

March

2008

# ON SITE Installer™

PROMOTING WASTEWATER TREATMENT QUALITY AND PROFESSIONAL [onsiteinstaller.com](http://onsiteinstaller.com)

**Pump Producers  
Hold Forum**

Page 26

**Troubleshooting  
Onsite Pumps**

Page 10

**2008 NOWRA  
Conference**

Page 22



# Reading the Landscape

**Soil scientist Randall Miles puts earthly knowledge to work for onsite treatment**

Page 16

PRSTD STD  
U.S. POSTAGE  
PAID  
PERMIT NO. 411  
Beaver Dam, WI

**CHANGE SERVICE REQUESTED**

COLE PUBLISHING INC.  
1720 MAPLE LAKE DAM RD.  
PO BOX 220  
THREE LAKES WI 54562



**16** **COVER STORY**  
**Reading the Landscape**  
By Gil Longwell

**ON THE COVER:** Dr. Randall Miles, associate professor of soil sciences at the University of Missouri, uses a variety of equipment to conduct onsite training courses at the university's field training site at Bradford Farms. Here, he checks an Aqua Safe treatment unit. (Photography by Ernie Gutierrez)

**6** **Breaking Ground: Just Boys Playing with Toys**  
Doing the work is fun; being the boss is tough. The approach of a new season is a good time to focus on becoming a developer of quality people.  
By Ted J. Rulseh

**10** **Basic Training: Troubleshooting Pumps**  
Here are descriptions of some common pump trouble symptoms, along with simple actions you can take to restore proper functioning.  
By Ted J. Rulseh

**14** **Rules and Regs: New California Rules on Track**  
By Doug Day

**20** **Machine Matters: Special Care**  
If you know how and why hydrostatic transmissions can fail, you'll be better prepared to take the right maintenance steps and prevent costly breakdowns.  
By Greg Northcutt

**22** **NOWRA Conference: Focus on Renewal**  
17th Annual NOWRA Technical Conference & Expo in Memphis offers exhibits, education, training, networking and entertainment.  
By Ted J. Rulseh

**24** **System Profile: A Perfect Fit**  
A pre-engineered sequencing batch reactor enables a lake property homeowner to comply with Vermont's revised onsite regulations.  
By Scottie Dayton

**26** **Sump and Sewage Pump Manufacturers Convene**  
By Scottie Dayton

**28** **Product News**

**30** **Association News**

**Coming Next Month: April 2008**

**Advanced Treatment Units**

- Profile: Coastal Plains Environmental, New Kent, Va.
- Basic Training: What makes a good equipment operator?
- The latest innovations in advanced treatment units
- Machine Matters: The upside of downsizing machinery

Published monthly by  
**COLE Publishing Inc.**  
1720 Maple Lake Dam Rd. • PO Box 220  
Three Lakes, WI 54562

In U.S. or Canada call toll-free 800-257-7222  
Elsewhere call 715-546-3346  
[www.onsiteinstaller.com](http://www.onsiteinstaller.com)  
E-mail: [info@onsiteinstaller.com](mailto:info@onsiteinstaller.com) • Fax: 715-546-3786  
Office hours: 7:30 a.m.-5 p.m. Central Time, Mon.-Fri.

**SUBSCRIPTION INFORMATION:**

A one year (12 issue) subscription to *Onsite Installer*™ in the United States or Canada is free to qualified subscribers. A qualified subscriber is any individual or company in the United States or Canada that partakes in the installation, design, maintenance, manufacture, treatment, consulting or sale of onsite wastewater treatment systems or supplies. Non-qualified subscriptions are available at a cost of \$60 per year in the United States and \$120 per year outside of the United States. To qualify visit [www.onsiteinstaller.com/qualify](http://www.onsiteinstaller.com/qualify) or call 800-257-7222.

**CLASSIFIED ADVERTISING:**

RATE: \$1 per word, per month. Minimum of 20 words or \$20. All classified advertising must be PAID IN ADVANCE. DEADLINE: Classifieds must be received by the 17th of the month for insertion in the next month's edition. PHONE-IN ADS ARE NOT ACCEPTED. Ads may be faxed only when charging to MasterCard, VISA or Discover. Please supply all credit card information with faxed ads. Be sure to include your phone number (with area code) in your ad. Make checks payable to COLE Publishing Inc. and mail with classified ad to the address above. CLASSIFIED ADVERTISING APPEARS IN ALL CIRCULATION REGIONS AND ON THE INTERNET. Not responsible for errors beyond first insertion.

**DISPLAY ADVERTISING:**

Call 800-994-7990, ask for Jeff, Jim, Kim or Winnie. Publisher reserves the right to reject advertising which in its opinion is misleading, unfair or incompatible with the character of the publication.

**CIRCULATION:**

Circulation averages 23,995 copies per month. This figure includes both U.S. and International distribution.

© Copyright 2008 COLE Publishing Inc.  
No part may be reproduced without permission of the publisher.



**PUMPER & CLEANER ENVIRONMENTAL EXPO INTERNATIONAL**

[www.pumpershow.com](http://www.pumpershow.com)






Education Day: Feb. 25, 2009  
Exhibits Open: Feb. 26-28, 2009

Kentucky Exposition Center  
Louisville, Kentucky

2009

# ADVERTISER **index**

March 2008

COMPANY	PAGE
A & M Bio-Filter LP	29
Alderon Industries, Inc.	11
 Alita Industries, Inc.	21
Aqua Test, Inc.	22
 Bio-Microbics Inc.	3
Bord na Mona	8
BrenLin Company, Inc./Seal-R Products	29
BS Design Corp.	29
 Clements Associates Inc.	18
Crest Precast Concrete Products	28
Cromaglass Corporation	31
Ecological Tanks, Inc.	8
 Eljen Corporation	21
Fergus Power Products	22
Geoflow Inc.	3
 Hoot Systems, Inc.	13
Jet Inc.	4
Medo USA	15
Orenco Systems, Inc.	5
Organic Products of South Carolina	27

COMPANY	PAGE
 Polylok Inc.	32
Ring Industrial Group	19
 Septic Products Inc.	28
 Septic Services, Inc.	12
 Septronics Inc.	27
Shaddix Company (The)	28
SIM/TECH FILTER, Inc.	27
Simple Solutions	29
 SJE Rhombus Controls	4
SludgeHammer Group Limited	26
Snyder Industries	7
 T&T Tools Inc.	19
 Tuf-Tite, Inc.	9
Water Cannon Inc.	29
 Wieser Concrete Products Inc.	14
Xerxes Corp.	12
Zoeller Pump Company	23

**To receive free product or service information** from advertisers in *Onsite Installer*, find the Reader Reply Number **999** appearing in each advertisement and circle it on the attached Reader Reply card in this issue.

**ONSITE installer**

Subscriptions are **FREE** to qualified industry professionals

To subscribe, return the attached Free Subscription card in this issue, visit [onsiteinstaller.com](http://onsiteinstaller.com), or call 800-257-7222.

## Innovative Wastewater Products

### BioSTEP

SCREENED PUMPING SYSTEMS

BioSTEP<sup>®</sup> screened pumping systems are versatile pump packages designed to transfer screened wastewater in numerous small-diameter, decentralized collection applications.

- Engineered for simple installation
- Filtered pump vaults and solids-handling pumps for redundant screening
- Exterior cleaning swab for clean-in-place maintenance
- An ideal, low-maintenance STEP package for clustered subdivisions

Visit us online for an animated look into the new BioSTEP<sup>®</sup> Screened Pumping System and our other wastewater products.



**Better Water. Better World.**

1-800-753-3278 • [www.biomicrobics.com](http://www.biomicrobics.com)

**BIO-MICROBICS**  
INCORPORATED

18



**New Products**  
**New Guidelines**  
**New Design Spreadsheet**  
**New and improved nano-ROOTGUARD<sup>®</sup>**  
**New BioDisc Filter with Geoshield<sup>™</sup> protection**

**77 GEOFLOW**

**SUBSURFACE DRIP**

*Established leaders of safe effluent dispersal*



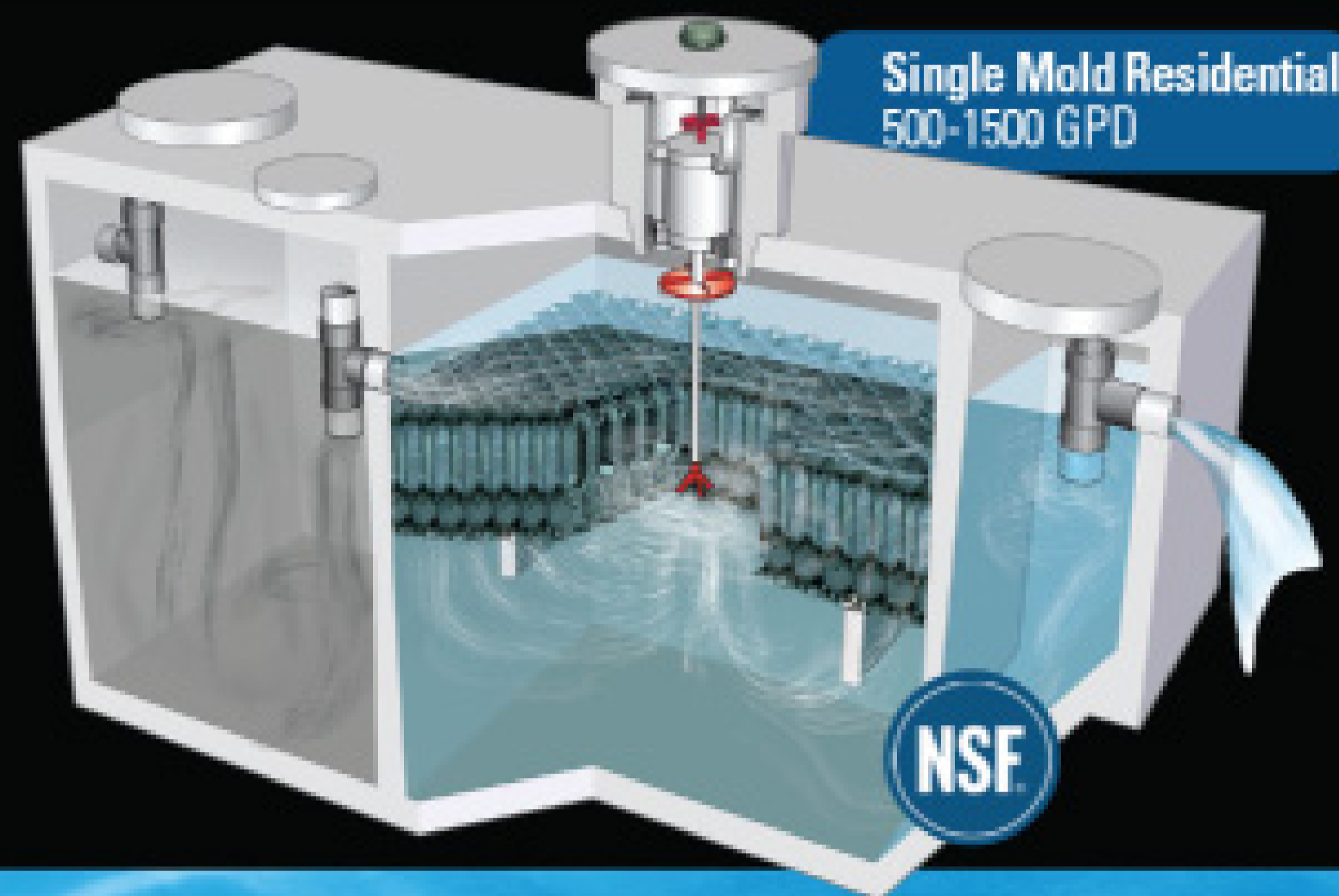
For a **FREE** copy of Geoflow's Drip Installation and Maintenance Guidelines contact GEOFLOW at 800-828-3388 or find it online at [www.geoflow.com](http://www.geoflow.com)



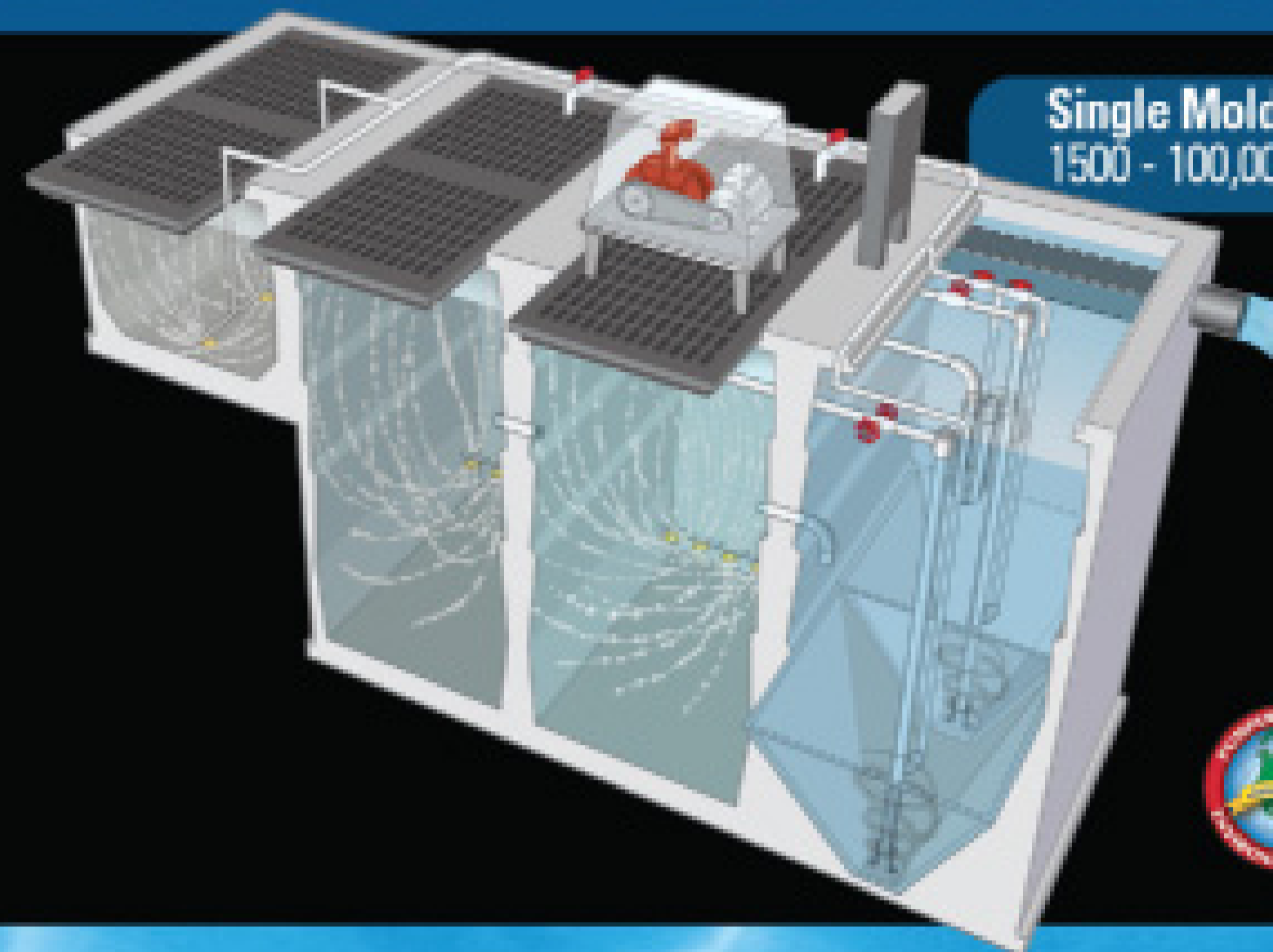
# SIMPLY Better™

Pioneers in Advanced Wastewater Treatment since 1955.™

Better For Precasting • Better For Installation • Better For Service



Single Mold Residential  
500-1500 GPD



Single Mold Commercial  
1500 - 100,000 GPD



Thanks for visiting us!

1-800-321-6960

[www.jetincorp.com](http://www.jetincorp.com)

[email@jetincorp.com](mailto:email@jetincorp.com)

109

# Peace of Mind

With Reliable On-Site Controls from SJE-Rhombus

For over 30 years, SJE-Rhombus has provided contractors, like yourself, with **reliable, trouble-free controls** for even your toughest on-site jobs. With easy-to-install products, exceptional customer service support and a three-year limited warranty, SJE-Rhombus offers you **peace of mind** for on-site installations.

The **PS Patrol™** pedestal system features a **built-in** high water alarm and provides a convenient location to connect all wiring for pump station applications. Cords are routed through a **weather-proof** post for protection from the elements. **PS Patrol™** is now available with factory-installed circuit breaker/terminal block option. **CSA Certified.**



**Installer Friendly Series™** control panels feature a **simple, easy-to-use touch pad** on the inner door for programming and monitoring pump and float operation. Simplex, duplex, demand, timed dose, capacitor start/run and drip irrigation models available! **UL/cUL Listed.**



## SJE-Rhombus

1-888-DIAL-SJE (1-888-342-5753) ■ [www.sjerrhombus.com](http://www.sjerrhombus.com)

41



New SJE-Rhombus  
Introductory Product  
Training CD-ROM!  
Call for your FREE copy  
or download it at  
[www.sjerrhombus.com](http://www.sjerrhombus.com)  
(high speed internet connection required)



# Pump It Up!

## Improve Wastewater Treatment

# ProSTEP™

## Effluent Pumping Systems

Orenco's ProSTEP™ Effluent Pumping Systems transport and filter septic tank effluent, protecting "downstream" components. And timed dosing improves drainfield performance. Fully integrated package ... no "parts and pieces." In-tank equipment is lightweight, comes preassembled, and installs neatly into most tanks, saving time and money. "Easy access" design simplifies O&M.

### Ideal for:

- Drainfields
- Effluent sewers
- Textile filters
- Sand filters
- Peat filters
- Trickling filters
- Mounds
- Aerobic units
- Wetlands
- Lagoons
- Effluent irrigation
- Other applications

### Typical system components:

- 1 Control Panel
- 2 Splice Box
- 3 Riser, Lid, and Accessories
- 4 Discharge Assembly
- 5 Level Control Float Assembly
- 6 Effluent Pump
- 7 Biotube® Pump Vault
- 8 Orenco® Fiberglass Tank



**Orenco Systems**  
Incorporated

*Changing the Way the  
World Does Wastewater®*

[www.orenco.com](http://www.orenco.com)

Call for brochure or nearest distributor • 800-348-9843

5

**Feedback**

Onsite Installer™ welcomes your comments, ideas and suggestions on how we can serve you better. Call 800/257-7222; fax 715/546-3786; e-mail to editor@onsiteinstaller.com.



## Just Boys Playing with Toys

Doing the work is fun; being the boss is tough. The approach of a new season is a good time to focus on becoming a developer of quality people.

By Ted J. Rulseh

A high school coach I knew used to greet his team for weekend practice by sniffing a basketball and saying, "There's nothing like the smell of leather on a Saturday morning." His players may not have agreed, but we all have favorite sensory experiences that we remember, or still appreciate.

For me, years ago, it was the scent of soil and last year's grass in early spring, the day my pals and I played our first after-school game of baseball, dodging remnant snow piles in the vacant lot behind the neighborhood tavern. Or maybe it was the aroma of black earth when I turned over the shovel in digging worms in the woods for the first bullhead fishing trip down at the river.

Maybe for you it has to do with earthy smells, too. There has to be something nice about getting back into the field after a long winter, pulling the backhoe off the trailer and taking that first scoop of soil. It's the scent of enterprise, of money, and of being able to do as a grown man, with full-size machines, what you did as a kid with toys in a sandbox.

(I know how much the attendees at last December's NOWRA Installer Academy enjoyed the Roe-D-Hoe competition.)

### Feeling free?

Maybe more than that, it's the scent of freedom. Sure, owning a business can be stressful. Sure, there are times it feels more like the business owns you. Sure, sometimes from the viewpoint of an

owner, a 9-to-5 job looks pretty good.

But hard work and long hours feel different when you're the owner. I don't think that's just because when you own there's a straight-line relationship between effort and reward (which most times isn't the case if you're an employee). It's because what you choose to do as a business is something you enjoy (or else why would you do it?).

Right now, if you live in a northern latitude, you're getting ready for another season. Maybe your off-season is a time when you slow down and enjoy life. If so, maybe it's a little difficult to contemplate another several months of long days in the saddle. Or maybe you've had your fun and you're glad to be busy again.

Whatever the case, now is a good time (a better time than January 1) to take stock and think of how you want the year and the future to look.

### The tough part

For many, the toughest part of running a business is working with the people. There are some who thrive on watching good people develop and grow into new responsibilities and better pay. And there are some who see managing people, with all their problems and petty issues, as a huge headache.

Most of us fall somewhere in the middle. In my own life as a supervisor, I am most ashamed of a bad hire I made — a young person who meant well but simply didn't have the skills to make it in the job

he was asked to do. He moved from another state to take the job; six months later we had to let him go. His failure was my fault, not his.

I am most proud of the next person I hired for the same job. Learning from my mistakes, I looked carefully for someone who clearly had the tools he needed. Then I nurtured and mentored him with care. I watched him progress up the ranks and ultimately into his own business.

You can probably recall successes and failures of your own. But where do you fall on the continuum between good boss and bad boss? Ben Simonton, author of *Leading People to be Highly Motivated and Committed*, offers a simple, 10-question test that lets you assess yourself.

### Take the test

For each question, rank yourself on a scale from 1 to 10, where 10 is the best or almost always, and 1 is the worst or almost never.

"Add up the points for each question," says Simonton. "If you score close to 100, I would expect that your employees will be over three times more productive than if your score was 30 or less. In addition, employees will unleash their full potential of creativity and innovation, love to come to work and have very high morale." Here is the test:

1. Do you provide regular and frequent opportunities for employees to voice complaints, suggestions and questions? Do you provide reasonable and timely responses, and give employees what they say they

need to do a better job?

2. Do you, at least weekly, elicit answers/responses from the team and get them to use their brainpower to solve problems?

3. Do you listen to employees with 100-percent attention, without distraction, without trying to figure out a response, and with the use of follow-up questions to obtain missing details and suggested fixes?

4. Do you refrain from giving orders, since by their nature they're demeaning and disrespectful and destroy innovation and commitment?

5. Do you treat members better in terms of humility, respect, timely and high-quality responses, forthrightness, trust, and admission of error, than they are expected to treat customers and each other publicly?

6. Do you recognize employees for their contributions and high performance and never take credit yourself?

7. Do you openly provide all company information to employees to the extent they need/desire?

8. Do you use values and high standards in order to explain why certain actions are better than others?

9. Do you use smiles and humor with subordinates, not frowns or a blank face?

10. Do you generate in employees a sense of ownership?

No little quiz like this is perfect, but perhaps this one gives you something to think about as you head into a new season. ■

*Snyder Industries offers the Broadest Range of Septic and Water Tanks on the Market - Making it easy to invest in the right tank, regardless of your application!*



# NUCONSEPT "PLUS"

Low Profile Septic Line



500, 750, 900, 1050, 1250, & 1500 Gallon Sizes.

Snyder offers a complete line of septic, cistern, and water tanks manufactured at multiple nation-wide plants capable of providing sufficient production capacity for even your largest jobs!



*Celebrating 50 years of producing "engineered" plastic tank solutions.*

602 Industrial Street • Marked Tree, Arkansas • 870-358-3400 • Fax: 870-358-3140

Corporate Offices: P.O. Box 4583 • Lincoln, Nebraska • 68504

Other manufacturing Locations: Lincoln, Nebraska • Philippi, West Virginia • Chowchilla, California • Mancelona, Michigan

[www.snydernet.com](http://www.snydernet.com)

# BORD NA MÓNA

ENVIRONMENTAL PRODUCTS U.S. INC.

INTRODUCING NEW PRODUCTS FOR COMMUNITY & COMMERCIAL APPLICATIONS

## Puraflo

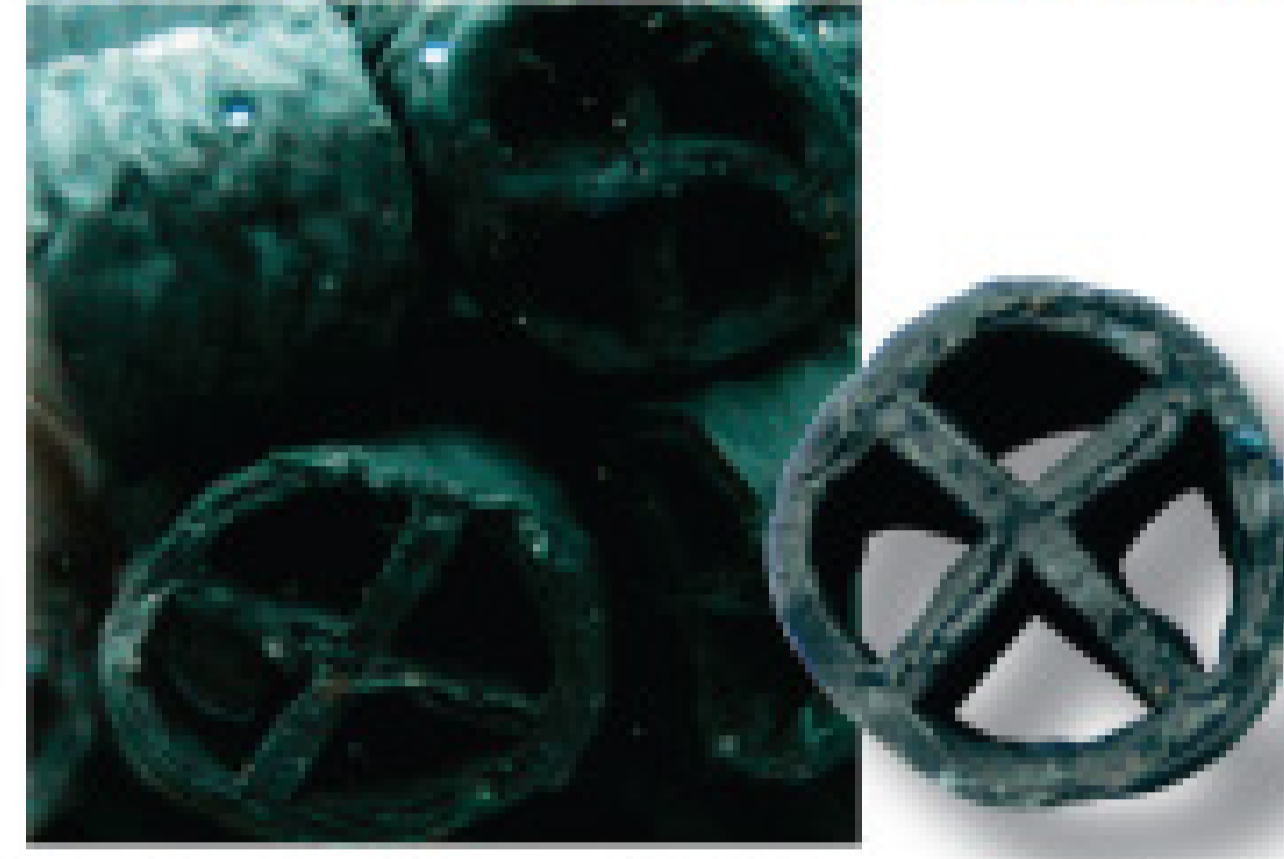
PEAT FIBRE BIOFILTER



- High quality effluent, guaranteed performance
- Minimal operating & maintenance costs
- Superior Solution for Difficult Soils, Shallow Water Tables, and Size Restrictive Sites
- Best solution for intermittent flows, including holiday homes
- Single house & community application

## PuraMAX

MOVING BED BIOLOGICAL REACTOR



- Specifically designed for the community & commercial sectors
- More compact & lower energy requirements than conventional activated sludge systems
- Simple reliable operation
- Suitable for high strength effluents
- Design flows from 1,000 gpd

## PuraM

MEMBRANE BIOREACTOR



- Specifically designed for the community & commercial sectors
- Compact footprint incorporating flat plate design
- Superior quality effluent
- Low operation & maintenance compared to other membrane systems
- Design flows from 5,000 gpd

P.O. Box 77457, GREENSBORO NC 27417 | TEL 1-800-PURAFLO | FAX 336.547.8559 | WEB: www.bnm-us.com

64

## Ecological Tanks, Inc.



Single and Multi Compartment Concrete or Fiberglass Aerobic Treatment Units

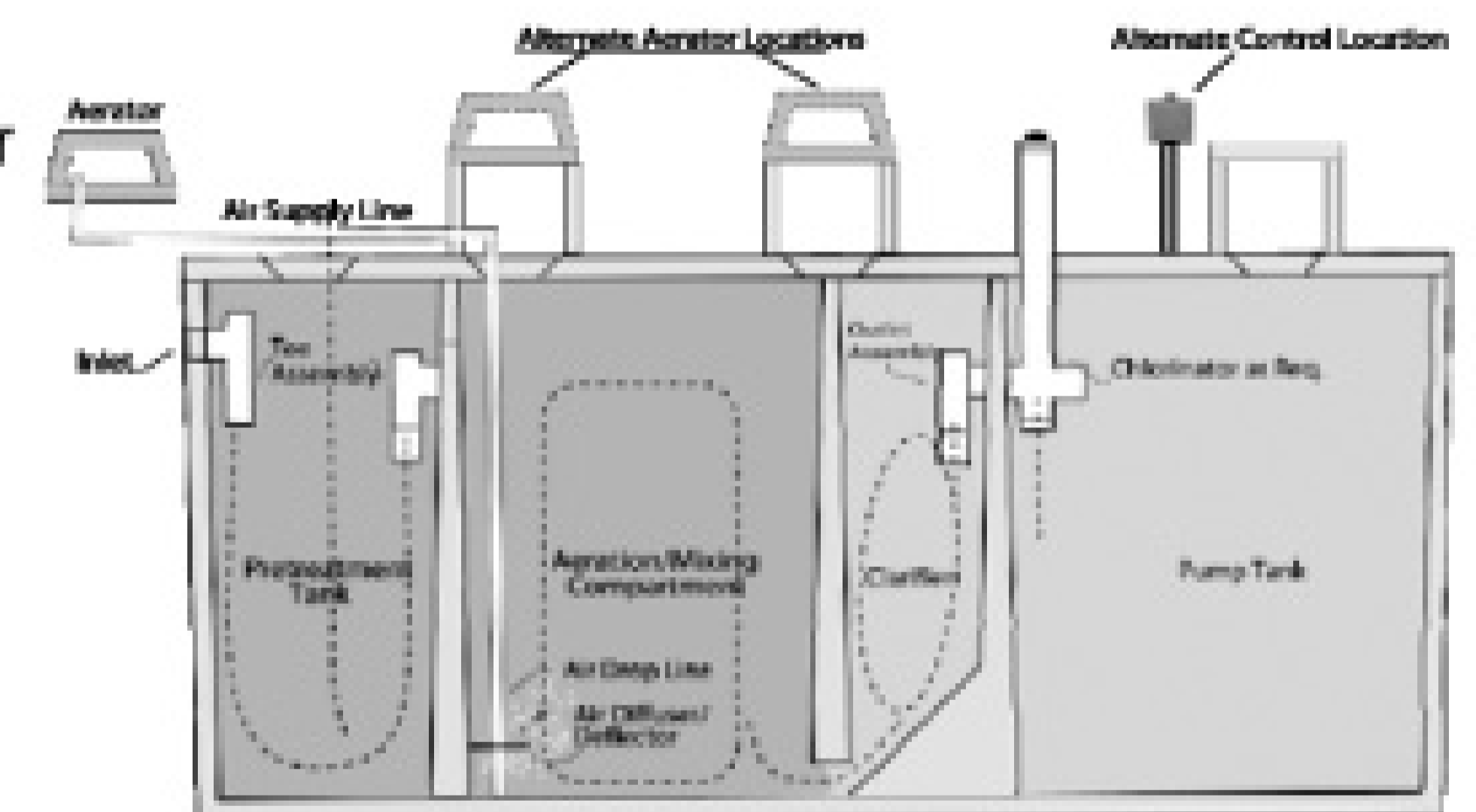
500 GPD -1500GPD

Over 50 different models to choose from

Custom Controls

Drip King® Pre Engineered Drip Systems

Short profile for easy installation



Aqua Aire AA500-4075 Patented

AQUA SAFE®

AQUA AIRE®



Thanks for visiting us!

Ecological Tanks, Inc. 2247 Hwy. 151 North  
Downsville, LA 71234 318-644-0397  
aquasafe@bayou.com www.etiaquasafe.com



14





# TUF-TITE®

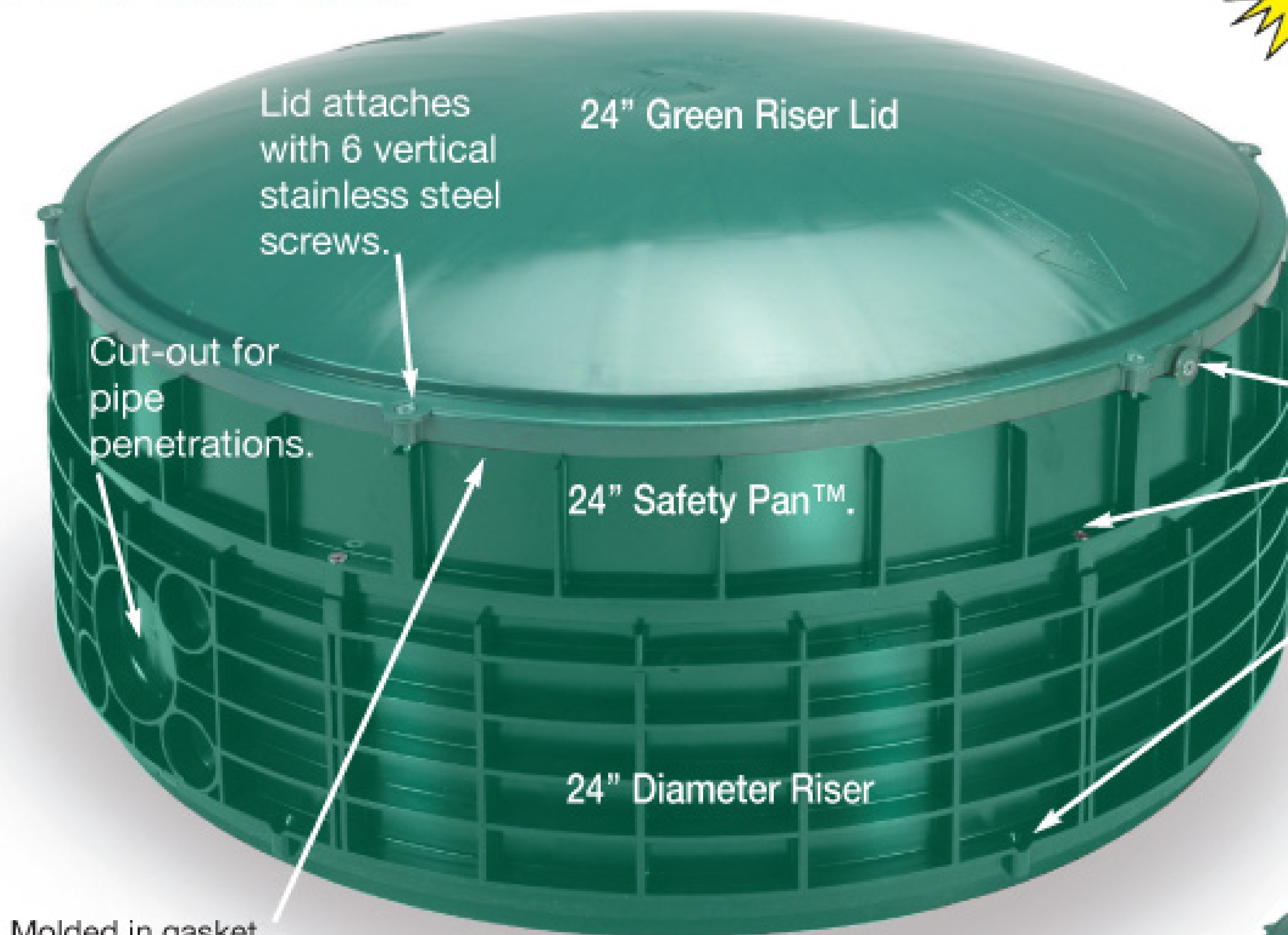


Thanks for visiting us!

For Samples & Pricing  
Call: 800-382-7009

## Septic Tank Riser, Lid & Safety Pan™

**FREE FREIGHT ON FULL CARTONS!**



Lid attaches with 6 vertical stainless steel screws.

24" Green Riser Lid

Cut-out for pipe penetrations.

24" Safety Pan™

24" Diameter Riser

Molded in gasket.

Available in 12", 16", 20" and 24" diameters.



### 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.

### Riser Lid

with Molded-in gasket.  
Available in 12", 16", 20" and 24" diameters.

Concrete Lid w/handle

### Safety Pan™

Safety Pan™ available in 16", 20" and 24" diameters.

### Riser

For septic tanks. Stackable in 6" increments. Available in 12", 16", 20" and 24" diameters.

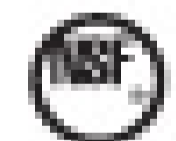
### Tank Adapter Ring

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  
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



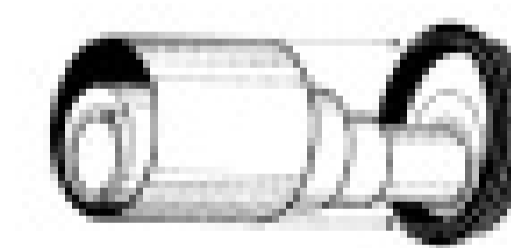
Gas/Solids  
Deflector

### One-Piece Tank Seal

For concrete Septic tanks and D-boxes.  
Accepts pipes from 1-1/2" to 4".  
Mounts with or without concrete flash.

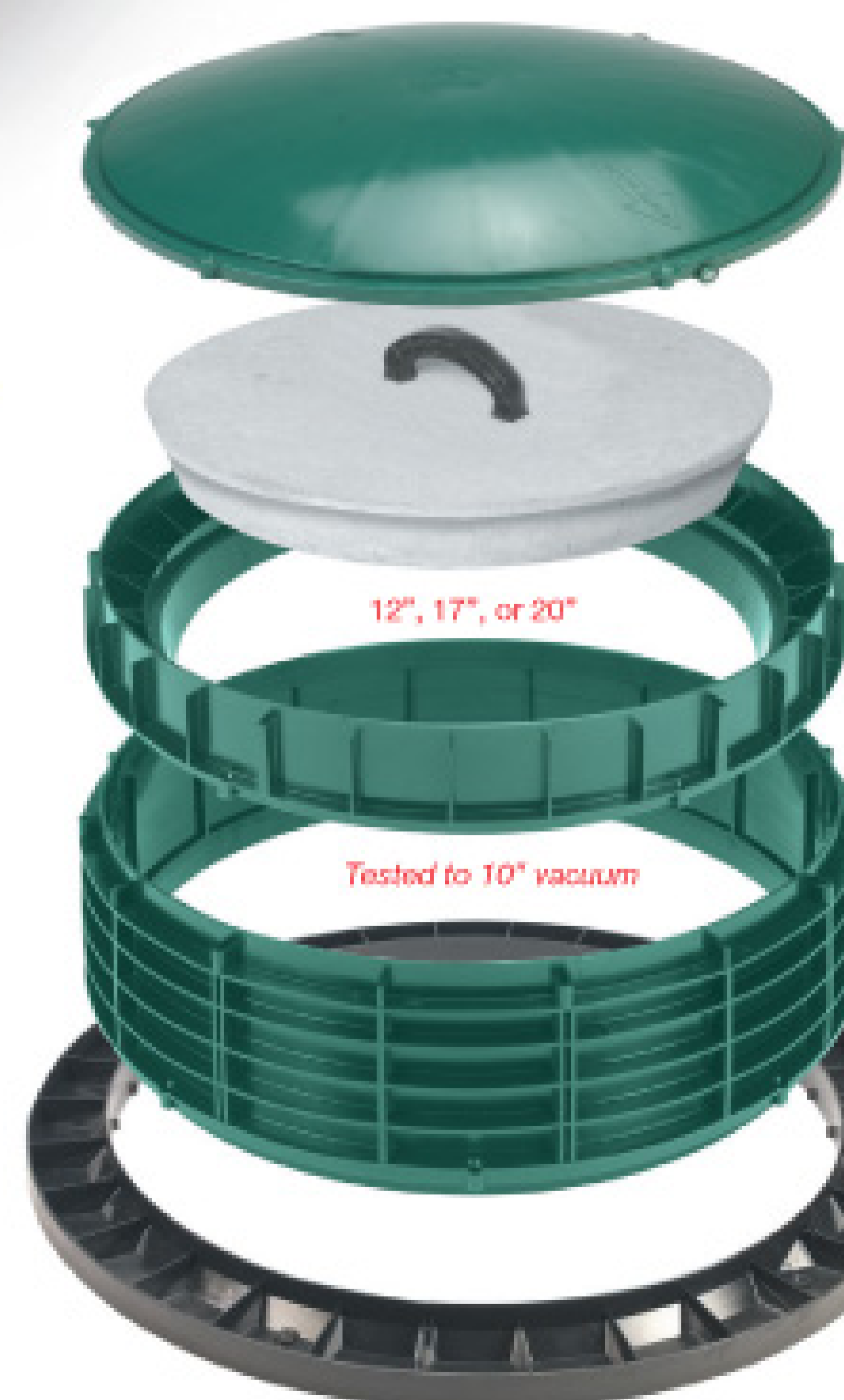


**TS-4-RUBBER TANK SEAL**  
(will hold 10psi)  
**TS-4PRO TANK SEAL**  
(will hold 5" vacuum)



Free Freight: 32c

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



12", 17", or 20"

Tested to 10" vacuum



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](mailto:ander045@umn.edu).

# Troubleshooting Pumps

Here are descriptions of some common pump trouble symptoms, along with simple actions you can take to restore proper functioning

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

Installers are often called to troubleshoot situations where someone installed a pump that does not appear to be working properly. These problems occur for a number of reasons, as often related to something the owner has done as to the pump itself having problems. Manufacturing standards for all pumps have risen in the recent past, which means you can expect high performance and long life.

The first step in troubleshooting is to understand what is happening at the site. Gaining access to the pump is the first step. If you installed the pump, this will be easy, because you will have made sure it is readily accessible. If a less

skilled competitor installed the pump, access can be a bit more time consuming.

The pump should be accessible and removable. Check the quick disconnect. If a fern co-coupling was used as the quick disconnect, this can be the root of the problem, as it may have become disconnected. Don't just replace the hose clamps. Be sure to replace with a quick disconnect designed for the pressure in the system. There are a number of really nice products that provide the quick disconnect capability.

## Run and check

The next step is to turn the pump on and see whether it is operating. Evaluating with your eyes and ears is an important part of finding the solution. Listen for the hum of operation and watch the effluent leave the tank. If the discharge pipe shakes and wobbles and there is no movement of effluent level, that signifies a problem.

Another useful tool is an amp/voltage meter. By checking the amperage draw on the pump, you can assess what is happening. For example, this step can identify whether there is a short in the system. If so, check all connections to see that they are in place and that there are no bare wires.

To use these tools, you need



In a quality pump installation, wiring runs through a conduit to a junction box mounted on a pole, away from dirt and moisture.

to 10 feet of head, or about 3 psi, so all that happens is that you get wet.

## Pump won't start

Suppose you operate the switch and the pump does not turn on. Evaluation now begins with the power source. Is the power turned on in the home? Has the power cord been cut in the yard? Are all the connections in good shape? The connections need to be watertight and protected for long-term performance; ideally the connections should be made outside the pump tank.

The next components to evaluate are the floats and controls. The floats must move freely if they are to function properly. Any number



This junction box was installed where water and soil could wash in. It has deteriorated severely.

of things can restrict float movement. Excessive FOG or other trash in the tank may be the culprit. At this point, you can use a sharp stick to knock the material off, then remove it from the tank.

The float can also become free-floating in the tank. Then the solution may be as simple as reattaching or repairing the weight for the float. The floats themselves also can wear out and require replacement. It is much easier to service the floats and verify that the controls are operating if you use a float tree to attach the controls.

If the controls are something other than floats, you need to verify the operation of those devices. One type of alternative to floats is pressure transducers, which operate with a change in pressure, typically in an airtight tube running from a sensor to a panel. Failure of this pressure tubing will cause the pump to fail. The usual remedy is to replace the tubing.

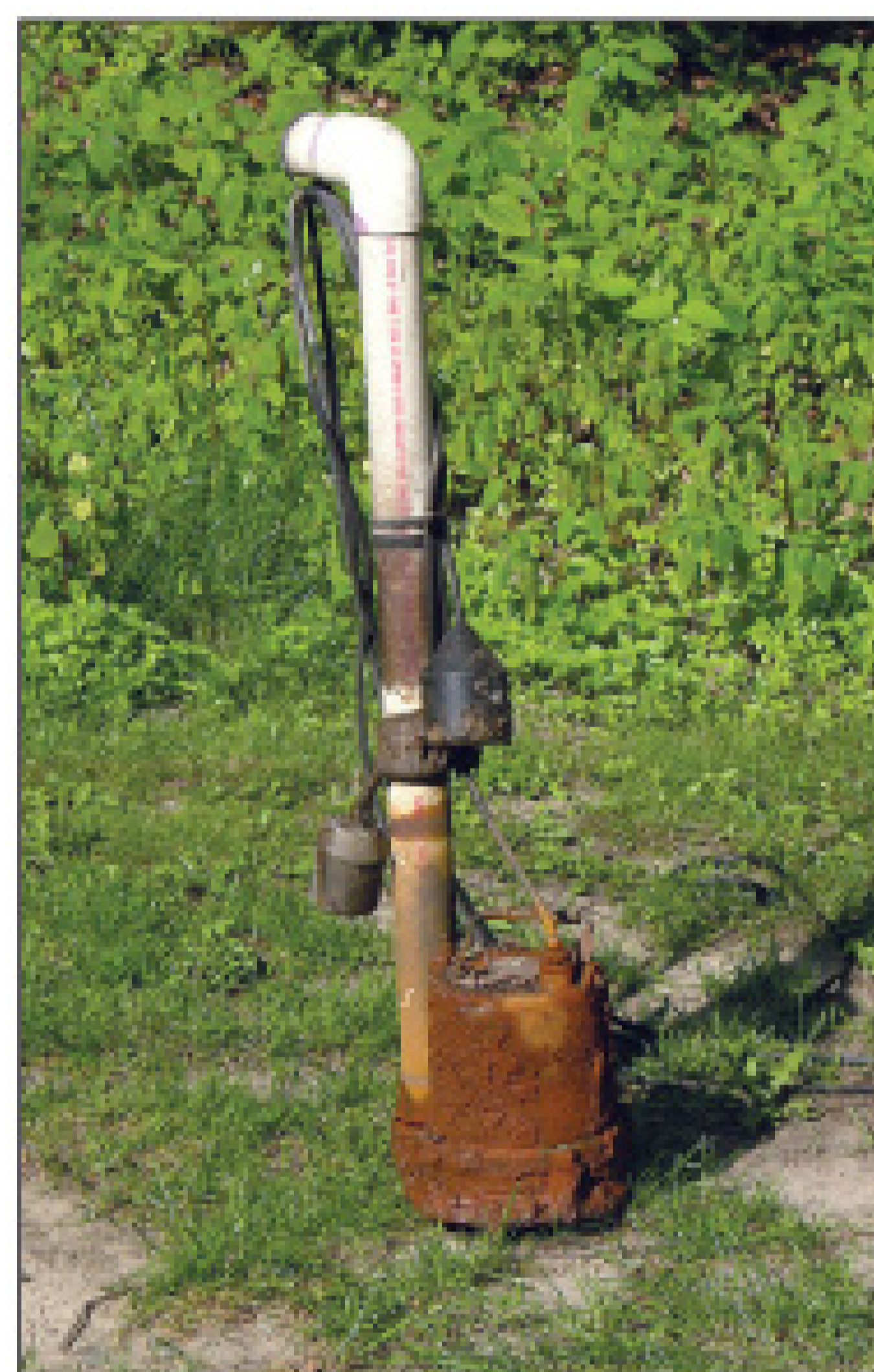
#### No water moves

If the pump sounds as if it is operating and the pipe vibrates, but the effluent levels do not change,

**The floats must move freely if they are to function properly. Any number of things can restrict float movement. Excessive FOG or other trash in the tank may be the culprit.**

another set of problems should be checked. The first is the proper voltage for the pump. Often, three-phase pumps are purchased for onsite systems, but the electrician ran two-phase power out to the pump. Check the pump label requirement and the wiring diagram to see whether this is the problem. If so, either the wiring or the pump needs to be replaced.

The next thing to check is whether the pump is sized properly — and in particular whether the minimum total dynamic head (TDH) requirement is met. It is



**This pump (shown after removal for servicing) uses floats mounted on the piping. A better approach is to mount floats on a float tree.**

important to understand that the TDH requirement can change with the seasons. In cold weather, the pump line can develop frost on the inside. This will reduce the diameter and increase the TDH requirement.

If there is enough of a change, the pump will not be able to push the effluent up the hill and out of the pipe. In some cases this will actually create a frozen system. After thawing the system it will work again, but over time the frost will return and again shut the system down. Be sure the discharge rate is at least 10 to 15 gpm in these pump-to-gravity systems to assure proper winter performance. In a pressure distribution system, the TDH requirement is set by the design flow.

In warm weather, a pump's inability to deliver sufficient head may be related to a failed check valve. All valves need to open and operate properly. In check valves, the problem may be related to air locking the valve.

A check valve needs to release air as the pump starts pushing effluent into the system. Many check valves have a small air release built in, but being small, these perforations can easily plug. Drilling a

1/4-inch perforation between the valve and the pump can minimize the potential for this problem.

The final concern here is that something is stuck in the pump. Feminine products and other bathroom trash items are common causes of this problem. Effluent screens can really benefit a system in this regard by keeping all trash in the septic tank.

#### Pump runs backwards

If the pump runs and everything (amps and voltage) checks out, but no effluent is leaving the tank, then the pump is wired improperly. The remedy is to have an electrician rewire the pump.

If the pump runs too frequently, this implies that the home has a leaking fixture, or that the tanks are not watertight. This problem is signaled by higher-than-normal electric bills and can be spotted by a resourceful O&M service provider

who has installed a cycle counter or running-time clock.

Failure of a check valve can also cause these symptoms. When checking for a failed check valve in the piping, watch the bottom of the tank after the pump has delivered a dose. If there is turbulence at the bottom of the tank, the check valve is allowing the system to empty into the tank.

If you observe this condition, but there is no check valve in the system, it is possible that the soil treatment system is not accepting effluent, and that the effluent therefore is draining back into the tank.

This information provides starting points for pump troubleshooting. For more information, check with your pump supplier or with the Sump and Sewage Pump Manufacturers Association ([www.sspma.org](http://www.sspma.org)). ■



**ALDERON Industries**  
Leading Edge Control Products



## NEW ONSITE EXPANDABLE POWER POST 4X

The **Power Post 4X** is a pump connection center used for septic systems. The base design provides safe connections for incoming pump power, alarm power, pump floats and alarm floats. Every **Power Post 4X** can be quickly designed or expanded in the field to accommodate local, state and federal codes.

- ✓ Field convertible 120 or 230 VAC
- ✓ Event Counter
- ✓ Clear cover for easy viewing
- ✓ Circuit breakers

### NEW CHECK IT™ SERIES SIMPLEX AND DUPLEX CONTROL PANELS



**LOOK** MORE NEW ALDERON PRODUCTS IN NEXT MONTH'S ONSITE INSTALLER !!!

Alderon Industries - [www.alderonind.com](http://www.alderonind.com) - 218-483-3034

- ✓ Check It™ One Button troubleshooting
- ✓ Contactors rated for 2 million electrical cycles





# Serious About Watertight Tanks?

When it comes to wastewater tanks, watertight design is gaining a lot of attention. The benefits of installing a watertight tank are numerous, and, with changing regulations; it's often mandatory. So, if you're serious about watertight tanks, consider what Xerxes fiberglass wastewater tanks have to offer:

- ❑ **One-piece construction** - no field installation of components requiring seams/seals to complete the tank.
- ❑ **Factory manufactured** - no need to form and fabricate a tank in place with unpredictable weather conditions, field crews and completion dates.
- ❑ **Proven track record** - Xerxes tanks have been used for nearly three decades for storage of petroleum products where watertight is the only design standard that is acceptable.
- ❑ **Strong design** - standard tanks are designed for burial depth to 7 feet, water table to grade **AND** an H-20 load rating.



So, if watertight design and ease of installation is important, consider Xerxes fiberglass tanks for your next project. Prices are competitive, even with tanks offering far less.

[www.xerxescorp.com](http://www.xerxescorp.com) • (952) 887-1890 phone • (952) 887-1882 fax

101

**XERXES**<sup>®</sup>  
CORPORATION

## LIBERTY PUMPS



Omnivore LSG 200  
Residential Grinder

We Carry a Full  
Line of  
**LIBERTY  
PUMPS**  
which come  
with a **2-year  
warranty**



280-Series Mid-Range  
Effluent Pump



Thanks For Visiting Us in Louisville!



**MEDO  
Piston**

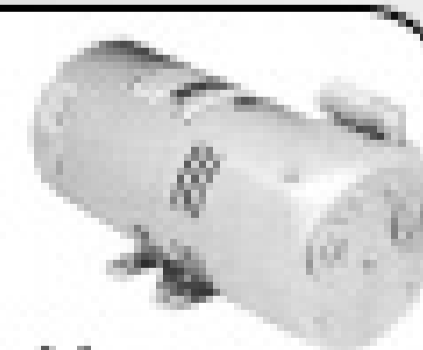
LA-60B \$275  
LA-80B \$300  
LA-100B \$445

### SECOH Diaphragm



EL 60 \$255  
EL 80 \$300

### 0523



Rotary Vane  
Compressor  
\$310

Regenair<sup>®</sup> **VEGAST**  
R3105-12  
Blower  
\$410



**Sutorbilt & Roots**  
Blowers



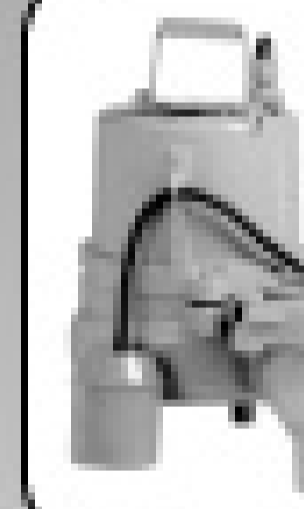
Heavy-Duty  
**DC-STAINLESS**  
Washdown Pump



**Moro M3**  
176 cfm



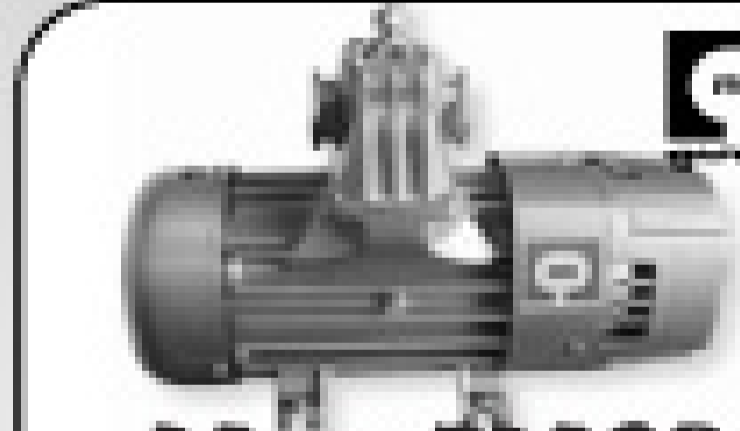
Hydromatic,  
Zoeller, ABS,  
Liberty &  
Myers  
Pumps



**SDS**  
From 70-180 cfm



**Moro PM80  
Turbo 350 cfm**



**Moro  
M-10  
230 cfm**



**Moro Pumps:** from 176 to 1642 cfm

## Flagg-Air Model 340

\$325

- 3450 rpm
- 1/4 hp, 115V
- Enclosed motor
- Stainless steel shaft
- High impact plastic parts
- Operates quietly
- 2-yr. warranty
- Fits in place of most original manufacturers' units
- Replacement parts available

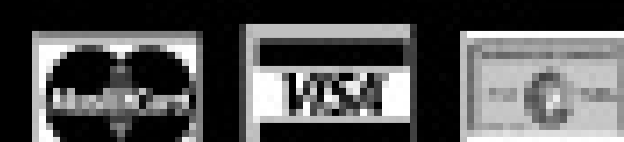


The Flagg-Air 340 does not carry the NSF seal. Check local and state regulations for approval in your area.



**Septic Services, Inc.**

toll free 1.800.536.5564 • 636.583.5564 • fax 636.583.6432  
e-mail [septic@fidnet.com](mailto:septic@fidnet.com) • web [www.septicserv.com](http://www.septicserv.com)



23



# HOOT SYSTEMS, LLC.

[www.hootsystems.com](http://www.hootsystems.com)



Thanks for visiting us!



Certified to NSF/ANSI Standard 245



Certified to NSF/ANSI Standard 40



Onsite Monitoring Ready

## Total Nitrogen Below 10 mg/L, No Matter the Influent Strength?

Now that the manufacturing community has begun to embrace On-Site Nitrogen Reduction, Hoot would like to educate you on what they have done.

In 1999, Hoot began their Nitrogen Reduction work in response to regulatory concerns they identified in Florida. There was a "Key's Standard" that was being largely ignored.

Since then, no less than 10 companies have tried to enter that market, some with as few as 6 samples to "Justify" system performance to below 10 mg/L TN, the level determined necessary to protect the critical springs area's.

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."

Hoot set out to prove that cost effective Nitrogen Reduction could be achieved, and the technology made available at a price that people could afford.

### WASTEWATER TECHNOLOGY

NSF/ANSI Standard 245 - Nitrogen Reduction Wastewater Treatment Systems

Final Report

Hoot Aesthetic Systems  
Hoot ANR-400 Wastewater Treatment System  
00000015000



NSF International  
791 N. Dixboro Road  
PO Box 130440  
Ann Arbor, Michigan 48111-0440 USA

In 2006, Hoot began 3rd Party NSF testing to "Prove" what was previously discovered through research. Cost effective, efficient Nitrogen Reduction to below 10 mg/L can be achieved.

As result the first (and only) system certified below 10 mg/L was born.

The Hoot-ANR is just one of a series of three treatment systems by Hoot that perform <10 CBOD<sub>5</sub> & <10 TSS at the lab and in the field. Additionally, Hoot offers two Nitrogen Reduction Technol-

ogies; one utilizing timed recirculation and another that achieves the maximum Nitrogen Reduction, for the most sensitive environments, that reduces Total Nitrogen as far as possible (5.8 mg/L under the Standard 245).

The Hoot-ANR utilizes a "patent pending" process that adds a food grade additive to provide additional carbon necessary to off gas as much Nitrogen as possible. This process is controlled by a controller, not homeowners.

By monitoring flow through the system, it ensures flow proportional dosing to provide reliable performance. Additional set points can be selected by the maintenance provider for a range of influent from of 35 to 75 mg/L TN.

Some recently advertised studies, NOT certifications, have allowed for system performance to be ignored for the first 16 weeks of the study. The NSF Standard 245 allows a maximum of only a 3 week startup. At the end of week 4, the Hoot-ANR achieved a 92% reduction. (2.7 mg/L TN)

When the environment demands this level of treatment and performance, Think Hoot.

If you need this level of performance now, Hoot is looking for local precasters and installers to cover the country.

**Hoot Systems, Working Today To<sup>TM</sup>  
Protect Tomorrow's Environment.**

*"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.*

# New California Rules on Track

By Doug Day

California continues to move toward implementation of the long-delayed onsite wastewater rules. The regulations are driven by Assembly Bill 885, passed in 2000 to establish a process for developing standard, statewide performance standards for onsite systems.

The original deadline for the regulations was Jan. 1, 2004. Budget cuts and controversy have delayed the work. The State Water Resources Control Board published the following schedule leading up to full

implementation in November 2008.

- Dec. 1-Feb. 15: Draft responses to public comments.
- Feb. 15-April 1: Final comment period followed by adoption.
- April 1-May 1: Record review by Office of Administrative Law.
- May 1: Rule becomes effective.
- November: Implementation.

## Alabama

The Alabama Onsite Wastewater Board has adopted changes to onsite treatment regulations. The changes include record-keeping

requirements affecting both tank manufacturers and pumping contractors. A copy of the new regulations is available from the Bureau of Environmental Services at 334/206-5373.

There has also been a change in the licensing requirement for septic tank manufacturers, installers, and maintenance companies that allows them to meet the licensing requirements by hiring a licensed subcontractor. A copy of those new rules is available by calling 888/737-2162.

## Florida

The Department of Environmental Protection's updated fee structure took effect in September. The largest increase is for an applicant to use an "innovative product." That fee increased from \$500 to \$2,500.

"Innovative system" means an onsite sewage treatment and disposal system that, in whole or in part, employs materials, devices, or techniques that are novel or unique and that have not been successfully field-tested under sound scientific and engineering principles under climatic and soil conditions found in Florida.

The application fee for a plan review or construction permit for a new system increased from \$50 to \$100, while the cost for an amendment to an operating permit was reduced from \$75 to \$50. The cost of variances increased from \$150 to \$200 for single-family homes, and from \$200 to \$300 for multi-family and commercial buildings.

## Illinois

The state Department of Public Works is proposing changes to the rules governing maintenance and

inspection of private sewage disposal systems. The new rules were published in November for public comment and can be found at [www.idph.state.il.us/rulesregs/proposedrules.htm](http://www.idph.state.il.us/rulesregs/proposedrules.htm).

The changes affect many sections of the regulations, including requiring suitable soils for subsurface seepage systems and clarifying the department's ability to approve technology tested by other government agencies. The rules update the requirements for contractors, spell out consequences for failing to attend examinations, and address many design criteria such as the sizing of chambers, sample ports, and reduction trenches.

## Minnesota

The Minnesota Pollution Control Agency has published final language for new rules governing subsurface sewage treatment systems (SSTS). The rules were scheduled to take effect on Feb. 19. The changes can be seen on the agency's web site at [www.pca.state.mn.us/programs/ists/index.html](http://www.pca.state.mn.us/programs/ists/index.html).

In addition, the state has formed an SSTS Licensing Stakeholder Task Force to develop clear guidelines for licensing qualifications. The state legislature called for the task force to report back by Feb. 15.

The group is looking at "professional qualifications and appropriate licensure for design, inspection, and operation and maintenance of sewage treatment systems less than 10,000 gallons of waste water flow per day," according to the group's Scope Statement. More information is available at [www.pca.state.mn.us/programs/ists/news.html](http://www.pca.state.mn.us/programs/ists/news.html). ■

**LARGE  
PRECAST  
TANKS  
TO 40,000  
GALLONS**



- ◆ Septic, Grease Interceptors, Holding Tanks
- ◆ Available in Sizes 750 to 40,000 Gallon
- ◆ Extra Heavy Duty Tanks—HS20 Loading
- ◆ Bituminous Coating, Fast, Efficient Setting
- ◆ Vacuum Tested, Water Tight Structures
- ◆ Tanks for Bio-Microbics and Nibblers, Sand Filters
- ◆ Nationwide Delivery • Custom Sizes for Any Project

**WIESER**

CONCRETE PRODUCTS, INC.

Website: [www.wieserconcrete.com](http://www.wieserconcrete.com)

**1-800-325-8456**





## ◀◀◀ **Rewind**

Looking at diaphragm blowers is like taking a trip back in time, while Medo's LA wastewater blowers take you into the future today. Here's how:

1) ***We run quieter. Your customers will like that.***

Medo's aerators have about as much ambient noise as a light ballast. Listened to a diaphragm pump lately? For indoor applications, Medo blowers are sweet music to your customers' ears.

2) ***We consume less energy. Your customers will really like that.***

In an era where energy costs continue to rise dramatically, Medo aerators have 50-60% of the line current requirements of diaphragm pumps—just one of the ways Medo helps drive down total costs of system ownership.

3) ***We last longer, especially in hot, humid climates. You'll like that.***

Medo's unique linear free piston design has one moving part per piston—one. In properly installed and maintained wastewater systems, Medo piston aerators have an expected service life of 6+ years.

## **Fast Forward** ▶▶▶

### **Take A Peek Into the Future - Today!**

A closer look within the Medo die cast aluminum housing reveals a pair of specially Teflon® treated pistons with extruded, hardened, and honed cylinders driven by highly efficient coils. Conventional diaphragm aerator designs can generate damaging waste heat. The Medo unified, heat sinking aluminum construction enables a greater, quieter operating aerator life, year after year after year.

So the next time you're specifying an aerator for your wastewater system design, demand five star performance. Call us today for a firsthand look at how the value adds up. The future is here, and you should be part of it.



Better Design. Better Manufacturing. *Better Value.*

**1-800-843-6336**

FAX: 630-924-0808 • e-mail: [inquiry@medousa.com](mailto:inquiry@medousa.com)

University of Missouri soil scientist Dr. Randy Miles inspects low-pressure pipe distribution demonstrator equipment at the university's Field Training Site. (Photography by Ernie Gutierrez)

# Reading the Landscape

University of Missouri soil scientist Randy Miles puts his earthy knowledge to work for the benefit of onsite wastewater treatment

By Gil Longwell

**Randall (Randy) Miles, Ph.D.,**  
Soil Scientist and Associate Professor of Soil Science, University of Missouri, School of Natural Resources

**SPECIALTIES:** Soil morphology and landscape evaluation applied to onsite systems

**YEARS IN PROFESSION:** 38

**EDUCATION:** Bachelor and master's degrees in agronomy; doctorate in soil science, all from Texas A&M University

**AFFILIATIONS:** NOWRA, Missouri Smallflows Organization, Consortium of Institutes for Decentralized Wastewater Treatment, numerous soil science and related societies



Soil always interested Randy Miles, who grew up on a farm in central western Indiana. It was a diverse farm. "We grew a wide variety of crops, and what we grew sustained the various animals we raised, and it all sustained our family," Miles recalls.

Living on the land that his family farmed, he became attuned to what soils had to say to him. The experience led him to study agronomy, which is the management of crops and soils. Over the years, he came to appreciate soil not just for its ability to grow food but for its capacity to accept and treat our wastewater.

He now dedicates much of his time to advancing the onsite profession by conveying to industry professionals the importance of soil to the proper design and functioning of onsite treatment systems.

"Soil is not dirt, but dirt is soil," Miles says. "4-H kids learn that early on, and so do those that constantly work with earth's thin skin." Miles has bachelor and mas-

ter's degrees in agronomy, and a doctorate in soil science, all from Texas A&M University.

He is now a soil scientist and associate professor of soil science at the University of Missouri, School of Natural Resources, in Columbia, Mo. His areas of interest, and his influence, go far beyond the campus and even beyond state lines. His participation in the Consortium of Institutes for Decentralized Wastewater Treatment brings him into contact with onsite educators from across the nation and around the world.

## More than roots

While it may seem a long stride from agronomy to onsite systems, Miles says that's not really the case. "The same soil characteristics that affect crop growth — texture, structure, composition and permeability — also affect the way effluent released from onsite systems will interact with the soil environment," he says.

In the late 1980s, with a research

**"It is the process of fixing systems one by one that is a kind of laboratory for refining field techniques that, when validated, can also become part of every installer's tool kit."**

— Randy Miles

grant to fund his work, he went to the Lake of the Ozarks in Missouri to study zones of saturation and the movement of water on and in the soil. "While we were there, we saw a large number of small lots where the onsite systems were malfunctioning," he recalls.

Those observations led him to a hypothesis that the way the soil responded to water from natural sources would be mimicked by the manner in which it responded to effluent generated by people. "Sure enough, the soil did not care where the water was coming from, it reacted the same way," he says.



Dr. Miles uses Norweco aerator treatment units to demonstrate the many ways to treat wastewater.



“To the soil, water is water.”

Miles views that project as a turning point in his career. Since that study, his work and interests have been directed to onsite systems and the soil that sustains them. Miles believes there are three reasons that academia is interested in onsite systems.

### In the field

First, the field (people’s yards) provides an opportunity for the real-world application of the lessons learned through scientific study. The process of taking research results out to the community is, in large part, the heritage and role of land grant institutions like MU, and Miles feels comfortable with and connected to that tradition.

Second, “the opportunity to first

fix problems and then, on undeveloped sites, to avoid duplicating those same problems, appeals to me and to many in academia,” Miles says. The roles of troubleshooter and problem avoider are rooted in the research findings. “It is the process of fixing systems one by one that is a kind of laboratory for refining field techniques that, when validated, can also become part of every installer’s tool kit,” Miles predicts.

Third, the linkage and, to some extent, the redirection of soil science to onsite treatment opens new horizons for those in the profession. Typically, it was the engineers who designed the perc test and determined appropriate vertical isolation distances and square footage requirements for absorption areas.

## Navigating Politics

Soil is so common that it is easily taken for granted. But taking the soil for granted — assuming that it will always perform as we want it to perform — is the biggest cause of our disappointment when it behaves not as we want, but as it must. “Translating this message into the realities of the political landscape is most taxing, and the reality is that not all science will find its way into regulations.”

Miles and the Onsite Sewage Task Force were unable to keep a permit exemption for sites of greater than three acres out of the regulations. “This is the

worst example of a failure of science to influence the regulations,” according to Miles. “The good news is that counties can, and most have, sewn that loophole shut!”

Karen Mand, an environmental scientist colleague from Ohio State University, likes to say, “Science changes at state lines.”

“Of course, science does not change like that,” assures Miles, “however, it’s that political landscape that affects how the same science may be applied in different ways across state lines!”



Soil profiles help Miles explain the intricacies of soils to students at a University of Missouri soil lab.

But soil scientists are now being called upon to apply their skills to issues from regulation writing to site evaluation, design review and approval.

“With more fields of specialty ready for the agronomist’s auger, it is becoming easier to recruit candidates to the soil science curriculum,” Miles says. “In some measure, job creation is dependent on a vibrant new crop of candidates each year.”

### A popular accessory

Miles sees soil science as an ever-more-attractive “accessory pur-

suit for students in planning, engineering, architecture, and similar curriculums. It adds a desirable depth of knowledge to supplement these other interests.” He sees that supportive role as good for the profession, as well.

Research brings one set of practical challenges. Incorporating the results into practical application entails an entirely different set of challenges. “Researchers must be skilled in reading and understanding a second and somewhat ephemeral landscape — the political landscape,” Miles says.

For Miles, the first step into this brave new world was to introduce the concepts of soil science to onsite regulators in the Missouri Department of Health and Senior Services. One clear result was that regulators saw a need to rewrite the rules to bring more soil science into play.

Miles chaired an 18-member Onsite Sewage Taskforce that included installers, builders, Realtors and others with interests in all aspects of onsite management. The committee, formed in 1992, took four years to get its first set of regulations adopted.

### Starting at the end

The group focused on the receiving environment (the soil) to determine how much pretreatment would be needed for specific sites. “Some folks thought we were starting the discussion at the wrong end

of the system," Miles chuckles. "But we wanted to base our standards on a soil's structure, texture, permeability and redoximorphic characteristics. Other influences were the site's slope and its position on the landscape.

"We wanted to assure that the soil could adequately complete the renovation process and that the system was sized so that whatever volume of liquid was released could indeed be received by and dispersed into the soil."

Still working "backwards," the committee created sizing tables that set forth the minimum square footage for various soils to accommodate various daily flows. Next, they set minimum isolation distances (also called vertical separation distances) for various soil absorption technologies.

While mounds can be permitted, site conditions are such that they are not seen in all areas. For mounds, the regulations specify minimum material depths and minimum soil depths. Drip irrigation lines are constrained by a maximum 6 to 8 inches below the surface and a minimum of 12-inch separation above restrictive soil layers or adverse features. Traditional subsurface gravel bed or trench bottoms must be at least two feet above these features, while the maximum excavation depth is 30 inches.

The drip parameters emerged from the second round of the National Onsite Demonstration Project (NODP II). "Also emerging from that study is the hypothesis that more frequent dosing helps to keep drip lines from freezing during the cold winters of the heartland," Miles says.

**Right, Dr. Miles displays various gravelless soil distribution technologies used in the onsite industry. Below, he shows a sequencing valve demonstration site.**



a development, I like to walk around and listen to the site," he says. "There is much to learn by listening to and reading the site. It's all in front of you, if you just listen and look.

"Asking some basic questions helps get the conversation started. Where is the water moving? Where are the high and low spots? What is the three-dimensional geometry telling you? What vegetation clues are there? These are just the beginning."

**"I like to walk around and listen to the site. There is much to learn by listening to and reading the site. It's all in front of you, if you just listen and look."**

— Randy Miles

#### **Listening to the site**

Miles enjoys putting his skills to work in the field. "When I get to

keep as much ground cover intact as possible. He cautions against compacting upslope and downslope areas — and especially the absorption area itself.

To test soil moisture, Miles advises using a shovel to dig a small hole and look for soil smearing. If smearing is present, it's necessary to wait a day or two, then test the site again. "Do not guess the soil moisture level — check it!" Miles says. Among his other basic soil-protective recommendations:

- Select the materials stockpile sites and the spoil storage sites carefully.
- Segregate excavated material into distinct piles — vegetative layer material, topsoil, subsoil.
- Use the best soil for the final cover and the least desirable for noncritical uses.
- Always plan the equipment travel routes to protect the site's most critical areas. Avoid needless equipment movements, as irreversible soil compaction occurs quickly.

"Eighty percent of the final compaction occurs the first three times a machine traverses the same travel route," Miles says. And he can show you research to prove it.

#### **In it together**

"Soil science is becoming an ever-more accepted partner on the onsite team," Miles observes. "Site evaluation, system design and installation are not separate tasks done by disconnected professionals.

In Miles' view, the more we learn about the natural environment, the more we realize that everything is connected to everything else. Finding a site for an onsite system, then designing, installing and successfully operating it, must be a collaborative effort. Soil scientists are expanding the horizons of regulators, designers, installers and homeowners, and that is good for all involved.

"Soil scientists have been invited to the dance, and we want all our partners to shine," Miles says. "We are all in this together." ■

Most homeowners looking at a lot will first pick the building site. Miles prefers to pick the site most appropriate for the absorption area. After protecting its upslope and downslope areas, he works with what is left for the house, drive, and any outbuildings.

"A great site can be instantly ruined when construction activities commence during too-wet soil conditions," he says. "Installers need to accept and work with nature. Postponing construction until a site dries out can avoid one or more call-backs, and may even save the entire absorption area."

He advises installers to first, divert upslope surface water, then



## **Sample Drainfields Quickly and Accurately!**

**Our lightweight & Portable JMC Backsaver Handle:**

- Gathers soil samples down to 4 feet
- Allows quick visual inspection of soil mottling & particle size
- Reveals drainfield composition in minutes
- Eliminates guesswork & minimizes property disturbance
- Improves accuracy of septic system inspections
- SAVES YOU TIME!!

**ORDER PRODUCTS ONLINE @ [www.jmcsoil.com](http://www.jmcsoil.com)**

**Clements Associates Inc.** • 1992 Hunter Avenue • Newton, IA 50208  
Phone: 641-792-8285 • Fax: 641-792-1361 • [jmcsoil@jmcsoil.com](mailto:jmcsoil@jmcsoil.com)

46

**T&T TOOLS**

**T&T TOOLS, Inc.**

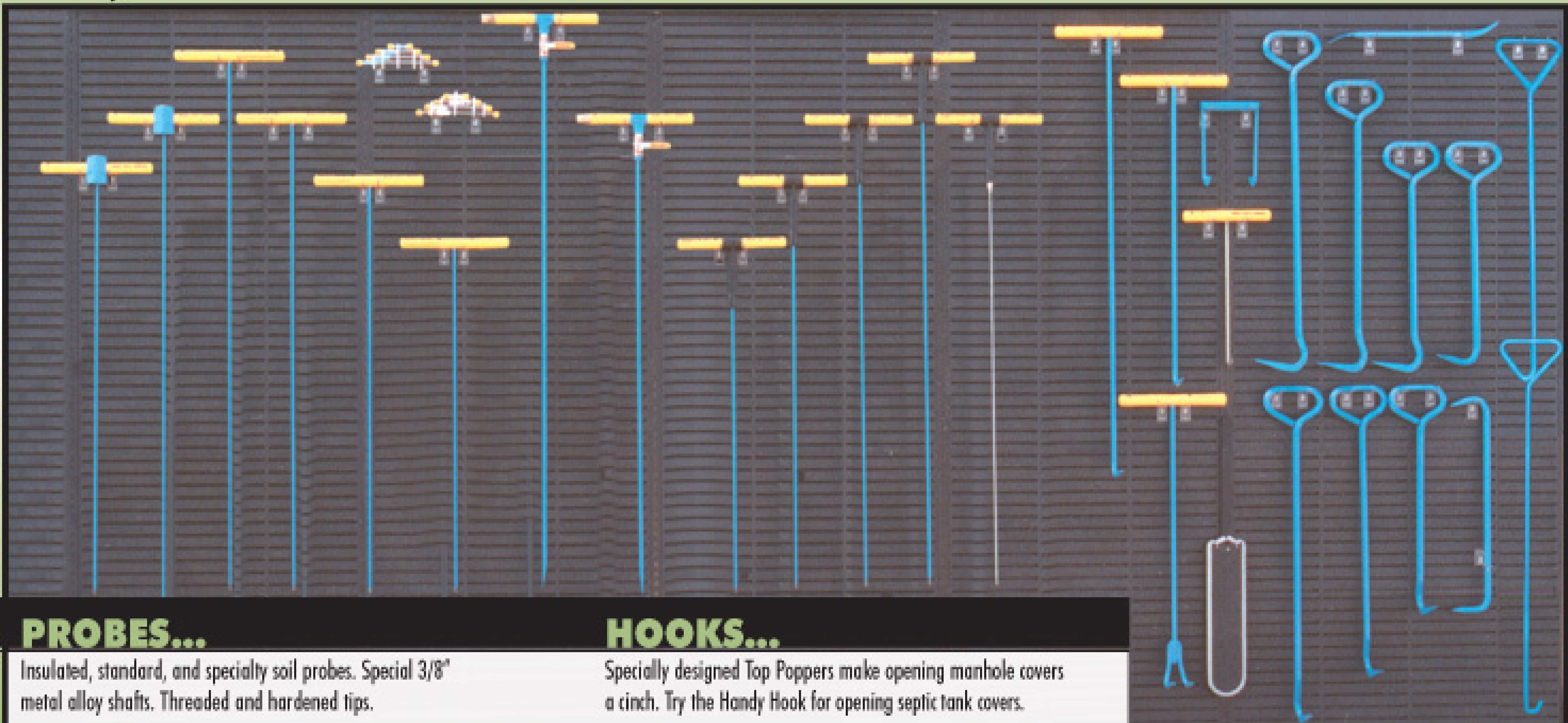
FAX: 800.521.3260 | EMAIL: sales@TandTtools.com

**800.521.6893**

[www.TandTtools.com](http://www.TandTtools.com)

CALL FOR A FREE CATALOG!

CALL FOR A FREE CATALOG!



**PROBES...**

Insulated, standard, and specialty soil probes. Special 3/8" metal alloy shafts. Threaded and hardened tips.

**HOOKS...**

Specially designed Top Poppers make opening manhole covers a cinch. Try the Handy Hook for opening septic tank covers.

24

Advertisement for EZflow drainage systems. A man in a grey polo shirt and blue cap stands in a trench lined with blue foam insulation. The word "EZ" is in a circle in the top right. Large white text reads "FLEXIBILITY" and "Install with Confidence. Install Blue."

# FLEXIBILITY

Install with Confidence. Install Blue.

EZ



Thanks for visiting us!

Whether you're an installer or a Regulator, **EZflow** is a name you can trust. **EZflow** is engineered to make your job and your life easier. So it's no wonder we have established a benchmark of performance, ease of installation, and value in the drainfield industry. **Flexibility** **EZ** does it. For more information about **EZflow** drainage systems, call 800-649-0253 or go to RingIndustrial.com.

22

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](mailto:editor@onsiteinstaller.com).

# Special Care

If you know how and why hydrostatic transmissions can fail, you'll be better prepared to take the right maintenance steps and prevent costly breakdowns

By Greg Northcutt

**T**he hydrostatic transmissions that power construction and maintenance equipment from ride-on lawn mowers and walk-behind loaders to skid-steer loaders and dozers are marvels of engineering design and operating efficiency.

Using pressurized hydraulic fluid rather than gears, clutches, disks and drive shafts to harness power from the engine for propulsion, they pack big performance in a small package. "No other type of transmission, mechanical or electrical, offers more power per pound," says Steve Zumbusch, manager of mobile application and commercial engineering for Eaton Hydraulics.

## Closed systems

Most hydrostatic transmissions are closed systems in which the hydraulic fluid circulates between a variable displacement pump that supplies the oil, and a motor, which uses the oil to drive the machine's wheels or tracks. A supplemental or charge pump, powered by the engine, maintains fluid supply to make up for leakage of fluid used to cool the system.

Both the right and left side of a skid-steer loader, for example, have a pump motor, typically connected by chains to drive the front and rear wheels. In other machines, the motor may be coupled directly to a wheel or track sprocket.

Normally, a piston in the pump moves a swash plate, which controls the flow of hydraulic fluid. The

greater the flow, the faster the motor turns. Depending on how far you push or pull the control lever, which operates this piston, you can control travel speed infinitely throughout the speed range and go from full forward to full reverse without shifting. It's simple, fast and efficient.

"A hydrostatic transmission provides a perfect match between travel speed and engine power, automatically providing the optimum power for a given speed," explains Diego Navarro, service marketing manager with John Deere Construction and Forestry.

Another big advantage is dynamic braking, which eliminates the need to apply brakes to slow down or stop,

---

**"If a hydrostatic transmission fails, it's usually because of improper maintenance."**

**Steve Zumbusch**  
Eaton Hydraulics

---

even on an incline. That's done by pulling back on the control lever.

A hydrostatic transmission is designed for long, dependable life. With proper care, it can last as long as the engine. "If a hydrostatic transmission fails, it's usually because of improper maintenance," says Zumbusch. Failure to maintain a hydrostatic transmission properly can cause a variety of problems.

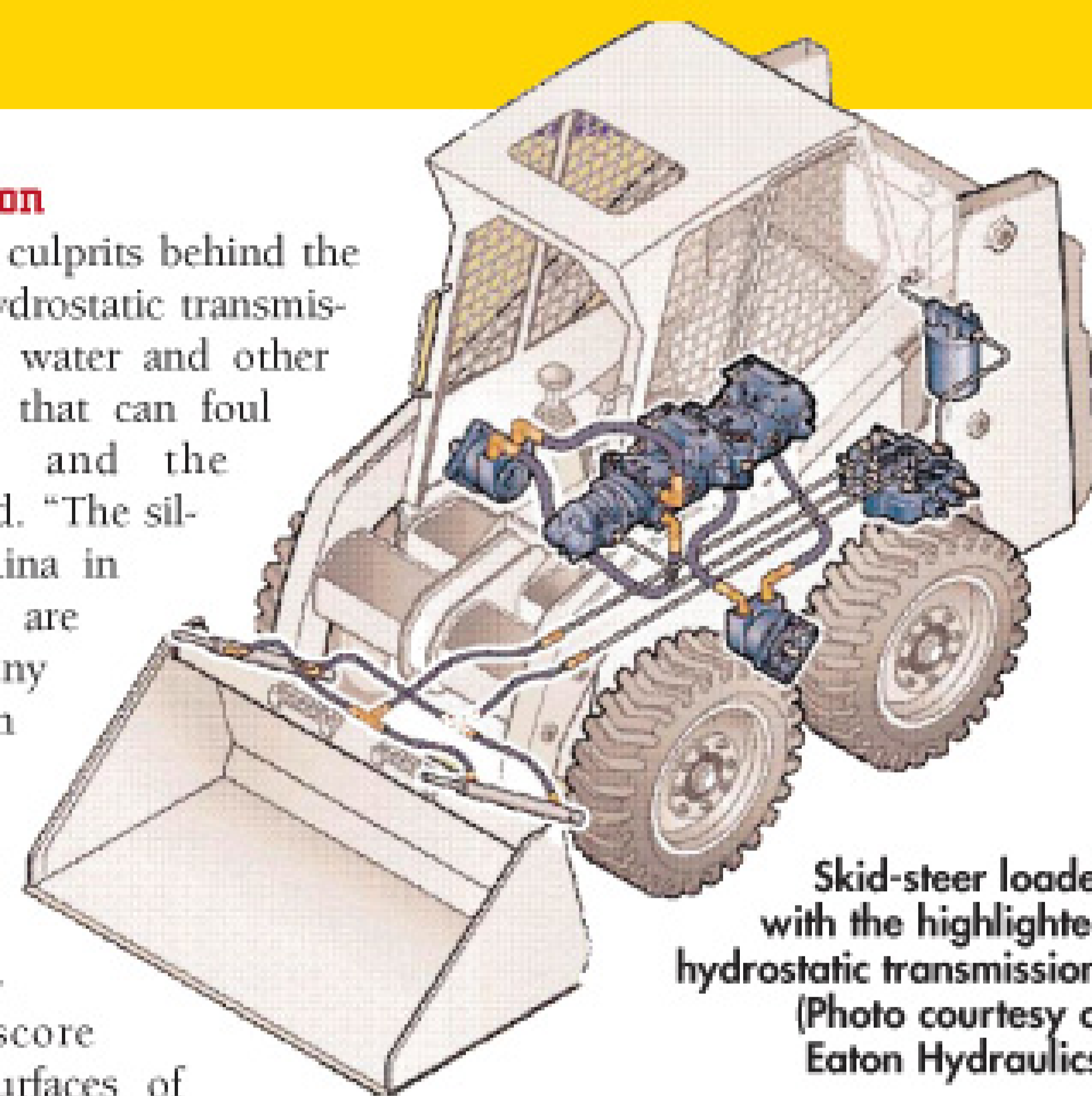
## Contamination

The main culprits behind the failure of a hydrostatic transmission are dirt, water and other contaminants that can foul components and the hydraulic fluid. "The silica and alumina in dirt particles are harder than any metal used in a hydrostatic transmission," says Navarro.

These particles can score and erode surfaces of motors, pistons and sleeves and the swash plates of pumps. And, they can enlarge finely machined clearances, some no wider than a just a few microns, leading to internal leakage and loss of transmission performance. Meanwhile, water in hydraulic fluid can impair its lubricating abilities and corrode system components.

"Dirt and contamination in a closed hydraulic system can create a tremendous amount of wear," says Bob Beesley, product manager for skid-steer and compact track loaders with Komatsu. "The wear feeds on itself, creating more particles, which create more wear."

Zumbusch adds, "When wear creates internal leakage of hydraulic fluid, efficiency of the transmission drops. That increases the load on the system, which leads to higher



Skid-steer loader with the highlighted hydrostatic transmission. (Photo courtesy of Eaton Hydraulics)

fluid temperatures. That, in turn, causes the fluid to break down, reducing its ability to lubricate and remove particles, leaving the system even more vulnerable to contamination."

The source of dirt and water in the hydrostatic system is the machine's hydraulic reservoir, which supplies oil not only for the transmission but for hydraulic operations. Most dirt enters the machine through the hydraulic cylinders that operate lift arms, buckets, and the like.

"There's a film of oil on the cylinder, which attracts dust and dirt," Zumbusch says. "If the seals are worn or damaged, these particles can be drawn inside the hydraulic system when the cylinder retracts."

Dirt and moisture in the air can also enter through the reservoir breather. When you operate the various systems on the machine, the hydraulic fluid level in the reservoir falls and rises as the oil circulates and draws in air.

Failure to clean the hydraulic reservoir cap before removing it, using dirty containers to top off the hydraulic reservoir, installing hoses that contain dirt and other debris on the inside, and even changing attachments, all can introduce

**"If your machine runs low on hydraulic fluid, the hydrostatic pump can draw in air. As the pump compresses these pockets of entrapped vapor, they collapse, releasing extreme pressure that can gouge metal and cause machined surfaces to implode."**

Bob Beesley  
Komatsu

contaminants. So can make-shift hydraulic tank caps. "I've seen machines brought into the shop for hydrostatic problems with the hydrostatic tank cap missing and rags stuffed into the opening," says Beesley.

### Cavitation

Although cavitation is much more common with hydraulic systems, it can also seriously damage

hydrostatic transmissions. Caused when gases in the fluid vaporize, it's characterized by noisy, erratic transmission operation.

"If your machine runs low on hydraulic fluid, the hydrostatic pump can draw in air," says Beesley. "As the pump compresses these pockets of entrapped vapor, they collapse, releasing extreme pressure that can gouge metal and cause machined surfaces to implode. This can damage the moving parts of the pump, such as the cylinder bore, the swash plate, the piston and the pivot connection between the two. This damage creates contamination, and the failure cycle begins."

Cavitation can also be caused by a restriction in the pump's inlet line, like a kink, a worn or failed charge pump, a broken or loose hose, or hydraulic fluid that is too thick, either because it is heavier than recommended or has thickened due to cold weather.

### Overheating

When hydraulic fluid becomes too hot, it oxidizes. This reduces the oil's ability to lubricate, increasing wear. It also damages seals and gaskets, allowing contaminants to enter the system. Excessive heat can be caused by a dirty oil cooler or by worn pump components. Fluid leaking through passages widened by wear can build up heat quickly.

These potential problems highlight the value of following the manufacturer's maintenance rec-

ommendations. They include:

**Use the correct oil.** Use only hydraulic fluid that meets the manufacturer's specifications. This ensures that it will have the proper viscosity and will contain any additives needed to provide the necessary lubrication and heat and corrosion resistance.

**Keep the fluid clean.** In addition to changing filters as scheduled, replace old ones with those that meet manufacturer specifications — otherwise the filter may not capture the smaller particles. Repair leaking seals and gaskets and replace broken lines or hoses. Keep parts clean when repairing. Use clean storage containers and clean the filler cap before removing it to check levels or add fluid. Zumbusch advises using a water gate filter on the hydraulic tank breather to remove moisture in the air.

**Keep the cooler clean.** Clean the oil cooler regularly with an air


hose or pressure washer to clear dirt and debris, which reduce cooling capacity. Beesley also recommends keeping fan belts tight and cleaning the air intakes on the hood or tailgate to keep air flowing through the engine compartment. Use a thermometer to check for overheating of the hydraulic fluid in the reservoir. Although hydrostatic systems may run as hot as 100 degrees F above ambient temperature, cooler is almost always better.

**Follow proper warm-up procedures.** To prevent cavitation in cold weather, Navarro says, let the hydrostatics warm up sufficiently before operating at full power.

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). ■

**NEW & Improved**

## ALITA® LINEAR AIR PUMP



- ☑ Full range of efficient and reliable aeration pumps for Aerobic Treatment Unit
- ☑ Low energy cost and quiet operation
- ☑ 3 Years Manufacturer Limited Warranty
- ☑ Parts and repair available for variety of brands of linear air pumps

☎ Call 626-962-2116 for more information

**ALITA INDUSTRIES, INC.**  
P.O. Box 660923, Arcadia, CA 91086-0923, USA  
phone: (626) 962-2116 fax: (626) 962-2177  
on-line: [www.alita.com](http://www.alita.com) e-mail: [sales@alita.com](mailto:sales@alita.com)

UL US  
UL certified in compliance to USA and Canada safety standards for outdoor air compressors

44

## Eljen GSF Geotextile Sand Filter

### Passive Advanced Treatment Technology



- Independent 3rd party testing confirms BOD and TSS <5 mg/l and Fecal Coliform reduction of 99.9%
- Much smaller installation area
- Greater long term performance capability...lasts indefinitely
- Good for sensitive lakeside and restricted building sites
- Lightweight recycled materials

**FLEXIBLE SITE INSTALLATION**

- Trench or Bed layouts
- Level or Sloped sites
- At Grade or Mound
- Serial & Pressure distribution
- Fast or Slow soils
- Clean & easy installation!

**TIME PROVEN FOR OVER 25 YEARS**

**eljen CORPORATION**  
Innovative Products and Solutions Since 1970  
125A McKee St., E. Hartford, CT 06108  
860-610-0426 • Fax: 860-610-0427  
Email: [info@eljen.com](mailto:info@eljen.com)

**eljen.com**  
800-444-1359

33

# Focus on Renewal

17th Annual NOWRA Technical Conference & Expo in Memphis offers exhibits, education, training, networking and entertainment

By Ted J. Rulseh

**E**lvis may have left the building, but onsite professionals will definitely be on hand in Memphis, Tenn., for the 17th Annual NOWRA Technical Conference & Expo, April 7-10. The theme of the conference, at the Cook Convention Center, is: Water — Manage, Reuse, Renew.

As always, the conference includes a large exhibit of the latest in onsite wastewater treatment equipment and service, an extensive technical education program, and opportunities to network with

installers, designers, researchers, regulators, and other industry practitioners from around the nation and the world.

The host city offers music, fine restaurants, and many historic sites, most notably Elvis Presley's Graceland mansion. The conference's headquarters hotel, the Memphis Marriott Downtown, connects directly to the convention center. A downtown trolley system provides easy access to blues clubs, museums, shopping, botanical gardens, and other attractions.

## More on nitrogen

The activities begin on Monday, April 7, with NOWRA's second Nitrogen Symposium. Presentations will cover basics about nitrogen including sources, fate and dissipation, environmental risks, basic chemistry, atmospheric processes, and effects on water resources. Also covered will be onsite sources, engineered treatment processes, and modeling of nitrogen in marine ecosystems and inland watersheds.

After the presentations, a panel discussion will address questions from the audience. In the afternoon, conference attendees will present their questions and comments. To find out more, contact Matt Byers at [mattb@zoeller.com](mailto:mattb@zoeller.com).

## Education for all

Technical sessions begin on Tuesday, April 8, with seminar tracks on education and training, cluster systems and applications, and performance and system evaluation. The program on Wednesday, April 9, includes tracks on standards, regulations and policy, suc-

cessful planning and management, treatment process evaluation, innovative technologies and solutions, and an update of projects from the Water Environment Research Foundation.

The Thursday program covers innovative technologies and solutions and other topics such as public-private partnerships, sustainable wastewater management, commercial system failures and solutions, and water reuse with subsurface drip irrigation. The day will also include a Memphis-area tour of decentralized systems.

All three days of technical sessions include the always-popular NOWRA Decentralized Systems Overview: A to Z series.

For more information about the 2008 NOWRA conference, visit [www.nowra.org](http://www.nowra.org) or call 800/966-2942. ■

Register Now!

**NOWRA**  
National Onsite Wastewater Recycling Association

**2008 TECHNICAL CONFERENCE & EXPO**

**Water**  
MANAGE • REUSE • RENEW

April 7-10, 2008  
Cook Convention Center  
Memphis, Tennessee

As the industry leader, the 2008 NOWRA Conference offers an unparalleled educational and training experience to individuals committed to achieving water quality results with decentralized systems.

- NOWRA provides the most comprehensive venue in which to present manufacturers and their products and services, with quality time available for discussions with representatives and visitors.
- You get the real answer to the real issues facing you in today's water quality industry without dealing with water crowded conditions.

The 2008 conference is a truly exciting opportunity to gain from the latest information, share knowledge and of course, **Get Connected!** There's always something new to learn, whether you're a professional or a hobbyist. Don't miss a chance to meet with the industry's leading experts and share your ideas and experiences.

## It's time for our industry to realize that all waste is not created equal!

**The NIBBLER®**

**Aqua Test & NIBBLER's working together**

Small Families, Large Families, Ski Resorts, Camps/Retreats, Food Processing Plants, Super Markets, Full Service Restaurants, Small Cafes, Families on Medications, Convenience Stores/Mini-Marts, Golf Courses, Fast Food.

**Aqua Test's Rules:**

- Never repair a system unless you know why it failed
- Never design or approve a system that doesn't address mass load, peak flow, and recovery features

Aqua Test has a full line of NIBBLER® CBP & SBP products to address waste strengths from residential to commercial.

**AQUATEST**  
For more information: 1.800.221.3159

28

## "Duel Power Lid"

Plugs, Lids & Adaptor Rings

Sizes Available: **18", 24", 30" & 36"**

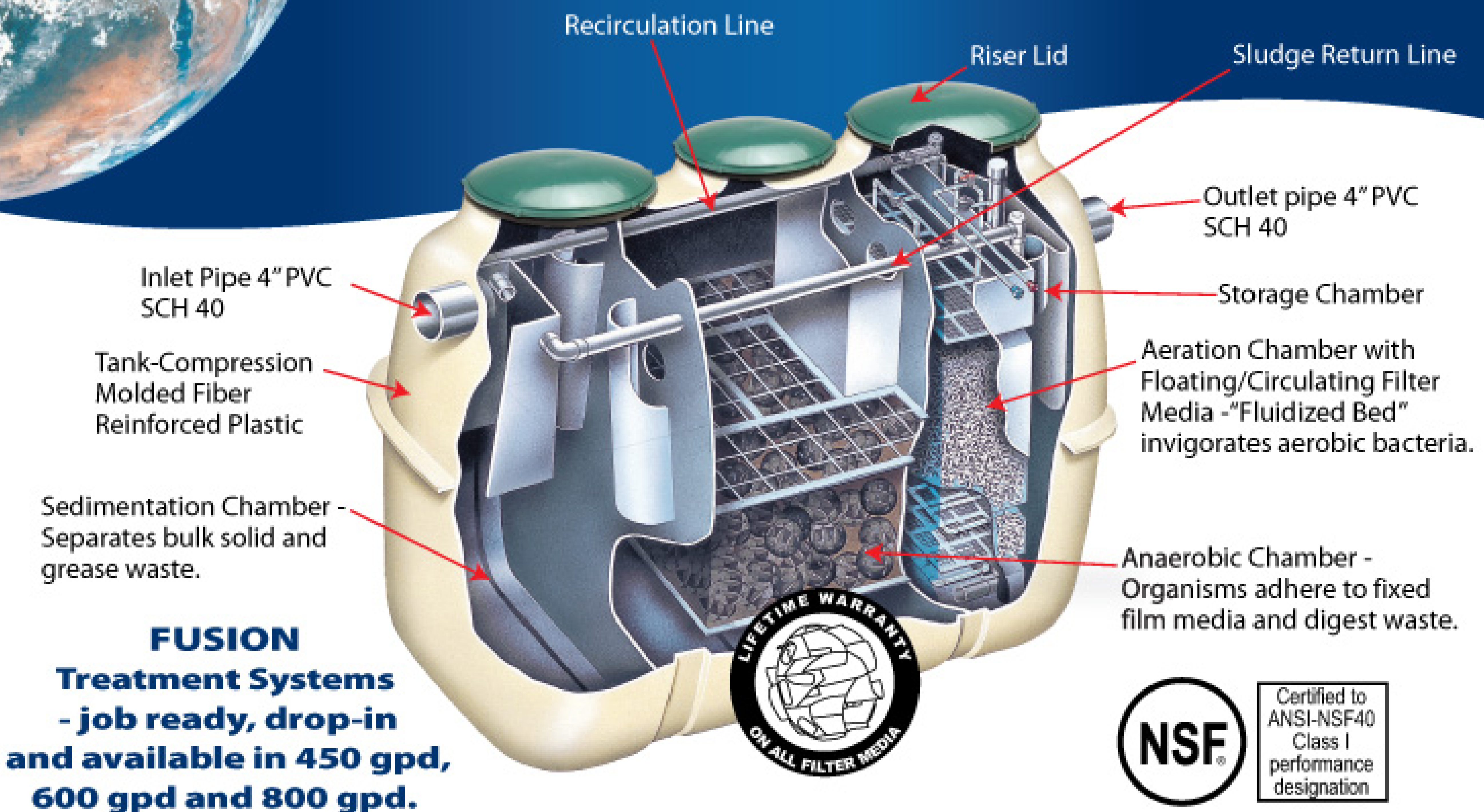
**Fergus Power Products** 190  
Providing "Environmental Products"

The Company who maintains a pulse on the environment!

Toll Free **1-800-243-7584**  
E-mail [fpproducts@prtcl.com](mailto:fpproducts@prtcl.com)

Zoeller searched the globe for proven wastewater technology

# Introducing **FUSION** Treatment Systems



Zoeller brings innovative technology to the American onsite wastewater market. FUSION Treatment Systems are fully assembled, compact, efficient and reliable. Designed for a wide range of residential applications, every system is backed by Zoeller's exceptional service and maintenance standards.



**Extensive line. Since 1939**

*The Fusion Series Treatment Systems are a Zoeller Pump Company and Fuji Clean Co., Ltd. collaboration.*

- Effluent Pumps • Effluent Filters • Filter Step Systems
- Z-Cell Systems • Fusion Series Systems • Recirculating Media Filters
- Decentralized Wastewater Systems • Accessories and Controls

Zoeller Pump Company • 3649 Cane Run Rd. • Louisville, KY 40211 • 502-778-2731 • fax 502-774-3624

Call or visit  
800-928-7867  
[www.zoeller.com](http://www.zoeller.com)

# A Perfect Fit

A pre-engineered sequencing batch reactor enables a lake property homeowner to comply with Vermont's revised onsite regulations

By **Scottie Dayton**

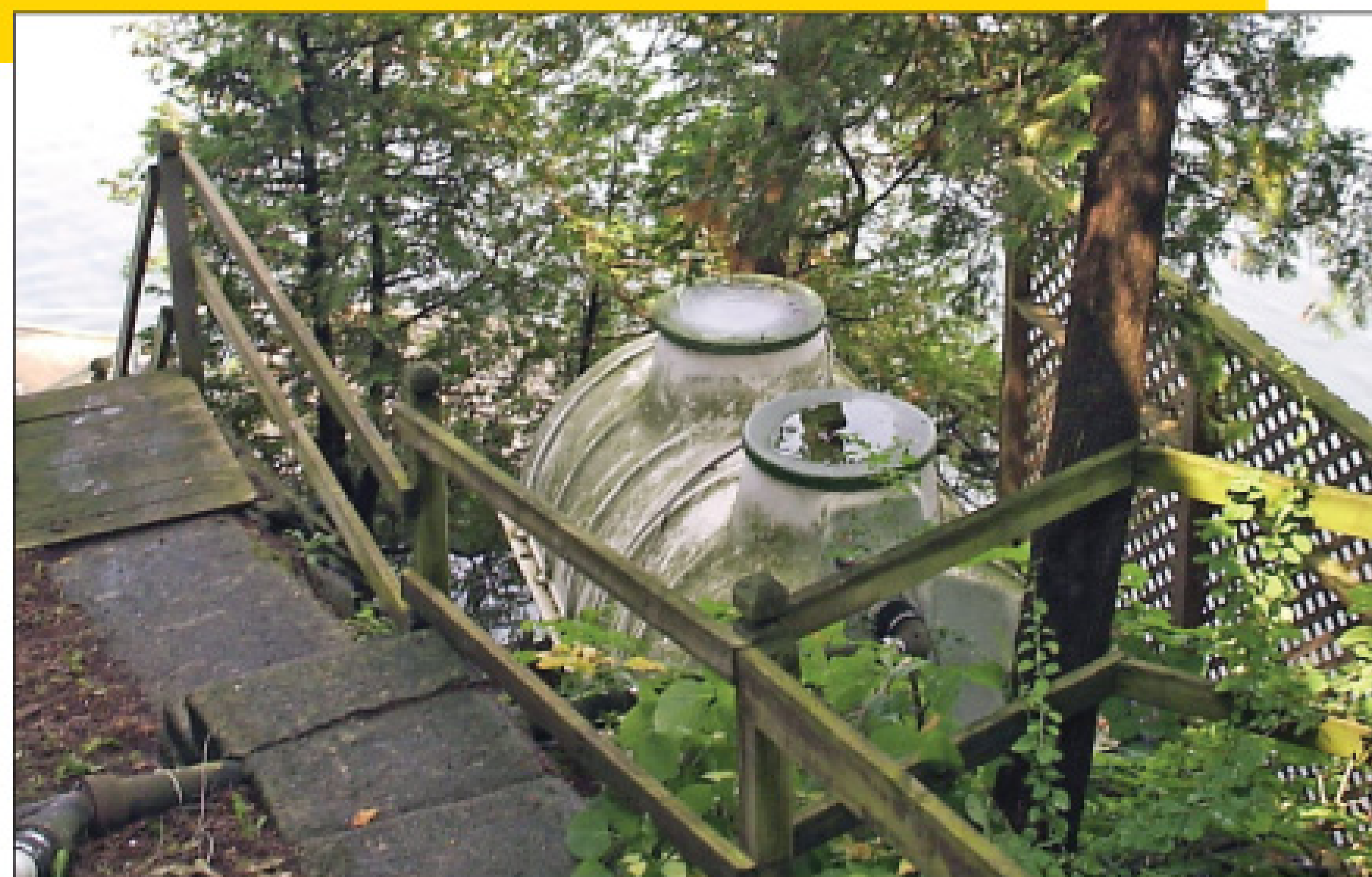
**B**efore Vermont's revised wastewater regulations went into effect on July 1, 2007, some North Ferrisburg residents decided to upgrade the systems on their lake homes to avoid dealing with the state.

Richard Hurd, chairman of the Long Point Homeowners Association, led by example. His 100- by 100-foot lot had a sequencing batch reactor installed in the early 1970s as part of a dry well system discharging into Lake Champlain. Hurd called Eli Erwin, environmental scientist at Lincoln Applied Geology Inc. in Lincoln, Vt., who suggested retrofitting the module with ultraviolet light disinfection.

When Brad Fischer of Bundy's

Sewer and Drain Inc. in Jericho inspected the unit, he found insufficient oxidization and broken baffles that allowed the system to pump itself dry. The unit was unsalvageable. "This site was very tough because the only room for a replacement pretreatment unit was on a deck overlooking the lake," says Fischer. "That really limited our options."

The solution was a sequencing batch reactor that Vermont had approved for pretreatment in 2007. The integrated, compact unit was the smallest of its kind. It was also transportable — an important feature, since the site was inaccessible to large equipment and all work was done by hand.



The sequencing batch reactor in place on the home site. The sidewalk guardrails have been restored.

## Site conditions

The clay/ledge soil has a percolation rate of 120 minutes per inch or more. The water table is four inches below grade. A slope with a 3:1 grade rises at the side of the house, ending in a 6-foot-high stone retaining wall abutting Shore Road. An L-shaped concrete sidewalk comes down the hill and around the side to the back of the house, which faces the lake.

## System components

Erwin sized the system to handle 360 gpd. The standard is 375 gpd for a three-bedroom home, but pretreatment allows a 50 percent reduction in size. The system's major components are:

- 500-gallon Model CA-5 sequencing batch reactor from

Cromaglass Corp., Williamsport, Pa.

- 252 feet of 3/4-inch Wasteflow plastic driplines on 1-inch centers with valves, headworks, and control panel from Geoflow, Corte Madera, Calif.

## System operation

Wastewater gravity flows through a 4-inch, cast-iron lateral that surfaces after passing beneath the sidewalk, slopes gently for three feet, and enters the 6-inch inlet at the top of the three-chamber reactor. (The deck on which the reactor rests is six feet lower than the sidewalk.)

Flow enters the solids retention section, where a non-corrosive screen separates and retains inorganic solids. One submerged 1/3-hp aeration pump in the aeration

## System Profile

<b>Location:</b>	North Ferrisburg, Vt.
<b>Facility served:</b>	3-bedroom home
<b>Designer:</b>	Eli Edwin, Lincoln Applied Geology Inc., Lincoln, Vt.
<b>Installer:</b>	Brad Fischer, Bundy's Sewer and Drain Inc., Jericho, Vt.
<b>Site conditions:</b>	Clay/ledge soil; percolation rate of 120 minutes per inch or more
<b>Type of system:</b>	Sequencing batch reactor, Cromaglass Corp., Williamsport, Pa.; Wasteflow plastic driplines, Geoflow, Corte Madera, Calif.
<b>Hydraulic capacity:</b>	360 gpd



section forces mixed liquor through the screen. The resulting turbulence, more vigorous than the action of a washing machine, breaks up organic solids.

Liquid and small solids pass through the screen into the aeration section. The pumps, with venturi aspirators, receive atmospheric air through individual intakes. The liquor is mixed continuously with air for aerobic treatment. After two hours, a pump transfers the treated mixed liquor to the clarification-discharge section, overflowing it. The excess spills through overflow weirs back into the aeration section. When the transfer is completed, solids separate under quiescent conditions for 45 minutes.

After the settling period, a 1/2-hp turbine pump with Sim/Tech filter discharges effluent through 1-inch PVC Schedule 40 pipe 35

**“The Geoflow package contains valves, headworks, and control panel. When the pumps shut off, the valves drain back, so no liquid is left in the driplines. That’s important because Vermont can have frosts and freezing weather through May.”**

**Brad Fischer**

feet to the drainfield. A submersible pump returns the sludge at the bottom of the clarifier to the aeration section. It takes less than four hours for an 80-gallon batch to reach the drainfield. Fischer programmed the system to cycle four times a day.

### Installation

Hurd reinforced his pressure-treated deck with a steel I-beam to accommodate the reactor. Fischer removed the sidewalk guardrails to make it easier to install the unit. “The most challenging part of the installation was the site,” says Fischer. “We stockpiled materials on Shore Road, then dumped them directly into the 20- by 15-foot area

for the drainfield.”

Before building the absorption bed, Fischer’s four men lowered a vacuum hose over the stone wall and pumped out the old sequencing batch reactor, which was occupying the space for the drainfield. They then put a lifting harness around the module and used a Case backhoe to hoist it onto a waiting truck. The new 7-foot, 11-inch square by 5-foot, 7-inch high fiberglass module was lowered the same way.

“We built a small skid from 6-by-6 timbers, hoisted the 704-pound tank onto it, then pushed and shoved it along the sidewalk to the deck,” Fischer says. Brute strength controlled the rate of descent. The plumbing inside the tank was unaffected by the jerky move. During normal operation, the module is half full of water, bringing its total weight to more than 2 tons. Its weight alone holds it in place. The module is fully exposed to the elements.

Erwin’s plans specified a mound sand absorption barrier beneath the driplines. Because the property sloped toward the lake and to meet regulations, the men first built three 2-foot-high retaining walls from pressure-treated 6-by-6 timbers to prevent the pre-washed sand from eroding and to enhance the bed’s appearance. The fourth side was the stone retaining wall. The backhoe dumped and stockpiled sand on one end of the drainfield, while the men leveled it with shovels and rakes to a depth of 18 inches. No native soils were excavated.

On top of the sand went fourteen 18-foot-long laterals on 1-inch centers covered with 12 inches of bark mulch. “The Geoflow package contains valves, headworks, and control panel,” says Fischer. “When the pumps shut off, the valves drain back, so no liquid is left in the driplines. That’s important because Vermont can have frosts and freezing weather through May.”

To activate the system, Fischer pumped mostly liquid from another septic tank and discharged it into the reactor’s solids retention section. “Because this is a seasonal home, we shock-load the system so it starts faster,” he says. “It’s only



The CA-5 sequencing batch reactor (background) is shown awaiting installation as a backhoe operator hoists the old module from what will become the drainfield.



The supply lines are covered with 12 inches of bark mulch. The 1-inch PVC Schedule 40 supply and return line runs 35 feet from the reactor to the driplines.

aerating, not discharging, and runs for about a week before the homeowners arrive.”

### Maintenance

The state requires an annual inspection, which Bundy’s Sewer and Drain Inc. does on a service contract. Because the home is seasonal, a technician pulls the pumps every fall and replaces them in spring. Any liquid in the reactor is pumped out in autumn to prevent it from freezing. Should a problem arise during summer, audio and visual alarms in the house alert the

owners, and they call Bundy’s. The system is dormant in winter. ■

### MORE INFO:

**163 Cromaglass Corp.**  
570/326-3396  
www.cromaglass.com

**77 Geoflow**  
800/828-3388  
www.geoflow.com

**16 SIM/TECH Filter Inc.**  
888/999-3290  
www.gag-simtech.com

### CORRECTION

Risers shown and described in the February 2008 System Profile in this magazine were supplied by **Tuf-Tite, Inc.** of Lake Zurich, Ill. (800-382-7009, www.tuf-tite.com). Because of incorrect information supplied to *Onsite Installer*, a different manufacturer was listed in the story. We apologize for this mistake.

# Sump and Sewage Pump Manufacturers Convene

By **Scottie Dayton**



SSPMA annual meeting.

**E**xperts gathered at the semi-annual meeting of the Sump and Sewage Pump Manufacturers Association (SSPMA) on Sept. 26 in Detroit Lakes, Minn., to discuss onsite issues and what pump companies can do to benefit the industry.

Twenty people representing nine pump companies (85 percent of the manufacturers) and nine associate member companies (makers of pump accessories) attended. As part of the event, they toured the headquarters of SJE-Rhombus Controls.

According to Pamela Franzen,

SSPMA managing director, the goal of the meeting was to find out what onsite installers and plumbing contractors needed from association members through questions submitted to a panel of onsite experts. "We're trying to assemble training materials so we can offer CEUs through other institutions and organizations," she says.

For example, SSPMA is offering non-credit training on "Sizing Effluent Pumps for Onsite Wastewater Treatment: Selecting the Right Pump for the Job" on March 14 at the Illinois Plumbing-Heating-Cooling Expo in

Oakbrook Terrace, Ill. Those interested may call Bev Potts at 800/795-7422 or visit [www.ilphcc.com](http://www.ilphcc.com).

## Learned colleagues

The panel discussion was moderated by Charles Cook from Liberty Pumps in Bergen, N.Y. Panel members were:

- James C. Converse, Ph.D., an emeritus professor in the Biological Systems Engineering Department at the University of Wisconsin in Madison.
- Richard J. Otis, Ph.D., P.E. DEE, an environmental consultant with Otis Environmental Consultants LLC in Madison, Wis.
- Bruce Jaster, R.S., director of environmental services for Clay County, Minn.
- Robert Rubin, Ph.D., professor emeritus at North Carolina State University.
- David Gustafson, P.E., extension engineer with the University of Minnesota.

Participants also answered questions about distribution treatment, how to educate others in the onsite industry, the future of onsite treatment, and the causes and treatment of filamentous bacteria in wastewater systems.

## Different approaches

When asked what pump companies could do to benefit the onsite industry, Rubin responded that they should evaluate how they communicate their companies' intrinsic value to the community. "Look beyond how many jobs you provide," he says. "Be more effective in knowing your legislators and other elected officials, and work with them to communicate your economic impact. Our industry

needs such recognition."

Otis said members should take part in organizations like NOWRA, get involved in committee work, and attend lectures at trade shows to learn what is happening.

Rubin said that the onsite industry began in 1972 with the Clean Water Act, and the EPA provided state grants to clean up the environment. Gustafson advised the audience to find out where the funding is and help low-income families get it.

"Most state funding agencies have priority funding lists, but you have to know the financial qualifications before you can help individuals get on it," says Rubin. "Then make sure your state knows the benefits of onsite treatment."

## Targeting performance

Otis observed that Minnesota engineers are required to evaluate how systems are performing during the facility planning process. "If the number of failures is low and can be corrected, or if the effluent can be routed to a cluster system, that is the first choice for a facility," he says. "If failures are significant, then clusters must be evaluated followed by regional treatment. If none are appropriate, only then is providing a treatment plant considered. This is a move in a positive direction."

Founded in 1956, SSPMA seeks to develop and promulgate quality standards, implement a certification and labeling program for all products conforming to the standards, investigate market size and activity, and promote improved provisions in building codes on the use of sump and sewage pumps. ■



## SludgeHammer®

nature called. we answered.




### The latest advance in wastewater treatment

The second generation SludgeHammer® aerobic bacterial generator is here—tried, tested, and reengineered for commercial and industrial applications (and more power for residential use, too).

Our original ABG advanced bio-technology revolutionized the industry in 2000 providing a highly effective, all natural, non-toxic wastewater solution. For proven results, insist only on SludgeHammer® products!

- Retrofits into any system or tank
- Is working biologically in 12 hours
- The only IAPMO approved ABG
- New or old systems
- For environmentally sensitive areas




For info call 1 800 426 3349 or visit [www.SludgeHammer.net](http://www.SludgeHammer.net)



Thank you for visiting us in Louisville



**Installing & Pumping is your business -  
Increasing your Profit Margins is Ours**

**From Installing a New System  
To Maintaining your Equipment**

**Products For:**

- ✓ Establishing / Reactivating systems
- ✓ Prevents freezing / Aids thawing
- ✓ Treating drain / leach fields
- ✓ Odor / build-up in lines
- ✓ Maintaining pump / vac trucks

**P**

**L**

**U**

**S**

**Products Are:**

- ✓ DHEC Approved
- ✓ Non-Hazardous
- ✓ Non-Corrosive
- ✓ Safe / Non-Toxic
- ✓ Made with All Natural Ingredients

**Our Products Cover your Needs**

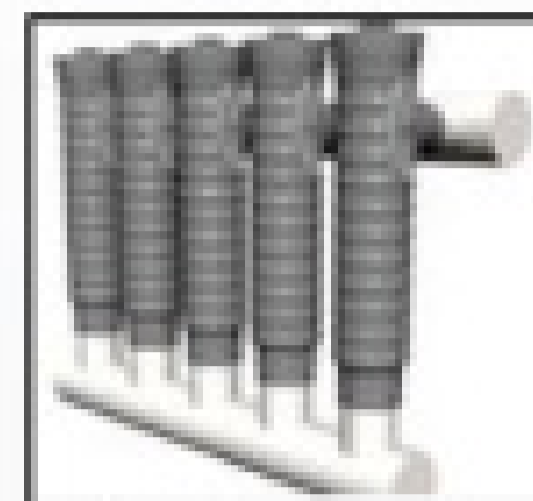


Organic Products of South Carolina  
PO Box 1245  
Sumter, SC 29151  
866-842-1708 \* Fax (803) 938-9573  
www.opsc-inc.com



Toll Free 888-999-3290

**The Last Line of Defense  
for Pressurized Distribution Systems**



Can be used in a manifold to handle almost any flow-rate

The STF-100 series pressure filter will:

- \* Lower total suspended solids (TSS)
- \* Keep distribution holes free of debris
- \* Protect with low head-loss (.5002 ft)
- \* Extend the life of the distribution field
- \* Filter to .062", .024", .007", or .004"
- \* Pass up to 83.8 gallons per minute @ 1PSI
- \* Allow for easy installation and service
- \* Protect from improper system maintenance
  - \* Protect from system abuse
  - \* Satisfy your customers

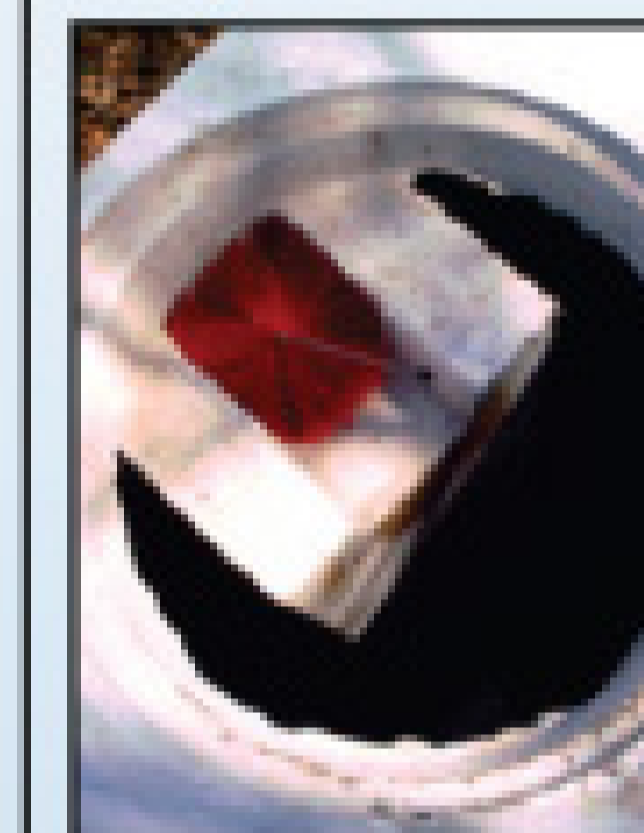


US Patent# 5,885,452  
CAN Patent# 2,237,751

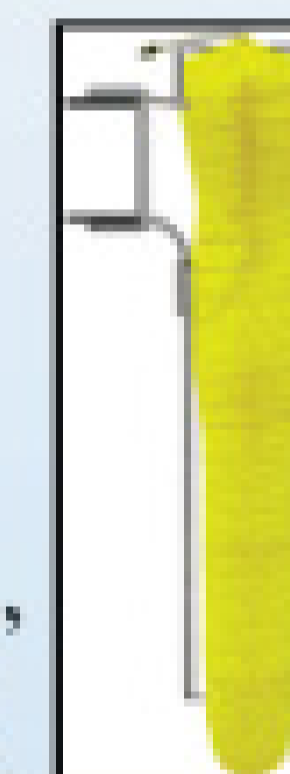


**Gravity Flow Bristle Filters for residential or commercial systems, septic tanks, onsite systems, or even your pond!**

Very effective at filtering tissue, hair, lint, and other solids common to waste water. And flexible enough to fit just about anywhere, most common applications are standard "tees" and square concrete baffles as shown below.



**Left:** The 7" filter in a 5" square concrete baffle.



**Right:** The 4" filter in a 4" Tee.

**Sizes Available:**

- 4" yellow
- 6" white
- 7" red
- 8" blue

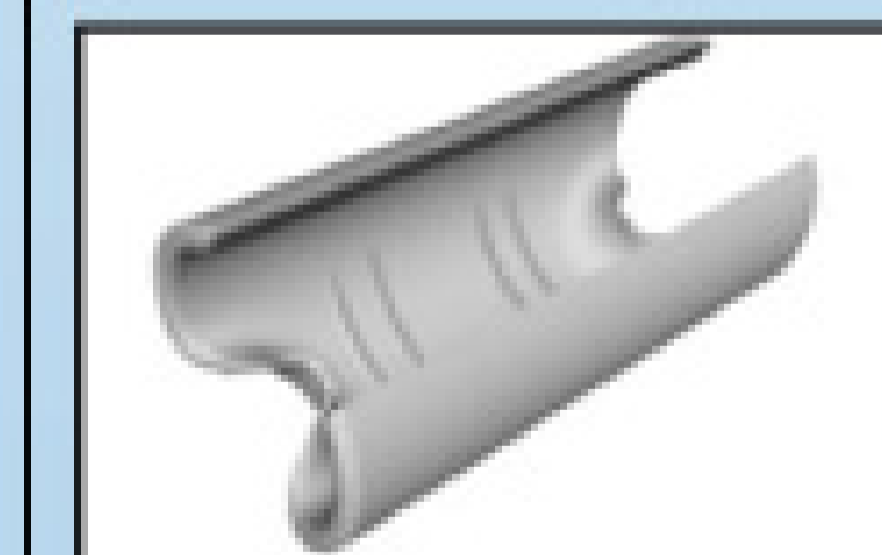
Patent# 6,811,692

**Polycarbonate Covers**



- \* 8,000 lb wheel load rating (H10 Rating)
- \* The Ultimate in UV protection and appearance
- \* Drop in feature for easy alignment
- \* Performance is not affected by temperature
- \* Can be used with most 24" risers and pipe
- \* Factory installed gasket won't fall out
- \* Stainless Steel Screws included
- \* Available insulated or easy to do so yourself
- \* Available with self locking web
- \* Low profile to allow for lawn mowers, etc.

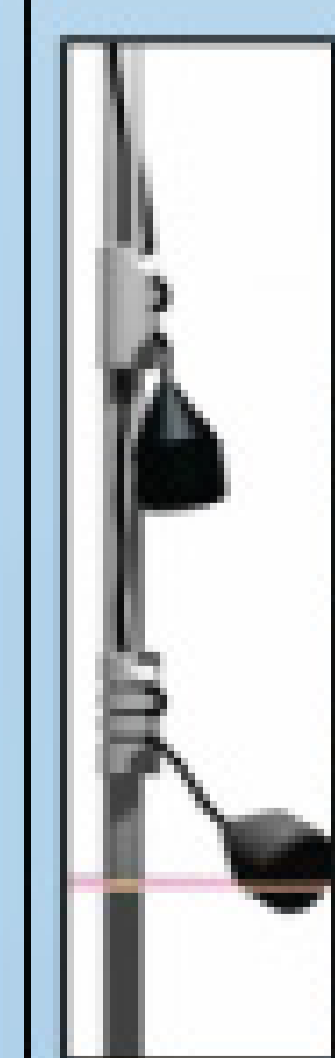
**Orifice Shields**



Patent# 6,167,914

- \* **The Original Orifice Protector**
- \* Sturdy design for all applications
- \* Easy to position
- \* Will not fill with gravel in any position
- \* Large discharge area that does not clog
- \* Large open area
- \* No moving parts to stick
- \* Will remain in place, even without glue

16



**Float Tree Accessories**

- \* Easy adjustments
- \* No tangled wires
- \* No float hang-ups
- \* No straps to break
- \* No entering tank
- \* Easy pump repairs
- \* Very affordable

*Check Out our other quality solutions!*

*Risers, Security Nets, Clean-Out Sweeps, etc.....*

*Call us or visit our website.*

**Toll Free 888-999-3290**

**www.gag-simtech.com**

**sales@gag-simtech.com**

**You've got the JOB  
We've got the Package**

**Onsite Component Packages**

Everything you need is in one package for the job.

**120V and 230V Exterior Pump Controls w/ Alarms**

- Includes Control Switch, Removable Terminal Board, NEW Corded Pump/PumpSwitch Receptacle, Cord Seals, Hi Impact Poly Pedestal, Pipe Nipple
- Options: Pump Switch, Circuit Breaker, Wall Mount



**120V and 230V**

**Exterior Pump Controls w/ Interior Alarms**

- Includes Removable Terminal Board, NEW Corded Pump/PumpSwitch Receptacle, Cord Seals, Poly Pedestal & Pipe Nipple or Low Profile Nema 4X Box, Interior Alarm System
- Options: Pump Switch, Event Counter, Alarm System



**Exterior and Interior Single & Dual Alarm Systems**



**Mechanical Control & Pump Switches**

**Simplex, Time Dose, & Duplex Panels**

**Septronics, Inc.**

602 E. Union St. • Oconomowoc, WI 53066 • Ph: 262.567.8908

**www.septronicsinc.com**

40

March 2008



25

## Zoeller Introduces 41-Gallon Pre-Assembled System

The Simplex 912 from Zoeller Pump Co. is a 24-inch by 24-inch, pre-assembled package system with 41-gallon capacity. The 360-degree molded handle acts as a secondary anti-flotation device, while flat areas allow for additional field installed inlets. Cover connections are threaded for vent and discharge piping. The unit is available with pump model 211 and cast-iron construction models 264 and 266. For more information: 800/928-7867; [www.zoeller.com](http://www.zoeller.com).

## ADS Presents ARC 36 Leaching Chamber 219

Made of high density polyethylene (HDPE), the ARC 36 leaching chamber from Advanced Drainage Systems Inc. features a 20-degree integral articulating joint for either straight or contoured applications. The corrugated chamber design eliminates flat surfaces and provides increased load-bearing capacity. The joint also incorporates a modified post and dome design for added strength. Available in 5-foot lengths, it offers a universal inlet/outlet cap with knockout inspection vent ports on every unit. For more information: 800/821-6710; [www.ads-pipe.com](http://www.ads-pipe.com). ■



# COMMERCIAL SIZED SEPTIC TANKS

**CREST** Precast, Inc.  
NPCA Certified Plant

47

LA CRESCENT, MN • BARNEVELD, WI  
1-800-658-9045 • [info@crestprecastconcrete.com](mailto:info@crestprecastconcrete.com)

## The Shaddix Company

## Don't Flip Past This Ad



### Custom Built Hydraulic Set Beds

- Length
- Height
- Color



Septic Tank Forms built to your state's specifications.

VISIT OUR WEB SITE TO VIEW AVAILABLE TRUCK UNITS AND A LIST OF USED EQUIPMENT



For more information, contact Tommy Shaddix.  
**Phone: 256-338-4987**  
E-mail: [tommy1850@adelphia.net](mailto:tommy1850@adelphia.net)  
Web Site: [www.theshaddixcompany.com](http://www.theshaddixcompany.com)

160

256-338-4987 • [www.theshaddixcompany.com](http://www.theshaddixcompany.com)



The most complete line of...  
System Alarms  
Float Switches  
On-Site Accessories  
Control Panels



Call Today  
**419-282-5933**

[www.septicproducts.com](http://www.septicproducts.com)  
[sales@septicproducts.com](mailto:sales@septicproducts.com)



Thanks for visiting us!

38

**THE DIRTY BIRD™** 45  
**Septic Vent Concealer**

Converts your ugly septic vent into an attractive bird bath and controls odor too!  Installs in **Easy Steps!**

**1.866.968.9668**  
**1.781.793.9334**  
[www.bsdesigncorp.com](http://www.bsdesigncorp.com)

### Seal it Tight! Seal it Easy! Seal it Fast!



- Easy 10 minute installation!
- Secure fit for all systems!
- Made & sold by septic installers!
- Prevent ground water infiltration and save money at the same time!

Are you tired of using risers that are too tall or too short for the job you are completing? Plastic riser pipe will give an exact height each time. Try our system and you will never have to carry concrete pipe and lids again. Save time by not having to assemble multiple sections.

*Seal-R™ Lids can be personalized. Seal-R™ Lids are manufactured with UV additive to resist degradation from exposure to sunlight.*

 **Seal-R™**  
**BrenLin Company, Inc.**  
 Herman, MN  
54 **888-606-1998**  
 Fax: 320-677-3001  
 E-mail: [brenlin@frontiernet.net](mailto:brenlin@frontiernet.net)  
 Web Site: [seal-r.com](http://seal-r.com)

### SEPTIC ODOR PROBLEM? ODORHOG™ Charcoal Activated Vent Pipe Filters Remove Sewer & Septic Odors from Plumbing Vents



**ODORHOG™** Filters Come in 5 Standard Sizes or Any Custom Size You Specify  
 SAME DAY SHIPPING & PRIVATE LABELING AVAILABLE  
**A&M BIO-FILTER, LP**  
**1.800.963.6746**  
[www.odorhog.com](http://www.odorhog.com)

**30% OFF FOR ALL ORDERS  
OVER \$2000**

**WATER CANNON** **1-800-333-9274**  
[www.Jettersonline.com](http://www.Jettersonline.com)

**Pressure Washers**

**HONDA @ 2700PSI \$377**  
**HONDA @ 3000PSI \$416**  
**HONDA @ 4000PSI \$859**


We Customize  high pressure pumps

**Honda Engines**

 5Hp GC **\$199**  
 6.5Hp GX **\$349**  
 8Hp GX **\$459**  
 9Hp GX **\$489**  
 18Hp GX **\$1,099**

**BEST Sellers ALWAYS on Sale**

5.6GPM @ 4000PSI **\$399**  
 8.0GPM @ 3500PSI **\$499**  
 7.0GPM @ 5000PSI **\$599**

 26 

Call For Free Quotation.  
 We Also Stock Pumps With Left Hand Drive,  
 Tapered Shaft, Car Wash Duty,  
 316 Stainless Steel and Unique Applications  
**1-800-964-9274**

**Water Cannon - 5 Offices Nationwide,  
Since 1981**

**Simple Solutions**  
 DISTRIBUTING LLC

**We Stop The Stink Guaranteed!**  
 Budget Conscious Solutions for  
 Wastewater Odor Control.

**ODOR ADSORBERS FOR:** • Manhole Openings  
 • Lift Station Vents • Plumbing and Septic Vents  
 • Large Industrial Applications

Mention this Ad and Save 10%!! 20% on orders over \$2000!!

180



**973-846-7817 or  
866-667-8465**

[www.IndustrialOdorControl.com](http://www.IndustrialOdorControl.com)  
[www.StopSepticOdor.com](http://www.StopSepticOdor.com)

Thank you for visiting us

### AERATORS

Septic Solutions, Inc. We sell linear and rotary vane air pumps, rebuild kits and repair parts. Gast, HiBlow, Secoh, Alita and more! Check out our online store full of septic products at [www.septicsolutions.net](http://www.septicsolutions.net) or 1-877-925-5132. (IM)

We sell Flagg-Air 340, Secoh, Gast and Medo Linear, FPZ and Gast Regenerative, Thomas and Gast Rotary Vane aerators, rebuild kits and alarms at wholesale prices. Septic Services, Inc. [www.septicserv.com](http://www.septicserv.com). 1-800-536-5564. (IM)

### BLOWERS

We sell Roots & Sutorbilt Rotary Lobe blowers. We also sell linears, regenerative, rotary vane aerators and alarm kits. Septic Services, Inc. [www.septicserv.com](http://www.septicserv.com). 1-800-536-5564. (IM)

### BUCKET MACHINES

GRADEBLADE — Convert your toothed bucket to toothless in 60 sec., NO tools needed, fast, inexpensive, fits backhoes, mini-excavators and large excavators. 1-888-372-8933 FREE DVD, literature. [www.gradeblade.com](http://www.gradeblade.com). (P14)

### BUSINESSES

PLUMBING BUSINESS IN BORGER, TEXAS WITH REAL ESTATE. Nineteen years operation. \$150,000. Call Curtis 806-690-2136. Ken Thompson, Inc. Quality R.E. (I4)

### EXCAVATING EQUIPMENT

2004 and 2006 Super Products Mud Dog Hydroexcavators for sale or rent. Call 330-270-9900 ext.3. (P3C4)

### HAND TOOLS

**Crust Busters** - Portable, lightweight machine guaranteed to mix up septic tanks and grease traps! Save time and money! [www.crustbusters.com](http://www.crustbusters.com), 1-888-878-2296. (IM)

### MISCELLANEOUS

FOR SALE: 1,000 gallon dual compartment septic tank form, top pour, excellent condition. \$5,000. Ph: 724-475-4625. (I3)

### POSITIONS AVAILABLE

**SALES ALABAMA:** Plastic Tubing Industries, a manufacturer of Corrugated Plastic Drainage Pipe and the patented Multi-Pipe Drainfield System, is looking for an experienced outside salesperson to call on contractors and wholesalers. We offer competitive salary, commission, expenses. Please visit our Web site at [ptdrainagepipe.com](http://ptdrainagepipe.com) and fax a resume to 407-578-9393. (I3)

### PUMPS

Hydromatic, Zoeller, Liberty, ABS, Myers, Grinder and Effluent pumps. Lift station packages and high water alarms are also available. Septic Services, Inc. [www.septicserv.com](http://www.septicserv.com). 1-800-536-5564. (IM)

### SEPTIC TRUCKS

1990 International, 2500 gal., good runner, A/C, Moro pump, 70 gal. fresh water, clean truck, single axle. \$19,000 OBO. Located in AZ. 928-667-0021. (PTI3)

1985 International, 400 Cummins, 145,000 on inframe, trans. rebuilt, new PTO and Wally pump done by Intl. dealer, 3400 gal., A/C, 70% rubber, good runner. \$22,000. In AZ. 928-667-0021. (PTI3)

It's **EASY** to submit your classified **ONLINE!**  
 Just go to:

**[www.onsiteinstaller.com](http://www.onsiteinstaller.com)**

CLASSIFIEDS

Place A Classified Ad

Fill in the **Online Classified Ad Blank!**

## Positive experiences

After attending the NAWT-sponsored Septage/Grease Trap Waste Treatment Symposium in Harrisburg, Pa., last September, Bob "Pepi" Murrell spearheaded the first Rural Waste Water Treatment Expo during the 2008 Ontario Association of Sewage Industry Services conference. More than 85 members attended.

David Bell from Saxe Law Office in Toronto spoke of the liability issues members could face. According to Bell, the government, by taking away options and offering nothing in their place, has increased the challenges of doing business. "Those in the septage industry are faced with a myriad of liability possibilities: personal injury, failure to comply, and the potential of accidentally causing environmental harm," he says.

Bell encouraged members to perform a business risk assessment and look at their hiring practices. "How you hire, with a contract or with a written or verbal agreement, will have a direct bearing on your liability," he says. Bell also suggested scrutinizing contracts with municipalities. He pointed out the importance of understanding exactly what the agreement says about sampling responsibilities, proving what is in a load, and similar issues. Call Bell at 416/962-5882 or e-mail [admin@envirolaw.com](mailto:admin@envirolaw.com).

## Funding assistance for onsite systems

Onsite or decentralized systems serve more than 25 percent of Missouri households, but funding assistance to individuals or small communities is limited. To help focus State Revolving Funds and other funding efforts for the greatest good, the Department of Health and Senior Services is asking pumpers to identify, quantify, and prioritize the needs in their areas.

The agency is seeking information about the cost of repairing or replacing different types of onsite systems. This will allow the state to

include onsite/decentralized needs in the Clean Watershed Needs Survey. Doing so may lead to increased funding assistance for individuals and small communities. To participate, contact the Onsite Sewage Program at 573/751-6095.

## CALENDAR OF EVENTS

### March 2-5

Ontario Onsite Wastewater Association Conference, Deerhurst Conference Centre, Huntsville. Call 905/372-2722 or visit [www.oowa.org](http://www.oowa.org).

### March 3-5

Minnesota Onsite Wastewater Association Convention, Cragun's Resort, Brainerd. Call 888/810-4178 or visit [www.mowa-mn.com](http://www.mowa-mn.com).

### March 11-13

Northeast Onsite Short Course, Marriott Hotel and Spa, Groton, Conn. Call 978/323-7929 or [www.neiwpcc.org](http://www.neiwpcc.org).

### March 24

Granite State Designers and Installers Association Septic System Conference & Exhibition, Radisson Hotel, Manchester, N.H. Call 603/228-1231 or visit [www.gsdia.org](http://www.gsdia.org).

### April 7-10

National Onsite Wastewater Association Conference, Cook Convention Center, Memphis, Tenn. Call 800/966-2942 or visit [www.nowra.org](http://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](http://www.soil.ncsu.edu), then Training, Short Courses and Workshops.

### May 12-15

California Onsite Wastewater Association Conference and Expo-

sition, DoubleTree Hotel, Sacramento, Calif. Call 707/579-4882 or visit [www.cowa.org](http://www.cowa.org).

## TRAINING & EDUCATION

### Ontario Onsite System Brochure

The Ministry of the Environment and the Ontario Rural Wastewater Centre developed a brochure with information about protecting the environment through the responsible operation and maintenance of onsite systems. Call 416/325-4000.

### Effluent Pumps for Onsite Systems

The Sump and Sewage Pump Manufacturers Association is presenting "Sizing Effluent Pumps for Onsite Wastewater Treatment: Selecting the Right Pump for the Job," a non-credit training program, on March 14 as part of the Illinois Plumbing Heating Cooling Expo at the Drury Lane Conference Center, Oakbrook Terrace. The program is in its certification stage and will become eligible for CEUs. Call Bev Potts at 800/795-7422 or visit [www.ilphcc.com](http://www.ilphcc.com).

### Florida

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

- March 6 – Master Contractor Maintenance
- March 11 – Onsite Systems: How Are They Approved?, northeast Florida (TBD)
- March 12 – Onsite Systems: How Are They Approved?, northwest Florida (TBD)
- March 25 – Work Smart, Not Hard, southeast Florida (TBD)
- March 26 – Work Smart, Not Hard, southwest Florida (TBD)
- April 7-8 – Master III-Basic Florida Soils
- April 9-10 – Master I-System Design and Function
- April 10-11 – Master II-System Materials and Regulation Requirement
- April 22 – Smart Business Practices: Portable Restroom Rental Industry
- April 23 – Septage and Grease in Florida
- May 6 – Smart Business

Practices: Portable Restroom Rental Industry

- May 20-21 – O&M Service Provider Program I, II, III, Miami
- Contact FOWA at 407/830-4381 or [www.fowaonsite.com](http://www.fowaonsite.com).

### Iowa

The Iowa Onsite Wastewater Training Center has the following courses:

- March 17 – Basic 101, Calmar
- March 27 – Media Filters, Indian Hills
- 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](mailto:dahayworth@dmacc.edu).

### Minnesota

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

- March 11-12 – General-Continuing Education, Willmar
- March 14 – Contractor Safety/ Pipelayer Certification, Continuing Education, Mankato
- March 25-26 – Pumping/Maintaining-Continuing Education, Brainerd
- March 31-April 1-2 – Introduction To Onsite Systems, Bemidji
- 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  
Call 800/322-8642 (612/625-9797) or visit [www.extension.umn.edu](http://www.extension.umn.edu).

## Missouri

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

- March 4 – Basics of Onsite Wastewater, El Dorado
- March 5 – Basic Drip Irrigation Design and Installation, El Dorado
- March 13-14 – Advanced Installer, Jefferson City
- March 18-19 – Operation and Maintenance, Sedalia
- March 25-26 – Advanced Installer, Springfield
- March 25 – Troubleshooting, Columbia
- March 26 – Hydraulics, Columbia
- 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

Call 573/526-6095 or visit [www.dhss.mo.gov/Onsite](http://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:

- April 2 – Sediment and Erosion Control Workshop, Raleigh
- April 22-24 – Land Application/Residual Operator, Raleigh
- April 23-25 – Subsurface Wastewater Operator, Raleigh
- 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

Call Joni Tanner at 919/515-1678 or visit [www.soil.ncsu.edu/training](http://www.soil.ncsu.edu/training).

## Pennsylvania

The Pennsylvania Septage Management Association offers the following training on March 19-20 at Grantville:

- Vac-Truck Training and Certification
- Basic Onlot Wastewater Treatment System Inspection
- Advanced Onlot Wastewater Treatment System Inspection
- Basic Onlot Wastewater Treatment System Inspection
- Advanced Onlot Wastewater Treatment System Inspection
- Standards Refresher

New Jersey Septage Management Association members qualify for PSMA member tuition fees. Call Jackie at 610/350-0590 or visit <http://psma.net>.

## Rhode Island

The University of Rhode Island's 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 and 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](http://www.uri.edu/ce/wq).

## 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:

- March 5 – Markup and Profit
- March 13 – Control Panel Wiring
- March 19-20 – Exam Review
- 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](http://www.wossa.org).

## Wisconsin

Wieser Concrete has a six-hour, general continuing education seminar that provides the necessary credits for installers, sanitarians, designers, and others working in the onsite wastewater treatment field,

- March 6 – Shell Lake
- March 13 – Fond du Lac
- March 20 – Wieser Concrete Maiden Rock Facility
- March 27 – Rhinelander

Call 800/325-8456 or visit [www.wieserconcrete.com](http://www.wieserconcrete.com). ■

**Wastewater Treatment Systems**

*Cromaglass*

Since 1965, Cromaglass has provided top-rated wastewater treatment systems. Find out for yourself. Call Cromaglass today.

**(570) 326-3396**  
Fax: (570) 326-6426

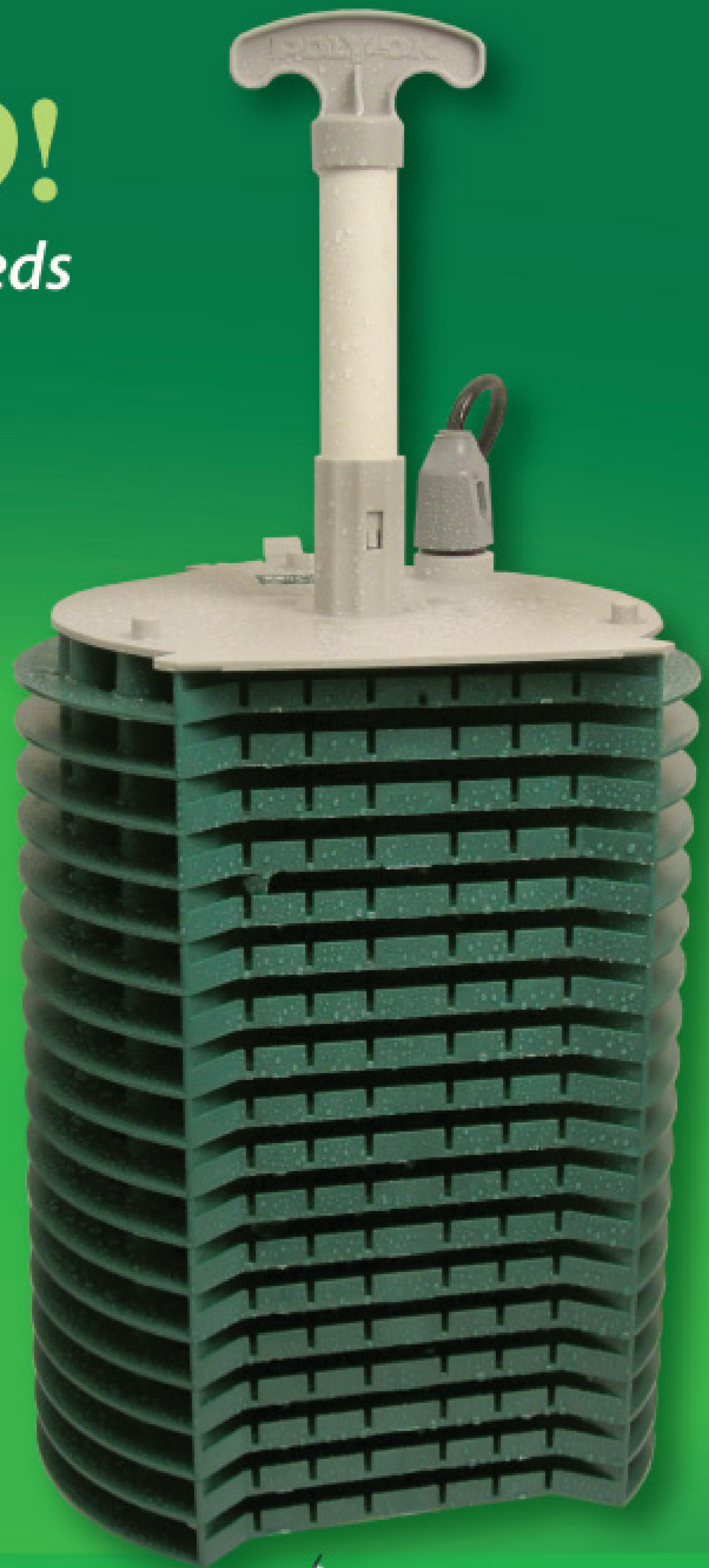
**nature undisturbed**

Cromaglass Corporation • P.O. Box 3215  
2902 N. Reach Rd., Williamsport, PA 17701

163

# Green since 1959!

For all your Onsite Wastewater Needs



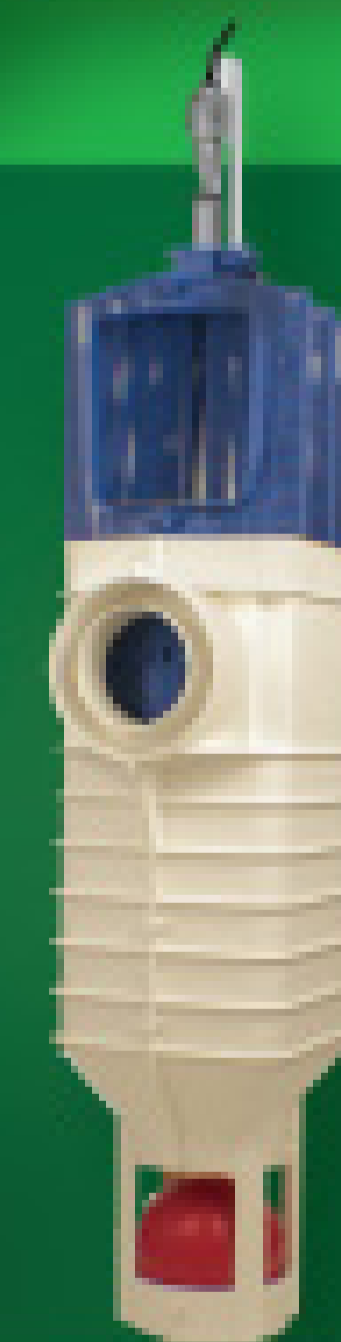
D-Boxes



Heavy Duty Cover and Adapter Ring for Corrugated Pipe



Pump and Filter Alarms



Effluent Filters



Risers



1-800-701-3946

For a Free catalog or to see other products call or visit our website: [www.polylok.com](http://www.polylok.com)

