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FEWER THRILLS, MORE REWARDS

Jason Birdsong left the high-adrenaline life of a 'repo man' for a less exciting but highly successful business in onsite treatment systems and storm shelters **PAGE 10**

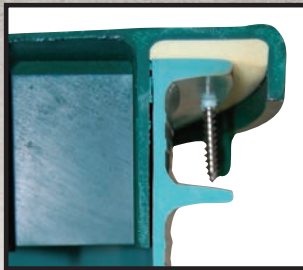
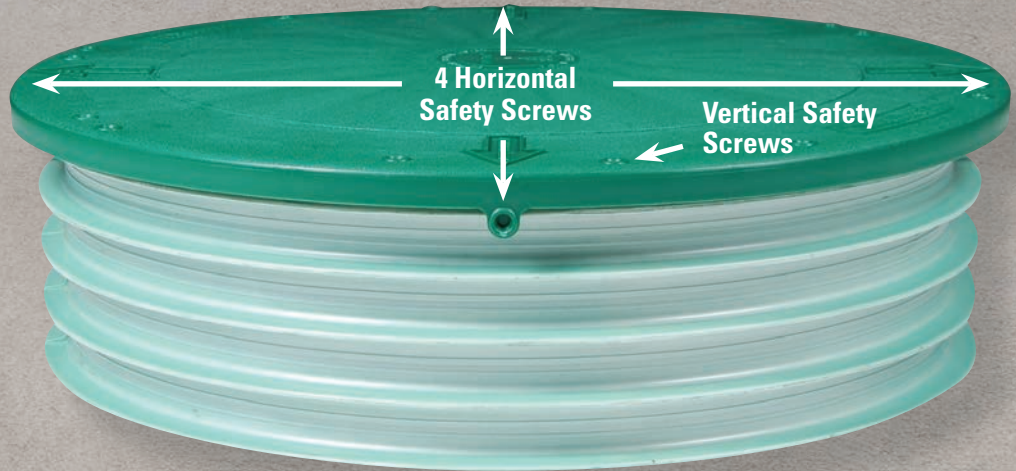
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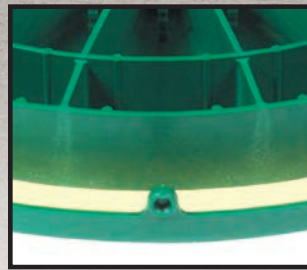
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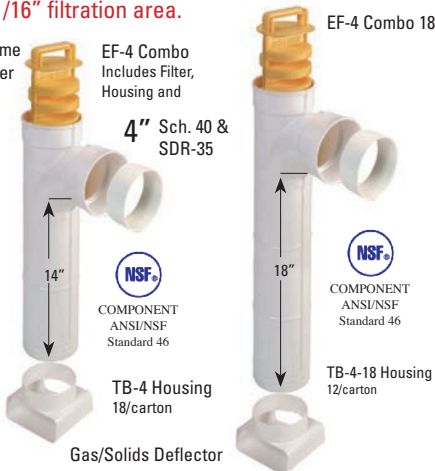


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Educate, Then Excavate to Build Your Business

Teaching is an important and often forgotten skill for the onsite installer who wants to land that next big job

By Jim Kneiszel



Working with onsite designers, permit authorities and your team of trained installers every day, sometimes you forget just how ignorant the general public can be about the operation of their septic systems. And I don't mean to sound disparaging when I use the term "ignorant," which Merriam-Webster defines simply as "lacking of knowledge or information."

To the professional installer, it seems obvious that anyone purchasing a home with a septic system would want to learn as much as they can about decentralized wastewater treatment. After all, repairing or replacing a septic system can be complex and expensive, and a working system is a prerequisite to occupancy. Let the buyer beware, right?

You always need to show your confidence to the next customer on your list. Homeowners want to be assured you'll have the right answer for their challenge. Tell them you and your crew are prepared to take care of them and will stand behind your work.

But a variety of factors can explain the uninformed consumer. It's possible a homeowner who calls you in a panic and then stares blankly while you describe a potential problem has not taken the least little step to learn anything about his or her septic system. However, it also might be that an onsite professional has never made an effort to educate the homeowner.

In either case, the way you approach a consumer with little to no understanding about onsite systems can make the difference between landing or losing a big project this summer. If your goal is to win over prospective customers during an initial site visit, it's critical to pay attention to their depth of knowledge from the moment you shake hands and walk to the backyard.

PUZZLED AND DISMAYED

A recent column in the *New Hampshire Union Leader* is a great illustration of what I'm talking about. The writer, Christopher Thompson, explained that he just purchased a home with a septic system, and that his previous two homes utilized a city sewer. He called on several installing companies, and was confused by getting different information and vastly different price estimates for a potential system replacement.

"I'm dealing with something that is completely new and a situation I really

have no experience with," he wrote. "It's puzzling and I'm a bit dismayed by the entire experience. ... The part that really blows my mind is that every company has a different opinion."

After researching on his own and talking to several installers, Thompson was ready to choose a contractor. His decision wasn't based solely on price, but on how well each installer conveyed a complex issue to a layman.

"The companies that really stood out ... were knowledgeable, consultative, and they didn't make me nervous by telling me I was in for a huge expense. They discussed the options and took the time to help me really understand what needed to happen and what they could do to help," Thompson wrote.

CUSTOMER SERVICE PAYS

Thompson said one company responded quickly and was willing to provide an estimate quickly. "They also gave me a list of about 50 references to call, should I have the desire to get feedback from their customers. That was a nice touch."

Thompson said homeowners who thoroughly check their options will see a few installers stand out from the crowd.

"And for something as serious and expensive as this, you can bet I'll be choosing a company that knows what they are doing and also has the customer experience skills to make us feel comfortable with the decision," he concluded.

I found the column provided an interesting look into the psyche of a potential onsite system customer. At first frustrated and overwhelmed by ignorance, Thompson sorted through the issue and eventually validated what I've always felt is important about customer education: Preparation, patience and being a good listener pay off.

BE THE PROFESSIONAL

So here are a few tips to remember the next time you go out to meet a homeowner for the first time:

Show up on time and with a professional appearance and demeanor.

"On-time service" doesn't only apply to when you show up with the excavator and a crew to dig a new drainfield. Make sure to show up on time for every appointment. In Wisconsin, where I live, many business owners try to live on "Vince Lombardi time." When the legendary Green Bay Packers coach set a meeting time, players were expected to show up 15 minutes early

because that's when the fanatically disciplined Lombardi would be there. If you adopt that attitude, staying on time will be ingrained in every task for you and your crews. And when you meet with a new customer, wear a clean uniform or business-casual attire that reinforces your attitude. Sloppiness can quickly disrupt the professional image you want to portray.

Listen to the potential customer before launching into a sales pitch.

Take time to hear what customers are saying about their onsite system. Let them air their concerns, fears and frustrations before you ask follow-up questions specific to their system issues. If they need a new system, learn about their family, the way they use water and appliances and their expectations for service. Are they moving from municipal sewer service and expecting the same type of usage from their onsite system? When you know about their experiences with water and wastewater, you are better prepared to give them a realistic picture of onsite system performance.

Express confidence that you can help the customer with their problem.

As an experienced installer, you've encountered a wide variety of onsite situations and come up with many workable solutions for your customers. Whether it's replacing an older system on a small lot or devising an advanced system for a waterfront property, you've solved the puzzle satisfactorily. You always need to show your confidence to the next customer on your list. Homeowners want to be assured you'll have the right answer for their challenge. Tell them you and your crew are prepared to take care of them and will stand behind your work.

Back up and explain how an onsite system works.

Don't make any assumptions about what customers know about onsite systems. Unless they tell you otherwise, consider that you're working with a blank slate and you need to start with Septic 101 when you meet them. And reinforce your lessons with helpful graphics that show how a septic system works. A variety of great drawings, photos, videos and other consumer-oriented education materials about onsite systems are available online. Arm yourself with these teaching aids when you make a presentation.

Share a realistic outlook for the potential cost of a system replacement.

While it may not be possible to give a full and complete estimate for a system on an initial customer visit, it's OK to talk dollars and cents to the degree you are comfortable. Realize the money question is always going to be on the top of your new customer's list, so be frank and realistic in your appraisal of the situation. Uneducated customers have no idea what it will cost and probably fear the worst. They might actually be relieved and the price range you give them to repair or replace a system may be less than what they expected.

Provide references.

It's a great idea to build a solid list of past customers willing to give references for your work. Have your reference list reflect the broad spectrum of the work you perform. Include system repairs and replacements, residential and commercial projects, conventional and advanced systems. Call each of these potential references and make sure they are willing to take calls from potential customers. And make sure they'll be giving you a positive review! Tailor each list of references to the type of job or customer who's considering hiring you. You don't just want to give references; you want to give references that will help the new customer make a decision and set you up for success. ▣

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Tank Deterioration Discussion Continues to Baffle Me

To the editor:

In the January issue of *Onsite Installer*, Jim Anderson and David Gustafson stated in their Basic Training article entitled “We Have an Answer for This Baffling Question” that “there must be air clearance of at least 1 inch between the top of the baffles and tank cover to provide for movement of gases and proper venting. Without the clearance, there will be excessive corrosion and deterioration due to accumulation of gases around the outlet baffles.”

The authors have yet to present any scientific evidence that validates their open-baffle and 1-inch clearance theories. On the other hand, I have hundreds of photos documenting baffles in septic tanks from the 1950s, ‘60s, ‘80s and ‘90s that are completely closed off by design to any air space, and there is no evidence of corrosion in the tank and no complaints from homeowners about septic odors.

Furthermore — and I have made this point in numerous presentations at multiple venues — most effluent filters are closed at the top, thus preventing any venting and impeding the movement of gases from the drainfield back to the septic tank via its outlet.

I look forward to discussing my documentation with the person responsible for the open-baffle theory and comparing it with his/her documentation.

Dawn Long
American Septic Service
Sierra Vista, Arizona



<<LEFT: A precast tank from 1979 with no air space above the baffles and no sign of hydrogen sulfide deterioration.

BELOW: A 1980s septic tank with inlet and outlet baffles precast through the lid. The T-baffle (not visible) is cast through the side. Note the closed outlet baffle and no signs of hydrogen sulfide deterioration. (Photos courtesy of Dawn Long)



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KEEPING IT SIMPLE ATU Mastery

This month's cover star Jason Birdsong is no novice when it comes to onsite system installation. He and his crew install about 70 systems a year. But when it comes to ATUs, which make up the majority, he likes to keep it simple. Look for this exclusive online story to read his tips and see why he prefers not to rely too much on electronic components. onsiteinstaller.com/featured

Overheard Online

“Try to keep yourself in a networking frame of mind all the time; any time you meet someone new, view it as a potential opportunity.”

- 8 Ways to Get Better at Networking

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TECHNOLOGY TO THE RESCUE

Remediation Options

If a system relies on soil treatment, what do you do when the treatment area is organically or hydraulically overloaded? It's usually possible to remediate the area and provide pretreatment using an ATU and media filters. Read up on the process in this exclusive online story from instructor Sara Heger. onsiteinstaller.com/featured

AN EYE ON EXCAVATORS

Model Maintenance

Excavators have come a long way since being invented over 60 years ago. They're more reliable and suffer fewer mechanical breakdowns. But all equipment still needs routine maintenance to continue running smoothly. Check out this story on excavator maintenance and make sure you're taking proper care of your equipment. onsiteinstaller.com/featured



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Jason Birdsong left the high-adrenaline life of a 'repo man' for a less exciting but highly successful business in onsite treatment systems and storm shelters

By Ted J. Rulseh | Photos by Kelcey Nobles

Jason Birdsong admits he liked the “adrenaline rush” of repossessing cars from owners who didn’t make their payments.

But when the repo business became less profitable, and when the occupational hazards included bullets whizzing over his tow truck, he decided to look for something more sedate. Today, he owns J & T Service Co., specializing in onsite systems and excavation, and Survivor Shelters, installing storm shelters within Oklahoma’s “tornado alley.”

It has been a profitable transition. He and his seven-member team install about 70 onsite systems per year — 80 percent of them with aerobic treatment units — and about 100 storm shelters. J & T Service also does a brisk business in maintaining ATUs within a 50-mile radius of home base in Claremore, about 15 miles northeast of Tulsa.

The businesses are founded on the ideal of providing quality work and responsiveness to customers. Aggressive marketing through conventional and social media channels helps keep the companies top of mind in the marketplace, and innovative financing helps make the offerings affordable.

STEALTH OPERATIONS

Birdsong grew up on a small beef farm near Claremore; he learned about machinery while working around his grandfather’s larger farm. After high school, though, he headed in a different direction, riding with and helping local “repo men.”

J & T Service Co., Claremore, Oklahoma



FOUNDED:	2006
OWNER:	Jason Birdsong
EMPLOYEES:	7
SERVICE AREA:	50-mile radius
SPECIALTIES:	Installation, maintenance, waterline installation, storm shelters
BUSINESS MIX:	40 percent installation, 40 percent storm shelters, 20 percent general excavation
WEBSITE:	www.jtserviceco.com

He eventually started his own repossession business. “It’s a feeling that’s hard to describe,” he says. “More or less, it’s like legally stealing cars. You drive around in the middle of the night and try to outsmart the people, because they’re trying to hide the cars from you.” He drove a special tow truck, sometimes maneuvering into backyards to hook up to a car, once in a while dragging a car sideways.

<<OPPOSITE PAGE: The J & T Service crew includes (back row, from left) Jason Birdsong, Josh Calvert and Jeff Eagle; (front row, from left) Charlotte Teehee, Becky Swan and Breanna Perry.

>>RIGHT: J & T Service owner Jason Birdsong digs a trench to run an effluent line at a residential installation. The company occasionally rents a trencher to work in very tight spaces rather than use a mini-excavator.

After a few years, Birdsong sold his business to another company and went to work for that firm, which a larger company then acquired. In time, the repossession business began to sour. “When I started in repo, I was making \$500 a car, and at the end I was making \$125,” Birdsong says. “What really did me in was that I had a wife (Erin) and a little girl (Delia), and I was being shot at about every couple of weeks. I decided that \$125 a car wasn’t really worth it.”

While still working in the repo business, he bought a tractor with a box blade and started doing earth-moving work on the side. Next he bought a skid-steer and broadened his offerings. He then connected with another contractor, Bill Vinson, who began giving him overflow work.

“When I started in repo, I was making \$500 a car, and at the end I was making \$125. What really did me in was that I had a wife and a little girl, and I was being shot at about every couple of weeks.”

Jason Birdsong

“I started installing septic systems here and there, and finally I got enough work where I could get out of the repo industry,” Birdsong says. “I sold my repo truck, bought a backhoe and got my installer certification. I took the ball and ran with it, and now Bill is one of my team members.”

COHESIVE TEAM

There are usually seven team members. Becky Swan, office manager, handles day-to-day matters, deals with credit unions on customers’ financing and helps with storm shelter sales. Birdsong’s mother, Charlotte Teehee, serves as controller. Breanna Perry helps in the office, handles social media marketing and works weekends.

In the field, Birdsong and Vinson (head installer) lead projects with support from Josh Calvert and Jeff Eagle. Extra workers help with storm shelter installations during tornado season.





Jason Birdsong runs electrical lines during a system install. The risers and lids are from Tuf-Tite and the tank was provided by Allegiant Precast.

The company's equipment inventory includes two Case 580 Super L Series 2 backhoes, a Caterpillar skid-steer with numerous attachments, a Bobcat mini-excavator, two service trucks and a Massey Ferguson box blade tractor.

Onsite treatment work has grown more challenging with changes in state regulations. "Until four years ago, for every 10 systems we installed, eight were conventional," Birdsong says. "Now eight out of 10 are aerobic treatment systems."

The biggest reason for that is what installers call the Creek Law, which says any system within 1,320 feet (1/4 mile) of a water body that is or leads to a public drinking water supply requires an aerobic treatment unit. Systems within 600 feet of such water bodies also require nitrogen reduction.

Oklahoma's geology can make installations extra challenging. Much of J & T Service's territory has limestone bedrock under as little as a foot of soil. Aerobic treatment systems typically discharge to spray irrigation, for which the company uses purple piping (the standard color coding for reclaimed water) and K-Rain sprinkler heads.

For conventional systems, J & T Service uses precast concrete septic tanks (Allegiant Precast) and washed rock drainfield media. The ATU of choice is the NuWater extended aeration system (Enviro-Flo).

MAKING IT AFFORDABLE

Birdsong doesn't claim to be the lowest-cost installer, yet he strives to help customers afford new systems — especially important in the case of replacements for failed systems. He does this by helping to arrange zero-

(continued)

TO THE RESCUE!

J & T Service gets lots of marketing mileage out of its service truck. Looking for a vehicle with ample space for tools and parts inventory, company owner Jason Birdsong considered various vans and U-Haul rental trucks, but in the end he bought an old ambulance.

He kept all the vehicle's emergency lights but converted them to yellow. The unit has a brand-new wrap that includes an orange stripe down the side and the company's logo in bold color. "It stands out," Birdsong says. "People remember it."

Its spacious interior also makes it highly practical: "Ninety percent of our service business is working on systems other people installed. That means I may have to carry nine different parts for one little joint that everybody does differently. Having space for all those parts saves the time it takes to drive to the parts store."



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Shelter from the storm

Storm shelters are a booming business in Oklahoma, which receives more than its fair share of the 1,000 or so tornadoes that strike the United States each year.

Jason Birdsong got into the business after his septic tank precastor began producing storm shelters. But he didn't stop with just one product line. Birdsong noticed sellers of the various types of shelters — concrete and fiberglass, inground, in-garage, in-home — all claiming to be the best. The result was customer confusion.

Birdsong chose a different approach, launching a Survivor Shelters superstore where he offers multiple models. "If it's made, I sell it," he says. "Now when people come to me, I can tell them there is no one right storm shelter for everybody. I tell them the pros and cons of each shelter and help them choose one that fits their budget."

He offers zero-interest financing arranged through a local credit union: "I even have a shelter they can get if they can't be approved for the zero-interest loan. It's basically a buy here/pay here shelter, in-house financed. As long as they have a job and a heartbeat, they can get a shelter. There is no reason anybody should leave my store without a shelter."

The company offers Lifesaver shelters in fiberglass underground, safe room and in-garage models. The buy here/pay here model is by Defiance Shelters. What happens if a buy here/pay here customer doesn't pay? "It's in our contract that we will get a replevin from the court system at the cost to repossess it," says Birdsong. "So far we have not had to repossess any — just persuade a couple of people that it wasn't in their best interest for us to do that. They paid."

The shelter business goes ballistic after major storms. "A tornado hits the ground, everybody wants a storm shelter yesterday," Birdsong says. "After the last big tornado, I literally had to turn the phones off. Within three days, I was booked for eight months."

interest financing through a local credit union. In essence, he buys down the market interest rate and adds the interest cost to his bill.

On one recent job, a couple had just bought a house, only to find later that the septic tank lid had collapsed. A closer look showed that the drainfield had failed. "Their whole system was junk, and because of the new laws they needed an aerobic system," Birdsong says. "They were facing an expense of several thousand dollars."

In such cases, if the owners have acceptable credit and a good work history, they can qualify for the financing. Birdsong gets paid up front, and the owners get their new system with a monthly payment they can afford.

Once an aerobic system is in the ground, state law requires the installer to maintain it for the first two years. After that, owners can contract for maintenance or take care of the system on their own and submit the maintenance logs to the state Department of Health.

Birdsong encourages customers to contract with J & T Service and offers a choice of two management programs, for which they can pay monthly or annually. The Standard Service offering includes two annual visits for basic maintenance and inspection. The Elite Service offering, at roughly four times the price, also covers pumping (by a subcontractor) in alternate years, plus the cost of any components that need replacing. About 60 percent of customers who opt for management programs choose the Elite package.

"It's easy to justify," says Birdsong. "Suppose their effluent pump goes out. Now they have to pay \$500 to have the system pumped so we can work on it, and the pump and primary floats cost another \$500 to \$600. They're looking at \$1,000 easily for the service call, whereas for an annual cost less than that, they get the Elite Service contract." J & T sells the contracts even for systems it did not install, provided the systems are in suitable working order.



Technician Jeff Eagle operates a Case 580 Super L Series backhoe during an installation.



Technicians Josh Calvert and Jeff Eagle install a new Hiblow septic aerator at the Verdigris, Oklahoma, Police Department. J & T Service has a maintenance agreement for the system.

“When I install a system, if I see that the owner is home, I knock on the door. I ask them, ‘Have you had a septic system before? Have you ever had an aerobic system?’ I give them a brochure that tells what to do and what not to do.”

Jason Birdsong

ONE-STOP SERVICE

Another money-saving offering from J & T Service is essentially a one-stop site preparation service for new homes. It started through a relationship with Ubuiltit, a company that provides consultation services to help people build their own homes.

For Ubuiltit projects, and for a few other builders who have come on board, J & T offers to clear the site if needed, pour the house pad, grade the yard for proper drainage, prepare a gravel driveway, and install the waterline and septic system. “We do all that in one to two days,” says Birdsong. “They don’t have to wait for the plumber, wait for the house pad guy, and coordinate all the different contractors’ schedules.”

Good word-of-mouth and effective marketing help keep this and all services humming. J & T Service and Survivor Shelters operate from the same location with frontage on a major highway and a billboard on the property. Each business has its own website. They print and distribute brochures and flyers on the various services and exhibit at farm and home shows.

Birdsong uses Google AdWords and Facebook to market specifically to rural couples who own homes; calls on Scott Roy of Trigger-Switch Marketing Services to design printed materials, including T-shirts; and IT consultant Charles Roush is available to help with computer issues.

TEACHING MOMENTS

An effective team helps Birdsong spend time on what he regards as a critical task: educating customers. “When I install a system, if I see that the owner is home, I knock on the door,” he says. “I ask them, ‘Have you had a septic system before? Have you ever had an aerobic system?’ I give them a brochure that tells what to do and what not to do.

“There is a third option on my maintenance program: For a one-time fee, I will teach them everything they need to know. Education is a big deal. It’s very important in whether these systems work right. The more people know about their systems, the better.” □

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Don't Drive Away Without Providing Finishing Touches

An onsite installation isn't done until you've addressed proper grading, landscape design and erosion control

By Jim Anderson and David Gustafson

How you put the finishing touches on a completed onsite system will have a huge impact on both the longevity of the system and enduring customer satisfaction about the project. Ensuring proper operation of the system and meeting the homeowners' vision for how they want the property to look is critically important. If ongoing maintenance or service is part of your business plan, taking care with the final details opens a path to continually connect with customers into the future.

Talk with homeowners about how they want the area around their system to look after vegetation is established. Finish the area to accomplish this vision, or if that vision would create problems with long-term system operation, have that conversation with them and come up with a solution. If you or your company do not want to be involved with the actual planting of vegetation over and around the system, establish relationships with landscapers in your area. Know who to suggest the homeowner contact and know what those planting needs will be so when you leave a site, the area is ready for that planting to occur.

The area around the system should be graded to ensure runoff water is directed away from the system and proper erosion control measures have been used to make sure soil over the system is not eroded with the first rainstorm after installation.

PREVENT RUNOFF

In terms of finishing the system, it is not enough to simply provide a smoothed-off surface with all of the associated trash removed. It is amazing to us how many sites we go to where this is the level of job completion. The area around the system should be graded to ensure runoff water is directed away from the system and proper erosion control measures have been used to make sure soil over the system is not eroded with the first rainstorm after installation.

Necessary erosion control depends on the location of the system near bodies of water or drainage ways and land slope. On nearly level sites away from any water body, a straw mulch can be used to protect the soil from raindrop impact and reduce erosion and soil movement. For sloping sites, an erosion control blanket should be used. These blankets are usually

composed of straw or coconut fiber layers between two jute-mesh layers. They are staked in place over the surface, over and surrounding the system. They can be left in place because they are meant to biodegrade and will disappear over time.

If the final landscape includes larger plants, a hole can be cut through the blanket to allow for the planting. Very often the site is seeded and the blanket laid over the top; whether this is the case depends on the final vision for the area. There are also blankets infused with ground cover seed. All these materials can be purchased through a landscape supplier. If you are putting in large numbers of systems, it will be less expensive to go directly to a wholesaler.

WORK WITH A LANDSCAPER

A landscaper we have worked with suggests using erosion blankets made of materials native to your area. Specifically, we do not have coconuts in Minnesota and Wisconsin, so we would not choose that product. His rationale is that you don't know what other characteristics these materials will have that might potentially inhibit the growth of native plant species. This makes sense. Why bring something foreign to the area if you have choice? We expect letters from landscapers asserting these blankets have been used extensively without any negative effects. This is true, but if there is a choice, go with the local materials and then there is no question.

If you're installing a system next to a waterway, you may be required to install a silt fence, usually a geotextile fabric staked along the contour to prevent silt or clay moving with runoff water from continuing downslope. The fences should be installed before any excavation or soil disturbance takes place on the site. An alternative is to use straw bales, staked on the contour. With the ease of installation of the fabric fences, straw bales are not used much anymore. The need for this is site and regulation dependent, but it is your responsibility as an installer to provide erosion control for the site.

In our cold environment it is important to have a vegetative cover of some type over systems. The vegetation provides some degree of insulation and holds snow in place to further insulate the system. This includes all parts of the system: septic tank, piping and soil treatment area. Snow prevents heat from escaping the soil, keeping the frost depth shallow. So if the installation is completed at a time of the year where vegetation will not be established, adding additional layers of straw over the area may be required to help prevent problems due to freezing. ❑

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EPA Clean Water Act Changes Remain in Limbo

By Doug Day

NATION

A Congressional attempt to block the U.S. Environmental Protection Agency's revisions to the Clean Water Act has failed. President Barack Obama vetoed proposed House legislation to block the law. The Senate had passed its version of the bill in November. The EPA is still not enforcing the Clean Water Act changes because a federal court blocked the law in 2015 while the courts continue to review challenges to the revisions. The EPA has said the changes clarify the law and apply it to fewer bodies of water than before, while opponents claim they expand the agency's power beyond what is allowed by the Clean Water Act. The votes in both houses were far short of the two-thirds required to override the veto, 53-44 in the Senate and 253-166 in the House.

ALBERTA

All holders of an Alberta Private Sewage Certificate of Competency must complete a training course covering the province's updated regulations. The Private Sewage Systems Standard of Practice 2015 went into effect in January. Certified onsite professionals must update their training by March 31, 2017. About 1,200 people will require the training. The Alberta Onsite Wastewater Management Association will be providing a number of courses on the new standards across the province.

NEW YORK

Residents of the watershed serving New York City who replaced or repaired septic systems in 2015 may be eligible for reimbursement for some of the cost. The Catskill Watershed Corporation had offered funding assistance last year, but only to those homes in priority areas close to bodies of water. Because the funding is still available, the group is now accepting applications from those who could not get assistance last year. Permanent residents of the watershed west of the Hudson River can get up to 100 percent of the cost covered, while part-time residents are eligible for reimbursement of up to 60 percent. The assistance program last year funded 276 septic system repairs and replacements, and aided in paying for 224 systems being pumped and inspected.

ILLINOIS

A barge company is facing about \$20 million in fines for illegally dumping sewage and wastewater into the Ohio River over seven years. The U.S. EPA

alleges more than 550 violations and seeks up to \$37,500 per case in a complaint against American Commercial Lines and a subsidiary, ACBL Transportation Services. A company spokesman says the discharges were related to two malfunctioning sanitation units and were self-reported when discovered. The complaint, filed under the Clean Water Act, claims the company discharged sewage and wastewater from two office septic systems, a marine sanitation device and a barge-cleaning operation from 2007 to 2014, exceeding permit limits for BOD, TSS, total residual chlorine and fecal coliform. The fecal coliform limits were exceeded on more than 50 occasions with levels nine times or higher than allowed, and were 100 times over the limit in at least 16 cases, the complaint claims. During one reporting period in 2009, the EPA reports chlorine was more than 700 times higher than allowed.

VIRGINIA

The state Department of Professional and Occupational Regulation is reviewing licensing requirements for onsite soil evaluators, onsite sewage system installers and onsite sewage system operators. The regulations have not been reviewed since 2009. According to the board's notice, the routine review is to make sure the regulations reflect current laws, procedures and policies, and to correct any errors. Meanwhile, the state Department of Health is reviewing its regulations for alternative onsite sewage systems. Both are periodic reviews and the agencies have invited public comments and suggested changes.

NOVA SCOTIA

Effective May 1, most onsite sewage system installations will require only a notification to Nova Scotia Environment rather than approval. To qualify, the system must meet the province's new On-Site Sewage Disposal Systems Standard. A professional engineer or "qualified person" must determine the best type of system and location, and inspect and certify the proper installation by a certified installer. The homeowner has the legal requirement to have an adequate system and must maintain it in working condition. The owner is also required to notify NSE of any malfunctions or release of untreated or partially treated sewage to the environment. □

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Spoil Sport

Working on unstable stone and soil posed intriguing challenges for the design and installation of a coal mine shower and office facility

By **Scottie Dayton**



Officials at Triad Mining wanted to open a new underground coal operation at its Log Creek Mine in Spurgeon, Indiana. In preparation, they built a structure housing lavatories and showers for 90 miners working two 12-hour shifts, an administrative office and a machine shop.

Tom Sutton, Triad general manager, hired Mark Hacker, owner of Hacker Plumbing and Drilling in Vincennes, Indiana, to design the onsite system. “The greatest challenge was being surrounded by hundreds of acres of mine spoil up to 80 feet deep,” says Hacker. “There wasn’t one area with undisturbed soils for the drainfield.”



Zak Sherman from Infiltrator Water Technologies (left) and Mike Haddon from Indiana State Department of Health connect two conduits using the provided 4-inch internal pipe couplings. (Photos by Robert Densmore, Zen Photo Arts)

He turned to David Ralston, president of Soil Tech Inc. and a soil scientist with mine spoil experience. “Dave found a usable site and was our intermediary with the state Department of Health,” says Hacker.

The department had assigned a loading rate of 0.25 gpd per square foot for disturbed soils, but significant voids between boulders threatened to short-circuit effluent. Hacker, concerned about achieving uniform treatment levels, called Dennis Hallahan, environmental engineer at Infiltrator Water Technologies, for design assistance.

Their solution treats effluent via a pressurized modified hybrid sand filter that reduces the drainfield’s footprint by almost half. “Instead of needing 4,200 feet of pipe-and-stone trenches, we met the application rate with 2,000 feet of Infiltrator advanced treatment leachfield conduits,” says Hacker. According to Hallahan, Log Creek is the largest ATL installation in the country to date.

SITE CONDITIONS

Soils are well-drained mine spoil (large and small boulders mixed with soil), shale and limestone.

SYSTEM COMPONENTS

Hacker and Dale Kruse, P.E., of Kruse Consulting, designed the system to handle 3,150 gpd. Major components are:

- 3,500-gallon concrete sediment tank (precast single-compartment tanks from Rex Vault Services, Odon)
- Two 3,500-gallon septic tanks with PL-525 effluent filter (Polylok) at second tank outlet

<<OPPOSITE PAGE: Mark Hacker uses a Spectra Precision Laserplane 500 to ensure sand beds are level at the Triad Mine in Spurgeon, Indiana.

>>RIGHT: Hacker employee Rich West positions the spacer Mark Hacker (far right) designed as he sights down a row of Infiltrator ATL conduits.

- 3,500-gallon dose tank with duplex SP33 1/3 hp Barnes pumps (Crane Pumps & Systems)
- Two two-hole distribution boxes (Rex Vault Services)
- 200 ATL conduits (Infiltrator Water Technologies)
- Duplex control panel (Septic Products Inc.)

SYSTEM OPERATION

Showers in the primary locker room drain to the sediment tank through a 4-inch PVC pipe. Graywater, comprising 75 percent of the hydraulic flow, then enters the first septic tank, as does wastewater from a second 4-inch pipe leaving the building.

The system relies on gravity until effluent reaches the dose tank with two 2-inch force mains, one each for zones one and two and zones three and four. Twice daily, on-demand alternating pumps discharge 750 gallons at 30 gpm, 100 feet to the designated zones. The 102- by 22-foot zones with five 100-foot-long laterals on 24-inch centers create a 408- by 88-foot drainfield.

A 4-inch distribution pipe inside the 10-foot-long by 12-inch-diameter conduits has 1/2-inch orifices spaced 6 inches apart at 2, 6 and 10 o'clock positions. Dosed effluent percolates down through large-diameter engineered aggregate encased in coarse geotextile, then small-diameter engineered media in fine geotextile. After leaving the conduits, liquid infiltrates through 24 inches of system sand (ASTM C33) to mining spoil.

"Instead of needing 4,200 feet of pipe-and-stone trenches, we met the application rate with 2,000 feet of Infiltrator advanced treatment leachfield conduits."

Mark Hacker

"The system is designed to infiltrate the dose volume before the next one arrives," says Hallahan. "However, the conduits have adequate storage capacity to handle abnormally high flows, then infiltrate them over time." During NSF/ANSI Standard 40 testing, the system achieved average treatment levels of 9 mg/L CBOD5 and 11 mg/L TSS.

INSTALLATION

Hacker and his four employees ran sewer lines 200 feet to the septic site, then Brandon Spanger, co-owner of B & M Excavating in Westphalia, Indiana, over-excavated the four 11-foot-deep tank holes by 50 percent using a Volvo EC300DL long-reach machine. "Mine spoil wants to cave in or slough off, making excavations challenging," says Hacker. "Brandon has the expertise to keep my men safe."

Safety was a major issue for those working around the long-reach excavators. The crew wore bright-colored safety vests, to increase visibility, and hard hats. "I stressed vigilance and caution every morning," says Hacker. "The installation was simple, and I didn't want that lulling the men into complacency."



SYSTEM PROFILE

Location:	Spurgeon, Indiana
Facility served:	Coal mine shower complex
Designers:	Dale Kruse, P.E., Kruse Consulting, Avon, Indiana; Mark Hacker, Hacker Plumbing and Drilling, Vincennes, Indiana
Installer:	Mark Hacker
Site conditions:	Well-drained mine spoil, shale and limestone
Type of system:	Advanced treatment leachfield, Infiltrator Water Technologies
Hydraulic capacity:	3,150 gpd

It took two days to excavate the holes and set the tanks on 24 inches of compacted crushed limestone. "Mine spoil is fluid and cobbly, requiring deeper beds to stabilize the tanks," says Hacker. Rex Vault Services delivered the tank halves and set them, then Triad employee Randy Moore backfilled using the mine's Caterpillar 320C long-reach excavator.

Digging the conduits' 24-inch-deep trenches held no safety concerns. They were filled with washed sand and the conduits laid on top. The system depends on 12 inches of sand between conduit rows, 12 inches adjacent to the first and last row in each zone, and 12 inches extending beyond both ends of the rows.

(continued on page 23)

Free Online Tool Helps Educate Onsite System Customers

The University of Minnesota created a customized owner's guide to raise awareness about proper use and maintenance of septic systems

By David Steinkraus

Many agencies and organizations offer an owner's guide for wastewater systems, but they are generic or limited to one or two major components. No comprehensive guide has been available for customers' particular systems — until now. With funding from the U.S. Department of Agriculture, the University of Minnesota Water Resources Center has developed online software that wastewater professionals can use to create customized guides that tell customers about their specific system.

It's called the Community Septic System Owner's Guide and installers can register and use the tool for free by going to www.h2oandm.com.

"The easiest way to describe it is to say it's like TurboTax, the online tax-preparation software. You put the specifications into the online form, and the software draws in related information to generate the guide," says Sara

Heger, a Ph.D. engineer and researcher at the Water Resources Center who led the project.

The guide is suitable for single-family homes, cluster systems or commercial buildings. Research partners in other areas of the country also looked at the software, and the result is a tool that adjusts for climates and conditions other than Minnesota's.

At the end of the process, the software generates a PDF file that can be shared electronically with customers, printed for them, or posted on the web-

site of a homeowners association responsible for a cluster system. Guides average 20 pages, but the complexity of a system and the number of photos or other graphic elements can change that. Stock images of a septic tank and other components are available, but the owner's guide can be enhanced with manufacturers' images of specific components. Companies will be able to customize guides with photos from each job so clients see exactly what they have.

"The industry can help itself, and professionals will look better to customers, if they give people the information they need to help themselves."

Sara Heger

GETTING STARTED

Once wastewater professionals create online accounts, they can set up a template. With photos and other information stored in their online account, and with practice, they can generate a new customer guide in five to 10 minutes, she says.

"For most people, I think the biggest barrier to using any type of software tool like this is that first project," Heger says. "It's working through the options and learning where to go."

The tool will work for systems that are installed now and for those installed 20 or 30 years ago. People who have just paid for a new system may be more receptive to education, but supplying a custom guide for an older system builds credibility with customers, too, Heger says.

People who have seen the online tool are excited and have their own ideas for it, Heger says, such as linking it to maintenance scheduling software. That may come in future versions, but updates will require more funding, Heger says. The USDA grant runs through August, providing enough time for finishing tweaks. For example, the software was adjusted to take into account regional names for the same thing: A low-pressure pipe system in one part of the country is called a pressure trench elsewhere.

"For this version we wanted to cover the basics, and we did that. I will never pretend this will cover 100 percent of the systems installed, but I hope it will cover more than 95 percent."



Contact Sara Heger at 612/625-7243 or sheger@umn.edu.

A webinar covering the *Community Septic System Owner's Guide* will be held **May 25, 2-4 p.m. (Eastern time)**.

>> For more information go to www.septic.umn.edu and look under "upcoming workshops." <<



Backfilling continues around the two 3,500-gallon septic tanks and 3,500-gallon dose tank bedded on 24 inches of compacted crushed limestone.

(continued from page 21)

To ensure the proper distance between conduits, Hacker designed and fabricated five spacers from reinforced 1-inch PVC pipe. "I wanted something that was white, lightweight, rugged and reusable," he says. "The spacers also prevented the conduits from shifting during backfilling."

Hacker used a Spectra Precision Laserplane 500 to ensure the sand beds were level before his crew laid the first five conduits in series. They used Hacker's spacers to maintain 24-inch centers, then connected the second series of conduits end to end with 4-inch internal pipe couplings. As soon as they moved to the next series of tubes, Moore backfilled the previous rows with sand. Once Moore stabilized the previous rows with sand, workers moved the spacers to the next series, enabling Moore to finish backfilling. Each zone took two days to install, then it was covered with 12 inches of topsoil hauled from another area of the mine and seeded.

MAINTENANCE


Hacker holds the annual renewable maintenance contract. Twice a year, he checks the pumps, capacities, floats, alarms and drainfield.



HELP FOR EVERYONE

It's not only designers, installers and pumpers who can use this, Heger says. County sanitarians, health department officials, or state natural resources staff may also find this guide a useful tool.

No other major household or business purchase comes without technical documents, she says. Buy a car, a computer, or a refrigerator, and there is a manual for each. But costly and complex wastewater technology doesn't typically come with an operations manual, she says.

"The industry can help itself, and professionals will look better to customers, if they give people the information they need to help themselves," Heger says. 

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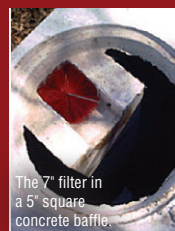


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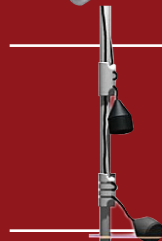


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The Onsite Wastewater Professionals of Illinois favors continuing education, licensing measures to improve systems and protect the environment

By Doug Day

You used to be able to get an installer license in Illinois by simply writing a check. Requiring an exam and continuing education has improved the qualifications of installers and pumpers, and regulatory changes over the years have improved the quality of systems going into the ground.



Rick Maguire
OWPI

The Onsite Wastewater Professionals of Illinois was formed in 1997 in response to proposed septic code changes, according to Rick Maguire, past president of the group and former member of the Illinois Department of Public Health Onsite Wastewater Advisory Commission, and Steve Johnson, a founding OWPI member and current board member, who also chairs the group's annual conference committee. The organization now has about 300 members.

There's a complex history in Illinois.

Can you take us back to the beginning?

Johnson: We were chartered in 1997. At the time, Illinois allowed surface discharge anywhere and environmental groups had threatened to sue. Our goal was to speak for contractors, regulatory agencies, designers, engineers, service personnel, portable restroom people, pumpers, anyone who has a stake in the game.

Eventually, the Illinois Environmental Protection Agency in 2006 proposed National Pollutant Discharge Elimination System permits on all surface discharge systems. The Department of Health tried to write a regulation but it wasn't acceptable to some legislators, so the U.S. Environmental Protection Agency got involved and regulations took effect in 2014. (See sidebar.)

Were you happy with the outcome?

Maguire: I'd say we agree with most of the changes. Overall, we came up with a good compromise.

Johnson: Compared to what it could have been, it's manageable. Change is a scary thing; it made things much more difficult and expensive. Some installers were doing mainly surface discharge systems and that came to a halt. Right now, we're in a "let's take a breath" mode to see how things

shake out. DPH is talking about reactivating its Advisory Commission to start addressing some of the issues in our state code. As an organization, we don't have a punch list of items, but we'll be involved.

Are you happy with the status of the onsite wastewater industry in Illinois?

Maguire: We have the right amount of government, just enough to make sure everybody plays by the rules. Designs are more site specific, utilizing the soils instead of just putting in a tank and discharging to a ditch. It's raised awareness of installers and they're trying new things, which helps the industry.

Johnson: It varies from county to county. The farther north you go, the more restrictive they are because it's more urban. Farther south is more rural, a different area, different population density. But there are minimum standards now that have raised the bar.

While the EPA surface discharge issue was being settled, were there other regulatory changes taking place?

Maguire: We did get mandatory maintenance into the state code and that will help. Septic tanks with a seepage field have to be evaluated every five years, sand filters and waste stabilization ponds every year, and aerobic treatment units every six months. All others have to be maintained according to manufacturer specifications. There are also requirements dealing with pumping frequency of various systems and recordkeeping.

Johnson: If you're concerned with what's going out, require mandatory service. It makes people responsible and holds them accountable for the treated effluent they're producing.

Continuing education was one of the changes that threw a lot of contractors for a loop initially. To get a license, you now have to pass an exam and get continuing education. It became effective January 2014 and contractors needed training hours by January 2015; it's only three hours per year.

Did you support that?

Johnson: Absolutely, but we wanted more than three hours. Any organization that wants to improve professionalism would support it. Having to take an exam cut the number of license holders roughly in half; people who didn't really do it for a living or were just putting in a tank and piping it to the ditch. Those people are gone.

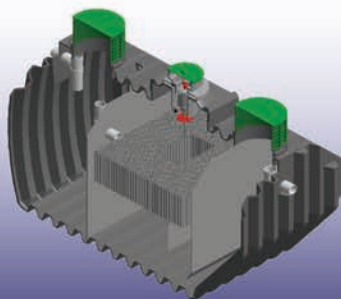


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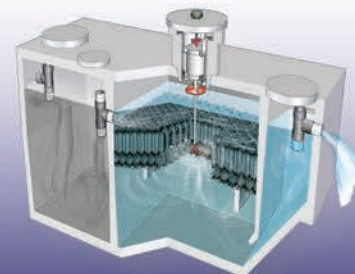
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We also partner with local health departments. We have a program that will provide seed money to help them do outreach and training for contractors.

How is the relationship between the industry and the regulators?

Maguire: It's going extremely well. When we were in the heat of the battle I wouldn't have said that. After the last two or three years, we have a good rapport with not only the Department of Health but with both Illinois and U.S. EPA. The relationships improved drastically.

What's the key to improving such relationships?

Johnson: Communication. We have to realize that we're all in the same field, whether you're sitting behind a desk as a regulator or sitting on a backhoe. Changes are coming. Technology improves, populations change, the economy changes, and all of that comes into play. You have to keep an open line of communication and not make it adversarial. In our situation, nobody came away with everything they wanted but everybody got enough of what they wanted. □

For more information on the Onsite Wastewater Professionals of Illinois, go to www.owpi.org.

US EPA moves to limit surface discharge in Illinois

Part of the onsite industry in Illinois is now regulated by the U.S. Environmental Protection Agency. About 10 years ago, environmental organizations began pressuring the EPA about surface discharges allowed in the state.

According to an EPA notice in April 2012, the Illinois Department of Public Health had allowed surface discharge for more than three decades: "IDPH and local health departments have overseen the proliferation of such systems to an extent that surface discharging systems have accounted for approximately 40 percent of all private sewage disposal system approvals issued, at least since the collection of permit data from local health departments began in 1996. An estimated 150,000 surface discharging systems now exist in Illinois."

As of February 2014, new or replacement surface discharge septic systems are only allowed if alternatives are technically or economically infeasible. They will need a general permit from the U.S. EPA if they discharge to traditional navigable waters, tributaries of traditional navigable waters, and wetlands that are adjacent to traditional navigable waters or their tributaries. The federal permits, under the National Pollutant Discharge Elimination System, set discharge limits at 1,500 gpd and require periodic inspection, reporting and effluent monitoring by a qualified person every six months, and visual inspection by the property owner twice a year, including a log of inspection dates and findings. Connection to a sanitary sewer system is required if it is less than 300 feet away from the property.

The IDPH still regulates systems that have no surface discharge as well as those that discharge treated effluent up to 1,500 gpd to the surface.

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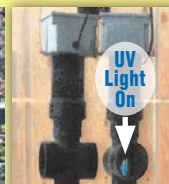
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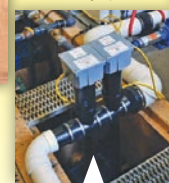


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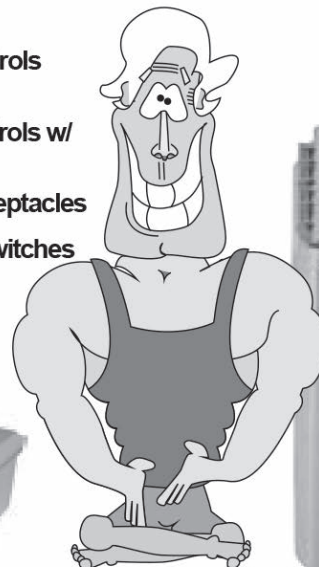
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Get Out of the Dark and Inspect Your Headlights

New bulbs offer a brighter view of the road ahead, but work truck drivers need to know there's a longevity price to be paid for this improved performance

By Ed Wodalski

Loaded down with supplies and headed out for an early morning job, you notice movement alongside the road — is it a deer? It's still dark and you can't clearly make out the object. Any collision could mean thousands of dollars in damage — or much worse. Safety is paramount, and downtime is lost time. Who can afford to have their work truck parked for repairs?

Fortunately, you pass by safely, but when's the last time you checked or changed your headlights? If you can't remember, you could be putting yourself and the lives of others in danger.

Original equipment automotive headlight bulbs typically have about a five-year, 1,000-hour life span, but can lose up to 20 percent of their output in two to three years.

To make sure you can see and be seen, it's best to inspect your headlights each time you drive. An easy way is to park your vehicle or truck on a level surface about 5 feet from a garage door or wall and turn the lights on. Both should be bright white. If one seems yellow or dim, it's time for a replacement. You might also want to do a headlight restoration if the lenses have yellowed. While you're at it, make sure your headlights are aimed properly. The beams should be at the same height on the wall.

A typical driver uses their low beams about 100 hours a year; high beams about 10 hours a year — commercial drivers much more.

Ronnie Tamez, owner of First Call Septic Services in Battle Ground, Washington, says he inspects his headlights every time he starts his truck.

"Our lights are on whenever we put the truck in gear," he says. "We replace the headlights about every six months and keep two spares in the truck at all times." Tamez spends about 10 hours a day driving and follows the recommendations of Mack/Volvo for bulb replacement.

HALOGEN OR INCANDESCENT

Most headlight bulbs today are filled with halogen gas. Introduced in the 1970s, halogen lamps burn brighter, are more efficient and last longer than incandescent bulbs.

"The benefits there, in what's called the halogen cycle of lighting, is it allows the filament to burn hotter and perform better at the same wattage," says Brian Noble, marketing manager, automotive light, for Sylvania. "The halogen gas, in its scientific form, is grabbing the tungsten that is burning off the filament and putting it back on the filament — not always in the same spot, but it's putting it back on. If you've seen a burned out incandescent light



Truck headlights typically have about a 1,000-hour life span. With continuous use and night-time driving, it's a good idea to inspect them daily, replace them often and keep a couple spare bulbs in the glove box.

bulb, there's black on the sidewall of the glass. That's the tungsten burning off. You won't see that with a halogen light bulb."

NEW TECHNOLOGIES

In the 1990s, high-intensity discharge (HID), or metal-halide technology, came into use. Brighter, metal-halide bulbs were slow to cool down and turn back on, as anyone who has been in a school gymnasium equipped with mercury vapor lights might recall. Adapting the technology to automotive use meant turning the process upside down.

"You had to have 80 percent output instantly and full power within four seconds," Noble says. "The performance benefit of an HID system is it produces between two to three times more light than a halogen product with considerably less wattage: a low-beam halogen headlight is about 55 watts; an HID system is about 35."

Keep in mind, because of their increased output, HID (xenon) headlights can blind oncoming drivers and are illegal for highway use unless factory installed. (Complete replacement kits to run legally with HID are available.)

Today, more and more vehicles use light-emitting diode (LED) technology. It can be found in dashboards and interior lighting, accent running lights, fog lights, brake lights, tail lights, backup lights — and some truck headlights. Brighter, focused, instantaneous light makes them a step up from other technology.

“The benefit of an LED brake light is full power instantly,” Noble says. “That can be 10-20 feet, compared to an incandescent light. The person behind you is going to see it that much sooner. And as we say, every foot counts.”

Although LED bulbs feel cool to the touch, they really aren’t.

“They create heat out the back,” Noble says. “A halogen or incandescent bulb creates more heat off the front.”

In addition to brighter, instantaneous light, the greatest advantage LEDs offer is longevity.

“People make claims of 50,000 hours,” Noble says. “In an automobile, that’s insane because low beams get about 100 hours of usage a year — 50,000 is forever in a car.”

THE LIFETIME BULB

In theory, you would never have to replace an LED. For that reason, Sylvania puts a lifetime warranty on its LED bulbs. Unfortunately, the supporting electronics are not as reliable, especially in the harsh truck world

“The oils on your finger act like dirt. It doesn’t let the light pass through. And if the light can’t pass through, it bounces around the glass, increases the heat within and helps burn out the filament.”

Brian Noble

where water remains an issue. Next up in the ever-evolving world of vehicle technology is laser LED and organic or OLED lights. It could be years before they enter the replaceable bulb market.

Sylvania offers three levels of lighting beyond its basic OEM halogen bulb: UltraVision for better down-road vision; SilverStar for brighter down-road vision and greater clarity; and SilverStar Ultra for brightest down-road vision, whiter light, greater clarity and ultra night vision.

As part of its Headlights for Haulers NASCAR sponsorship, Sylvania has been putting SilverStar Ultra lights on trucks for years.

“They have a shorter life,” Noble says. “We know it. The hauler drivers know it. But in the end, it’s more important that when they’re driving 80,000 pounds and have millions of dollars behind them that they can see an item or object in front of them.”

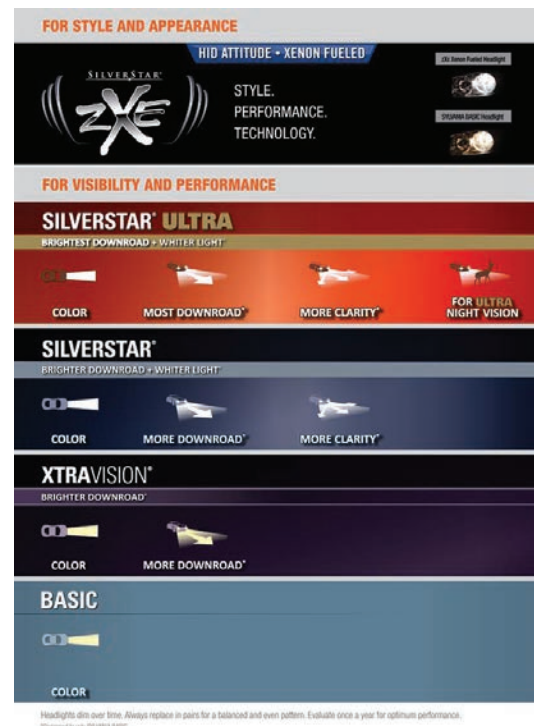
VISIBILITY VS. LIFE SPAN

In each case, greater visibility means shorter life and higher cost. Replacing a 1,000-hour OE halogen bulb with a 250-hour aftermarket bulb will greatly increase performance but decrease the life span by about 75 percent. Note: Since each bulb is different, read the contents label for lumens and estimated life.

“We can make a light bulb that lasts a crazy amount of time,” Noble says. “But your performance is going to be less than optimal. Do you want to see

>>RIGHT: Sylvania offers three levels of brighter, whiter halogen bulbs beyond basic OEMs for greater visibility.

BELOW: Gas-filled halogen bulbs are brighter and last longer than incandescent lights. (Photo courtesy Sylvania)



that deer? Do you want to see that person walking? Do you want to see that branch in the road? Hitting it is a bad thing. That’s our mindset, and we’re very passionate about it.”

REPLACE IN PAIRS

For best visibility, it’s best to replace both headlights at the same time. If one bulb is burned out or showing its age, there’s a good chance the other will soon do the same.

When changing bulbs, be careful not to touch the glass. Wear clean latex or nitrile gloves to prevent skin oils from getting on the bulb. Trace amounts of oil or grease on the glass can create hot spots that will cause the bulb to crack.

“The oils on your finger act like dirt,” Noble says. “It doesn’t let the light pass through. And if the light can’t pass through, it bounces around the glass, increases the heat within and helps burn out the filament.”

Noble says if you get oil on the bulb, wipe it off with rubbing alcohol. Finally, double-check the bulb to make sure it’s sealed properly — a hot bulb touching the lens will melt the plastic. You can tell if the bulb is sealed properly by focusing the light on a wall — the beam should be level, not pointing up or down.

Like any maintenance, it’s best to check the owner’s manual before you begin — even for something as elementary as changing a light bulb. ◻

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Drainfield Media and Design

By Craig Mandli

CHAMBERS

Sim/Tech Filter STF-BTPS Bow Tie

The STF-BTPS Bow Tie pipe stand from Sim/Tech Filter is designed for use in chamber systems where the distribution piping is suspended above the soil. The stand is independent of the chamber, allowing the pipe to be installed prior to chamber installation and before the squirt test is performed. They install by a squeeze and release action that makes installation quick and easy. The stand can be installed on the pipe before placing it in the trench, and is easily adjusted to any desired spacing. They store flat for economical shipping and easy storage. Versions are available to fit 1-, 1 1/4-, 1 1/2- and 3-inch pipe. 888/999-3290; www.simtechfilter.com.



DRAINFIELD COMPONENTS

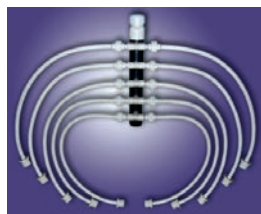
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Clarus Environmental Spider Valve

The Spider Valve assembly from Clarus Environmental ensures appropriate filtered effluent distribution when regulations require pressurized splitting or when small lots require lateral lines of unequal length. Combined with a pump, customizable orifices within the manifold ensure that no lateral receives more than its share of total flow. A convenient sizing program is available to allow customization for any project. It is available in models serving up to 10 laterals. Each assembly includes 5/32-inch predrilled washers and a union for each washer. Unions allow washers to be removed for cleaning and maintenance. It comes with 3 feet of 1/2-inch PVC flexible pipe on each discharge for easy assembly. It mounts in a 24-inch-diameter access riser. 800/928-7867; www.clarusenvironmental.com.



E-Z Treat Company Re-Circulating Synthetic Sand Filter

The Re-Circulating Synthetic Sand Filter from E-Z Treat Company has passed NSF 350 Water Reuse, NSF 245 and NSF 40 testing. The reuse system was sampled for 34 weeks including double stress tests instead of the normal 26 weeks with one stress test. Test results indicate BOD of 2, TSS of 1.9, turbidity of 2, DO of 3.5 and pH of 7.2. Systems are available from 100 to 100,000 gpd. 866/753-4770; www.eztreat.net.



Fergus Power Products Dual Power Lids and Dual Adaptor Rings

Dual Power Lids and Dual Adaptor Rings for septic tank installations or restorations from Fergus Power Products are designed for new installation or to complete a restoration project by replacing a concrete lid. It is designed like the rafters in a home to give structural durability to support heavy wheel load without added weight to the lid. The top is slightly domed to meet compliance throughout the U.S. Lids can be insulated with R-value of 6 and are available in 18-, 24-, 30- and 36-inch sizes. 218/736-6772; www.ferguspowerproducts.com.



Geomatrix Systems GeoMat

The GeoMat leaching system from Geomatrix Systems consists of a core of fused, entangled plastic filaments surrounded by a high-capillary geotextile fabric. When sized accordingly, it is compatible with pretreated wastewater or septic tank effluent. Uses also include subsurface irrigation and evapotranspiration systems. It is 1 inch high and available in 6-, 12- and 39-inch widths. A pressurized distribution pipe typically runs the length of the lateral for uniform application of wastewater. Additionally, it can be configured with a time-dose pump station for flow equalization. The combination of pressure dosing and flow equalization reduces peak hydraulic loading. The thin, narrow profile, shallow burial depth and uniform hydraulic loading maximize efficiency of oxygen transfer. It has complete surface contact with the soil and is not reliant on complex valving and filtration systems. The distal head pressure is fully adjustable through manual zone valves. 888/764-5247; www.geomatrixsystems.com.



Polylok distribution box

Distribution boxes from Polylok allow installers to choose the height of inlets and outlets. They come with a seal that accepts 2-, 3-, 4-inch and corrugated pipe (the 20-inch unit



accepts 6-inch pipe). The 12-inch unit comes with stabilizing feet to anchor the box. 877/765-9565; www.polylok.com.

Presby Environmental EnviroFin

The EnviroFin passive onsite wastewater treatment and dispersal system from Presby Environmental is designed to have a small footprint and ship easily, while maintaining and exceeding NSF/ANSI Standard 40 treatment. The effluent leaves the septic tank and enters the fin distribution unit (FDU), where it settles and breaks down suspended solids. Skimmer tabs located at the perforations prevent grease and suspended solids from leaving the FDU. The FDU distributes the effluent into each of the eight treatment fins, which are filled with coarse green plastic fibers, filtering and digesting more suspended solids while creating a massive bacteria treatment area. Each treatment fin has a perforated pipe functioning as an air duct across the top, providing oxygen to promote bacterial growth. The unit is buried in C-33 concrete sand and is installed with differential vents for airflow. It ships in a 2- by 4- by 2-foot box weighing under 65 pounds. 800/473-5298; www.presbyeco.com.



Tuf-Tite distribution box

Strong, stable, permanent, noncorrosive distribution boxes from Tuf-Tite come with a Speed Leveler in each outlet. They are available in four sizes: four-, six-, seven- and nine-hole. Risers are available for the four- and seven-hole units. All boxes come with a one-piece watertight seal that accepts 1.5-, 2- to 3-, and 4-inch SDR35 or Schedule 40 pipe, including corrugated for ease of installation. 800/382-7009; www.tuf-tite.com.



PIPE

Advanced Drainage Systems septic stack

Available in configurations of nine, 11 and 13 pipes, septic stack units from Advanced Drainage Systems allow for soil contact without the use of gravel. Pipe is engineered with holes and slots, allowing it to collect and disperse the effluent as it passes over the corrugations in the pipe. Using 4-inch HDPE pipe provides abrasion and corrosion resistance. With lengths of 10 feet, design flexibility is allowed due to the fast installation times. The units are lightweight and have a high storage volume with structural strengths that will support H-10 load rating with 12 inches of settled cover. Applications include trench low-pressure piping, pressure distribution, and trench, mound, and bed configuration. They are available for use in both residential and commercial applications. 800/821-6710; www.ads-pipe.com.



VENT PIPE FILTERS

Pagoda Vent septic vents

Septic vents from Pagoda Vent can help enhance system function with landscape appeal and homeowner approval. The pre-made units provide the necessary ventilation to the drainfield, and have a durable, lightweight exterior that won't fade or rust. The units encourage a healthy subsurface environment, mitigate harmful gases and preserve concrete component integrity by diminishing the opportunity for microbial-induced corrosion. Optional odor filter cartridges are available and fit concealed in the vent unit. 888/864-1468; www.pagodavent.com. □



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Drainfield Media and Design

By Craig Mandli

Aerated filter system helps rejuvenate clogged septic drainfield

Problem: The homes in Glenwood, a 300-home subdivision built in the 1970s in Nebraska, all used individual septic systems. At the time, there were no local regulations, and 1,000-gallon concrete tanks were installed and outfitted with only 50- to 100-foot drainfields on an old blue clay riverbed with a soil percolation range of 50 to 60 minutes per inch. Over the next 40 years, many of these systems failed.

Solution: Nathan Cramer of All American Sewer & Drain found the S.O.S.-Save Our Septic Program through Bio-Microbics. For one of the problem systems he was pumping every few weeks, he installed his first RetroFAST in the tank. After he had the septic tank pumped, cleaned and inspected for leaks and deficiencies, he installed the retrofit aerobic system inside the existing tank. By sending less-loaded, higher-treated and oxygen-rich effluent into the drainfield, the clogged biomat around the drainfield trench sides and bottom began to perc and repair itself.



Result: Within a few weeks under observation, the visible signs of failure had subsided and clear, bubbling effluent was visible in the tank. Four other properties have been repaired, with more scheduled. 800/753-3278; www.biomicrobics.com.

System allows seasonal home to be converted to full-time residence

Problem: The owner of a small seasonal home on Lake Michigan's Green Bay in Dyckesville, Wisconsin, wanted the property to become a full-time residence. To do so, he needed to upgrade the decentralized wastewater system. A compact and flexible treatment system was needed that could conform to the challenges of the lot, fit in the small footprint and protect the bay.

Solution: Door County designer Bob Berceau specified the Eljen GSF system to minimize the footprint and give the homeowner a system that meets state and local code. He specified a 1,000-gallon tank and a 15-unit GSF system, which was installed by Lily Bay Sand & Gravel and supplied by First Supply.



Result: The homeowner now lives on the bay with his family year-round, and several neighbors are looking into how they can do the same. 800/444-1359; www.eljen.com.

Vent filters used to eliminate campground odor problem

Problem: The owners of Tall Timbers Association campground in Vernon, New Jersey, were concerned about reduced business due to complaints caused by odor from a vented septic system.

Solution: A new Puraflo Peat Fiber System was installed, and 20 Wolverine brand vent filters from Simple Solutions Distributing were connected at each park unit and travel trailer site. The odor filters were tied into the drainlines, providing a flow for the air exiting the trailer wastewater systems. This allowed the odorous air to be scrubbed, eliminating odor problems. A second stage of odor control was later installed by placing Super Wolverine filters with solar fans on the pump stations in the campground. They circulate fresh air throughout the plumbing system, reducing gas concentrations and eliminating any odors as they pass through the filter.



Result: After two years, the campground is odor-free and the original carbon that came with the filters is still in use. 866/667-8465; www.industrialodorcontrol.com.



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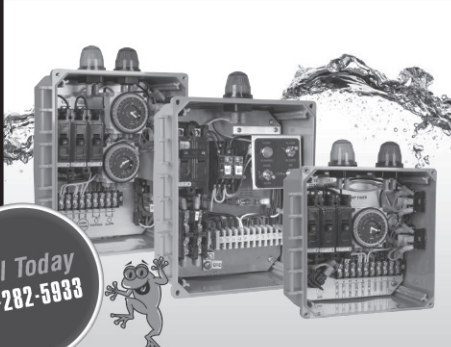
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Septic pipe cover provides aesthetic solution in garden area

Problem: A Massachusetts homeowner spent thousands of dollars on a new porch and landscaping, only to have a 3-foot-tall vent pipe next to his porch in the middle of his garden. Traditional vent filters only addressed the odor problem, not the aesthetics.

Solution: Kevin Orlando from All Season Septic in Stoughton, Massachusetts, was scheduled to pump the system, and the homeowner informed him of the problem. Orlando suggested **The Dirty Bird** septic pipe cover. The product addresses odor problems with an included charcoal filter, comes in three colors and fits into the landscape as a common yard ornament, a pedestal/birdbath.

Result: Grateful for a simple solution, the homeowner has a focal point instead of an eyesore. Guests don't even know he has a vent in his yard, and Orlando can service the charcoal filter when he pumps the system. 866/968-9668; www.thedirtybird.com. ❑



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Professional Onsite Wastewater Reuse Association of New Mexico;
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www.wwns.ca; 902/246-2131

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Canadian Regional

Western Canada Onsite Wastewater Management Association;
www.wcowma.com; 877/489-7471 □

JCB North America celebrates production milestone

JCB North America celebrated the production of its 100,000th compact excavator. The company's first compact excavator was manufactured in 1989.

Continental ContiTech to expand industrial hose plant

Continental ContiTech announced a \$7.2 million expansion of its industrial hose plant in Mount Pleasant, Iowa. The company expects construction to be completed by the end of the year.

JWC Environmental names regional sales manager

Paul Schuitt has joined JWC Environmental as the western regional sales manager for the municipal wastewater market. Schuitt has over 31 years of operations and maintenance experience in the water and wastewater industry.



Paul Schuitt

WERF accepting nominations for annual awards

The Water Environment Research Foundation is accepting applications for the 2016 Award of Excellence for Innovation and Paul L. Busch Award. More information on the awards, including the nomination process, is online at www.werf.org/awardforexcellence or www.werf.org/PaulLBusch.

Grundfos Pumps regional managing director to leave company

Duncan Cooper, regional managing director for Grundfos Pumps and group senior vice president for Grundfos Americas, will leave this summer. Cooper has been instrumental in improving company performance, most significantly in the area of financial stability, since arriving in 2013, according to a press release.



Duncan Cooper

Vermeer names board of directors

Vermeer appointed Robert Hund and Scott Nelson to its board of directors. Both are veteran corporate executives within the industrial equipment manufacturing industry.

Franklin Electric supports military vet with home water system solutions

Franklin Electric was one of several manufacturers that teamed with the national television series *Military Makeover* to provide retired military veteran Kevin Parke and his family with multiple water system solutions for their home in Crestview, Florida. Franklin Electric's pumping solutions included Inline 400 pressure boosting system, Koi pond water feature, Little Giant WRS Series compact water removal system, Little Giant VCMX-20 Series condensate pump, and a Little Giant disappearing fountain feature. □



Liberty ProVore Grinder Pump Makes Quick Work of Troublesome Wipes

By Jennifer West

Flushable wipes are one of those products you love to hate. Sure, they've made cleaning easier and taken the hassle out of so many daily household chores. After all, they're convenient, and consumers love to flush and forget. But by now, the wastewater industry is keenly aware of the problems flushable — and non-flushable — wipes are causing in residential pipes, septic systems, municipal wastewater systems and wastewater treatment plants.

At the 2016 Water & Wastewater Equipment, Treatment & Transport (WWETT) Show, several manufacturers displayed products designed specifically to combat the flushable wipes problem. At the Liberty Pumps booth, the ProVore grinder pump took center stage, showing off its ability to completely shred even the most difficult solids.

"I don't think anyone had the intention that (flushable wipes) were going to cause this problem," says Adam Flint, Liberty Pumps corporate trainer, as he stood over the demonstration unit. Flint grabbed a dowel and stuffed a large maroon rag into the bucket. He turned on the pump, and in seconds, the fabric spit out the other end in a fine pulp, now capable of moving through any pipeline without creating obstructions.

Although flushable wipes dominate the discussion about bad consumer habits, they aren't the only problem the ProVore can handle, according to Flint. The grinder pump is also designed to shred feminine products, rags, towels and anything else that can jam a solids-handling pump. It's designed to be a useful addition to homes connected to a municipal system as well as those with septic systems.

With its V-Slice cutter technology, the ProVore is engineered for use in residential applications where the addition of a bathroom or other fixtures below sewer lines requires pumping. The cutter technology means that a greater surface space is used with each rotation, allowing for a sharper cut and more efficient shredding.

"It's slicing with small V-shapes,"



Close-up of the Liberty Pumps ProVore grinder pump.



ABOVE: Adam Flint, Liberty Pumps corporate trainer, shows fine pulp, what's left of rags sent through the ProVore grinder pump during a demonstration at the 2016 WWETT Show floor. (Photos by Jennifer West)

>>RIGHT: Rags and non-flushables are ground into material that can pass through most septic and sewer systems.



Flint says. "This pump is typically installed in areas where they've had trouble with flushable wipes or rags. But now, (contractors) are being proactive."

Flint explains that contractors have installed the grinder pumps in new construction as a pre-emptive strike against flushable wipes. It is a massive problem that's costing municipalities millions of dollars each year. Homeowners with private wastewater treatment systems aren't immune to the wipes problem. Flushable wipes and other materials can clog pipes and filters, and cause septic backups in bathrooms, showers and basements.

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"Depending on what you have on the other end, (flushables) cause problems," Flint says.

With higher flow rates, the unit allows use with 2-inch discharge lines. Its 1 hp motor operates on a standard 115- or 230-volt circuit requiring a 20-amp breaker. The residential pump can be used as a replacement pump in any 2-inch discharge system using LE40- and LE50-series solids-handling pumps. The grinder's heavy cast iron construction and powder-coated exterior are designed for corrosive environments.

"This pump is typically installed in areas where they've had trouble with flushable wipes or rags. But now, (contractors) are being proactive."

Adam Flint

During the WWETT Show, a constant stream of attendees mingled around the demonstration, watching as Liberty Pumps representatives shoved rag after rag into the watery bucket.

"The first day was really super steady, and we had great coverage," Flint says.

Liberty Pumps is a regular exhibitor at the WWETT Show, and Flint says it's one of the company's most anticipated trade shows of the year.

"This is one of our biggest and best shows," he says. "That's why we bring so many guys here. Our engineering team is here so they get to listen and take notes. Plus, we all get to walk around and see what's new." 800/543-2550; www.libertypumps.com. □

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Franklin Electric grinder pumps

Little Giant GP Series grinder pumps from Franklin Electric operate across 208 to 230 volts. The GP-A (automatic) and GP-M (manual) models are designed to handle low-pressure sewage applications and feature a cutter system that operates at 414,000 cuts per minute. Other features include a nonclogging, corrosion-resistant brass impeller, a shut-off head of 130 feet, and a single-phase, capacitor start/run motor with built-in overload protection. 260/824-2900; www.littlegiant.com.



BAYCO Products LED angle lights

Nightstick LED angle lights (models XPP-5570R, XPR-5572R and XPR-5572RM) from BAYCO Products offer safety features including low-battery indicator, multiple power options and a "survival mode" that provides 20 lumens of light in emergency situations with a runtime of 3 1/2 days. Each model is cULus- and MSHA-certified Intrinsically Safe Permissible, water-rated as IP-X7 waterproof and meets requirements of NFPA-1971-8.6. A stainless steel pocket clip eliminates slippage when attached to a jacket or respirator pack. Each model has user-selectable settings of 200, 100 and 60 lumens plus a strobe feature with an 875-foot beam distance. 800/233-2155; www.baycoproducts.com.



Milwaukee Tool high-tension hacksaw

The 12-inch high-tension hacksaw from Milwaukee Electric Tool Corp. is designed for contractors who need to make fast, accurate cuts. A reinforced metal frame provides extra durability. A high-leverage tension knob at the top of the frame allows the user to tighten the blade to the highest tension needed. It features six-blade storage capacity and a 45-degree blade position for a better angle on flush cuts. 800/729-3878; www.milwaukeetool.com.



Xylem dewatering pump

The Flygt 2190 submersible dewatering pump from Xylem is designed to handle abrasive liquids. The midsize pump is available with two impeller options: the Dura-Spin safeguards against wear by sweeping abrasive particles away from the impeller neck, while the semi-open impeller increases uptime by preventing fibrous solids from obstructing the pump. The pump's conical trim sleeve restores clearances to near-original condition. 704/409-9700; www.xyleminc.com.



Hyundai Construction Equipment Americas hydraulic excavators

HX Series hydraulic excavators from Hyundai Construction Equipment Americas provide increased fuel economy over previous models. The HX140L is a 13-metric-ton model powered by a Perkins 1204F Tier 4 Final engine rated at 116 hp and features a 39.4-inch-wide digging bucket. It achieves a maximum digging depth of 22 feet 1 inch and a maximum digging reach of 32 feet 9 inches with a digging force of 24,890 ft-lbs. The 24-metric-ton HX235LCR excavator is a compact-radius model, featuring a Cummins QSB6.7 Tier 4 Final engine rated at 183 hp and 39.4-inch bucket. It can reach a maximum digging depth of 22 feet, maximum digging reach of 32 feet 6 inches, and a digging force of 37,104 ft-lbs. 877/509-2254; www.hceamericas.com.



Komatsu America Corp. wheel loader

The WA600-8 wheel loader from Komatsu America Corp. is designed to maximize production efficiency in loading off-highway trucks or load-and-carry applications. The 529 hp, Tier 4 Final certified engine improves power train and hydraulic efficiency and consumes up to 13 percent less fuel than its Tier 3 predecessor. It features a standard bucket capacity of 9.2 cubic yards. 847/437-5800; www.komatsuamerica.com.



Water Cannon electric pressure washer

The 15M71 electric pressure washer from Water Cannon — MWBE has a 20 hp, 460-volt three-phase motor with an auto start/stop feature that powers a TSP Series General triplex plunger pump and delivers 4.5 gpm at 6,000 psi using the poly-chain drive system. It comes with 500 feet of high-pressure hose, gun/wand kit, safety couplers rated at 10,000 psi and 12 feet of power cord. 800/333-9274; www.watercannon.com/catalogrequest.aspx. □



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