

April

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Taking Care of MOM

By Gil Longwell

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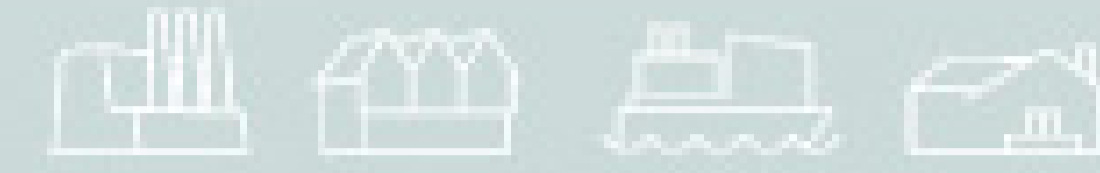
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Time to Wake Up

To the Editor:

Your February column ("Bringing It All Back Home," *Breaking Ground, Onsite Installer*, February 2008) mentioned that our profession has an "opportunity to do good for the environment." Not as I see it.

With the way almost all septic pumping, installations and maintenance companies look at the industry as a whole, we will all be out of the onsite business real soon, and it would be of our own doing.

"What has my company done for the environment today?" should be each company's motto to live by, but it is not. Most companies in my area endorse, market and flat out enjoy injecting waste via a 2-inch pipe into the ground, deeply and forcefully, to avoid going to a wastewater treatment plant.

"Who cares? I just saved a trip to a treatment plant and made a higher profit by doing it." That is not me saying it, but somebody I asked on why they "aerate a cesspool off a pump truck" and leave empty from the jobsite. Is this professional?

If I have to tell you "no," you might just want to stop reading the rest of this and do the industry a big favor and just sell your septic, cesspool business. Does illegal dumping of any kind look professional? How does illegal dumping or aerating a cesspool off a pump truck make the industry look good? It does not. Illegal dumping, even hiding it, is still illegal dumping.

Installers, are you still installing that antiquated technology called

cesspools? Maybe you can't pick out of a crowd what the heck a septic tank, filter or a chamber system is. If so, you are the problem.

You've never seen an ATU? Never been to the PASEO show? Don't like the money you are making? Look in the mirror — you are to blame. You are driving your customers to beg for a sewer hookup so they don't have to deal with companies who demand to install only antiquated systems.

Yes, sewer systems have done some good, but when it became a tax-generating stream of income for local governments, suddenly there was no money for repairs to stop inflow into the system. Governments just found it easier to raise taxes than to fix a broken sewer line.

Why spend money on a CIPP repair when nobody will say a peep about a 50-percent increase in the sewer tax? If a sewer system is bid out for repairs, I guarantee that the lowest bidder with less experience will get the job. In the government's eyes, the cheaper the job, the better the job. This is not the way to repair sewers.

How can professional installers (and not the illegal dumpers as described above) compete on the utopian idea of a sewer? Rick Howe of Cape Cod Bio-chemical has been doing something respectable for some 25 years: education.

Educating our clients will save the professionals who install environmentally friendly onsite systems. Teach your customers why it is important to service an onsite system on a regular basis. Another way is to not do business with illegal dumpers or install antiquated technology.

I don't care if the current codes state that you can. If you are a member of an industry association and they do not endorse advanced treatment of septic waste installations, get out and run far away from them and start your own association.

Illegal dumping and antiquated septic systems have become a multimillion dollar business, and that business will sink us all. Be a professional and start acting like it.

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Beyond Argument

A timeless principle of human relations can help smooth sometimes testy communication between regulators and onsite practitioners

By **Ted J. Rulseh**

Now and then I get that certain kind of phone call. An installer or designer is fed up with the local regulators, who simply will not see things his way.

Testy relations between regulators and practitioners aren't new. Often there are good reasons for disagreement and often (not always) the installer or designer is right. Still, these disputes remind me of a story I read while taking the Dale Carnegie course in leadership some years ago.

The story is pertinent not just because it illustrates a basic principle of human relations but also because it involves people on different sides of a dispute over an inspection according to standards.

You can't win

One of the Carnegie principles for handling disagreements is to show respect for the other person's opinion and never to say, "You're wrong."

In his classic book, *How to Win Friends & Influence People*, Carnegie wrote, "You can tell people they are wrong by a look or an intonation or a gesture just as eloquently as you can in words — and if you tell them they are wrong, do you make them want to agree with you? Never!"

"For you have struck a direct blow to their intelligence, judgment, pride and self-respect. That will make them want to strike back. But it will never make them want to change their minds. You may hurl at them all the logic of a Plato or an Immanuel Kant, but you will not

alter their opinions, for you have hurt their feelings."

When another person says something we believe is wrong, or know is wrong, Carnegie advised beginning with a statement such as this: "Well, now, look. I thought otherwise, but I may be wrong. I frequently am. And if I am wrong, I want to be put right. Let's examine the facts."

Legend of lumber

Carnegie then told the story of a salesman for a lumber company who struggled constantly with lumber inspectors. He argued with them frequently, and often proved them wrong, but they never changed their minds once they had made a decision. The salesman eventually saw that his firm was "losing thousands of dollars through the arguments he had won." So he decided to try something different.

One day he got a call from a purchasing agent who said that a rail shipment of white pine lumber was running 55 percent below grade and that he would not accept it. The salesman's reflex was to quote the grading rules and convince the lumber inspector that he was misinterpreting them. This time, his approach was just the opposite.

"When I arrived at the plant, I found the purchasing agent and the lumber inspector in a wicked humor, both set for an argument and a fight," the salesman said. "We walked out to the car that was

being unloaded, and I requested that they continue to unload so that I could see how things were going. I asked the inspector to go right ahead and lay out the rejects, as he had been doing, and to put the good pieces in another pile."

Turning the corner

The salesman soon saw that the inspector was being too strict, but he did not object to the way he was grading the boards. He asked a few questions about why certain

grade. I was very careful, however, not to let him think I was making an issue of this point."

In time, the inspector admitted that he was not experienced with white pine and began to ask questions of the salesman, who knew that type of lumber well. "He finally got to the point where he felt guilty every time he put a piece in the rejected pile. And at last he saw that the mistake was on their part for not having specified as good a grade as they needed." The

"You can tell people they are wrong by a look or an intonation or a gesture just as eloquently as you can in words — and if you tell them they are wrong, do you make them want to agree with you? Never!"

— Dale Carnegie

pieces were unsatisfactory, but without suggesting that the inspector was wrong.

"By asking questions in a very friendly, cooperative spirit, and insisting continually that they were right in laying out boards that were not satisfactory to their purpose, I got him warmed up, and the strained relations between us began to thaw and melt away," the salesman said.

"An occasional carefully put remark on my part gave birth to the idea in his mind that possibly some of these rejected pieces were actually within the grade that they had bought, and that their requirements demanded a more expensive

company in the end accepted the shipment and paid for it in full.

A little diplomacy

An approach like this might not resolve every dispute between an onsite installer and a regulator. But it's likely to give it a better chance of success than old-fashioned arguing and head-banging.

So consider a little diplomacy the next time you find yourself and the local inspector at odds. You might be surprised at how it affects decisions about the issue at hand and your longer-term relationship with that person. The business itself is tough enough. Why let needless conflict make it tougher? ■



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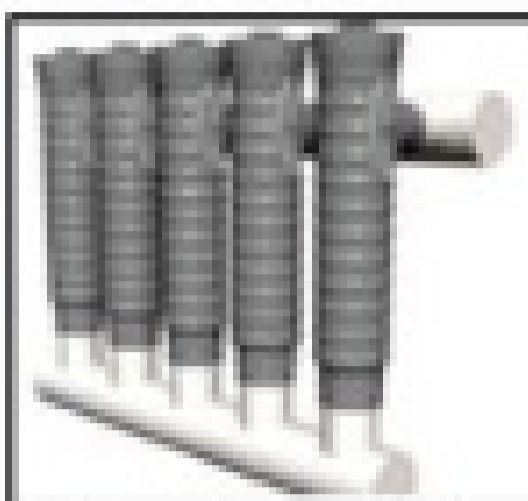
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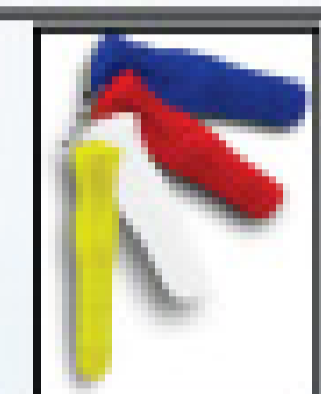
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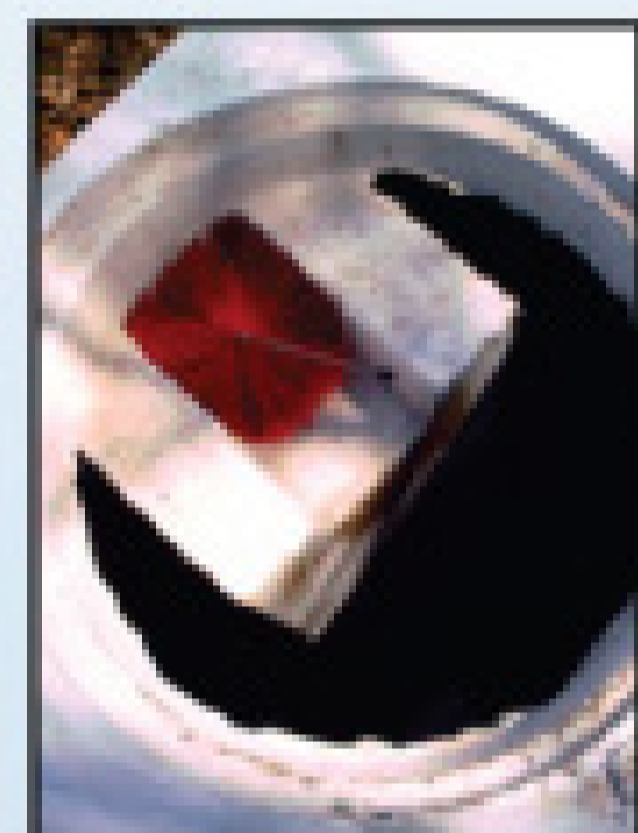
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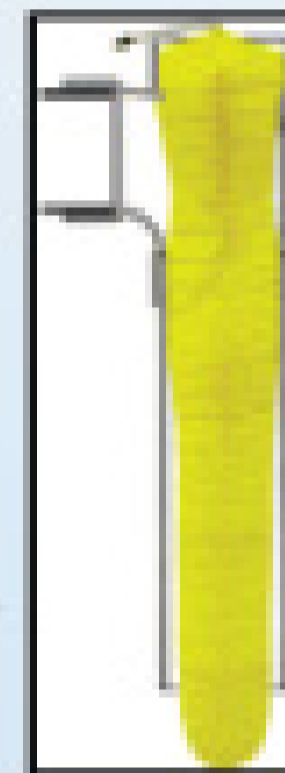


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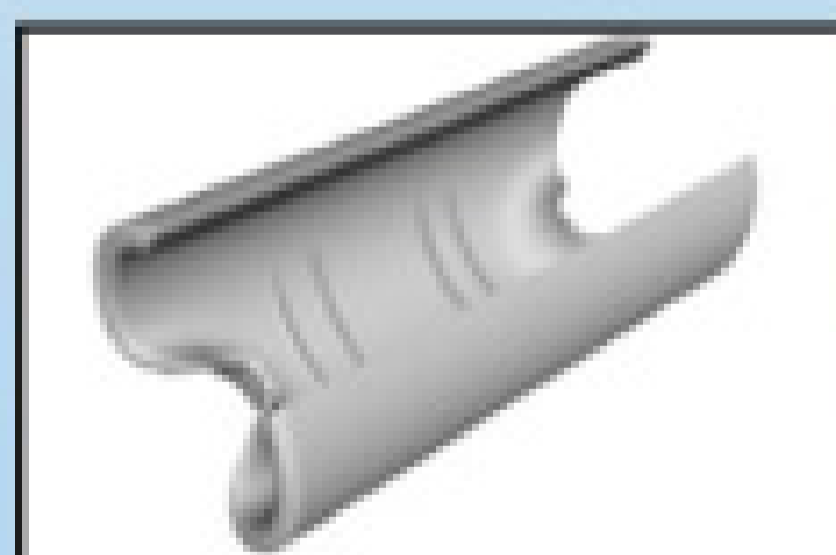
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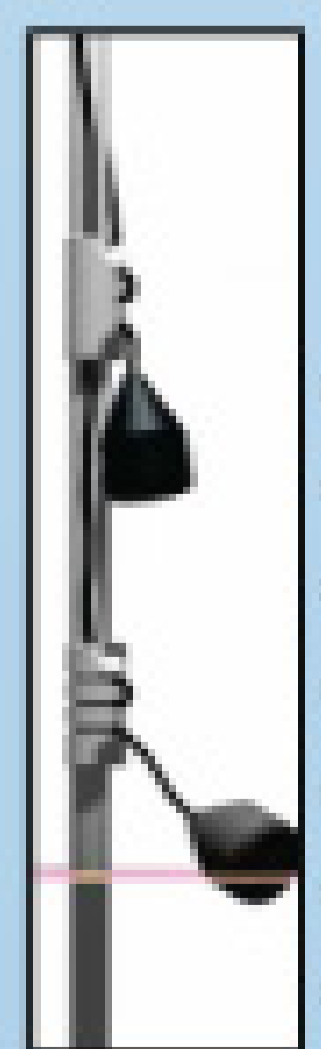
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Initial research at Baylor University focused on utilizing 4 different configurations of Hoot systems.



Hoot has spent the last 6 years and millions of dollars in Research & Development working to get Total Nitrogen below 10 mg/L. During this time the Nitrogen issue has been marginalized and regarded by some as "less important than making sure a riser is screwed down."

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WASTEWATER TECHNOLOGY

NSF/ANSI Standard 245 - Nitrogen Reduction Wastewater Treatment Systems

Final Report:

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Becoming an Equipment Pro

On installation sites, the best machine operators share traits that go well beyond mere proficiency at moving the control levers

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

A while ago, we sat down with a group of Minnesota installers. Among the questions we asked them was: What makes a good equipment operator?

Now, on this issue everyone is in a little different position. Some do it all themselves, while others have several employees who operate equipment. Still, there were a number of factors that everyone agreed upon.

The first thing mentioned was that acquiring skill takes time and practice, as in any other profession. Spending time in the cab is essential to operating equipment safely and efficiently. But a number of other qualities identify good operators. In the discussions it became clear that skillful use of the levers is not enough by itself.

Being observant

The operator must be observant, having an overall sense of what is happening around the equipment and the work area. Certainly following OSHA safety requirements for excavations is a part of being observant.

In the Competent Person requirements, visual testing at the site is essential. Watching the excavation surfaces for changes and identifying changes in soil conditions that may result in unsafe conditions for other employees or visitors is critical. Identifying disturbed or fill soils by sight or by the feel of the equip-

ment can be considered a gift.

But recognizing mixed color conditions that are different from natural soil profiles aids in identifying filled or disturbed soil that can be dangerous. This is less a gift than it is being observant to change. Sharing these observations with other employees and operators is important to work at future jobsites.

The good operator always keeps track of where other people are on the site. It helps when everyone on the site follows OSHA rules about wearing hardhats and high visibility vests or jackets. We have never seen a good operator swing the boom while doing something else — like talking on the phone. Focusing on the job is critical.

Being aware

A good operator is aware of other things to look for on the site. One simple item is underground utilities. Obviously, we need to make the one call and have them located before starting to excavate.

However, the good operator is aware of situations where there may be private utilities that would not have been part of the locator process. Examples are the electric lines for pumps in the decorative pond or for the shed out back. When wires are dangling off the front of the backhoe bucket is not the time to start asking questions of the owner.

Other concerns include erosion control and protecting the land-



On any type of machine, a quality operator will enhance job performance, cost-efficiency, and customer satisfaction.



scaping. Coming too close to the retaining wall can be an expensive lesson when you have to replace the wall because it collapsed. Damaging trees with the backhoe, intentionally or not, can create problems and lose a good customer. We were on a site once where each child had a tree planted for them at birth. A good operator knows about things like that before starting to dig or operating equipment in the area. It is a part of being aware.

Operating the machine

Skill in operating the machine is an important quality that identifies the cream of the crop. Speed can be a part of this quality from the perspective of operating smoothly and efficiently. Having a good eye and a good touch to control the backhoe bucket for leveling and excavating is important.

It is critical to understand the ability of the machine and to have a feel for the controls in terms of

Jim Anderson and David Gustafson are with the University of Minnesota's widely recognized onsite wastewater treatment education program. Anderson is Director of the university's Water Resources Center and Gustafson is the university's Extension Onsite Sewage Treatment Educator. Readers are welcome to submit questions or article suggestions to them at ander045@umn.edu.

bucket movement. Having an eye for details is also important. The eye does not replace the need for a level, but developing the skill to keep things level will really move the job forward.

Operators should know the equipment and its limitations in terms of lifting, reach and clearance requirements. The best control pattern is what you feel comfortable with and is usually something you learn early in your career. Overloading and damaging equipment through misuse slows the job and can be hazardous, so the good operator does not go beyond the equipment capacity.

Managing the site

The final quality of a good operator is the ability to manage the site. Tracking the flow of work at the site is critical for the system to be installed correctly and efficiently. Delivery of materials and the timing of activities takes practice and time for the operator to master. Working with others onsite and talking through the flow of work to be done helps

all workers do their jobs better.

It is always fun to walk onto a site with a real pro and have him identify the unique site characteristics and problems and how they were solved. One prime example of this is thinking ahead about how the tank gets delivered to the site.

The difference between an easy job and one that is difficult often is wrapped up in this delivery route. Having room to operate is important. If it is necessary to build a road in, it is easier to have this done ahead of time than while the driver is waiting and calling back to the shop to explain why he is not out on the next delivery.

A good operator is a fantastic resource for any company. So whether that operator is you or one of your employees, take a step back and realize that it takes time and practice to become proficient. For those just beginning to learn the skills, take time to watch those who are proficient. Talk with them and learn from them. ■

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DC-STAINLESS Washdown Pump



Moro M3 176 cfm



Hydromatic, Zoeller, ABS, Liberty & Myers Pumps



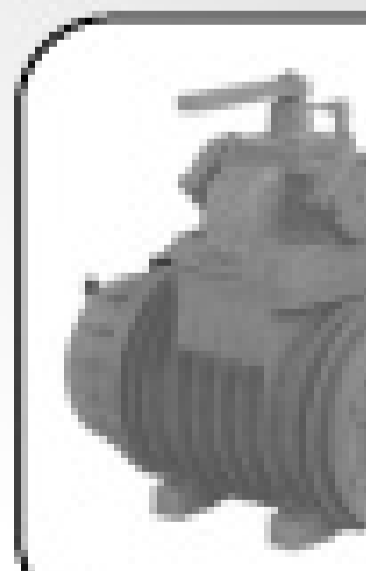
SDS From 70-180 cfm



Moro PM80 Turbo 350 cfm



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The Flagg-Air 340 does not carry the NSF seal. Check local and state regulations for approval in your area.



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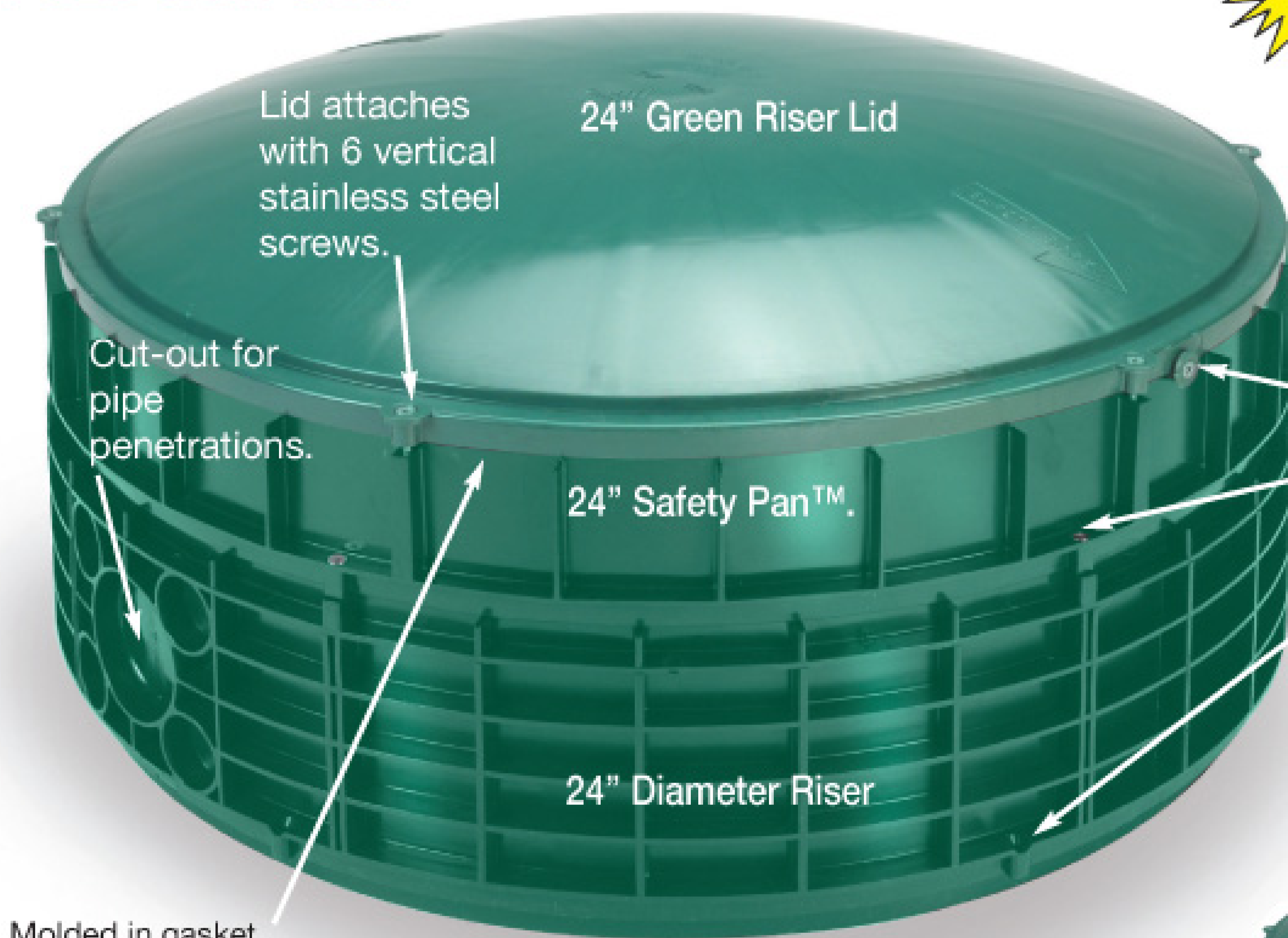


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Tank Adapter Ring

New - Horizontal Safety Screw.

Safety Pan™ to Riser attachment with 6 vertical stainless steel screws.

Riser to Riser attachment with 6 vertical stainless steel screws.

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

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Concrete Lid w/handle

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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
ANSI/NSF
Standard 46



4" Sch. 40 &
SDR-35

EF-4
4" Filter



1500 GPD
ANSI/NSF
Standard 46



4" Sch. 40 &
SDR-35

244 ft. of
1/16" filtration
area.

EF-6
6" Filter

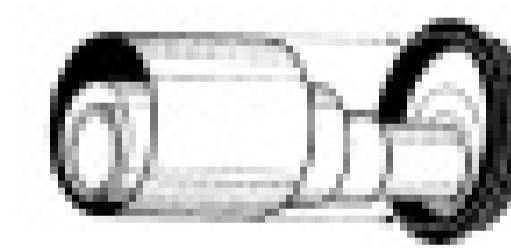
Gas/Solids
Deflector

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TS-4-RUBBER TANK SEAL
(will hold 10psi)
TS-4PRO TANK SEAL
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Free Freight: 32c

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



12", 17", or 20"

Tested to 10" vacuum



"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.

Targeting Nutrients

Delaware seeks funding sources for onsite system inspections, upgrades and replacements needed to reduce nutrient loadings to a critical watershed

Delaware is exploring ways to offset some of the expected cost of complying with new septic tank regulations designed to reduce the nutrient load to the Inland Bays Watershed. Nearly 19,000 small onsite systems contribute an estimated 11 percent of the region's total nitrogen load.

The Department of Natural Resources and Environmental Control is working to clarify the costs and financing needs of low-income households and identify financing opportunities to address those needs.

The regulations have not yet been finalized, but the proposal calls for inspection and pumping of all small septic systems every three years and for new and replacement systems to use nutrient reducing technologies by 2015. The DNREC estimates the need for \$1.9 million to \$3.8 million in assistance for low-income households and \$10 million to \$20.0 million for moderate-income homes from 2010 to 2014.

After 2015, an estimated \$1

million to \$2 million per year would be needed to subsidize the installation of new systems. A report on the matter is available at www.etc.umd.edu/pdf/DE_Septic_Report.pdf.

Vermont

The Vermont Agency of Natural Resources has revised onsite rules to allow constructed wetlands, sub-surface drip distribution systems, and smaller onsite systems. Previously, design flows for single-family homes had to accommodate at least three bedrooms. The design requirement is now a minimum of two bedrooms.

The rules also waive the replacement drainfield requirement if the primary system handles 150 percent of the design flow and uses pressure distribution. Mound systems also do not require a replacement area if sized for 100 percent of the design flow.

The previous rules did not mention composting toilets, although they have been allowed for years.

The revisions specifically allow composting toilets, reduce the size of the onsite system to handle just graywater, and eliminate the requirement to install an onsite system for flush toilets, even though composting ones are proposed.

A new exemption allows residences with outhouses or outdoor water pumps to continue as is until they apply for a permit to construct a piped supply or system. Vermont's rules are at www.ant.state.vt.us.

Virginia

New rules requiring mandatory licensing of onsite soil evaluators, installers and providers become effective on July 1, 2009. Licensing will fall under the Department of Professional and Occupational Regulation, which has created a board to determine what type of training or certifications are required.

K.R. "Trapper" Davis' Coastal Plains Environmental Group manages, operates, and maintains small-flow alternative wastewater treatment systems. His company's lobbying on behalf of licensing resulted in Gov. Kaine appointing Davis to the DPOR board. Contact him at 804/966-9190 or krdavis@cpeglc.com.

Pennsylvania

The state Department of Environmental Protection filed a petition in Commonwealth Court to enforce a 2002 order requiring Cromwell Township to provide public sewers and operate the treatment plant. Malfunctioning onsite systems are causing the township's problems.

When the township received

sewer bids that exceeded initial estimates and would have raised user rates, it signed an agreement to send sewage to the Orbisonia-Rockville Joint Municipal Authority. The DEP approved the plan, but newly elected township supervisors repealed the ordinances.

Missouri

The state Department of Health and Senior Services Onsite Sewage Program is updating its inspection and evaluation forms to allow better assessment and reporting of the condition of onsite systems. The agency will phase in the forms over six months, and conduct mandatory training classes for inspectors and evaluators. The training will qualify for continuing education credits. The phase-in period is expected to conclude in July 2008. After that, no old forms will be accepted.

Nationwide

The Water Environment Research Foundation (WERF) has completed the first research phase for responding to reports of illness possibly caused by land-applied biosolids, animal manures, food residuals, septage and compost.

The investigation procedure will undergo pilot testing and refinements before being implemented, but organizations or individuals may use it before the subsequent research phases are completed. The project was the highest ranked priority at the 2003 WERF Biosolids Research Summit. Download the report at www.werf.org.

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



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NEW AT THE expo



New at the Expo

By Ted J. Rulseh

Advances in onsite treatment were on display at the 28th Annual Pumper & Cleaner Environmental Expo International in Louisville, Ky., Feb. 28 to March 1. The event attracted 11,415 attendees representing 4,688 companies and municipal agencies. The record total of 562 exhibitors included producers of treatment units, tanks and accessories, pumps, controls, drainfield media, software, and other products of interest to onsite professionals. Here is a sampling of new products on display.

Two alarms in one

The **TS150 exterior dual alarm** from **Septronics Inc.** can be configured to monitor a filter and a pump, two basins, or a high-level and low-level alarm. The unit operates on 120V AC primary voltage with secondary battery backup

(9V to 15V). It includes touch-pad operation and automatic alarm reset. Red alarm LED, green power-on LED, and yellow filter alarm LED are included. The alarm horn generates 83-85 db. Call 888/565-8908 or visit www.septronicsinc.com.

A record number of exhibits include a variety of products to enhance ease of installation and operation and improve onsite treatment quality



TS150 exterior dual alarm from Septronics Inc.

Efficient filter

BioDisc filters from **Geoflow Inc.** are placed between the effluent pump and the drip dispersal field to trap debris that could plug tubing and drip emitters. The units are designed for flows high in organics.

The disc filters are protected with molded-in Geoshield material to discourage biological growth on the element. Filters can be installed in a self-cleaning mode with a second filter and two solenoid valves, or they can be cleaned manually. The filter body and discs are molded from nylon resins. Filtration is 120 mesh/130 micron. The two-piece body is serviced by untwisting and includes an O-ring seal. Call 415/927-6000 or visit www.geoflow.com.



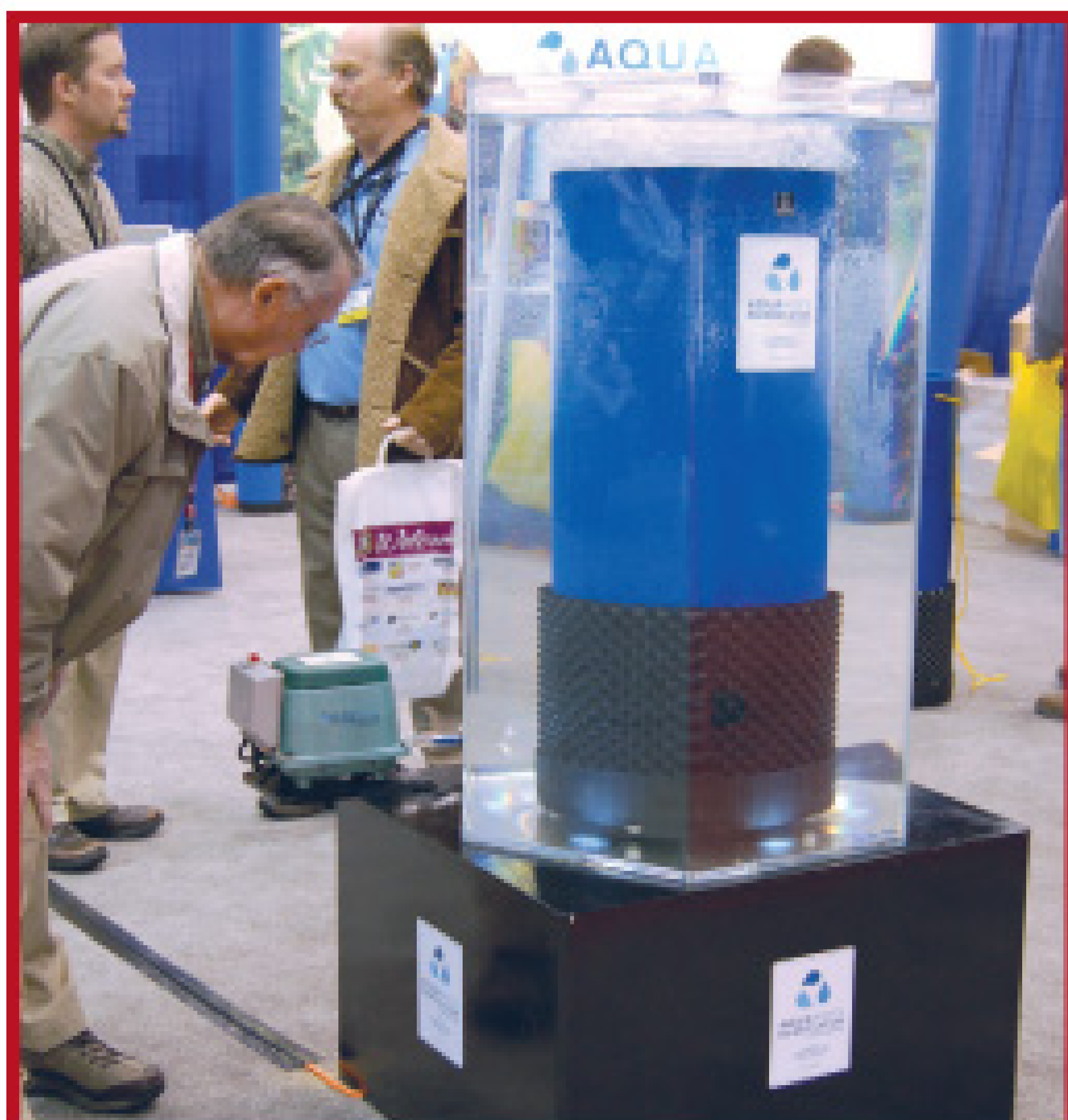
BioDisc filters from Geoflow Inc.

Drainfield remediator

The **Aquaworx** remediator from Infiltrator Systems Inc. is designed to restore failing septic systems with minimal landscape disruption. Inserted into an existing septic tank, it reverses the drainfield clogging process. The unit includes a bacterial catalyst, a blend of aerobic bacteria that accelerate the consumption of clogging matter (biomat) in the drainfield.

The system includes an airlift column. Cusped plastic is wrapped around the bottom outside of the unit and placed within and above a bubble diffuser. The cusped plastic provides a substantial surface area for colonization of the introduced bacteria. The unit aerates and circulates effluent within the septic tank to generate an active bacteria culture, which creates an aerobic environment within the unit. These bacteria then enter the drainfield and consume the clogging layer. Call 800/718-2754 or visit www.infiltratorsystems.com.

Aquaworx remediator from Infiltrator Systems.



ARC 18 drainfield chambers from Advanced Drainage Systems Inc.

New chamber style

ARC 18 drainfield chambers from Advanced Drainage Systems Inc. are designed to maximize infiltrative surface area and storage capacity. The chambers include an integral 20-degree articulation connection.

The units, made from HDPE, are five feet long with a secure joint connection that enables sections to be quickly installed in straight or contoured applications. A diamond-plate traction pattern on the external corrugations provides a non-slip surface. An optional side port coupler easily snaps onto the chamber for cleanout access and to provide additional plumbing options.

Weighing 15 pounds, the sections can be installed by one person. The corrugated design increases load-bearing strength in a trench, meeting the H-10 (16,000 pounds per axle) specification. Call 800/821-6710 or visit www.ads-pipe.com.

Flow controller

A **flow controller** from Polylok Inc. makes it easy to alternate or divide the flow of effluent between two separate drainfields. It is



Flow controller from Polylok Inc.

installed by direct attachment to Schedule 40 or SDR 35 pipe. A channel split design enables an equal split of the wastewater stream. The valve can be set for equal distribution or to direct all flow to one side or the other. An optional handle simplifies the process of adjusting flows. Call 888/765-9565 or visit www.polylok.com.





Artificial rocks from Topp Industries Inc.

Landscape rocks

Artificial rocks and boulders from Topp Industries Inc. can be used to hide above-ground components of onsite treatment systems. The rocks are made of weather-resistant polyethylene resin that is fade-resistant and has a natural look and feel. Call 800/354-4534 or visit www.toppindustries.com.



Algaewheel technology from Oldcastle Precast.

Advanced treatment

Algaewheel technology from Oldcastle Precast is a complete onsite design that includes a single-pass, flow-through system capable of treating high-strength waste. The Algaewheel consists of a single vessel in which biological and ecological treatment and filtration occur.

Bacteria colonies in the aerobic, anoxic and anaerobic portions of the unit provide biological treatment. Algal colonies provide expanded treatment. The primary treatment tank removes large, inert solids. The bacpac treatment tank uses Algaewheel technology to provide secondary treatment and remove phosphorus. Tertiary treatment occurs in a standard settling tank where converted nitrates are removed as nitrogen



MultiTank from Roth Global Plastics Inc.

gas. Call 800/428-8110 or visit www.oldcastleprecast.com/onsite.

Dual-purpose tank

The **MultiTank** from Roth Global Plastics Inc. can be used as a septic, holding or pump tank, rainwater tank, or potable water cistern. It has an inner layer of FDA-approved virgin HDPE, two inside layers of polyethylene for stability, and an outer layer of black UV-stabilized polyethylene. The tanks are manufactured with a computer-controlled blow molding process. Call 866/943-7256 or visit www.roth-usa.com. ■



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5

What's New in Treatment?

Manufacturers of aerobic and other advanced treatment units present their latest accomplishments and innovations for the onsite business

By **Scottie Dayton**

Each year brings innovations in advanced treatment units — not only brand-new systems but also line extensions, new components and capabilities, new test results verifying treatment performance, and approvals for use in new states and provinces. Here is a look at the latest developments in advanced treatment units.

Remediation system

The **aerobic remediation system** from **Aero-Stream LLC** is designed to restore and maintain optimum performance in existing onsite systems. Last year, it received a U.S. patent, and has several pending for incorporating a nitrification/denitrification process. In addition, the suspension mechanism was revised, allowing the unit to be installed through a 2 7/8-inch opening rather than an 8-inch opening. Other improvements included sound output reduction features and a redesigned outlet manifold.

The remediator reverses and maintains biomat permeability to restore full system function within weeks. Installable in any system configuration, media and soil type combination, the unit sustains more than a 95-percent success rate across North America, according to the manufacturer. The unit is UL listed and meets National Electric Code requirements as a permanent outdoor appliance. Installation takes an hour or less using common hand tools. All parts and materials are included in a kit. **Call 877/254-7093 or visit www.aero-stream.com.**

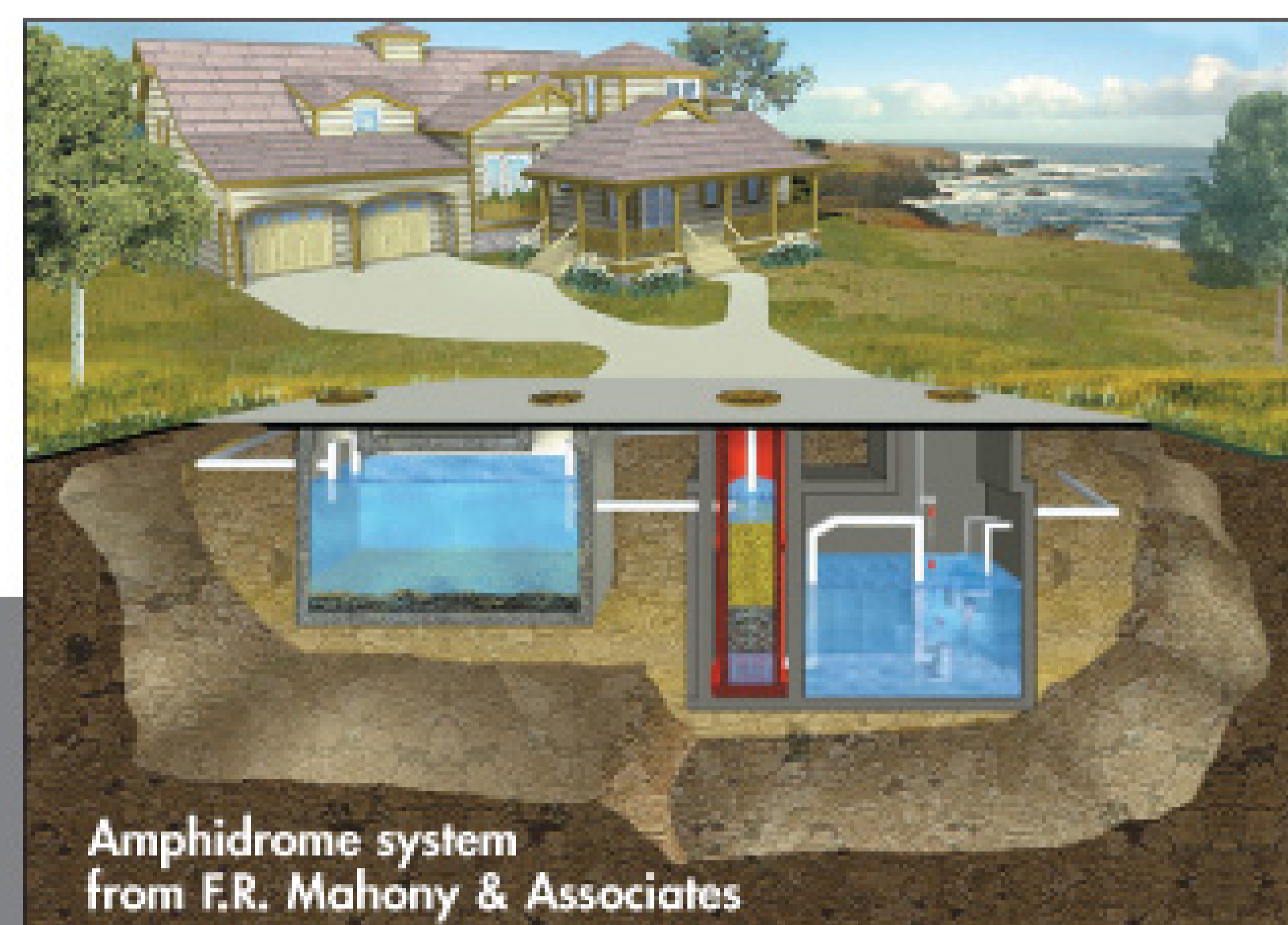
Sequencing batch biofilter

The **Amphidrome system** from **F.R. Mahony & Associates** is a deep-bed sand filter that removes nitrogen, soluble organic matter, and suspended solids using a submerged attached growth bioreactor working in batch mode.

Units operate with a high concentration of viable biomass and without a solids separation process after biological treatment. This results in low hydraulic retention time and smaller volumes to treat. Aerobic and anoxic treatment processes achieve simultaneous oxidation of soluble material,



Aerobic remediation system from Aero-Stream



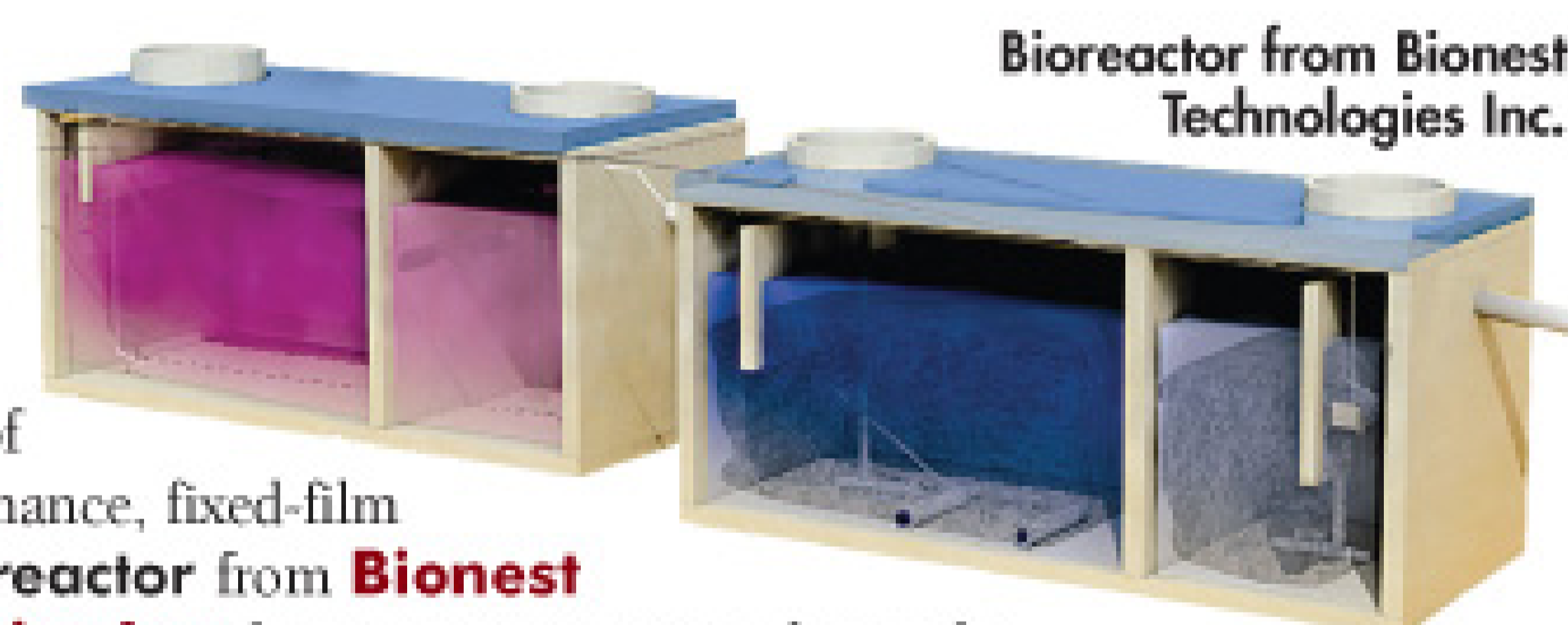
Amphidrome system from F.R. Mahony & Associates

nitrification, and denitrification by using intermittent aeration and recycling wastewater through the reactor. **Call 800/791-6132 or visit www.frmahony.com.**

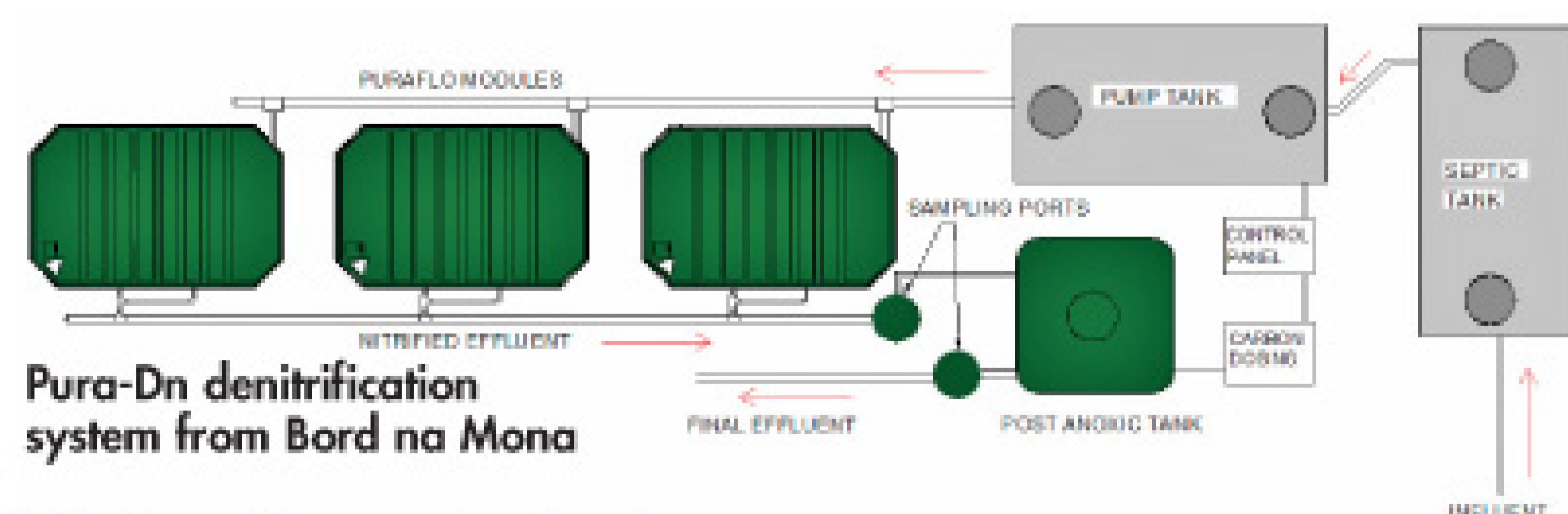
New to the United States

A new generation of high-performance, fixed-film aerated **bioreactor** from **Bionest Technologies Inc.** has come to U.S. markets. The advanced treatment system has completed NSF Standard 40, BNQ (Canada), and NSF-ETV certification programs.

Canada has more than 6,000 single-family, cluster, and commercial or high-strength installations. The pre-engineered modular system can achieve reclamation- and reuse-quality effluent even in severe weather. The bioreactor offers nitrification and denitrification with disinfection and phosphorus removal options. It is approved in Canada, the Caribbean, Florida, Alabama, Hawaii, Wisconsin and Europe. **Call 866/538-5662 or visit www.bionest.us.**



Bioreactor from Bionest Technologies Inc.



Pura-Dn denitrification system from Bord na Mona

Meeting nitrogen standards

Even with high-strength influent, the single-pass **Pura-Dn denitrification system** from **Bord na Mona Environmental Products** can achieve total nitrogen (TN) less than 10mg/L without relying on recirculation for a percentage reduction of the influent concentration.

The process uses NSF-listed Purallo peat fiber biofilters to provide high levels of nitrification, and uses the post anoxic carbon-closed Pura-Dn system for denitrification. The nontoxic carbon additive is 100-percent natural. The

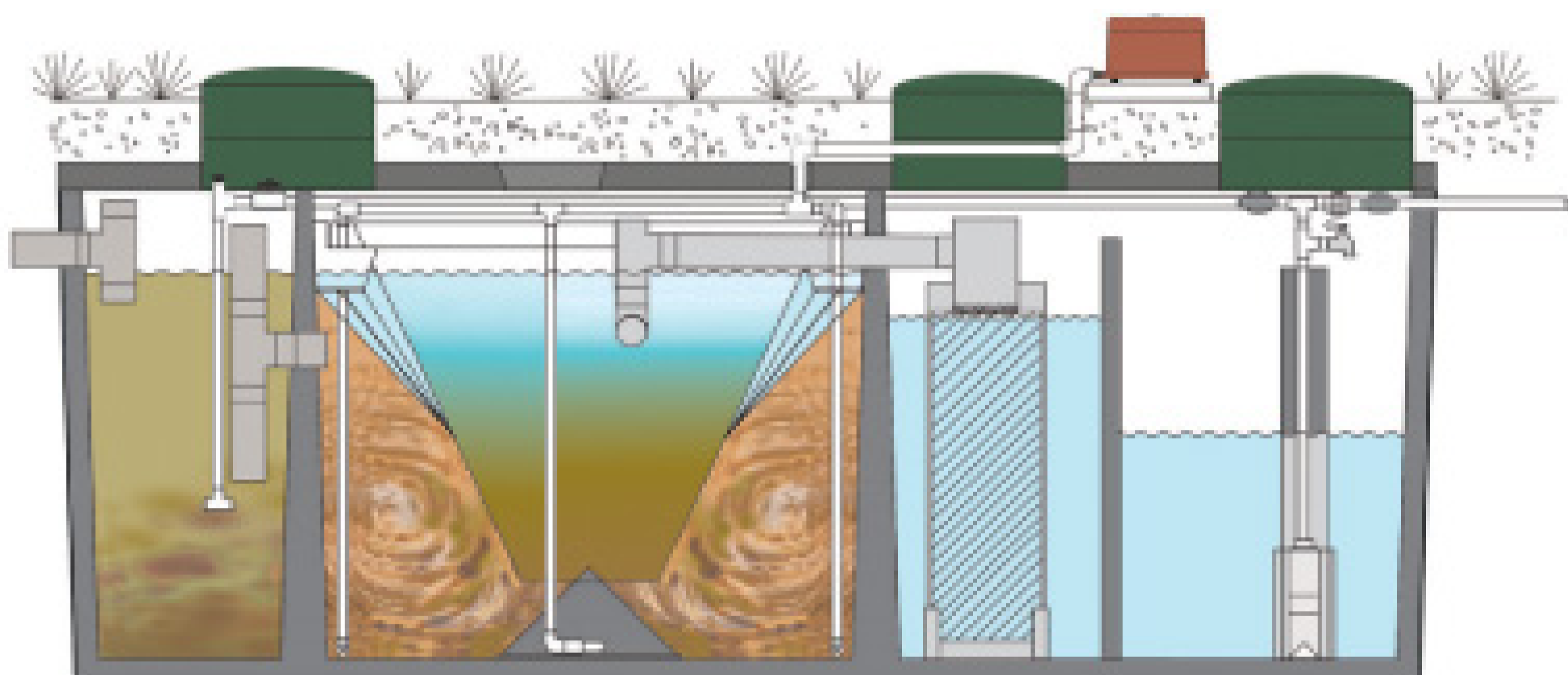
Pura-Dn is designed for single-family and cluster applications where total nitrogen standards must be guaranteed. Call 800/787-2356 or visit www.bnm-us.com.

Composite filter

The **Ecoflex packed-bed textile filter** from **Premier Tech Environment** is suitable for single-family homes, commercial properties, and small community projects with domestic wastewater. The system provides stable total nitrogen removal in warm and cold climates and is easy to install, operate and maintain.

The packed-bed filter obtains high performance when treating single-family wastewater. When the unit is combined with a recirculation loop, effluent concentrations in CBOD₅, TSS, and fecal coliform meet advanced secondary treatment standards and a stable total nitrogen removal near 60 percent.

For high-strength wastewaters, municipal projects, and residential developments, the unit is preceded by a Bioseg recirculating trickling filter. This compact and efficient combination offers an effluent concentration in CBOD₅ and TSS lower than or equal to 5 mg/L. The combination also has good performance for nitrification and fecal coliform reduction. Call 800/632-6356 or visit www.ptenv.com.



Hoot-ANR from Hoot Systems LLC

Advanced nitrogen reduction

In the NSF/ANSI Standard 245, the **Hoot-ANR** from **Hoot Systems LLC** produced results of 6 mg/L total nitrogen, 6 mg/L CBOD₅, and 4 mg/L TSS during the six-month performance evaluation. Extended year-long testing, including winter, averaged 7 mg/L TN. These results exceed an 85-percent reduction of TN.

The unit has a built-in water meter and controls that monitor and adjust operating parameters automatically to ensure optimum performance. Units are available through local precasters and were recently approved in Delaware, Maryland, Michigan, Mississippi, Ohio, North Carolina, Pennsylvania and Wisconsin. Call 888/878-4668 or visit www.hootsystems.com.

Impervious to domestic sewage

Enviro-Flo **polyethylene tanks** from **Enviro-Flo Inc.** are rotationally molded to produce one-piece, leak-free structures. The NSF-listed tanks resist corrosion, exceed environmental stress cracking levels and recommended wall thickness, and have a horizontal batten



Enviro-Flo polyethylene tanks

around the vertical frames for additional support. The tanks are permanently marked with the manufacturer's name, month and year of manufacture, and model number. Detailed instructions allow for water-free backfilling in conventional and aerobic systems. Call 877/836-8476 or visit www.enviro-flo.net.

Remote management

The **Service Pro control center** from **Norweco Inc.** manages Singular advanced wastewater treatment systems. Using monitoring, compliance and diagnostic (MCD) technology, the unit operates the treatment plant, monitors system operations, and verifies maintenance. It also monitors three additional components such as an influent or effluent pump chamber, filter maintenance alarm, disinfection system, or recirculation pump.

The center records every alarm and service call. Maintenance technicians can access detailed information describing the performance of the treatment plant and accessories via the Internet. Call 419/668-4471 or visit www.norweco.com.



Service Pro control center from Norweco

Nutrient reduction

Oreco Systems Inc. has announced the results of third-party nutrient reduction studies on its **AdvanTex AX20 systems**. In Pennsylvania, an ongoing technology verification study at eight homes recorded 64-percent total nitrogen reduction (17 mg/L mean) and 95-percent ammonia (NH₃) reduction (1.7 mg/L mean).

In Virginia, a two-year approval study at 13 homes found means of 15 mg/L TN and 1.8 mg/L NH₃. In New York, the Skaneateles Demonstration Project found mean TN of 14 mg/L, mean NH₃ of 0.9 mg/L, and mean total phosphorus (TP) of 10 mg/L on two single-family homes.

AdvanTex AX20 from Oreco Systems

In New Zealand, in a 13-month test center trial using municipal effluent, the Rotorua District Council and Environment Bay of Plenty compared the AdvanTex AX20 system with four other systems and found the AX20 had the most consistent results, at 82-percent reduction of TN (to 13 mg/L), 99-percent reduction of NH₃ (to 0.3 mg/L), and 33-percent reduction of TP (to 8 mg/L). Call 800/343-9843 or visit www.oreco.com.

Septage processing

The **White Knight microbial inoculator/generator** by **Knight Treatment Systems** introduces and cultivates task-specific selected microorganisms through IOS-500 inoculums to enhance biological augmentation of onsite systems and other wastewater treatment processes, such as package plants, aerobic treatment unit retrofits, and community system upgrades.

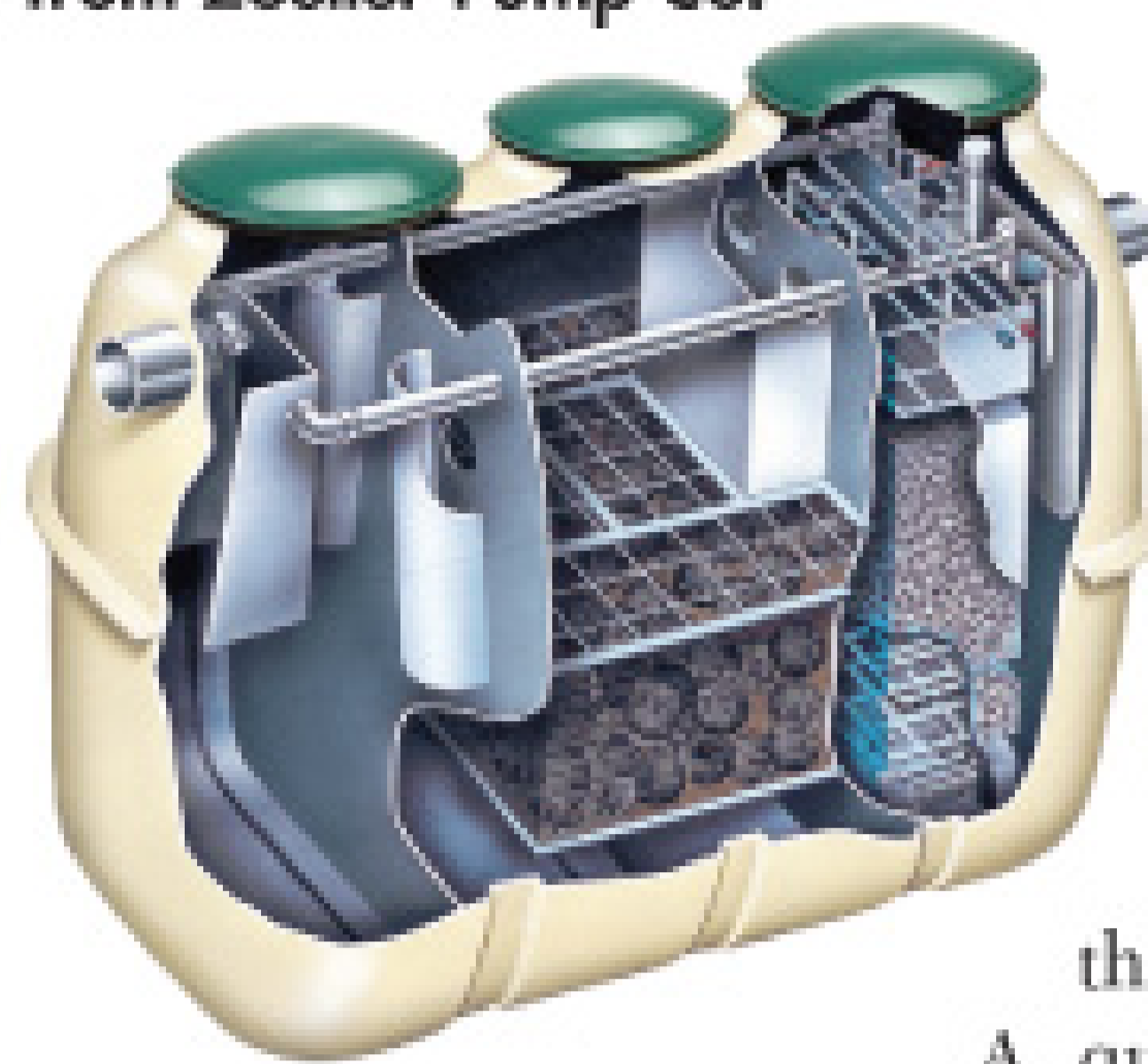
Originally marketed as a method to recover organically clogged drainfields, the microbial inoculators/generator has evolved into a principal component of Big Fish Environmental LLC, a new turnkey septage processing facility in Michigan. Call 800/560-2454 or visit www.knighttreatmentsystems.com.



White Knight microbial inoculator/generator from Knight Treatment Systems

Fusion treatment systems from Zoeller Pump Co.

Drop-in job ready



Based on Fuji Clean wastewater technology, **Fusion treatment systems** from **Zoeller Pump Co.** use anaerobic and aerobic zones, eliminating the need for a preceding septic tank, and produce secondary-quality effluent. Polypropylene filter media are never removed or replaced. Operating features include constant recirculation of treated waste and twice-daily automatic backwash that returns sludge to the head of the system.

A quiet, programmable compressor delivers oxygen to aerobic zones, while consuming the same energy as an 80-watt light bulb. The control panel powers the blower and monitors system airflow and water level. The drop-in system is easy to install and maintain. Models include the ZF-450, ZF-600, and ZF-800 for 3-, 4-, and 5-bedroom homes. All are NSF/ANSI Standard 40 Class 1 systems and are approved by many state and regional health entities. **Call 800/928-7867 or visit www.zoeller.com.**



Nitrex systems from Lombardo Associates

Nitrate removal

Nitrex systems from **Lombardo Associates** achieve total nitrogen reduction to less than 5 mg/L, and average 3 mg/L for individual and cluster or commercial applications. The filter-passive, carbon-fed system eliminates wastewater nitrogen to levels comparable with the most sophisticated centralized wastewater treatment systems.

A unit installed in a 16,000-gpd system at Malibu Creek Plaza Shopping Center in Malibu, Calif., produces effluent for unrestricted water reuse with TN averaging 3.87 mg/L. A 10,000-gpd system in Eastham, Mass., achieves TN less than 3 mg/L. Monthly sampling at a 6,000-gpd system in Mashpee, Mass., shows TN at 3.6 mg/L.

The groundwater nitrogen removal system was field-evaluated by third parties. Nitrate-N at the Massachusetts sites was less than 0.007 mg/L. In Rhode Island, the dissolved inorganic nitrogen (ammonium, nitrate, and nitrite) levels are less than 0.2 mg/L. **Call 617-964-2924 or visit www.lombardoassociates.com.**

Fast installation

Waterloo Biofilter has a below-ground configuration for its foam-based **treatment system**. Lightweight tanks come plumbed and ready to install. The disposal pump and float controls in the built-in pump chamber are set for correct doses.

The system achieves tertiary-quality effluent and nitrogen removal with an intermittent pump. Two risers provide easy access.

Treatment system from Waterloo Biofilter



Components are non-corrosive and durable. An anti-flotation option is available for systems up to 800 gpd. The units were tested under US EPA-ETI and NSF-ETV programs. **Call 866/366-4329 or visit www.waterloo-biofilter.com.**

Treatment tank from AquaKlear Inc.



All-in-one solution

The **all-in-one treatment tank** from **AquaKlear Inc.** has received NSF listing. Model AKF5B1 has a 500-gallon septic tank, Model AK500FF fiberglass treatment plant, and 750-gallon fiberglass dosing tank. This configuration has an 8- by 10-foot footprint and shallow design, requiring only an excavator and trencher to install.

Units use an extended activated sludge treatment process. An automatic skimmer in the clarifier removes any floating solids and returns them to the aeration zone every 24 hours to keep the chamber clean. The blower operates continuously, allowing the system to handle shock loads, while fine air diffusion to the aeration chamber maximizes the rebound period. Under normal operation, BOD and TSS are in the single digits. **Call 877/936-7711 or visit www.aquaklear.net.**

Extended aeration

Ecological Tanks Inc.

has added the 600-gpd AA600-50 and 800-gpd AA800-65 with 500- and 650-gallon built-on **pretreatment tank** to its **Aqua Aire line** of advanced treatment systems. Monolithic configurations simplify installation and allow for adequate pretreatment. Systems outfitted with linear or rotary vane compressors and controls can be designed for most applications. Units are available through precast distributors. **Call 800/277-8179 or visit www.etiaquasafe.com.**



Pretreatment tank from Ecological Tanks Inc.



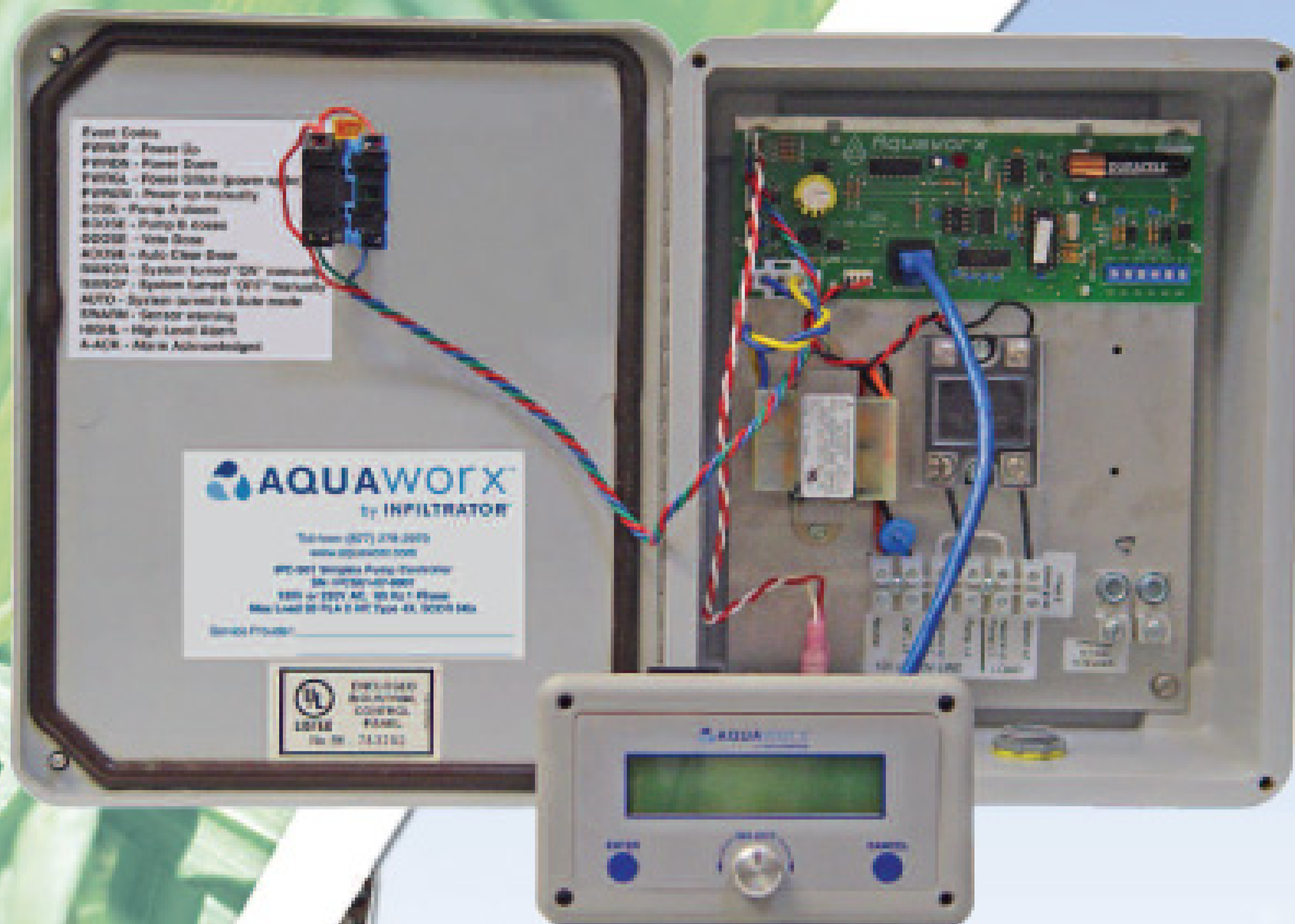
Recirculating trickling filter systems from Koi Environmental Inc.

Reuse system

Recirculating trickling filter systems from **Koi Environmental Inc.** allow reuse of treated wastewater. Systems have a primary tank followed by a single insulated trickling filter or two filters in series. Effluent, disinfected with ozone and UV light, is stored in separate tanks, one for flushing toilets; the other for landscape irrigation or disposal.

Effluent has less than 4 mg/L BOD, no detectable TSS or fecal coliforms, and turbidity of less than 0.4 NTU (Nelson Turbidity Units). Systems use a computerized Phonetics supervisory control and data acquisition unit with proprietary operating program. Tertiary treatment units for single homes and facilities up to 200,000 gpd work at altitudes of 7,000 feet and temperatures from minus-10 to higher than 90 degrees F. **Call 800/980-9898 or visit www.koienvironmental.com.** ■

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Machine Matters is designed to help readers get the most from excavators, backhoes, skid-steers and other mechanical equipment through proper maintenance, operation and financial practices. Readers are welcome to submit ideas for this column and can send them to Ted J. Rulseh, editor, by calling 800/257-7222, or e-mailing to editor@onsiteinstaller.com.

The Up Side to Downsizing

When a full-size tractor-loader-backhoe is too much machine for the job, look to compact equipment as an effective use of power, time and space.

By Greg Northcutt

If you rely on a full-size tractor-loader-backhoe for septic system construction, it can be easy to dismiss the value of a compact TLB for your work.

After all, large machines offer a lot more power and capacity for digging, loading and moving earth and gravel. That means you can do more work in less time to produce more profits. Right?

Not always. Not when you're tackling a repair job in close quarters, digging test pits or doing other work where much of the performance built into a full-size TLB goes unused. That's where smaller machines can save you time and effort. They can also prove valuable for making some money in other light construction work, from residential construction and drainage jobs to water, power and communication line installation.

A compact TLB can squeeze through a restricted access point too small for a full-size machine. It can also work more efficiently in the confined spaces of a back yard, where sidewalks, trees and bushes can hamper or even prohibit use of the larger units.

Smaller can be better

Just like their full-size counterparts, compact machines can be equipped with a variety of loader and backhoe attachments. There, again, smaller can be better. For example, using a compact machine with a 12-inch trenching bucket to

install a gas line reduces the amount of spoil to be removed and replaced by one-half compared to using a full-size TLB with a 24-inch bucket.

A smaller package also means a lighter machine. The operating weight of TLBs with digging depths of 7.5 to 12 feet generally ranges from 3,000 to 8,000 pounds. That can pay off by minimizing damage to lawns, sidewalks and other sensitive surfaces and the time and money to repair it. What's more, depending on the size and local licensing requirements, you can also transport many compact TLBs on a trailer pulled by a pickup truck,



eliminating the need for a CDL.

Don't let the small stature of these machines mislead you. Offering roughly the same power and capacity, proportionally, as full-size TLBs, many are built to withstand long, hard work, manufacturers say. And, compact machines generally come at a lower price tag



Compact tractor-loader-backhoes include this 225 unit from Allmand Brothers and the M59 from Kubota.

"The engines of the very first TLBs started out in the 50-hp range. Then, as the demand for bigger and bigger machines grew, many full-size machines now have engines with 70 hp or more. Our newest model fills this gap."

Keith Rohrbacker
Kubota Tractor Corp.

and with lower operating costs.

Take a look at the latest in two lines of compact TLBs and you might be surprised by the ability of these machines to help you out of a tight situation.

Performance features

Allmand Brothers Inc. prides

itself on the heavy-duty construction of its six gasoline- or diesel-powered models. They range from the 20-hp, 3,115-pound TLB 220 with a 7.5-foot digging depth to the 35-hp, 5,800-pound TLB 6235 with four-wheel drive and 10-foot digging depth. Loader lift capacity of these models at full height ranges

from 1,700 to 2,100 pounds. Loader breakout force for the 6235 tops out at 3,400 pounds, while maximum backhoe digging force is 6,000 pounds.

Rather than offering the lowest price tags, this line is built to provide top value, reports Doug Dahlgren, product manager for Allmand Brothers. "We design our models for the rental market," he says. "That means they have to be able to handle a wide variety of applications, a wide range of operator experiences, and limited maintenance. So we build them with components that go above and beyond the minimum requirements."

This includes the likes of oversized chrome cylinder pins for added durability, sealed bearings featuring poly-lined bushings to eliminate metal-to-metal contact and reduce wear, and planetary axles designed to outlast single reduction axles.

Durability features on Kubota compact TLBs include a heavy-duty rear axle with multiple wet-disc brakes and an integral main frame that absorbs twisting loads during backhoe and loader operation without transmitting flex to the tractor chassis. "This makes the tractor's structural integrity extremely sound," says Keith Rohrbacker, product manager for Kubota Tractor Corp.

Kubota's line of diesel-powered TLBs includes the 26-hp B26 with an 8-foot digging depth, the 39-hp L39, with a 9-foot digging depth, and the 59-hp M59, the newest and largest TLB, introduced in February.

The M59 occupies a niche abandoned by makers of full-size TLBs, Rohrbacker notes. "The engines of the very first TLBs started out in the 50-hp range," he says. "Then, as the demand for bigger and bigger machines grew, many full-size machines now have engines with 70 hp or more. Our newest model fills this gap."

Complementing the M59's lifting capacity of 3,960 pounds is its maximum lift height of 10.5 feet to the pivot pins for loading into a standard dump truck. The 8,345-pound M59 also has a loader breakout force of 5,961 pounds and backhoe digging force of 7,602 pounds.

Sophisticated systems

Load-sensing hydraulic steering helps enhance the performance of Allmand's compact machines. "Unlike conventional steering with open-center circuit hydraulics, load-sensing is more sophisticated and efficient, supplying hydraulic fluid only when turning the steering wheel," Dahlgren says. "This provides maximum available hydraulic power to the backhoe, loader or attachment."

Some models also have a servo-controlled hydrostatic transmission. It provides positive neutral

"Unlike conventional steering with open-center circuit hydraulics, load-sensing is more sophisticated and efficient, supplying hydraulic fluid only when turning the steering wheel. This provides maximum available hydraulic power to the backhoe, loader or attachment."

Doug Dahlgren
Allmand Brothers Inc.

and infinite control of the machines along with less pedal effort in either forward or reverse travel mode.

The high-performance inching valve on the Kubota compact TLBs results in smooth, precise operation of the backhoe arm and boom, Rohrbacker says. That is handy for moving the arm and boom simultaneously when using the backhoe for finish work.

Another Kubota feature, similar to that found on full-size TLBs, is the backhoe crawling mode. "This allows you to creep along while at the controls of the backhoe, saving you valuable time when repositioning along lengthy trenches," says Rohrbacker.

Added versatility

Loader bucket capacities of the compact TLBs range up to about one-half to one-third cubic yard, while width of the backhoe buckets can range from 8 to 36 inches, depending on machine capabilities.

Many compact TLBs offer standard or optional quick-attach systems for changing loader and backhoe attachments. On the loader end, you can attach a wide range of types and makes of skid-steer loader attachments, including pallet forks and landscape blades, depending on size and power of the TLBs.

Optional auxiliary hydraulics, with convenient thumb control in some cases, can be used to power hydraulically-driven tools, like augers, 4-in-1 buckets, and sweepers. Specific choices depend on the hydraulic capacity of the machines.

For extra versatility, the backhoe on Kubota compact TLBs can be removed to install either a Category I or II three-point hitch, which stores out of the way when not needed, for use with such implements as disks, rototillers and mowers.

Ease of operation

Manufacturers have also kept operator comfort and convenience

in mind with ergonomic cab design and control placement. For example, some Allmand models offer servo-controlled hydrostatic transmissions for smoother, easier operation, and separate seats for tractor or backhoe operation. The seats flip out of the way when not needed.

Kubota features include an auto-leveling valve that keeps the loader bucket level as the boom changes to minimize spillage; a slanted boom and hood design for improved visibility; and a curved backhoe boom. The curvature makes placing material in the center of a truck bed easier and allows you to dig at maximum depth while minimizing the length of the trench cut.

More information is available at www.allmand.com and www.kubota.com.

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

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Risers and Grinders

Installers discuss how-to tips for septic tank riser installation and the virtues of using grinder pumps in onsite systems

Question:

Does anyone have recommendations for what type of risers to retrofit on concrete septic tanks? I've had a couple of customers request them and have been turning them down, but now I would like to get into it.

Answers:

I have had good luck with Polylok risers. They have available

an adapter ring that makes them easy to install on the tanks.

As a precaster, we offer concrete risers, but they can be hard to handle, and most folks don't want a concrete lid with rebar handles sticking up, especially on new systems. An alternative is a product called Ultra-Rib that fits down in our 24-inch round manholes. It can be cut to any length and has a heavy plastic lid secured with screws.

For tanks with odd-size openings, Polylok adapter rings are ready-made for either 20- or 24-inch riser rings. Polylok makes riser rings in 12- and 6-inch lifts that are easily installed. One drawback on concrete or Polylok risers is not being able to cut them to an exact height.

The precast tanks in our area have two, 21-inch, round-concrete lids that are beveled. Black ABS culvert can be easily cut to length with a hand saw, placed in the hole, sealed with caulking, and the original lid put on top and buried a few inches below grade.

For tanks that are not more than two feet deep, I prefer precast concrete risers. You just can't beat the price or durability. If the tank is deeper than two feet, we use the Fralo tank adapter ring, plastic culvert pipe and Fralo lid.

50 feet in distance and with 25 feet of head?

Answer:

You can find a pump to do it, but I've been told of studies that show grinding the waste is less than ideal — that it interferes with the normal settling and floating that occurs, and messes with the retention time of solids, allowing more to be passed to the drainfield. A solids handling pump and a little education for the homeowner as to what goes down the sinks and toilets is a better option, from what I've heard. ■

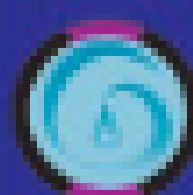


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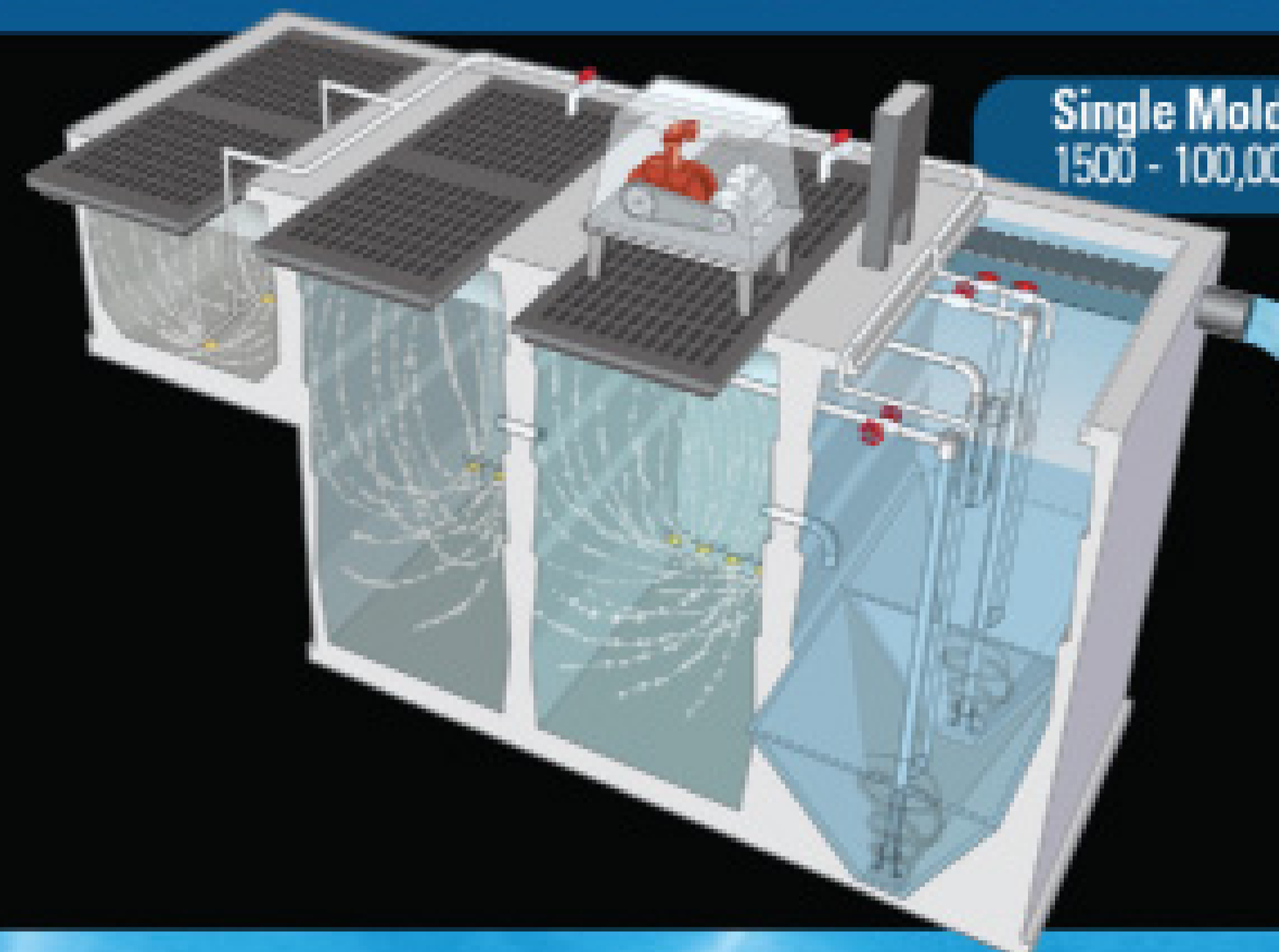
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With the Richmond skyline behind them, employees Jamal Jones, Brandon McDowell, Daryl Jones and owner Kornell "Trapper" Davis pose for a team photo. (Photography by Joe Mahoney)



Taking Care of MOM

Coastal Plains Environmental finds a large and growing niche in maintenance, operation and management of advanced onsite systems

By Gil Longwell

Coastal Plains Environmental Group LLC, New Kent, Va.

OWNERS: K.R. "Trapper" and Anna Davis

YEARS IN BUSINESS: 6

EMPLOYEES: 5

MARKET AREA: 200-mile radius

ANNUAL REVENUE: \$500,000 in contracts

SPECIALTY: Onsite system management, operation and maintenance

AFFILIATIONS: NOWRA, Virginia Onsite Wastewater Recycling Association

WEB SITE: www.cpeglc.com



Kornell R. "Trapper" Davis is responsible for the operation of more than 1,000 advanced onsite treatment systems. And yet his company, Coastal Plains Environmental Group in New Kent, Va., has never installed a single system.

Davis is a self-labeled "reformed regulator" who left that side of the industry. In 2001, with his wife, Anna, they formed Coastal Plains.

"I saw an opportunity to fill a niche market that would be in high demand and which, for now, is not too crowded," he says. From their office about 20 miles east of Richmond, Coastal Plains Environmental Group technicians service systems across about half the Commonwealth of Virginia. "A technician is usually less than three hours away from any customer," Davis says.

The company services systems from Annapolis, Md., on the north and into North Carolina to the south. Some systems are in the Blue Ridge corridor to the west. To overcome the challenges of time

and distance, each technician is assigned a company service vehicle and drives it home every night.

Management mandate

Today, Virginia does not mandate onsite system management, yet all of Davis' customers have chosen to manage their systems. That will change on July 1, 2009, when a management mandate goes into effect for all alternate-technology systems. Traditional box-and-rocks systems will be exempt.

Davis compliments his customers for being ahead of the compliance and knowledge curves. "First, they have recognized the need to protect their onsite system investment and extend its usable life," he says. "Second, they have acted voluntarily."

It was easy for Davis to anticipate the demand for his services. As a regulator, and later as a service provider, he lobbied the state legislature for about seven years before it created the management mandate. Similar requirements are being

"I saw an opportunity to fill a niche market that would be in high demand and which, for now, is not too crowded."

— K.R. "Trapper" Davis

established across the nation, creating entrepreneurial opportunities.

Davis describes his service menu as maintenance, operation and management (MOM for short). The work covers manufacturer-specified actions — such as filter cleaning or replacement, component inspections, and chemical replacement — that are required at set intervals.

It also includes surveillance and data storage. System control panels measure and record pump cycles and run time which, in turn, relate to daily flows. Owner-supplied information includes the population served and the structure's maximum occupancy.

Knowing the patterns

Operation starts with the user and continues with Davis and his crews. "Operation is far more than the system user flushing a toilet," Davis says. In the operation arena, water use patterns are addressed to ensure that the onsite system performs as designed. Different families and cultures have different usage patterns.

"Those patterns are neither good nor bad — they are what they are," Davis says. "Part of our job is to recognize them. Then, using education and, to a lesser extent, system tweaking, we work to bring actual flow into the system as close to the manufacturer's expectations as possible."

Davis describes an aerobic treatment unit that was specified in the system design and installed to serve a four-bedroom house. "When only two elderly people lived in the house, the treatment device did not receive sufficient food to preserve the biological or chemical environments needed to perform as intended," Davis says. He calls that condition "underload."



Jamal Jones pulls a pump from the second stage of a packed bed filter system.

Brandon McDowell checks the continuity of the relays in the timer system of an onsite installation.



On the other hand, systems serving restaurants or similar commercial establishments typically experience overload. Each situation brings its own challenges, some "further complicated by seasonal variations or special events: Thanksgiving weekend, daughter's wedding, graduation, grandparents' 50th anniversary party.

It may be impossible to adjust the onsite technology for such shock loadings. A well-proven work-around is a rented portable toilet or two. Davis tells customers: "Monitoring and operation are inseparable."

Critical communication

Customer briefings and education are essential, but communication does not stop there. "I want the system to contact me when it encounters atypical conditions," Davis says. Davis specifies telephony and telemetry upgrades that on all system designs he prepares or collaborates on. "Communication with systems must be a two-way process to be effective," he says.

This two-way communication allows Davis or his crew to interact with and adjust a system's operations from any place where there is a telephone line for Internet service. "Telephony tells us when there is a problem," he says. "Telemetry enables us to address the issue as if we were standing on the site." Equipping a system with telephony adds about \$650 in hardware. Adding telemetry can double the communication hardware cost, but it also cuts response time and miles traveled.

Trapper Davis takes pride in the quality service work done by his team.



Systems at Risk

"There are way too many actions by the homeowner that can upset advanced treatment systems," says K.R. "Trapper" Davis, owner of Coastal Plains Environmental Group LLC.

These same things actually upset a conventional septic tank and drainfield as well, but because in those systems most treatment takes place in the soil, no one sees the problems until the soil absorption system fails.

"The simple act of painting a room and cleaning the brushes in the sink can cause major problems with most advanced treatment systems," Davis says. "Latex paint has built-in anti-bacterials that will kill, prevent or inhibit the growth of the good bacteria that the system needs to operate. The addition of chemicals,

particularly medicines, can upset the system, too."

It has been long rumored that water softeners put onsite systems at risk. Davis, a member of a joint task force with representatives from NOWRA and the water softener industry, is studying various types of water softener discharges to prove or disprove that rumor definitively.

Too often, Davis has seen repair permits issued when simply educating the homeowner, or removing a discharge such as a condensate drain or a sump pump from the system, will correct the problem.

"Homeowners have the most to learn and the most to gain from management, operation and maintenance," says Davis. "It's just that simple."

Davis also wants to see a remote county-level data storage and management tool put into use. When a county specifies a single data repository, it makes consistent information available to all who rely on that data. Regulators can see data for all systems in their jurisdictions, while service providers can only see their own customers' data. Davis espouses common data management for all Virginia counties. "Such a system would enable statewide data compilation and, more important, analysis," he says.

Annual contracts

Coastal Plains' MOM contracts are priced using a sliding scale. "The system's components and their corresponding maintenance intensities are factored into the pricing structure," Davis says. "Every manufacturer's cleaning, inspection and service interval is covered, as well as 24/7/365 emergency response."

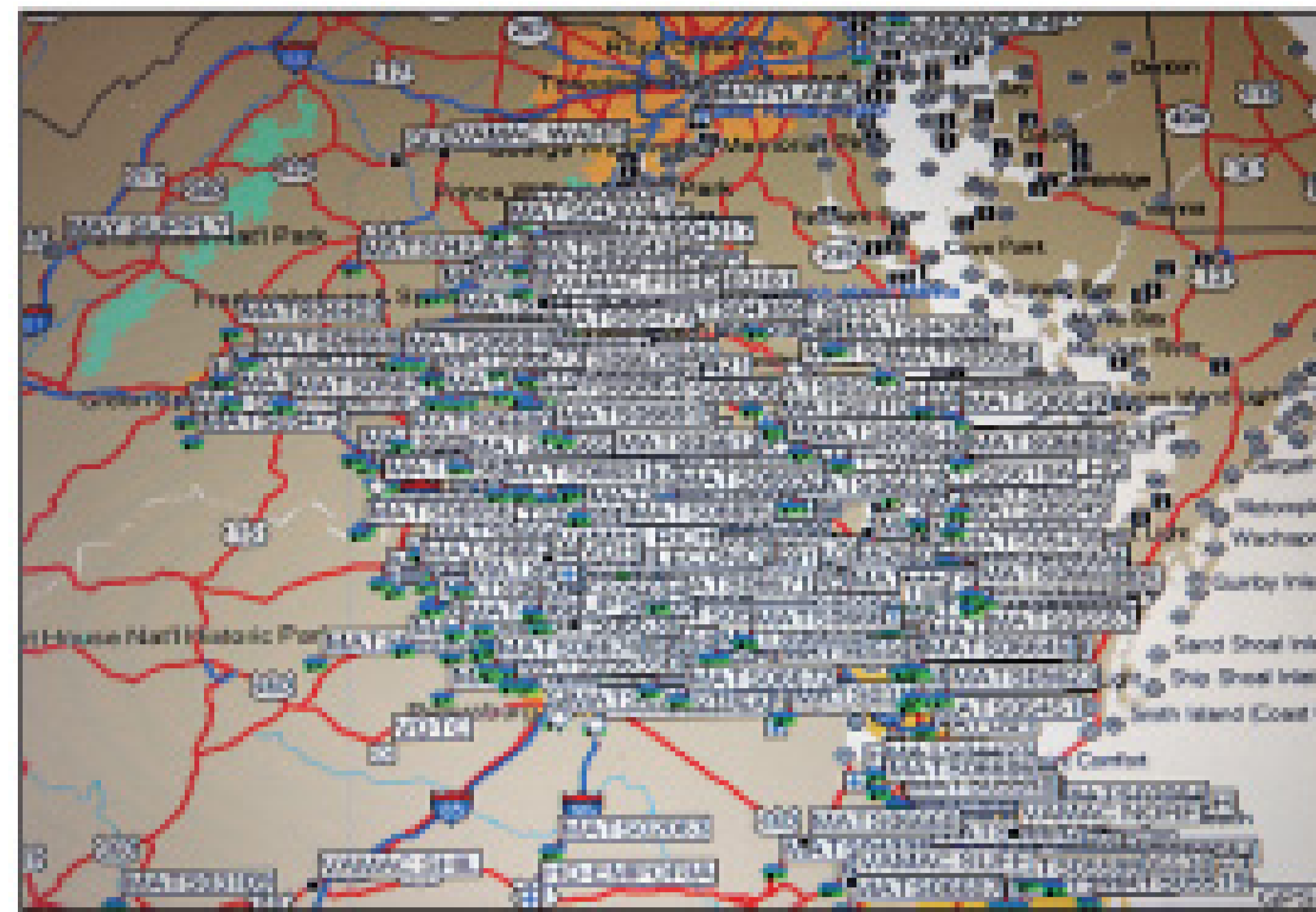
Customers also receive a five-year warranty on all pumps, panels, level sensing devices, switches and mechanicals. In effect, Coastal Plains becomes the manufacturer's agent, assuring prompt service and a hassle-free transaction for the homeowner. The initial price is locked in through a five-year contract. Service fees do not include treatment tank cleaning. Insistence on telephony and telemetry at the front end enable Davis to control his costs and keep contract prices stable.

Makers of a dozen technologies recognize Coastal Plains as a factory-authorized service provider. These include American Manufacturing Company Inc., Bio-Microbics Inc., Bord na Mona, Clearstream Wastewater Systems Inc., Eco-Pure Waste Water Systems, E-Z SET Co., Geoflow Subsurface Drip Systems, Hoot Systems Inc., Norweco, Orenco Systems Inc., Pentair/Delta Environmental Products, and Waterloo Biofilter Systems Inc.

This diversity of technologies provides breadth to the skills Coastal Plains offers its customers. Davis also acts as the technology trainer for some equipment manufacturers.

Focused on MOM

Davis' wife supported his career



A screen shot from a laptop computer shows the locations of some of the more than 1,200 systems Trapper Davis and his team can monitor remotely via the Internet.



The pump in a recirculation tank gets a cleaning.

Davis says. "It gives the technician an indication of the parts that may be needed before they ever leave to service the alarmed system."

Growth opportunities are everywhere. It is estimated that in Virginia in 2007 there were 15 companies dedicated to MOM, and more than 6,500 alternative treatment systems installed. Coastal Plains is one of the largest MOM providers, and in 2007 wrote contracts for about 4.5 percent of

"The largest majority of alternative treatment systems that are being installed are not being professionally maintained. They do not have a dedicated and knowledgeable service entity looking after them."

— K.R. "Trapper" Davis

switch. Today, she is the office manager, account manager, official timekeeper, secretary, financial administrator, and more. "I may know how to evaluate sites and design, install and maintain treatment systems, but she keeps the office functioning," Davis says.

He has avoided or walked away from some aspects of the business. Davis reserves soil evaluation and design work to system repair projects. "While we are trained and qualified to inspect existing systems under Virginia law, we have purposefully chosen not to be included on any list of approved inspectors," he says. "We want to stay focused on the main mission of MOM."

Coastal Plains' service technicians cover about half of the Commonwealth. Daryl Jones, Jamal Jones and Brandon McDowell are each supported by a fully equipped vehicle that carries a complete inventory of diagnostic tools and the most commonly needed repair parts.

"The telemetry is important in the dispatch side of our work,"

those systems.

"The largest majority of alternative treatment systems that are being installed are not being professionally maintained," Davis says. "They do not have a dedicated and knowledgeable service entity looking after them."

In demand

Davis' work and the reputation he has built have earned him a position of influence in the industry and beyond. Locally, Coastal Plains belongs to the Chamber of Commerce and Better Business Bureau.

Inside the industry, Davis is part of the leadership of the Virginia Onsite Wastewater Recycling Association (VOWRA) and represents that organization on the National Onsite Wastewater Recycling Association (NOWRA) board of directors.

Virginia Gov. Tim Kaine has appointed Davis to a board within the Commonwealth Department of Professional and Occupational Regulation. "That board is currently

figuring out what type of training or certifications will be required to achieve state licenses for onsite system soil evaluator and designer, onsite system installer, and onsite treatment system service provider," Davis says.

Davis was a speaker at the NOWRA Installer Academy in Las Vegas last December, and later this year will speak about MOM at conferences in Colorado, British Columbia, and elsewhere. "Across the country, demand for MOM and information about MOM is rising," he observes.

Whether to fill a knowledge gap or satisfy a customer's need, Coastal Plains Environmental Group's Trapper Davis is ready to answer the call and fill the niche. ■

MORE INFO:

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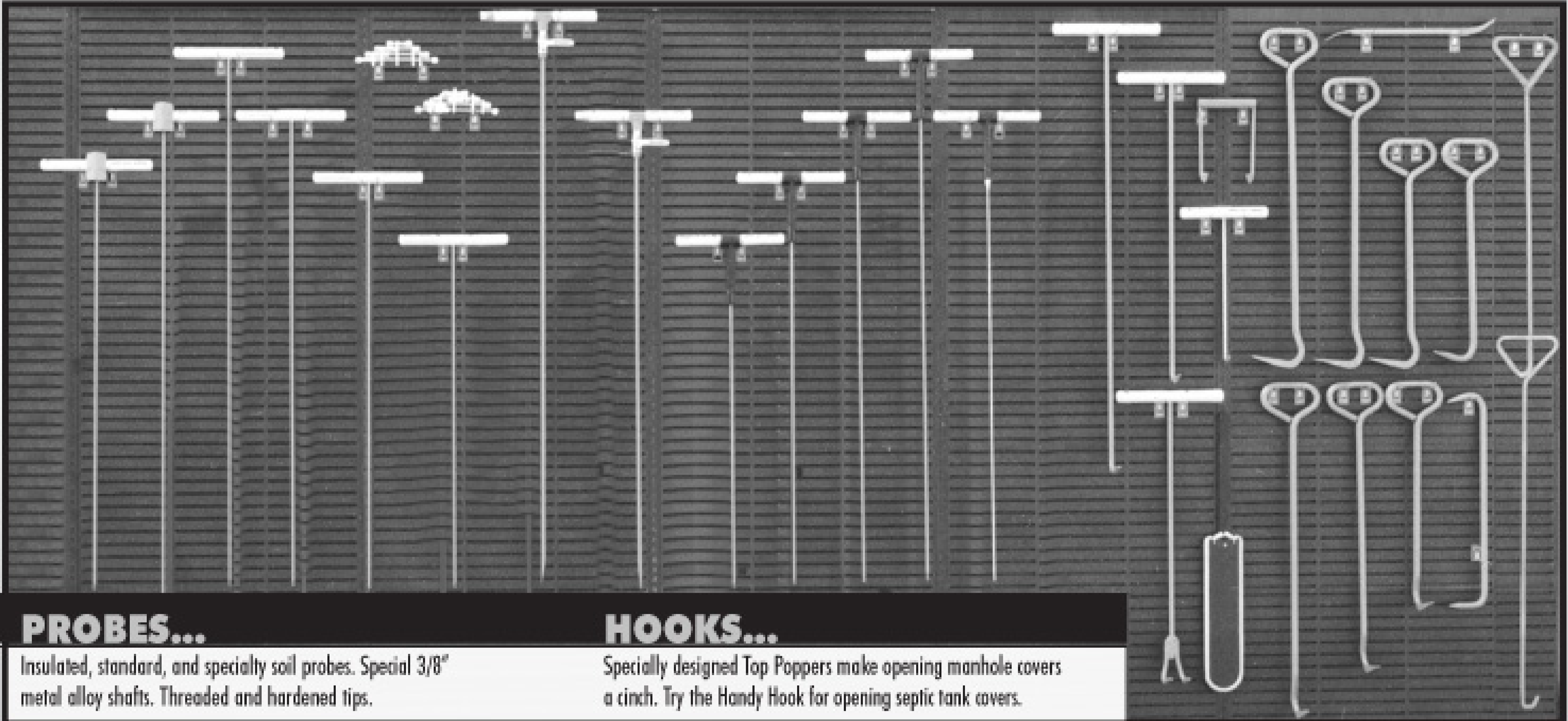
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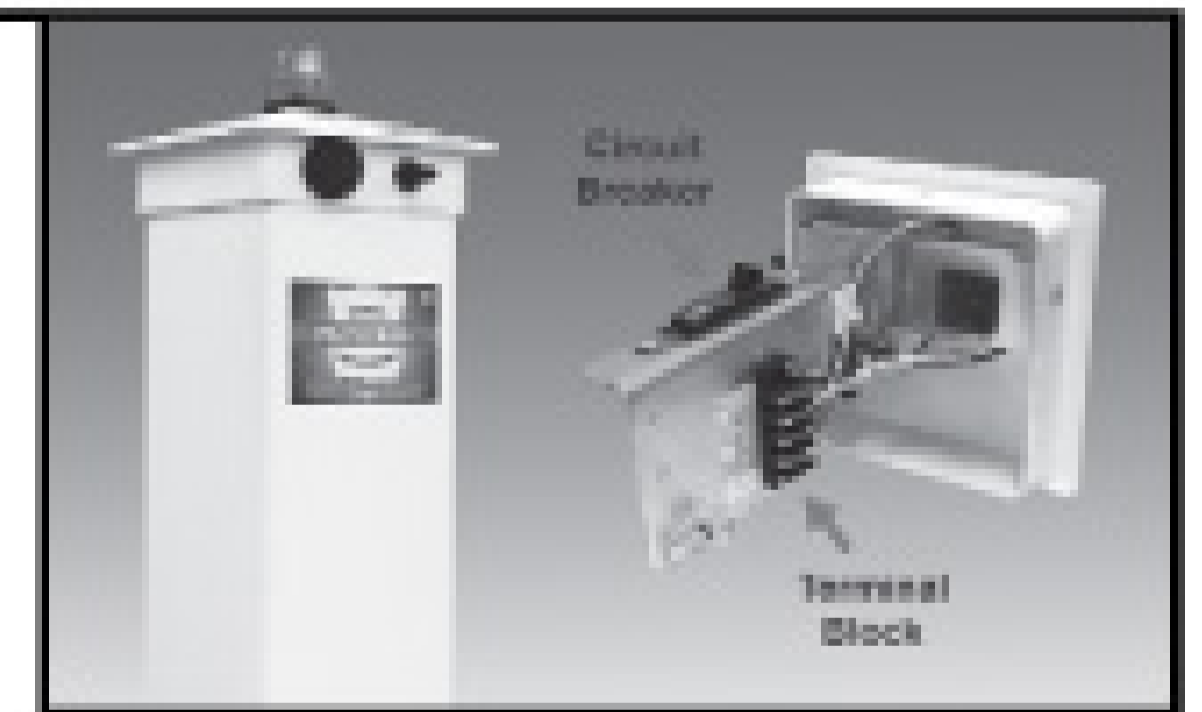
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Zero Drainfield

An innovative onsite system for a truck stop and restaurant in Ontario relies heavily on water recycling to suit site conditions

By **Scottie Dayton**

Plans for Cedar Creek Fuel Centre, being developed for 401 Multiplex Inc., included two existing buildings and a truck stop with a 42-seat restaurant and six showers, truck wash with two bays, and five-unit industrial mall, all on 14.7 acres in Ayr, Ont.

The area had no municipal sewer or water, but nitrogen levels of 80 mg/L from long-term corn farming concerned the provincial Ministry of Environment (MoE). Besides restricting nitrogen discharge, the ministry limited the amount of water onsite systems

could discharge and how much water the complex could draw from its two wells.

Martin Sommer, project and general manager, went a step beyond and designed a system that enabled the truck stop to meet any environmental objectives in the next decade. "The largest factors were the showers putting out 3,900 gallons per day, and the high-strength waste from the restaurant," he says. "I worked with Christopher Jowett of Waterloo Biofilter Systems to plan the tanking and flow."

Their innovative solution eliminated drainfields and contains more than 2,000 feet of 2-inch force main connecting 11 tanks, six trickle filters, disinfection, a commercial irrigation system, custom-built water reuse system, and stormwater maintenance pond. Contrary to what outside engineers predicted, the system works brilliantly.

Soil conditions

The property is part of the Cedar Creek subwatershed and is located in the low point of an open field. Soils are glacial till (sandy and gravelly loam) with percolation rates of less than one minute per inch. Cedar Creek, a Provincially Significant Wetlands, is one of the best coldwater fisheries in the area.

System components

Sommer sized the system to handle 7,925 gpd. Its major components are:

- 1,200-gallon concrete holding tank. Large tanks made by Wilkinson Heavy Precast, Dundas, Ont., and smaller tanks by Unit Precast, Breslau, Ont.
- 6,000-gallon grease trap.
- 3,000-gallon pump tank.
- Two 800-gallon pump tanks.
- Two GP200 grinder pumps on alternating duplex demand control from Monarch Industries, Winnipeg, Man.
- Two 12,000-gallon, two-com-

All pipes with less than four feet of cover were insulated against frost.



System Profile

Location:	Ayr, Ont.
Facility served:	Cedar Creek Fuel Centre
Designer:	Martin Sommer, Cedar Creek Fuel Centre, and Christopher Jowett, Waterloo Biofilter Systems Inc.
Installers:	Rob-Hart Mechanical Inc., Kitchener, Ont.; D.W. Cooper Contracting Ltd., Brantford, Ont.; Core Earthworks Ltd., Cambridge, Ont.
Site conditions:	Glacial till with percolation at less than one minute per inch
Type of system:	Absorbent trickle filters with disinfection, Waterloo Biofilter Systems Inc., Rockwood, Ont.; irrigation, stormwater maintenance pond, and water recovery system
Hydraulic capacity:	7,925 gpd

- partment septic tanks in series.
- PL-525 effluent filter (1/16-inch filtration) from Polylok Inc., Wallingford, Conn.
- 3,000-gallon balance tank.
- Two Monarch WS100HM 1-hp, single-phase effluent pumps on alternating duplex timer control.
- Six biofilters in polyethylene tanks from Waterloo Biofilter Systems Inc., Rockwood, Ont.
- 3,000-gallon disposal tank.
- Two Monarch MSS30, 2-hp, 4-inch, high-head well pumps on alternating duplex demand control.
- CATEC water recovery system from Custom Applied Technology Corp., Sarasota, Fla.



John Van Neiuwenhuizen (left) and Dave Mc Cready from D.W. Cooper Contracting install a rainwater infiltration gallery.

"The concept of disposal sinks connected to a separate holding tank is unique. It eliminates compensating for environmentally unfriendly products in the treatment process."

— Martin Sommer

- Custom-built control panel from IDT Systems Inc., Cambridge, Ont.

System operation

A special labeled disposal sink in the kitchen separates coffee grounds and soups from the remaining wastes, which flow through the grease trap into the pump tank. A disposal sink in the janitor's room separates harsh chemicals from restroom wastewater. The sewage combines with the grease trap discharge in the pump tank. The mixture is pumped into Septic Tank 1, then flows into Septic Tank 2. Sewage from an existing building and the truck wash flows into Septic Tank 1.

"The concept of disposal sinks connected to a separate holding tank is unique," says Sommer. "It eliminates compensating for environmentally unfriendly products in the treatment process." The holding tank is pumped every three months.

From Septic Tank 2, effluent flows into the balance tank, then is pumped up 20 feet to the biofilters in a heated building. Helical spray nozzles pressurized at 10 psi or more spray effluent evenly over foam cubes. Timer settings dose the units evenly throughout 24 hours at 1.5 gallons per cubic yard. A vent on the roof of each biofilter connects to a fan that draws air out of the tanks.

Microbes treat the wastewater as it trickles through the media. Liquid gravity-drains to the disposal tank, where pumps return 50 percent to Septic Tank 1. The remaining half flows to the disposal tank, passing through three Big Bubba filter cartridges (50, 20, and 5 microns) and two Hallett 30

A crew places the last of five 13,200-gallon water reservoir tanks for fire-fighting in the north end of the property.



The crew from Unit Precast places (background to foreground) the kitchen holding tank, grease interceptor, and one pump tank.

1.5-inch disinfection units in parallel, then to the distribution network.

Effluent dispersal

Distributing the tertiary-treated effluent was challenging. One goal was to reuse it in the truck wash, replacing the 45 gallons lost with each tractor-trailer washed and livestock or food truck disinfected. "By making up the water, it doesn't show on our records as water taken in or disposed of," says Sommer.

Because the effluent contains nitrogen and phosphorus, another goal was to use it for irrigation. In winter, the water surface-discharges into a 250- by 50- by 15-foot-deep stormwater management pond.

Two-thirds of the disposal tank's capacity is dedicated to the

irrigation system. One-quarter of the rest is reserved for the truck wash. What remains prevents the pumps from running dry. To give water a chance to soak into the ground, the custom-built programmable irrigation system cycles twice in 24 hours, pumping 40 gpm at 100 psi. It takes 50 minutes to pump down the disposal tank.

The third goal was to recover the water used in the truck wash. The CATEC water recovery system targets soap and specific chemicals in the water. The lengthy treatment train has three baffled, 1,500-gallon balance tanks and an 1,800-gallon pump tank. Water in the pump tank returns to the truck wash for reuse. The pump tank has an emergency overflow pipe that drains into a 4,700-gallon graywater holding tank with high water alarm. Every part of the onsite system is fully redundant.

System installation

"The project was three months behind, and that's all the time we were given to complete everything," Sommer says. Contractors leveled the hills on a next-door property, trucking in more than 460,000 cubic yards of sand to raise the ground level 6.5 feet. The site also supplied all the B-grade gravel.

The two precast companies set their own tanks. Wilkinson used a 100-ton crane with outriggers to handle the 40,000-pound, 24- by 10-foot-square tanks. Some excavations were 14 feet deep, giving Sommer the five feet he needed to run piping overhead or maintain the required slope.

Because of site constraints, they backfilled as work was completed. "The installation was pretty straightforward," says Sommer. "We worked long hours and met our deadline." The system also satisfied the MoE's nitrogen concerns, achieving 20 mg/L.

Maintenance

Startup was shaky. Stones rising in an incorrectly assembled water softener jammed open the rapid flush, releasing 24,000 gallons over a weekend. That flushed out the onsite system, killing the organisms in the biofilters. Sommer sent a vacuum truck to a nearby fuel center to pump up 3,000 gallons of sewage and kick-start the system.

Although the onsite system has operated for a year, Sommer hasn't started the CATEC recovery system for fear of biologically contaminating the vehicles being washed. "We wanted to make sure the sewage system operates correctly, which it

does," he says. "We also don't know how the remaining nitrates in the water will react with the soap in the truck wash. Recovering water from a truck wash is extremely difficult, because water has a high affinity for dirt and doesn't want to release it."

Sommer does the maintenance. Monthly, he inspects the biofilters, sends effluent samples to ALS Laboratories, inspects the spray nozzles and control panel, tests the pumps, and inspects the float switches and septic tanks. ■

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April 2008

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SJE-Rhombus Hosts National Sales Meeting

More than 50 factory representatives from independent sales agencies throughout the United States and Canada attended SJE-Rhombus national sales meetings in Las Vegas, Atlanta and Detroit. The meetings included new product demonstrations, sales training, marketing programs and strategies. ■



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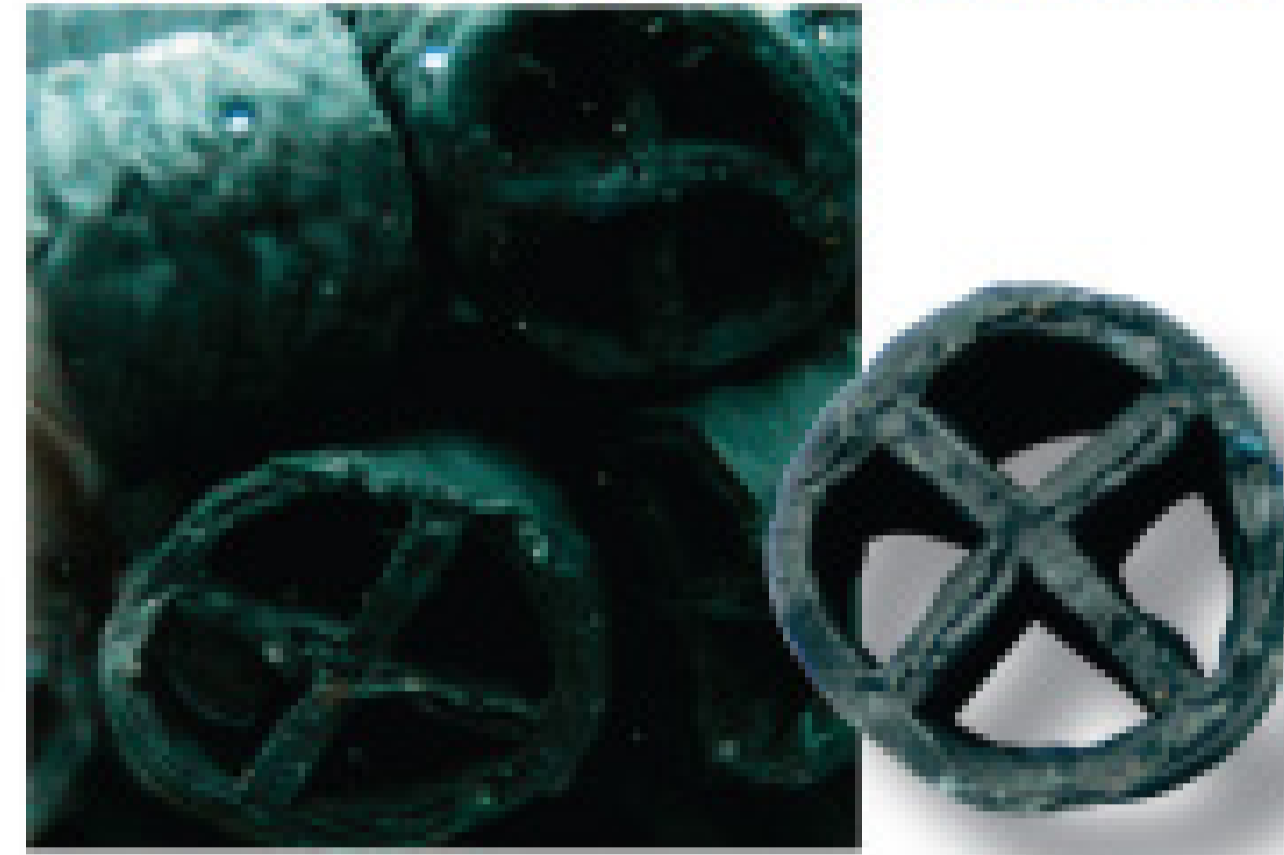
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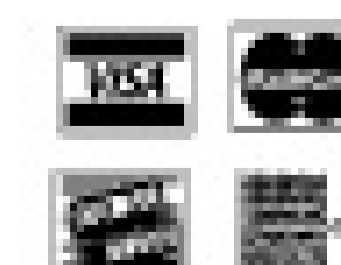
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No-Dig Show

The Gaylord Texan Resort and Convention Center in Grapevine is home to the No-Dig show, April 27-May 2. Four educational tracks representing more than 100 presentations and panel discussions will cover sewer, stormwater, and potable water solutions, theoretical models, gravity and pressure pipes, design/build and assessment concepts, case histories, and mainline and lateral trenchless rehabilitation.

Special pre- and post-conference seminars include new construction techniques and rehabilitation methods, good practices guidelines in horizontal directional drilling and new installation methods, damage investigation workshop, and the NASSCO Pipeline Assessment Certification Program and Manhole Assessment and Certification Program. For more information, visit www.nodigshow.com.

CALENDAR OF EVENTS

April 4-5

Alabama Onsite Wastewater Association Trade Show, Pelham. Call 888/737-2162 or visit www.aowb.alabama.gov.

April 7-10

National Onsite Wastewater Association Conference, Cook Convention Center, Memphis, Tenn. Call 800/966-2942 or visit www.nowra.org.

April 15-17

North Carolina On-Site Wastewater Treatment Conference, North Carolina State University, Raleigh. Call Joni Tanner at 919/515-1678 or visit www.soil.ncsu.edu, then Training, Short Courses and Workshops.

May 12-15

California Onsite Wastewater Association Conference and Exposition, DoubleTree Hotel, Sacramento, Calif. Call 707/579-4882 or visit www.cowa.org.

June 29-July 2

American Society of Agriculture and Biological Engineers International Meeting, Providence, R.I. Call Sharon McKnight at 269/428-6333 or visit www.asabe.org.

Oct. 14-15

Delaware Onsite Wastewater Recycling Association Conference and Exhibition, Dover Downs Hotel and Casino, Dover. Call 302/739-9331 or visit www.dowra.org.

Oct. 23-26

Ontario Association of Sewage Industry Services Conference and Exposition, Best Western Conference Centre, Orillia. Call Don Kelloway at 877/202-0082 or visit www.oasisontario.on.ca.

TRAINING & EDUCATION

National Association of Wastewater Transporters

NAWT has scheduled sessions in the following locations:

- June 5 – Inspector Recertification Training, Flagstaff, Ariz.; Call Kitt Farrell-Poe at 928/782-3836; kittfp@ag.arizona.edu
- Aug. 26-27 – Inspector Training and Certification, Tucson, Ariz.; Call Kitt Farrell-Poe at 928/782-3836; kittfp@ag.arizona.edu
- Oct. 14 – Inspector Training and Certification, Tucson, Ariz.; Call Kitt Farrell-Poe at 928/782-3836; kittfp@ag.arizona.edu

Alabama

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

- May 1-2 – Pumpers
- May 7-9 – Advanced Installer Level 2

- June 11-13 – Basic Installer
 - June 26-27 – Continuing Education, Dothan
- Call Allen Tartt 205/652-3803 or visit www.aowatc.uwa.edu.

California

Certification courses are sponsored by the California Onsite Wastewater Association and National Association of Wastewater Transporters. Check web site for locations.

- April 17-18 – Inspector Training and Certification
 - April 24 – Soils
 - June 12 – Soils
 - July 17-18 – Operation and Maintenance, Part 1
- Call Cliff Trammel at 707/579-4882 or visit www.cowa.org.

Florida

Courses are at the Florida Onsite Wastewater Association's Training Center in Polk City unless stated otherwise.

- April 7-8 – Master III-Basic Florida Soils
 - April 9-10 – Master I-System Design & Function
 - April 10-11 – Master II-System Materials & Regulation Requirement
 - April 22 – Smart Business Practices ... Portable RR Industry
 - April 23 – Septage & Grease in Florida
 - May 6 – Smart Business Practices ... Portable RR Industry
 - May 20-21 – O&M Service Provider Program I, II, III, Miami
 - June 10 – Management of Decentralized Systems, Jacksonville
 - June 11 – Management of Decentralized Systems, Daytona Beach
 - June 16-17 – Master III-Basic Florida Soils
 - June 18-19 – Master I-System Design & Function
 - June 19-20 – Master II-System Materials & Regulation Requirement
- Contact FOWA at 407/830-4381 or www.fowaonsite.com.

Iowa

The Iowa Onsite Wastewater Training Center has the following courses:

- May 14 – Drip Irrigation Dispersal Systems, Ankeny
 - June 19 – Basic Soils, TBD
- Call Annette Adams at 800/362-2127, ext. 6464 or e-mail Dennis Hayworth at dahayworth@dmacc.edu.

Michigan

The Michigan Onsite Wastewater Training and Education Center at MSU Tollgate Center in Novi is offering these courses:

- April 8-9 – Onsite Wastewater Systems 101
 - May 6-7 – Soils Training
- Contact Barb DeLong at 517/355-4720 or visit www.egr.msu.edu/age, then Extension & Outreach.

Minnesota

The University of Minnesota Extension has these hands-on workshops:

- April 3-4 – Installing Onsite Systems, Bemidji
 - April 11 – Contractor Safety/Pipelayer Certification, Continuing Education, Little Falls
 - April 14-15 – General-Continuing Education, White Bear Lake
 - April 16-18 – Designing Onsite Systems, Detroit Lakes
 - April 22-23 – Inspecting Onsite Systems, Waseca
 - April 28-30 – Introduction to Onsite Systems, White Bear Lake
 - May 1-2 – Installing, White Bear Lake
 - May 5-7 – Pumping and Maintaining, Mankato
 - May 5-9 – Pumper/Maintaining and Service Provider Combo, Mankato
 - May 6-9 – Service Provider, Mankato
 - May 29-30 – Soils, Brainerd
 - June 2-4 – Designing Onsite Systems, Mankato
 - June 5-6 – Soils, Mankato
 - June 10-11 – Soils, Sartell
 - June 12-13 – Inspecting Onsite Systems, Waseca
 - June 20 – Soils-Continuing Education, Sartell
 - June 26 – Soils-Continuing Education, North Branch
- Call 800/322-8642 (612/625-9797) or visit www.extension.umn.edu.

Missouri

The Department of Health and Senior Services is offering the following training professional CEU courses:

- April 15 – Troubleshooting, Springfield
- April 15-16 – Advanced Installer, Cape Girardeau
- April 16 – Hydraulics, Springfield
- April 22 – Basics on Onsite Wastewater, Chillicothe
- April 23 – Basic Drip Irrigation Design and Installation, Chillicothe
- May 6 – Troubleshooting, Grandview
- May 7 – Hydraulics, Grandview
- May 20-21 – Operation and Maintenance, Camdenton
- May 27 – Troubleshooting, Maryville
- May 28 – Hydraulics, Maryville
- June 17-18 – Operation and Maintenance, Hannibal
- June 24-25 – Operation and Maintenance, St. Louis

Call 573/526-6095 or visit www.dhss.mo.gov/Onsite

New Hampshire

The New Hampshire Department of Environmental Services is offering the following at its Concord auditorium:

- April 2 – Installers, review class
- April 8 – Installers, exam
- April 16 – Onsite Designers, review class
- April 22 – Onsite Designers, exam

Call NHDES Public Information Center at 603/271-2975.

North Carolina

North Carolina Soils and On-Site Wastewater Training Academy is offering the following courses:

- May 5-8 – Spray Irrigation Systems Operator, Raleigh
- May 13-14 – Writing A Certified Nutrient Management Plan, Raleigh
- May 20 – Introduction to Decentralized Wastewater, Fletcher
- May 21-22 – Onsite Wastewater System Inspector, Fletcher
- June 10-12 – Subsurface Wastewater Operator Training, Fletcher
- June 25 – Soil Survey in the 21st Century, Raleigh

Call Joni Tanner at 919/515-1678 or visit www.soil.ncsu.edu/training.

Rhode Island

The University of Rhode Island Onsite Wastewater Training Center offers these professional development workshops at its Kingston campus:

- April 17 – Bottomless Sand Filter Design and Installation
 - April 30-May 1 – Conventional Onsite Wastewater System Inspection
 - May 8 – Innovative & Alternative Technology Overview
 - May 14 – Hands-On Component Installation
 - May 29 – Innovative and Alternative Systems Field Tour
 - June 4-5 – Innovative and Alternative Systems Operation and Maintenance
 - June 18 – Soils Basics for the Onsite Wastewater Contractor (contact Mark Stolt)
 - June 25 – Bottomless Sand Filter Design and Installation
- Call Holly Meehan at 401/874-5950 or Mark Stolt, when directed, at 401/874-2915 or visit www.uri.edu/ce/wq.

Texas

The Texas Onsite Wastewater Association is offering a Basic Maintenance Provider course, May 8-9, in the Beaumont area. Call 888/398-7188 or visit www.txowa.org.

Washington State

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

- April 2 – Maintenance Basics
- April 16 – Pumpers
- April 23 – Design/Install Subsurface Drip Systems
- May 6-7 – Combined Basics of Onsite Sewage
- May 14-15 – Installation Basics, Part 2
- May 20 – Mounds/Sand Filters
- May 22 – Maintenance Basics, Bremerton

Call John Thomas at 253/770-6594 or visit www.wossa.org. ■

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