yanmar Tier 4 (Z17) and Interim Tier 4 engines (Z27, Z35, Z45, Z80). The zero-tail-swing machines eliminate cab overhang beyond the tracks in all directions. The hydraulic system incorporates two variable pumps and two gear pumps for simultaneous operation without loss of hydraulic power. The Z80 also features the ECO mode that reduces engine rpm by 10 percent, saving fuel when full speed is not needed. 800/628-0491; www.gehl.com.



Mustang zero-tail excavators

Zero-tail-swing compact excavators from Mustang feature Yanmar Interim Tier 4 engines. Available in five models, the machines have no cab overhang beyond the tracks in any direction. Models 270Z, 350Z, 450Z and 800Z also have a hydraulic quick coupler. 800/628-0491; www.gehl.com.



Clarus centrifugal STEP system

The 5040 Series septic tank effluent pump (STEP) system from Clarus Environmental, designed for use in a septic tank as an alternative to a separate pump tank, eliminates the need for a separate pumping chamber. The system can be equipped with a control panel for use in either demand-dose or timed-dose applications. The vault ensures the system draws liquid from the clear zone of the tank while protecting filters from premature clogging. Not recommended for flows greater than 50 gpm, the system has 528 linear feet of 1/16-inch filtration for longer service intervals. 877/244-9340; www.clarusenvironmental.com. □



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ABOUT THE AUTHOR

Eric Casey is executive director of NOWRA.
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Drive Home Your Message

Make personal appeals for new business, then provide a unified marketing message and a clean, professional image to wrap up more customers

By Eric Casey

In this final installment of a three-part series on ways installers and other onsite industry professionals can market their businesses, we'll focus on ideas that are fairly easy to implement. In some cases, you may not even think of them as marketing-related, but they are. Marketing is more than just the sales call, a company brochure or a website. Anything that leaves an impression about your company in the minds of your customers has a marketing component.

Incentives for your customers

Word-of-mouth is the most effective form of advertising. Make sure to leave extra business cards or brochures with customers upon completing your job. Consider offering your customers a finder's fee, coupons for movies or restaurants, or some other incentive if a referral from them results in business for you.

If you are the business owner, it is in your interest to make sure you deal with problem customers personally. No matter how good your employees are, they are not as invested in the success of your company as you are, and won't care as much about the consequences of poor customer relations.

Incentives for your employees

New work frequently comes from neighbors who see your employees on the job. Make sure your crew understands how to deal with potential new customers and put your company's best foot forward. Also, take advantage of workers' circle of family, friends and other contacts. Give some thought to providing incentives that encourage them to identify and exploit opportunities to sell your services. And who knows? Perhaps there is a great salesperson among the folks who work for you.

Advertising items

Little giveaways such as refrigerator magnets, pens, notepads, etc. can be effective ways to keep your company top-of-mind when people need your

services. They work well as giveaways at fairs, but can work in a wide range of settings where you connect with potential customers. The best items are likely to be used or seen frequently.

Appearances matter

How you present your company will leave an impression on both current and potential customers. If the inside of your truck is filled with fast food wrappers and other trash, if your equipment is caked with mud, if you aren't reasonably well-groomed with clean clothes, people will take notice. As the expression goes, "You only have one chance to make a first impression."

Have a consistent look

Everything used to advertise your company – brochures, website, truck signage, estimate forms, invoices, etc. – should present a uniform message to promote your company. One goal of advertising is to get people to recognize your company right away. If everything about your company looks different, your message is less likely to be easily retained by your customers. The two characteristics all company materials should have are your company logo and a consistent color scheme (ideally not more than one or two colors).

EPA Rolls Out SepticSmart Consumer Education Program

The U.S. Environmental Protection Agency recently introduced SepticSmart, a homeowner education program that advises owners of septic systems about ways to manage and maintain systems. To help spread the word, the EPA has provided materials for contractors to use in their own marketing materials. The most useful of these tools is a "badge" you can download and put on your website to hyperlink back to EPA's SepticSmart website. By linking your business to a "trusted authority" like the EPA, your credibility with customers and prospective customers is enhanced (and they will have access to reliable, authoritative information). To learn more, visit the SepticSmart website: <http://water.epa.gov/infrastructure/septic/septicmart.cfm>.

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Ask customers how they heard about you

This is the simplest way to figure out what's working and what isn't with your marketing. Over time, it will be clear which tactics are the most effective and which should be dropped. As you plan next year's marketing strategy, asking customers how they learned about your business may be the most important intelligence you can gather to make the most of your limited marketing budget.

Handle problems personally

Studies show that 50 percent of the time an unhappy customer will return if the company made a good faith effort to address a problem. If you are the business owner, it is in your interest to make sure you deal with problem customers personally. No matter how good your employees are, they are not as invested in the success of your company as you are, and won't care as much about the consequences of poor customer relations. ■

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BUSINESSES

North Florida portable restroom business: Owner retiring, four route drivers, three locations, very dominant in area. Cell 386-365-2308. jkjasper2000@yahoo.com. (P04)

National Grease Recycling Inc. Let us teach you how to recycle restaurant's waste, fryer grease and oil (yellow grease) only. **No trap grease.** 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. Dewey Walker, 813-752-9535 or 813-758-2552. (PBM)

SUNNY SOUTH FLORIDA business for sale: Full service septic tank contractor; retiring. Established over 20 years. POTENTIAL FOR GROWTH. Call Chris 305-297-2171. (PI07)

Business for sale! Industrial vacuum contractor middle Georgia. Five Guzzler vacuum trucks, four PipeHunter jetters and more. Established business for 15+ years! Gross average 1.5 million/year. Contact Greg 478-456-1634. (P05)

Business for sale: \$1,200,000. Vacuum truck and portable toilet business in northern Ontario, Canada. Established, turn key operation, large customer base, three vacuum trucks, two toilet trucks, 100 plus toilets, wash stations, trailers and five dump sites. Owner retiring, but can help with transition. Property optional. 705-356-3444. (P04)

BUSINESSES

Business for sale, central Florida, 75 degrees, February, company established 1987, \$1,000,000 + 2012. Retiring negotiable terms. SepticForSale.com. (P04)

Well established full service septic installation and pumping business in Minnesota. Large customer base, new 20k lbs. excavator, John Deere loader/backhoe, new 25 hp tractor/backhoe, Gehl track loader, 4,500-gallon and 3,000-gallon pump trucks, (2) dump trucks, (1) new dodge, 2,500 diesel pick up, (1) Freightliner cube van. (4) tailer's, misc. tools and equipment. Owner looking to retire due to health issues, but can stay on to assist with licenses etc. For more info call Mark at 651-236-7554. (P04)

FOR SALE: Premier Portable Restroom business in southwestern Colorado/Four Corners region, 25+ years with solid customer base and service reputation. 2012 revenue \$472,000; last four year average \$465,000. Equipment includes: 24' comfort station, 2 NuConcepts, 15 Premier units, 800 units in excellent condition, 13 handicaps, 16 pots on wheels, 13 sinks, 6 service trucks, (2) 34' heavy duty trailers and more. Turn Key \$550,000 cash. Inquire to DHRMS@frontier.net or Bob's Johns, 406 Snowcap Lane, Durango, CO 81303. (P04)

HAND TOOLS

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

PUMPS

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

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NEW YORK

Red Dot Marks Certified Precast Tanks

The Precast Concrete Association of New York certification program specifies procedures to test water and wastewater products to comply with state, local and industry specifications. Initially, the program was limited to precast septic tanks, but it has been expanded to encompass grease interceptors and oil-water separators. A cast-in 3-inch red plastic disk identifies tanks that have passed testing and evaluation by a licensed professional engineer. The association publishes a public registry of precasters participating in the program and a comprehensive list of each company's certified products. The registry is at www.pcany.org.

MISSOURI

Food for Thought

Chefs preparing a meal for 100 people from what is considered "unsalable" food gave Janet Murray, Randolph County (Mo.) Health Department regulator and president of the Missouri Smallflows Organization, an idea. Every day, retail and wholesale businesses discard tons of meat cut-offs and vegetables not perfect in appearance. Murray thought how food pantries would benefit if they received them and suggested members approach store managers and green grocers about donating food destined for the trash. "If 10 people each picked up discarded food three times per month and transported it to the food pantries, think how it would help the hungry in your community," she wrote in the December newsletter.

NATION

NOWRA Nuggets

In April 2012, New Jersey passed a law requiring installers of advanced treatment units to earn NEHA-CIOWTS credentials by Jan. 1. The National Environmental Health Association approached the National Onsite Wastewater Recycling Association about providing the training. "As an association, we are big supporters of education and people earning professional credentials," says executive director Eric Casey. "CIOWTS certification is the best, most thorough test of an installer's knowledge."

After selling out its January installer course in Flemington, N.J., NOWRA scheduled another session in March. "Even with the Pennsylvania Septage Management Association offering the Certified Installer of Onsite Wastewater Treatment Systems basic and advanced exams at its annual conference in January, we expect demand to be significant enough to hold a course in southern New Jersey," says Casey. NEHA proctors administered the tests.

NOWRA rolled out a more robust website earlier this year with content organized into homeowners, professionals and wastewater planning categories. A new page is the Research Library, containing the 400 to 500 papers presented at NOWRA conferences since 2004. "Over the next one to two years, we'll scan papers from 1993 to 2003," says Casey. "The main reason for doing it is to provide access to original research that was built on in subsequent years."

Another website first is compiling onsite information from multiple sources and organizing it by area of professional interest. "We've filtered the

Google search for you," says Casey. "Links to all relevant material on a subject is on one page. For example, installers will find information from the EPA, CIDWT, WERF and NOWRA." Eventually, some of the compiled contents will also reside on the new Septic Locator page, providing reliable information for consumers.

"Our goal is to establish credibility for the industry by providing the good and the bad about onsite systems," says Casey. "Septic Locator will also be tied into our website, enabling members to update their information in real time. We haven't been able to offer that feature before."

While search engine optimization marketing techniques has greatly enhanced the site's e-commerce capabilities, it also presents a challenge. "We're looking for volunteers to oversee and update portions of the website content," says Casey. Anyone interested can call Casey at 800/966-2942.

The Water Quality Association is expected to present the results from the water softener study at its conference on April 2-5 in Indianapolis. Learn more at www.wqa.org.

CANADA

Town Hall Meetings About Onsite Systems

The Western Canada Onsite Wastewater Management Association-British Columbia hosted four town hall meetings to discuss poorly or under-designed and illegal onsite systems. The association then presented the information for discussion at the November 2012 Onsite Wastewater Forum hosted by Applied Science Technologies and Technicians of British Columbia, and was asked to provide a report and suggestions for improvement at the next meeting in May. When completed, the full report will be distributed to WCOWMA-BC members. The forums identify areas of concern and look for collaborative solutions.

Worksafe Alberta issued a health and safety bulletin outlining the hazards and providing best practices for people working with sewage and septic systems. The material also is relevant for U.S. workers. Download the bulletin at <http://humanservices.alberta.ca/documents/GH017.pdf>.

The Alberta Onsite Wastewater Management Association held six sessions of the Onsite Wastewater Practitioner Training Program Level One with 145 participants. A Septic Summit focusing on regulation, permitting, inspection and enforcement was part of the association's annual conference in February.

Greg Plett, president of Saskatchewan Onsite Wastewater Management Association, provided a presentation on the importance of a trained and certified workforce to the Provincial Health Inspection Managers last October. There is strong support among provincial inspectors for mandatory training and certification. Last November, Plett gave a presentation on new technologies at the Saskatchewan chapter of the Canadian Institute of Public Health Inspectors conference. In March 2013, the association represented the onsite industry at the Saskatchewan Association of Rural Municipalities Convention and Trade Show.

CALENDAR OF EVENTS

April 5-6

Oregon Onsite Wastewater Association Conference, Riverhouse Hotel and Convention Center, Bend. 541/389-6692; www.o2wa.org.

April 11-12

Ohio Water Quality and Waste Management Conference, Woodlands, Cleves. Call Keith Smith at 800/589-8292 (Ohio only) or 614/292-1868; http://setll.osu.edu/programs/owqwm_conf.html.

April 13

Waste Water Nova Scotia Society Conference, Best Western Glengarry, Truro. 902/246-2131; www.wwns.ca.

April 23-25

Fats, Oils and Grease Training Conference, Merle Manders Conference Center, Stockbridge, Ga.; www.georgiafog.com.

TRAINING AND EDUCATION

Alabama

Licensing classes are the joint effort of the Alabama Onsite Wastewater Association and University of West Alabama. Courses are at UWA Livingston campus unless stated otherwise:

- May 8-10 – Basic Installer
- May 30-31 – Pumper
- June 20-21 – Continuing Education, Dothan

The first day of Continuing Education classes is for installers and the second day is for pumpers and portable restroom operators. Call the training center at 205/652-3803 or visit <http://aowatc.uwa.edu>.

California

The California Onsite Wastewater Association is offering a Low-Pressure Pipe Drainfield and Drip Dispersal Design class on May 22 in Sacramento. Call Kit Rosefield at 530/513-6658 or visit www.cowa.org.

Michigan

The Michigan Department of Environmental Quality approved these courses, presented by Stephens Consulting Service, for CSE credits:

- April 8 – Essential Knowledge for the Onsite Practitioner, Iron Mountain
 - April 9 – Onsite System Design and Management, Iron Mountain
 - April 10 – Essential Knowledge for the Onsite Practitioner, Newberry
 - April 11 – Onsite System Design and Management, Newberry
 - April 16 – Essential Knowledge for the Onsite Practitioner, Holland
 - April 17 – Onsite System Design and Management, Holland
- Call Stephens Consulting Service at 517-339-8692.

Minnesota

The University of Minnesota Onsite Sewage Treatment Program has these classes:

- May 2-3 – Installing Onsite Systems, Bemidji
- May 7-9 – Basic Onsite System Design, St. Cloud
- May 20-22 – Maintaining Onsite Systems, Mankato
- May 20-24 – Maintenance and Service Provider Combo, Mankato
- May 21-24 – Service Provider, Mankato
- May 29-31 – Soils, Mankato

- June 11-12 – Inspecting Onsite Systems, St. Cloud
 - June 14 – Soils Continuing Education, Fergus Falls
 - June 18 – Soils Continuing Education, Mankato
 - June 20 – Soils Continuing Education, Farmington
- Call Nick Haig at 800/322-8642 or visit <http://septic.umn.edu>.

New Hampshire

The Granite State Designers and Installers Association is offering its Certified Septic System Evaluator Program May 7 (classroom) and 11 (field session) in Bow. Call 603/228-1231 or visit www.gsdia.org.

North Carolina

North Carolina State University has the following courses:

- May 8 – Saprolite, Morganton
- May 15 – Principles of Gravity System Design, Greensboro
- May 16 – Onsite System Layouts, Greensboro
- May 22 – Soils of the Low Mountains in the Southeast U.S., Mills River
- May 28 – Basic Troubleshooting of Onsite System Malfunctions, Greenville
- May 29-30 – Advanced Troubleshooting of Onsite System Malfunctions, Greenville
- June 5 – Soils of the Upper Mountains in the Southeast U.S., Laurel Springs

Contact Joni Tanner at 919/513-1678; soils_training@ncsu.edu; or visit www.soil.ncsu.edu/training/training.htm#38, scroll down, click No. 8.

Oregon

The Chemeketa Community College in Salem has an Installer class on May 30. Call 503/399-5181 or visit www.chemeketa.edu/busprofession/ccbi/customizedtraining/deq/classes.html.

Virginia

The Virginia Center for Onsite Wastewater Training is offering a Foundational Concepts of Pump Systems class on May 10 at Pickett Park. Contact Latonya Fowlkes at 434/292-3101 or latonya.fowlkes@southside.edu or visit www.southside.edu.

Washington State

The Washington On-Site Sewage Association and Washington State Department of Health in cooperation with Washington State University are offering these certification courses at the Puyallup training center unless stated otherwise:

- May 1-2 – Certification for Proprietary Devices
 - May 15 – Electrical Control Panels
 - May 22 – Design/Install and O&M of Subsurface Drip, Bremerton
- Call WOSSA at 253/770-6594 or visit www.wossa.org. □

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