

February

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Getting SepticSmart

U.S. EPA wants to help owners of the nation's 26 million onsite systems take better care of them – to extend their lives and protect the environment

By Ted J. Ruiseh, Editor



It's pretty much unanimous in the onsite industry: Homeowners need more education on how to care for their septic systems.

That's whether those owners have just built new homes or have lived in the country on a septic system for decades. Many people simply would rather forget they have a wastewater treatment system buried in the yard.

Some universities, some state agencies, some counties – and for that matter, a number of onsite practitioners – do a great job with education. But there are, to say the least, major gaps in coverage.

Going national

Now there's a national approach to education that may help fill in some of the "bare spots" in the educational map of the country. The U.S. EPA late last year launched the SepticSmart campaign (www.epa.gov/septicmart). In a way, it replicates the methods of the ENERGY STAR program, which promotes energy efficiency, and the WaterSense program, which promotes water conservation.

A key difference is that ENERGY STAR and WaterSense go so far as to rate and certify products for their performance. That isn't the case with SepticSmart, but the program does include a variety of good informational materials.

The program website includes links to pages with basic information about system care, and fact sheets on various more technical topics like

large-capacity systems and recovery after flooding.

Likely of more interest to onsite professionals is an Outreach Toolkit that includes a variety of print-ready materials you can download from the website and take straight to a local print shop. These items include:

- A doorhanger advising homeowners to take proper care of their systems
- A 9-page "Homeowner's Guide to Septic Systems"
- A 4-page homeowner's guide in a "rack brochure" format
- Postcards with basic system maintenance advice

Good information

These seem well suited for installers, service contractors and local regulators who would like good educational "leave-behinds" or mailers, but lack the resources to create their own and haven't yet found publicly available

Some universities, some state agencies, some counties – and for that matter, a number of onsite practitioners – do a great job with education. But there are, to say the least, major gaps in coverage.

items they can use. There's also a SepticSmart logo graphic that you can easily post on your website.

The EPA says SepticSmart aims to inform homeowners who have septic systems about the importance of maintaining them, and to provide valuable resources to help those owners make sound decisions where their systems are concerned.

Now there's no good reason for an onsite practitioner to shy away from education. The big roadblock to educational material has always been the time it takes to develop and design high-quality presentations. Now all that work has been done, and it's just a matter of getting the items printed locally in an appropriate quantity.

Printing is cheap these days, and so it should be easy for just about any entity, public or private, to get a supply of materials that offer sound advice.

Have you seen the SepticSmart materials? What do you think of them? Will you make use of them? If so, how? What's your opinion about the quality of information? We'd like to hear your opinions and ideas. Send a note to editor@onsiteinstaller.com and I promise to respond. □

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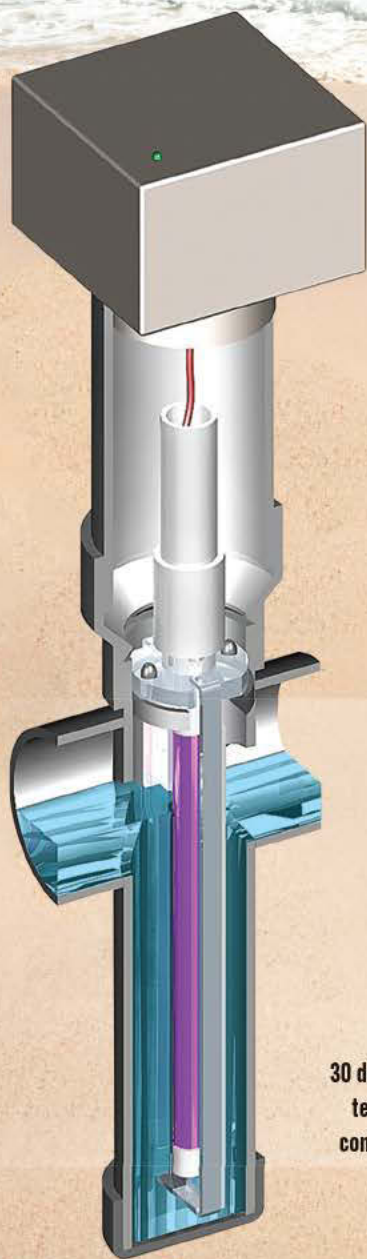
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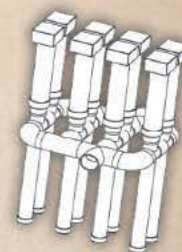
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MIRACLE WORKER

A Georgia installation company has built its solution-driven reputation on creating systems for problem lots previously deemed unusable

By *Scottie Dayton*

Harold Kilgore dislikes the word “can’t,” and has spent the last 12 years proving it through his solution-driven company, Gravelator Systems. The small family-run business in Talmo, Ga., opened in 1997 and specializes in designing and installing systems for sites classified as unbuildable.

Gravelator Systems Inc., Talmo, Ga.



OWNER:	Harold Kilgore
YEARS IN BUSINESS:	15
EMPLOYEES:	3
MARKET AREA:	100-mile radius
ANNUAL REVENUE:	\$657,000
SPECIALTY:	Designing and installing systems for challenging sites
AFFILIATIONS:	Georgia Onsite Wastewater Association
WEBSITE:	www.gravelator.com

Kilgore’s list of pilot systems includes Hall County’s first aerobic treatment unit (model AK600S96 from AquaKlear) in 2001 and the county’s peat biofilter (PuraFlo from Anua) in 2002. In early 2007, he added the county’s first Eljen In-Drain sand filter to the list.

He did it by earning the respect of state and county regulatory officials and building solid working relationships with them. Kilgore spends months studying new technologies before presenting his case for them with clarity and facts.

Gravelator, with its “git-er-done” reputation, is often the last hope clients have for developing their properties. From working on 60-degree slopes and hand-excavating sites to lowering a mini-excavator down the face of a cliff, there is nothing Kilgore won’t do to solve the problem. “If clients want the system installed and money is not an issue, we will make it happen,” he says.

Following destiny

Kilgore, 50, and wife, Sharon, built the business by seeking out tract builders such as KB Home, Colony Home Builders, and Bonner Custom Homes. “Our goal was to find developers building 100 to 200 houses and install the onsite systems,” Kilgore says. “We wanted volume, and the cookie-cutter systems – chamber drainfields with a single septic tank – enabled my three crews to install one, sometimes two, per day.”

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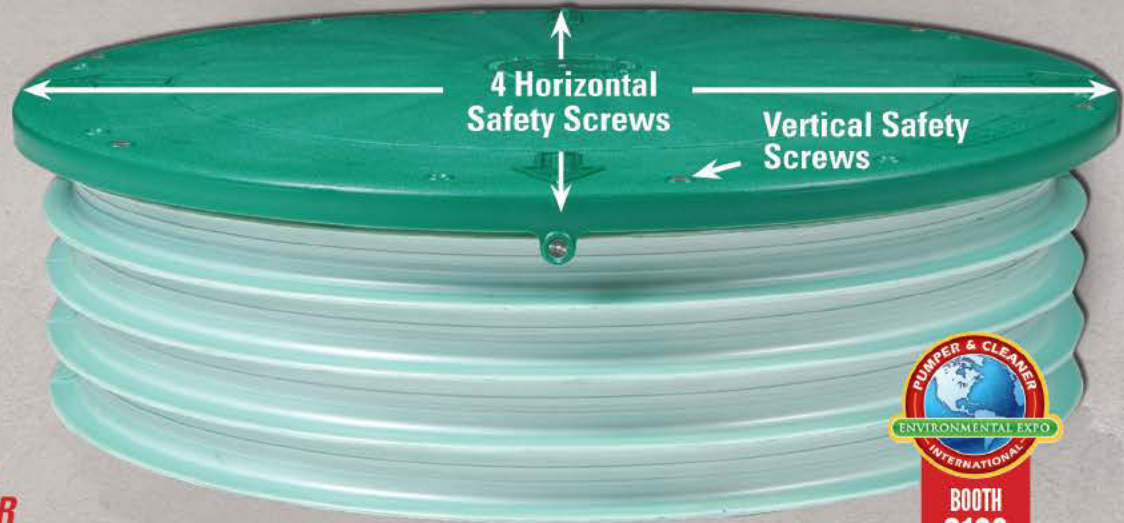
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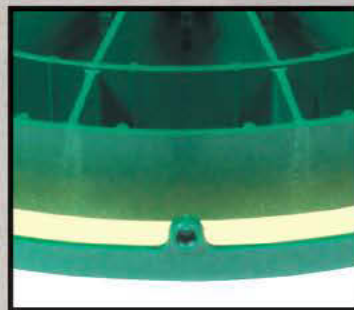
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Installing onsite systems is pure play for Kilgore, who grew up with heavy equipment for toys, job sites for sandboxes, and a father who taught him how to install systems safely and successfully. He joined his dad full time after graduating from high school in 1980. After a brief partnership with another company in 1990, he struck out on his own, and he has never looked back.



Heath Kilgore (left) and Justin Kilgore fill in with sand around a new Liberty Retro grinding station in Blue Ridge, Ga.

“Equipment has always fascinated me and I love being outdoors doodling in the dirt,” he says. “Tract building filled the bill.” The company had its best year

“Doing something everybody says can’t be done is my greatest professional reward. Personally, the gratification from helping people achieve their dreams is immense.”

Harold Kilgore

in 2000, installing more than 400 systems. But production work never broadened Kilgore’s horizons, and when the opportunity came to install advanced treatment units, he snatched it. Today, Kilgore, son Heath and nephew Justin Kilgore, both licensed practitioners, install 90 mostly residential advanced systems per year, accounting for 80 percent of annual revenue. The rest is repair work.

“When I compare our profit margin then and now, the money is still about the same, but the work is more satisfying,” says Kilgore. “I enjoy learning about new technologies.” The state requires eight continuing education hours every two years to renew installer licenses. Kilgore amasses up to 40 hours a year attending courses or manufacturers’ product demonstrations.

He taught himself a computer-aided design program to design the systems his company installs. “The software enhanced our ability to produce plans similar to what professional engineers submit,” says Kilgore. “The state recognized that and works well with us.” Kilgore partners with SCE



In the process of installing a Liberty pump in a new system, Justin Kilgore drills air release holes, while Heath Kilgore steadies the pump.

Engineering in Gainesville for systems larger than 2,000 gpd, which require an engineer’s stamp.

Dream chaser

In early 2000, the world changed for Gravelator. Chris Cooley of Cooley Custom Homes in Gainesville told Kilgore he had a 2-acre lot with slow percolation rates and a high water table. The county said it was unbuildable.

“Scott Uhlich, program director for the Land Use Unit of the state Department of Public Health, pushed me in the direction of aerobic treatment units,” says Kilgore. “I researched them and was amazed at the options they provided.” Within three months, he had enough information to convince the Hall County Health Department to issue the onsite permit.

Cooley returned to Kilgore with another problem lot and met with equal success. He told other builders, the domino effect took over, and Gravelator became the company with answers no one else had. "Doing something everybody says can't be done is my greatest professional reward," says Kilgore. "Personally, the gratification from helping people achieve their dreams is immense."

Georgia has 159 counties and five main regions. Often, advanced systems installed in other counties haven't yet made their way to Jackson County and the six others in Gravelator's 100-mile service radius. "Once we open the door for new technologies, they spread through a county," says Kilgore. Between 30 and 40 percent of Gravelator's business comes from referrals based on Kilgore's ability to work with state and county regulators to resolve issues.

Changing tactics

Gravelator's reputation is based on its groundbreaking accomplishments. For example, state code requires a primary system and a full-size recovery area, but it doesn't specify the type of recovery area. The omission enabled Gravelator to become one of the first companies to change the media. It took Kilgore nine months to get a permit for a system on a lake lot with 50 percent slope and drinking water wells on three neighboring properties.

"Accounting for setbacks eliminated any room for the second 1,200-square-foot gravel drainfield,"

says Kilgore. "The county and district evaluated four designs before they approved changing the media to a sand filter, laying out the drainfield in zones, and sizing it based on Eljen's effluent application rate."

"The county health official said it couldn't be done, but if there is a legal way to do it, we'll figure it out."

Harold Kilgore

Another first involved a fishing cabin on a notch carved into a cliff above Lake Lanier. When the property changed hands, a barrel with some gravel around it that had served as the onsite system predictably failed an inspection.

(continued)

Whatever it Takes

Harold Kilgore, owner of Gravelator Systems, doesn't do many repairs, but the ones he accepts other contractors call impossible. For example, when the drainfield failed on a 68-acre estate in Suwanee, Ga., two contractors told the caretaker that replacing it would mean tearing up the landscaping and removing ornamental trees.

The caretaker called Gravelator. Kilgore, son Heath, and nephew Justin derooted the decorative ground cover, protected it under plastic, hand-excavated four 36-inch-wide trenches 100 feet long for chambers, replaced the soil, and reinstated the plants. The project took five days. "When we left, the area looked like it did before we arrived," says Kilgore.

A golf club community with fancy landscaping and a failing system also tested Kilgore's ingenuity. A high rock wall made it impossible to bring in a pump tank, and the homeowner association wanted minimal destruction of the property. Kilgore removed a gate just wide enough for the mini-excavator and dug the tank hole.

Instead of using the machine to carry spoil to the stockpile, workers transported it in wheelbarrows, preserving the lawn. "It took a day to dig the hole and another for the hired 80-ton crane to lift the tank over the wall and set it," Kilgore says. Both projects came from referrals.

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Owner Sharon Kilgore keeps everything in order back at the office in Talmo, Ga.

A referral sent the new owner to Kilgore, who designed a Puraflo system.

The driveway from the cabin to a small parking pad was too narrow for the 2009 Bobcat 331 mini-excavator, so Kilgore rented a wrecker to lower himself and the machine over the cliff and down to the 5-foot-square area between the back of the house and a dirt bank.

Heath Kilgore and a laborer laid plastic on the parking pad, then disassembled the two biofilter modules and hauled the peat and gravel up the hill in 5-gallon buckets, stockpiling it beside the house. They dragged the fiberglass tubs up next, set them on blocks behind the house, and reassembled the media.

“As I age, I want to remain involved in the industry and the Georgia Onsite Wastewater Association, and to keep learning about new technologies.”

Harold Kilgore

Instead of a gravel drainfield, Kilgore installed EZflow geosynthetic aggregate (Infiltrator Systems), becoming the first in the state to use it. When the system was finished, the wrecker returned to haul the excavator and Kilgore back up the cliff.

Staying focused

Many contractors won't work on lots steeper than 35 percent, but Gravelator installs drainfields on terrain with up to 60 percent grades. They use a RotoMatic digging tool to cut steps down the side of the hill. If soils are good, they bench (terrace) the trench areas with the mini-excavator, enabling the equipment to sit level. “We do one ditch at a time and slide the chambers down the hill to it,” says Kilgore. “If we can't use the excavator, we dig by hand.”

On one Eljen system, the excavator dug the trench, but the slope was too steep for the John Deere 3005 four-wheel drive landscape tractor to transport the sand. “We formed a bucket brigade and passed sand down from the top



With Justin Kilgore keeping electrical lines under control, Heath (left) and Harold Kilgore lower a Liberty Pump into a grinding station in Blue Ridge, Ga.

of the hill in 5-gallon pails,” says Kilgore. “The county health official said it couldn't be done, but if there is a legal way to do it, we'll figure it out.” It took five days to move the sand.

Kilgore's father taught him to forget his girlfriends and personal problems when climbing on equipment: “You have to be in charge of the machine and in control of yourself. I tell whoever is working with me that we will not hurry. We will stay focused to avoid mistakes and prevent accidents.” No one has been injured on any of the company's jobs.

All in the family

Home to Gravelator is a 2,100-square-foot shop with 600-square-foot office addition on 12 acres. The fleet includes a 2006 John Deere 120-C excavator, 2009 Takeuchi TL130 rubber-track loader, 2011 Bobcat E45 excavator, 1998 Mack 600 dump truck, 2003 Chevrolet C5500 flatbed truck, 2011 Ford F-450 Super Duty pickup truck, 2010 Chevrolet C-150 pickup truck, and six equipment trailers.

In 1995, Kilgore's wife left a full-time position to become Gravelator's office manager, a job she had been doing on evenings and weekends. “Sharon is the most integral part of the company,” says Kilgore. “She puts the



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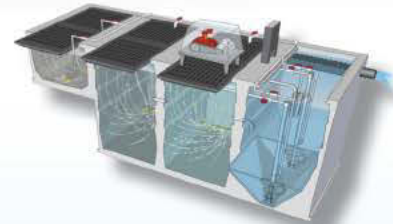


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grease on the gears to keep us rolling. I couldn't begin to replace her." She isn't afraid to move equipment around or jump in the trenches with a shovel to help.

When the Kilgore family members take some days off, they attend biker rallies such as Daytona Beach Bike Week and the Panama City Beach Motorcycle Rally. Kilgore saddles a 2006 Ultra Classic Harley-Davidson with Sharon behind him. "I'm not as apt on a bike as I am on a tractor, so we go for the food and vendors, to watch events, and see old friends," he says. They also enjoy NASCAR races.

As Heath takes over fieldwork responsibilities, Kilgore plans to spend more time consulting and problem-solving. "As I age, I want to remain involved in the industry and the Georgia Onsite Wastewater Association, and to keep learning about new technologies," he says.

Kilgore is serving his first term on the association's board of directors and would like to sit on the Technical Review Committee. "I want time with my senator and house representatives to explain what changes are necessary to our regulations and why," he says. "I know how to work with regulators and how to increase the association's ability to achieve its objectives." □

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2013 expo



Visitors enjoy tasting the craft beers at Sun King Brewing Co. in downtown Indianapolis.

Tip a Frosty Mug

Whether on foot or on a guided tour, Expo visitors can whet their whistles at several Indy craft breweries

By Sharon Verbeten

In a state home to more than 50 breweries, no frosty mug will go unfilled. Many of those breweries — more than a dozen — are housed in the greater Indianapolis area.

“Craft beer in Indianapolis has been a part of our city’s culture for over 20 years,” says Clayton Robinson, owner of Sun King Brewing Co. “Over the last four years, there has been an explosion of breweries and interest in craft beer. Indiana led the 2012 Great American Beer Festival with the greatest percentage of medals to entries, so there is plenty of world-class beer to discover and enjoy.”

“My husband and I started the business because a number of craft breweries were starting up in Indianapolis and there was not an easy, safe way to visit them all. We allow people the opportunity to taste great local beer and something that is uniquely Indianapolis.”

Megan Bulla

Sun King is among the largest breweries in the state, making hand-crafted seasonal and specialty beers. Its house beers include Sunlight Cream Ale, Wee Mac Scottish Ale and Osiris Pale Ale. Its brews were among those honored at the Great American Beer Festival, as well as the Indiana Brewers Cup and World Beer Cup competitions. While tours and tastings are only offered at the end of each week, the brewery is open for retail sales all week. 135 N. College Ave.; 317/602-3702; www.sunkingbrewing.com.

With so much malt and hops abounding, one city attraction aims to



The bright green Indy Brew Bus is one way to visit several local microbreweries in one three-hour tour. Visit, taste and take in the ambience of what the city’s brewing world is like — with a group of like-minded, beer-loving friends.

take locals and tourists to visit some of these beer venues. The bright green Indy Brew Bus, which can host 14 riders, offers a three-hour tour (\$30 per person) of three to four local breweries. Samples of house, seasonal and specialty beers are provided at each stop. And a personal sampling scorecard lets you and your friends (ages 21 or older, of course) rate your favorites.

“My husband and I started the business because a number of craft breweries were starting up in Indianapolis and there was not an easy, safe way to visit them all. We allow people the opportunity to taste great local beer and

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something that is uniquely Indianapolis," says Megan Bulla, who owns the tour bus with her husband, Andy.

In addition to Sun King, three other breweries are part of the tour, with about 45-minute stops at each. While the Brew Bus has limited tours during the Pumper & Cleaner Expo (more info at www.indybrewbus.com), all but the Bier Brewery and Taproom are located either a long walk or a short cab ride from the Indiana Convention Center.

For more information:

- Flat 12 Bierworks is a craft production brewery in the historic Holy Cross neighborhood. Sample their beers with most interesting names (Mustache Ride Red, Lacto-Matic Milk Stout, Upside Down Blonde and Liquid Fiction). 414 N. Dorman St.; 317/635-2337; <http://flat12.me>.
- Fountain Square Brewing Co. is located in the historic Fountain Square neighborhood; it started in 2011, born of the perfect storm of chemistry, microbiology, automation and a good old-fashioned love of the brew. Among their brews are Hop for Teacher, Backyard Porter, Preacher's Daughter Amber Ale and Workingman's Pilsner. 1301 Barth Ave.; 317/493-1410; www.fountainsquarebrewery.com.
- Bier Brewery and Taproom won the Indiana State Fair Champion Brewery Award in 2011 and 2012. One of the brewery's slogans is "come taste our awesomeness." Brews change frequently, and, like most microbreweries, the names don't disappoint, including Dirty Farmgal, Oranjunkle, Sanitarium, Wee Fatty and Billy Baroo. 5133 E. 65th St.; 317/253-2437; www.bierbrewery.com. □

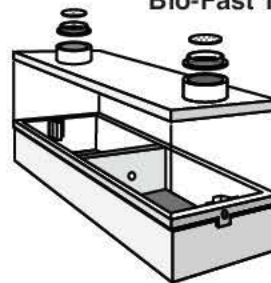
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Jim Anderson and Dave Gustafson are connected with the University of Minnesota onsite wastewater treatment education program. Dave is Extension Onsite Sewage Treatment Educator. Jim is former director of the university's Water Resources Center and 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.

The Age-Old Distribution Question

Does effluent ponded in trenches mean the system is failing? The answer depends on how the effluent was intended to flow in the system.

By Jim Anderson, Ph.D., and Dave Gustafson, PE.

One topic that has generated numerous questions over the years is the distribution of effluent by gravity in an onsite treatment system.

The question has come up again in the context of inspections for real estate transactions and for inspections by service providers to determine how to take care of systems into the future. The specific question this time is: If I evaluate trenches and I find effluent is ponded in them, should I be worried? The answer actually goes back to the initial installation and how effluent is supposed to move through the system.

Three components

We like to break gravity distribution into three pieces. The first is the gravity sewer pipe from the house to the septic tank; the second is the outlet pipe from the septic tank to the soil treatment unit; and the third is between parts of the soil treatment unit (in most cases this means a series of trenches).

How does effluent get distributed between parts of the soil treatment unit? There are three recognized types of gravity distribution between trenches: parallel, sequential and serial.

For the first piece where the pipe will carry both liquid and solids from the house to the septic tank, the piping needs to be laid with a slope of 1/8 to 1/4 inch per 8 feet. This ensures that both the liquid and the solids pass along the pipe to the tank. In between water uses in the house, there should



be nothing but air in this pipe. If there is, something is wrong with the way the

Dormant patches of grass during a dry period offer a telltale sign where drainfield trenches are installed.



Drop boxes are being installed where EZ Flow media is used.

piping was laid out. We also always suggest, and many codes now require, that a clean-out be provided for this pipe so that the piping can be accessed from the outside.

The piping from the septic tank to the soil treatment unit should also run empty between water uses. The slope here is not critical because the pipe is not expected to carry solids, only effluent. Nevertheless, the piping needs to be laid with a slope and without any dips where effluent could collect and freeze.

Critical question

Now to the real core of the question: How does effluent get distributed between parts of the soil treatment unit? There are three recognized types of gravity distribution between trenches: parallel, sequential and serial. While some differences in these methods are subtle, they have a large impact on how the system operates.

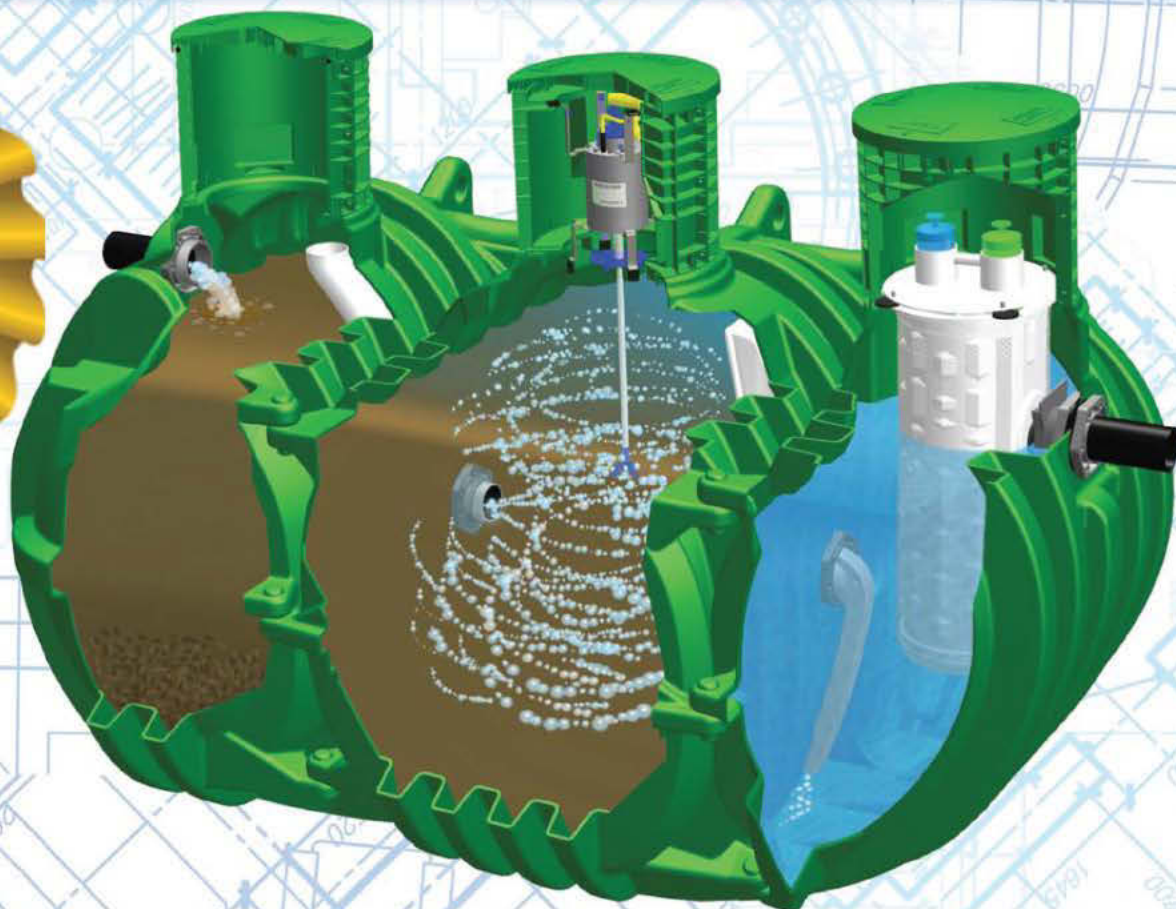
Parallel distribution

The design theory for gravity parallel distribution is that the effluent moves through the piping from the septic tank into the highest elevation

(continued)

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within a distribution box, which then has multiple outlets established at the same elevation within the box. Piping from these outlets supplies effluent to each of the trenches. The theory is that with each outlet at the same elevation, once the box fills up to the outlets, equal amounts of effluent move out to each trench.

In reality, this almost never happens! People often highlight for us that they set boxes up on a level site and run water in, and some water goes into more than one outlet pipe. But when we explore further the answer is: "Well, no, it's not exactly equal and more does go out one pipe." Our response is: "If it's not equal, it's not equal."

This idea of equal distribution has also led to an assumption that all trenches need to be of equal lengths. This flies in the face of natural soil variability, which says that even if exactly the same amount of effluent went to each trench, the trenches will not accept exactly the same amount of water.

These points and others have now led some to recommend that parallel distribution be used only on level or nearly level sites. There can still be significant problems with this arrangement as well, and we will probably discuss them in future articles.

In practice, what often happens in the parallel trench arrangement is that the installer, through the use of pipe caps and holes or leveler products, makes sure the effluent actually moves through the trenches in a sequential fashion. Now, the trench at the highest elevation receives the effluent first, then the second, and so forth. This leaves effluent in some of the piping that may be subject to freezing.

Sequential distribution

In sequential distribution, effluent is loaded directly into the first trench and then, as the biomat forms, the trench gradually fills up to a predetermined



Drop boxes are being installed where rock is the drainfield media.

level. Effluent then passes on to the next trench in the sequence. This is best done using drop boxes instead of a distribution box.

A drop box has the inlet elevation in the box at least 1 inch above the invert of the outlet pipe to the next box in sequence. Then, at the bottom of

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the box, there are outlets to convey effluent to the trenches.

The piping between the boxes serving the trenches should have at least a 1-inch drop in 8 feet to make sure the pipe runs empty between water uses, leaving no effluent at risk of freezing. Here, the second trench in sequence does not see any effluent until the biomat is fully developed in the first trench and liquid has ponded within that trench to the level of the outlet.

Serial distribution

Serial distribution looks somewhat similar, but with some important distinctions that explain why many jurisdictions do not allow it. All of the effluent passes through the first trench before being conveyed either with drop boxes or some other type of relief device to the other trenches. Here the flow pattern is serpentine, so there is no easy way to manage the system.

The bottom line

So, in answer to the question about effluent in the trenches being a problem: First we need to know how the effluent is to move in the system. If in sequential distribution the first trench is full, the second in sequence has some effluent, and the third is dry, the system is operating exactly as it should, so the ponding is not a problem.

On the other hand, if there is effluent ponded to the top of the first two trenches and effluent is nearly ponded to the distribution pipe in the third trench, this system is operating near capacity, and there may be surfacing problems in the near future.

We hope this description has helped. Since we have been talking about these issues since we started, we are sure there will be more distribution questions in the future. □

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Just the Right Recipe

A pretreatment system including microbial inoculator generators provides a solution for a restaurant and apartments on a tiny brookside lot

By **Scottie Dayton**

Slow drains and backups at a restaurant and pub in Amenia, N.Y., attracted the attention of regulators. When frequent septic tank pump-outs failed to provide relief, the owner closed shop. The three-story building also had three apartments.

A system upgrade was the only solution. Officials suggested the owner contact Onsite Engineering in Syracuse, which specializes in complex designs. “The location would never meet today’s construction standards,” says owner Eric Murdock, P.E. “Because it had a 30-seat restaurant and 20-seat bar, we could grandfather it into the regulations.”

The building used half the lot, leaving a 62- by 32-foot space for the pretreatment tanks and the drainfield, with the toe 10 feet from a trout stream. “When the Dutchess County Health Department saw my drawings, they said the drainfield was only 20 percent of what was required to handle the design flow,” says Murdock. “The prescriptive code structure doesn’t acknowledge pretreatment.”

A year passed before the state approved his solution, which called for eight tanks including two grease interceptors, septic tanks, two microbial inoculator generators (MIG), three purification units, and gravelless chambers.

(continued)

SYSTEM PROFILE

Location:	Amenia, N.Y.
Facility served:	Cozy Corner Restaurant & Pub
System designer:	Eric E. Murdock, P.E., Onsite Engineering, Syracuse, N.Y.
Installer:	Kect Construction, Patterson, N.Y.
Site conditions:	Sand and gravel, percolation rate 6 to 12 minutes per inch, groundwater 30 inches below grade
Type of system:	Combination treatment and dispersal system
Hydraulic capacity:	2,200 gpd



Two of three Fusion purification units sit in the block enclosure. The small space between the building and retaining wall contains the two grease interceptors. The two septic tanks and pump tank are opposite the purification units on the other side of the wall. (Photos courtesy of Onsite Engineering)



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LEFT: A 6-inch pipe sleeve penetrates the head of the retaining wall. It houses the recirculation line from the first distribution box to the septic tank. Beyond the wall are three Fusion purification units and the drainfield. The grease interceptors are between the building and right leg of the enclosure. ABOVE: The clay berm at the foot of the drainfield enclosure is 10 feet from a protected trout stream defining the west boundary of the property.

Site conditions

Soils are sand and gravel with a percolation rate of 6 to 12 minutes per inch. The 0.19-acre lot has groundwater 30 inches below grade. Cascade Brook, a protected trout stream, defines the west boundary of the property.

System components

Murdock designed the system to handle 2,200 gpd. Onsite Sales and Service in Syracuse (also owned by Murdock) provided the major components. They include:

- 1,500-gallon concrete grease interceptor (All tanks are traffic-rated and made by Woodard's Concrete Products, Bullville, N.Y.)
- 1,000-gallon grease interceptor
- 2,000-gallon, two-compartment septic/recirculation tank with four WW4 effluent filters from Clarus Environmental, a Division of Zoeller
- 1,500-gallon, two-compartment septic/pretreatment tank, each with a WK-80 White Knight MIG from Knight Treatment Systems
- 2,000-gallon dose tank with duplex 0.3 hp pumps from Clarus
- Three Fusion 800 gpd purification units from Clarus
- 180 feet of Equalizer 36 chambers from Infiltrator Systems
- Duplex time-dosing control panel from Clarus

System operation

Kitchen waste flows by gravity through a 4-inch PVC lateral and through both grease interceptors before entering the septic tank. Wastewater from the public restrooms and apartments flows through a separate 4-inch lateral to the septic tank, discharging to the pretreatment tank. A 4-inch-thick piece of rigid foam insulation caps the laterals for frost protection.

The compartments in the pretreatment tank each have a 27.5-inch-high by 16-inch-diameter high-density polyethylene MIG column inoculated with a bag of ISO 500 bacteria.

The units are fixed above two fine-bubble membrane diffusers.

An air pump (HiBlow USA) introduces 3.5 cubic feet per minute at 2 psi at the bottom of the columns. The steady stream of fine bubbles mixes and distributes the microorganisms throughout the tank, where they digest organic matter. Each column reduces 6 pounds of BOD daily. The offgas from the tank vents through a 4-inch line to a 20-foot-square bark bed that controls odors.

Effluent from the pretreatment tank flows by gravity into the dose tank. Every 20 minutes, alternating pumps lift 40 gallons to a distribution box that splits it four ways. Three outlets drain to the purification units. When the pump shuts off, water in the distribution box runs back through 1.5-inch PVC piping to the dose tank.

The fourth line drains to the septic tank. "For the price of the pipe, we attained 25 percent recirculation using the same energy that lifted the effluent for dispersal," says Murdock. "Another benefit is denitrification, achieved by returning oxygenated water to the septic tank."

"For the price of the pipe, we attained 25 percent recirculation using the same energy that lifted the effluent for dispersal. Another benefit is denitrification, achieved by returning oxygenated water to the septic tank."

Eric Murdock

The purification units sit in series inside a 24-inch-high retaining wall filled with soil for the drainfield. Each four-chamber fiberglass module constantly recirculates effluent from the third compartment (aeration) to the first (septic). The fourth chamber temporarily stores water before it flows by gravity to the drainfield's main distribution box. This box simultaneously doses distribution boxes at three zones of three 20-foot laterals.

"We installed the distribution network to deal with future situations," says Murdock. "If part of a zone becomes saturated, we can open the D-box and cap off the trenches under stress."

Installation

The original system had a 1,500-gallon concrete septic tank, grease interceptor, and concrete leaching galleries installed partially below the water table and under the parking lot. Kect Construction in Patterson, N.Y., decommissioned the components and lot to make room for the new system.

"Access was so tight between the building and drainfield area that we worked backward, digging holes and setting tanks one at a time," says Murdock. "The structure's laid-up stone foundation wasn't in fantastic shape, so

we were very cautious not to dig too close to it.”

The crew dewatered the 8- to 10-foot-deep excavations using a vacuum line inside a 12-inch slotted pipe in a small pit. Tanks arrived in halves and were set on 8- to 12-inch-deep gravel beds. The grease interceptors went alongside the building, and the septic tanks and pump tank were placed in a row that would abut the head of a retaining wall. The work took four days.

The county health department requires vertical separation to the seasonal high water table, so Murdock designed an elevated bed inside a U-shaped retaining wall with 36-foot header and two legs, 60 and 62 feet long. To support the three-tiered wall made of 2-foot-high by 2-foot-wide blocks each weighing 1,600 pounds, workers installed 48-inch-wide by 12-inch-deep compacted stone footings.

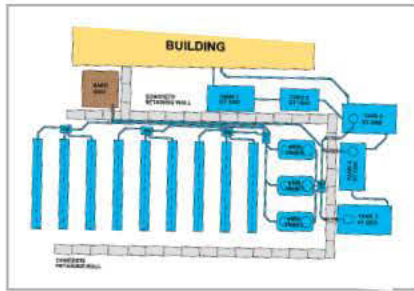
Where the pump, recirculation and air vent lines penetrated the footing, the crew laid a 6-inch pipe to sleeve the lines, then topped them with 4 inches of rigid foam insulation. They built the wall using a 3-ton mini-excavator. “The wall toenails (angles) inward 2 feet to prevent any effluent from escaping,” says Murdock. “We also lined the interior faces of the blocks with impermeable membrane to prevent seepage.”

The crew constructed a clay berm at the foot of the enclosure near the stream. “The precast blocks were expensive, and we didn’t want to use them where they wouldn’t be seen,” says Murdock. The work took a week.

Using the excavator, the crew distributed 30 inches of soil in the enclosure and set the purification tanks at the head. They were careful not to compact the soil in the drainfield area. After plumbing the tanks, they distributed 12 inches of gravel, sloping it 3:1 into the berm. They placed the chambers, back-filled with another 12 inches of gravel sloped at the toe, and topped the field with 6 inches of topsoil. “That left one tier of the wall below grade and two tiers above it,” says Murdock.

Meanwhile, workers ran the vent pipe from the pretreatment tank through a sleeve in the wall, then through two chambers to distribute the vapors evenly in the bark bed. They covered the chambers with 2 inches of bark on which the moisture would condense. The work took another week.

The crew also installed an electric shut-off solenoid valve on the public water supply to the restaurant. “The pump tank has one day’s storage capacity,” says Murdock. “During power failures, the pump won’t run. Stopping water to the restaurant prevents 1,450 gpd from entering the system and causing overflows.” The apartments still have water.



The layout of the combination treatment and dispersal system at Cozy Corner Restaurant & Pub.

Maintenance

Onsite Sales and Service holds the maintenance contract. Twice a year, technicians check the pretreatment and purification units. “It’s a low-maintenance, power-efficient system,” says Murdock. “The only energy users are the air pump, dosing pump and control panels.” □

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By Doug Day and Scottie Dayton

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

Washington

A report by the U.S. EPA and the Washington Department of Ecology found that nitrogen from onsite systems was insignificant in contributing to low-oxygen events that kill fish in Hood Canal. The findings said stricter pollution limits are not warranted. The agencies and outside experts also concluded the evidence was not strong enough to link human activity to oxygen problems. According to the report, the geography of the canal and ocean conditions were the overwhelming causes of massive fish kills.

Michigan

The Grand Traverse County Board of Public Works in October agreed to an annual levy of \$25 for all properties that have septic tanks, subject to public hearings and further approval. The proceeds would fund the county septage treatment plant, which has been losing money since it opened in 2005.

Maine

The state Department of Environmental Health has made its Subsurface Wastewater Disposal Rules available for e-readers and tablets. Files can be

downloaded for Kindle, Nook and other devices that can read .epub or Adobe PDF files. The files are available from the website of the Maine Sub-surface Wastewater Unit.

www.maine.gov/dhhs/mecdc/environmental-health/plumb/index.htm

Indiana

The Indiana Onsite Wastewater Professionals Association is exploring a program to certify septic system inspectors and maintainers. The first step was to review various sources to develop a state-specific checklist of items to include in an adequate inspection. The reviewed material came from other states and the National Association of Wastewater Technicians. The program would be designed to match the standard ordinance developed by the Indiana Environmental Health Association and provided to counties as a guideline.

Once the program design is complete, IOWPA plans to develop training and testing. □

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Essential Seal

Watertightness is an essential attribute of onsite treatment system tanks, regardless of material and in any specific application

By Dennis F. Hallahan, PE.

Watertightness is critical in onsite treatment system tanks, and in risers, lids and inlet and outlet piping. A septic tank or pump tank that is not watertight can cause a number of problems:

- Groundwater or surface water leaking in will cause hydraulic overloading of the drainfield and may flush solids out, eventually plugging the field.
- Untreated wastewater leaking out can contaminate water resources, causing a threat to public health – in areas with high groundwater, viruses and other pathogens from wastewater can travel great distances.
- Cracks or open seams can allow roots to penetrate and expand the openings.

Whether tanks are made of the traditional concrete or newer materials, watertightness is essential. Fiberglass and plastic tanks have become widely accepted by contractors, designers and regulators, largely because their light weight makes them easy to move around difficult job sites.



Plastic tanks are becoming more common in onsite systems based on ease of shipping and installation, strength, watertightness and materials inert to septic gases.



A concrete tank with a top seam and cast-in access risers is a good watertight tank option.

Each material has its place and its benefits. Advances in the structural integrity of plastic tanks and new approaches to ensuring watertightness are making them candidates on almost any job. Concrete tanks have been improving as well.

There is an optimal approach and a “right” tank for each project, depending on location, size, budget and application. What is not negotiable in the world of septic tanks is the need to be watertight.

Materials and best practices

Codes related to septic tanks help ensure that minimum standards are met. Several states and provinces have adopted strict requirements on watertightness. Codes typically focus on the end goal of defining watertight test criteria and do not specify manufacturing processes or tank materials.

In most areas, codes still state only that a watertight tank must be provided, but that is beginning to change. Many recent code changes now require testing to ensure tank watertightness, and best manufacturing processes and technologies have been developed to meet the new requirements.



LEFT: The inlet and outlet piping and the access risers should also be watertight. ABOVE: Injection-molded parts on plastic septic tanks allow precise wall thickness. A continuous gasket is physically locked in place to ensure watertight conditions.

Concrete tanks

The National Precast Concrete Association has developed a *Septic Tank Manufacturing Best Practices Manual* that helps precasters manufacture high-quality watertight tanks.

According to the manual, “The growing dependence on these systems places a greater emphasis on system performance and component structural integrity. As such, protection from water infiltration and exfiltration is a critical element in the design of tanks used in onsite systems. Regulatory codes and project specifications requiring structurally sound and watertight tanks are becoming the rule rather than the exception, as they should be.”

Plastic and fiberglass are naturally inert to wastewater constituents and will not corrode. Tanks manufactured with plastic or fiberglass are notably lighter, making them ideal for difficult-access sites.

The manual goes on to explain, “With the increasing regulatory demands for structurally sound and watertight tanks, it is critical for precast concrete manufacturers to continually raise the bar on quality. And, that proper installation of the tank is absolutely critical for maintaining structural integrity and watertightness.”

Concrete tanks have been the standard for septic tanks and pump tank applications. They are now offered with top-seam joints to minimize the risk of leakage. Additives are necessary in the concrete mix to prevent corrosion from the wastewater environment: If additives are not included, the oxidation of hydrogen sulfide will corrode the concrete. Concrete tanks are also ideal for traffic applications as they can be designed to meet the required loading.

Plastic tanks

Plastic and fiberglass are naturally inert to wastewater constituents and will not corrode. Tanks manufactured with plastic or fiberglass are notably lighter, making them ideal for difficult-access sites.

Injection molding or rotational molding allow the inclusion of corrugations and ribbing to strengthen the tanks. Interior structural bulkheads can be included to increase strength even further. Injection molding is new to tanks in the 1,000-gallon capacity range, but the process has been evolving and offers a variety of benefits.

The walls of injection-molded tanks have a consistent wall thickness, and the process enables use of much higher-strength plastic. This yields strong yet light tanks that are manufactured in halves, allowing the tanks to nest for increased shipping density.

In addition, injection-molded tanks are manufactured with high precision, allowing an EDPM watertight gasket to be inserted between the halves to ensure watertightness. Plastic tanks that are rotationally molded do not have seams.

New applications

In septic system applications, the need for compact systems for small lots and for lots in environmentally sensitive areas is serving as a catalyst for tank innovation, including further safeguards to ensure watertightness.

Other applications coming to the forefront of tank design include rainwater harvesting, in which homeowners collect runoff from roofs and other structures to irrigate their yards or garden. It is essential for these tanks to be watertight, as well.

Septic tanks are the heart and lungs of onsite treatment systems, which the U.S. EPA has identified as critical components of the nation’s wastewater infrastructure. Technologies are available to provide homeowners and businesses with watertight tanks that protect the environment. The future of tanks is sound: higher quality, higher standards and new technology. □

About the author

Dennis F. Hallahan, P.E., is technical director with Infiltrator Systems in Old Saybrook, Conn.

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What's Your Fluid Game Plan?

When pulling equipment back from storage, pay special attention to hydraulic oil, transmission fluid and grease

By Linda Edmondson

If you don't work in a warm climate where you stay on the job most of the year, then you've stored your equipment while you waited out the snow and cold. Anytime machines have been sidelined – whether for the winter or on a used equipment lot – putting them back in service takes more than turning the ignition key.

Ideally, equipment should be stored in a dry, dust-free place. But “ideal” is the operative word – machines often sit outdoors, exposed to the elements. A few simple steps can make a big difference in the way your equipment

Bryan advises consulting the owner's manual for the manufacturer's guidelines when getting an engine ready to operate.

Choosing the right hydraulic fluid helps ensure smoother operation and protects hydraulic systems. Two components to look for when selecting hydraulic fluid are water emulsifiers and zinc. Emulsifiers disperse water that separates from the oil and help reduce the water damage in the hydraulic system. Products that claim to shed, separate or reduce water will provide less protection, if they work at all.

When equipment will be used in varied temperatures and weather, always choose a multi-season transmission fluid. It will improve operation at temperature extremes and help you avoid seasonal fluid changes.

operates when you put it back to work, and in your cost of ownership, according to Gary Bryan, national warranty manager and preventive maintenance expert for Takeuchi U.S.

Startup checklist

“The first order of business is to inspect the machine for any dirt, dust or debris that may have been missed during the last cleanup,” says Bryan. “Then, remove any anti-corrosion protective coatings that may have been applied before going into storage.” You'll also need to remove covers, such as on air intake hoses and the muffler, that should have been applied before storage. The rest of Bryan's recommended startup list is probably familiar:

- Test the battery and recharge it if necessary.
- Check all belts, including the air conditioner belt, for proper tension and adjust as necessary.
- Check the radiator and hydraulic cooler for dirt and debris, using compressed air to clean lines.
- Check tire pressure or track tension.
- Inspect the undercarriage for damage or debris.

Choosing lubricants

Without question, some of the most important startup steps have to do with lubricants and with selecting the right ones to maximize equipment life and minimize downtime.

Zinc helps reduce component wear. Always choose a product with at least 300 to 500 parts per million (ppm) of zinc; premium hydraulic fluids contain as much as 1,200 ppm.

Before adding hydraulic fluid, experts at Midwest equipment distributor Miller-Bradford & Risberg advises filtering the fluid first, even if brand new, to avoid contamination.

Transmission fluid tips

In selecting transmission oil, the most important consideration is climate. When equipment will be used in varied temperatures and weather, always choose a multi-season transmission fluid. It will improve operation at temperature extremes and help you avoid seasonal fluid changes.

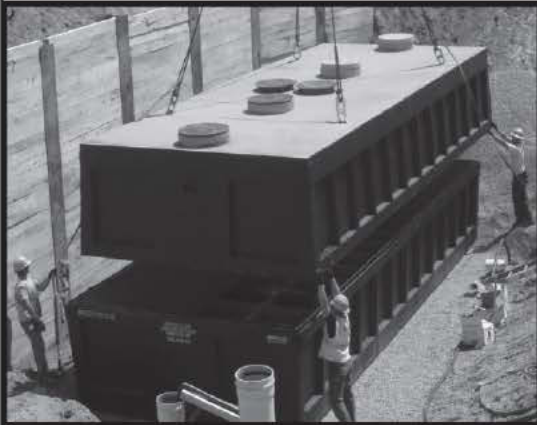
As always, take every precaution to avoid contamination. This includes hosing off the transmission tank before removing the cap, draining the old fluid as quickly as possible, keeping filter packages sealed until ready for installation, and handling filters carefully during installation.

Keeping it greased

Next, make sure all the machine's grease points are taking grease and are properly lubricated. Miller-Bradford & Risberg recommends using grease that meets or exceeds the owner's manual requirements – that helps increase parts life and performance.

It's also important to purge the old grease when changing grease in any

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part of the machine from one type to another – the old and new grease may not be compatible. Once the machine is back in service, always keep a grease gun handy and lubricate as often as the manufacturer recommends.

Once you complete all startup and maintenance processes and checks, it's time to turn the ignition key. Let the engine warm up for about 15 minutes, then slowly engage all hydraulic and drive functions to make sure they function properly.

Last but not least, walk around the machine and do a visual inspection, checking for damaged or missing items and for leaks. Engage the drive train and test the brakes to make sure they work properly, too.

Don't sell short the value of listening to the machine as it starts up and runs. Experienced operators can probably detect when something just doesn't sound right and needs attention before the machine heads for the job site to make you money.

"The bottom line is your productivity and your repair costs and how they impact your cost of ownership," says Bryan. "Well-maintained equipment operates more smoothly and efficiently, breaks down less often, and helps reduce costly repairs." □

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Just an 'Ole Boy'

Craig Morgan brings his humble approach to chart-topping country music to the stage at the Expo's Industry Appreciation Party

By Ted J. Ruiseh



Country star Craig Morgan rolls into Indianapolis and the Pumper & Cleaner Environmental Expo a year removed from his latest CD, "This Ole Boy," which peaked at No. 5 on the *Billboard* Top Country Albums chart.

"When you go out and buy an album, and I've done it myself, you sometimes feel, 'Well the songs on the radio were great but the rest was just OK,'" says Morgan, a member of the Grand Ole Opry since 2008. "When they play this record, I want them to say, 'Man, I like the songs on the radio but I love this other song even better!' That's what's rewarding about an album."

Reviewers seem to think Morgan's latest meets that standard. A review on the Taste of Country website says, " 'This Ole Boy' is an easy listen. Morgan includes 12 wholesome, folksy country songs, most sung with a crooked grin but no lack of sincerity. You find yourself charmed by his good-natured, every-man character on songs like 'More Trucks Than Cars,' 'Being Alive and Living' and 'Better Stories.' "

Great American Country says the album is "full of easygoing charm. Songs like the sexy 'Love Loves A Long Night' and 'Fish Weren't Bitin' fill out a solid collection that feels like a warm conversation. Craig's music and voice have always been engaging and accessible, and it's no different here."

A successful decade

Expo attendees will sample tracks from that album when Morgan performs on Tuesday, Feb. 26, at the annual Industry Appreciation Party at the JW Marriott Hotel, connected to the Indiana Convention Center. They'll also hear some of his 14 Top Ten hits, which include "Redneck Yacht Club," "Almost Home" (Music Row song of the year in 2003), and "That's What I Love About Sunday" (Billboard's most played country song of 2005 with five weeks in the No. 1 spot).

Morgan's songwriting and recording career goes back 13 years. He made his first appearance on the Grand Ole Opry stage on April 21, 2000, and was invited to become an Opry member during a special concert for troops at Fort Bragg in Fayetteville, N.C., on Sept. 18, 2008. The setting was fitting, since Morgan himself was stationed at Fort Bragg for two of his 10 years of active duty tenure in the U.S. Army's 82nd Airborne Division.

His Grand Ole Opry profile ascribes his appeal to honesty, work ethic and humility. "We grew up tough – dirt road, single-wide trailer," he says. He never saw



"People ask me how I stay grounded. Man, I go home and I still mow my own grass, I clean my own pool. I have kids that I play with and love the same as everybody else. I will always be that same guy."

Craig Morgan

himself in a music career, even though his father was a bass player in Nashville. He spent time as an emergency medical technician, a contractor, a sheriff's deputy, and an assistant dairy manager at a Walmart store, in addition to his nearly two decades of military service, which include nine years in the Army Reserve.

He remains a big supporter of service members, travelling even to dangerous places to entertain. "I was one of the first artists to go into Afghanistan," says Morgan, who received the 2006 USO Merit Award. "Right after the invasion, they were still sweeping up glass in Kandahar in the airport. I get to give those men and women a little piece of home. It really does make a difference."

Hard at work

Success in the music business doesn't seem to have changed him. "After most gigs, he is right there with his band and road crew loading up the truck," according to his Opry profile. Morgan adds, "Something in my genes and my blood requires that I work – right or wrong, it makes me feel like a man."

His Opry appearances number more than 130, and he plays some 200 sold-out concerts per year. He has toured with the likes of Carrie Underwood, Keith Urban, LeAnn Rimes, Brad Paisley and Trace Adkins. He is also a competitive dirt bike racer in the Mid-South Hare Scramble Series.

In June 2010, he launched the "Craig Morgan: All Access Outdoors" TV program on the Outdoor Channel. It follows his lifestyle at home, touring and outdoors: hunting, aerial bow fishing, bungee jumping and skydiving. In its first season, it became the network's top-rated Saturday morning hunting show.

Staying grounded

Amid all the activity, family comes first with Morgan. "I love the music. I love singing and writing songs and producing records," he says. "But ultimately, I do what I have to do to take care of my family. People ask me how I stay grounded. Man, I go home and I still mow my own grass. I clean my own pool. I have kids that I play with and love the same as everybody else. I will always be that same guy.

"Whether I was working at Walmart or as a police officer, I enjoyed what I did. And I could go right back to that today. I'm going to make whatever I do interesting and fun. I've always tried to look at this like, 'It's a job, and I'm blessed to have it.'"

Reflecting on his latest album, he observes, "No matter what level of an artist you are, you choose songs based on who you are at that time and how you feel. I'm at a point in my life where I'm extremely comfortable, extremely confident. I feel good about my family, my children, my friends, my career. I think the songs that I picked, looking back now, kind of reflect that." □

Five Questions with Craig Morgan

Q. How does your long experience in the military inform your approach to life? And does that inform your songwriting in any way?

Morgan: My time serving in the Army helped shape who I am today. It reinforced the values I learned at home – discipline, hard work, loyalty and sacrifice. I like to write from experience, and so I recently wrote a song called "What Matters Most," about our military men and women and the spouses and families they leave behind to serve our country. We recorded it and then donated it to *Folds Of Honor* to help raise money to support the families of fallen soldiers.

Q. What would you say is your signature song, and why?

Morgan: We've had a lot of hits, but to name one signature song is tough. I'd say, though, that everything we cut for my newest record, "This Ole Boy," is me to a T, especially "Being Alive And Living," and our newest single, "More Trucks Than Cars."

Q. Are there any lessons you feel small-business owners like Pumper & Cleaner Expo attendees could learn from your experiences working your way into the music business?

Morgan: There are two big things I've learned as an artist and entrepreneur in the music business and outdoor world. First, surround yourself with talented people. I like to joke and give everyone a hard time, but all my guys on the road with me and everyone back at home in Nashville keeping the machine running are top-notch. And second, never give up. You have to want it more than the next person and you have to be willing to work really hard to build your business, whether as an artist or in any career field.

Q. What is the single most important thing you would like the Pumper & Cleaner Expo audience to know about you before your performance?

Morgan: I'm a hardworking guy just like everyone out there. I like to dream big and live big, whether it's through my music, in the outdoors, or at home with my family.

Q. What should the Pumper & Cleaner Expo crowd expect from a Craig Morgan concert?

Morgan: Expect to be on your feet the whole time! I approach my shows like I approach my life – with a LOT of energy.



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Old-Fashioned Marketing

New online tactics are fine, but there's still a lot to be gained by mastering conventional methods that have worked for decades

By Eric Casey

The first column of this three-part series on marketing tactics focused on ways your company can promote itself online. This column looks at some of the many ways to reach customers through more traditional channels.

The ideas in this series are more like an a la carte menu than an all-you-can-eat buffet. Your time is limited, and so are the financial resources you can dedicate to marketing your business. That's why it's so important to have a marketing plan – it will help ensure that you make the most effective use of your time, energy and money.

Direct mail

Direct mail can be an effective way to get business, but it can also be expensive, so it's important to do it well. Unless you have direct mail experience, it's often a good idea to leave the development of your campaign to someone who does. Your most important role is ensuring that you have the best mailing list possible.

The U.S. Postal Service website (www.usps.com) has good resources to help you identify mailing lists, and there are list brokers who can also assist

Contribute articles to local news outlets that might help homeowners better understand their systems. Get to know local editors, radio and TV producers and make sure they know you are a source for septic system information.

here, but don't forget to check into what might be available from local public agencies – health departments and others. Also ask your distributors or the manufacturers you represent if they can support you.

Another approach, especially if you serve an area with mostly onsite systems, is to use a mailing service such as Valpak, MoneyMailer or Red Plum. These services put ads from multiple companies in a single envelope, delivered to a specific geography.

One more option is Every Door Direct Mail from the Postal Service. From the website, you can create your direct mail piece, identify your list and send out your mailing. It's not for everyone – for this to be cost effective, your area needs to be heavily served by onsite systems and should align fairly closely with ZIP code schemes.

Be an expert

Contribute articles to local news outlets that might help homeowners better understand their systems. Get to know local editors, radio and TV producers and make sure they know you are a source for septic system information. They will almost certainly put you in their Rolodex.

Don't forget online sources of news such as www.patch.com and online versions of printed newspapers. Consider offering consumer training sessions at health fairs and community events. Offer to go to local schools to educate children on potty do's and don'ts. You might even wish to write a blog for your website. The point is to be as visible as possible. The more places homeowners see you, the more likely your company will be top-of-mind when they are looking for onsite system related services.

Use free press

You may be surprised at the number of newspapers that serve your area. Many will run press releases about your company word for word. Don't overlook this free advertising. Keep an eye open for milestones or other important activities and events related to your business – new location, 100th

system installed, new service added, awards received. Send a short press release to note these highlights.

Business networking groups

These "clubs" can be effective in getting strong leads for new business. Business Network International is perhaps the best known and one of the most effective. They have local chapters all over the country, each made up of local businesses that share your customer base – people like electricians, painters, real estate brokers and insurance agents. The point of BNI chapters is to encourage business networking and referrals. You are expected to share leads, and you can expect to get leads from others in the group. The cost is about \$500 per year, but many small businesses swear by this channel.

Xylem acquires Heartland Pump

Xylem acquired privately held Heartland Pump Rental and Sales. Based in Carterville, Ill., Heartland has been a business partner with Godwin, a Xylem brand, in dewatering pump rental, services and systems design since 1995. Heartland has 100 employees with branches in Indiana, Mississippi and Tennessee.

SJE-Rhombus names Thomas CEO

SJE-Rhombus named David Thomas chief operating officer following the retirement of Laurie Lewandowski. Thomas had been president/director of Standard Products. Lewandowski joined the company 31 years ago, serving as president, vice president of marketing, purchasing director and IT director. She has seen the company grow from a garage assembly operation to a global business with six locations and 100-percent employee ownership.



Dave Thomas



Laurie Lewandowski

Norweco's Singulair Green receives ARM award

Norweco's Singulair Green tank took top honors in the global Large Product competition at the annual meeting of the Association of Rotational Molders (ARM). Winning products must demonstrate a significant new use of plastics, design ingenuity, cost effectiveness, performance improvements, manufacturing economics and energy savings. ARM is a worldwide trade association representing 200 member companies in 58 countries. □



Harry Covington (left), past-president of ARM, presents the Large Product award to Chris Smith with Norweco.

Fairs and other events

Meeting prospects one-on-one through a display at a county fair, festival or health department event can be an effective way to gain new business. With a bit of digging, chances are you can identify events on many week-ends in spring, summer and fall. Invest in a tabletop display or other graphics that portray your business professionally.

Watch for more marketing ideas in the third and final installment of this series. □

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Thrill Seeker

A contractor uses his background in plumbing and municipal infrastructure to write his first suspense novel

By **Scottie Dayton**

An interest in Elliott and Kondratiev stock market waves coupled with 20 years of researching and comparing biblical and Old Testament chronology against ancient history triggered William Struse's desire to write *The 13th Enumeration*.

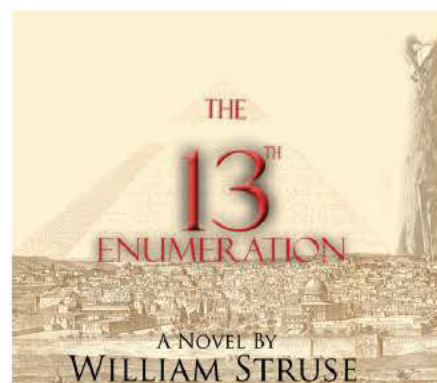
"When I stumbled upon the chronology of the 70-week prophecy of Daniel 9, it all came together," says Struse, a resident of Hereford, Ariz., and owner of Water Drain Works, a company that does onsite system repairs and other work related to household plumbing systems. "It's the anti-Da Vinci Code."

He plotted the complex thriller while turning wrenches under sinks and toilets, and occasionally replacing baffles on septic tanks and clearing related blockages. Back in the truck, he jotted down his ideas.



William Struse

Struse, who had never written anything before, finished the 468-page book in six months. Plots include a terrorist attack on New York City's water supply, archaeological digs with history-shattering artifacts, murder to protect ancient secrets, international intrigue, and drinking water production technology that changes the balance of global power.



"I had fun putting plumbing and municipal sewer and water infrastructure in the novel, then showing how vulnerable they are to terrorism," says Struse, 41. Editing was the most painful part. After six revisions, he hired editor Rachel Starr Thomson before uploading the manuscript.

Struse began his own publishing company, PalmoniQuest, and published the book through Lightning Source, a print-on-demand and distribution service, and CreateSpace, a comprehensive online self-publishing service. The sequel is unfolding in his head. □

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Expo Eats: 10 to Try

Grab a hungry friend and explore these walkable downtown Indy restaurant destinations that fit all tastes and budgets

By Judy Kneiszel

The Pumper & Cleaner Environmental Expo International does something to attendees and exhibitors ... it makes them hungry! Fortunately, there are numerous lunch and dinner options in Indianapolis within walking distance of the Indiana Convention Center and downtown hotels.

So check out the varied menus of these popular nearby eateries — featuring ethnic and popular local fare — then enter an address in your smartphone GPS and point your walking shoes down the street.

(Take note that price ranges are a per person estimate not including tax, tip or beverage.)

The Eagle's Nest at Hyatt Regency

1 S. Capitol Ave.
317/632-1234
www.indianapolis.hyatt.com

The Eagle's Nest, perched high atop the Hyatt Regency, slowly revolves, giving diners stunning views of the skyline. The menu, which changes seasonally, provides elegant and creative takes on classic American continental cuisine.

Hours: 5-10 p.m. daily
Price range: \$40-\$80

Menu sampling: Dry-aged, peppercorn-crust, bone-in New York strip steak; pan-seared halibut with Parmesan potato gratin; lobster corn chowder; strawberry crème brûlée.

Giorgio's Pizza

9 E. Market St.
317/687-9869
www.giorgiosindy.com

If you're in a hurry, you can grab pizza by the slice. If you've got more time, settle in for a whole pie in thin or thick crust style, some pasta or a calzone. And if you're too tired to go out, Giorgio's delivers for free with a \$10 minimum order.

Hours: Monday through Thursday: 9 a.m. to 9 p.m.; Friday: 9 a.m. to 10 p.m.; Saturday: 11 a.m. to 10 p.m.

Price range: Slices range from \$3-\$4; whole pies from \$10.95 for a 14" thin crust cheese to \$22.95 for a stuffed 16" large. Pasta dishes are \$6.45.

Menu sampling: Meatball Parmigianino hot sub; baked lasagna; pepperoni-filled bread sticks; Giorgio's chef salad with black olives and extra cheese; Sicilian cannoli.

Slippery Noodle Inn

372 S. Meridian St.
317/631-6974
www.slippery noodle.com

Established in 1850, the Slippery Noodle is the oldest bar in Indiana, and has been called one of the nation's top blues bars by *Rolling Stone* magazine. The Noodle serves up a full menu as well as live blues seven days a week.

Hours: Full menu available till 11 p.m. nightly; late night menu offered. Opens daily at 11 a.m.

Price range: \$8-\$20

Menu sampling: Shooter of shrimp; BBQ chicken quesadillas; whiskey pepper cheeseburger; filet mignon; Southern-style pork barbeque; chicken and broccoli Alfredo; toasted turkey sub.

Scotty's Brewhouse Downtown

1 Virginia Ave.
317/571-0808
www.scottysbrewhouse.com

Scotty's is perfect if you're dining with a group that can't make up its collective mind about where to go. This huge casual restaurant and bar has an enormous menu, more than 70 beers and countless sports-playing TVs. For those with special dietary needs, there's a gluten-free menu and a low-calorie menu. For those less-restricted folks, there's the "Big Ass Brewhouse Burger," which comes with a T-shirt for \$36.

Hours: Sunday through Thursday: 11 a.m. to 11 p.m.; Friday and Saturday: 11 a.m. to midnight

Price range: \$7.50-\$20

Menu sampling: Dill chips (fried pickles); Brewhouse Buffalo wings; "Macho Nachos"; spicy sirloin steak sandwich; barbeque ribs; the "Shewman Special" half-pound burger with peanut butter, jalapenos, cheddar cheese and bacon; homemade soup of the day; "Mile-High Grilled Cheese"; sweet chicken club wrap; homemade German chocolate cake.

Shapiro's Delicatessen

808 S. Meridian St.
317/631-4041
www.shapiros.com

Named one of the Top 10 delis in the country by *USA Today*, Shapiro's is a must for corned beef fans. Quick cafeteria-style service means more time

to savor your sandwich, contemplate dessert from their full-service bakery or simply get back to the Expo!

Hours: 6:30 a.m. to 8 p.m. daily

Price range: \$5-\$14

Menu sampling: Sandwiches including Reuben, pastrami, and smoked turkey; matzo ball soup; cabbage borscht; Shapiro's bagels; stuffed cabbage; short ribs; stuffed peppers; potato pancakes; sour cream egg noodles; hot German potato salad.

Shula's Steak House at the Westin

50 S. Capitol Ave.

317/231-3900

www.donshula.com/shulas-steak-house-indianapolis

Shula's combines steak and football in elegant, fine dining style. The restaurant is themed after the 1972 Miami Dolphins' "Perfect Season." The menus are even hand-painted on an official NFL game football.

Hours: Open daily, 11:30 a.m. to 2 p.m. and 5 to 10:30 p.m.

Price range: \$60-\$80

Menu sampling: French onion soup; jumbo lump crabcakes; prime rib; 22-ounce ribeye; roasted corn with bacon and shallots; truffle fries; molten lava chocolate cake.

Maxine's Chicken & Waffles

132 N. East St.

317/423-3300

www.maxineschicken.com

Home cooking is always on the menu at Maxine's, where their slogan is "A taste of love in every bite." This is a menu full of made-from-scratch comfort food.

Hours: Tuesday: 10:30 a.m. to 2:30 p.m.; Wednesday through Friday: 10:30 a.m. to 8:30 p.m.; Saturday: 9 a.m. to 8:30 p.m.; Sunday: 9 a.m. to 6 p.m.

Price range: \$5-\$15

Menu sampling: Jumbo fried chicken wings and waffle topped with peach butter; omelets with house potatoes; smothered chicken; catfish or tilapia with grits; half-pound burgers; fried green tomatoes; candied yams; black-eyed peas; seasonal cobbler.

Fast Burrito Mexican Grill

111 Monument Circle

317/917-8090

www.fastburritomexicangrill.com

If you need lunch in a hurry, but want something a bit healthier than a fast food burger, Fast Burrito offers fresh cuisine prepared using authentic Mexican recipes. Four salsas from mild to extra hot will add just the right kick.

Hours: 7:30 a.m. to 3 p.m. daily

Price range: Under \$10

Menu sampling: Burrito with choice of fillings; burrito bowl; grilled quesadilla; tacos; nachos; salad with chipotle ranch dressing. Fillings include marinated chicken, skirt steak, barbacoa (marinated beef brisket), ground sirloin, or sautéed peppers and onions.

Loughmiller's Pub & Eatery

301 W. Washington St.

317/638-7380

www.loughmillerspub.com

A patriotic décor welcomes diners to this casual, independently owned pub serving up an array of burgers, sandwiches and other traditional American favorites. Choose one of their 35 beers to wash down the hearty pub grub.

Hours: 11 a.m. to midnight daily

Price range: \$8-\$15

Menu sampling: Bacon and cheese fries; Southwest nachos; homemade chili; Indiana Cobb salad; Loughmiller's Little Cuban sandwich; pulled pork sandwich; English beef sandwich with cheddar and horseradish.

McCormick & Schmick Seafood Restaurant

110 N. Illinois St.


317/631-9500

www.mccormickandschmicks.com

Despite Indiana's distinct lack of ocean coastline, McCormick & Schmick provides 30 seafood choices daily in 80 different preparations, and staff members who can help you wade through the choices.

Hours: Monday through Thursday: 11 a.m. to 11 p.m.; Friday: 11 a.m. to midnight; Saturday: noon to midnight; Sunday: noon to 11 p.m.

Price range: \$15-\$25

Menu sampling: Lump crab tower; buttermilk-fried oysters; lobster bisque; Romano chicken chop salad; horseradish-crusted steelhead; fish & chips; shrimp and Andouille mac and cheese; filet mignon; Kobe burger; pan-roasted wild mushrooms; tiramisu torte. 

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Grundfos S-tube impeller

The S-tube channel impeller from Grundfos eliminates the need for add-on assemblies designed to cut, shred or treat wastewater as it flows from the pump. A new balancing method delivers smooth, quiet operation. The hydraulic design reduces abrasive wear and enhances anti-clogging capabilities. 800/921-7867; www.grundfos.us.



Carpenter Group digital percometer

The AccuPerc digital percometer from The Carpenter Group performs digitally accurate soil bed and seepage pit percolation tests. The three-station system can be transported in the optional 20- by 12- by 15-inch carry case and weighs less than 5 pounds. 800/743-7127; www.accuperc.com.



SJE-Rhombus Endura control panels

The Endura line of VFD (variable-frequency drive) control panels from SJE-Rhombus include the PB (pressure booster) and IR (irrigation) models. The PB is designed for commercial applications using 1-4 VFDs and includes the VFDC-4000 controller and one VFD for each pump. The IR panel is designed for irrigation pump applications up to 500 hp. It includes a VFD,



NEMA 3R enclosure with circuit breaker, VFDC-1300 controller, and pressure transmitter. 888/342-5753; www.sjerhombus.com.

Ditch Witch vacuum excavator

The 49 hp FX50 vacuum excavator from Ditch Witch is designed for cleanup and soft excavation tasks, including cleaning out sewers and valve boxes, horizontal directional drilling support, removing road construction debris, posthole digging and exposing utilities. The unit can be configured with a choice of four water tanks (80 to 500 gallons), four spoils tanks (300- to 1,200-gallon capacity), hydraulic boom and hydraulic valve exerciser. 800/654-6481; www.ditchwitch.com.



Xylem Goulds grinder pump retrofit kit

The Goulds Water Technology grinder pump retrofit kit from Xylem includes a single-phase, 2 hp motor (60 Hz, 3,450 rpm, 230 volts) and capacitor start with winding thermal protector. The Class F motor has a 300 series stainless steel threaded shaft and permanently lubricated upper and lower ball bearings. Piping and electrical connections for retrofitting other pump brands are included. 866/325-4210; www.completewatersystems.com/brands/goulds.



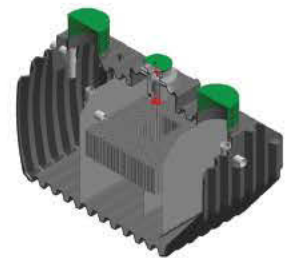
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J-500-800PLT series plastic septic tanks from Jet are a lightweight alternative to the concrete J-1500 Series BAT media plants. PLT tanks are available in treatment capacities from 500 to 800 gpd. The seamless tanks are rotational molded from lightweight polyethylene. 800/321-6960; www.jetincorp.com. □





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February 23-24, 2013 - Indianapolis, IN
Pre-Expo NAWT
info@nawt.org
April 4-5, 2013 - (TBA) Oregon
Contact: Belinda Rasmussen
(541) 389-6692 or info@o2wa.org

NAWT Vacuum Truck Technician:

February 24, 2013 - Indianapolis, IN
Pre-Expo NAWT
info@nawt.org
March 6, 2013 - Ruidoso, NM
N-MOWA - Jace Ensor at (575) 937-8304
or nmowa.president@gmail.com

Operation and Maintenance Training Certification:

February 6, 2013 - Kearney, NE
NOWWA - Contact: Jason Orton at
(402) 476-0162 or jason@h2ohoy.net

Principles of Septic System Design

February 23-24, 2013 - Indianapolis, IN
Pre-Expo NAWT
info@nawt.org

Visit www.nawt.org
for information on all
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--- Watch the NAWT website and industry publications for updates ---

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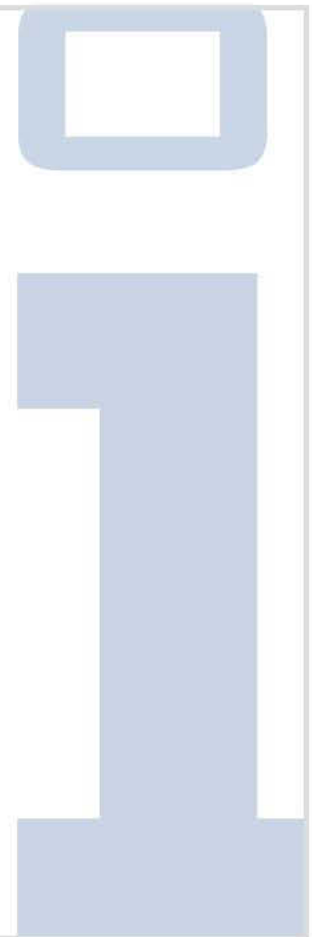
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EDUCATION DAY SEMINARS

MONDAY
FEBRUARY 25TH

NAWT

National Association of Wastewater Technicians

- 8 a.m. Introduction to Pressure Distribution
- 9:30 a.m. Designing Systems, Boundaries and Barriers from a Soils Perspective
- 11 a.m. Pump Choices and Settings: Decisions for Proper Operation
- 1:30 p.m. Operation and Maintenance of Pressure Distribution Laterals
- 3 p.m. Installing with Management in Mind: How to Get the Most out of Your System
- 4:30 p.m. Design and Maintenance of Grease Interceptors

NEHA

National Environmental Health Association

- 8 a.m. What Makes a Professional in Onsite Wastewater Systems?
- 9:30 a.m. Part One: The Science and Engineering of Onsite Wastewater Treatment
- 11 a.m. Part Two: The Science and Engineering of Onsite Wastewater Treatment
- 1:30 p.m. Education and Training: Professionalization of the Practitioners
- 3 p.m. Management Models: Management and Becoming a Management Entity
- 4:30 p.m. The Future of the Onsite Wastewater Industry: How to Make it Work for You!

SSCSC

Southern Section Collection Systems Committee

- 8 a.m. Seven Powerful Tools for CCTV Inspection Perfection
- 9:30 a.m. Easements – A Collection System Maintenance Nightmare
- 11 a.m. Nozzle Science – The Next Generation of Tier 3 Nozzles and Beyond
- 1:30 p.m. Pass or Fail – Is Your Company Going To Make It? How to Ensure Success
- 3 p.m. Social Media and Web-Based Promotion: Is it Right for Your Business?
- 4:30 p.m. Pipeline Relining and Rehabilitation Solutions

NASSCO

National Association of Sewer Service Companies

- 8 a.m. Ultraviolet Manhole Rehabilitation
- 9:30 a.m. Convey Your Stormwater and Plug Your Holes!
- 11 a.m. Jet Up! Sewer and Storm Water Cleaning
- 1:30 p.m. Rethinking Collection Maintenance with Sewer Line Rapid Assessment Tool or SL-RAT
- 3 p.m. Case Study of Cleaning Large Diameter Sanitary Sewers and Siphons
- 4:30 p.m. Pipeline Assessment Certification Program (PACP) 2013 Update Workshop

NOWRA

National Onsite Wastewater Recycling Association

- 8 a.m. Time Dosing ... Why? How? And How Much?
- 9:30 a.m. Loading Rates – How Much Can the Soil Take?
- 11 a.m. Troubleshooting Pumps, Floats and Panels
- 1:30 p.m. The Dirty Dozen – Toxins That Kill Septics
- 3 p.m. How Installers Can Use the Poor Economy to Increase Profits
- 4:30 p.m. Are Seepage Pits Really Bad?

- 8 a.m. Designing Drip Dispersal Systems
- 9:30 a.m. Soil Erosion Control During and After Septic System Installation
- 11 a.m. Decentralized Wastewater Collection System Maintenance

NOWRA Room 2

SCOTT HUNTER

Business Coach

- 8 a.m. - 5:30 p.m. | 2013 - Your Best Year Ever

WJTA/IMCA

WaterJet Technology Association

- 8 a.m. Safety and Efficiency – You Don't Have to Choose!
- 9:30 a.m. Selecting the Best Jetting Tip Doesn't Have to Be Scary
- 11 a.m. Hydroexcavation – The Non-Destructive Solution

PHIL STEIN

Vacuum System Information

- 1:30 p.m. | Understanding the Power: Physics of Vacuum and How it Works

NEXSTAR

Independent Residential Service Contractors Association

- 1:30 p.m. | The Art and Science of Business Management
- 3 p.m. | The Business of Contracting

PSAI

Portable Sanitation Association International

- 4:30 p.m. | GAP: Good Agricultural Practices



DETAILED SESSION INFORMATION AVAILABLE AT:
WWW.PUMPERSHOW.COM

Education schedule subject to change without notice.



FEBRUARY 25-28, 2013

INDIANA CONVENTION CENTER • INDIANAPOLIS, IN

TUESDAY TRACKS

FEBRUARY 26TH, 2013

TRANSPORTATION AND LAND APPLICATION

- 8 a.m. Driver Compliance and Certification: How to Meet DOT Requirements
- 9:30 a.m. Staying in Compliance with 503 Regulations for Land Application
- 11 a.m. Land Application: Case Study of a Long-Term Operation

INDUSTRY SAFETY

- 8 a.m. One Piece Nozzles Enhance Performance and Safety
- 9:30 a.m. Confined Space Entry Permit and Equipment Review
- 11 a.m. Utility Line Locating

SSCSC

- 8 a.m. Making Emergency Response Your Business
- 9:30 a.m. How to Protect and Maintain Sewer Hose From Mini Jetters to Combination Units
- 11 a.m. How to be Successful in the Cleaning/CCTV Business

GENERAL BUSINESS

- 8 a.m. New Untapped Techniques to Capture Today's Customers
 - 9:30 a.m. 10 Steps to Marketing Success
 - 11 a.m. Cloud Computing for Small Business and the Field Service Industry
- 8 a.m. Don't Win the Price Game
 - 9:30 a.m. Make the Phone Ring with Low-Cost Marketing
 - 11 a.m. Local Marketing on the World Wide Web

Business Room 2

SEWER COLLECTION & REHABILITATION

- 8 a.m. Chemical Grouts and Grouting Methods
- 9:30 a.m. Watch Your Assets – Remote Monitoring Can Save You Big Bucks
- 11 a.m. Lateral Connection Rehabilitation: Biggest Bang for the Rehabilitation Buck

SPANISH/ESPAÑOL

- 8 a.m. Floods in Mexico City
- 9:30 a.m. Best Practices for Working in Confined Spaces
- 11 a.m. How to Overcome the Difficulties of Doing Business in South America

WEDNESDAY TRACKS

FEBRUARY 27TH, 2013

SEWER COLLECTION & REHABILITATION

- 8 a.m. Cash for Compliance: The New Boom in Home Sewer Replacement
- 9:30 a.m. Trenchless Point Repairs, a Low Cost Permanent Solution
- 11 a.m. Penn State University Performs Manhole-to-Manhole Lining In-House

GAS, OIL & MINING

- 8 a.m. How to Decide What Dewatering Option is Best for You
- 9:30 a.m. Blower 101: The Basic Operation of the Positive Displacement Blower
- 11 a.m. Principles and Equipment of Hydro-Pneumatic Vacuum Excavation

GENERAL BUSINESS

- 8 a.m. Save Money – Move Your Business to the Cloud
- 9:30 a.m. Morally Bankrupt
- 11 a.m. Measuring Success Matters: Your Ads, Your Agents, Your Technicians

MUNICIPAL

- 8 a.m. Benefits of Digital Side Scanning Inspection Camera Systems
- 9:30 a.m. Application for Sewer and Storm Nozzles
- 11 a.m. Grinder Pumps & Application

PORTABLE LIQUID WASTE

- 8 a.m. A View from the Receiving End: Regulatory Challenges in FOG Programs
- 11 a.m. Now You Smell Me, Now You Don't: Deodorants

NEW TECHNOLOGY

- 8 a.m. Improving Safety and Technology with Wireless Technology
- 9:30 a.m. New Technology for Locating Sewer Line Leaks
- 11 a.m. Solve Decentralized System Malfunction Issues and Site Challenges

ADVANCED INSTALLER COURSE

- 8 a.m. - 5 p.m. Presenters: Jim Anderson and Dave Gustafson
- Sponsored by Onsite Installer and COLE Publishing
- An all-day course detailing site planning and preparation



Conference on high-strength wastewater

The Ohio State University Extension will sponsor the Ohio Water Quality and Waste Management Conference April 11-12 at Woodlands in Cleves. The topic, high-strength wastewater, will feature a sand bioreactor developed at the university to treat wastewater from an Ohio poultry plant. The low-cost, odorless, park-like system has saved the Harrison facility more than \$10 million over conventional treatment. A field trip will introduce regulators, designers and installers to the system. Visit http://setll.osu.edu/programs/owqwm_conf.html for a program schedule and registration form.

Home dialysis

An article in the fall Ontario Onsite Wastewater Association newsletter alerts service entities and system designers to the effect of home dialysis on onsite systems. A treatment, often done every other day to cleanse toxins from the blood due to kidney failure, uses 100 to 1,264 gallons of water. The significant flows can upset the septic tank, flushing solids into the drainfield and precipitating failure. Author Brock Cross, project manager with Gunnell Engineer, suggests increasing the size of the septic tank or installing a pump chamber if the original vessel is large enough. He also advises inspecting the health of the field. Dialysis does not release contaminants. The bulk of the flow is purified water from pre-dialysis reverse osmosis filtration. The remaining fluid carries wastes found in urine, and the concentrations of chemicals in the dialysate are low due to dilution.

Antibiotic-resistant bacteria in wastewater

A study by the Maryland Institute for Applied Environmental Health found methicillin-resistant *Staphylococcus aureus* in wastewater entering two mid-Atlantic and two Midwest treatment plants. Onsite systems also could become contaminated as home and hospice care replace hospitals. The risk of infection exists for pumpers cleaning septic tanks and installers rehabilitating systems. Researchers found that only UV disinfection or chlorination destroyed the superbugs. They encouraged operators and service providers to wear gloves and wash their hands frequently. Visit <http://ehp.niehs.nih.gov/wp-content/uploads/2012/10/ehp.1205436.pdf>.

Frost-fighting BMPs

Minnesota Pollution Control Agency staffer Barb McCarthy reports that St. Louis County installers have adopted best management practices (BMPs) to help keep water from freezing in the 2-inch pressure pipe just after it leaves the pump tank. This portion of piping can sag as the ground settles, allowing ice to accumulate in the dip when the pump shuts off and effluent drains back to the tank. Enough ice will plug the system.

To avoid the situation, installers tamp down the backfill, especially beneath the pipe outlet. Then, they install a length of Schedule 40 4-inch pipe (less prone to bending) from the tank to the undisturbed soil, and use a reducer adapter to attach the 2-inch supply line. Workers also insulate at least the upper portions of tanks with foam board or spray foam (the latter doesn't leave gaps and also will insulate riser lids). Finally, they cover the dispersal mound with straw or other insulating material.

Electronic plan review

The Wisconsin Department of Safety and Professional Services (DSPS), Division of Industry Services, will accept onsite design plans electronically. After registering for access, designers can upload required documents in PDF format, then follow the status of the review through SharePoint communication software. "The agency wants to ensure that our profession is reasonably regulated without multiple agency staff duplicating responsibilities and slowing down the process," says Aaron Ausen, president of the Wisconsin Onsite Wastewater Recycling Association. "DSPS wants us as qualified professionals to make our own decisions."

NOWRA nuggets

NOWRA is completing development of an advanced onsite system design course at the request of the Maryland Onsite Wastewater Professionals Association. The project stems from state Department of Environment regulations requiring best available technology units for all new construction. The law became effective Jan. 1, 2013.

"We saw a big need for the course," says NOWRA executive director Eric Casey. "Many engineers contracted to design systems have little experience with pretreatment. It's usually the soils that trip them up." Numerous Maryland health officials responsible for approving, inspecting, and certifying advanced designs also will benefit from the training.

MOWPA board members, which included representatives from the state Department of Health and Mental Hygiene and MDE, reviewed the curriculum. NOWRA members Dick Otis, P.E., Bob Mayer, P.E., and Hilary Valentine, an instructor at Delaware Technical Community College, developed the course. They incorporated material from sources including the Consortium of Institutes for Decentralized Wastewater Treatment, Michigan State University, soil science and engineering communities, and elsewhere.

Otis and Valentine planned to present the first course April 23-24 and May 1. It includes classroom studies and fieldwork in which students will design two systems using alternative solutions. Two more field exercises and an exam follow in May. Visit www.mowpa.org.

In the future, NOWRA will offer a train-the-trainer course, enabling others to present the advanced design material in their states. The association also is developing an online training platform and will beta test it with one or more affiliates before rolling out the program nationally. The anticipated release is mid-summer.

CALENDAR OF EVENTS

Feb. 6-8

Kansas Small Flows Association Convention, Ramada, Hutchinson. Call Elma Ball at 913/594-1472 or visit www.ksfa.org.

Feb. 7-9

Western Canadian Onsite Wastewater Management Association of British Columbia Trade Show and Conference, Ramada Convention Centre, Abbotsford. 877/489-7471; www.wcowma.com.

Feb. 21-23

Alberta Onsite Wastewater Management Association Trade Show and Convention, Ramada Convention Centre, Edmonton. 877/489-7471; www.aowma.com.

Feb. 25-28

Pumper & Cleaner Environmental Expo International, Indiana Convention Center, Indianapolis. 866/933-2653; www.pumpershow.com.

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. Call 575/937-9429 or email carboyman@hotmail.com.

March 13-14

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, 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.

March 25-26

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

www.onsiteinstaller.com

online exclusives, classifieds, e-zines, etc....



TRAINING & EDUCATION

Minnesota

The University of Minnesota Water Resources Center has these classes:

- March 12-15 – Intermediate Onsite System Design and Inspection, St. Cloud
 - March 19-21 – Maintaining Onsite Systems, St. Cloud
 - March 25-26 – Maintainer Continuing Education, Owatonna
 - March 27-28 – General Continuing Education, Detroit Lakes
 - 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
- 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:

- March 19 – Redoximorphic Features, Soil Wetness, and Water Table Relationships, New Bern
 - March 20 – Nature's Way: Water Movement and Treatment through Soils, New Bern
 - March 27 – Soils of the Felsic/Mafic Piedmont Region, Salisbury
 - 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
- Contact Joni Tanner at 919/513-1678 or soils_training@ncsu.edu.

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

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.pisma.net.

Virginia

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

- March 4 – Foundational Concepts of Pump Systems
- March 29 – Understanding the Septic Tank, online
- April 9-10 – Water Movement in Soils
- April 12 – Nitrogen Dynamics, online

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

(continued on page 47)

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Onsite Installer magazine is written for professionals who design, manufacture, engineer and install septic systems serving both residential and commercial onsite wastewater applications

(continued from page 45)

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:

- March 13 – Troubleshooting Onsite Systems
 - March 20 – Design/Install Subsurface Drip
 - March 21 – First Aid/CPR
 - March 27 – Advanced Soils
 - April 3 – Design High-Strength Waste
 - April 17 – Design/Install Subsurface Drip, Moses Lake
 - April 18 – First Aid/CPR
 - April 24 – Pumper, Vancouver
- Call WOSSA at 253/770-6594 or visit www.wossa.org.

Wisconsin

Wieser Concrete Products offers simultaneous six-credit Septic Training seminars for: Commercial Plumbing Inspector Certification, Initial Qualifying Training - POWTS Maintainer Registration, Journeyman Plumber License, Journeyman Plumber - Restricted Service License, Master Plumber License, Master Plumber - Restricted Plumber License, POWTS Inspector Certification, POWTS Maintainer Registration, and Soil Tester Certification. The courses will be held:

- March 5 – Wieser Concrete, Fond du Lac
- March 12 – Wieser Concrete, Maiden Rock
- March 14 – Wieser Concrete, Portage
- March 19 – Arts Center, Shell Lake
- March 21 – Town Hall, Arbor Vitae

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 PO Box 220, Three Lakes, WI 54521

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PUMPS

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