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ON THE COVER: Dart and Becky Kendall, of Advanced Septic, Acworth, Ga., are shown with their LM42 Vermeer walk-beside vibratory plow. Good tools and proper training have been keys to the company surviving during lean times. (Photography by Harris Hatcher)

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### Progress on Softener Backwash

National and state-level initiatives are working toward agreement in the debate over brine discharges to septic systems from household water treatment units By Ted J. Rulseh, Editor



f you live in the country and have a water softener, what should you do with the backwash water? Discharge it to your septic system? Pipe it into a separate trench?

For the time being, that's an open question, and NOWRA and at least one state regulatory agency are trying to reach a resolution. Some in the onsite industry claim brine discharges from water softeners harm septic system function. Others, including the Water Quality Association (WQA), which represents the water softener industry, disagree.

To their considerable credit, the parties to this debate have not simply stood on opposite sides and tossed rock salt at each other. They're trying to resolve the question scientifically and conclusively so that everyone concerned – from homeowners to plumbers to onsite installers – knows how to handle backwash properly.

#### Goodbye and Good Luck!

This issue and this column mark the end of my nine years as editor of *Onsite Installer* magazine. I hit age 60 last November and it's time to start throttling back my workload, so I can spend more time enjoying our Birch Lake cottage in northern Wisconsin, spoiling new grandson Tucker Kulow, doing volunteer work, and writing about water quality and environmental education.

I will continue as editor of *Treatment Plant Operator (TPO)* and *Water System Operator (WSO)* for COLE Publishing, and I may still write the occasional article for this magazine, if the new editor will let me. Speaking of which, that new editor is Jim Kneiszel, who has edited *Pumper* magazine for several years and will continue in that role. Since Jim is already involved with the maintenance side of the onsite industry, you should expect a smooth transition. Please give him a warm welcome.

I've enjoyed editing this magazine and learning about the onsite side of wastewater treatment (my background had been on the municipal side). It's been a pleasure meeting some of you at the Pumper & Cleaner Expo and the NOWRA conference and chatting with others by phone. I hope *Onsite Installer* has been and continues to be helpful to you in your business endeavors. As always, COLE Publishing welcomes your thoughts on how *Onsite Installer* can serve you better. Please send your ideas to editor@onsiteinstaller. com; Jim will see them there. Here's wishing you much happiness and success in the future.

—Ted J. Rulseh

#### Study committee

At the national level, NOWRA and the WQA began working this issue cooperatively in 2010. The WQA proposed a study of the issue, and several NOWRA members joined a committee to design and direct the study, now complete and awaiting a final report. The committee also includes representatives from the State Onsite Regulators Alliance, NSF and other organizations.

Leading the research was John Novak, Ph.D., P.E., professor of civil and environmental engineering at Virginia Tech. His work included experiments in which he added varying levels of sodium to wastewater influent, then fed it to columns that contained solids from operating septic tanks. He also conducted experiments to determine how sodium affects the production of gases

#### To their considerable credit, the parties to this debate have not simply stood on opposite sides and tossed rock salt at each other. They're trying to resolve the question scientifically and conclusively.

and the degradation of solids and investigated influent slug loads designed to mimic softener discharges. Researchers also compared samples from septic tanks that receive softener flows and from which such discharges are diverted.

NOWRA executive director Eric Casey has called the project "an excellent example of two organizations recognizing an issue in the industry and working in a forthright, constructive way to provide a scientific response." He observes that both parties are comfortable with the science and the way study was conducted. Watch for the research report later this year.

#### Three-way discussion

Meanwhile, three parties in Minnesota are working on the same basic issue: The Minnesota Pollution Control Agency (which regulates onsite systems), the University of Minnesota (which educates and trains people about onsite systems) and state Department of Labor and Industry (which regulates plumbing).

It turned out that those entities were not in sync about the proper disposition of softener discharges for rural homes, according to Gretchen

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Sabel, coordinator of the Subsurface Sewage Treatment Systems (SSTS) program for the MPCA.

"The university was saying don't put softener discharge into a septic system," she notes. "Labor and Industry was saying backwash was sewage and had to go in the septic system. MPCA was saying the backwash could go into the septic system or into another specially designed trench – it just could not be discharged on the surface."

Representatives from those three entities have been meeting informally to work toward a resolution. They met most recently last January. The ideal scenario, according to Sabel, would be to issue a fact sheet resolving the question in time for this spring's construction season, so that people out in the field know what they should be doing.

These groups are to be commended for working cooperatively. Industry practitioners should be watching for the results with considerable interest.

#### Clarification

The "Breaking Ground" column in the December issue of *Onsite Installer* suggested that onsite professionals offer their customers signs to post next to their toilet tissue holders saying: "S.O.S. (Save Our Septic): Please flush nothing except toilet tissue."

A representative from Bio-Microbics, a manufacturer of treatment units for onsite systems, has since notified the magazine that "S.O.S.- Save Our Septic" is a registered trademark for a prevention and remediation program that company offers with its RetroFAST septic system enhancement product, a remedy for failed septic systems.

*Onsite Installer* regrets any confusion that may have been caused by our suggested wording for an educational card.





Never satisfied, Dart Kendall modifies equipment and installation techniques to save time, cut costs, and deliver reliable, long-lasting systems

By Scottie Dayton

or 30 years, Dart Kendall worked as a firefighter with the Cobb County (Ga.) Fire Department – 24 hours on, 48 hours off. He filled his spare time remodeling homes (including the lieutenant governor's), building and landscaping high-end houses, and installing septic tanks.

In 1985, he opened his own business in Acworth. The uncertain construction industry pushed Kendall into specializing in installing and repairing residential and commercial onsite systems. It also prompted him to

"I was raised to always prepare for bad times, then do the best I could to get through them. That training enabled me to survive when so many others have not." Dart Kendall

name the company Advanced Septic. As drip emitter systems replaced gravel-and-pipe drainfields, he kept a log detailing installation problems, then used the patterns he saw to change installation techniques, increase efficiency, improve peace of mind, and make customers happier. During slow periods, Kendall, wife Becky, and son Cliff brainstormed about how to work more efficiently. They rearranged trucks, modified equipment, or custom-built machinery so that they could install a complete drip system in one day. When that work slowed to a crawl, they turned to *(continued)* 

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pumping tanks and repairing systems to stay busy.

An opportunity to install 20,000 gpd or larger systems in east Tennessee helped Kendall diversify into a wastewater utility called Aqua Green Utility. "I was raised to always prepare for bad times, then do the best I could to get through them," says Kendall, 56. "That training enabled me to survive when so many others have not."

#### Roller coaster

As environmental issues gained traction and onsite systems became more complex, Kendall enjoyed the challenge of finding proper solutions. He spent days at trade shows talking to vendors and taking classes on new technologies and products, then upgrading the business. Kendall earned state installer licenses for residential, commercial and drip emitter systems, and received Pumper I and II licenses.

"We did a lot of new construction during the housing boom because it was easy, profitable and fast," says Kendall. "I'd bid a subdivision, the developer would fax eight or 10 permits, and we would install the systems – a 1,000-gallon tank with 250 feet of drainfield."



Cliff Kendall installs aggregate from ICC Technologies using the Bullseye 5+ machine control laser receiver from Apache Technologies. The RL-H4C laser from Topcon Positioning Systems is on the tripod in the background.

When the advent of aerobic treatment units (ATUs) enabled developers to build on sites with too much clay for conventional drainfields, Kendall



chose geosynthetic aggregate from ICC Technologies and became a certified installer and distributor for Delta Environmental Products (Pentair). He even bought molds and precast tanks to ensure structural and watertight integrity for ECOPOD or Whitewater ATUs.

Pumping helped the company bridge the hard times. Kendall bought a 1994 GMC vacuum truck with a 1,800-gallon steel tank and Becker pump from Keith Huber. "Branching into a pumping enabled us to pay bills during the worst slowdowns," he says.

Cliff Kendall levels the septic tank using an RL-H4C auto-leveling, slope-matching laser from Topcon Positioning Systems.

#### Fighting back

As the housing bubble exploded in late 2008, Kendall listed upcoming jobs on a board in the shop to apprise his eight employees of the situation. "They talked up business and kept us going a lot longer," says Kendall. "When the work ran out, I had to let them go. That really hurt." He also sold off excess equipment and made the last payment on a new backhoe, entering the recession debt-free.

Kendall and son Cliff, who joined the company in 2002, expanded into installing drip emitter systems for large warehouse complexes. The work lasted 18 months. They

returned to residential pumping and system repairs, growing both businesses. "In 2008, we were installing eight residential systems per week and three commercial

#### "Branching into a pumping service enabled us to pay bills during the worst slowdowns." Dart Kendall

systems a month," Kendall says. Today the company installs only 10 residential and two commercial systems per year, and those numbers could have been even lower. Some of the current work is a result of competitors going out of business.

In 2009, Kendall branched into installing 20,000- to 50,000-gpd systems for schools and exclusive subdivisions in Tennessee (see sidebar). The massive scale of the projects enabled him to hire Barry Little, who had lost his job at the local wastewater treatment plant. Kendall designs the systems



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Today, onsite installations account for 70 percent of annual revenue, system repairs for 25 percent, and pumping for 5 percent.

#### **Innovation rules**

Over the years, father and son kept rearranging the box trucks pulling the Caterpillar 420 backhoe and 226 skid-steer with a Bradco trencher until they were loaded with everything to install or repair systems for fourbedroom homes except the septic tank. They built pipe racks under the boxes and mounted toolboxes inside to organize components. "We don't ever want to stop working to visit a supply store," says Kendall.

In truth, the supply store travels with them in one of eight enclosed trailers. A customized 20-foot Haulmark auto hauler serves as their warehouse on wheels. On one side, Kendall and son built shelves and pull-out drawers to organize 200 or more drip system components. The other side stores 100 sticks of 20-foot-long 1.25- or 1.5-inch pipe.

"We have another enclosed trailer just for new construction," says Kendall. "Becky often hauls material all day with it, enabling us to install a system in one day." She also runs the office at home.

Kendall has a 6,000-square-foot shop with two service bays and two loading docks on 8.5 acres in Acworth. "The docks are necessary because materials arrive by the tractor-trailer load," says Kendall. "Buying in bulk saves money, and paying on time puts my company at the top of vendors' lists for better deals. I can buy \$5,000 worth of fittings discounted 70 to 80 percent."

#### **Production investments**

Upgrading equipment also improved efficiency. "Before I bought the RL-H4C laser (Topcon Positioning Cliff Kendall cuts pipe in the back of the 20-foot Haulmark auto hauler that serves as a customized warehouse on wheels. It carries most supplies and has enough space to carry the Vermeer LM42.

Systems) and Bullseye 5+ machine control laser receiver (Apache Technologies), it took four people to install a gravel drainfield using a transit," says Kendall. "Now it takes two, working faster and with perfect accuracy."

Kendall bought a Vermeer LM42 walk-beside vibratory plow with 50 hp turbo diesel just to install drip tubing. Because many drip fields are on wooded sites with 60 percent slopes, Cliff mounted dual wheels on the downhill side of the plow for added stability.

Initially, tubing connectors couldn't slip past the blade on the machine. Feeding in a new roll and splicing it to the installed tubing left hundreds of 20-foot-long pieces of scrap. Cliff fabricated a larger trenching blade that allows connectors to slip past, saving them thousands of dollars in discarded material.

To install tubing between tightly spaced trees, they modified a 16-inch disc-cutting saw powered by a 6.5 hp

chain saw engine. They also radio-controlled a 2,000-pound, 8- by 4-foot trencher with 3-foot-diameter saw for working on steep slopes. "Chips fly at the operator when the saw hits rock," says Kendall. "It's much safer operating it remotely." The prototype uses scale boat or aircraft servos and radio equipment. *(continued)* 

#### Tough But Worthwhile

Owning and operating a wastewater utility isn't for everyone. Dart Kendall of Advanced Septic has seen people quit halfway through the complex application process, or complete it only to be refused a permit. "It was a nightmare, and I probably wouldn't do it again," he says. "However, only utilities are allowed to install large onsite systems in Tennessee, and I had the opportunity to build and operate 20,000- and 25,000-gpd systems for two schools."

The systems use Brentwood trickling filters, drip emitters and programmable logic controls. The Tennessee Regulatory Authority requires applicants to show substantial financial capability, business capability and expertise in the field. They must set aside one year of utility income in a bond or letter of credit for as long as they own it.

"The department scrutinized my credentials of expertise under a microscope," says Kendall. "It took one year before Aqua Green Utility was certified in July 2009." The utility also owns and operates a 50,000-gpd system in an exclusive subdivision. As homes are built, subcontractors install the septic tanks and 1,000-gallon pump tanks.

Kendall wrote specifications to make sure each system has identical components. "Nobody in the area stocks even the basic fittings," he says. "Standardization enables me to have every part on hand to fix any problem." With automation and redundancy in the plant designs, Kendall is able to operate them from 400 miles away. Plant computers report operating conditions to the Aqua Green computer every eight hours. If one doesn't check in, it triggers an alarm. Control panels also send alarms in emails and text messages.

"The pump tank has 600 gallons of reserve, and we're four hours away from these systems," Kendall says. "Whoever is the least busy has a day to respond." Kendall uses True Connect cards that plug into the routers to connect to the Internet. "The service fee is \$5 per month and we pay per megabyte," says Kendall. "Our monthly wireless invoice per plant computer is around \$10 per month." Like a municipality, Aqua Green sends users a monthly sewer bill.

"We put a great deal of effort into making customers happy," says Kendall. "Sometimes they send pleasant notes acknowledging our service."

# <image>

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ABOVE: Cliff Kendall gets more PVC pipe from one of the compartments on their truck outfitted to haul supplies. RIGHT: Worker Barry Little installs a Polylok PL-68 effluent filter in a septic tank.

#### **Digging with care**

To keep trash from entering pressure supply mains during installation, Kendall mounted screw-down caps on the ends, removed them to flush the pipe when the system went online, and replaced the caps. "That eliminated trash blocking the pressure-relief valves, K-Rain indexing valves, and pressure regulators," he says.

#### "Joining their state onsite association is one of the best things contractors can do to improve business and stay in business. The day they think they know everything is the day they begin falling behind."

#### Dart Kendall

They initially used nipple couplings to attach drip lines to supply lines, but some always broke off during settling in the rocky soil. Kendall switched to compression couplings from the drip irrigation industry. "If they settle too much, the tubing pulls out," he says. "We just cut it, add an extension, and shove it into the coupling. It's an easy fix."

Careful trench excavation ensures that soil supports the tubing as it leaves the supply lines, reducing the chance that it will come out. Kendall also uses flexible tubing for air lines because it bends instead of breaking as it settles around ATU tanks.

To keep inlet and outlet tees from twisting or breaking off during settling, the crew members level the bottoms of tank holes with the laser to ensure that the tees align with the pipes. Then they excavate the trenches, leaving the virgin soil supporting the lines. They also excavate smaller tank holes to reduce backfill settling.

"I don't mind fixing something, but it's a point of pride to do it correctly the first time," says Kendall. Advanced Septic has won two customer service awards from Angie's List.

#### **Stepping stones**

Early in his career, Kendall joined the Georgia Onsite Wastewater Association to get as much training as possible and to network with experts. Eventually, he was asked to give presentations at onsite conferences and to serve on the GOWA board of directors – he became president in 2012. With association lobbyist Bruce Widener and Assistant Environment Protection Division Director Jim Ussery, Kendall is working to reverse revenue-killing restrictions on land application of septage.



"Joining their state onsite association is one of the best things contractors can do to improve business and stay in business," says Kendall. "The day they think they know everything is the day they begin falling behind."

Meanwhile, Kendall coaches Cliff, 31, for the day when he assumes responsibility for the company. "I stress planning for when things go from bad to worse," he says. "It's not how fast you leverage yourself. Sustainable growth is through steady plodding."

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Jim Anderson and Dave Gustafson 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.

### Planning for a Good System

Follow this basic advice to build systems your customers can depend on to protect the environment and give long, trouble-free treatment service By Jim Anderson, Ph.D., and Dave Gustatson, PE.

or the last eight years we have presented workshops on installation practices at the Pumper and Cleaner Expo. Afterward, we always get questions and comments. In the next few articles, we'll highlight some of the materials we cover in these workshops – we hope this will lead to continuing conversations about best installation practices and techniques.

We like to point out that the definition of a "good" system has changed over the years, and some people installers meet during an installation have their own definition. For some people, the only definition that matters is low cost. This is one area right from the start where an installer can do some education, pointing out why – for system operation and long life – each component needs to be installed as proposed. To us, a "good" system is one that is:

- Installed to protect public health and the environment
- Installed according to the permit and the plan and with the proper materials
- Installed so that all components are accessible for maintenance and management in the future



For proper planning, you must ensure access to all areas necessary for the system installation.

#### What you must do

Here are some thoughts on installer responsibilities that, if observed, will result in good systems that will last indefinitely.

#### Envision the project.

Right from the first visit to bid on the job and the design, think about how the installation will be carried out. This is not only important for the actual installation but also for bidding the project properly. Is there easy access to the site? Or are there problems like slope, trees, rocks or other items you need to address before starting work? Also think about where you will stage materials; how you'll protect the primary and alternate soil treatment units before, during and after installation; and how to finish the job.

#### Follow the plan.

If you are not the designer, you need to follow the design you're given.

This means recognizing and identifying where the system is located, the important elevation differences, and how the system will lie on the land.

If possible, walk the area with the designer and owner to discuss any site limitations that might affect the installation. We recommend staking out the site to show the actual locations of the components, along with the significant elevations. You must use the materials called for in the design without substitutions.

#### Communicate with the designer.

Some installers tell us a complete design is one they can follow without having to go back to the designer for clarification. We always respond: How often does that happen? And the answer is: Seldom. Therefore, you need to have good communication with the designer. Talk to the designer before the installation to resolve any questions about the plan, or any differences in the way you plan to install the system.





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Make no changes to the plan without the designer's approval. Get approval for any changes in writing and, if necessary, have the plans redrawn. We recommend taking digital photos throughout the project to document the installation process and practices.

#### Use proper practices.

You are responsible for applying proper installation principles. For tanks, this means installing the proper size and seeing that it is properly bedded and backfilled. All appropriate attachments, such as effluent screens, need to be installed. Risers, pipe penetrations and seams need to be watertight.

Install the soil treatment unit at the proper depth, using the design media materials. We recommend checking the design calculations for the soil treatment area sizing. If the system uses pressure distribution, it is your responsibility to have the proper pipe, orifice sizes and spaces. If there are questions about any of these, consult the designer before proceeding.

Accessibility is important – include observation ports. As always, follow the Keep It Shallow, Keep It Dry and Keep It Natural principles. Make notes documenting any problems or unexpected conditions you encountered and what you did as a result.



Know your setback and separation distances, including data on the water table where you plan to install a system.

#### *Communicate with the inspector.*

During installation, the system will be inspected for

compliance. Communication with the inspector is key. Understand at what point the inspector wants to come in and discuss the timing. While you may have timing issues during installation, recognize the inspector may The desired outcome is that the inspection meets all requirements and the system is in compliance with the permit. If it is not at the time of initial inspection, ask the inspector to go through the entire system and indicate

### Finishing well is important. Provide a to-scale, as-built drawing of the installation to the permitting authority, the owner and the designer, and keep one for your records.

also have scheduling concerns. It is better to talk through them than to run up to the point where you need the inspector and then get frustrated or angry because it's not going as you feel it should.



Using reliable and accurate measuring devices is key to establishing proper elevations.

where changes are needed. This can avoid having the inspector back only to find out something else is wrong. It's your job to obtain a valid permit, so it's important to work toward that end efficiently – you'll save time and money.

#### Tie it in a bow.

Finishing well is important. Provide a to-scale, as-built drawing of the installation to the permitting authority, the owner and the designer, and keep one for your records.

The job isn't finished until the site is cleaned up, the backfill is properly placed, and vegetation is established. One customer-service approach we encourage is to visit the site a month to six weeks after the installation to fix any cosmetic problems that may have occurred from settling or other activities.

This is also a good time to walk the owner through proper care for the system. You can provide good information about the specific system and provide any of several good general homeowners guides that are free or relatively inexpensive. If maintenance is part of your business, this is a good time to sell the owner on the virtues of that service.

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### Your Weakest Link?

Failure to check and adjust machine track tension frequently risks damaging the undercarriage and can increase operating and maintenance costs

t may be out of sight, but it should never be out of mind. The undercarriage of the average track loader or crawler contributes to 20 percent of the machine's purchase price and can eat up close to 50 percent of its maintenance budget.

Proper maintenance is an essential task for slowing normal wear and tear. One of the most important ways to avoid undercarriage damage is to keep a close eye on track tension. In fact, track-chain tension is probably the most controllable element in reducing undercarriage wear.

#### Too loose? Too tight?

When no one is regularly checking or staying on top of adjusting track tension, a lot can go wrong. Acceptable track sag for conventional crawlers is usually about 2 inches. A track that has more slack than that and is too loose is likely to come off and damage the undercarriage.

"All it takes is an uneven surface or a slope and you can walk your machine right out of its track," says Gregg Zupancic, marketing product manager for skid-steers and compact track loaders at John Deere. "When you detrack, you're going to damage undercarriage components, which

parameters might have about 800 pounds of tension at the track adjuster. But too-tight track sag on the same machine can create up to 5,600 pounds of tension. That much tension robs horsepower from the machine, requiring it to burn more fuel. It also creates heat buildup that contributes to premature wear.

The impact on operating and maintenance costs is clear. The cost of track replacement is something to avoid as long as possible, given that today's new tracks can run as much as \$2,000 for each track/side.

#### Measure or eyeball?

While some OEMs recommend special tools to check track tension, others say visual inspection is adequate. "At John Deere, we believe ensuring you have the right track tension should be your number one priority," says Zupancic. John Deere, which does not require any measuring device, recommends visual inspection in most cases to assess if there is too much looseness in the track.

"You will most often see slop or sag at the top of the track plane between the idler and the high sprocket in the back of the track," Zupancic says. "If

### "It pays to stop and check the tension mid-job to make sure you don't walk out of the track. And always refer to the operator's manual for information on how to adjust track tension for your specific machine." Gregg Zupancic

could include the frame itself, three to five small rollers, two big rollers or idlers, the sprocket that moves the track around the idler and rollers, and the rubber around the track."

Track tension that is too loose also allows rocks and other debris to get between the rollers and damage undercarriage components.

While tracks will wear out faster if too loose versus too tight, a tight track can also increase roller, idler and track wear by up to 50 percent. A tight track increases load, resulting in more wear on the track bushings-to-sprocket-teeth contact areas and the track-link-to-idler and roller contact areas. The track-link-to-idler contact point and track-link-to-roller contact points are affected by the added load and will wear faster, too.

An 80 hp crawler with track sag that falls within recommended

taking an actual measurement, measure the distance between the lowest part of the sag and the top of the track." Whether taking actual measurements or eyeballing the track, there are a few ways to make sure you're accurately measuring slack or looseness.

#### When and where

Some service organizations advise checking track tension only on the job site, because a track properly tensioned in the shop may become too tight when packed with mud out on the job.

To check tension on site, Zupancic advises putting the loader arm or boom all the way down, then tilting the bucket, curling it slightly downward. This should lift the front of the machine slightly off the ground. "Deere machines have four rollers in the middle of the track, but no matter how many, we recommend picking one on the bottom edge," he says. "If you only see about a 1-inch gap between the roller and where the track would tend to sag, you're good to go. You can even just use the width of your thumb to eye it up."

If the gap is as wide as 2 to 3 inches, there's a high likelihood of walking

the machine out of the track when trying to turn or when moving on a slope where the tracks naturally fight against each other. But when there is less than a 1/2-inch to 1-inch gap, Zupancic cautions, tension may be too tight.

#### Add grease carefully

Track tension adjustments are made by pumping or draining grease through the track adjuster, located just behind the front idler. Grease pumped into the zerk fitting expands a cylinder that then tensions out undercarriage or track components away from each other. Add grease slowly, as even small adjustments in track sag can have a big impact on tension. You should also inspect the adjuster valve itself periodically for leakage, another cause of tension loss and greater wear.

The tension cylinder should expand well beyond the life of the track itself, says Zupancic. "In most cases, when the cylinder won't expand any further and you've added as much grease as it will take, it's probably a sign that those tracks need replacing." Another indication that tracks are ready for replacing is when steel becomes visible under the rubber, and the ride gets rougher.

#### Breaking in a new track

New tracks tend to be stiff to start; most stretching will occur during the first 50 to 100 hours of operation. Checking track tension daily is important during break-in. After that, weekly checks are probably adequate.

However, significant temperature swings on the job site – such as below-freezing mornings that become warmer afternoons – can be a red flag that suggests checking the tension more often, Zupancic says. Tracks that are rigid and tight in the morning can become looser as the weather warms up. Black tracks will absorb heat on sunny days, so even at 50 degrees ambient temperature, some stretching can occur.

"It pays to stop and check the tension mid-job to make sure you don't walk out of the track," Zupancic says. "And always refer to the operator's manual for information on how to adjust track tension for your specific machine."





### Yes, We Have Bananas!

A school for environmental education practices what it preaches with a treatment system that feeds tropical plants before discharging to the soil By Ted J. Pulseh

H idden deep in Wisconsin's Northwoods, Conserve School offers semester-long immersion programs for high school juniors in environmental studies and outdoor activities. The school's offerings are designed to deepen students' appreciation for nature, reinforce their commitment to conservation, and inspire them to meaningful action as environmental stewards.

The 1,200-acre wilderness campus near the community of Land O'Lakes includes eight lakes and some 20 miles of wooded trails for all-season use. It also includes a greenhouse filled with plants not otherwise found in Wisconsin – including banana plants and papyrus, used for papermaking in art classes.

The greenhouse actually represents the secondary and tertiary sides of the school's onsite wastewater treatment system. It's part of a closed-loop water system that begins with a well and ends with dispersal of tertiary effluent to the soil. School personnel call the treatment system "the Green Machine"; officially it's a Living Machines system supplied by Worrell Water Technologies. *(continued)* 



ABOVE: The second ecological fluidized bed (EFB) tank provides final polishing filtration before effluent discharges to the drainfield. BELOW: Tropical plants including banana "trees" grow hydroponically in the open aerobic tanks inside the greenhouse-based process. (Photos by Ted J. Rulseh)

SYSTEM PROFILE

Location:	Land O'Lakes, Wis.
Facility served:	Conserve School campus
System supplier:	Worrell Water Technologies, Charlottesville, Va.
Site conditions:	Depth to groundwater: 8-30 feet; soils primarily sand and gravel
Type of system:	Activated sludge with tertiary filtration
Hydraulic capacity:	38,000 gpd (now operating at 7,000 gpd)



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#### Site conditions

Conserve School lies within a mixed coniferous and deciduous forest in northern Vilas County, Wis., just south of the Michigan border. Depth to groundwater in the drainfield areas ranges from 8 to 30 feet. Soil is caving dirty sand and gravel from the surface to an 8-foot depth; caving coarse sand from 8 to 17 feet; caving medium sand from 17 to 30 feet; and caving coarse sand and gravel from 30 to 36 feet.

#### System components

- Four 12,000-gallon septic tanks
- 9,600-gallon anoxic tank for ammonia removal (treatment tanks from US Filter/Siemens Water Technologies)
- 9,600-gallon closed aerobic tank with mulch filter for odor control
- Three 9,700-gallon open aerobic tanks with tropical plants for nutrient removal
- 12,000-gallon secondary clarifier
- Two 4,500-gallon ecological fluidized bed (EFB) polishing tanks
- Five drainfields with 27,300 linear feet of drip tubing
- · Custom control system (Orenco Systems)

#### "You have to trim the plants in summer, otherwise they get out of hand. The banana plants grow fast. They go from nothing to bananas in two years." Dale Mattson

#### System operation

The Green Machine was designed with a capacity of 38,000 gpd. Because the school's enrollment has declined since it converted from a full-time operation to a semester-based program, flow has declined and now averages about 7,000 gpd (2,000 to 3,000 gpd when classes are not in session).

Wastewater from the entire campus (classroom and administration buildings and student living quarters) is pumped by a lift station to the septic tanks for primary treatment. Myers pumps (Pentair) lift the septic tank effluent into the greenhouse treatment system. Wastewater first passes through the anoxic tank and into the closed aerobic tank, which contains a mulch filter to trap odorous gases. The condition of plants on top indicates when the mulch is drying out and needs watering. Dissolved oxygen in this tank is kept above 2.0 mg/L to sustain bacteria that break down organic matter in the wastewater.

Water then flows to the open aerobic tanks (one of which is out of service because of reduced flow), where tropical plants grow hydroponically. The plant roots provide

The clarifier settles solids from the aeration process; clarified water moves on toward final polishing filtration.



Effluent from the Green Machine treatment process is delivered to pump tanks before being pumped through drip tubing to the drainfields.

fixed media for attachment of aerobic bacteria that consume waste matter and convert ammonia to nitrate (nitrification). Dissolved oxygen in the tanks is sustained at 2.0 mg/L or above by aeration blowers (Siemens Water Technologies).

After the series of aeration tanks, the wastewater is recirculated through the anoxic tank at roughly four times the rate of influent flow to the system. Here, nitrate is converted to nitrogen gas (denitrification). The control system maintains the anoxic tank's dissolved oxygen at 0.1 to 0.3 mg/L; glycerol solution is fed into the tank automatically as a carbon source for the denitrifying bacteria.

The next step in the process is the secondary clarifier. Settled solids are piped from the clarifier bottom to a holding tank outside the greenhouse.





Water Treatment Specialist Dale Mattson adjusts a timer on the control panel that regulates all functions of the treatment process.

#### MORE INFO:

Orenco Systems, Inc. 800/348-9843 www.orenco.com (See ad page 3)

Pentair 888/416-9513 www.pentair.com US Filter/Siemens Water Technologies Corp. 866/926-8420 www.water.siemens.com

Worrell Water Technologies, LLC 434/973-6365 www.worrellwater.com

#### The material is thickened, removed by a septic service tank contractor, and limed for pH adjustment before application to land.

The first EFB tank contains a bed of rocks at the center for filtration. Water is continuously pumped through the rocks with airlift pumps. The rocks are cleaned by monthly backwashing; the backwash is treated the same as septic waste and land applied.

The second EFB tank provides final polishing and yields crystal-clear water that is discharged to the five drainfields, which are used alternately.

The control system uses timers to regulate recirculation to the anoxic tank, nutrient feed to the anoxic tank, return activated sludge volume, aeration tank airflow, and other parameters.

Analytical reports on the treatment system typically show influent BOD at about 140 mg/L, TSS at about 90 mg/L, and total nitrogen (TKN) at about 50 mg/L. Effluent results typically are non-detectable for BOD and TSS and 6 to 8 mg/L for total nitrogen.

#### Maintenance

Dale Mattson, water treatment specialist, operates and maintains the treatment system essentially full time; he also operates the on-site water treatment plant and assists with grounds maintenance. He continuously monitors and finetunes the process, sometimes calling on Steve Ohm, area wastewater engineer for the state Department of Natural Resources, for technical advice and assistance.

Basic maintenance includes pump service, periodic cleaning of the septic tank effluent filters, pumping of the septic tanks twice per year, regular cleaning of the treatment tanks, changing of the aeration diffusers (about every five years), degreasing of the clarifier, and trimming of the tropical plants. "You have to trim them in summer, otherwise they get out of hand," says Mattson. "The banana plants grow fast. They go from nothing to bananas in two years."

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### TELL US YOUR STORY.







By Doug Day and Scottie Dayton

#### Indiana

The Charlestown City Council adopted an ordinance to penalize residents with onsite systems in two subdivisions who do not connect to the district's sewer in 30 days. About 15 to 20 homeowners face fines of \$50 to \$1,500 each day if they do not pay the \$1,600 impact fee and \$2,300 connection charge.

#### Minnesota

Mower County will examine 1,800 onsite systems spread over 16 townships to ensure that they comply with regulations adopted in 2009. Counties have until 2014 to complete the process. Two inspectors who answered the county's request for proposals will conduct the work. County officials estimate that 180 systems pose a health risk.

#### New Mexico

Contractors who pump septage now must be certified through the National Association of Wastewater Technicians vacuum truck technician training program or an equivalent program approved by the state Environment Department. At least one qualified person must be on site during every pumpout.

#### New York

More than 4,000 septic systems have been repaired or replaced since 1997 to protect groundwater in the Catskill-Delaware watershed. Owners of failed residential and small business septic systems can receive assistance from the Catskill Watershed Corp. if they are located within 250 feet of a waterway. Full-time property owners get 100 percent funding of eligible costs and part-time residents get 60 percent. There is an assistance program to help maintain systems installed since 1995. Homeowners can get up to 50 percent funding for inspections and pumping.

#### Washington

Staff from Clark County Public Health and Washington State University Clark County Extension plan to offer hands-on training classes to homeowners on how to inspect their gravity-feed onsite systems. The new hands-on format, if approved by the county health board in late November, aims to save homeowners money and invest them in their systems. Certification enables homeowners to have a professional inspection every six years instead of every three years. The county has more than 30,000 onsite systems, 80 percent of which are gravity-feed systems.





### Pumps

By Craig Mandli

#### Linear Air Pump

The Alita AL Series linear air pump is designed for use with aerobic treatment units. It features energy-efficient, electromagnetically operated double diaphragms and a weatherproof compact aluminum alloy housing with a quickaccess air filter. An optional integrated alarm activates when operating pressure drops below



the normal functional level. Models range from 10.6 to 106 gpm. Also available are 230VAC, DC models and solar power packages. 626/962-2116; www.alita.com.

#### High-head effluent pump

The 35-pound CPEH5 effluent pump from Champion Pump Company is designed for long pipe runs or high static heads. It can pump through the equivalent of 5,200 feet of 2-inch pipe (based on 5-inch static head) and handle 3/4-inch solids. The rotating components of the pump are in the motor housing, which





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helps keep hair and debris from wrapping around the sealing surface. Features include a 115-volt PSC motor (230-volt optional) and 20-foot power cord (50-foot available). 800/659-4491; www.championpump.com.

#### **Cast iron effluent pump**

Effluent pumps from Clarus Environmental feature cast iron construction and automatic and non-automatic options. The low-flow design was engineered for STEP applications in which the pump is protected from septic solids by a filtered vault and moves effluent directly out of the septic tank without an additional pump tank. The



Model 51 produces a maximum flow of 18 gpm at 5 feet of TDH and can reach 21 feet at shutoff. The Model 142 produces a maximum flow of 18 gpm at 5 feet of TDH and can reach 62 feet at shutoff. Both can pass 1/2-inch spherical solids. 800/928-7867; www.clarusenvironmental.com.

#### Slide rail system

The lift-out slide rail system from E-Z Out Manufacturing is designed for most vertical-discharge submersible pumps under 5 hp, with 1-, 2and 3-inch NPT discharge nozzles or 2- or 3-inch horizontal discharge. It provides easy aboveground service access without confined-space entry



for most submersible sewage, sump and grinder pumps from wet pit applications. 604/942-7994.

#### Grinder Pump Retrofit Kit

The Grinder Pump Retrofit Kit from Goulds Water Technology is designed for residential grinder pump stations as a more economical option to replacing an entire pump system. The kit allows for continuous operation, and can be retrofitted with other grinder pumps as well as progressive cavity pumps. The kit includes a single-phase, 2 hp motor with 60 Hz, 3,450 rpm, 230V and a capacitor start with winding thermal protector. It also includes piping and electrical connections for retrofitting to competitors' systems. The pump's capacity is up to 41 gpm with heads to 95 feet and discharge of 1 1/4 NPT. 866/325-4210; www.gouldswatertechnology.com.



#### Sewage pump

S Pumps from Grundfos Pumps can transfer unscreened raw sewage or raw water or pump water containing sludge. A SmartTrim system makes it easy to adjust the factory-set impeller clearance and maintain maximum pump efficiency. A SmartSeal auto-coupling



gasket provides a leakproof connection between the pump and the base unit of the auto-coupling system. The shaft can rotate in either direction. When the pumps are installed with separate pipework, sludge sedimentation can be avoided by backflushing the system at regular intervals. 800/921-7867; www.grundfos.us.

#### **Residential grinder pump**

The Omnivore residential grinder pump from Liberty Pumps uses the company's V-Slice cutter technology, which provides more cuts per revolution for high shredding performance in wastewater applications. The hardened stainless steel cutting system shreds jeans, shop rags, diapers, sanitary napkins and other solids into fine slurry. An open volute improves solids flow and reduces jamming. Other features include a one-piece cast iron body, quick-disconnect power



cord, stainless steel impeller and dual shaft seals. Models are available in single- or two-stage designs, providing maximum pumping heads to more than 180 feet. 800/543-2550; www.libertypumps.com.

#### Built-in alarm aerator

The HEMLA-80B built-in alarm aerator from Medo USA can be used on 500 to 600 gpd residential wastewater treatment systems. Along with a visual alarm, the pump has distinct audible alarms that sound when the pump's working pressure is less than 1 psi or greater than 3.27 psi. This tells maintenance



providers and homeowners where to look when troubleshooting. The aerator is a linear, motor-free piston system with a Teflon-treated cast aluminum piston as its only moving part. 800/843-6336; www.medo-water.com.

#### Septic tank effluent pump

The Polylok STEP System is available in 49or 57-inch depths and includes a polyethylene basin, effluent filter, and a 0.5 hp high-head turbine effluent pump in 10, 20 (standard) and 30 gpm versions. It includes internal PVC 1 1/4-inch piping and valves, mechanical float switches pre-installed on a float tree, and a NEMA 4X simplex or duplex control panel



with audible and visual alarm. The unit draws and filters wastewater from the middle layer of a septic tank and pumps the effluent to a dispersal field or wastewater treatment unit. It installs quickly in a 19- to 23-inch-diameter opening in a new or existing concrete or fiberglass tank. The dual-compartment basin design allows the filter cartridge to be removed without pulling the pump or the entire vault. 800/701-3946; www.polylok.com.

#### Shaft-style aerator

The Flagg-Air 340HP shaft-style aerator from Septic Services is easy to install, quiet and trouble-free and fits in place of most original units. Model 340HP-J has 12-inch mounting brackets and fits 10-inch tank riser openings. The 340HP-N has 13.5-inch mounting brackets and fits 12-inch openings. The aerators offer low rpm (1,750) with high airflow, a fully enclosed continuous-duty motor with 2-foot power cord, pre-lubricated and sealed bearings, powder-coated steel brackets with rubber vibration restrictors for mounting stability and strength, high-impact plastic suds restrictor, a stainless steel shaft and bronze counter shaft, an integrated T-bar handle, and a 7-amp mini-breaker. 800/536-5564; www.septicserv.com/store.



The V-Series wastewater pump from Webtrol for residential and commercial applications has a recessed cast iron impeller that reduces bearing load and prevents clogging. The pump comes with potted epoxy cord seals and double silicon carbide mechanical seals to protect it from water damage. All motors include overload protection. The pump is made of cast iron and stainless steel and is available in ratings from 0.5 to 2 hp in 115V, 230V, single-phase and three-phase. 800/769-7867; www.webtrol.com.



### UPCOMING TRAINING & EVENTS NAVOT National Association of Wastewater Technicians

#### Inspector Training and Certification:

April 3-4, 2013 - Bend, OR O2WA, Belinda Rasmussen at (541) 389-6692 or info@o2wa.org

May 10-11, 2013 - San Antonio, TX Real Estate Training Systems, Brian Murphy at (817) 861-9998 or rets@rets-llc.com

August 28-29, 2013 - (TBA), Arizona Univ. Of AZ, Janine Lane at (928) 782-5882 or janinel@cals.arizona.edu

#### Vacuum Truck Technician:

March 6, 2013 - Ruidoso, NM N-MOWA - NAWT, Jace Ensor at 575-937-8304 or nmowa.president@gmail.com

#### Operation and Maintenance Training Certification:

March 1-2, 2013 - Helena, MT Lewis and Clark County & NAWT Beth Norberg at (406) 447-8385 or bnorberg@co.lewis-clark.mt.us

#### **Other CEU's for Recertification:**

March 19, 2013 - San Francisco, CA OSI Basic of Wastewater Analysis Contact: Evelyn Rosefield at (530) 513-6658 or evelyn@cowa.org

#### March 20, 2013 - San Francisco, CA

OSI Basic of Wastewater Analysis Contact: Evelyn Rosefield at (530) 513-6658 or evelyn@cowa.org

--- Watch the NAWT website and industry publications for updates ---For more information call: 800-236-6298 WWW\_NAWT\_ORG



Pumps

By Scottie Dayton

#### Pump package relieves solids buildup

#### Problem

A South Carolina homeowner installed a 1,000-gallon septic tank atop a former gravel pit. The soils had limited absorption and solids buildup required frequent clean-outs. Adding a conventional grinder pump reduced the volume of solids, but hydrogen sulfide gas ruined the pump in four years. When the fourth replacement pump began making bearing noise, the homeowner looked for another option.

#### Solution

The pre-engineered low-pressure sewage system from Flygt was recommended. It has a fiberglass-reinforced polyester wet well with either a progressive cavity or centrifugal grinder pump. The impeller's hardened cutting rings macerate solids. The package includes a level indicator, panel display, alarm, and waterproof control box isolated from possible sump flooding.

#### Result

The system installed easily and solved the homeowner's problem. 704/409-9700; www.flygtus.com.

#### STEP system survives hurricane

#### Problem

The Pearlington (Miss.) Wastewater Treatment Facility needed a way to transport wastewater from homes and businesses to the plant.

#### Solution

Engineer Nick Mignone of Compton Engineering in Bay St. Louis designed a septic tank effluent pump system using components from Quanics. Each of 600 locations received a septic tank with cast-in-place risers, a STEP package with a filtered pump vault and P-TE-10P high-head effluent pump, and a control panel with emergency generator hookup. The pump discharged to small-diameter pressure lines running to the plant.

#### Result

In August 2012, Hurricane Isaac hit Pearlington and did only minor damage to its wastewater collection system. 877/782-6427; www.quanics.net.

#### Linear air compressor eliminates odors

#### Problem

Tom Cook, sales manager of Southwestern Controls in Dallas, Texas, had a customer complain of a foul odor from surface irrigation. Cook found the air compressor was working on the 500-gallon aerobic treatment unit, but the system was experiencing heavier-than-average loads.

#### Solution

Eddie Burns and Mike Ormsby, territory managers with Septic Sewage Pumps, recommended a Gast DBM80 linear compressor to supply more air to the aeration chamber, allowing bacteria in it to thrive and digest nutrients.

#### Result

The odor disappeared and the customer was satisfied. 800/292-9087; www.septicsewagepumps.com.

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### associationnews

By Scottie Dayton

#### EPA Supports Onsite Industry

The U.S. EPA SepticSmart program helps reinforce conversations installers and service providers have with homeowners about the care and maintenance of their onsite systems. The program, suggested by NOWRA and other members of the EPA's Decentralized Wastewater Management Partnership, provides print- and electronic-based tools for industry practitioners and local governments. Visit http://water.epa.gov/infrastructure/septic/septicsmart.cfm.

The EPA Decentralized Memorandum of Understanding (MOU) Partnership developed four fact sheets that highlight the benefits of decentralized treatment systems. They demonstrate how such systems can be sensible, cost-effective, sustainable solutions. Visit http://water.epa.gov/ infrastructure/septic/Decentralized-MOU-Partnership-Products.cfm.

#### **Adjudicative Tribunal Favors Tree**

Rob Palin's article in the fall Ontario Onsite Wastewater Association newsletter discusses a Building Code Commission (BCC) ruling that allowed a homeowner to replace his holding tank with a larger one rather than upgrade to an onsite system. The ruling came after the homeowner appealed a decision by a regulator enforcing the installation of a filter media bed that would possibly kill an old-growth tree on the property. High groundwater required a partially raised drainfield, and the driveway running through part of the soil mantle was a design challenge. Palin views the decision that favors the tree and aesthetic appeal over environment protection as a "tremendous setback to the industry's efforts toward long-term sustainable private servicing."

#### **First Association Meeting**

The Onsite Wastewater Association of Idaho will hold its first annual meeting at Boise State University on March 14 in conjunction with the Idaho Environmental Health Association Education Conference March 13-14. The half-day meeting will include presentations from distinguished industry members. For more information, call 208/664-2133 or visit www. owaidaho.org.

#### **Instructional Videos**

The Waste Water Nova Scotia Society shot two more training videos last year. "Flushing a Septic System" shows how to flush and repair a malfunctioning drainfield and what reports to file. The association will use the video with a flushing course it is developing for pumpers needing certification for the work. "Installation of a C3" details the installation of a pressurized disposal bed. The video also covers installation of leaching chambers and gravel-and-pipe drainfields. The first in the series, "The Selection and Installation of a Raised C2", is at www.wwns.ca.

#### New Directors Join Michigan Association

Misty DeJonghe of Matt DeJonghe Septic Tank Cleaning Service in Britton and Paul Lawrence of All American Septic Service in Imlay City were elected to the Michigan Septic Tank Association Board of Directors. Former MSTA President Rep. Ken Goike introduced a bill to eliminate the ban on storage tanks by 2025 along with language to allow haulers to access the receiving stations of their choice.

#### Canadian Onsite Wastewater Study

The Canadian Mortgage and Housing Corporation commissioned a study on onsite wastewater infrastructure in Ontario and Alberta. The study will determine what effects the systems have on potable and surface water and design protocols to alleviate environmental stresses.

#### Association Commendation

The State Senate adopted a resolution congratulating the Pennsylvania Septage Management Association on its 25th anniversary. Senate Environmental Resources and Energy Committee Majority Chair Mary Jo White sponsored resolution SR 390.

#### **NOWRA Nuggets**

NOWRA elected new officers and members to the 2012-2015 board of directors. Officers are President Tom Fritts, Residential Sewage Treatment Co., Grandview, Mo.; Vice President Greg Graves, Norweco; Secretary/Treasurer Robert Mayer, American Manufacturing Co.; and immediate past President Richard Otis, Otis Environmental Consultants, Madison, Wis.

Joining the board are installer Robert Himschoot, Crews Environmental, Ft. Myers, Fla.; regulator James Vincent, New Mexico Environment Department; and service provider David Ritchie, Zaring Septic and Drain Service, Crestwood, Ky. Allison Blodig of Bio-Microbics was appointed to fill the remainder of Mayer's term.

#### CALENDAR OF EVENTS

#### March 3-5

Ontario Onsite Wastewater Association Conference, Blue Mountain Ski Resort, Collingwood. Call Don Krauss at 855/905-6692 or visit www.oowa. org.

#### March 3-5

Pennsylvania Association of Sewage Enforcement Officers Conference and Trade Show, Holiday Inn, Grantville. 717/761-8648; www.pa-seo.org.

#### March 7-8

New Mexico Onsite Wastewater Association Onsite Wastewater Conference, Ruidoso Convention Center. 575/937-9429; carboyman@hotmail.com.

#### March 14

Onsite Wastewater Association of Idaho Conference, Boise State University Conference Center, Boise. Call Justin VanCleave at 208/664-2133, Matt Gibbs at 208/660-8982, or visit www.owaidaho.org.

#### March 15

Saskatchewan Onsite Wastewater Management Association Trade Show and Convention, Travelodge Conference Centre, Saskatoon. 877/489-7471; www.sowma.ca.

#### March 19-20

Texas Onsite Wastewater Association Conference, Waco Convention Center, Waco. 281/738-3355; www.txowa.org.



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Go to www.SepticPages.com/Pumper for full details.

#### March 21-22

Alabama Onsite Wastewater Association Trade Show, Civic Complex, Pelham. 334/396-3434; www.aowainfo.org.

#### March 25-26

Granite State Designers and Installers Association Septic System Conference and Exposition, Radisson Hotel, Manchester, N.H. 603/228-1231; www.gsdia.org.

#### 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, The Woodlands, Cleves. Call Keith Smith at 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, Stockbridge, Ga.. www. georgiafog.com.

#### **TRAINING & 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:

- April 17-19 Advanced Installer II
- May 8-10 Basic Installer
- May 30-31 Pumper

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 these classes:

- April 24-25 Soils, Hydrogeology and Site Evaluation, Monterey
- May 22 Low-Pressure Pipe Drainfield and Drip Dispersal Design, Sacramento

Call Kit Rosefield at 530/513-6658 or visit www.cowa.org.

#### Minnesota

The University of Minnesota Water Resources Center has these classes:

- April 3-4 Solutions for Difficult Sites Continuing Education, Alexandria
- April 9-11 Basic Onsite System Design, Owatonna
- April 17 Design Continuing Education, St. Cloud
- April 18 Inspector Continuing Education, St. Cloud
- April 17-18 Design/Inspector Continuing Education Combo, St. Cloud
- April 23-26 Advanced Onsite System Design and Inspection, St. Cloud
- April 29 May 1 Introduction to Onsite Systems, Bemidji
- 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

Call Nick Haig at 800/322-8642 (612/625-9797) or visit http://septic.umn.edu.

#### North Carolina

- North Carolina State University has these courses:
- April 2-3 18-hour Introductory Installer Training, Raleigh
- April 4 Gravity and Pump Systems: A Better Installation Equals a Better System, Raleigh
- April 5 Advanced Septic System Installer Guidance, Raleigh
- April 9-10 Soil Profiling for Wastewater and Stormwater System Siting, Carthage
- April 24 Soils for the Outer Piedmont and Foothills, Morganton
- 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

Contact Joni Tanner at 919/513-1678 or 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 these classes:

- April 2-3 Maintenance Operator, Bend at O2WA Conference
- April 4 Installer, Bend at O2WA Conference
- May 30 Installer

Call 503/399-5181 or visit www.chemeketa.edu/busprofession/ccbi/ customizedtraining/deq/classes.html.

#### Pennsylvania

The Pennsylvania Septage Management Association is offering these courses at Wyomissing:

- April 2-3 Basic Onlot Wastewater Treatment System Inspection
- April 2-3 Advanced Onlot Wastewater Treatment System Inspection

Call 717/763-7762 or visit www.psma.net.

#### Virginia

The Virginia Center for Onsite Wastewater Training has these classes at Pickett Park:

- April 9-10 Water Movement in Soils
- April 12 Nitrogen Dynamics, online
- May 10 Foundational Concepts of Pump Systems

Contact Latonya Fowlkes at 434/292-3101 or latonya.fowlkes@ southside.edu or visit www.southside.edu.

#### Washington

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:

• April 3 – Design High-Strength Waste

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#### Ditch Witch SK750, SK755 tool carriers

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system with bolt-on sprockets, wide-track rollers and replaceable spindles. The carrier has an optional single-level joystick control and two-way auxiliary control foot pedal for attachments. 800/654-6481; www.ditchwitch.com.

#### SJE-Rhombus lift station control panel

The 331 Lift Station control panel from SJE-Rhombus is designed for standard duplex applications, covering three phases (up to 32 amps each) and three voltages (208, 240, 480) with one panel. Available in a stainless steel or fiberglass wall-mounted enclosure, features



include single-point power connection, IEC hp-rated motor starter with adjustable overload module, Class 10 ambient-compensated overload relay, tri-voltage step-down control transformer, and separate alarm/control fuses. 888/342-5753; www.sjerhombus.com.

#### Larson Electronics rail-mount LED work light

The Magnalight WAL-JH-2XWP400 rail-mount LED work light from Larson Electronics features dual LED light heads and mounting options with an adjustable J-hook ladder-mount bracket. The light produces 2,924 lumens of white light distributed in a flood pattern, illuminating 15,000 square feet of work space. 800/369-6671; www. magnalight.com.



#### • April 17 – Design/Install Subsurface Drip, Moses Lake

- April 18 First Aid/CPR
- April 24 Pumper, Vancouver
- 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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Soil Shaker 2000. Universal skid steer attachment for drainfield restoration. Buy factory direct. \$6,250. www.soilshaker.com or call 320-293-6644. (P03)

Terralift: Huge discounts on Terralift Machines. Call Dick Crane or John Vanzandt at 800-223-2256. (P05)

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#### 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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**ABOUT THE AUTHOR** 

Allison Blodig, REHS, is director of regulatory affairs for Bio-Microbics and a NOWRA board member. Jennifer Cisneros is manager, marketing and multimedia, for Bio-Microbics and chairs the NOWRA Marketing Committee. For more information or to join NOWRA, visit www.nowra.org, or call 800-966-2942.

# Where was the Water Sector?

The water and wastewater industry was lightly represented at the 2012 Greenbuild Show. It's time for the onsite industry to take more interest in green building. By Allison Blodig and Jenniter Cisneros

ccording to the U.S. Drought Monitor, 2012 saw the driest months on record in the Midwest. A different kind of drought prevailed at the U.S. Green Building Council (USGBC) Greenbuild Expo in San Francisco Nov. 14-16: Of the 906 exhibitors, only six had anything to do with wastewater. Further, of the 181 sessions given at the show, only 11 dealt with water.

Widely publicized as the world's largest conference and expo dedicated to green building, the Greenbuild Show is a critical part of the growth seen in the green building industry and the advancement of the sustainability movement.



Onsite wastewater treatment systems maker Bio-Microbics was represented at the 2012 Greenbuild Show in San Francisco.

Rick Fedrizzi, founding chairman and CEO of the USGBC, delivered an inspiring keynote address to nearly 6,500 people at the opening session. He emphasized that there are critics of the green building program: "Journalists, lobbyists, prehistoric industry associations, and scoundrels who campaign against environmentally responsible buildings," but that "Our detractors are dead wrong, and we are right!" He sent the audience off to the three days of workshops, conference sessions, and three buildings of exhibitions and booths at the San Francisco Moscone Convention Center.

*Professional Builder*, a construction publication, hosted a Greenbuild Show Village where homes constructed on site touted the latest green building techniques. The January National Association of Home Builders International Builder's Show in Las Vegas included similar Show Village homes, which featured NOWRA Business Benefit Program members Bio-Microbics and Infiltrator Systems.

Bio-Microbics attended this event to gather more information about the USGBC Leadership in Energy and Environmental Design (LEED) green building certification program and about the green building industry as a whole.

There is time to make our industry known and push to be part of the answer for responsible buildings. The onsite industry should take its place in the green building and sustainable development industry.

Most of the talk this year was about the proposed changes to the guiding document of the LEED Certification Program. The proposed changes (LEED Version 4) were met with some debate and have been put on hold until June 2013 for more discussion. Proposed changes include adding new credit categories and prerequisites for products, revising the point distribution used to score projects, and adjustments to the technical content.

The big news for LEED Version 4 is that there will be more transparency of materials used in green building products. Companies cannot just say they are green; they must prove it. With sustainable design, construction standards, certification programs (like the new NSF/ANSI Std 350 for Water Reuse), and building codes that are directed towards improving long-term building performance, the focus is currently on energy efficiency. For wastewater treatment and reuse to ultimately prevail in the sustainability arena, the onsite industry would need to participate more in these green-building certification programs.

While LEED and green building may not be an area of focus for many people in the onsite industry now, we should be involved in setting the goals and guidelines that may concern the industry in the near future. There is time to make our industry known and push to be part of the answer for responsible building. The onsite industry should take its place in the green building and sustainable development industry ... because we are right, too.

If you would like more information about the USGBC or the Greenbuild Expo, visit www.usgbc.org.







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**RISERS, COVERS, GRATES, ADAPTER RINGS** 







Risers can be cast into concrete tanks or retrofitted to accommodate plastic tanks, fiberglass or concrete tanks.





**EXTEND & LOK** 

EASY AS 100

Before (Cast Iron Pipe)

After (4" Extend & Lok)

With PL-68 Filter & Tee

Our Extend & Lok™ is a simple, easy to use solution that can extend the inlet or outlet pipe and make filter and/or baffle installation a snap. No more fighting with pipes that are flush against the septic tank wall.

DISTRIBUTION

ACCESSORIES

Available in 6". 4" & 3"

2



12", 20" & 24" Safety Screens

20" & 24" **Riser Pans** 

SAFETY DEVICES

20" Lid-Lok

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