

June

2009

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# A Better Way

**J.L. Schmitz and Sons uses an innovative conveyor to install rock for onsite installations**

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## Happenings in Ohio

To the Editor:

I hope this letter will expand on some important points made in the media related to pending onsite legislation in Ohio. The outcome of this is critically important to the onsite industry in our state and potentially nationwide.

The new legislation recently introduced in the General Assembly requires the Public Health Council to redraft rules regulating sewage treatment systems. The bill, SB 110 sponsored by Sen. Tom Niehaus, amends current law by providing greater flexibility to consumers in sewage system choice. It also establishes uniform statewide soil absorption standards that balance system costs with environmental health protection, and centralizes the sewage treatment system regulations.

The legislation is the result of a year-and-a-half initiative coordinated by the Sewage Treatment Study Commission, in cooperation with treatment system manufacturers, local health districts, the state Department of Health, installer organizations, real estate organizations, manufactured housing organizations, local government groups, home builder organizations and environmental advocates.

The bill was crafted in response to growing concerns and fears that rules adopted by the Public Health Council effective Jan. 1, 2007, would cause a substantial increase in system cost for rural homeowners while limiting consumer choice. These rules, adopted by the Public Health Council were placed on a two-year moratorium but will go back into effect July 1 if the current legislation does not pass.

If passed, this legislation will rescind the 2007 rules and will require the Department of Health and the Public Health Council to create new rules that are more favorable to rural homeowners and that will offer greater environmental protection and regulatory consistency throughout the state.

Sincerely,

**Brock Wanless**  
Ohio Onsite Industry Representative

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### CLARIFICATION

The Pumper & Cleaner Expo product review in the April *Onsite Installer* used the adjective "multi-pipe" in describing an alternative leachfield technology from ICC Technologies. **Plastic Tubing Industries, Inc.**, reports that the proper name **Multi-Pipe** is a registered trademark for its patented alternative, rockless drainfield products. *Onsite Installer* regrets any confusion or misperception that may have been caused by our use of "multi-pipe" as a generic descriptor.

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## Seen and Heard at NOWRA

The 18th annual expo and technical conference brings news of challenges as well as continued progress in the onsite industry

By Ted J. Rulseh

**T**he National Onsite Wastewater Recycling Association's 18th Annual Technical Conference & Expo felt the effects of the economy, but that didn't keep the attendees and exhibitors from marking more steps forward for the onsite industry.

The conference, held at the Midwest Airlines Center in Milwaukee, Wis., April 6-9, drew about 250 attendees to 39 exhibits and three-plus days of technical sessions, panel discussions, field trips and networking. Attendance was down by about one-third from 2008. Here are some highlights:

### A mascot for onsite?

None other than the U.S. EPA is planning a national public education program to raise homeowners' awareness of their septic systems and enlist them as partners in proper system usage and maintenance.

Don't look for many specifics yet, as the program is now under review through EPA channels. However, reports Joyce Hudson, senior environmental engineer with the EPA Office of Wastewater Management, the agency hired a consultant to conduct consumer research and develop a program that could end up including a slogan, a mascot, simple messaging, and a variety of communication materials. Watch for more information as this program unfolds.

### The economy head-on

A special workshop on Thursday morning focused on "Weathering the Economic Storm." There was

acknowledgement that the industry's professions have seen cutbacks in work, dramatic in some cases. A panel of manufacturers, installers, O&M providers and policy advocates discussed strategies in areas such as protecting revenue streams, entering new markets, refining business practices, and diversifying.

The group explored topics such as seeking funding for cluster systems through publicly owned treat-

The report stated that NOWRA now has 5,250 members, about 18 percent of them installers (still the largest constituency). Other major membership groups include O&M service providers, 14 percent; contractors, 13 percent; designers, 8 percent; government and regulatory officials, 6 percent; and consulting engineers, 6 percent. The membership includes 24 affiliate groups — 22 in the United States and two in Canada.

**Items on NOWRA's strategic agenda ... include a new e-newsletter, more activity in state and federal government affairs, creation of a resource library, a revamped Web site capable of more e-commerce, greater focus on greening the onsite industry, more partnerships and joint conferences, and a funding structure that is less dependent on membership dues.**

ment provisions, receiving subsidies from the federal economic stimulus package, diverting state revolving funds into homeowner loans, and seeking subsidies for green schools, universities, multi-family housing projects, public buildings, military bases and other projects where sustainable wastewater treatment and reuse systems should be part of the project.

### A new tagline

NOWRA is using a new tagline, "People Caring About Water." It showed up in a presentation that association president Tom Groves and others gave during a business session on Wednesday, April 8.

Items on NOWRA's strategic agenda, according to Groves, include a new e-newsletter, more activity in state and federal government affairs, creation of a resource library, a revamped Web site capable of more e-commerce, greater focus on greening the onsite industry, more partnerships and joint conferences, and a funding structure that is less dependent on membership dues.

### Steps forward in training

A Wednesday presentation from Bruce Lesikar of Texas A&M University described training materials for installation and startup of onsite wastewater treatment sys-

tems, developed by the Consortium of Institutes for Decentralized Wastewater Treatment (CIDWT).

The materials describe the basic knowledge, skills and abilities that installers should have. The training program promotes uniformity in practitioner training and supports installer credentialing. The project was funded by the U.S. EPA through the Water Environment Research Foundation (WERF).

A writing team of professionals from across the country wrote the training materials, which then went through peer review and pilot testing. A Project Review Group provided oversight and monitored progress. The training manual will be available through Midwest Plan Service in July 2009. More information is available from Lesikar at [blesikar@tamu.edu](mailto:blesikar@tamu.edu).

### Out exploring

The event that got the best reviews among show attendees was Monday's tour of five decentralized treatment systems in the Milwaukee area. Those who took part came back well impressed by the technologies and innovation on display.

The highlight of the trip seemed to be the Cabela's outdoor and sporting goods store northwest of Milwaukee. This huge retail outlet, built as a tourist attraction in its own right, uses a system of aerobic treatment units with drip distribution. Other sites included a 100-home subdivision served by ATUs and mounds, a commercial development with mounds, a high school with a constructed wetland



and mounds, and a renovated system at a condominium complex.

### Drugs in the water

The effect of traces of pharmaceuticals and personal-care products in the drinking water supply is an area of growing concern, and it was the focus of Monday's NOWRA conference program. A series of speakers addressed the issue from various viewpoints, and then a panel discussion solicited ideas on how NOWRA can have a positive influence on the issue.

### New tools for the industry

The exhibit hall revealed a vari-

ety of new products making their way into the onsite business. Look for the highlights in a special article elsewhere in this issue. The most compelling new offering was the E-Z Perk system, which automates the age-old process of percolation testing.

### Looking to 2010

NOWRA will hold its 19th Annual conference March 22-25, 2010, in St. Louis, Mo. The conference will highlight comprehensive wastewater planning with a focus on integrating decentralized and centralized options. Watch for more information on the association Web site at [www.nowra.org](http://www.nowra.org). ■

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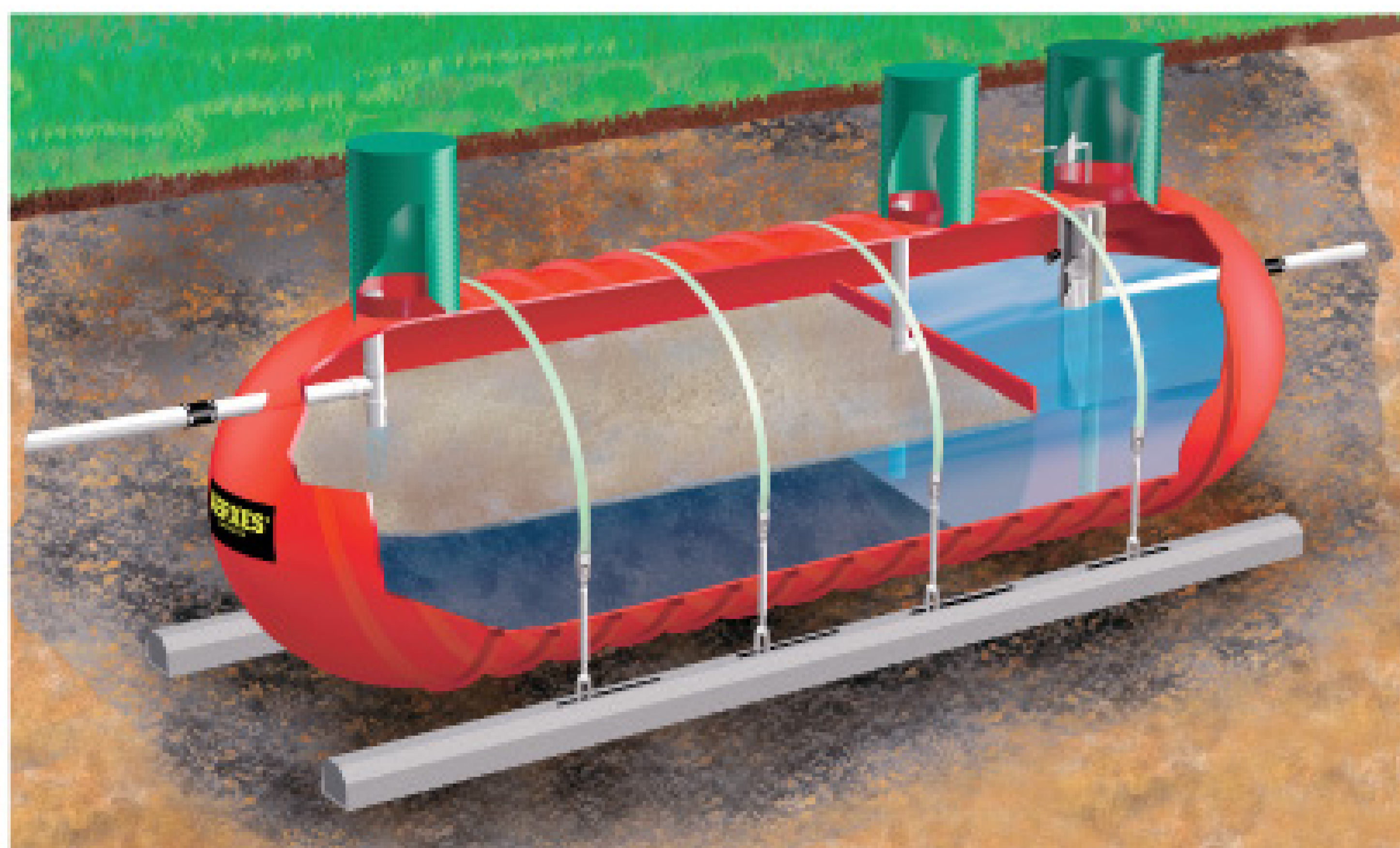
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# Installing Filter Liners

Proper choice of liner materials and proper installation will help ensure effective long-term performance in a media filter system

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

The local inspector is working on a small lot system, and in the course of discussion the idea of using a single-pass sand filter is chosen as the design alternative. The system will incorporate pressure distribution into 24 inches of a clean sand media.

The effluent will move through in an unsaturated flow pattern and will be drained out of the media filter through a 12-inch layer of pea rock, drainfield rock and slotted 4-inch piping. All of this is installed in a watertight liner. Installation of this liner is the component of the system that we will explore here.

## Liner applications

All media filters incorporate

some type of liner. Many times the liner for a smaller filter is a manufactured container of plastic or concrete. Installations of these components require similar procedures to installing any other type of sewage tank. These include making sure that the tank is in the right direction, that the bottom is level, that the soil is well compacted, and that the unit is installed in a manner to prevent floating.

The first purpose of the liner is to hold the effluent inside the filter for discharge to the final soil treatment area. This allows the treated effluent to be delivered to the correct location on the site.

A second and just as critical requirement is to keep clean water

out of the media filter. The introduction of uncontrolled clear water to the system will overload the filter, which then will not provide proper treatment. We have seen too many sites with unlined filters where water enters the system and

have gone to the container design as a quality-control feature for ease of installation and the ability to maintain water tightness.

Other public-domain filter designs (such as sand filters and constructed wetlands) are larger

**The use of media filters may seem like a long way off in your area, but trends in treatment make these technologies valuable for solving site issues. It is important to understand the various materials and their proper application.**

is delivered to the treatment area, causing hydraulic overload

The actual design of the filter doesn't change the requirements of the liner. The flow pattern in the system may affect installation steps. All recirculating filters need a drain, and this requirement has pushed a number of manufacturers to use solid boxes to make this drain easier to install. As the filter gets larger, synthetic liners are used.

## Liner materials

The choice of the liner material is often made by the media filter manufacturer. Many licensed filters

and tend to use liner materials such as PVC, rubber and clay. Each has different characteristics and different concerns for use.

For PVC, it is critical to use a material thick enough to handle and manipulate without damage. A thickness of 30 mil seems to be workable for most applications. Thinner material is available (20 mil is typically used for swimming pool applications), but it is easier to tear during filling with media, and on many sites the repair time for the liner minimizes the cost-saving element of the product. Thicker liner material is also available, but it is more expensive.

One important care step for the installation of PVC liners is protection from sunlight and UV radiation. These liners can break down

**A plywood box is often used in creating a constructed wetland filter. Liner material must then be properly fitted to this box.**



*Jim Anderson and David 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 Transporters. Readers are welcome to submit questions or article suggestions to Jim and David. Write to [ander045@umn.edu](mailto:ander045@umn.edu).*



from extended UV exposure.

EPDM materials — rubber roofing products — tend to be a little more expensive but are more UV-resistant and easier to order for the site and easier to work with. These products meet the ASTM standard D-1418.

Clay liner materials are available in commercial-grade products. The key for their application is that the soil surrounding the materials should be unsaturated. The typical clay material used in media filter liners is bentonite. This material swells in contact with water to the tune of 900 percent by volume or 700 percent by weight, forming a low-permeability clay layer.

Access to any of these products depends on availability at suppliers in your area. Check around for materials and prices.

### Liner installations

There are a couple of key factors in ordering liner components. Make sure the liner is the right size. It is critical to have at least a foot of extra material for securing the liner. When using clay, a shortage of material will allow leaking of effluent into the soil.

PVC and EPDM liners need to be moved around the site. They should be stored and shipped on a pallet for handling and to protect the liner from other damage, such as punctures. These liners should not be stacked, as that can cause damage. In removing the binding of the liner, take care not to puncture it with the cutting tool.

The liner should be accordion-folded in two dimensions to make it easier to install. Some rubber liners are delivered as a roll. Many manufacturers include directions for unfolding the liner. Following these will make the installation easier and quicker. Liners typically are factory-seamed to avoid the hassles of seaming in the field.

All liners are harder to handle and move around in cold weather. Wind can also create problems, putting stress on the edging and causing tears. Care is also needed when placing filter materials, as falling rocks can cut the liner. Dropping the drainage material on a material such as plywood can reduce that risk.



**Proper installation of lining material is essential to long-term filter performance and effective treatment.**

Before adding filter materials, make sure the base of the liner is compacted and free of any objects that could cause a puncture. Over-excavating and backfilling with sand can create a protective layer that is easier to level. In a bedrock site, the use of sand as protection can be critical. If the system will use a container for the liner, the long-term support requirements are similar to those for synthetic liners.

Liner sidewalls also need to be protected. If the soil has few rocks, the soil itself can be used. In rockier soils or sites with large roots, a plywood box may be needed for protection. This box can be framed and sided with a variety of materials. Long life is not necessary, since after installation the potential for damage to the liner is minimal.

### Boot installations

Drainpipe installation needs to include a watertight seal. If the liner is a concrete tank, this boot needs to be cast into concrete. The boot must maintain a watertight connection even in the event of shifting. A rubber product with a stainless steel band creates a great seal for a drain. In plastic or fiberglass containers, the drain seal is typically a glued fitting. Make sure the piping is properly bedded to avoid movement.

In installing the drainage system in synthetic liners (PVC or EPDM), a hole must be cut in the liner and the pipe boot installed to create a watertight connection. Here, the boot is glued (seamed) to

the liner, and a stainless steel band seals the boot to the piping.

The cut in the liner should be as small as possible. Do not guess at its location. Be sure you know where the piping will enter the filter. Also check the elevations for the pipe to ensure that it will drain properly to the next component. Standing water in the drainage system will significantly reduce the filter performance.

The seaming then proceeds by adding the chemical fusing agent (CFA) to both surfaces. Make sure to bond at least 2 inches of material. The boot material should have rounded edges, and the surfaces need to be clean. Work the seam on a flat surface.

Be sure that both the liner and boot are wet with the CFA. Add pressure to both layers and hold them until the CFA has set. CFA materials have a specific curing time. Any spilled CFA must be removed from the liner, since it can create a weak spot. Check the material safety data sheets for these

products for guidelines on exposure and other safety requirements.

### Pump installations

When a system uses a pump for dosing the soil treatment area, a boot at the bottom is not necessary. Often a pump is used to avoid the need for a boot. The pump needs a basin and a little deeper drainage material to allow for storage of the effluent to be dosed. Pump floats need to be installed to avoid saturation of the filter media.

For all liners, long-term watertightness means making sure trees do not intrude. Roots on the outside are not the problem, but growth inside the filter can be. Constructed wetlands in particular must be protected from tree growth in the wetland. Regular removal is important to avoiding system failure.

The use of media filters may seem like a long way off in your area, but trends in treatment make these technologies valuable for solving site issues. It is important to understand the various materials and their proper application. Appropriate installation of the liner or container is a critical contributor to long-term performance. ■

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*"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.*

# Texas Commission Looks at Onsite Code Changes

By **Scottie Dayton**

**T**he Commission on Environmental Quality adopted proposed revisions to the septic system code. Changes include:

- Eliminating a requirement that installers be certified by aerobic treatment plant manufacturers to maintain their systems.
- Allowing designated representatives (DR) to inspect any system at any time, and requiring homeowners to obtain a maintenance contract if they fail to correct a violation within 10 days.
- Eliminating the requirement of an Installer II or DR license to renew a site evaluator license.
- Basing ATU tank sizing on 120 gallons per bedroom.
- Allowing homeowners to maintain their systems without training or filing reports provided the county has not changed its control orders.
- Requiring maintenance providers to have an Installer II or Class C wastewater license or three years of verifiable experience.
- Designating food-serving sites to have a high-strength waste system that produces less than 1,200 mg/l BOD5.

The regulations are at [www.tceq.state.tx.us](http://www.tceq.state.tx.us).

## Idaho

As of July 1, 2009, Idaho has a new method for estimating wastewater flow from single-family dwellings. The new rules will "provide for a more refined soil classification system" for more precise sizing of drainfields, according to the public notice. Visit [www.deq.state.id.us/rules/subsurface/58\\_0103\\_0801\\_notice.pdf](http://www.deq.state.id.us/rules/subsurface/58_0103_0801_notice.pdf).

Flow rates for single-family dwellings have been updated, and there is a new definition of the terms "bedroom" and "module." The number of soil classifications was increased from three to six, and the maximum allowable size for a standard drainfield was increased to account for the increased estimated flow rates.

## Maine

After extending the public comment period, the state Subsurface Wastewater Program has proposed new regulations dealing with septic systems. A published list of changes indicates the rules were to become effective April 1, 2009. The proposals came after study by an outside task force of site evaluators, local plumbing inspectors, system installers, system inspectors, and equipment suppliers and manufacturers. Visit [www.maine.gov/dhhs/eng/plumb/index.htm](http://www.maine.gov/dhhs/eng/plumb/index.htm).

## Maryland

The state now offers free septic system upgrades for low-income households to help protect water quality in the Chesapeake Bay. The Bay Restoration Fund is offering to fund new equipment, installation and five years of maintenance for systems that qualify. Others may qualify for financial assistance to upgrade systems. Visit [www.mde.state.md.us/Water/CBWRF/osds](http://www.mde.state.md.us/Water/CBWRF/osds).

## Michigan

An Ingham County circuit court judge ordered Worth Township to stop unauthorized discharges of raw or partially treated sewage from failed septic tanks and tile fields within its boundaries. The state attorney general's office filed suit after unsuccessful attempts to resolve the matter with the town-

ship, according to the Michigan Department of Environmental Quality, which found high concentrations of E. coli and fecal coliform in water samples taken from the township near Lake Huron. Judge Joyce Draganchuk ordered the department and the town to agree on a final order to determine how the problem will be solved.

## Delaware

The Class H Inspection Program now requires installers to use the new Class H inspection form and guidance document. Notable changes include mandatory pumping during inspections, scaled drawings and more detailed reports.

The state Ground Water Discharges Section is amending regulations to allow spray irrigation for systems larger than 2,500 gpd. It also prescribes the use of site-specific soil evaluations, infiltrometer tests, and preliminary groundwater assessments as the basis for system selection and sizing. The draft is at [www.wr.dnrec.delaware.gov](http://www.wr.dnrec.delaware.gov).

## Virginia

The Chesapeake Bay Nitrogen Reduction Act of 2009 would strengthen restoration plans for the Chesapeake Bay by requiring new or replacement onsite systems to have nitrogen removal technology. The Bay Restoration Fund would help homeowners pay the difference between conventional systems and those with nitrogen removal.

## Alabama

Will septic system users in Jefferson County, Ala., be forced to help pay for the \$3.2 billion in debt facing the county's sewer utility? It was one recommendation issued in January by "special masters" assigned by the U.S. District Court to help

the county deal with a bond market meltdown that left it with debt it can't pay. Sewer rates have increased 329 percent since 1997 but the sewer utility is still facing bankruptcy.

Despite statements from county officials indicating that such a fee is not being considered and would not be instituted, several municipalities have passed or are considering local ordinances that would prohibit the suggested \$20 to \$30 monthly fee for nonusers of the sewer system.

## Florida

The Florida Keys Aqueduct Authority is offering people \$500 to convert old septic tanks into cisterns for watering their lawns and gardens. The idea came about after people in the Keys were required to abandon septic systems and hook into central sewer.

According to the Miami Herald, a retired engineer came up with a way of making the conversion for \$500, about what it costs to properly abandon the septic tank. The state Department of Health has approved the conversion as safe for irrigation. Tanks have to be tested by local health departments before they can be used.

## Illinois

The Department of Public Health has withdrawn proposed changes to state codes dealing with private sewage disposal systems. According to a posting on the department's Web site, it will reopen discussion in order to restructure the rules to "properly address issues related to alternative technology, subsurface drip irrigation, portable sanitation requirements and NPDES requirements."

## British Columbia

The 2005 change in septic system



regulations that relies on industry self-regulation is "a classic case study in regulatory failure," according to a report from the University of Victoria Environmental Law Centre. A release from the Centre says British Columbia is "virtually the only North American jurisdiction that doesn't require a government official to examine a sewerage system before it goes into use."

On March 4, a coalition of groups issued a statement calling for immediate reform. The govern-

ment's Healthy Living and Sport Department oversees the regulations. Its minister, Mary Polak, told the *Vancouver Sun* that the majority of the coalition's recommendations actually came from her department's staff. She also said the provincial government acknowledges problems and will issue a plan to address them in September.

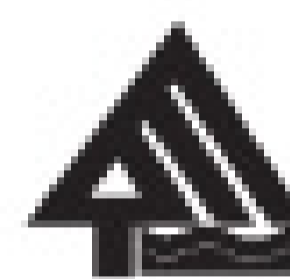
*Correspondents Doug Day and Scottie Dayton contributed to this report.* ■



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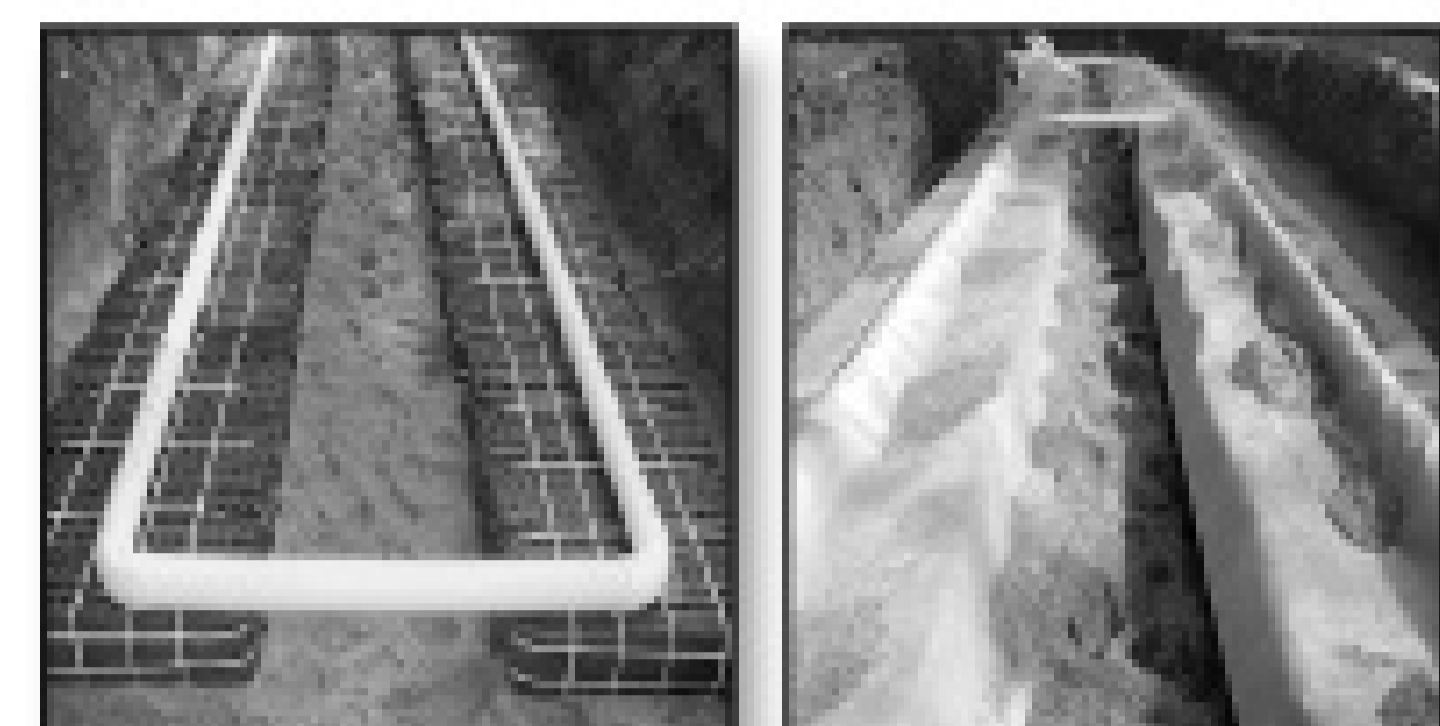
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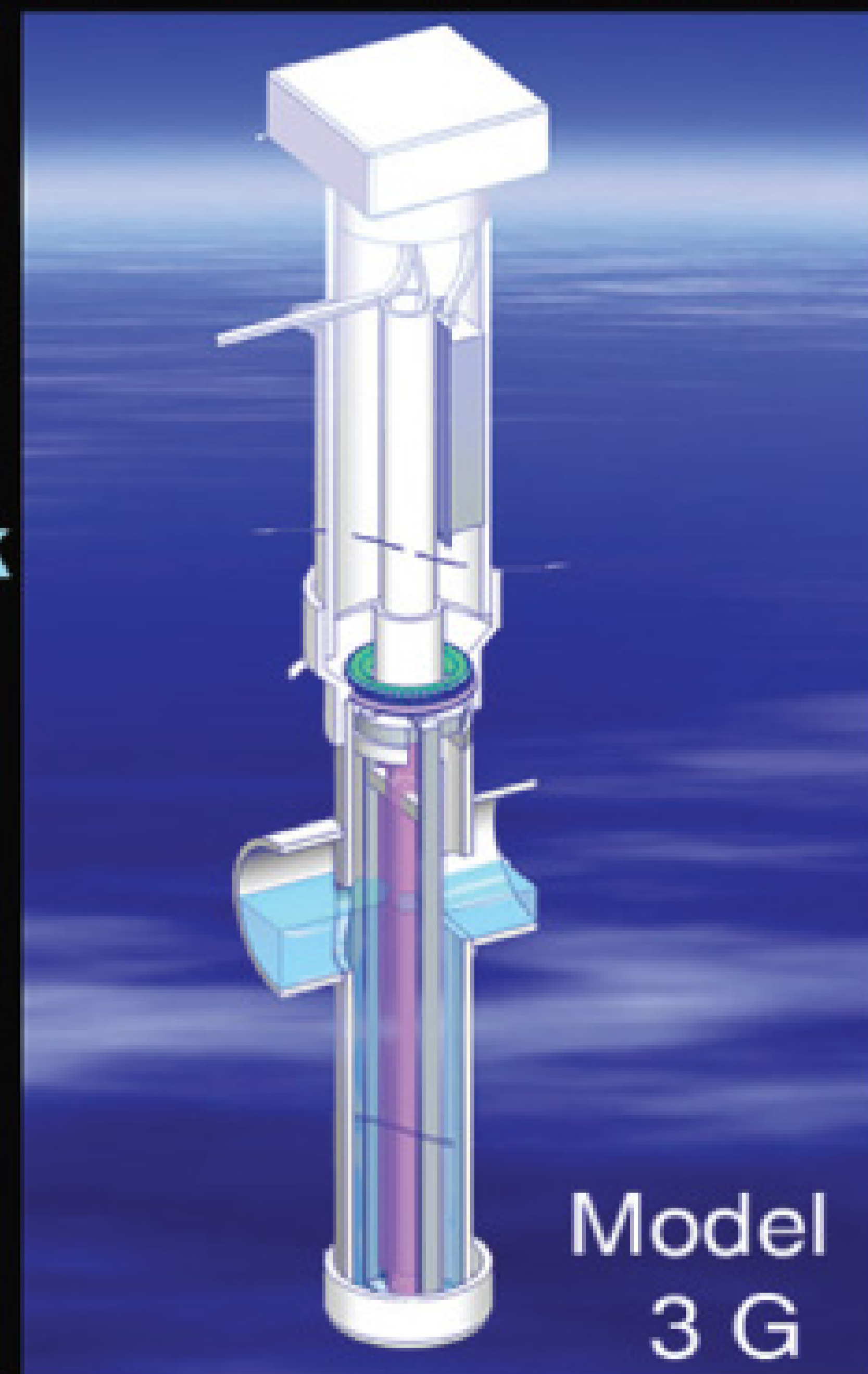
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From left, Jayme Orrock, Harry Zimmer and Al Schmitz place 1 1/2-inch rock 10 inches deep in a pressure bed for a residential onsite system at a lakefront property. (Photos courtesy of J.L. Schmitz and Sons)

# A Better Way

**J.L. Schmitz and Sons uses an innovative conveyor system that saves time, reduces site impacts, and limits machine wear when installing rock**

By Doug Day

## J.L. Schmitz and Sons, Monticello, Minn.

**OWNERS:** Pete and Al Schmitz

**YEARS IN BUSINESS:** 34

**SPECIALTIES:** Onsite installation, excavation, agricultural drainage

**EMPLOYEES:** 5 full-time, 3 part-time

**MARKET AREA:** Five counties

**AFFILIATIONS:** Minnesota Onsite Wastewater Association, NOWRA



**A**s they moved from digging basements to installing septic systems, the team at J.L. Schmitz and Sons brought along some technology from the old job to do better at the new one. It's nothing fancy, but a small adaptation of a gravel conveyor means less work and better results for Pete and Al Schmitz and their customers around their home base of Monticello, Minn., just northwest of Minneapolis.

Founded in 1975 by John L. Schmitz and his sons Pete and Al, the business started in excavating, farm drainage and irrigation installation. They soon added farm liquid waste handling to their services.

By 1978, they were installing Harvestore slurry storage systems, and they soon found a new market for commercial pumping of slurry tanks and lagoons, then applying the material to farm fields. They

still run four liquid manure applicator trucks.

They eyed another growth opportunity in 1987 when Pete and Al decided to install their own septic systems while building their homes. They thought it was nice to be working in sandy soil instead of the farm fields. "For us it was easy compared to installing drain tiles where you're constantly in the mud and clay," Al Schmitz says. "We also saw there was a need for septic installers in our area."

### Entrepreneurial spirit

Today, the company installs 15 to 20 onsite systems per year. The fleet includes a Cat 312C excavator, a Cat D-5G dozer, a Cat 950 loader, a Cat 257 multi-terrain loader, a Cat 226 skid-steer loader, a Parson 150 Trencher, a 580 Case backhoe, a Mack dump truck, a Mack Lowboy tractor, and four vacuum

**"We're not willing to put dirty rock in a drainfield or bed, so we avoid dumping the rock on the ground as much as possible. Any time you put the rock onto the ground, you're contaminating some of the rock with dirt and grass."**

Al Schmitz

trucks on Mack chassis with 3,300-gallon tanks for septic system servicing and other waste pumping and hauling.

After buying a gravel conveyor in 1995 for use in backfilling basements, they soon found a way to use it in their septic system business for placing rock in drainfields, pressure beds and mound systems.





Members of the Schmitz and Sons team, from left: Josh Linder, Al Schmitz, owner, Pete Schmitz, owner, and Harry Zimmer.

"It's such a labor saver, because you don't have to shovel or rake rock to get the pipe to the proper elevation, and you do very little of it around the pipes," says Pete, the elder of the brothers.

When backfilling a basement, the conveyor can throw aggregate up to 50 feet. It took some refining to make it useful for septic systems. The changes included slowing the conveyor, fabricating a hopper, and attaching a 4-foot-long handheld 8-inch flex hose to distribute the rock to the proper grade throughout a drainfield or mound.

"It takes about 10 minutes to hook the conveyor to the back of the gravel truck," says Pete. "You pull a couple of safety clips and stretch it out and you're ready to use it right then and there."

#### Precise installation

It takes one person to operate the 20-foot conveyor and another in the drainfield to handle the hose for precise installation of the rock. It takes 15 to 20 minutes to unload 15 tons of rock from a truck. "What

we like the most about using the conveyor is the better quality we're giving the customer," Pete says. "We don't drive a Bobcat loaded with rock all over the drainfield, compacting the soil."

The system also ensures clean rock. "We're not willing to put dirty rock in a drainfield or bed, so we avoid dumping the rock on the ground as much as possible," says Al. "Any time you put the rock onto the ground, you're contaminating some of the rock with dirt and grass."

The innovation also reduces waste of rock. "You're going to lose a lot of rock every time you dump aggregate on the ground and try to pick it up," Al says. Moving it directly from the truck to the conveyor and into the drainfield saves money and reduces cleanup time.

**The Schmitz and Sons crew use a Cat 312C excavator to dig a pressure bed. The wood saddles, all set at the designed elevation, will support 2-inch Schedule 40 PVC pipe.**

That means a more efficient operation, and assurance to homeowners that their yards will be free of rock when the job is done.

The system also saves wear and tear on the company's compact track loader, which is fitted with rubber tracks. "We were able to get 2,475 hours out of our tracks when we were told to expect about 1,100 hours," says Pete. "Our machine isn't crawling in the bed system. There are no rocks getting in the tracks or cutting the rubber bogies and track." He says a Caterpillar salesman told them the machine got more hours out of its tracks than any other he knew of.

#### Aid to business

The brothers also know they've picked up some work because of the conveyor system. "We explain to the customer exactly how we're going to place the rock into their drainfield and that we're not going to be putting rock on their driveway or lawn," says Pete. Customers respond positively.

Pete relates a story about a home on a small lot with little room to get to the backyard. The woman wanted them to go through a neighbor's yard instead. Not wanting to make her responsible for any damage to a neighbor's property, Pete came up with a plan. "We told her we'd cut down a basketball pole

## Age and Its Rewards

For Harry Zimmer, digging trenches and putting in septic systems is a way of taking it easy in retirement. Zimmer, a former dairy farmer and customer and current employee of J.L. Schmitz and Sons, may be 71 years old, but he'll work any youngster into the ground — and teach him a thing or two along the way.

"He is such a great influence on everyone here," says company co-owner Al Schmitz. "He is so meticulous at what he does. He's such a hard worker. He's been that way his whole life. When we worked on his farm, I could drop a sandwich on the milking barn floor behind the cows and I wouldn't have been afraid to pick it up and eat it."

Zimmer helps everyone work to achieve the company motto: "We don't need to be the fastest, we strive to be the best." That means getting 100 percent from everyone 100 percent of the time on every project. "We only get paid to do something once, so it had better be done right the first time," says Schmitz. Zimmer serves as an example to help the J.L. Schmitz and Sons team do just that.





and weld it back in place when we were finished," he says. "When the job was done she said that was one thing that got us the job, along with using the conveyor."

Leaving the jobsite as if it were their own is one of their goals on every job. "We take pride in our yards, and we want customers to be able to plant grass or install sod right away," Pete says. "They shouldn't have to do anything else."

They'll even use the conveyor in the few situations when tight spaces keep it too far from the

**Al Schmitz (foreground) guides the installation of a 1,500-gallon, two-compartment septic tank from Brown Wilbert Concrete Products of St. Cloud, Minn.**

pipes in half and chop them up into one-inch strips, which become the saddles," explains Pete.

At the site, the saddles are attached to 18-inch-long 1-by-2 boards driven into the ground to the proper elevation, using a laser level system. "That puts every saddle

**"We take pride in our yards, and we want customers to be able to plant grass or install sod right away. They shouldn't have to do anything else."**

**Pete Schmitz**

installation. "We'll take the conveyor and drop the rock into our excavator bucket and then dump it into the mound or drainfield," says Al. That keeps the aggregate clean, prevents waste, and keeps heavy machinery off the installation — even though it means a little shoveling and raking that normally is not needed.

#### **Another family secret**

The Schmitzes have also developed their own saddle system to hold drainfield lines in place — it works well with their gravel installation method. They build the saddles during winter when installation work is slower. "We'll take old PVC pipe and instead of throwing it in the garbage, we'll cut the

at the exact elevation it needs to be," says Pete.

Al observes, "We set our pipe in the saddle, and we don't have to touch that pipe at all as we're installing the rock with the conveyor system." That's easier than trying to keep piping at the proper level as they place rock around it.

Being always willing to try something new or a little different has served them well. It's a spirit they got from their late father, says Pete: "He taught us to never be afraid of taking risks." ■

**Josh Linder uses a Cat 302 mini-excavator to prepare the site for a 2-inch pressure line running from the lift tank to the pressure bed.**



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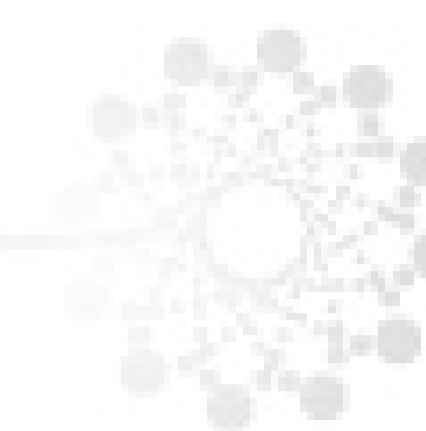
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# Give Yourself a Lift

Looking to save time and hard labor in cramped quarters? It's tough to beat the new breed of workhorse mini-loaders.

By Greg Northcutt

**T**hey're called by such names as mini-loaders, mini skid-steers, and compact utility loaders — machines you operate while riding piggyback in a standing position or walking behind. Typically, they measure no more than about 6 or 7 feet long. Some can even slip through doors and gates less than 36 inches wide.

But don't let their size fool you. These backyard helpers offer the power, performance and ease of operation to let you take on jobs too big to handle with shovels and wheelbarrows in areas too small for skid-steers.

Powered by gasoline or diesel engines, they provide 13 to 32 hp of muscle to save time and back-

breaking labor. With hinge pin heights as tall as 6 feet, they can dump a load over the side of lighter-duty dump trucks or haul construction debris to a container. Some can carry a ton or more without tipping forward.

These machines aren't designed for clearing and leveling land for a shopping center, much less for moving mountains. But mini-loaders can get into and grade a small backyard and tackle a variety of other jobs on residential and commercial projects.

## Multipurpose power

The versatility stems from a broad range of attachments, matched by the ability to produce up to 3,000 psi of hydraulic pressure. It is the kind of power that can make easy work of auguring holes, tilling soil, digging trenches, breaking up concrete or asphalt, grinding stumps, and more.

Choose between hydrostatically driven skid-steer wheeled machines for agile maneuvering or dedicated rubber tracks for traction and flotation.

"If you think the mini-loaders are too small to fit your operation, you owe it to yourself to rent one for a day," suggests Andy Lewis, marketing manager for Compact Power Inc., which makes the Boxer

**At least 70 attachments are available for mini-loaders, like the angle sweeper on this Bobcat MT55.**



Depending on the job, mini-loaders like this Vermeer S600TX can do the work of four people.

line of compact utility loaders.

"These machines are power plants for operating hydraulic and non-hydraulic implements and solving all kinds of material handling problems in tight spaces," Lewis says. "More and more contractors realize that, in terms of cutting costs and the ability to handle a wide range of work in tight quarters, often there's no alternative."

## More work, fewer workers

Depending on the job, a mini-loader and operator can replace two to four workers, Lewis notes. That's one reason these machines, priced

at \$13,000 to \$27,000, can pay for themselves in short order. They can also replace single-purpose machines such as a trencher or boring machine.

Another plus is ease of operation, with such features as pilot-operated drive system controls and an unobstructed 360-degree view. Learning to operate a mini-loader is simple, adds Neil Borenstein, senior marketing manager with the Toro Co. "With just a few minutes of instruction, you can run one of these machines," he says.

Mini-loaders are also easy and cheap to transport. The biggest weigh about 2,500 pounds and can be hauled on a trailer pulled by a full-size pickup. Performance and





This Ditch Witch SK350 mini-loader makes quick work of a landscaping job.

operating and servicing features vary. Here are some basics in choosing a mini-loader:

**Wheel versus track.** With travel speeds up to 4.5 mph, wheeled machines can complete lift-and-carry jobs faster than tracked models, which travel at 3 to 3.5 mph. Although both types can turn around within their own length, wheeled models are more maneuverable due to their short wheelbase. Also, tires wear longer.

On the other hand, tracks spread the weight over a larger footprint, providing more traction and flotation in wet and muddy conditions. What's more, a track model can lift more than a comparable size wheel model.

Track choices from some manufacturers include an aggressive tread pattern for more traction or a turf-friendly option to minimize surface disruptions. Meanwhile, Boxer's largest mini-track loader lets you adjust the machine stance to fit the job. Retract both tracks to reduce the outside width to 36 inches for narrow access points. Then extend the tracks to an outside edge width of 43.5 inches for maximum stability.

**Walk, ride on or both.** You can select a mini-loader with or without

a platform to stand on. Proponents of walk-behind units favor them for traveling over rough terrain and for jobs involving slow ground speeds. The ride-on models are designed for comfort on jobs that involve more hauling and longer hauls and for better attachment visibility.

Choices include permanently mounted, spring-cushioned platforms, removable platforms, and



One advantage of a compact track loader like this Boxer 427 is its ability to lift more than a comparable size wheel loader.

those that flip up or down. You might want to check platform height for adequate ground clearance when backing over curbs or other obstacles.

**Controls.** The way you control the machine varies. For example, Boxer machines have two finger-

touch levers, each of which controls the forward and reverse direction of the wheels or tracks on one side. A third lever raises and lowers the loader arms, while a fourth controls bucket curl. With its single T-bar control, Toro machines can be driven forward or backward and turned using one hand. The other hand operates a joystick to control the loader arms and bucket.

**Hydraulic systems.** Instead of a single pump to power the drive system and loader arm and attachment, some mini-loaders have two-pump operation. These systems provide both high and low hydraulic flows to match attachment power to performance needs. Several, like Toro and Vermeer Corp. models, offer four-pump systems that let you drive and turn the machine and raise and lower the boom all at the same time. Some machines let you select a high travel-speed range for transporting materials or a low range to direct more power to the attachment.

**Safety.** To prevent injuries and equipment damage, the travel controls of mini-loaders are self-centering. That way, when you release the controls, they automatically return to neutral. Also, when backing up, a pressure-activated safety bar

**"These machines are power plants for operating hydraulic and non-hydraulic implements and solving all kinds of material handling problems in tight spaces. More and more contractors realize that, in terms of cutting costs and the ability to handle a wide range of work in tight quarters, often there's no alternative."**

Andy Lewis / Compact Power Inc.



Learning to operate a mini-loader like this Ramrod Taskmaster takes only a few minutes of instruction.



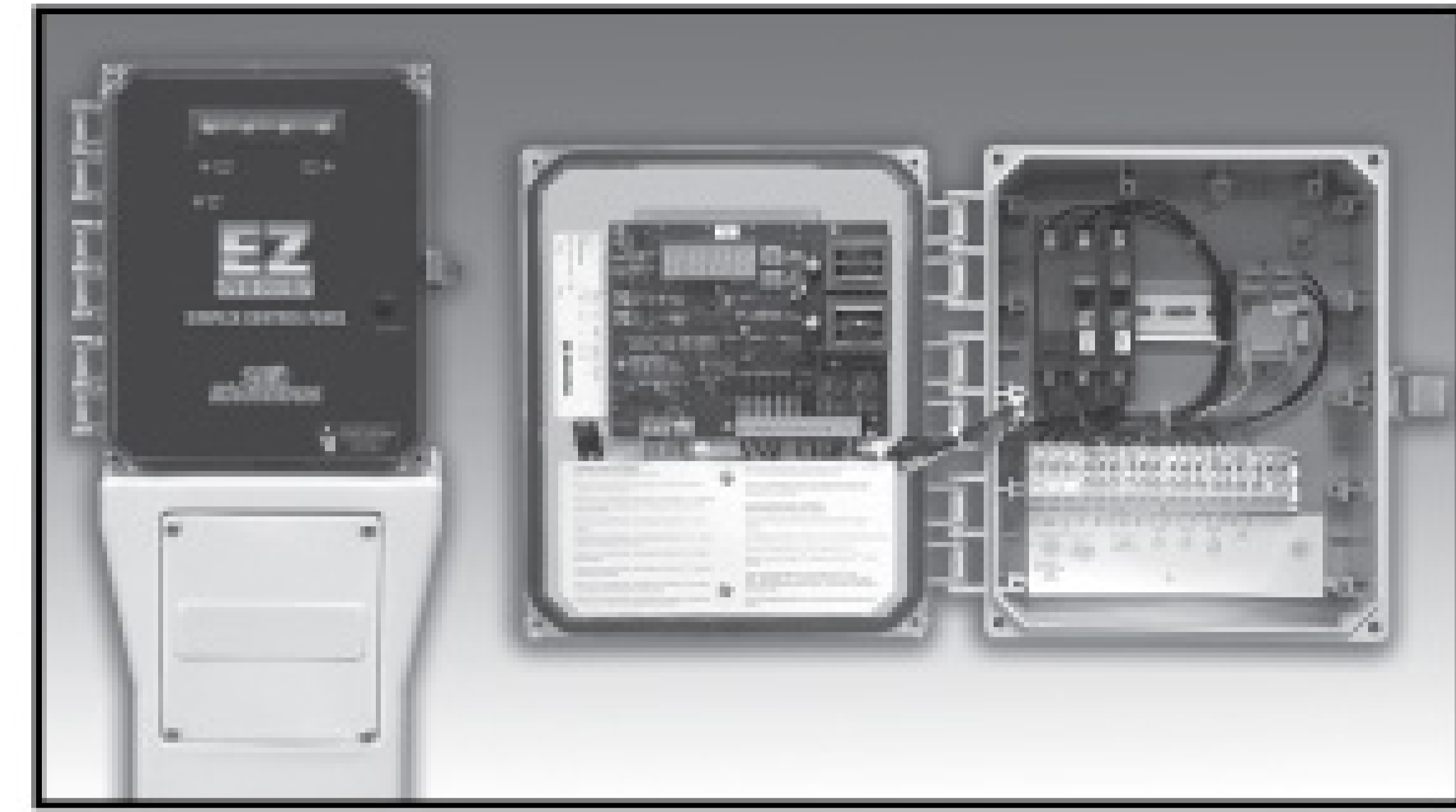
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Mini-loaders, such as this Toro TX 525, have enough power to dig a 4-foot deep trench.

across the back of the machine stops reverse travel to prevent you from being pinned.

**Attachments.** At least 70 attachments are available, from grapples, power box rakes and vibratory plows to snow blowers and tree

forks. Quick-attach systems make switching tools easy. When it comes to buckets and other material-carrying attachments, a self-leveling lift system, like that offered by Ramrod Taskmaster, can be a real convenience. It keeps the attachment level throughout the lift cycle to prevent spilling.

Hydraulic systems with the



Mini-loaders like this Bobcat MT52 can tackle a variety of residential and commercial projects.

float feature can add convenience and productivity. DitchWitch mini skid-steers allow buckets, blades and other attachments to follow ground contours.

**Serviceability.** Look for features that make it easy to access the engine and components. They include a lift-up hood and openings or easy-to-remove covers for reaching filters and fluid fill points. In most cases, you have to raise the

loader arms to reach the battery, but you can't do that if a dead battery prevents you from starting the engine. Some manufacturers offer an outside connection to the positive battery post for jump-starting a machine.

Greg Northcutt is a freelance writer based in Port Orchard, Wash. He can be reached by e-mailing this publication at [editor@onsiteinstaller.com](mailto:editor@onsiteinstaller.com). ■





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# Easier in the Field

An automated percolation testing system highlights new product and technology offerings at the 18th annual NOWRA conference

By Ted J. Rulseh

An automated system introduced at the 18th Annual NOWRA Technical Conference and Expo is designed to simplify the process of percolation testing and make the testing itself more consistent and reliable.

**Percolation Technologies Inc. of St. Cloud, Minn., introduced the E-Z Perk system,** designed to help onsite professionals save time by running single and multiple perc tests unattended. The



Chad Kraemer (right) of Percolation Technologies explain the E-Z Perk technology for automating percolation tests to Phil Lundman of Peterson Supply. (Photography by Ted J. Rulseh)

system is the brainchild of Chad Kraemer, himself an onsite designer and installer. Colleague Brian Prigge helped Kraemer turn his idea into a marketable product.

Kraemer observes that in per-

forming a perc test manually, the contractor digs a test hole, sets up a soak system, returns about four hours later to unhook the soak system, then returns a third time to do the actual test.

With the E-Z Perk system, the user connects a flexible hose to a fill tube in the base of the unit, positions the unit directly over the test hole in its heavy-duty carrying case, and connects a water source using a standard hose connection. The water source can be by gravity flow from a portable water tank or barrel, or from a garden hose connected to an outdoor faucet.

The user enters information using a small LCD screen and keypad. The first screen records the site location using an on-board GPS and records the date and time. The second screen allows the user to program the test parameters. The third screen displays the test results.

During the actual test, a sensor in the base of the unit intermittently reads and records the water level in the hole. Meanwhile, the unit automatically adds water to the hole as needed.

A computer program calculates the perc rate. At the end of the test, the contractor can print the results on roll paper. Remote units enable a contractor to conduct two tests (one remote unit) or three tests (two remote units) at the same time. **Call 320/258-2873 or visit [www.percolationtechnologies.com](http://www.percolationtechnologies.com).**

Other innovations presented at the NOWRA conference included:

**The Salcor 3G UV disinfection unit from Salcor Inc.**

This unit was developed for disinfecting effluent from small aerobic treatment units. It can reduce fecal coliform levels to well below the strictest U.S. treatment standards, even when the treatment unit is running in mild upset conditions. The maximum flow is 4,320 gpd assuming less than 30 mg/l BOD and TSS. It installs in less than 30 minutes and is designed to operate with minimal attention. **Call 760/731-0745.**

**The Pugo-PS advanced treatment unit from Pugo Systems** (a business of Adelante Consulting Inc. in Santa Fe, N.M.). This household-scale wastewater treatment and recycling system pro-



Mike Corry of Corry Consultants in Madison, Wis., learns about the Salcor 3G UV disinfection unit from John DeLacio of Salcor Inc.

vides primary settling, fixed-film aerobic treatment, and tertiary filtration in a single tank. The unit



Gene Bassett of E.C. Bassett Construction Inc., in Edgewood, N.M., looks over the Pugo-PS advanced treatment unit with Joe English of Adelante Consulting Inc.





Carl Thompson of Infiltrator Systems Inc. shows a sample of the company's Smart-Rock drainfield media to Larry Stephens, P.E., Stephens Consulting Services P.C. of Haslett, Mich.

has a treatment capacity of 450 gpd. Call 505/866-5076 or visit [www.pugosystems.com](http://www.pugosystems.com).

**Smart-Rock drainfield media from Infiltrator Systems Inc.** This drainfield media is an expanded polystyrene material that surrounds

a perforated pipe. It eliminates the fines associated with gravel, reduces compaction and reduces embedment. The aggregate is held in place by high-strength netting. Made from recycled material, it is sold in 10-foot lengths. Call 800/221-4436 or visit [www.infiltratorsystems.com](http://www.infiltratorsystems.com).

**Septic Assistant software from Ayres Associates.** Installers may encounter local or state regulatory agencies using this software, which is designed to track performance, maintenance and operation of onsite systems. It can be customized to meet agencies' specific needs for system inventory, tracking and scheduling, document storage and retrieval, inspections, reporting and more. Call 800/800-5191 or visit [www.ayresassociates.com](http://www.ayresassociates.com).

**Mantis leachfield media from Eljen Corp.** This product, so far approved only in Connecticut, comes already assembled for drop-in-trench installation. The system requires no special tools or fabric covering. It is rated for pressure and gravity systems. Call 800/444-1359 or visit [www.eljen.com](http://www.eljen.com). ■



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22

# Alternate Materials

Manufacturers expand the range of septic tank options with models made from fiberglass and plastic in a variety of configurations

By Benjamin Wideman

Septic tanks in fiberglass and plastic have been around for years. Experience in the field has taught manufacturers new tricks in making those tanks strong, long-lasting and leak-free. Here are some of the latest innovations in septic tanks, pump tanks and tank accessories now available to innovative installers.



Dominator from Snyder Industries

## Low-profile Tanks

The **Dominator** from **Snyder Industries** is a new line of low-profile septic tanks. A monolithic structural design provides high top-load strength, and a proprietary manway isolation design keeps manholes from distorting during backfill and pump-outs. The tanks require no special water-filling procedures during backfill and can be used in both septic and pump tank applications. The septic tank is available pre-plumbed with inlet and outlet tees preinstalled. The unit is available in 750-, 900-, 1,050-, 1,250- and 1,500-gallon capacities and in single or double compartments. 402/467-5221; [www.snydernet.com](http://www.snydernet.com).

## Seamless Design

High-performance **polyethylene septic tanks** from **Premier Tech Environnement** have a seamless design that makes them airtight and watertight, eliminating water infiltration or leaks and minimizing odors. The easy access for inspection and servicing ensures compliance with government standards and requirements. 800/632-6356; [www.ptenv.com](http://www.ptenv.com).



Polyethylene septic tanks from Premier Tech Environnement

## Rust-resistant

Rust-resistant **fiberglass septic tanks** from **Containment Solutions** are IAPMO-approved and range from 4 to 12 feet in diameter. The tanks are manufactured using a premium resin, glass fibers and a specially treated silica that results in a composite matrix suitable for non-potable water applications. The rib design adds strength and durability. The tanks, with single-, double- or triple-wall construction, range from 600- to 50,000-gallon capacities. 800/537-4730; [www.containment-solutions.com](http://www.containment-solutions.com).

## Integral Ribs

**Fiberglass tanks** from **Xerxes Corp.** are constructed of rustproof, long-lasting material. They are designed with integral ribs for added strength and for H-20 load conditions. They are manufactured to applicable requirements of UL 1316 and ANSI/AWWA D120-02. The tanks are available in single-, double- or triple-wall models. Sizes range from 600 gallons to more than 60,000 gallons. 952/887-1890; [www.xerxescorp.com](http://www.xerxescorp.com).

## Strength for Durability

**TW-Series septic tanks** from **Infiltrator Systems Inc.**

are designed for extreme strength for long-term, water-tight performance. Innovations include:

thick, triple-wall design **TW-Series septic tanks** from **Infiltrator Systems** manufactured with advanced rotomolding technology; permanent, factory-installed structural bulkheads; and reinforced access ports. No special installation, backfill or water-filling procedures are required. 800/718-2754; [www.infiltratorsystems.com](http://www.infiltratorsystems.com).





Roth MultiTank from Roth Global Plastics Inc.

### Multiple Layers

The **Roth MultiTank** from **Roth Global Plastics Inc.** has an inner layer of FDA-approved virgin HDPE, two inside layers of PE for improved stability, plus one outer layer of black and UV-stabilized PE. The tank meets or exceeds state requirements and NSF 61. 866/943-7256; [www.roth-global.net](http://www.roth-global.net).



### Three Sizes

**Coon Manufacturing Inc.** provides **polyethylene septic tanks** in 500-, 1,000- and 1,500-gallon capacities. The 500-gallon tank is a single compartment unit, and the 1,000- and 1,500-gallon tanks are available in single or double compartments. The seamless, waterproof tanks are manufactured using rotational molding. 800/843-1532; [www.coonmfginc.com](http://www.coonmfginc.com).

### Built Leakproof

Fiberglass **septic and advanced treatment tanks** from **Webtrol** offer a double-rib design. The tanks are made of high-quality resin fibers and bonded well above the inlet for a leakproof unit. The tanks have no middle seam and include a built-in lifting system for easy placement. 800/769-7867; [www.webtrol.com](http://www.webtrol.com).

### Durable Lids

**RotoSolutions** offers a durable and economical **roto-molded septic tank lid**. The 18- and 24-inch lids are manufactured from lightweight and durable polymers and are designed for easy handling and transport. They come complete with hardware kits that include stainless steel components.



Roto-molded septic tank lid from RotoSolutions

The lids are sold in boxes of six and are made to fit 18- or 24-inch corrugated pipe. They can be used with or without the sand-filled or foamed option and come in green or black. 800/868-0973; [www.rotosolutions.com](http://www.rotosolutions.com). ■

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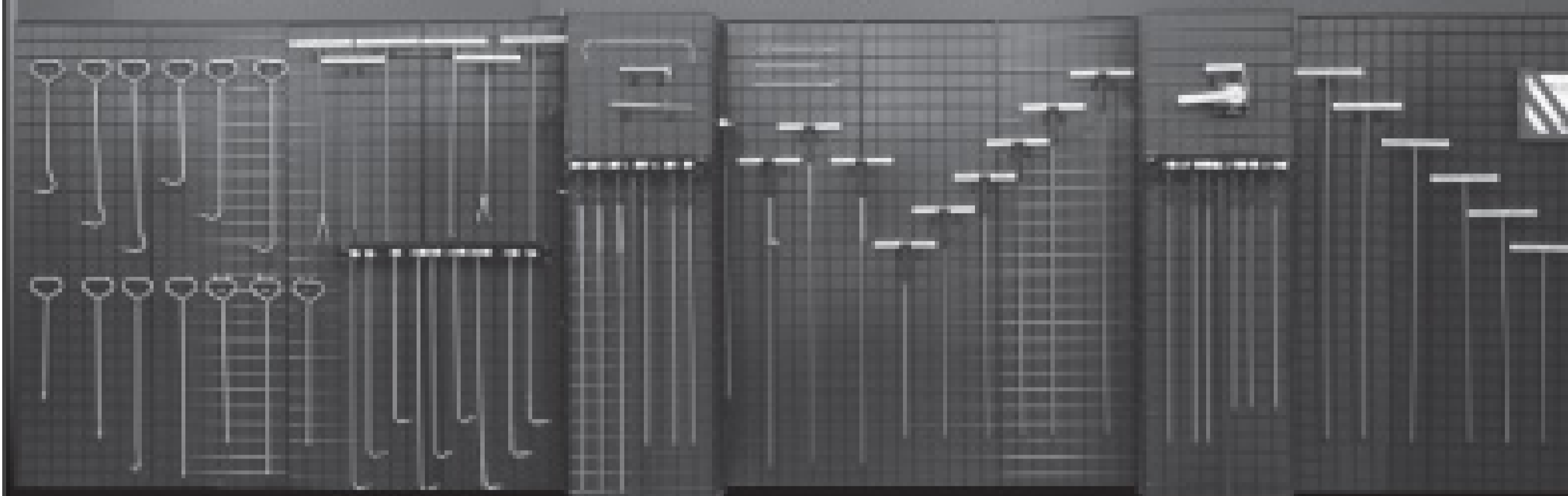
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# Simpler Solution

A cluster system using aerobic treatment units enables a developer to go forward with plans for a 60-home subdivision in east-central Wisconsin

By **Scottie Dayton**

**J**eff Wellhouse of Breezewood Properties Inc. in Neenah, Wis., wanted to develop a 60-home subdivision in the Town of Greenville northwest of Appleton, Wis.

The town had a Conservation Subdivision Ordinance that determined the number of lots per development and their minimum size. The ordinance and poor soils over much of the site encouraged a cluster onsite system because it reduced site disturbances and potential problems caused by individual conventional systems.

The onsite plans developed by a Minnesota firm looked too complex to Wellhouse, especially since the town expected to operate and maintain the system. Installer Dan Arnoldussen of Earth Works in

Kaukauna, Wis., agreed, seeing too many unnecessary, high-maintenance components. Wellhouse then hired Dave LaBott, CPSS, MPR, of Baudhuin Inc. in Sturgeon Bay, Wis.

LaBott's solution involved a trash tank, surge tanks, fixed activated sludge treatment (FAST) units, lift station, dosing tank and four mound systems. The installation, the first of its kind in Outagamie County, enabled Wellhouse to proceed with his plans for Crestview subdivision.

## Site conditions

Soils are sandy loam with the water table at 48 to 108 inches below grade. The topography is hilly. The elevation on the 80-acre



An operator from Jon's Crane and Rigging of Fond du Lac, Wis., uses a 90-ton Link-Belt crane to set the top half of the tank on the south FAST unit. (Photos courtesy of Martenson & Eisele Inc.)

parcel drops 60 feet from west to east. Agricultural fields surround the site.

## System components

LaBott sized the system to handle 27,000 gpd. Its major components are:

- 18,000-gallon one-compartment concrete trash tank. All tanks made by Wieser Concrete Products Inc., Maiden Rock, Wis.
- Two 18,000-gallon one-compartment surge tanks.
- 8-inch plug valve, Val-Matic Valve and Manufacturing Corp., Elmhurst, Ill.

- Two 3/4-hp Goulds WS0712B submersible sewage FAST dose pumps (40 gpm/26 feet total dynamic head).
- Three 9,000-gallon pretreatment tanks, each with 9.0 FAST aerobic treatment units from Bio-Microbics Inc., Shawnee, Kan.
- 6,000-gallon lift station with two 15-inch Orenco effluent filters and two 1-hp Goulds WE1012 effluent pumps (40 gpm/55 feet TDH).
- 450 feet of pre-insulated 2-inch force main from Insul-Pipe Systems, Buda, Texas.
- 12,000-gallon dosing tank with

## System Profile

<b>Location:</b>	Greenville, Wis.
<b>Facility served:</b>	Crestview subdivision
<b>Designer:</b>	Dave LaBott, CPSS, MPR, Baudhuin Inc., Sturgeon Bay, Wis.
<b>Installer:</b>	Dan Arnoldussen, Earth Works, Kaukauna, Wis.
<b>Site conditions:</b>	Sandy loam; water table 48 to 108 inches below grade
<b>Type of system:</b>	FAST aerobic treatment units, Bio-Microbics Inc., Shawnee, Kan.
<b>Hydraulic capacity:</b>	27,000 gpd



2-hp Goulds WS2012BHF submersible sewage pump (157 gpm/42 feet TDH).

- EZflow geosynthetic aggregate drainage tubes, Ring Industrial Group, Oakland, Tenn.
- Main and dose pump control panels, SJE-Rhombus, Detroit Lakes, Minn.

### System operation

The town would not issue building permits until the system was installed. Home construction began this spring. Leaving the sewer lateral, wastewater enters an 8-inch PVC gravity feed main discharging into a lift station. It is pumped to a 48-inch manhole at the head of the treatment train, then flows through an 8-inch PVC pipe to the trash tank. Trash tanks do not need to meet the state's size requirements for septic tanks.

Effluent gravity feeds from the trash tank to the first surge tank, then passes through a plug valve

into the second surge tank. Duplex pumps in the tank send equal amounts of effluent through a 2-inch PVC force main to three 36-inch manholes. Each discharges through a 2-inch pipe to a FAST unit (only two are now on-line).

Treated effluent gravity feeds from the units to two 48-inch manholes, then into a 4-inch PVC line, where a ball valve recirculates the liquid back to the first surge

gravity flows 190 feet through a 4-inch pipe to the dosing tank. Alternating on-demand pumps send 2,372 gallons (543 gallons drain back) through a 6-inch force main to one of four 62-foot-wide mounds. Each has four laterals on 7-foot centers. Currently, only the bottom two cells are operational.

Depending on their length and distance from the dosing tank, distribution lines are 1 1/2 or 2

them in the proper sequence so Mark's 90-ton Link-Belt crane could reach across and safely set the 30-foot-long tank halves," Arnoldussen says. The process took two days.

"The timing was good because groundwater froze in the bottom of the holes," says Arnoldussen. "When the crane arrived, we dug out the ice and bedded the holes with 8 inches of gravel. We didn't worry about equipment sinking or cave-ins because the soil was frozen hard."

Meanwhile, Falcon Drilling and Blasting Inc. of Eureka, Wis., dynamited an 800-square-foot area of limestone bedrock to make room for the lift station tank and pipe trenches. "We needed a 6-inch separation, but Falcon over-blasted by 2 feet, which is typical," says Arnoldussen.

The crew filled the void with compacted washed stone and stockpiled the blasting spoil for Wellhouse to use on roads. They used the excavation spoils to back-fill holes.

The Greenville engineer, Martenson & Eisele Inc. of Menasha, Wis., sent a technician to observe the installation.

"The town had some standards that went beyond state code," says Arnoldussen. "For example, we had to air-test all lines to its specifications. That was great for me because I knew everything was good."

The county health department inspector also observed every phase of installation. "Even the entire zoning department came out one day," says Arnoldussen. "Everybody asked questions, but they liked what they saw and heard."

### Maintenance

Greenville formed a sanitary district to manage Crestview subdivision following manufacturer-recommended procedures. The district will also pump tanks, clean effluent filters, check pumps (mounted on rail systems), and monitor alarms. When the system produces sufficient flow, Arnoldussen will squirt-test the laterals to ensure equal distribution. In spring 2009, Wellhouse began selling lots. ■

**"The timing was good because groundwater froze in the bottom of the holes. When the crane arrived, we dug out the ice and bedded the holes with 8 inches of gravel. We didn't worry about equipment sinking or cave-ins because the soil was frozen hard."**

**Dan Arnoldussen**

tank. Until 40 homes are on-line, wastewater will recirculate to feed the bacteria in the advanced treatment units.

When the first surge tank reaches capacity, the ball valve closes, sending liquid via gravity to the lift station. It passes through the effluent filters into the second compartment, where pumps send it 400 feet uphill to a manhole. To eliminate freezing, the 2-inch PVC force main is pre-insulated with 12 inches of closed-cell polyurethane.

From the manhole, effluent

inches. The longest measure 360 feet and the shortest 160 feet. All laterals have a squirt valve on both ends. The mounds, separated by 12 feet, have a 17-foot down toe. A 6-inch force main divides the separation zones lengthwise.

### Installation

Another contractor cut in roads and installed the sewer laterals and force main. In November 2008, Arnoldussen's four men installed the mound system. The two active cells will handle 18,000 gpd from 40 homes.

Arnoldussen hired a farmer to plow the area, then hauled in 2,100 tons of ASTM 33 sand. "Dave's design enabled us to work on three sides of a mound, so my drivers kept dumping and we kept spreading sand to a depth of 18 inches with a Caterpillar bulldozer," he says.

After excavating 3-foot-wide trenches in the mounds, the men inserted three EZflow tubes instead of aggregate. Laterals with hand-drilled 5/32-inch orifices every 4 feet went inside the tubes. The two active mounds received a geotextile fabric covering followed by 12 inches of seeded, fertilized and mulched topsoil. Mounds 3 and 4, plumbed and stubbed, await the construction of the remaining houses.

In January, Arnoldussen met with Mark Wieser of Wieser Concrete to coordinate excavation of the tank holes. "We had to dig

**Left, excavated spoil to backfill the dosing tank. Below, backfilling one of the 36-inch manholes, the 2-inch discharge pipes to the FAST units, and the observation ports.**



June 2009

## Superior On-Site Teams with US Concrete Precast

Superior On-Site Solutions LLC has selected US Concrete Precast Group to manufacture and assemble its Hoot Treatment System. The US Concrete subsidiary has provided California with quality precast concrete products and services since the 1950s.

## Topp Industries Updates Web Site

The updated Topp Industries Inc. Web site, [www.toppindustries.com](http://www.toppindustries.com), provides information on the company's polyethylene, structural foam and fiberglass basins, stainless steel guiderail sets, Freeflo Base Elbow Rail system, septic tank risers, covers, lift stations and landscape rocks. Other features include installation guides, specification sheets and CAD drawings. ■

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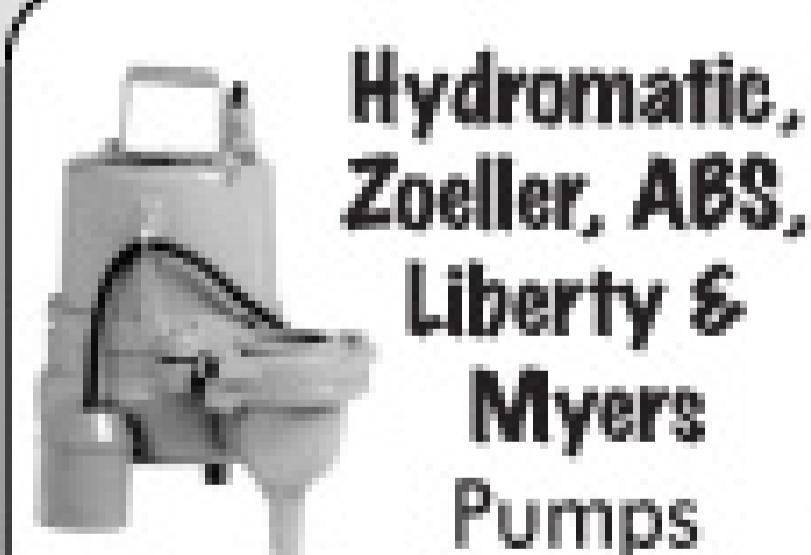
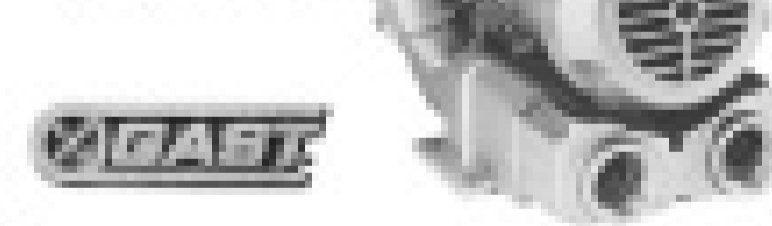


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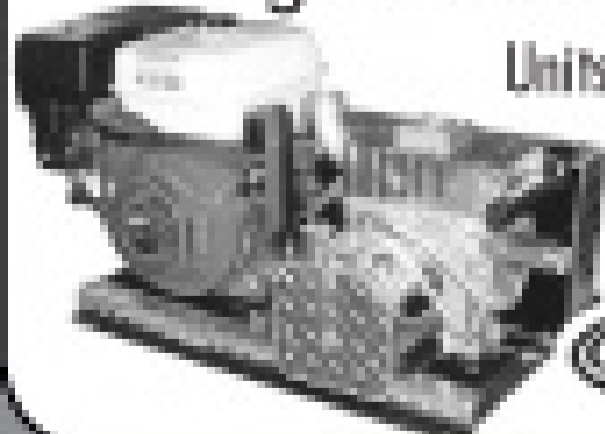
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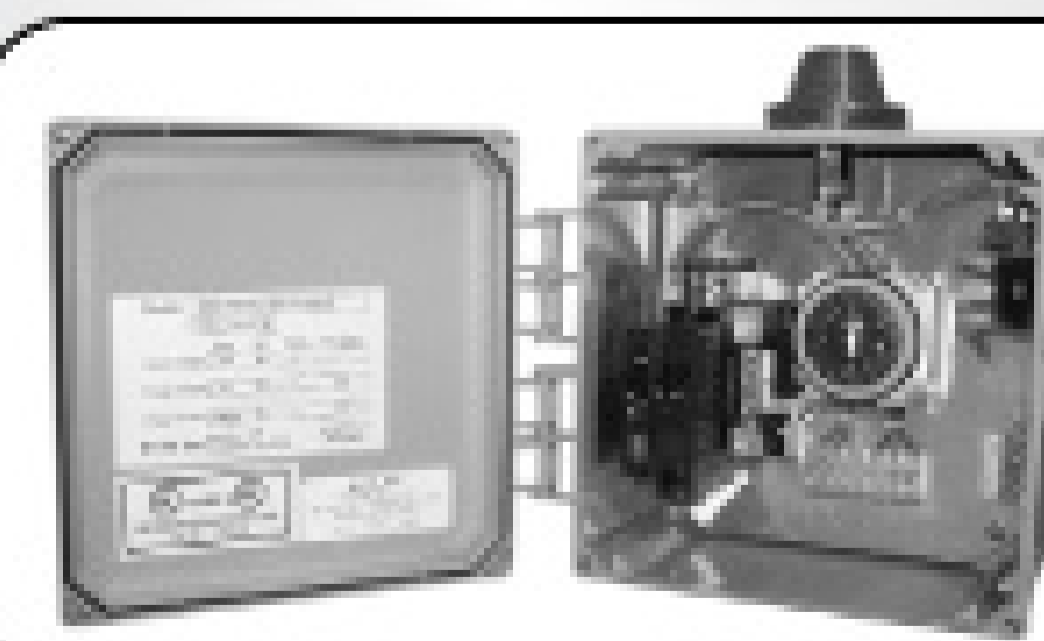
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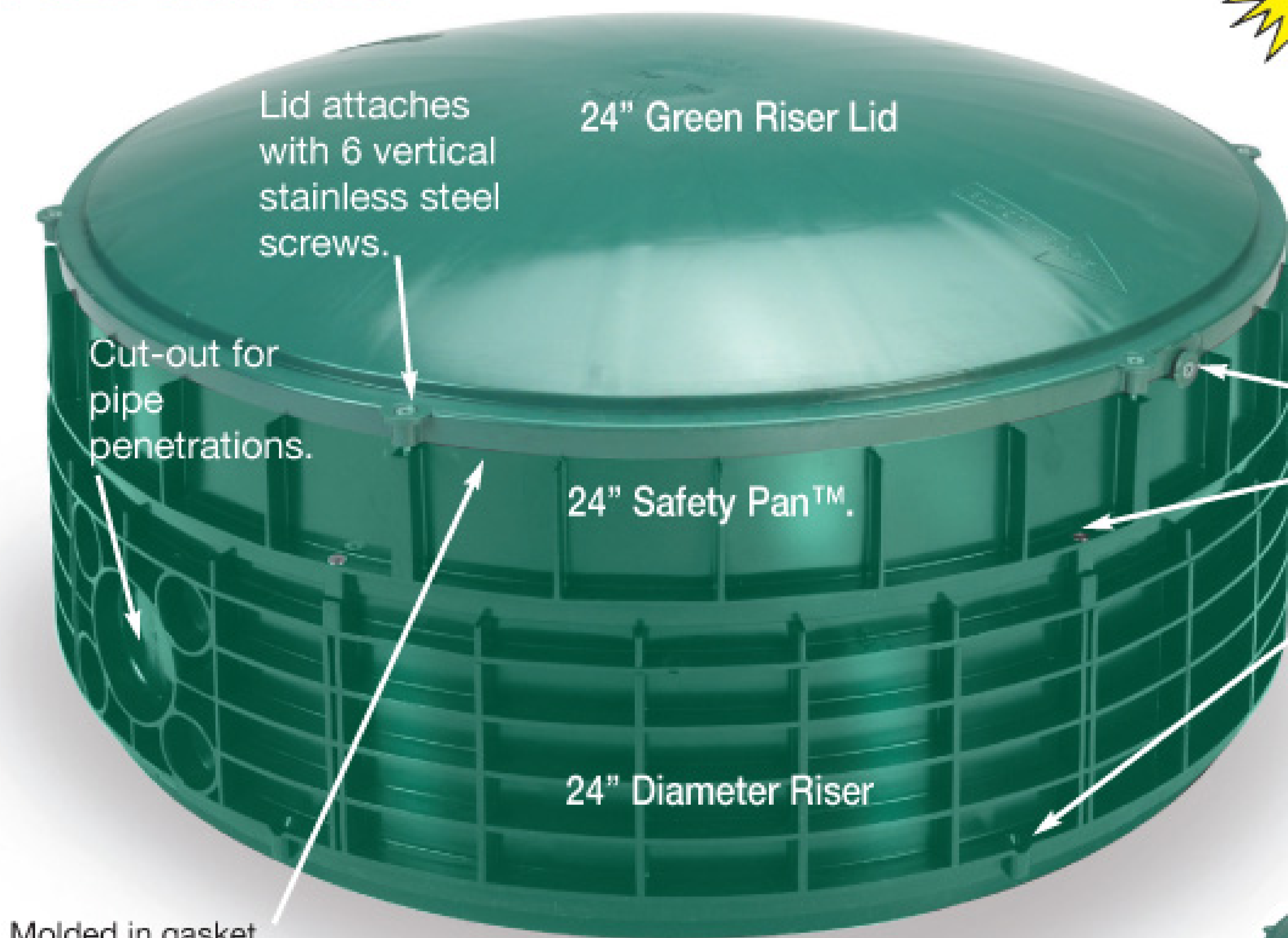


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Patent Numbers  
5,617,679 &  
5,852,901; other  
pats. pending.

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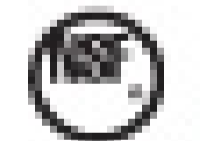
### Tank Adapter Ring

For mounting riser flush to top of tank when casting-in is not an option.

### Effluent Filters

Patent Numbers  
6,319,403; D 431,629; other  
pats. pending.

800 GPD  
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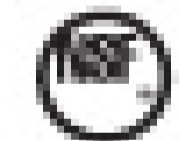


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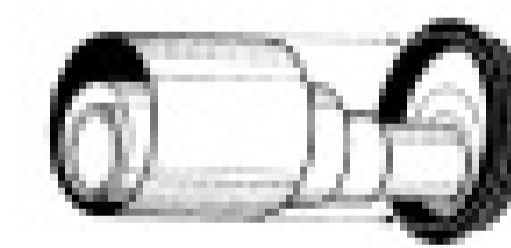
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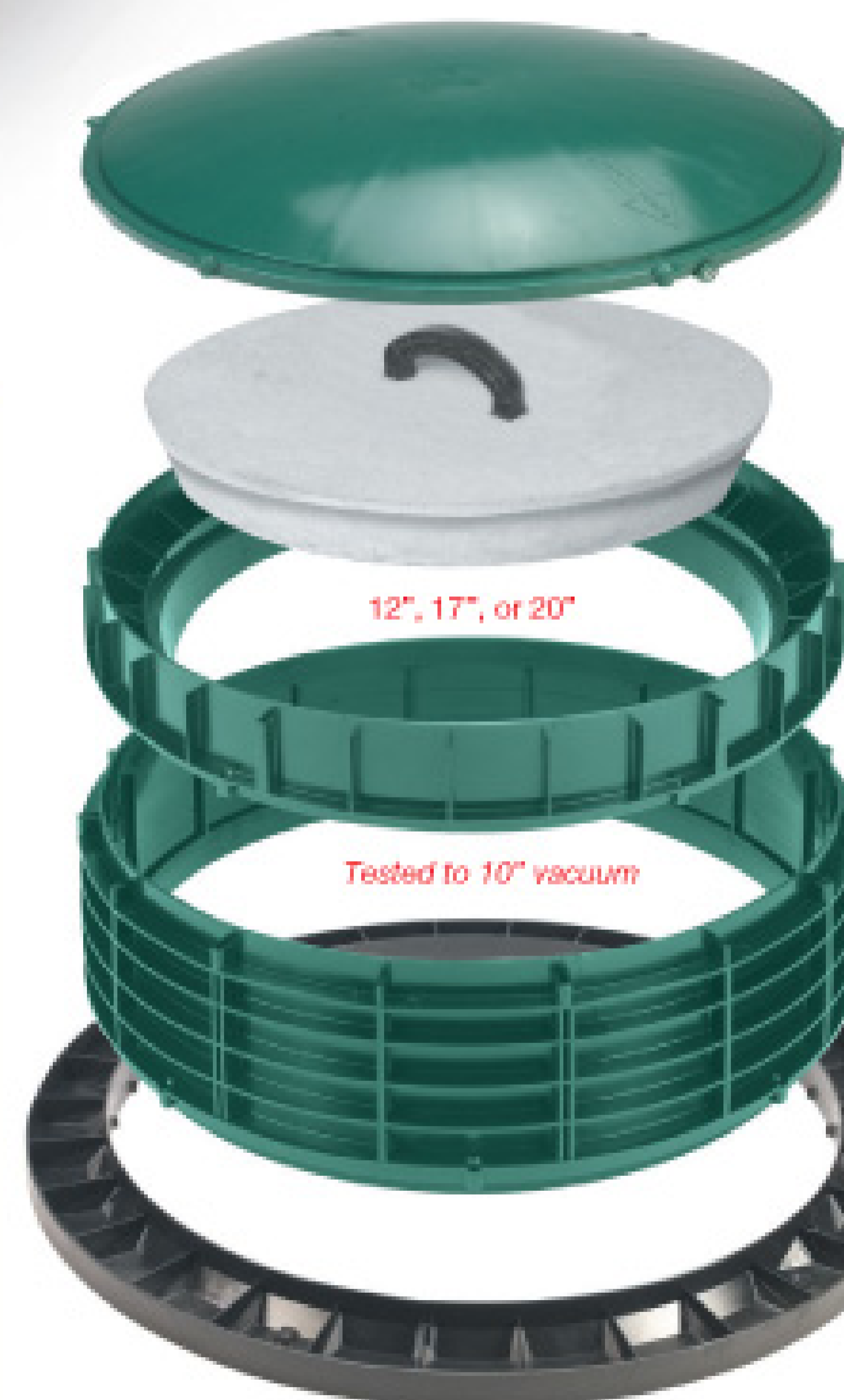


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Patent No's  
4,951,914,  
5,624,123  
& 5,711,536;



12", 17", or 20"

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June 2009

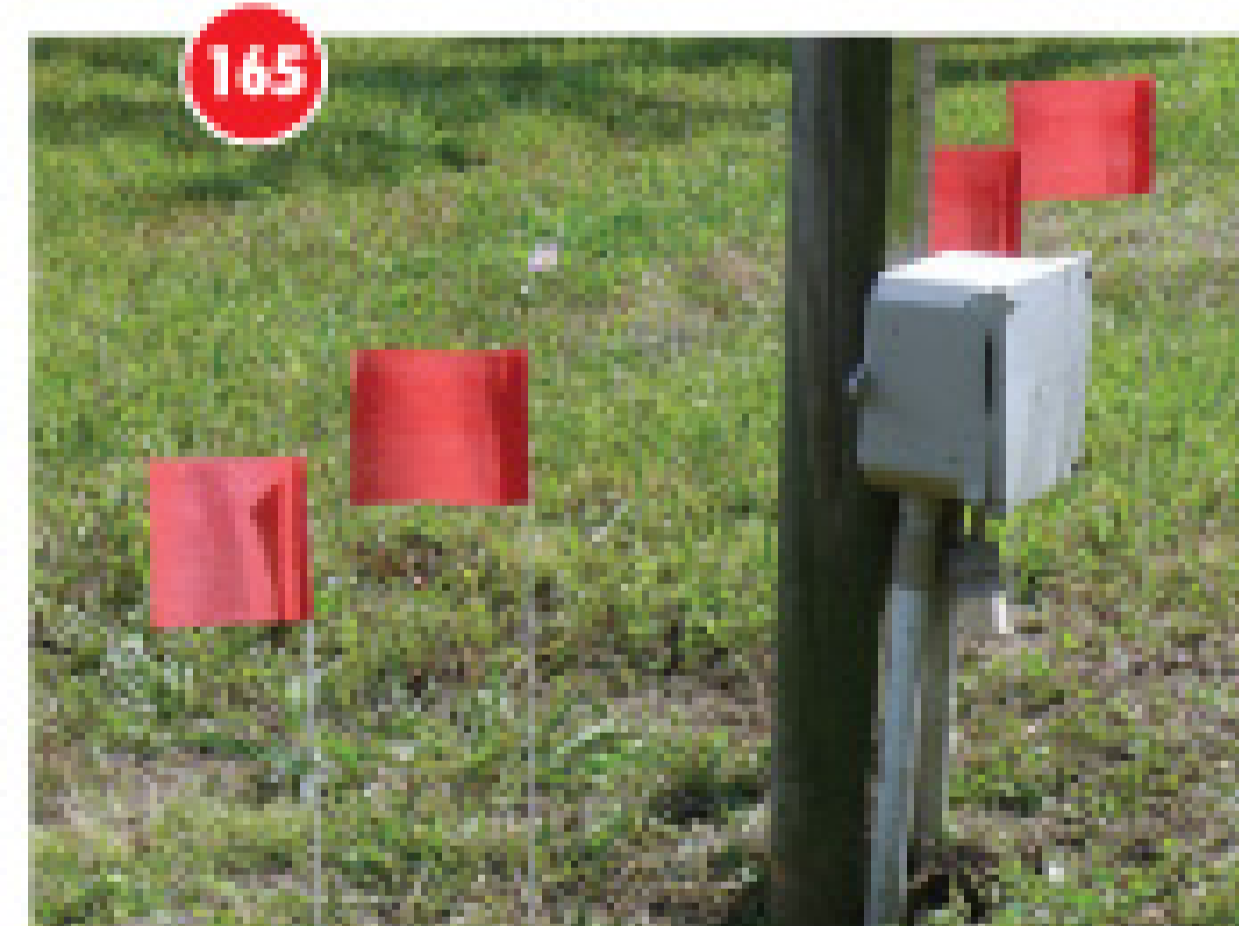


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## Blue Angel Introduces BSP45 Backup Sump Pump

The BSP45 24-volt, cast iron, battery backup sump pump system from Blue Angel Pumps is made to deliver flows up to 48 gpm at 5 feet total dynamic head. The system includes a heavy-duty battery charger with audible alarm, reed vertical float switch, and top suction to prevent air locks and clogging. **888/636-6628; www.blueangelpumps.com.**



## Carlton Designs Biodegradable Safety Flag

Biodegradable identification safety flags and 24-inch wood staffs from Carlton Industries are made of non-woven cellulosic material derived from wood pulp and have a usable lifespan of about six months. Flags come in a choice of five colors and can be printed with biodegradable ink. **800/231-5988; www.carltonusa.com.** ■

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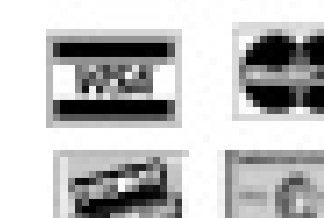
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## Wastewater Contaminants Study

The Wisconsin Onsite Wastewater Recycling Association newsletter reported on a study published in the *Journal of Environmental Quality*, "Removal of Organic Wastewater Contaminants in Septic Systems Using Advanced Treatment Technologies." The study looked at the impact of onsite systems on releasing pharmaceuticals and other organic contaminants to the environment.

Researchers analyzed effluent samples and found that caffeine, the stimulant paraxanthine, and the pain reliever acetaminophen were the most frequently detected. Levels in conventional systems were comparable to those of municipal treatment plant influent, and levels after advanced onsite treatment were comparable to levels in municipal effluent. Sand filtration or aerobic treatment significantly lowered concentrations. For a copy of the study, call Ann Gryphan at 608/256-7757.

## Wonder Worms

Stephan "Alex" Clary, son of Ray Clary of Hone Septic and Grading in Saint James City, Fla., received first place in the Environmental Sciences division at the Southwest Florida Thomas A. Edison Kiwanis Regional Science Fair.

His project, Wonder Worms, hypothesized that the digestive tracts of earthworms could destroy *E. coli* and fecal coliform bacteria found in onsite wastewater systems. Clary also won First Runner Up overall and received a full-tuition four-year scholarship to Florida Gulf Coast University in Ft. Myers. He is an eighth grader at Providence Christian School in Cape Coral, Fla.

## Volunteer of the Year

The Indiana Onsite Waste Water Professionals Association named Don Jones, Purdue University, retired, its 2008 Volunteer of the Year. Jones, a member of the board, was instrumental in developing the organization's certification program. Gary C. Steinhardt, Ph.D., replaced Jones

on the board. Steinhardt, a professor of agronomy and extension agronomist at Purdue University, is helping add CEUs to the association's certification program.

## Onsite Triathlon

The Florida Onsite Wastewater Association newsletter reports that A-1 Septic of Orlando promotes the onsite industry through its triathlon team. Members wear jerseys with the sponsor's name — Infiltrator — on the front and the letters FOWA on the back. As they travel the state, triathletes are often asked the meaning of the acronym.

"The question lets them respond with facts about onsite systems and how they keep our environment healthy," says A-1 Septic owner Dave Smith. "I can't believe the difference the effort has made across the state." Smith is challenging any onsite company, Department of Health, supplier, or manufacturer to a race. The proceeds would benefit FOWA. Call Smith at 407/859-6285.

## Public Service Announcements

The Michigan Septic Tank Association approved funding for three professionally developed public service announcements. The 30-second spots encourage routine maintenance of onsite systems and proper septage disposal.

## CALENDAR OF EVENTS

### June 17-19

Arizona Onsite Wastewater Recycling Association 2009 Onsite Wastewater Educational Conference, Radisson Woodlands Hotel, Flagstaff. Call 928/632-3900 or visit [www.azonsite.org](http://www.azonsite.org).

### Aug. 6-8

Florida Onsite Wastewater Association Conference, Ocean Center, Daytona Beach. Call 407/937-2228 or [www.fowaonsite.com](http://www.fowaonsite.com).

### Aug. 12-14

North Carolina Septic Tank Association Outreach Symposium, Greenville Convention Center,

Greenville. Call Monica Rhea at 704/739-5849 or visit [www.ncsta.net](http://www.ncsta.net).

### Aug. 28-29

Georgia Onsite Wastewater Association Conference, Marietta Conference Center, Marietta. Call 678/646-0379 or visit [www.onsitewastewater.org](http://www.onsitewastewater.org).

### Oct. 20-21

Delaware On-site Wastewater Recycling Association Technical Conference, Dover Downs Hotel and Casino, Dover. Call Mike Cotten at 302/226-2844 or visit [www.dowra.org](http://www.dowra.org).

### Oct. 22-23

Ontario Association of Sewage Industry Services Rural Wastewater Treatment Expo, Hamilton. Call 877/202-0082 or visit [www.oasisontario.on.ca](http://www.oasisontario.on.ca).

## TRAINING & EDUCATION

### NAWT

The National Assoc. of Wastewater Transporters has these sessions:

- Aug. 25-26 – Inspector Training, Flagstaff, Ariz.
- Sept. 29-30 – Inspector Training, TBD, Ariz.
- Oct. 9-10 – Waste Treatment Symposium, Orlando, Fla.

Call NAWT at 800/236-6298 or visit [www.nawt.org](http://www.nawt.org). For Arizona classes, contact Kitt Farrell-Poe at 928/782-3836 or e-mail [kittfp@ag.arizona.edu](mailto:kittfp@ag.arizona.edu).

### Alabama

Licensing classes are the joint effort of the Alabama Onsite Waste Water Association (AOWA) and University of West Alabama (UWA). Courses are at UWA Livingston campus unless stated otherwise:

- July 9-10 – Pumper
- July 21-22 – Maintenance Training for Onsite Installers, Crestview, Fla.
- July 29-31 – Basic Installer. Call 334/396-3434 or visit [www.aowa.org](http://www.aowa.org).

### California

The California Onsite Wastewater

Association has a Science of Soils and Onsite Wastewater Disposal class on July 24, site TBD. Call MaryAnne Bobrow at 530/321-2207 or e-mail [maryanne@cowa.org](mailto:maryanne@cowa.org).

### Florida

The Florida Onsite Wastewater Association offers the following classes:

- July 7 – System Design and Function, Ft. Myers
- July 9 – System Design and Function, Master IV, Davie
- July 21-22 – Maintenance Training for Onsite Installers, Crestview.

Contact FOWA at 407/937-2228 or [www.fowaonsite.com](http://www.fowaonsite.com).

### Minnesota

The University of Minnesota Extension has these classes:

- July 1 – Soils Continuing Education, Crookston
- July 14 – Soils Continuing Education, Blue Earth.

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

### New England

The New England Onsite Wastewater Training Program at the University of Rhode Island in Kingston has these workshops:

- July 15 – Surveying Techniques for the Onsite Wastewater Contractor
- July 16 – Microbiology for Wastewater Professionals
- July 29-30 – Advanced Soil Morphology (Mark Stolt).

Call 401/874-5950 or visit [www.uri.edu/ce/wq](http://www.uri.edu/ce/wq). Contact Mark Stolt at 401/874-2915 or [mstolt@uri.edu](mailto:mstolt@uri.edu).

### Pennsylvania

The Pennsylvania Septage Management Association is offering these courses:

- July 15-16 – Onsite Inspection, Chester
- July 22-23 – Onsite Inspection, Bordentown, N.J.

Call 717/763-7762 or visit [www.pasma.net](http://www.pasma.net). ■



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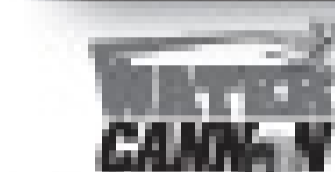
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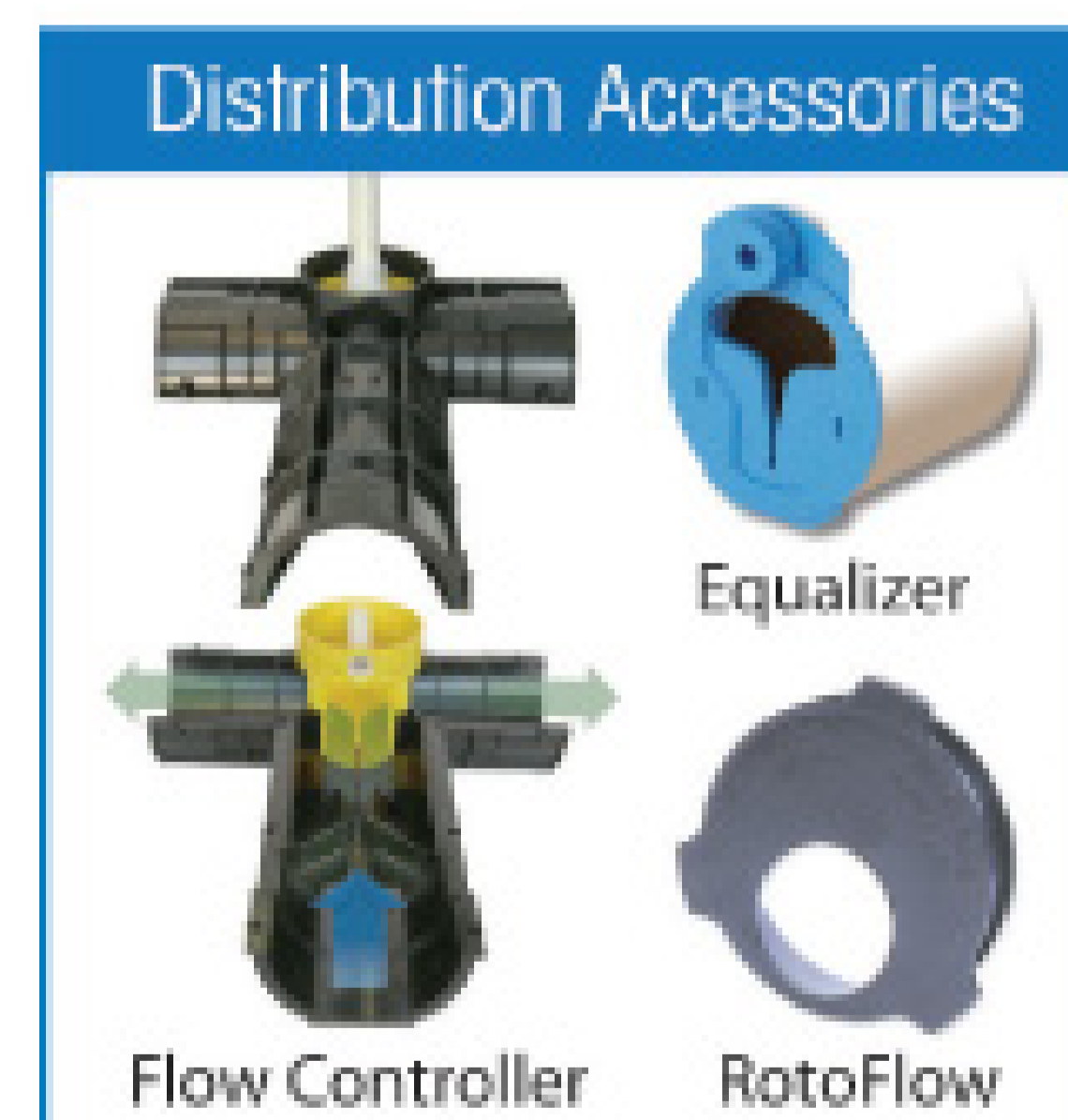
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