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O & M Tracking Database Gains a Foothold

One Cape Cod county built its own program to monitor advanced onsite system maintenance. Is this the key to ensuring tip-top performance across the country?

By Jim Kneiszel



A county public health official on Cape Cod in Massachusetts has a vision for better tracking of operations and maintenance of alternative onsite systems throughout his state and beyond, wherever waterways or public health are threatened by failing wastewater systems.

Brian Baumgaertel devised and administers a tracking database for innovative/alternative onsite systems in 14 towns on the Cape. He's hopeful this online project will expand from town to town, providing a means to ensure ever-improving decentralized wastewater technology reaches its full treatment potential over the long haul.

“Unfortunately, there are areas of the country right now that seem to be willing to require folks to install an alternative system but not require that they maintain it. That seems to be an incredible waste of time and money.”

Brian Baumgaertel

A NEW TECH TOOL

Baumgaertel, environmental project assistant for the Barnstable County Department of Health and Environment, responded to my November 2015 column about the State of Minnesota laying a mile-long sewer pipe and spending \$1.3 million to provide a bathroom at a remote boat launch. He agreed that decision-makers often jump to the conclusion that the big pipe is the answer to any wastewater challenge. But he said improved routine performance checks of onsite systems could change a pro-sewer perception.

Since it was started in 2005, the Barnstable County database (septic.barnstablecountyhealth.org) has helped improve onsite system performance by 10 percent by keeping track of O & M contracts, Baumgaertel contends. It automatically alerts health department mandated system inspections and monitoring, allowing service providers to make adjustments for optimal performance.

Too many health departments require O & M contracts for only up to two years, then leave future maintenance of these complex systems up to the discretion of the homeowner, Baumgaertel says.

“We have to abandon the ‘bury-it-and-forget-it’ mentality. There has to

be both an educational and a regulatory component in areas where onsite systems are installed to ensure not only that they are protecting the public health and the environment, but that they are performing to their highest potential,” he says. “Unfortunately, there are areas of the country right now that seem to be willing to require folks to install an alternative system but not require that they maintain it. That seems to be an incredible waste of time and money.”

Started with a U.S. Environmental Protection Agency grant, the Barnstable County project identifies alternative systems and tracks necessary inspections and maintenance as spelled out by each of the participating towns. Each type of system requires different monitoring and sampling, and the service providers log on and report results. The county handles all correspondence regarding systems that are no longer under service contracts or are not performing well. Daily updates red flag systems that are missing scheduled sampling.

COMPLAINTS ARE FEW

The Barnstable County project started with 500 to 600 systems, and now tracks about 2,000. Its 17,000 sample reports and 124,000 influent and effluent sample parameter results represent one of the largest data sets regarding advanced system performance in the country, Baumgaertel says. The local health departments appreciate that they don't have to do the tedious tracking work, and compliance has been good for the most part, he says.

Complaints have been few and are limited to those homeowners most resistant to paying for ongoing maintenance that the towns determine is necessary, he says. O & M contracts can vary in cost between \$200 to \$300 for annual visits and \$1,400 to \$1,600 to cover quarterly inspections and monitoring for large sampling parameters, he says.

“We make a lot of the data we collect public on our website so that homeowners, designers and regulatory officials can make good decisions on the best technology to use, and so manufacturers can see how their systems compare to others in our area,” Baumgaertel says. “In the very near future, we will begin offering database access to system owners so they can check on their system performance, and also set up email and text alerts for when their contracts come due or when their inspections and samples indicate problems. We'll also be providing them with educational materials to help them understand not only why their system was installed, but also the importance of properly maintaining their system.”



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THE BENEFICIARIES

Homeowners may feel the sting of onsite maintenance costs, but the O & M tracking is really doing them a favor in helping them get the most life out of a costly system. Paying a little every year to ensure an onsite system performs properly is a wise investment.

For service providers, the tracking ensures more scheduled maintenance work and helps avoid emergency calls prompted by failure of poorly maintained systems during periods of heavy loading. Homeowners added to the database are given a list of qualified contractors in their area to set up O & M contracts, bringing more work directly to the inspectors/maintainers.

The entire onsite industry benefits from an organized and efficient O & M tracking program. Properly maintained systems last longer, perform better and lead to a general improved perception of decentralized wastewater treatment as a strong, viable alternative to municipal sewer systems. As onsite technology gets its due, industry manufacturers continue to meet new and tougher treatment challenges that expand options for economic development.

And don't forget the environment. Nitrogen in groundwater and sensitive waterways is a big problem. Keeping tabs on advanced systems will minimize nitrogen loading, protecting drinking water and recreational fishing, boating and swimming for generations to come.

WHAT'S NEXT?

Baumgaertel has been reaching out to communities beyond Barnstable County, including some towns in the tourist haven island of Martha's Vineyard. There have been some preliminary discussions at the state level. He sees the potential to use the tracking system anywhere alternative systems are specified to protect water resources. Installers or regulators interested in learning more are invited to reach out to Baumgaertel at bbaumgaertel@barnstablecounty.org.

I hope the industry will take Baumgaertel up on his offer to share what Barnstable County has learned. Installers should advocate for long-term O & M requirements for advanced systems and convenient reporting of results on a database shared with system owners, service providers and regulators. It's the best way to breed confidence and respect for onsite technologies — and maybe discourage a sewer-everywhere mentality. □

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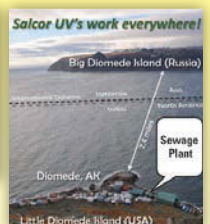
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TOUGH QUESTIONS

Repair or Replace?

A property owner will always ask if you can repair their system. They're looking for the lowest cost option to deal with a problem. Ultimately, there are some questions that need to be asked and answered to determine if a repair is warranted or if a new system is needed. If the repair doesn't solve the problem long term, they might be better served by putting the repair funds toward a new system. Here are some tips to find the best solution.

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Overheard Online

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- *The Pros and Cons of Merchant Cash Advance*
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HITTING THE MARK

Chlorine Testing Tutorial

If you service systems providing chlorine disinfection, you need to know how to test for chlorine levels in both the chlorination and dechlorination processes. Chlorine is toxic to a lot of wildlife and most regulations regarding discharge levels are strict so you need to be confident you are meeting them. Here's a rundown of methods to get you up to speed. onsiteinstaller.com/featured

PLAYING THE GAME

Negotiation Strategy

If you need to hire a new employee, you want to attract someone who is a good fit for both your company and your payroll budget. If you find the perfect candidate but they want a bigger salary, do you negotiate or move on? Here's some advice on how to win the negotiation game.

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A DYNAMIC TIME FOR INSTALLERS

Regulatory changes, diverse sites and soils, and many diversification opportunities bring fresh challenges to the crew at Minnesota's Advanced Septic Solutions

By *Scottie Dayton* | Photos by *Brad Stauffer*

When it came time to embark on a third career, retired U.S. Navy and commercial airline pilot Tom Wirtzfeld sought an occupation that was recession-resistant and kept him close to home for a change.

His startup onsite services company, Advanced Septic Solutions, in Northfield, Minnesota, accomplished those goals and has been a rewarding business ownership experience. In just over a decade, Wirtzfeld has had an impact on the advancing decentralized wastewater industry, built up a company that rewards his loyal employees and helped many customers along the way.

Wirtzfeld had flown patrol aircraft for the U.S. Navy and completed 25 years as an airline pilot before retiring in December 2004. Research into small businesses with strong growth potential led him to the onsite industry. According to the Minnesota Center for Environmental Advocacy, Minnesota has an estimated 535,000 homes and 10,000 businesses using septic systems.

Through membership in the Minnesota Onsite Wastewater Association (MOWA), Wirtzfeld learned about upcoming changes in the septic code. Effective in 2008, the new provisions included inspecting residential systems every three years, advanced treatment systems multiple times a year and large decentralized systems daily. The code also incorporated approved advanced treatment products.



Tom and Bev Wirtzfeld review records in the company office.

<<OPPOSITE PAGE: Technician Nick Simonsen uses a Spectra HR 500 laser level and grade stick while working on a system installation. The company's Kubota KX080-4 excavator is seen in the background.

>>RIGHT: Tom Wirtzfeld, from left, Rice County Parks and Facilities Director Jake Rysavy, Tim Barry and Nick Simonsen address onsite system compliance at McCullough Park in Shieldsville, Minnesota.

"As soon as licensure became law, my people were in the first available classes for them," says Wirtzfeld, who earned his installer, designer, pumper, inspector and service provider licenses in one year. Later, he and employee Paul Simonsen earned wastewater operator Class C licenses.

With the code changes, contractors who refused to adapt went out of business. Advanced Septic Solutions became qualified to do inspections and install ATUs. Soon word-of-mouth and a solid reputation filled the service board to overflowing year-round. "The challenge became to not overextend ourselves," says Wirtzfeld. "Then and now, we turn away work."



"It's important to ask where the husband wants to put his storage shed 12 years from now, or where the wife wants to plant a new tree. Exploring all possibilities is time well-spent because it helps customers make informed decisions."

Tom Wirtzfeld

MAINTENANCE RULES

Wirtzfeld's home, abutting three counties, is a prime location to mine for customers. A 2013 inventory in Rice County identified 600 properties with noncompliant systems, many with wet wells or straight pipes. "It's safe to assume that Dakota and Scott counties have similar situations," he says. "That's a lot of work."

Wirtzfeld strives to bring the most value to projects instead of the lowest bid. As the Minnesota Pollution Control Agency (MPCA) approved advanced treatment technologies, he and other employees became certified installers of AdvanTex pods (Orenco Systems), PuraFlo peat biofilters (Anua), FAST units (Bio-Microbics), sequencing batch reactors (CromaFlow Inc), Multi-Flo units (Consolidated Treatment Systems), E/One grinder pump stations (Environment One Corporation) and the Ecopod series (Delta Environmental Products/Pentair Flow Technologies).

"I'm not a distributor because no matter how good technologies are in certain circumstances, they are not a one-size-fits-all panacea," says Wirtzfeld.

Advanced Septic Solutions, Northfield, Minnesota



OWNERS:	Tom and Bev Wirtzfeld
YEARS IN BUSINESS:	11
EMPLOYEES:	5 to 9 seasonally
SERVICES:	Onsite system design and installation, system inspections, operations and maintenance, septic pumping
TERRITORY:	200 square miles
WEBSITE:	www.advsepsol.com

"I want unrestricted access to the best solution for every site, and it will not always be the same product."

Wirtzfeld fulfills manufacturers' two-year service agreements and has not lost a contract renewal. "Once owners understand they have a large investment in advanced treatment technology, and it has worked perfectly for 24 months because of routine maintenance, they continue the service," he says. In 2015, the company had 400 homes under contract, but its major maintenance effort is the long-standing operation of 13 decentralized systems in rural communities, schools and golf courses.



The crew at Advanced Septic Solutions includes, from left, John Fink, Nick Simonsen, Tom Wirtzfeld, Paul Simonsen and Tim Barry. They're shown in the company shop with a Ditch Witch JT20 horizontal directional drill.

Employing Bluetooth technology

Tom Wirtzfeld measures success by how many problems he solves or customers he helps. He designs onsite systems for golf courses, resorts or campgrounds, schools and other businesses. His company, Advanced Septic Solutions in Northfield, Minnesota, installs basic and advanced treatment systems. With the frost line at 3 feet or deeper, workers must insulate all the tanks and piping.

Wirtzfeld's solutions often include the latest technology. A recent 3,000 gpd replacement system for Afton-Lakeland Elementary School in Lakeland, Minnesota, was the first he designed with wireless telecommunication. Major components are:

- 2,000-gallon concrete grease interceptor (precast tanks from Wieser Concrete)
- 1,500-gallon dose tank
- Two 6,000-gallon single-compartment septic tanks
- Two AdvanTex AX100 treatment pods (Orenco Systems)
- 6,000-gallon equalization tank
- 2,000-gallon dose tank
- TCOM custom control panel with touch screen (Orenco) and Bluetooth communication

Alternating pumps in the second dose tank send effluent 25 feet through 2-inch Schedule 80 PVC pipe to an automatic distribution valve. The valve feeds five zones, each with two 95-foot-long chambered (Infiltrator Water Technologies) trenches discharging effluent through 2-inch perforated Schedule 40 pipe.

"The installation took a month and included a 283-foot-long directional bore under trees, sidewalks and a parking lot using our Ditch Witch (JD20) machine," says Wirtzfeld. "We also poured pads for the control panel and vent blower. The Bluetooth adaptor plugs into the panel, enabling a wireless connection to Bluetooth-enabled computers." Wirtzfeld chose this technology because he says it's more reliable for real data transfer than voice Internet phone service, and Bluetooth uses Verizon cellphone technology, readily available in most locations.

In Minnesota, onsite systems larger than 10,000 gpd require a National Pollutant Discharge Elimination System (NPDES) permit and a Class C or D (lowest) licensed operator for plants with subsurface discharge. Wirtzfeld or Simonsen visits those systems twice a month, spending two hours checking components, adjusting active drainfields and pulling samples.

INSPECTION LAW

Besides maintaining onsite systems, Wirtzfeld's team also inspects them for various clients. "We were one of three companies (in 2015) each inspecting 48 systems for the Town of Randolph in Dakota County," he says. "The number of viable systems would help determine if the community was a candidate for a decentralized system."

When point-of-sale inspections became law, Wirtzfeld networked with Realtors to perform them, test well water and repair systems. Brokers invited him to meetings to explain inspections and sway the opposition. "Once audiences understood the process, I talked about hydraulic capacity and how adding two bedrooms to a system designed for only three affected treatment and the drainfield," he says. "It made believers out of them."

Today, the company averages 60 inspections annually. Wirtzfeld's biggest job is educating people about their expectations, especially when the seller wants to provide a Yugo of a system and the buyer wants a Lexus. "By explaining the scope of work, I help establish what the seller will pay and how much the buyer must kick in to achieve his goal," he says. "Then I advocate the best solution, often a Ford of a system."

Wirtzfeld also earned his advanced designer license, enabling him to design systems up to 10,000 gpd and assist engineers with

(continued)

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Tom Wirtzfeld starts the day by reviewing the details of a project with Paul Simonsen.

systems greater than 10,000 gpd. Because of the state's complex and area-specific soils — everything from pure sand to dense clay and glade (soil 12 inches deep or less over limestone or dolomite) — his license renewal includes six hours of soils work every three years. For challenging sites, Wirtzfeld hires licensed soil scientist Terry Bovee.

COMPLEX SITUATIONS

Soils aren't the only thing to perplex Wirtzfeld. Difficult clients bring their own complications, but the worst situation he ever faced was a woman accustomed to having her own way. "She insisted the system be put 'here,' but here was in the middle of a wetland," he says. "Finding an acceptable location became my most frustrating business experience because her attitude never changed."

Another challenge Wirtzfeld confronts is convincing owners to have their land surveyed when the records are absent. "Some people insist emphatically that they know where the property lines are," he says. "If they argue with me for too long, I walk away from the job." Most clients relent, including the one whose lot lines were 40 feet off from where he thought they were.

For new systems, Wirtzfeld insists on walking the property with customers and discussing long-term site planning during the early design phase. "It's important to ask where the husband wants to put his storage shed 12 years from now, or where the wife wants to plant a new tree," he says. "Exploring all possibilities is time well-spent because it helps customers make informed decisions."

On the regulatory scene, Wirtzfeld's greatest challenge is jurisdiction. After the state passes a new septic code, counties have a year to enforce it, then townships have another year to accept it. "I spend a lot of time checking which county I'm in, whether I'm in the orange, yellow or lavender rule book, and what day it is to keep up with townships when they enact an ordinance," he says. "Our code is cumbersome and inflexible."

Consequently, Wirtzfeld joined the MOWA legislative committee, which works with the MPCA and receptive legislators to affect change. Issues on the table include nitrogen standards, the half-mile rule for common ownership, seven-day averaging to determine a system's hydraulic capacity, seasonal use exemptions and an appeal process.

NEW OPPORTUNITIES

While working for legislative changes, Wirtzfeld slowly changed the direction of his company. Since 2010, he has focused less on residential work and more on complicated systems with flows from multiple buildings. Four or five times a year, such projects required horizontal directional boring. Wirtzfeld subcontracted the work, then purchased the JT20 Ditch Witch machine from that contractor. "When word got out we had it, a bunch of jobs came in," says Wirtzfeld.

The most interesting project happened in the last weeks of January 2013. The owners of White Bear Lake Yacht Club were adding a pavilion and swimming pool with showers, and hired Wirtzfeld to determine and install the tankage. Effluent would discharge to a central main handling

seven other onsite systems. The nearest junction was 138 feet from the pavilion, and the route to it traversed fairways and greens belonging to the club's golf course.

"It took three days for insulated, heated blankets to thaw the areas for excavating the drill's entrance pit and exit pit," says Wirtzfeld. "The bore team drilled 8 to 10 feet below the lake's water table, pulling a 4-inch sleeve for the 2-inch discharge pipe."

Meanwhile, other workers excavated through 3 or more feet of frost to set 21,000 gallons of tanks. To improve treatment, Wirtzfeld specified micro (0.25 mm) bubble diffusion aerators (Schaus-Vorhies Water Treatment, sourced from WEXCO Environmental). "The pounds of treatment produced by the oxygen transfer rate – typically 10 to 27 pounds/horsepower-hour – give an incredible bang for the buck," he says. "Especially if three-phase power is available." The course opened on time that spring.

LOOKING FORWARD

Working year-round, especially during brutal Minnesota winters, challenges workers and machines. To maintain and protect them from the elements, Wirtzfeld built a 60- by 160-foot shop with four heated bays near his 300-acre home site. He built a 76- by 32-foot heated building to store a Ford LT 9000 vacuum truck with 4,200-gallon steel

"Once owners understand they have a large investment in advanced treatment technology, and it has worked perfectly for 24 months because of routine maintenance, they continue the service."

Tom Wirtzfeld



Technician Nick Simonsen fuels a Crust Buster tank agitator in the company yard.

tank, Masport pump and carrying a Crust Buster tank agitator; Ford F-800 with a Mongoose jetter and 6,000-gallon water tank; Volvo dump truck with a Henderson box; and Ford 1-ton dump truck with an Anthony box.

Wirtzfeld converted a 60- by 88-foot sheep barn to store supplies and a John Deere 400 backhoe, Bobcat T200 skid-steer, Takeuchi TB 135 excavator, Kubota SVL 90-2 compact track loader and KX 80 excavator, and the directional boring machine. "Much of the equipment is old but reliable," he says.

Equipment constitutes half of a business' success. Wirtzfeld ensures his employees like where they work, providing benefits including a 401(k) retirement plan. In 2013, he sweetened the pot by beginning an IRS-approved cash balance retirement plan. "It's a benefit for my five full-time employees, some of who have been with me for eight of our 11 years," he says. Further, to


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A Spectra HR 500 laser level is shown in the foreground as Tom Wirtzfeld, Tim Barry and Nick Simonsen use Kubota equipment during a system installation at McCullough Park in Shieldsville, Minnesota.

ensure seasonal workers return, Wirtzfeld offers wage increases for each additional season of service.

Having prepared well to seize business opportunities, Wirtzfeld now prepares for the next milestone in his life. December 2015 marked his 65th birthday, and within a year

he intends to semi-retire. "Working 70- to 80-hour weeks has become too challenging for my wife, Bev, and me," he says. "Therefore, we're grooming our employees to carry on the business. We have sufficient depth of bench that they could take over today." □

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Do You Need a Rolling Workbench/Warehouse?

Full- and midsize cargo vans may be the answer to haul parts and tools to the job site and give you a warm, dry place to keep your on-location projects moving along

By Ed Wodalski

Tired of working in the snow and rain? Do you find yourself tripping over parts and tools? Need more power for towing or room for stowing? Perhaps it's time you parked your pickup, moved up to a full-size cargo van or stepped into a new midsize Mertis.

Already established as a go-to service vehicle, cargo vans offer indoor comfort, carrying capacity and overall convenience that make them a smart choice for installers looking to bring a work space and organized parts supply to any job site.

Ready to kick some tires? Here's a look at some of the new models for 2016:

FORD TRANSIT

Let's start with 2015's top-selling Ford Transit. New for 2016 is a dual-sliding door option, available on its medium- and high-roof models. Delivering the most flexibility in its class, the Transit offers 58 vehicle configurations in 2016, up from 47 on 2015 models, along with a variety of wheelbases and body lengths to match your business needs:

- 130-inch wheelbase, 126-inch load floor with low (83.6 inches) and medium (100.8 inches) roof heights
- 148-inch wheelbase, 143.7-inch load floor with low, medium and high (110.1 inches) roof heights
- 148-inch wheelbase/extended body, 172.2-inch load floor with high (109.4 inches) roof height

The Transit's cargo volume ranges from 246.7 cubic feet (regular wheelbase and low roof) to 487.3 cubic feet (long wheelbase/extended and high roof) with a payload capacity ranging from 3,060 pounds (single rear wheels) to 4,560 pounds (dual rear wheels, 148 inches extended). Ladder racks on the roof can carry up to 420 pounds. Maximum GVWR is 10,360 pounds with a maximum towing capacity of 7,500 pounds.

Engine options include standard 3.7L Ti-VCT V6 with advanced twin independent variable cam timing, 3.5L EcoBoost or 3.2L Power Stroke turbo



The Ford Transit offers a dual sliding door option on its medium- and high-roof 2016 models.

diesel. The 3.7L V6 Transit is also available with a compressed natural gas (CNG)/propane gaseous engine prep package that includes hardened exhaust valves and valve seats for improved wear resistance and durability.

MERCEDES-BENZ MERTIS

The new kid on the block for 2016 is the midsize Mertis. The van has been available in Europe since 1996 and joined the U.S. market in October. The Mertis has a starting MSRP of \$28,950 and is powered by a four-cylinder gasoline engine (208 hp/258 ft-lbs) with an optional ECO Start/Stop mated to a 7G-Tronic seven-speed automatic transmission.

- Wheelbase: 126 inches
- Cargo volume: 186 cubic feet
- Payload capacity: 2,502 pounds
- Towing capacity: 4,960 pounds
- Length: 202.4 inches
- Width: 88.3 inches (including mirrors)
- Height: 75.2 inches
- Maximum roof load: 331 pounds
- GVWR: 6,724 pounds

SPRINTER

The time-tested Sprinter has more airbags and a smaller fuel tank (24.5 gallons) in 2016 but otherwise remains basically unchanged. Both the Mercedes-Benz and Freightliner 2500 and 3500 models are available with a 144-, 170- and 170-inch extended wheelbase.

All 3500 models (9,990 GVWR [standard]; 10,140 and 11,030 GVWR) feature dual rear wheels with optional high roof (144-inch wheelbase) and super high roof (170-inch and 170-inch extended wheelbase).

Engine options include the 2.1-liter, four-cylinder BlueTEC turbo diesel with seven-speed automatic transmission (standard) and 3.0-liter V6 BlueTEC turbo diesel with five-speed automatic.



The midsize Mertis from Mercedes-Benz enters the U.S. market as a complement to its big brother, the Sprinter.

(continued)

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Model 2500 (GVWR 8,550 pounds)

- Length: 233.3-289.8 inches
- Height: 94.5-114.3 inches
- Width: 95.5 inches (with mirrors)
- Maximum payload: 3,512 pounds (standard)
- Maximum interior height (no trim): 66.6-87.3 inches
- Towing capacity: 5,000 pounds

Model 3500 (9,990 GVWR)

- Length: 233.3-289.8 inches
- Height: 107.3-115.4 inches
- Width: 95.5 inches (with mirrors)
- Maximum payload: 4,456 pounds (standard)
- Maximum interior height (no trim): 77.8-87.3 inches
- Towing capacity: 7,500 pounds (standard); 5,000 (170-inch extended models)

Model 3500 (10,140 GVWR)

- Length: 233.3-289.8 inches
- Height: 107.3-115.5 inches
- Width: 95.5 inches (with mirrors)
- Maximum payload: 4,750 pounds (standard)
- Maximum interior height (no trim): 77.8-87.3 inches
- Towing capacity: 7,500 pounds (standard); 5,000 (170-inch extended models)

Model 3500 (11,030 GVWR)

- Length: 233.3-289.8 inches
- Height: 107.3-115.4 inches
- Width: 95.5 inches (with mirrors)
- Maximum payload: 5,507 pounds (standard)
- Maximum interior height (no trim): 77.8-87.3 inches
- Towing capacity: 7,500 pounds (standard); 5,000 (170-inch extended models)

NISSAN NV

Nissan offers three models of cargo vans (NV1500, NV2500 HD and NV3500 HD). Power options range from the 261 hp (281 ft-lbs) 4.0-liter V6 offered on the standard roof NV1500 to the 317 hp (385 ft-lbs) 5.6-liter V8 offered on the NV3500 standard or high roof.



Nissan's power options range from the 261 hp 4.0-liter V6 offered on the standard roof NV1500 to the 317 hp 5.6-liter V8 offered on the NV3500.

Model NV1500 (8,550 GVWR)

- Length: 240.6 inches
- Width: 99.5 inches (with mirrors)
- Height: 83.9 inches (standard roof)
- Maximum payload: 2,752 pounds; 2,645 (SV)
- Cargo volume: 299.7 cubic feet
- Towing capacity: 7,000 pounds

Model NV2500 (9,100 GVWR)

- Length: 240.6 inches
- Width: 99.5 inches (with mirrors)
- Height: 83.9 inches (standard roof); 105.5 (high roof)

- Maximum payload (standard roof, V6): 3,301 pounds (S); 3,159 (SV); 3,144 (SL)
- Maximum payload (standard roof, V8): 3,144 pounds (S); 3,002 (SV); 2,987 (SL)
- Maximum payload (high roof, V6): 3,138 pounds (S); 2,996 (SV); 2,981 (SL)
- Maximum payload (high roof, V8): 2,991 pounds (S); 2,849 (SV); 3,783 (SL)
- Cargo volume: 234.1 cubic feet (standard roof); 323.1 (high roof)
- Towing capacity: 7,000 pounds

Model NV3500 (9,900 GVWR)

- Length: 240.6 inches
- Width: 99.5 inches (with mirrors)
- Height: 83.9 inches (standard roof); 105.5 (high roof)
- Maximum payload (standard roof, V8): 3,937 pounds (S); 3,795 (SV); 3,780 (SL)
- Maximum payload (high roof, V8): 3,783 pounds (S); 3,641 (SV); 3,626 (SL)
- Cargo volume: 299.7 cubic feet (standard roof); 420.5 (high roof)
- Towing capacity: 7,000 pounds

CHEVROLET EXPRESS

The 2016 Chevrolet Express features a 4.8-liter Vortec V8 gasoline engine with optional 6.6-liter, Duramax turbo-diesel V8 that delivers 260 hp and 525 ft-lbs of torque, as well as a CNG option (282 hp/320 ft-lbs). Mated to the Hydra-Matic six-speed automatic transmission (standard), the Express is offered in regular (135-inch) and extended (155-inch) wheelbase models.



The 2016 Chevrolet Express delivers 10,000 pounds of towing capacity.

New for 2016 is OnStar 4G LTE connectivity with Wi-Fi hotspot that connects to seven devices and navigation radio with Chevrolet MyLink infotainment system.

Model 2500 (8,600 GVWR)

- Length: 224 inches; 244 (extended)
- Width: 79.2 inches
- Height: 84.6 inches; 84.3 (extended)
- Maximum payload: 3,247 pounds; 3,013 (extended)
- Cargo volume: 239.7 cubic feet (regular wheelbase)
- Towing capacity: 10,000 pounds

Model 3500 (9,600 GVWR)

- Length: 224 inches; 244 (extended)
- Height: 84.5 inches; 84.1 (extended)
- Width: 79.2 inches
- Maximum payload: 4,120 pounds; 3,899 (extended)
- Cargo volume: 284.4 cubic feet (extended)
- Towing capacity: 10,000 pounds

FIAT-CHRYSLER RAM PROMASTER

The 2016 Ram ProMaster (1500, 2500 and 3500 models) features front-wheel drive and 4,420 pounds of payload capacity. The 1500 is available in low-roof and high-roof options with 118- and 136-inch wheelbases. The 2500 high roof is available with a 136- and 159-inch wheelbase, while the

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3500 high roof is available with a 159-inch wheelbase and 159-inch extended wheelbase.

A 3.6-liter, 24-valve V6 gasoline engine with six-speed automatic transmission is standard on all models with a 3.0-liter ECO diesel option.



The 2016 Ram ProMaster features class-exclusive front-wheel drive and 4,420 pounds of payload capacity.

Model 1500 (8,550 GVWR)

- Length: 195 inches (118 wheelbase); 213.1 inches (136 wheelbase)
- Width: 82.7 inches
- Maximum payload: 3,990 pounds (low roof, 188-inch wheelbase); 3,920 (low roof, 136-inch wheelbase); 3,810 (high roof, 136-inch wheelbase)
- Towing capacity: 5,100 pounds

Model 2500 (8,900 GVWR)

- Length: 213.1 inches
- Width: 82.7 inches
- Maximum payload: 4,130 pounds
- Towing capacity: 5,100 pounds

Model 3500 (9,350 GVWR)

- Length: 236 inches; 250 inches (159-inch wheelbase extended)
- Width: 82.7 inches
- Maximum payload: 4,420 pounds
- Towing capacity: 5,100 pounds

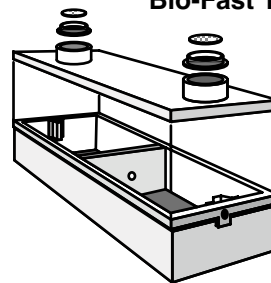
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More sophisticated wastewater systems will improve health of Alaska citizens

By Doug Day

With presentations from three remaining teams, the Alaska Water and Sewer Challenge has moved into its third phase of a multiyear project aimed at eliminating "honey buckets" (hand-carried pails) in the state's rural communities. According to the project's website (watersewerchallenge.alaska.gov), the Alaska Department of Environmental Conservation began the project in 2013 to "spur worldwide research to develop innovative and cost-effective water and sewer systems for homes in remote Alaska villages. The project focuses on decentralized water and wastewater treatment, recycling and water minimization."

More than 3,300 rural homes have no running water or flush toilets, with many using buckets to collect human waste and carry it to community sewage lagoons. A 2010 study found higher rates of invasive pneumococcal disease (IPD) among Alaskan children who did not have access to piped water. IPD is a serious bacterial infection that can affect the brain, blood and lungs, and residents of southwest Alaska suffer rates among the highest in the world.

Funding for prototype development and pilot lab testing will be awarded to three of the six teams that presented detailed proposals. Results of the testing will be presented in fall 2017. Those that meet the performance targets will be provided further funding, followed by field testing and technology improvement.

The final three teams are:

DOWL Alaska (engineering firm) — Water and wastewater holding tanks located in a small vestibule attached to the house to minimize space requirements in the home and avoid the use of expensive heat trace to a separate holding tank outside the home. The pilot system will be set up in Fairbanks at the Cold Climate Housing Research Center.

Summit Consulting (engineering firm) — Treatment of raw water by means of a two-stage cartridge filtration process followed by ultraviolet disinfection, which allows flexibility to treat a wide range of raw water quality. The pilot system will be set up at the company's main office complex in Tok.

University of Alaska Anchorage (UAA) — Recycle both graywater and some black water, as well as the use of a modular approach that will allow homeowners to select in-home components that fit their lifestyles and space available. UAA's pilot system will be set up on the school's Anchorage campus.

CANADA

The failure of a referendum in a British Columbia community has officials wondering what will happen next with septage. It started in 2014 when the City of Fort St. John announced it was closing its septage receiving facility because several illegal dumping cases threatened the city's treatment system. Septage has become a problem in recent years due to an increase in waste from oil drilling worker camps. Many of the trucks carrying septage

are also used to haul chemicals for oil operations that can harm sewage treatment plants.

In response, the 46,000-square-mile Peace River Regional District (PRRD), located northwest of Calgary, began planning for new septage receiving stations to serve its rural residents and worker camps. The City of Dawson Creek also built a \$3.5 million trucked waste facility at its municipal wastewater treatment plant.

Last fall, a referendum to fund operations at a newly opened (PRRD) receiving station in Charlie Lake failed. It would have levied a tax of 11.4 cents per \$1,000 of assessed improvements to properties. Operations will have to be funded through user fees, expected to be high because of the small pool of users. That may cause many people to take their septage to Dawson Creek, posing capacity problems and increasing operating costs.

IDAHO

Several updates to onsite wastewater rules are being considered in Idaho. The Department of Environmental Quality says revisions will cover easements for when septage is stored, treated or disposed of on property other than where it originated, minimum recommendations for intermittent filter dosing and constructed wetlands used for secondary wastewater treatment.

MINNESOTA

The Minnesota Pollution Control Agency is offering \$270,000 in grants to improve or replace old diesel engines to reduce their impact on the environment. Since 2006, the MPCA Clean Diesel program has reduced emissions equivalent to taking 750,000 cars off the road.

The grant requires the vehicle owner to cover 60 percent of the cost of upgrading or replacing a diesel engine, or 75 percent of the cost of replacing a truck or piece of construction equipment. Vehicles to be upgraded must be fully operational, and if the engine is replaced, the old engine must be permanently disabled. The agency says it has completed projects on more than 1,800 school buses along with garbage trucks, tanker trucks, construction cranes and delivery trucks.

MISSOURI

Ozarks Water Watch has received a second \$1 million grant from the Missouri Department of Natural Resources to replace and repair failing septic systems in the White River watershed that feeds the Lake of the Ozarks. Under a previous grant, 130 systems were repaired or replaced. Homeowners can get up to \$25,000 with half being in the form of a grant and the other half a no-interest loan. With the new grant money and loans, 200 systems are expected to be repaired or replaced in this round. New is a \$50 rebate to help with septic system pumpouts.

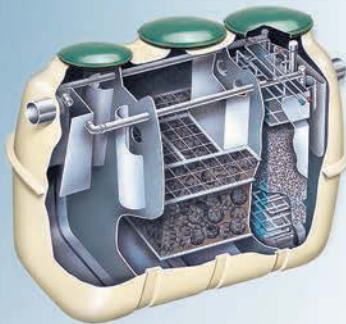
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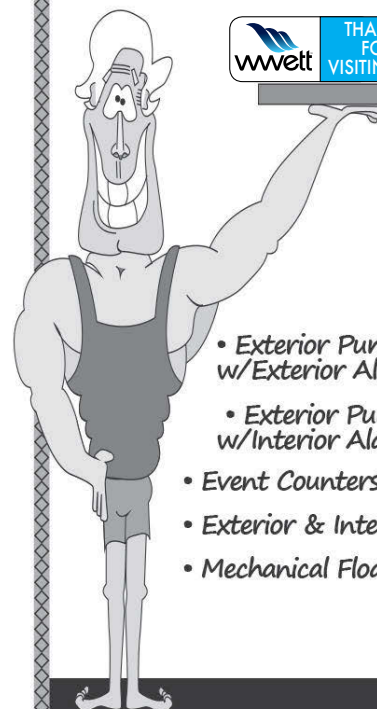
OREGON

While food carts in the state are licensed by local health departments, removing and hauling their wastewater requires a license from the Oregon Department of Environmental Quality, according to a reminder posted on the agency's website. That's because such a license is required to pump or haul wastewater that is defined as sewage; "water-carried human and animal wastes, including kitchen, bath and laundry wastes from residences, buildings, industrial establishments or other places." Portland has more than 500 such carts, according to Food Carts Portland. □

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Grease is the Catalyst for a Full System Replacement

A team of onsite professionals builds and connects a new septic system to a Missouri school and students don't even miss a beat

By David Steinkraus

Shelterwood Academy had a grease problem, and that led to a septic problem, and that led the Missouri school to seek help from Residential Sewage Treatment Company.

The school has been around since the 1980s and provides Christian-based therapy for troubled teens. Its wastewater system is more recent, although Jason Vaughn of Residential Sewage is not sure how old it is. The old system consisted of six septic tanks, a drainfield and no grease trap. (One was installed after the problem was discovered.) As grease plugged the drainfield, water began appearing on the surface of the ground, and that led the school to look at a new wastewater system. In the meantime, they used the old one and had the tanks pumped.

"As we worked on a new system, we also thought about using the existing septic tanks, but when Udell investigated their condition he discovered they were leaking, so he collapsed all six," Vaughn says. Udell is installer Udell Dooley of Dooleys Backhoe Service in Raymore, Missouri.

Still, the old system provided one convenience: a manhole where all

SYSTEM PROFILE

Location:	Independence, Missouri
Facility served:	Shelterwood Academy
Designer:	Residential Sewage Treatment Company, Independence, Missouri
Installer:	Dooleys Backhoe Service, Raymore, Missouri
Type of system:	Time-dosed LPP
Site conditions:	Sandy soil
Hydraulic capacity:	3,000 gpd



<<OPPOSITE PAGE: As drainfield installation continued, Udell Dooley ran the Case backhoe while George Montgomery backfilled a trench with the John Deere skid-steer. After a trench was dug, another worker spent all his time clearing old tree roots, which are visible in the photo.

ABOVE: The electrical building at Shelterwood Academy not only has a flashing red light to warn of wastewater system problems, but it also has a buzzer to attract attention. To the right rear of the building is the 7,700-gallon pump tank, and visible on top of it is the custom-made concrete box that holds the drainfield distribution manifold.

>>RIGHT: A beige box behind Shelterwood Academy holds a backup generator. The generator's propane tank is out of the picture, and all the generator controls are in the gray building at left, which also holds the control panel for the wastewater system. Between the generator and a school building are two Polylok risers that mark the location of a pair of 2,000-gallon pretreatment tanks.



“We figured service would be much easier if we put all the valves in one box. The problem was we needed a really big box. No one makes a box that large, so we decided to make it ourselves.”

Jason Vaughn

the pipes came together from the five buildings in the school complex. It was a simple matter to cut off the old system and splice in the new one — except it wasn't quite that simple because Dooley had to find a quiet time early in the morning to make the switch when no one was using the wastewater system.

COMPONENTS

The solution Residential Sewage came up with uses:

- Two 2,000-gallon concrete septic tanks from SI Precast in Grandview, Missouri
- A model 9.0 FAST unit from Bio-Microbics
- A 9,100-gallon concrete tank from Wieser Concrete of Roxana, Illinois
- A 7,700-gallon concrete tank from Wieser
- Two Zoeller Model 189 pumps
- Two Sim/Tech Filter pressure filters
- 3,110 feet of EZflow media from Infiltrator Water Technologies
- Polylok risers and lids on the 2,000-gallon tanks and EZset risers and lids on the 7,700- and 9,100-gallon tanks

UP THE HILL

From the collection point in the manhole near the school buildings, wastewater runs by gravity through 150 feet of 6-inch Schedule 40 PVC pipe to a pair of 2,000-gallon septic tanks connected in series by 6-inch pipe and spaced 10 feet apart. These provide primary treatment and settling.



Half of the concrete tank for the Bio-Microbics FAST unit is in place at Shelterwood Academy in Missouri. The tank has a seam with a tongue and groove and was sealed with standard mastic.

From the second tank, water flows 26 feet through 4-inch Schedule 40 PVC into the Bio-Microbics unit enclosed in the 9,100-gallon concrete tank. Another 10-foot run of 4-inch pipe takes treated water to the 7,700-gallon concrete pump tank. The pair of Zoeller submersible pumps pushes water through two Sim/Tech pressure filters and then 2-inch Schedule 80 PVC pipe uphill about 18 feet to the drainfield.

Feed lines for the drainfield come from a 27- by 76- by 38-inch concrete box placed directly on top of the pump tank. The box came from Allied Concrete, a subsidiary of Residential Sewage. “We figured service would be much easier if we put all the valves in one box. The problem was we needed

Mike Wilcox works on one of the drainfield zones. Because the slope of the ground was so great, each zone had to be split into subzones to ensure there was enough water pressure to fill all the laterals. A Spectra laser level is in the background.

a really big box. No one makes a box that large, so we decided to make it ourselves,” Vaughn says.

To match the contour of the ground, the drainfield is split into seven zones, and the feed line for each zone is further divided in half so there is sufficient pressure to fill every lateral to its end. Zones varied in length from 400 feet to 520 feet. All the laterals were made of a 1-inch pipe placed inside a 4-inch perforated pipe wrapped with EZflow.

The system is controlled with an Alderon panel. It is mounted in an electrical building that also holds controls for a backup generator. That was required by the Missouri Department of Natural Resources, Vaughn says. The generator system was installed by an electrician hired by the school, but Vaughn took advantage of the building, too. Although the Alderon panel has a port for a USB drive to collect data about the system, it does not provide remote notifications of problems. So the outside of the electrical building has a flashing red light and a buzzer to attract attention if there is a problem with the system.

INSTALLING ON THE SLOPE

In between rains, the job went fairly smoothly. But first Dooley had to wait for the soil to dry out so he could get on the ground, especially to install the drainfield. “That hill is really steep. It’s not very high, not more than 18 feet, but there was about an 18 percent slope on that hillside,” he says.

He did the job with a backhoe mounted on a tractor. “We don’t have a track backhoe, so I’m very used to digging on slopes,” he says. He put in trenches with the Case 580 Super L backhoe, and one of his guys came along behind and backfilled with the John Deere 322 skid-steer.



The Bio-Microbics FAST system includes this Gast Regenair blower model R6150J-2 cfm open 60/50 Hz: 215. The chamber holding the unit is vented with a single 6-inch pipe.

Another worker was involved, too, and a fair amount of his time was taken up with the other challenge: tree roots. The project was delayed about six months by the Missouri Department of Natural Resources permitting process. During that time another company cut down all the trees that covered the hill where the drainfield is sited. But they didn’t clear the roots. “Every time Udell would dig a trench, he needed one guy working full time to clear the old roots out of the way,” Vaughn says.

Once the project was complete, school maintenance workers seeded the hill with grass. The only task remaining for Residential Sewage was to add some insulation to the valve box so it doesn’t freeze during winter. With 18 feet of height, any water remaining in the laterals will rapidly drain back to the pump tank.

After more than 30 years, Shelterwood Academy is now equipped with a wastewater system that will let the school staff give their full attention to their primary job: helping the children in their care. □

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The Nuts and Bolts of Pressure Distribution

For more than 40 years, system designers have sought to perfect effluent dispersal by controlling dosing to the soil treatment area

By Jim Anderson and David Gustafson

In the past year we have discussed installation of pressure distribution systems and there have been a few comments and questions, so we will briefly revisit the topic. If you came in late on some of the discussion, here is a review of some attributes of pressure distribution:

Pressure distribution has been a part of the onsite sewage treatment system picture for over 40 years. It was used in mound systems installed in 1971 in Wisconsin and it was taught in classes for onsite professionals in Minnesota as early as 1972. It was somewhat slow to catch on but now it is a part of final soil dispersal areas and a number of media filters as well. Anyone working in the profession now needs to know about and understand pressure distribution.

If properly designed and operated, pressure distribution provides an aerobic environment in the soil, avoiding development of the biomat and allowing for efficient treatment.

True pressure distribution is where effluent is delivered uniformly to multiple points through a distribution network of pipes; it can be low pressure as in mound or at-grade systems, or high pressure as is the case with drip systems.

TIMING IS EVERYTHING

Pressure distribution systems substitute for the biomat to deliver effluent across the entire soil treatment area. A pump is used to control the application on demand, where effluent is pumped as water is used in the residence, or using a timer to spread the flow out more evenly during the day. If properly designed and operated, pressure distribution provides an aerobic environment in the soil, avoiding development of the biomat and allowing for efficient treatment.

By applying effluent uniformly over the area and maintaining oxygen, the vertical flow through the soil remains unsaturated and reduces the development of the biomat as aerobic organisms are present to break down the organic component of the waste. The more even the effluent is distributed, the better the treatment, with less chance of certain areas of the system being overloaded leading to less efficient treatment.

The designer and installer are balancing the desire for equal distribution

across the area as well as distributing the effluent throughout the day. Designs should allow for resting periods between applications. This gives the soil time to recover and operate efficiently in terms of treatment.

The original mounds we designed and worked on in Minnesota called for four equal applications during the day. That way any single dose to the system would be no more than 25 percent of the average daily flow. So for a 600 gpd system, the maximum dose volume to the mound bed would be 150 gallons. This would theoretically mean the doses would be spread out during the day with more uniform application, resulting in more consistent oxygen levels and better treatment.

TARGET USAGE SPIKES

However, these were on-demand systems. So when does the majority of water get used in a house? Of course, during the week it's in the morning when everyone gets up and goes off to school or work, and then again in the evening when everyone is home. Laundry typically gets done all in one day whenever there is time off. So the idea that effluent is being evenly distributed over time is not quite accurate in on-demand systems.

Timers are now often added to the system, and tank storage capacity is increased so flow during high-use periods can be collected and sent out in even doses across the 24-hour time period. This strategy has proven to improve treatment.

Work done on sand filters in California showed marked improvement of treatment if effluent was applied to the sand filter by pressure in small doses. By extension, this has been applied to soil treatment areas as well. Using a timer, effluent can be sent to the field in small doses over the entire day and as long as the daily flow estimate is not routinely exceeded, treatment is handled more efficiently.

There are a couple of things to be aware of, however, with using small doses.

There are limitations to the size of the dose. In order for pressure systems to operate, all of the piping needs to be filled before effluent will be applied to the soil. This means the supply pipe, the manifold piping and the distribution laterals are full. So the volume of the piping system must be calculated to know the appropriate minimum dose to start the distribution. We have seen pumps burn out due to continuously pumping effluent because they are delivering such low dose volumes.



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This is addressed on the design side by setting the minimum flow requirement for system operation at four to five times the volume of the piping. This ensures the pump operates efficiently and will last longer. Many state codes currently require this operational volume but it sometimes gets lost in the drive to have more efficient systems. The point is not that five times the volume is a magic number; it is to make everyone aware there is a limitation and to be careful when setting dose volumes, thinking you are helping with treatment while damaging another part of the system.

Another benefit of proper dosing is that enough water moves through the piping and orifices to prevent solids growth and plugging. This does not mean the piping never needs cleaning but it reduces problems due to plugging. □

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Making Connections is a Key to Successful Lobbying

Virginia wastewater professionals build strong relationships with regulators

By Doug Day

The Virginia Onsite Wastewater Recycling Association (VOWRA) has built an improving relationship with state regulators over the years, but the group representing onsite wastewater professionals is striving to do more with important issues, including the shortcomings of real estate transfer inspections, says its president, John Powell.

VOWRA was formed in the 1980s and today boasts a roster of about 300 members, most of them installers, pumpers, soil evaluators, engineers and regulators. The group has done a lot to raise industry standards — and the quality of onsite wastewater treatment in general, Powell says. He brings us up to date on the group's activities.

“Most real estate companies use home inspection or pest control companies that will do a \$50 to \$100 walkover with no assurance for the purchaser. They’ll go in and just flush some dye down the toilet and walk the yard. Almost never will you see the dye. They look in the front yard when the system could be in the back and vice versa.”

John Powell

What is VOWRA's primary purpose?

Powell: VOWRA is an affiliate of and set up much like NOWRA (National Onsite Wastewater Recycling Association). Our mission is to support, strengthen, advance and unify the industry through education, training and representation for our members, and to collaborate with everybody in the onsite industry. I think we do well with that. We attempt to offer conveniently located trainings around the state so our members don't have to travel so far to maintain their license.

The federal Chesapeake Bay Watershed Program has some states trying to ban or limit septic systems. What is the attitude of state regulators toward onsite wastewater?

Powell: That there are alternatives to big pipe, and onsite wastewater is critical to protecting the environment. We're in the Chesapeake Bay

John Powell,
president of Virginia Onsite Wastewater
Recycling Association at www.vowra.org
or 540/377-9830

VOWRA



program, so we have to reduce nitrogen. In 80 percent of Virginia, any new alternative system has to be a nitrogen-reduction system.

Our relationship with the Virginia Department of Health (VDH) is excellent, it's very collaborative. Two of our board members are VDH employees. We're heavily engaged with them on public policy and provide a forum for regulators to express their views and opinions to the industry.

We have a good set of regulations covering soils, design, installation, and operation and maintenance. An owner of an alternative disposal system is required to have an annual inspection along with maintenance requirements, which all need to be performed by a licensed operator and reported to the state's database.

Over the last few years, what do you see as VOWRA's biggest accomplishment?

Powell: Virginia starting phasing in licensing for onsite professionals about seven years ago, so we're finally on a smoother road with that. We supported that and are where we need to be, I feel.

There were a few who didn't support it and still don't. I think it put a lot of fear into the older-generation contractors who were afraid of taking the test. The Virginia Department of Professional and Occupational Regulation (DPOR) reworked the exam a couple of times to make sure it was clear and appropriate, and held several workshops last year to help those needing a license. We took that opportunity to provide a low-cost wastewater math course to provide further help.

DPOR allowed an interim license and you had four years to take the exam, along with a certain amount of continuing education. A few dragged their feet, so the Legislature granted a six-month extension for taking the test as long as you had maintained your continuing education requirements. For the most part I think most involved are getting it.

We've also worked with VDH to get them to be more of a regulator than

a competitor. They used to do soil work and system design much, much cheaper than the private sector could and most felt it wasn't fair. VDH has adjusted its fee structure, does a much smaller percentage of designs and only does the most basic conventional designs. If it is a tough site, or alternative system, it always goes to the private sector.

VDH has always expressed desire to get out of evaluation and design and is under considerable pressure to do so. Budgetary reduction in VDH could likely result in continued privatization. In the rural parts of the state, privatization could be difficult, plus some localities don't want it.

This issue is tough, as VDH is responsible to ensure public health protection.

What do you see as issues to tackle in the future?

Powell: We have to have regulations to dictate proper practices for real estate transfer inspections. They are not required by law, but the lenders normally require one.

Most real estate companies use home inspection or pest control companies that will do a \$50 to \$100 walkover with no assurance for the purchaser. They'll go in and just flush some dye down the toilet and walk the yard. Almost never will you see the dye. They look in the front yard when the system could be in the back and vice versa. For the most part they don't pull any information from the Health Department.

They just do what is minimal to close the deal. Then the purchaser is stuck with thousands of dollars of needed repairs. I see it almost daily. That needs to be stopped and we are working on it. This issue is one not limited to public health but also consumer protection and sustainable infrastructure. It's going to be a challenge. VOWRA is just starting to discuss the issue, and we have a ways to go yet.

How are you raising awareness about the importance of effective onsite treatment?

Powell: VOWRA does not have a lobbyist, or an adopted formal plan of action. For the most part we try to be informed as much as possible and to make sure things move in the right direction, or at least not the wrong one. It is very difficult as some folks expect us to straighten things out for them.

We are affiliated with NOWRA, and they're going after funding for the industry. The Chesapeake Bay agreement has provided more funding for the big pipes and agriculture, but not for onsite wastewater systems in Virginia.

Tom Fritts, past president of NOWRA, testified before an appropriations committee last year asking Congress to direct funding more fairly and to the (U.S. Environmental Protection Agency) decentralized wastewater office. He testified that more than 99 percent of the EPA Clean Water State Revolving Fund goes to municipal wastewater, less than 1 percent goes to onsite. We'd like to see at least 20 percent dedicated to increasing staffing and resources. EPA has only one full-time employee focused on decentralized wastewater.

Virginia has a program to help fund septic repairs for certain situations. The only problem is, we don't have a source of funding. Once the EPA, or whoever, starts handing money to the states, we hope to put some money into that fund.

You had a Mega Conference last November. How did that go?

Powell: NOWRA has been going around to different states, teaming up to do joint conferences. VOWRA and NOWRA presented the conference with the National Association of Wastewater Technicians (NAWT) and the State Onsite Regulators Alliance (SORA). We have a good conference every year. Having it with NOWRA and the other groups was an honor. All can attend and go away with something, whether it is good advice from others in the field or from manufacturers about new products. □

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By Craig Mandli

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EFFLUENT PUMPS

Ashland Pump effluent pumps

Heavy-duty effluent pumps from **Ashland Pump** are available in multiple horsepower sizes for various performance requirements, and feature efficient permanent split-capacitor motors. The oil-filled pumps have an upper and lower ball bearing design and handle solids up to 3/4 of an inch. They are made of heavy cast iron, with cast iron impellers and equipped with a piggyback switch (20-foot standard cord) or in manual configurations. They are offered in 3/10, 2/5, 1/2, 3/4, 1 and 1 1/2 hp models. 855/281-6830; www.ashlandpump.com.



Gorman-Rupp Company 6500 Series

The 6500 Series line of solids- and clean-liquid-handling end suction centrifugal pumps from **Gorman-Rupp Company** is available in sizes from 3 to 16 inches, flows to 15,000 gpm, total dynamic head to 530 feet and solids-handling capabilities up to 4 inches. They come standard with oversized bearings, an atmospheric vent, side access inspection port (on solids-handling models) and an indexable Smart Scroll discharge locator. 419/755-1011; www.grpumps.com.



Grundfos Pumps LCSE

LCSE split-coupled end suction pumps with integrated motor, drive and control from **Grundfos Pumps** come with MLE variable-speed motors in ranges from 3 to 30 hp in 3,500 rpm and 3 to 25 hp in 1,800 rpm. Available in 21 different models, the fully integrated, intelligent pumping system offers energy savings of up to 50 percent. The system consists of a controller, variable-frequency drive and standard asynchronous motor. Its footprint is 35 percent smaller than that of a frame-mounted design, and its plug-and-pump design results in quick and easy installation. GO technology allows building managers to remotely control and monitor the pump from a smartphone or tablet. 800/921-7867; us.grundfos.com.



Orengo Systems Biotube ProPak

Biotube ProPak from **Orengo Systems** are complete, ready-to-install pump packages in a box. They include a Biotube filter cartridge that filters up to two-thirds of solids. Only liquid from the tank's clear zone is pumped, significantly reducing the load on the



drainfield. Biotube filters are easy to remove and clean without pulling the pump vault. They can be used for filtering and pumping effluent from single- or dual-compartment septic tanks to gravity or pressurized discharge points. Their pump vault technology eliminates the need for a separate dosing tank, reducing system cost and footprint. 800/348-9843; www.orenco.com.

Polylok PL-CPE4A

The PL-CPE4A from Polylok is a submersible 4/10 hp 115-volt single-phase effluent pump with a 2-inch NPT vertical discharge. It has a maximum head of 38 feet and a maximum flow of 56 gpm. It is designed with a 3,450 rpm oil-filled permanent split-capacitor motor and has an amp rating of 6.6 for 115 volts, and a cast iron housing and volute that is equipped with a cast iron vortex impeller capable of passing 3/4-inch-diameter solids. The stainless steel shaft is supported by two single-row oil-lubricated ball bearings. The shaft seal is an inboard seal design with a secondary Exclusion V seal. The rotating face is made of carbon with a ceramic stationary face. All elastomers are BUNA-N and the hardware is 300 Series stainless steel. It has a 20-foot-long UL/CSA-listed power cable suitable for submersible service and is fitted with a three-prong plug. 877/765-9565; www.polylok.com.



GRINDER PUMPS

Champion Pump Company 2 hp grinder pump

Champion Pump Company's 2 hp grinder pump provides flows up to 44 gpm and heads up to 104 TDH. It has a double-seal configuration with a seal-failure alarm option. The 208/230-volt single-phase, ball-bearing, oil-filled motor has the option of providing the starting components in the pump, eliminating the need for control panels. It is also available in three-phase. The quick-disconnect sealed cord is readily available in up to 100-foot lengths, allowing it to be easily replaced without disturbing wiring in the panel and conduit. The Rockwell 440 hardened stainless steel shredder and shredder ring are designed for a long cutting life. It is offered as a packaged system with guide rails built to specifications. A standard leg kit is provided for applications where a rail system is not required. 800/659-4491; www.championpump.com.



Environment One Corporation Upgrade

The Upgrade replacement grinder pump from Environment One Corporation is engineered to fit into virtually any grinder pump wet well. Universal design allows easy drop-in conversion, ready to connect. All solids including plastic, rubber, fiber and wood are ground into fine particles, allowing them to pass easily through the pump, check valve and small-diameter pipelines. The grinder is designed not to jam and for minimum wear to the grinding mechanism. It comes with a self-contained level control system, eliminating float switches. 518/346-6161; www.eone.com.



Flygt - a Xylem Brand M3068.175

The M3068.175 progressive cavity pump from Flygt - a Xylem Brand has a durable impeller for optimum hydraulic efficiency and a heavy-duty cutting device that grinds solids into 1/4- by 5/8-inch particles for easy transport through small-diameter pipes eliminating the risk of clogging. It has a Griploc seal system consisting of two mechanical seals that



provide double security against water intrusion. Its air-filled motor has stators that are trickle-impregnated with resin to eliminate air pockets and allow 30 starts per hour. Its radial grinding mechanism has been used in municipal pumps for over 20 years. 855/995-4261; www.flygtus.com.

Liberty Pumps ProVore

The ProVore grinder pump from Liberty Pumps is designed for use in residential applications where the addition of bathroom or other fixtures located below sewer lines requires pumping. It features the same V-Slice Cutter technology utilized in Omnivore Series 2 hp grinder pumps. Powered by a 1 hp motor, it is designed to operate on a standard 115- or 230-volt circuit requiring a 20-amp breaker. No special wiring is needed. Compact factory-assembled systems are available in both simplex and duplex versions. 800/543-2550; www.libertypumps.com.



Pentair - Myers V2

The V2 Series grinder from Pentair - Myers is designed with computational fluid dynamics software and has a new volute and impeller design that allows shut-off heads up to 180 feet with a single-stage centrifugal pump. This design gives operators the flexibility to change between the standard and high-head flow design by swapping the impeller and cutter plate, simplifying maintenance and reducing service parts inventory for low-pressure sewage system projects. It is available with an optional quick-disconnect cord for easier servicing in the field, double-row bearings to absorb axial and radial loads, and an oil-filled motor for cooler operating temperatures and longer life. 888/987-8677; www.femyers.com.



Webtrol Pumps MVP Series

MVP Series grinder pumps from Webtrol Pumps are constructed from 304 stainless steel and cast iron. They are engineered and manufactured to handle demanding residential and commercial applications. A hardened anti-wear grinding ring and cutter, along with a recessed cast iron vortex impeller, provides long life. Double mechanical seals and potted epoxy cord seals prevent water intrusion into the motor. They are available in 1 and 2 hp, with heads up to 100 feet TDH. 800/769-7867; www.webtrol.com.



Zoeller Pump Company Shark Fractional Horsepower Grinder Series

The Shark Fractional Horsepower Grinder Series from Zoeller Pump Company is designed to handle difficult residential applications where sewage ejectors struggle. These 115-volt, 7- to 11-amp (and 230-volt, 3- to 5-amp) all-cast-iron pumps are integral automatic grinders available in 1/2 hp (803), 3/4 hp (805), and 1 hp (807) models. They offer performance head up to 55 feet. Tri-Slice Cutter technology provides over 300,000 cuts per minute. Non-automatic versions and package systems are available. 800/928-7867; www.zoeller.com.



product focus continued >>>

SEWAGE PUMPS

Hydra-Tech Pumps S4THL

The S4THL 4-inch hydraulic drive vortex impeller trash pump from Hydra-Tech Pumps offers 3-inch solids handling and head capabilities up to 210 feet. It can be bolted directly into a pipeline or fitted with a suction hose for underwater dredging. Combined with HT50 to HT75 power units, it is capable of flows up to 1,000 gpm. This safe and variable-speed hydraulic drive submersible pump can be used where electric power is hazardous or impractical. 570/645-3779; www.hydra-tech.com.



Myers Seth Pump DD-6

The high-volume DD-6 double diaphragm pump from Myers Seth Pump has long run-times and is easy to maintain and operate. It can be used for wellpointing, ponds, sludge, sewage and handling solids up to 4 inches in diameter. It is difficult to clog and is self-priming, with head pressure of 135 feet and a flow rate of 475 gpm. It can run up to 10 days on 65 gallons of fuel. Its industrial engines can be repaired in the field easily. 904/389-6114; www.myersseth.com.



SUMP PUMPS

Vertiflo Pump Company Series 800

The Series 800 industrial vertical immersion sump pump from Vertiflo Pump Company can be used for sump drainage, flood control and process drainage to meet U.S. Environmental Protection Agency and U.S. Occupational Safety and Health Administration (OSHA) requirements. It is designed for severe service at heads to 230 feet and temperatures to 350 degrees F, and operates in pit depths to 26 feet and up to 3,000 gpm. It includes carbon line shaft bearings, semi-open impeller with external adjustment, high-thrust angular contact ball bearing, 416 stainless steel shafts to 1 15/16 inches and a standard NEMA C face motor. Construction materials available are cast iron, 316 stainless steel or alloy 20. 513/530-0888; www.vertiflopump.com.



SUBMERSIBLE PUMPS

Franklin Electric FPS NC Series

Submersible centrifugal FPS NC Series non-clog pumps from Franklin Electric meet water transfer needs in challenging commercial, residential and industrial applications. Manufactured in 3- and 4-inch 125-pound ANSI flange discharge connections, they are available in 3, 5, 7 1/2 and 10 hp models with heads up to 66 feet and flows up to 610 gpm. They can pass up to 3-inch solids, retrofit easily to any standard rail system and contain replaceable internal components for optimal maintenance. Ductile-iron-casted impellers provide added corrosion resistance and handle rigid debris. Its fluoroelastomer motor enclosure sealing system improves chemical and temperature resistance, and the double-row ball lower bearing offers high loading and wear characteristics. It has a field-adjustable wear plate. 866/271-2859; www.franklinengineered.com.



Goulds Water Technology 33GS - 80GS

Goulds Water Technology 33GS - 80GS 4-inch high-capacity submersible pumps are designed for residential, small municipal water supply and light irrigation applications. Powered for continuous operation, they can run nonstop without damaging the motor. They are constructed with a strong and corrosion-resistant stainless steel casing. To protect against abrasion, they are made with a durable polymer bearing material and a stainless steel and FDA-compliant BUNA rubber built-in check valve that ensures quiet operation. Components include impellers, diffusers and bearing spiders that are nontoxic, and a six-sided hex shaft design that ensures a positive impeller drive. They can be easily serviced with common tools and readily available repair parts. 866/325-4210; www.goulds.com.



Keen Pump Model KPCG

The Model KPCG 1 hp submersible progressing cavity grinder pump from Keen Pump offers a high head for long-run applications. It has a triple-sealed cord entry with epoxy potting, high-torque press fit motors cooled with proprietary dielectric oil, three-bearing support, dual silicon-carbide mechanical seals, moisture probes, a scratch-resistant hardened tool-steel rotor, Viton blend full-lobe stator with wear liner, through-hardened stainless steel cutter assembly, and an internal or external start kit. It is available for rail mounting and base mounting, and configured for field replacement. 419/207-9400; www.keenpump.com. □



casestudy

Grinder pump lift station installed to treat hospital food waste

Problem: Salem Hospital in Oregon needed to expand its current food preparation facility to meet growing demand from adding more patient rooms. Due to the depth of the waste line from the food preparation room, a new lift station needed to pump directly from the kitchen area into an oil-water separator. The wastewater from the food preparation facility would contain large amounts of FOG and food waste solids.

Solution: Salem Hospital's civil engineering firm, HHPR Inc., contacted Romtec Utilities to get help with the design and supply of a complete packaged lift station. The design used Weil grinder pumps and a KSB Amamix mixer to handle the presence of oil/grease and any food solids. In addition to the grinder pumps and mixer, the wet well interior was coated with Tnemec Series 61 self-priming epoxy to help with general maintenance and to prevent grease buildup on the wet well walls.

Result: Romtec Utilities supplied a complete package grinder lift station that was installed by the site contractor, K & E Excavation. The new grinder lift station functions as designed without any excessive required maintenance. 541/496-3541; www.romtecutilities.com. □

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Gehl adds Aerial Access Equipment to dealer network

Gehl added Aerial Access Equipment to its dealer network for compact track loaders and compact excavators. Aerial Access provides sales and service to southern Louisiana and southeastern Texas.



JCB raises \$85,000 at golf fundraiser

JCB North America raised \$85,000 for The Lady Bamford Center during its ninth annual Lady Bamford Center Golf Tournament at The Club at Savannah Harbor in Savannah, Georgia. The Center provides education and social skills development to local children.

GPS Insight recognized for rapid growth

GPS Insight ranked No. 431 on Deloitte's Technology Fast 500, a ranking of the 500 fastest-growing technology, media, telecommunications, life sciences and energy tech companies in North America. The company was also ranked the 40th largest and 21st fastest-growing company in Arizona at the *Phoenix Business Journal's* Arizona Corporate Excellence (ACE) Awards. □

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Water Cannon electric pressure washer

The 14M10 portable, 115-volt electric-powered pressure washer from Water Cannon delivers 3 gpm at 1,000 psi. Designed for restricted areas with power but no water, the washer has a 25-gallon onboard tank with room for a small hose reel under the tank. Applications include cleaning air-conditioning coils on rooftops or basements, jetting pipes in bathrooms or kitchens and quick cleanups. 800/333-9274; www.watercannon.com.



Komatsu parallel link undercarriage system

The parallel link undercarriage system (PLUS) from Komatsu America Corp. is an option on the D85EX/PX-18 dozer. Available in three shoe widths (24, 26 and 28 inches), the PLUS system is designed to provide up to twice the life of a conventional undercarriage and features oil-lubricated, rotating bushings. 847/437-5800; www.komatsuamerica.com.



Ditch Witch RT80 ride-on trencher

The midrange RT80 ride-on trencher from Ditch Witch is powered by a 74.5 hp turbocharged Deutz Tier 4 diesel engine. A compact design and axle capacity give the trencher a static load rating of 39,000 pounds. Features include a tight turning radius, three-speed, shift-on-the-fly ground drive controls and a standard cruise control system that automatically adjusts to changing load conditions. An LCD color display shows engine information and diagnostics. 800/654-6481; www.ditchwitch.com.



Trimble pipe lasers

The Spectra Precision DG613 and DG813 pipe lasers from Trimble are designed for manholes with precast inverts and a tight radius. Both models have a grade range from negative 12 to 40 percent and are fully self-leveling over the entire grade range. The cross axis is fully compensated for quick setup and ensures the laser will be level. The RC803 remote control provides full function control and utilizes infrared communications when in the pipe at a distance of up to 500 feet. It operates up to 40 hours with NiMH rechargeable batteries and 50 hours with alkaline batteries. 800/527-3771; www.spectralasers.com. □



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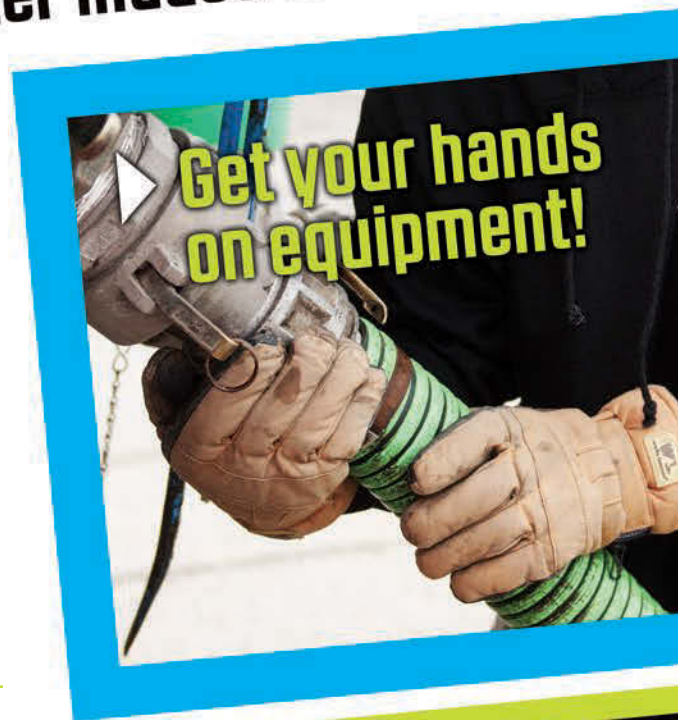
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Call 866-933-2653 for more info.



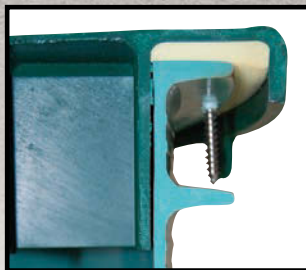
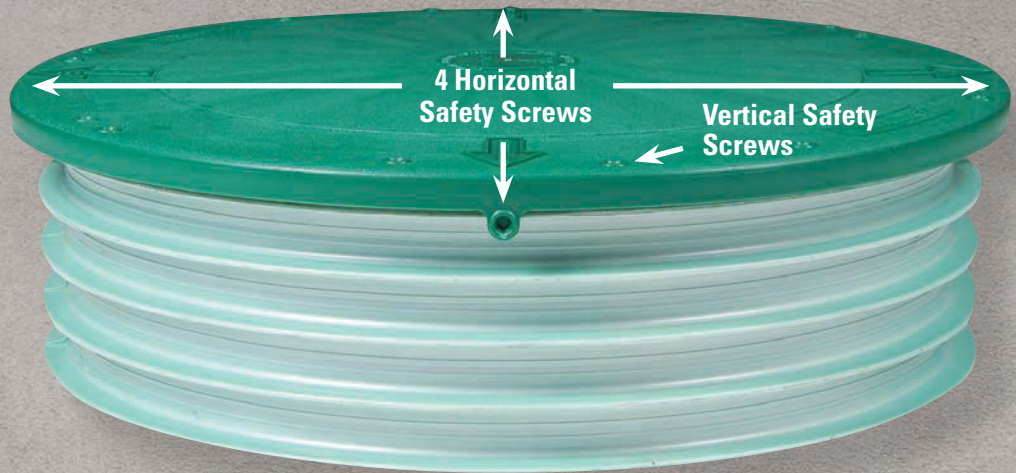
24" HEAVY DUTY MULTI-PURPOSE FLAT RISER LID

FREE FREIGHT
 on Full Cartons!

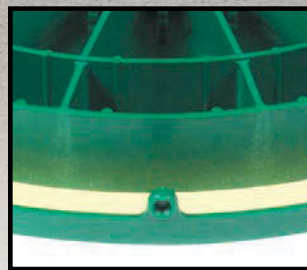
Fits most commercially available:

- Risers
- IPEX PVC Ribbed Pipe
- Corrugated Pipe

LID MAY BE USED WITH OR WITHOUT CONCRETE CENTER



Secured by 6 Vertical and 4 Horizontal Safety Screws. Screws Included.



Foamed-in Permanent Polyurethane Gasket.



Concrete Keepers™
 Holds up to 70 lbs of Concrete for Added Safety.



Tuf-Tite® Riser
 Water-TITE™ Joint Vertical and Horizontal Safety Screws

4" Effluent Filter and 4" T-Baffle™

86 ft. of 1/16" filtration area.

Increases time between filter cleaning.



EF-4 Combo Includes Filter, Housing and

4" Sch. 40 & SDR-35

NSF®
 800 GPD
 ANS/NSF
 Standard 46

NSF®
 COMPONENT
 ANS/NSF
 Standard 46

EF-4 Combo 18



NSF®
 COMPONENT
 ANS/NSF
 Standard 46

TB-4-18 Housing
 12/carton

4" Effluent Filter EF-4

One-piece effluent filter fits in 4" Sanitary Tee.

- Injection molded PolyPro
- Simple to install - Easy to clean

4" Sanitary Inlet/Outlet T-Baffle™

Injection molded T-Baffle™.

- Injection molded T-Baffle
- Fits 4" Sch. 40 and SDR-35 pipe
- Simple to install
- May also be used as Inlet & Outlet Tee

6" Effluent Filter and 6" T-Baffle™

244 ft. of 1/16" filtration area.

Increases time between filter cleaning.



EF-6 Combo Includes Filter, Housing and Bushing

4" Sch. 40 & SDR-35

NSF®
 1500 GPD
 ANS/NSF
 Standard 46

NSF®
 COMPONENT
 ANS/NSF
 Standard 46

TB-6 Housing

Gas/Solids Deflector

6" Effluent Filter EF-6

One-piece effluent filter fits in 6" T-Baffle™.

- Injection molded PolyPro
- Simple to install
- Easy to clean

6" Sanitary T-Baffle™

Injection molded T-Baffle™.

- Injection molded
- Fits 4" Sch. 40 and SDR-35 pipe
- Simple to install
- May also be used as Outlet Tee with Solids Deflector

PL-250 6" Effluent Filter



NOW NSF CERTIFIED!
NSF/ANSI Standard 46

Polylok, Inc., the industry leader in effluent filter technology, is pleased to introduce our latest effluent filter - the PL-250. The PL-250 is designed to handle up to 3000 GPD with 250 linear feet of filtration. Like our other filters, installation is easy!

Polylok, Inc. is recognized as the industry leader in effluent filter technology. With our proven track record, you can't go wrong. We offer three unique filter lines: Polylok, Zabel and Best. All of our filters are designed with functionality and longevity in mind. The PL-250 incorporates nearly a century of experience in its design.



FEATURES & BENEFITS

- Accepts 1" PVC handle
- 250 linear feet of filtration
- 6" diameter
- Rated for 3,000 GPD
- 550 SQ.IN. of total surface area
- "W" design prevents solids from settling
- Cannot be installed incorrectly



Polylok PL-68 Polylok PL-122 Polylok PL-525 Polylok PL-625 Zabel A1800 Zabel 8 Series A100/300/600 Zabel 12 Series A100/300/600 Best GF-10