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JACE OF ALL TRADES

From farming and swinging a hammer on a construction crew, New Mexico's Jace Ensor grew into a rewarding career with several specialties in the onsite wastewater industry PAGE 10

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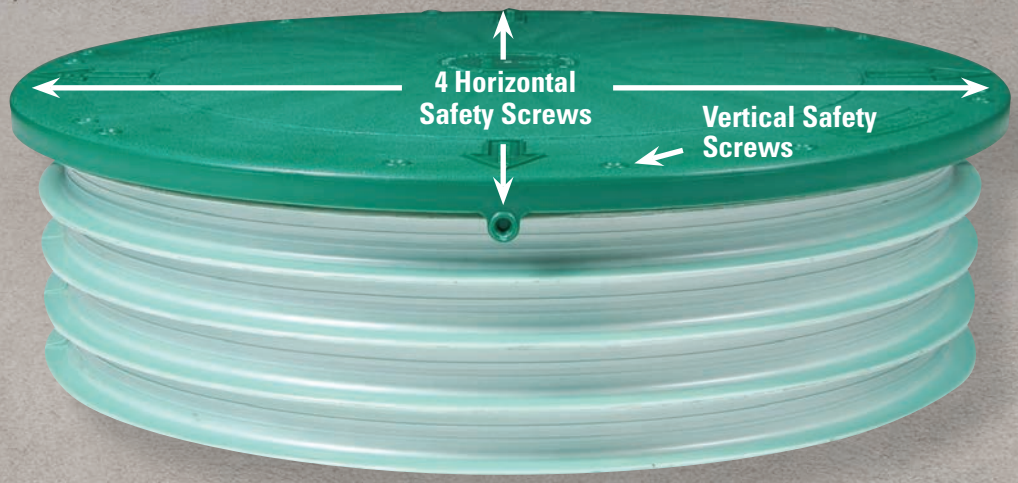

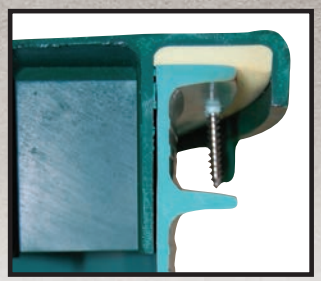

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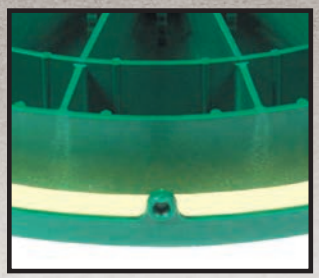

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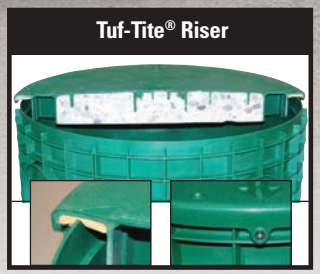

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contents

June 2016

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- **Contractor Profile:** Arkansas installer gets a technology boost
- **System Profile:** Installing on a tiny subdivision lot in Illinois

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We Need to Share the Onsite Success Story

When local politicians condemn all septic systems in a war on groundwater contamination, it's time to stand up and be counted

By Jim Kneiszel

There's a fundamental problem with frequent criticism of decentralized wastewater treatment by politicians whose municipalities are constantly seeking to expand the reach of their public sewer systems. Headlines in newspapers and TV news reporters parrot those who are promoting sewer expansion.

"Septic systems are to blame for water-quality issues," the critics say, assigning blame for nonpoint pollution problems to all septic systems in an environmentally sensitive area. Their next response? One county in Florida recently stiffened its rules for new onsite projects, dropping the allowable daily flow from the state's maximum of 10,000 gpd to 2,000 gpd for all larger systems.

Nobody in the onsite industry would argue aging septic systems aren't one cause of pollution in sensitive areas like the Chesapeake Bay region along the East Coast. Onsite professionals constantly advocate for better monitoring of these private treatment systems and requirements to repair or replace failing systems. They've been fighting an uphill battle for tougher regulations for years, saying oversight of onsite systems is the right thing to do to protect the environment and our critical drinking water supplies and recreational waterways.

MISSING THE POINT

But critics are missing an important point about effective treatment: The concern shouldn't be over how many gallons a system is allowed to treat. It's about how many gallons it can treat effectively. The general public, and I'll include local government politicians in that group, simply don't understand the capabilities of today's onsite wastewater treatment systems.

They don't realize that in 2016, systems can be designed to effectively treat 2,000 gallons or 10,000 gallons or more. Advanced technologies can produce effluent clean enough to safely recharge local groundwater aquifers. I can't stress this enough: It's not about reducing the flow and slowing the usage of onsite systems. The issue is about pinpointing failing systems and utilizing all the advanced technologies available to repair or replace them.

I asked Jim Anderson, co-author of our Basic Training column in *Onsite Installer*, for his opinion about the drastic cut in the maximum allowable flow in Florida. "Performance is what should matter," he said, adding that there are often other factors at play in these political battles — including controlling development and pressure to extend the big pipe. These other factors tend to overshadow the known effectiveness of decentralized wastewater systems.

"We have products and systems that provide the desired performance. We have a well-trained professional group that sites, installs and services these products or systems to make sure they are performing," Anderson continued. "We have a county staff that works closely with professionals that are also well trained to fix problems as they arise."

Explain how you can produce cleaner water with a smaller, more reliable system than a generation ago. This protects the homeowner's biggest investment, protects their family and helps the environment.

MAKE A DIFFERENCE

So why does the message of the onsite naysayers often come through louder and clearer and command more media attention than experts in the onsite field?

"This type of thing plays out all across the country," Anderson said. "We have to have the information and the data available to challenge these types of moves as an industry. In my view, it takes everyone working together."

Amen to that, Jim. Public education is the answer to forging a better understanding of onsite wastewater treatment in our towns and counties. With that goal in mind, here are a few steps installers can take to help:

Keep SepticSmart going all year long

Set up strong lines of communication with your local health department and offer to lead a consumer education effort. Health officials or your County Extension office would be a good place to start reaching out to homeowners about the proper care and maintenance of septic systems. The U.S. Environmental Protection Agency four years ago started a program called SepticSmart Week in September and it has gained a growing following. Many wastewater professionals have jumped on the bandwagon and planned public outreach programs for that week. There's no reason installers can't continue to offer septic seminars or work with homeowner groups the rest of the year.

Talk with your elected local officials

If you catch wind of a controversy over failing septic systems or a large

development that seeks to utilize onsite technology, don't just sit at your kitchen table and read about the political battle in your newspaper. Get involved! Call your county supervisor or town chairman. Tell them you're ready, willing and able to explain the nuts and bolts of these treatment systems. Remember you are the expert and can play a valuable role in helping your neighbors understand wastewater issues. Your reassurances can tamp down these burning issues and calm fears.

Change minds one at a time

Take the time to explain all the benefits of private wastewater treatment to potential customers. This means going beyond simply walking the backyard with customers and handing over an estimate. Craft a presentation that tells the technology success story of onsite systems. Explain how you can produce cleaner water with a smaller, more reliable system than a generation ago. This protects the homeowner's biggest investment, protects their family and helps the environment.

Keep sharpening your skills

Onsite technology is evolving all the time, so installers can't rest on their laurels when it comes to continuing education. Get involved with your state and national wastewater trade association and foster partnerships with manufacturers to promote product demonstrations. Attend industry events like the WWETT Show and learn about new systems and components. Once you learn the capabilities of a new technology, don't shy away from telling local regulators about it. Make sure you stay on top of continuing education credits and don't stop when you fulfill the minimum requirement. Seek to be the most informed installer in your region.

LET'S WORK TOGETHER

What have I missed? If you have more ideas about how we can better promote the onsite industry to neighbors, local officials and the general public, now is the time to share. Drop me a line at editor@onsiteinstaller.com and I will broadcast them through this column. ◻

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SYSTEM RESTORE

Faced With Flooding?

Floods can be disastrous for onsite systems but they can often be rescued if you know what to do to minimize the damage. With a little luck, you can possibly help homeowners recover a flooded system – they'll be customers for life! Here we break down tips for things to watch for before, during and after a flood to get a system back up and running. **onsiteinstaller.com/featured**

Overheard Online

"If there is damage to your property, such as offices, storage yards or maintenance areas that prevent them from being used, business income insurance provides coverage so that you can rent space elsewhere to get your work done."

- Insurance Coverage: What Do You Need?

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STACK THE ODDS

10 Tips for Success

There's no way to guarantee success, but there are plenty of little things you can do, habits you can form, to boost your chances and stack the odds in your favor. One of the keys to successful entrepreneurship is settling into the right groove, fostering the traits and routines that lend themselves to productivity, creativity and vision. Here we share 10 tips to get you on top of your game. **onsiteinstaller.com/featured**

HERO TO HOMEOWNERS

Extending System Life

How do you help homeowners make their onsite systems last as long as possible? Or give new life to a system on the brink of failure? There are some low-tech and low-cost solutions to help struggling systems that your customers will really appreciate. Read up on some ideas to rejuvenate and remediate a system in this exclusive online article. **onsiteinstaller.com/featured**

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JACE OF ALL TRADES

From farming and swinging a hammer on a construction crew, New Mexico's Jace Ensor grew into a rewarding career with several specialties in the onsite wastewater industry

By Scottie Dayton | Photos by Roberto Rosales

Growing up on a farm taught Jace Ensor of Ruidoso, New Mexico, everything he needed to know about being independent. By age 20, he was married and foreman of a construction crew.

Three years later, he opened Ensor Construction in 1978. Ensor's attention deficit hyperactivity disorder (ADHD) worked to his advantage, driving him to add profit-driven dimensions to his businesses whenever possible.

"It isn't always easy to step away from new adventures and focus on the basics," he says. "However, adaptability enabled me to survive while other contractors succumbed to economic downturns."

Today, Ensor's Mountain Top Inc. installs, repairs and maintains residential onsite systems. In preparation for branching into installing and managing decentralized systems, Ensor earned a Level 3 utility wastewater operator license (Level 4 is the highest). Last year, he formed Sun Snow Development and built a composting facility to produce Class A biosolids.

Ensor attributes his success to wife Jan's unwavering support; his talented office manager, Nanci Swanner; and living in a mountain resort community in the middle of New Mexico. "We have more advanced treatment units per square mile than anywhere else in the state," he says.

CHANGING TIMES

Building houses was a wonderful life for Ensor until the 1981 recession crippled the market. He noticed that real estate agents always received commissions whether homeowners or contractors made or lost money. Ensor became a licensed Realtor in 1982 and joined a residential real estate franchise. "I despised wearing a coat and tie and working in an office," he says. He relinquished his license in 2001.

As the economy recovered, Ensor returned to building houses until he burned out in 1997. Friends rescued him as he searched for another source of revenue. Excavation contractor Mark Hughes mentioned the price of

Mountain Top Inc., Ruidoso, New Mexico

OWNER:	Jace Ensor
YEARS IN BUSINESS:	15
EMPLOYEES:	3 full time, 2 part time
SERVICES:	Residential and commercial onsite installations and maintenance; dewatering sludge
ASSOCIATIONS:	New Mexico Onsite Wastewater Association

<<OPPOSITE PAGE: Jace Ensor inspects the tornado system he's developing that serves an RV park. The system utilizes a 7,000-gallon Xerxes Corp. tank, Orenco Systems lids and risers, SmartRelay programmable logic controller (Idec), Square D power distribution panel (Schneider Electric), DESGenset generator control panel (Deep Sea Electronics), Metasol motor contactors (LSIS Co.), circuit breakers (CHINT Electrics), control relays (Finder), and switches and indicating lamps (WEG Industries).

Ensor inspects composted waste and wood chips spread out to dry at his Three Rivers Composting site.

precast septic tanks had increased from $350 to $450, but the cost of concrete hadn't changed. Tom White, another contractor, knew of a precast company in Santa Fe selling 20-year-old molds.

Ensor gambled on the opportunity and bought a set of 1,200-gallon molds. The first tank took a day to pour. To ensure quality, Ensor purchased concrete from the local ready-mix plant. "Mark installed one tank a month and was my ready-made market. I charged him $400 and made $175 with a lot of effort."

Three months later, Ensor was selling and setting tanks for homebuilders, and purchased two sets of new 1,250-gallon molds from Taylorsville Precast Molds. To help ramp up production, White offered some land next to the concrete plant. (Ensor purchased the property in 1999.)

At an auction, Ensor bought a Pitman corner-mount crane truck designed for setting telephone poles. Its deck was just large enough to stack the tank halves upside down, but it served as the company's delivery truck until Ensor replaced it with a Ford L8000 flatbed truck and National knuckleboom crane (Manitowoc Cranes). Then he added a Lorain MCH350D 35-ton hydraulic truck crane capable of setting septic tanks 80 feet away.

Ensor maintains a Bio-Microbics MicroFAST system housed in a shed that serves 10 cabins feeding into one dripfield. The risers and lids are from Tuf-Tite.

"We have more advanced treatment units per square mile than anywhere else in the state."

Jace Ensor

ADVANCED SYSTEMS

Although busy, Ensor still accepted odd jobs. In 1999, a homeowner asked him to add more bedrooms to a three-bedroom home he had built. "I had no idea what septic systems were because I'd always hired people to install them," he says. Ensor was about to find out.

State inspector Carl Stubbs caught the now noncompliant system and told Ensor to install an aerobic treatment unit. "Nobody knew how to install

them because the state had just approved them," says Ensor. Sensing an opportunity, Ensor received training to install ATUs and completed the job. Then he installed a second unit on a lot with no suitable soils.

"Lincoln County is unique, with Ruidoso soils — clay loam or silty clay loam above clay — on valley floors between very steep rock outcroppings," says Ensor. "As conventional systems failed, ATUs were their salvation."

Ensor soon switched to MicroFAST systems (Bio-Microbics) with nitrogen reduction, and became a distributor. In 2005, he added a Taylorsville half mold to pour the top or bottom of 3,000-gallon tanks. Today, worker Chris Anaya casts 120 assorted tanks annually. Sales and installations account for 30 percent of the company's total revenue.

Until 1999, 30 area earth-moving contractors each installed two or three conventional septic systems annually. Many dropped out when ATUs hit the market. "Specializing in onsite systems was a new concept," says Ensor.

In 2001, he earned his installer's license, bought a Caterpillar 416C-IT backhoe, and opened Mountain Top. State code enabled Ensor to design systems, and the building boom made ATUs a massive part of his income. "Instead of dirt contractors buying septic tanks from me, they purchased FAST units that I install and service," he says.

Today, the crew installs 25 residential aerobic systems per year, down from 50 at the company's height. Annually, they replace 12 conventional systems. Nearly all replacements are FAST units discharging to chambers or EZflow bundles from Infiltrator Water Technologies.

The state requires maintenance agreements for ATUs. Inspections and effluent monitoring happen twice a year, and Mountain Top services 400 contracts. Swanner generates the monthly list of systems to inspect, then employees Sam Blatchley and John Wright visit them and do authorized repair work.

DEWATERING FOCUS

Ensor prepares to inspect an ATU, one of the many services he offers through Mountain Top Inc.

As the service provider branch expanded, Ensor purchased a wrecked Mack KSA septage dewatering truck (Simon Moos Mfg. A/S, Clearwater Cleanup Co. distributor). He spent 2004 rebuilding components and added a Jurop/Chandler R260 pump in 2016.

The KSA, in the 22nd year of its 20-year life span, has a 1,200-gallon steel vacuum tank, 3,000-gallon dewatering compartment and 900-gallon filtrate (reject water) compartment. The truck is too large for tight locations, so Ensor bought an Isuzu portable sanitation truck with 1,500-gallon steel tank (Keith Huber Corp.), removed its baffle wall and created an agile septic truck.

"I can pump seven tanks, mostly ATUs, with the KSA," says Ensor. "After cleaning the last tank, I retain 500 gallons of filtrate for the washout and to reconstitute the 2.5 percent solids for discharge at the Carrizozo Wastewater Treatment Plant." Ensor and Patrick Hansel, who helps two or three times a week, pump 150,000 gallons per year. The truck dewaters septage to 60,000 gallons, or 20 loads.

Rehydrating cake (dewatered solids) defeated the truck's purpose and irritated Ensor. So did paying the municipal plant's $384 tipping fee. In 2015, he formed Sun Snow Development, bought 20 acres, and built Three Rivers Composting to produce Class A biosolids. His nearest neighbor is a horse farm a half mile away.

The facility has a 100- by 100-foot plastic-lined pit bedded with 24 inches of compacted native sand. A local company delivers 100 cubic yards of wood chips, then Ensor forms a 30- by 15-foot "bathtub" in the center with a John Deere 6944AB wheeled loader. He also has a Cat 277B multi-terrain loader for use at the compost facility.

Ensor uses a Caterpillar 277B multi-terrain loader to move waste and wood chips at his composting facility.

Every two days, they dump a load of sludge. "That's when the flies emerge," says Ensor. "They're after the moisture, but disappear as we blend the chips and sludge with the loader and form a windrow. It's amazing how effective wood chips are at managing odors and flies."

Windrows remain in the pit until composted, as there is adequate room for mixing and storing. When the time comes, Ensor owns another 20 acres for expansion.

The facility is still too new to produce marketable Class A biosolids. Furthermore, municipal wastewater treatment plants give away their biosolids. "New Mexico has an abundance of them and not enough takers," says Ensor. "Currently, our operating costs are identical to the tipping fee, but as pumping increases, we'll make money on the receiving end and donate product to farmers."

PAIN, PAIN,GO AWAY

Heavy physical work in the Ruidoso, New Mexico, building and onsite trades exacerbated neck and low back injuries Jace Ensor suffered as an adolescent.

In 1994, the disc between vertebrae C6 and C7 at the base of Ensor's neck ruptured for the second time. Surgeons replaced the disc with bone chiseled from his hip.

By 2010, Ensor was in chronic pain from the damaged disc in his lumbar region. Surgeons at the Laser Spine Institute in Tampa, Florida, removed the disc, opened nerve canals and eliminated pain sensors no longer needed by adults.

"After that, I felt great for the first 15 minutes of each day, then had to chase the pain with ibuprofen," says Ensor. "When a pressure point on the sole of my left foot acted up, I knew it was time to take the next pill."

Monthly visits to a chiropractor and the back exercises he recommended hastened Ensor's improvement. "I was under the impression that the physical work I did more than compensated for an exercise program," he says. "I learned that wasn't true. Certain exercises strengthen the abdominal, buttocks and hip muscles. When they're strong, they support the spine, keep it in alignment, and facilitate movements that extend or twist the back."

Ensor committed to a 10-minute exercise routine every morning. He does 50 bent-knee sit-ups, 40 back arches and 40 standard pushups. After three years of exercising, he's pain free and no longer needs ibuprofen. "Although I don't know why, even my neck has improved," says Ensor. "I would advise an exercise program to everyone."

SERVICE MENU GROWS

To increase pumping, Ensor branched into portable sludge dewatering. He bought a roll-off truck, a 20-cubic-yard roll-off container and an Envirotube dewatering bag (Industrial Fabrics). Processing material on site enables small municipal wastewater treatment plants to eliminate their sludge holding tanks and associated costs.

"We're still developing this market," says Ensor. "We pump sludge from a 12,000 gpd facility, blend in Superfloc polymer (Kemira), then send the mixture to the Envirotube in the container. A pipe returns filtrate to the headworks and the cake goes to Three Rivers."

Another pumping venture Ensor began last year is a voluntary annual inspection program for owners of conventional septic systems. It's designed to overcome the "flush and forget" mindset and promote proper maintenance. "I despise telling homeowners that pumping their tanks five years ago would have saved them spending $10,000 to replace the system," he says.

Ensor and Hansel mention to customers that for an annual fee of $75, they will open the septic tank, clean the effluent filter, measure the sludge, check for concrete deterioration and provide a written report. "More than 50 percent of the people we talk to sign up," says Ensor. The company recently hired Chad Swanner, Nanci's son, to create a customer database of completed home inspections that will be used to promote the service.

KEEP IT GOING

With the residential side of the business rolling along, Ensor felt comfortable testing the feasibility of commercial work. "As developers grapple with small lot sizes and poor soils, decentralized systems are becoming more attractive," he says. "I want to install and manage them."

At age 60, Ensor has too many plans and is far too busy to contemplate retirement. His biggest challenge is maintaining the business at a manageable size when all it does is grow. However, the farm boy knows that adding one more cow at a certain point will tip the delicate balance between financial stability and overexpansion. ◻

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An Iowa Farm Community Finds Solution to Wastewater Woes

Individual pump/dose tanks flow to a lagoon system, offering efficient treatment for homeowners and businesses required to eliminate direct discharge

By David Steinkraus

The State of Iowa determined it was time to modernize the wastewater system in Woden, a cluster of homes in the rural north-central part of the state. A new system serving the community brought a summer's worth of work to North Iowa Septic Solutions (NISS) of Mason City, Iowa.

NISS worked as a subcontractor on the project. Woden consists of 137 houses and a few other buildings in an agricultural area. There's an elevator for drying grain, a post office, a store, a bank and a restaurant. An existing wastewater system was installed primarily in the 1950s and 1960s, says Corey Nichols, project manager and co-owner of NISS.

The previous system consisted of individual septic tanks for each home, but they discharged into a ditch that ran into the channelized Lindsey Creek along the eastern side of Woden. Replacements are being ordered for direct discharge systems across the state.

The Woden project covered about 160 acres and cost an estimated $2.3 million, with $350,000 of that dedicated to the NISS portion of the work.

MODERN BUT SIMPLE

Engineers from Jacobson-Westergard & Associates in Estherville, Iowa, designed a system to handle the community's wastewater without the expense of a small treatment plant. Each property received a 1,600-gallon concrete septic tank from Wieser Precast Steps of Stewartville, Minnesota. These are dual-chamber tanks with half dedicated to settling and the other half housing an Orenco Systems model PF100511-30 effluent pump package with floats already in place. The tank provides settling and primary treatment.

SYSTEM PROFILE

Location:	Woden, Iowa
Facility served:	Small community of homes and businesses
Designer:	Jacobson-Westergard & Associates, Estherville, Iowa
Installer:	North Iowa Septic Solutions, Mason City, Iowa
Type of system:	Low-pressure sanitary sewer and lagoons
Site conditions:	Wet sandy and clay soils
Hydraulic capacity:	16,600 gpd

The vault pump sends wastewater out through a 1 1/2-inch outlet pipe that NISS technicians stepped up to 4-inch HDPE ERDR11 pipe to join the sewer mains installed by another contractor. The average run was 20 feet.

Mains and lift stations move wastewater uphill to a lagoon about a half mile north of Woden, where tertiary treatment of the effluent occurs. The lagoon is divided into three cells. The largest stores 449,500 cubic feet, and each of the other two cells has a capacity of 112,600 cubic feet. The lagoons

<<OPPOSITE PAGE: Technicians from North Iowa Septic Solutions set a Wieser Precast Steps tank at one of the buildings in Woden, Iowa, during installation of a new community wastewater system. Each concrete tank contained an Orenco Systems pump package that sent effluent into a collection pipe. Shown are, from left, Eric Morf, Colby Nichols and Rick Amundson.

>>RIGHT: Technician Colby Nichols of North Iowa Septic Solutions works on a connection for part of the Woden, Iowa, community wastewater system. Where necessary, old pipe from homes to septic tanks was replaced with new PVC. When tanks had to be placed deep, technicians created custom risers with tubes supplied by Orenco Systems. (Photos courtesy of Corey Nichols, North Iowa Septic Solutions)

treat wastewater in stages, with the largest cell taking inflow from the mains. Eventually water is discharged into nearby Lindsey Creek. The lagoons are bordered with ballast rock on the inside and seeded on the back slope. They are not designed to be cleaned, but Nichols says he has heard of problems in other communities that choose to save money by emptying pump trucks into lagoons. In those cases the communities may have to aerate in order to promote digestion of the organics. The lagoons and mains were all in place when NISS began its work.

Commercial buildings received the same package. Those businesses have so few patrons at any given time that they do not produce a flow large enough to warrant a larger tank, Nichols says. Although no grease trap was specified for the restaurant, Nichols took the precaution of mentioning the issue. If the owner sees a problem developing, Nichols already knows where a trap can be installed.

"I have to give the engineer a lot of credit because he had the locations of the old tanks correct almost every time. We removed the ones we needed to when they were in the way of our excavation, and when we could we abandoned the old tanks in place."
Corey Nichols

ABANDON AND REPLACE

"I have to give the engineer a lot of credit because he had the locations of the old tanks correct almost every time," Nichols says. Only four or five were difficult to locate. "We removed the ones we needed to when they were in the way of our excavation, and when we could we abandoned the old tanks in place." Of the 137 tanks NISS dealt with, technicians had to remove about 45.

Many of those old tanks were steel, and some fed two- or three-tile drainfields. In this part of Iowa that means one to three 24-inch tiles of about 100-gallon capacity each set in a row.

"I was only at each house for one day. People were nice enough to give me those five hours and do their best to not use water while we were working. Some people work in Mason City and weren't home until 7 or 8 at night." As his crews worked setting two to three tanks per day, Nichols moved a block ahead to meet as many people as he could and explain what would happen. Everyone in town had a copy of his schedule so they knew when to expect a service interruption. There was also a municipal employee acting as a liaison with the community, and this same person became

Rick Amundson (left), Eric Morf (center) and Colby Nichols (right) of North Iowa Septic Solutions cut a trench for some of the piping in the community wastewater system for Woden, Iowa. They're using the company's Yanmar excavator for the job.

Technician Rick Amundson from North Iowa Septic Solutions sets one of the Wieser Precast Steps tanks in Woden, Iowa. The small community now uses a combined system consisting of septic tanks and a lagoon.

"We had to pump out our holes most of the time. ... Typically we did that after we set the tank and before we backfilled. Leaving water in the hole helped stabilize the sides of the excavation when we dug in sand."
Corey Nichols

responsible for managing the completed system and will arrange for tank pumping when that becomes necessary.

Doing the job took almost the entire 2015 season. Work started May 15 and ended about Sept. 15. Half of the company was devoted to the project — two two-man crews and a floater, who was Nichols. Rain delayed the project by about a month to a month and a half. Because the job was only about 45 miles from the NISS office, crews drove to the job site every day and were not stuck idle in a motel waiting for the soil to dry out.

PUMPING WATER

Groundwater sometimes made the job less than enjoyable. The water table was naturally high in the area, and rains didn't help. Main Street, which runs roughly through the center of Woden from north to south, was the high point, and the land sloped away to either side. Soils varied from sandy to clay.

"We had to pump out our holes most of the time with a Multiquip electric pump. Typically we did that after we set the tank and before we backfilled. Leaving water in the hole helped stabilize the sides of the excavation when we dug in sand. When we worked in clay we could pump while we were digging."

For digging and other heavy work the crews used a Yanmar VIO75 excavator, a Case CX160 excavator, a Case 590 tractor backhoe, and a Case TR270 tracked skid-steer.

At their best pace technicians could set three tanks per day, he says. Sometimes they had to replace the pipes coming out of buildings with new Schedule 40 PVC. In a few cases they had to dig down 12 or 13 feet in order to get a gravity feed from wastewater pipes that emerged at the bottoms of basements. In these cases they made long custom riser tubes from large plastic pipes supplied by Orenco. Elsewhere, tanks were fitted with standard Orenco risers, and Orenco lids were used throughout the project.

Even though the Woden wastewater system was not that old, it needed to be upgraded. Thanks to NISS and the other contractors, the town now has a system that will treat its wastewater without endangering the environment. ◻

MORE INFO:

Case Construction Equipment
866/542-2736
www.casece.com

Multiquip, Inc.
800/421-1244
www.multiquip.com

Orenco Systems, Inc.
800/348-9843
www.orenco.com

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SEPTIC TANK DIRECTORY 2016

	BRAND	MATERIAL	CAPACITY (GALLONS)	DIMENSIONS	WEIGHT (LBS)	COMPARTMENTS	INLET (ALL)/ OUTLET (BLL)	CERTIFICATION
CONCRETE TANKS								
Jet Inc. 750 Alpha Dr., Cleveland, OH 44143 800-321-6960 440-461-2000 Fax 440-442-9008 email@jetincorp.com www.jetincorp.com See ad page 37	Jet	Concrete	500 - 1,500	120"l x 59"w x 69"h	10,000	3	56"/53"	NSF 40 & 245
Wieser Concrete W3716 US Hwy. 10, Maiden Rock, WI 54750 800-325-8456 715-647-2311 Fax 715-647-5181 winkler@wieserconcrete.com www.wieserconcrete.com See ad page 30	Wieser	Concrete	1,600	84"l x 145"w x 53 1/4"h	10,250 base 6,350 lid	3	Adjustable	NPCA Certified
	Wieser	Concrete	10,000 (Hs20 rated)	120"l x 192"w x 126"h	35,975/section	Adjustable	Adjustable	NPCA Certified
	Wieser	Concrete	40,000	168"l x 480"w x 140"h	70,000/section	Adjustable	Adjustable	NPCA Certified
FIBERGLASS TANKS								
Xerxes Corporation 7901 Xerxes Ave. S, Ste. 201, Minneapolis, MN 55431 952-887-1890 info@xerxes.com www.xerxes.com	Xerxes	Fiberglass	600 - 62,000 Custom Built	4' to 12'				
POLY TANKS								
Ace Roto-Mold, a Div. of Den Hartog Industries, Inc. PO Box 425, Hospers, IA 51238 800-342-3408 712-752-8432 Fax 712-752-8222 sales@denhartogindustries.com www.denhartogindustries.com See ad page 29	Ace Roto-Mold Septic	HD Polyethylene	500	63" x 74"	197	1		
	Ace Roto-Mold Septic	HD Polyethylene	1,250	58"l x 118"w x 72"h	492	2		IAPMO 21000, CAN/CSA-B-66
	Ace Roto-Mold Septic	HD Polyethylene	1,500	58"l x 137"w x 72"h	580	2		IAPMO 21000, CAN/CSA-B-66
Jet Inc. 750 Alpha Dr., Cleveland, OH 44143 800-321-6960 440-461-2000 Fax 440-442-9008 email@jetincorp.com www.jetincorp.com See ad page 37	Jet	Polyethylene	500 - 800	121"l x 62"w x 70"h	1,000	3	59"/56"	NSF 40 & 245
Infiltrator Water Technologies 4 Business Park Rd., Old Saybrook, CT 06475 800-221-4436 info@infiltratorwater.com www.infiltratorwater.com See ad page 3	IM-540	Polypropylene	500	65"l x 62"w x 55"h	191	1	47/44	IAPMO
	IM-1060	Polypropylene	1,050	127"l x 62"w x 55"h	346	1 or 2	47/44	IAPMO
	IM-1530	Polypropylene	1,500	176"l x 62"w x 55"h	501	1 or 2	47/44	IAPMO
Premier Tech Aqua 1, avenue Premier Riviere-du-Loup, QC G5R 6C1 Canada 800-6ECOFLO 418-867-8883 ext 6250 Fax 418-862-6642 pta@premiertech.com www.premiertechaqua.com See ad page 13	Premier Tech Aqua	Polyethylene	1,140	117"l x 52"w x 68"h	585	2	55"/52"	CSA
	Premier Tech Aqua	Polyethylene	2,481	128"l x 92"w x 108"h	1,435	2	79"/76"	
	Premier Tech Aqua	Polyethylene	12,258	514"l x 92"w x 108"h	4,770	2	79"/76"	
Roth Global Plastics PO Box 245, Syracuse, NY 13211 888-266-7684 315-475-0100 Fax 315-475-0200 info@roth-usa.com www.rothmultitank.com See ad page 23	Roth MultiTank	Polyethylene	750	51"l x 62"w x 103"h	360	1 or 2		
	Roth MultiTank	Polyethylene	1,000	51"l x 62"w x 118"h	450	1 or 2		
	Roth MultiTank	Polyethylene	1,500	51"l x 62"w x 177"h	640	1 or 2		

SEPTIC TANK DIRECTORY 2016

POLY TANKS CONT.

	BRAND	MATERIAL	CAPACITY (GALLONS)	DIMENSIONS	WEIGHT (LBS)	COMPARTMENTS	INLET (ALL)/ OUTLET (BLL)	CERTIFICATION
Snyder Industries, Inc. 6940 "O" St., Ste. 100, Lincoln, NE 68510 402-467-5221 Fax 402-465-1220 sales@snydernet.com www.snydernet.com	Snyder NexGen D2	Polyethylene	1,000	127"l x 61"w x 51"h	350	1 or 2		IAPMO/Most States
	Snyder NexGen D2	Polyethylene	1,250	157"l x 61"w x 51"h	420	1 or 2		IAPMO/Most States
	Snyder NexGen D2	Polyethylene	1,500	157"l x 69"w x 51"h	550	1 or 2		IAPMO/Most States

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Jim Anderson, Ph.D., and David Gustafson, P.E., are connected with the University of Minnesota onsite wastewater treatment education program. David is extension onsite sewage treatment educator. Jim is former director of the university's Water Resources Center and is now an emeritus professor. Readers are welcome to submit questions or article suggestions to Jim and David. Write to ander045@umn.edu.

Explore Landscaping Options for the Septic System

Turf grasses used to be the go-to choice for ground cover, but today's homeowners are looking for ornamental alternatives that look pretty and require fewer chemical inputs

By Jim Anderson and David Gustafson

Last month we talked about finishing an onsite system site for proper performance and customer satisfaction. An aspect of that discussion is addressing a common landscaping question after a system is completed: What can I plant over and around the septic system?

As the installer, you may not want to get involved with establishing vegetation, but there are some basic things a homeowner should know about planting around or over a system. Give them some guidance now and it can save both you and the homeowner headaches down the road. What follows are do's and don'ts we've learned over the years about landscaping over the septic system.

TURF GRASS CHALLENGES

Well-established vegetative cover will help ensure a long-lasting operating system by reducing problems due to erosion, removing water and nutrients from the soil, providing an insulating layer and making for a more attractive yard. In the past, the accepted vegetative cover was some type of turf grass adapted to the area of country where the system is installed. Turf grasses were viewed as ideal because they have relatively fibrous root systems and seed is readily obtainable. The only choice to be made was the right mixture for sun or shade. Once established, they create a nice open area good for dogs and kids, while the root system is not going to interfere with the operation of the system.

There are some basic things a homeowner should know about planting around or over a system. Give them some guidance now and it can save both you and the homeowner headaches down the road.

This is still a popular option for a lot of people, but it is not without some drawbacks. Keeping turf grass in good condition requires input of herbicides, fertilizers and, most of all, water. We advise not to add extra water to burden onsite systems, so watering common turf grasses during dry periods is undesirable. More and more, installers are asked about alternatives because the homeowner does not want to have to take care of a lawn area. Or the homeowner is a gardener and wants the area covered in flowers and vegetables!

NO EDIBLES

When they ask about vegetables, the quick answer is "absolutely not!" Sometimes this message is not given clearly enough, but the message needs to be emphatic; growing vegetables over the soil treatment part of the system is a bad idea. There are several reasons: First, there is the opportunity — particularly with root crops like carrots or potatoes — to come directly in contact with untreated septic tank effluent containing all the associated pathogens. It is a good way to get sick.

Aside from the health risks, gardening involves constant tilling of the soil. This can lead to compaction that can negatively impact oxygen exchange to the system, reducing acceptance rates and treatment. Gardening usually also entails clearing the surface to reduce plant diseases, leaving the surface open to potential erosion and reducing the amount of vegetation needed for insulation during the cold months.

In addition, ensuring good growth in the garden requires use of pesticides, herbicides, fertilizer and, most of all, water. These operations can add excess water to the system and cause soil compaction problems.

ORNAMENTAL OPTIONS

Homeowners also ask if ornamental grasses or perennial prairie grasses and wildflowers can be planted over the system. Some of these grasses and wildflowers have extensive, wide-ranging root systems that can cause problems with system operation. Although having watertight tanks and piping goes a long way toward solving root issues, any type of vegetation that has a large, laterally ranging or deep root system would not be desirable.

We are fortunate in our region to have a lot of plant material options exhibiting compact fibrous root systems that, once established, can be colorful and require little maintenance. These plants also tolerate drought or low-water conditions, another desired characteristic of plantings over the soil treatment area. Examples of these plants include certain fescues, blue grama, little bluestem for grasses, and native wildflowers like prairie clover, certain native asters and the showy purple coneflower. For ornamentals, day lilies and numerous types of sedum varieties can be good choices.

We worked with the Horticulture Department at the University of Minnesota to develop plant lists for the state. Contact your county Extension Service office and they can put you in touch with someone who can help provide ideas of appropriate plantings for your area and climate.

TREES AND SHRUBS

What about trees and shrubs? Just as with other plants, trees and shrubs that are water-loving or have large lateral root systems should not be placed within 20 feet of the edge of the system. This is a minimum distance and a larger cushion is preferable. Examples of trees in our area that should be kept a distance from the system are poplars (aspen, cottonwood), silver maple, willow, elm and cedars. Again, check with an expert to see what is in your area and what the options might be.

We see a lot of problems with roots when we have worked in the Southwest. No surprise that some of the desert trees and shrubs are very aggressive at seeking water; particularly mesquite shrubs can present a lot of problems. In Arizona we get reports that non-native species present more problems than some of the native plants. Major culprits are palm trees, which were once a common planting. Fortunately, palms are being phased out due to their need for water, but the issue underscores that homeowner choices are often not the best choices where the septic system is concerned. This shows there is an ever-present need to educate your customers and provide them with alternatives.

Ashland Pump Grinder Combines Dual Cutting Technologies to Attack Wipes

By Craig Mandli

Problems caused by the proliferation of so-called "flushable" wipes have pump manufacturers playing catch-up.

Most grinder pumps on the market have radial cutters, which grind waste into a fine slurry. Those are susceptible to clogging, though. Axial cutters, on the other hand, are designed to chop refuse into pieces that will pass through a small-diameter discharge. Those axial cutters, however, still leave solids in the waste stream that can clog filters and downstream piping.

Ashland Pump attempts to solve both problems with the AGP-HC200 Grinder Pump, which the company featured at the 2016 Water & Wastewater Equipment, Treatment & Transport (WWETT) Show.

The unit includes "double-edged sword" grinding technology, according to Jason Davis, Ashland Pump director of engineering. Its cutter includes both radial and axial cutters that the company claims are designed to handle the "flushable" items that aren't always so flushable.

"Most of the grinder pumps out there are radial, but with the new waste stream, you need the scissor-cutting action that axial cutters provide, especially for wipes," says Davis. "We designed this pump to provide the best of what you can expect from radial and axial systems."

Jason Davis, left, the director of engineering for Ashland Pump, points out some of the features of the new AGP-HC200 grinder pump, while holding a model of the pump's hybrid axial/radial cutting system. (Photo by Craig Mandli)

The hybrid cutting system chops and cuts fibrous material, while turning soft solids into slurry. Not only are downstream solids minimized, preventing clogging, the radial cutters continue to make slurry that can be filtered through most septic and lift station filtration systems. The cutter system has serrations that grab fibers while maintaining strength and holding an edge, while a slinger system prevents the wrapping of shop rags and other fibrous material that can lead to clogging.

FIELD TESTING

"We've been doing some pretty extensive testing on this unit in the field over the last year, and it's passed all our tests with flying colors," says Davis. "One issue you can see with axial pumps is clogging when the blades get dull. The radial portion of this pump helps stop that clogging, as the blades don't dull as easily."

The pump includes an ergonomic handle/lifting rail, quick-connect power and control cords, a choice of internal or external start components, Viton O-rings, an energy-efficient motor, a double-row angular contact lower bearing, and the choice of either vertical or horizontal discharge. Davis feels the unit is a good fit across a variety of applications.

"It's certainly a solid fit for residential and light-commercial settings, and can be used with septic systems or low-pressure sewer discharge," he says. "It's also a technology that is scalable up to wastewater treatment plant units. The wipes issue is certainly one that we see across multiple areas, and this technology is our answer for that."

While the AGP-HC200 was rolled out at the WWETT Show, Ashland Pump has had several units being tested in the field over the last year, according to Davis. The company also received positive feedback from customers.

"Many of our customers came to the show this year just to see and learn about this pump," says Davis. "I've spoken with many people who are pretty excited to give it a try. We're getting great results from our testing in the field. It's an innovation that we're feeling very positive about."

Ashland Pump is a longtime exhibitor at the WWETT Show, and Davis says the company makes a point of rolling out its new technology annually in Indianapolis. He says the goal is to have the AGP-HC200 available by early summer.

"I feel that this technology will revolutionize the grinder pump market," says Davis. **855/281-6830; www.ashlandpump.com.**

Are You Ready For a Green Fleet?

Truck manufacturers provide alternative fuel power options at NTEA Work Truck Show

By Ed Wodalski

With diesel and gasoline prices hanging steady around $2 a gallon, you probably haven't given alternative-fueled vehicles much thought. But should you?

At first glance, the math doesn't add up. With CNG (compressed natural gas) selling at $2.11 a gallon at the end of 2015 and gasoline selling at $2.04, driving an alternative-fueled truck can cost you an extra 7 cents a gallon. Add in the higher purchase price (about $7,000), and there appears to be no chance to recoup your financial investment.

So why go green? Incentives might be one reason. Government grants can lower the purchase price and tax rebates can close the gap in fuel cost. Another reason might be to break away from the competition. As a "green" contractor you create fewer emissions, less noise and leave a smaller carbon footprint. Cleaner burning fuels also mean less engine maintenance and a healthier work environment for your employees.

LOTS OF CHOICES

In the case of liquefied propane gas (LPG), there's also the opportunity to expand your business by serving as a refueling station. One thing's for certain — diesel and gasoline prices won't stay low over the long term. Historically, prices have taken violent swings, as anyone familiar with fuel surcharges might recall. In contrast, abundant supplies of natural gas have held prices steady over time.

This year's NTEA Work Truck Show in Indianapolis showcased some of the latest advances in alternative fuel options. Here's a quick look at what a few manufacturers had to offer:

CLOCKWISE

- The all-electric, zero-emission E-Cell from Mitsubishi Fuso Truck of America. (Photo by Ed Wodalski)
- A Ford chassis outfitted with a Roush CleanTech dedicated CNG fuel package. (Photo by Ed Wodalski)
- Isuzu Commercial Truck of America's cab-forward 2018 FTR chassis powered by a 5.2-liter turbocharged four-cylinder diesel engine. (Photo by Ed Wodalski)
- The S2G LPG commercial chassis from Freightliner. (Photo courtesy Freightliner)

All electric

The 100 percent electric, zero-emission E-Cell from Mitsubishi Fuso Truck of America delivers over 60 miles in a single charge. Powered by four lithium-ion batteries, the vehicle can be recharged on a regular AC or fast-charging system. Designed primarily for delivery and fleet use, it offers clean-air alternatives for contractors in California and urban environments such as Philadelphia and New York City.

With a GVWR of 13,230 pounds and payload capacity of 6,470 pounds, it has the potential of working as a delivery or parts truck in the onsite and portable sanitation sectors. With a seamless, one-speed transmission and 390-volt, air-cooled motor, the E-Cell operates at less than a whisper. Safety features include crush bars in each door, energy-absorbing steering wheel, forward-swing doors, high-visibility halogen headlamps and pedestrian audible warning system.

Why go green? Incentives might be one reason. Government grants can lower the purchase price and tax rebates can close the gap in fuel cost. Another reason might be to break away from the competition. As a "green" contractor you create fewer emissions, less noise and leave a smaller carbon footprint.

Liquid propane

In areas where CNG is still not available, liquid propane gas offers a go-anywhere, clean-air option. The S2G LPG commercial chassis from Freightliner has a GVWR of 33,000 pounds and is powered by an 8-liter liquid propane engine that delivers 339 hp at 4,100 rpm and 495 ft-lbs of torque at 3,100 rpm. It has a 12,000-pound single front axle and 21,000-pound single rear axle with 60-gallon, right-hand-mounted LPG fuel tank. An Allison automatic transmission with PTO provision is standard.

On a smaller scale, Freightliner's MT propane walk-in van chassis features a General Motors 6-liter V8 engine delivering 308 hp and 367 ft-lbs of torque at 4,400 rpm with an Allison 2000HS Series automatic transmission. The chassis has a GVWR of 23,000 pounds with 8,000-pound front axle and 13,000-pound rear axle. A 48-gallon LPG tank is mounted to the right side of the frame.

Natural gas

Peterbilt's 337 chassis is equipped to operate on natural gas utilizing a Cummins Westport ISL-G engine and Agility CNG fuel system. The chassis can be configured as a truck or tractor and complies with U.S. Environmental Protection Agency and California Air Resources Board emission regulations.

A bit of both

Kenworth's T-880 straight truck with roll-off system is powered by a Cummins ISX12-G natural-gas-fueled engine that can operate on either compressed natural gas (CNG) or liquefied natural gas (LNG). It does not require a diesel exhaust fluid tank, diesel particulate filter or selective catalytic reduction technology.

The 19,500-pound GVW Class 5 Hino COE 195H electric hybrid (also available with clean diesel powertrain) features a 5-liter J05E Series engine delivering 210 hp and 440 ft-lbs of torque, and comes with a six-speed Aisin A465 automatic transmission.

Ford also displayed its E-350/450 and F-650/750 cutaway chassis with dedicated CNG/propane packages. Both are available with a 6.8-liter Triton V-10 engine and TorqShift six-speed automatic overdrive transmission.

ON THE HORIZON

While not a true "green" machine, Isuzu Commercial Truck of America unveiled its new, environmentally friendly four-cylinder entry into the Class 6 medium-duty truck market.

The FTR chassis is powered by Isuzu's 4HK1-TC 5.2-liter turbocharged diesel engine.

Although horsepower and torque ratings have not been finalized, the power plant will be mated to an Allison 2000 Series automatic transmission. The engine carries a B10 durability of 310,000 miles.

"This truck represents our vision of the future of the medium-duty truck industry," says Shaun Skinner, executive vice president and general manager of Isuzu Commercial Truck of America.

Eight wheelbase configurations will accommodate bodies from 16 feet to 30 feet, allowing for a variety of body applications. The cab-forward 2018 FTR is scheduled to go into U.S. production in mid-2017.

A New Focus on Septic System Inspection in Mississippi

The state will have fewer inspectors, but they will be well-versed in onsite issues and technology, says a Department of Health official

By Doug Day

It's a time of transition for the Mississippi onsite wastewater industry. While the number of state health department inspectors is being reduced greatly, their duties are now specific to wastewater services and they are expected to benefit from better supervision and access to more training and resources.

Jim Weston, the director of onsite wastewater for the Mississippi State Department of Health, says budget cuts led to several recent changes, but he is expecting an improvement that will help the onsite installing and septic service industry.

What is the major change in the inspection program?

Weston: We used to have 103 environmentalists statewide who did all kinds of things: food programs, wastewater, rabies inspections, all kinds of stuff. As of March 1, we've gone to 33 locally based inspectors spread around the state with three supervisors in each office. They will focus exclusively on onsite wastewater and hopefully become subject matter experts over time by being able to concentrate on training on a single program. We're going to assign duties based on where they are located and reduce the amount of travel. We're also going to leverage technology, using iPads to generate recommendations, issue violations and provide services.

> "Local environmentalists will be in a chain of command that goes all the way up to the Division of Onsite Wastewater and they'll have more support because the supervisors will be more technically savvy."
>
> Jim Weston

I think the most positive of this is that before, we had a supervisor in each of the nine districts. But we didn't have anyone above that person who had knowledge of the wastewater program. Now, the local environmentalists will be in a chain of command that goes all the way up to the Division of Onsite Wastewater and they'll have more support because the supervisors will be more technically savvy.

We did 7,100 site evaluations last year in which we made recommendations. But we did only about 1,600 final approvals, which are required by law. That's one of the problems we had with the old system. That doesn't mean people are just doing whatever they want with those other systems or don't take action on our recommendations.

Jim Weston
Director of onsite wastewater for the Mississippi State Department of Health

Being such a rural state, oftentimes there are not mechanisms to ensure final inspections take place. Of 83 counties, 27 have their own codes that require a final approval, so that's a separate mechanism from us that ensures people in those counties get final approval. Fortunately, most of those are the counties with larger populations. We hope to bring up those numbers.

So I think it's going to be a positive change. Onsite wastewater is a very technical field, and having them specialize and having the opportunity to train them and spend time making them the best inspectors they can be will make a huge difference.

How many onsite professionals do you deal with across the state?

Weston: There are about 490 installers, 170 pumpers and 80 certified manufacturers. We have a Wastewater Advisory Council with 21 members including certified installers, business people, real estate agents, the chair of Mississippi State University Engineering and others. They give us advice on regulatory changes and provide feedback from the industry. When we change regulations, they generally set up a subcommittee and we meet with them. We try to make adjustments as we can to meet the needs of the onsite and public health communities and the clients we serve.

My office is responsible for training and certification programs for installers and pumpers. We offer continuing education classes every year where we go over regulation changes for the 13 CEUs required of certified installers and pumpers. They often help our four program specialists in training our own people annually; we have courses in systems and soils for the staff, and we spend time with them in the field to make sure everyone's on the same page.

With our new system, we're looking at ways to reduce the number of hours but increase the opportunities for installers and pumpers to get their credits, and offering them online and having home-study courses. We're going to give them credit for taking community college courses, helping us with training and serving on the advisory committee. There are ways to learn other than sitting in a classroom so we're thinking about options for continuing education credits or professional development hours.

We hope we can encourage onsite professionals to help each other. One of the things we're thinking about is development of an apprenticeship program.

What types of systems are common in Mississippi?

Weston: We use (conventional) septic systems with drainfields when we can. In the southern third of the state we have coastal plains soils that are very sandy and we run into water table problems as we get close to the ocean, of course. Across the state, we have a wide variety of soils ranging from sandy loam to clays. So we offer advanced treatment systems that rely on secondary disposal like overland or spray distribution, drip irrigation and elevated sand mounds.

We make good recommendations and do good final inspections when we're involved. I think the changes will definitely make it to where we're enforcing the laws and regulations as they're written. And we're going to start holding people more accountable for their actions when it comes to installing these systems to make sure installers are doing it correctly and that the property owners are doing what they have to do so their systems work properly. ◻

EPA Targets Nitrogen Reduction in Five Eastern States

By Doug Day

The U.S. Environmental Protection Agency has warned five states they aren't doing enough to reduce nitrogen in Long Island Sound. EPA proposed new strategies to reduce nitrogen in a letter to officials in New York, Connecticut, Massachusetts, Vermont and New Hampshire. Besides continuing to upgrade wastewater treatment plants, EPA said nitrogen targets for each state would help reduce the amount of nitrogen reaching the Sound from other sources such as storm drains, septic systems and lawn fertilizers.

COLORADO

Illegal dwellings are popping up all over Colorado as people look to cash in on the state's new legal marijuana industry. It's not known how many people are living off the grid with no running water, sanitation or proper heating systems. One fire chief in Park County said he counted 287 illegal homes in a single 50-mile drive, including RVs, campers, tents and makeshift structures. The county has hired two additional code enforcement officers and are updating zoning codes to make sure local ordinances properly regulate the dwellings.

NEW YORK

The Chautauqua County Board of Health began inspecting all private onsite wastewater systems within 250 feet of its five lakes in May. The inspections will focus on two lakes in 2016, with the project expected to take a few years to complete as the county reduces phosphorus reaching into the lakes and contributing to algae blooms. The county will be looking at systems more than 30 years old and those installed before permits were required.

Property owners will not be charged for the inspections but will have to pay the cost of uncovering the system and the cost to have it pumped for inspection. Local health officials will conduct a visual inspection and dye testing to determine the capacity and structural integrity of systems. The Environmental Health Department will work with owners of failed systems to determine actions needed to repair or replace them in order to meet sanitary codes.

Officials in Astoria, New York, say it will be 2019 before a popular park's bathrooms can be reopened. Last spring, it was discovered that the bathrooms for Astoria Park pool and playground were draining directly into the East River for decades because of an outdated septic system installed in the 1930s. Portable restrooms are being used in the interim as repairs go through the community's design and procurement process.

"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.

Septic Tanks and Components

By Craig Mandli

SEPTIC TANKS (POLY, CONCRETE, FIBERGLASS)

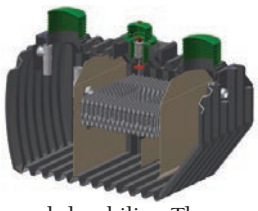
Den Hartog Industries Ace Roto-Mold septic tanks

Ace Roto-Mold 1,000-gallon septic tanks from **Den Hartog Industries** are designed to be strong and easy to install. Manufactured from high-density polyethylene with UV inhibitors, they have a horizontal flow designed for belowground installations up to 36 inches. The AST1000-2 double-compartment tank has been tested by NSF to meet the IAPMO Z1000 and CAN/CSA-B-66 standards. It has a trapezoidal deep-rib design and an interior divider panel, and a custom-molded gasket in the lid. Manufactured from extruded nitrile rubber, the gasket snaps into the lid to ensure a watertight seal. The tank divider panel slows the flow of wastewater and directs it to the middle of the tank so wastewater can separate from solids. An outlet baffle allows partially treated liquids to flow out for further treatment. **800/342-3408; www.denhartogindustries.com.**

Infiltrator Water Technologies IM-Series tanks

IM-Series tanks for septic, pump and potable water applications from **Infiltrator Water Technologies** are designed to be lightweight, durable, watertight and strong. The two-piece tanks are available in a variety of sizes including the IM-540 pump tank, the large-capacity IM-1530 septic tank, and the IM-1760C potable water tank. Enabling a wide range of installation options including shallow, multiple and serial tank configurations, tanks have integral heavy-duty lids that interconnect with the TW Riser System. They have structurally reinforced access ports, reinforced structural ribbing and fiberglass support posts for added strength. Inboard lifting lugs make delivery and handling easy. No special installation, backfill or water-filling procedures are required, and tanks can be pumped dry during pumpouts. The two-piece design nests for efficient shipping and reduced freight costs. **800/221-4436; www.infiltratorwater.com.**

Jet Inc. J-500-800PLT plastic tank



The **J-500-800PLT** plastic tank from **Jet Inc.** offers a lightweight alternative to concrete J-1500 Series BAT Media Plants. The tanks provide variable treatment capacity from 500 to 800 gpd. They are rotational molded from polyethylene material to offer a seamless tank with strength and durability. They are easy to transport and install in difficult site conditions, and are locally supported by a network of trained and certified distributors. **800/321-6960; www.jetincorp.com.**

Norwesco low-profile one-piece septic tanks

Low-profile one-piece septic tanks from **Norwesco** have molded-in support columns. These columns in the middle of the tank are filled with flowable soil before backfilling to maximize strength, stabilize the tank during backfill and reduce buoyancy. They have molded-in corner tie-down and lifting lugs for ease of handling and moving. The inlet and outlet holes are predrilled. Gaskets and field-adjustable sanitary tees that accept SDR 35 or Schedule 40 pipe are included. The installer can also use dual-wall pipe or PVC ribbed pipe for a riser. **800/328-3420; www.norwesco.com.**

Premier Tech Aqua large-capacity rotomolded polyethylene inground tanks

Heavy-duty and lightweight large-capacity rotomolded polyethylene inground tanks from **Premier Tech Aqua** are manufactured according to an assembly process and welding control system that makes them sturdy and high quality, according to the maker. Developed specifically for water storage and wastewater treatment use, the tanks are adapted to North American climates and are suitable for a large variety of commercial, community and municipal applications, including rainwater harvesting and firewater storage, septic tanks, equalization tanks, different types of bioreactors (MBBR, MBR, SBR) and complete process lines. Easy to handle and available in 4,000- to 12,000-gallon capacities, they are delivered ready to use. **800/632-6356; www.premiertechaqua.com.**

Roth Global Plastics MultiTank

The **MultiTank** from **Roth Global Plastics** can be used as a water cistern, pump tank, holding tank, rainwater tank or septic tank. It is constructed of an inner layer of FDA-approved virgin HDPE, two inside layers of polyethylene for improved stability and one outer layer of black and UV-stabilized polyethylene. **866/943-7256; www.rothmultitank.com.**

LIDS

Fergus Power Products dual power lids

Dual power lids for septic tank installations or restorations from **Fergus Power Products** are designed for new installation or to complete a restoration project by replacing a concrete lid. It is designed like the rafters in a house to give structural durability to support heavy wheel load without

added weight to the lid. The top is slightly domed to meet compliance throughout the U.S. Lids can be insulated with R-value of 6 and are available in 18-, 24-, 30- and 36-inch sizes. **218/736-6772; www.ferguspowerproducts.com.**

Hedstrom Plastics septic tank covers

Hedstrom Plastics septic tank covers are designed to eliminate riser systems. They are available in 18- and 24-inch lids made from strong polyethylene UV-protected material, yet lightweight for easy installation and transportation. Lids can be sand filled or foam filled for additional strength. A gasket and safety screws come standard, along with optional custom nameplates displaying a service provider's company name and contact information. **888/434-5891; www.hedstromplastics.com.**

RotoSolutions roto-molded septic tank lid

Roto-molded septic tank lids from **RotoSolutions** are manufactured from lightweight and durable materials for easy transport and handling during installation. They are sold with hardware kits that include stainless steel components. The lids are sold in boxes of six and are made to fit 12-, 18- or 24-inch I.D. corrugated pipe. They can be used with or without the sand filled option. **800/868-0973; www.rotosolutions.com.**

RISERS

TOPP Industries septic tank riser

Corrosion-resistant polyethylene septic tank risers from **TOPP Industries** eliminate the need to cut tubing from awkward lengths. Risers are available in 24- and 6-inch heights for bolt-on or concrete cast-in work. Six-inch septic tank riser extensions are also available. Risers and extensions are lightweight and UPS shippable. A fiberglass cover securely fits poly risers and extensions. The risers are easy to install, as they simply bolt into position or get concrete poured around the durable flanged base. They have tapered, lightweight construction for convenient stacking and reduced shipping costs. They have four built-in, recessed side pockets for easy handling of pipes and other penetrations. Installation mounting kits are available. **574/223-3681; www.toppindustries.com.**

Tuf-Tite tank risers

Tank risers from **Tuf-Tite** have internal supports or ledges to reinforce internal plastic safety lids. The ledges will strengthen the company's plastic internal safety lids or a variety of internal safety devices made by others, such as concrete, fiberglass or rope netting. The riser lids come with all necessary mounting hardware, including safety screws. **800/382-7009; www.tuf-tite.com.**

SEPTIC FILTERS

Anua Airashell

Airashell from **Anua** is a modular biofilter with a small footprint. The air treatment system removes a wide variety of noxious odor compounds, including more than 99 percent hydrogen sulfide, and can handle high variability in compound concentrations, according to the maker. It is prepackaged with recycled seashells, which protects the environment while reducing solid waste. The seashell media acts as a host for biological activity and a catalyst for pH neutralization. Chemicals are not required, operation is easy and life cycle costs are low. Applications include manholes, lift stations, wastewater treatment plants, sludge processing facilities, manufacturing facilities and solid waste or composting operations. **336/547-9338; www.anuainternational.com.**

Bio-Microbics SaniTEE effluent filters

SaniTEE effluent filters from **Bio-Microbics** provide consistent retention of wastewater solids whether as a stand-alone filter in the tank or prescreening for a complete wastewater treatment system, according to the maker. Available in 4-, 8- and 16-inch sizes to screen flows from 500 to more than 20,000 gpd, the screening devices are designed to reduce suspended solids discharged in the septic tank by promoting natural sedimentation and prevent gas-lifted particles from entering the outlet pipe. The keyhole weirs provide consistent flow, and the angled slots resist blinding to extend the life of the system, reduce clogging material and improve flow conditions. They incorporate a slip-in installation design and swabbing feature for easy clean-in-place maintenance. **800/753-3278; www.biomicrobics.com.**

Clarus Environmental WW4

The **WW4** effluent filter from **Clarus Environmental** has integral bypass protection screens to keep solids in the tank and out of the drainfield while servicing. The pleated design provides 528 linear feet of 1/16-inch filtration. It is designed for both residential and commercial applications with flows up to 4,000 gpd. It can be installed in parallel with additional units for greater flows. **800/928-7867; www.clarusenvironmental.com.**

Norweco Hydro-Kinetic Bio-Film Reactor

The **Hydro-Kinetic Bio-Film Reactor** attached-growth filtration system from **Norweco** is designed to help reduce BOD and solids from wastewater effluent without using electricity. Installation between a treatment tank and disposal field helps extend the life of the field. Gravity flow through the reactor eliminates the need for a pump-dosed filter. The lightweight, rotationally molded polyethylene reactor treats up to 800 gpd. It is completely nonmechanical, user-friendly and easy to install and maintain, according to the maker. **800/667-9326; www.norweco.com.**

Orenco Systems Biotube ProPak

Biotube ProPak ready-to-install pump packages from **Orenco Systems** filter up to two-thirds of solids, and only liquid from the tank's clear zone is pumped, according to the maker. The filter is easy to remove and clean without pulling the pump vault. It is used for filtering and pumping effluent from single- or dual-compartment septic tanks to gravity or pressurized discharge points. Its pump vault eliminates the need for a separate dosing tank. All components are designed to be quickly installed and easily maintained. The PF Series high-head effluent pump is field serviceable and repairable, and pump controls are designed for the specific package purchases. Free ProPak Select software provides fast, error-free hydraulic calculations and generates system curves. **800/348-9843; www.orenco.com.**

Polylok PL-250 effluent filter

The **PL-250** effluent filter from **Polylok** is designed to handle up to 3,000 gpd with 250 linear feet of filtration. According to the maker, PL-250 and its other filters are easy to install and designed with functionality and longevity in mind. **877/765-9565; www.polylok.com.**

Simple Solutions Distributing Super Wolverine vent filter

The solar-powered **Super Wolverine** vent filter from **Simple Solutions Distributing** is designed to eliminate odorous airflows up to 10 cfm, and the solar fan vents the tank, reducing accumulation of sewer gas. It holds between 8 and 10 pounds of activated carbon and is available with inlet sizes between 3 and 6 inches. It can be used for larger aerobic systems found at restaurants or on small commercial buildings. It has an optional saturation indicator for monitoring the life of the carbon bed and uses a 2-inch drain plug for media replacement. **866/667-8465; www.industrialodorcontrol.com.**

Sim/Tech Filter pleated filters

Pleated filters from **Sim/Tech Filter** are available for gravity effluent filtration in septic tanks and turbine pump filtration in pump tanks. Filtration size is 3/32 inch in two dimensions. Flow channels in the pleated material are designed to provide increased longevity. All filter types start at over 2,000 square inches of filtration area. The 45 percent open area (over 900 square inches) is equivalent to 800 linear feet of 3/32-inch slots. Various configurations and larger units are available. **888/999-3290; www.simtechfilter.com.**

SeptiTech STAAR residential trickling filter systems

STAAR residential trickling filter systems from **SeptiTech** are NSF/ANSI Standard 40, Class 1 and NSF/ANSI Standard 245 (nitrogen removal) certified. The clean effluent prevents biomat formation and leachfield clogging. They are compatible with shallow drip, direct discharge, pressure distribution, spray irrigation and conventional leachfields. Utilizing an enhanced, biological, unsaturated media filter process, they are ETV-EPA verified and NSF/ANSI Standard 40/245 certified. With an optional UV disinfection system, the systems are designed for direct discharge or water reuse and engineered to fit most typical small-flow residential and commercial applications. **800/318-7967; www.septitech.com.**

casestudies

Portable septic tank installed on tight site

Problem: A British Columbia, Canada, installer had a customer who needed a new septic tank in the backyard. A traditional rectangular concrete tank was out of the question because installation would require a large crane for placement. There was no road access to the backyard, and the space between neighboring structures was tight. A poly tank would not have worked effectively, either, as a high water table would lead to tank floating.

Solution: The installer installed two **Turtle Tanks**. "One of the many advantages of spherical concrete tanks is the portability, as it can be maneuvered with either a large or small excavator," says installer Luis Goncalves. Large excavators can handle the 1,320-gallon septic tank, and a mini-excavator can handle one half of the tank at a time. The tank can then be put together with a butyl rubber sealant.

Result: The tank has performed without issue since installation. **778/363-0828; www.turtletanks.com.**

Commercial system meets residential quality standards

Problem: Located between Eau Claire and Chippewa Falls in Wisconsin, Lake Hallie has undergone a development boom in recent years. One area of commercial development recently added a decentralized system called the Midway Mile. The system serves 12 to 15 commercial parcels and other special needs. Within the development, Markquart Motors needed a system to treat its wastewater to meet residential quality standards prior to sending it to the Midway Mile system.

Solution: The installed system consists of four precast concrete tanks in series furnished by Wieser Concrete Products. Each has a capacity of approximately 12,000 gallons. The first tank serves as the settling tank, with two compartments to help separate solids. The second is an equalization tank to prevent surge flows from going into the main system. Inside the tank are duplex pumps that meter forward 150 gallons every half hour. The third tank holds an aerobic treatment system: the Bio-Microbics MicroFAST 9.0 fixed activated sludge treatment system. The final tank is a two-compartment clarification tank with pumps that dose the cleaner effluent out to the Midway Mile system. The tanks were delivered and installed in four hours using a 120-ton crane to meet the customer's deadline.

Result: The system produces an effluent with less than 30 mg/L of BOD and TSS along with nitrogen reduction. **715/647-2311; www.wieserconcrete.com.**

Wisconsin State Fair Park, Milwaukee, Wisconsin

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WEQFAIR.COM

Call 866-933-2653 for more info.

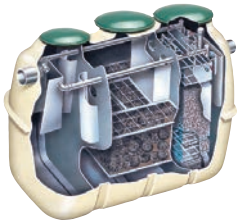
Milwaukee Electric Tool Corp. cable-cutting pliers

Cable-cutting pliers from Milwaukee Electric Tool Corp. feature a hardened blade for clean cuts through 4/0 – 2/0 copper wire. The bevel jaw design minimizes deformation of the wire, allowing the user to quickly complete an installation. The forged metal body and black oxide rust protection prevents damage, and rubber mold grips provide added comfort. **800/729-3878; www.milwaukeetool.com.**

John Deere small-frame skid-steer

The 312GR skid-steer loader from John Deere is designed for work in tight spaces or indoor operations. It features a 51 hp, Final Tier 4 engine with a 1,550-pound operating capacity. The radial-lift option offers a one-person boom lockout system that can be activated from within the cab. The lift system is designed for lower maintenance and optimal digging performance. All G-Series models are compatible with more than 100 Worksite Pro attachments. **800/503-3373; www.johndeere.com.**

Clarus Environmental Products treatment systems



Fusion Series treatment systems from Clarus Environmental Products are drop-in wastewater treatment units designed for decentralized applications where effluent quality needs to meet or exceed secondary treatment standards. Units are designed for residential, commercial and small-community applications. They are available in treatment capacities from 450 to 4,000 gpd and can be installed without a pretreatment tank. Effluent disposal options include conventional trenches, dosed systems, drip irrigation or disinfection with direct discharge. **800/928-7867; www.clarusenvironmental.com.**

Pettibone telehandler

The 1157B from Pettibone is the highest-reaching telehandler in the company's Extendo product line. It offers a load capacity of 11,000 pounds with a forward reach up to 42 feet 1 inch and lift height of 57 feet. A single pilot-operated joystick allows for smooth control of all boom and auxiliary hydraulics. It is powered by a 117 hp Cummins QSF 3.8 Tier 4 Final turbo diesel engine, and a Carraro Powershift transmission offers four speeds, forward and reverse. Other features include four-wheel, two-wheel and crab steering modes with a turning radius of 12 feet 6 inches. A Parker IQAN-MD3 display provides instant engine and aftertreatment diagnostics. **906/353-4800; www.pettiboneheg.com.**

Ditch Witch digging system for walk-behind trenchers

The OptiCut digging system from Ditch Witch, a Charles Machine Works Company, is made to enhance walk-behind trencher productivity in all soil conditions. Designed for depths up to 36 inches and 3.5 inches wide, the digging system uses low-profile teeth for a smoother cut with less chain wear. Configurations include a four-pitch DuraTooth, a two-pitch Shark and a two-pitch DuraTooth/Shark combination. The digging system is compatible with Ditch Witch C12, C14, C16, C16X, C24X and C30X walk-behind trenchers and can be adapted to other makes and models with a special conversion sprocket. **800/654-6481; www.ditchwitch.com.**

Empire Level True Blue I-Beam levels

The e55 Series True Blue I-Beam levels from Empire Level feature a top-read window for clear overhead viewing and built-in molded grip zones for enhanced portability. Magnetic models include a continuous magnetic edge. High-contrast vial surrounds provide visibility in all light conditions. **800/558-0722; www.empirelevel.com.**

SJE-Rhombus data logging control panel

The EZ Series In-Site CL data logging control panel from SJE-Rhombus is designed to control one or two 120-, 208- or 240-volt single-phase pumps in water and sewage installations. The panel utilizes the C-Level sensor for continuous level monitoring and records up to 4,000 system events, including pump runtimes, pump cycles, alarm conditions, HOA settings, power outages and service calls. The software formulates system data to create reports quickly and easily. The panel includes a Bluetooth Smart Ready module for wireless connection to an Android device that allows users to configure the panel, view system status or download data via the EZ Connect mobile app. **888/342-5753; www.sjerhombus.com.**

Franklin Electric centrifugal close-coupled pumps

The AG Series of centrifugal close-coupled pumps from Franklin Electric are designed for efficiency in challenging water transfer applications. Ten models cover the most popular hydraulic performance ranges from 3 to 75 hp, flow ratings from 50 to 2,000 gpm and heads up to 300 feet. Each pump is equipped with either a NEMA standard JM or JP motor for mechanical seal or packing gland configurations, both of which include a 416 stainless steel sleeve for durability and ease of service. **260/824-2900; www.franklinwater.com.**

Reelcraft spring-retractable reels

Series L 70000 spring-retractable cord reels from Reelcraft Industries are designed to accommodate up to 100 feet of 12-gauge cord. Steel construction and powder-coat finish combine for a heavy-duty, corrosion-resistant finish. The containerized drive spring offers safer and easier handling during maintenance. Two sealed ball bearings produce a smoother spool rotation and easier operation. All cord reels are UL-listed. **800/444-3134; www.reelcraft.com.**

BJM Pumps shredding pumps

The SKG Series of high-performance shredding pumps from BJM Pumps are available in three sizes with two impeller trims for lower head requirements and the ability to handle industrial liquids with gravities higher than water. Features include RAD-AX dual shredding technology to chew through difficult solids, hardened 440C stainless steel shredding elements and large-solids-size passage through the impeller and volute coupled to a high-torque, four-pole motor (2, 3 and 5 hp). **877/256-7867; www.bjmpumps.com.**

If you would like your wastewater trade association added to this list, send contact information to editor@onsiteinstaller.com.

Serving the Industry

Visit your state and provincial trade associations

Alabama
Alabama Onsite Wastewater Association; www.aowainfo.org; 334/396-3434

Arizona
Arizona Onsite Wastewater Recycling Association; www.azowra.org; 928/443-0333

Arkansas
Arkansas Onsite Wastewater Association; www.arkowa.com

California
California Onsite Wastewater Association; www.cowa.org; 530/513-6658

Colorado
Colorado Professionals in Onsite Wastewater; www.cpow.net; 720/626-8989

Connecticut
Connecticut Onsite Wastewater Recycling Association; www.cowra-online.org; 860/267-1057

Delaware
Delaware On-Site Wastewater Recycling Association; www.dowra.org

Florida
Florida Onsite Wastewater Association; www.fowaonsite.com; 321/363-1590

Georgia
Georgia Onsite Wastewater Association; www.onsitewastewater.org; 678/646-0379

Georgia F.O.G. Alliance; www.georgiafog.com

Idaho
Onsite Wastewater Association of Idaho; www.owaidaho.org; 208/664-2133

Illinois
Onsite Wastewater Professionals of Illinois; www.owpi.org

Indiana
Indiana Onsite Waste Water Professionals Association; www.iowpa.org; 317/889-2382

Iowa
Iowa Onsite Waste Water Association; www.iowwa.com; 515/225-1051

Kansas
Kansas Small Flows Association; www.ksfa.org; 913/594-1472

Kentucky
Kentucky Onsite Wastewater Association; www.kentuckyonsite.org; 855/818-5692

Maine
Maine Association of Site Evaluators; www.mainese.com

Maine Association of Professional Soil Scientists; www.mapss.org

Maryland
Maryland Onsite Wastewater Professionals Association; www.mowpa.org; 443/570-2029

Massachusetts
Massachusetts Association of Onsite Wastewater Professionals; www.maowp.org; 781/939-5710

Michigan
Michigan Onsite Wastewater Recycling Association; www.mowra.org

Michigan Septic Tank Association; www.msta.biz; 989/808-8648

Minnesota
Minnesota Onsite Wastewater Association; www.mowa-mn.com; 888/810-4178

Missouri
Missouri Smallflows Organization; www.mosmallflows.org; 417/631-4027

Nebraska
Nebraska On-site Waste Water Association; www.nowwa.org; 402/476-0162

New Hampshire
New Hampshire Association of Septage Haulers; www.nhash.com; 603/831-8670

Granite State Designers and Installers Association; www.gsdia.org; 603/228-1231

New Mexico
Professional Onsite Wastewater Reuse Association of New Mexico; www.powranm.org; 505/989-7676

New York
Long Island Liquid Waste Association, Inc.; www.lilwa.org; 631/585-0448

North Carolina
North Carolina Septic Tank Association; www.ncsta.net; 336/416-3564

North Carolina Portable Toilet Group; www.ncportabletoiletgroup.org; 252/249-1097

North Carolina Pumper Group; www.ncpumpergroup.org; 252/249-1097

Ohio
Ohio Onsite Wastewater Association; www.ohioonsite.org; 866/843-4429

Oregon
Oregon Onsite Wastewater Association; www.o2wa.org; 541/389-6692

Pennsylvania
Pennsylvania Association of Sewage Enforcement Officers; www.pa-seo.org; 717/761-8648

Pennsylvania Onsite Wastewater Recycling Association; www.powra.org

Pennsylvania Septage Management Association; www.psma.net; 717/763-7762

Tennessee

Tennessee Onsite Wastewater Association; www.tnonsite.org

Texas

Texas On-Site Wastewater Association; www.txowa.org; 888/398-7188

Virginia

Virginia Onsite Wastewater Recycling Association; www.vowra.org; 540/377-9830

Washington

Washington On-Site Sewage Association; www.wossa.org; 253/770-6594

Wisconsin

Wisconsin Onsite Water Recycling Association; www.wowra.com; 608/441-1436

Wisconsin Liquid Waste Carriers Association; www.wlwca.com; 608/441-1436

NATIONAL

Water Environment Federation; www.wef.org; 800/666-0206

National Onsite Wastewater Recycling Association; www.nowra.org; 800/966-2942

National Association of Wastewater Technicians; www.nawt.org; 800/236-6298

CANADA

Alberta

Alberta Onsite Wastewater Management Association; www.aowma.com; 877/489-7471

British Columbia

British Columbia Onsite Wastewater Association; www.bcossa.org; 778/432-2120

WCOWMA Onsite Wastewater Management of B.C.; www.wcowma-bc.com; 877/489-7471

Manitoba

Manitoba Onsite Wastewater Management Association; www.mowma.org; 877/489-7471

Onsite Wastewater Systems Installers of Manitoba, Inc.; www.owsim.com; 204/771-0455

New Brunswick

New Brunswick Association of Onsite Wastewater Professionals; www.nbaowp.ca; 506/455-5477

Nova Scotia

Waste Water Nova Scotia; www.wwns.ca; 902/246-2131

Ontario

Ontario Onsite Wastewater Association; www.oowa.org; 855/905-6692

Ontario Association of Sewage Industry Services; www.oasisontario.on.ca; 877/202-0082

Saskatchewan

Saskatchewan Onsite Wastewater Management Association; www.sowma.ca; 877/489-7471

Canadian Regional

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

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BUSINESSES

Septic Installation and Repair Business for Sale - Northwest Illinois. Owners looking to retire after 25 years. Operating in four counties, primarily Stephenson. Sale includes equipment and loyal customer base. Serious inquires only. $200,000. Call 815-865-5066. (i06)

PRESSURE WASHERS

Industrial Pressure Washer - New w/warranty $9,500. 2,000psi, 18gpm. 999cc Kohler & AR pump. Will deliver. 321-800-5763 (iM)

Honda horizontal GX engines, new in-the-box w/warranty. GX200QX - $399; GX-270QAG - $579; GX390QA - $599 delivered price. 800-363-9855 or GXParts.com (iM)

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, 1-800-536-5564 (iM)

SEPTIC TANK FORMS

Used Del Zotto Equipment for Sale: 24" Eccentric cone form $3,750; Bottom female pallet $750; 48" x 48" barrel form $3,800; Top male pallet $1,125; Bottom female pallet $1,350; 48" x 48" extended-base form $5,500; Top male pallet $1,125; 12" tall flat lid form $475; Cone wire jig $765. Selling 50% of new price. Call 618-228-7702 (i06)

TRUCKS - BOOM

Septic Tank Delivery Truck: 2000 Peterbilt truck with QMC QLR25A crane. CAT C12 engine 410hp, Eaton Fuller 10-speed 8LL transmission. 18,000 lb. front axle, 40,000 lb. rear axles. FOB Salinas, CA. .....$75,000 OBO

Andy 831-449-4273
www.donchapin.com/for_sale i07

Ever wish you had a few more inches?

We heard you! Polylok now offers 20" risers in 2" and 3" heights. These new risers are similar to our 24" x 3" riser pan. Whether you are working with a septic tank, distribution box or drainage box, stacking these new heights with our existing series of 6" and 12" high risers will enable you to get the perfect fit you want every time!

Worried about safety? We are too! That's why you can install a concrete plug in our 20" and 24" riser series. Additionally, we offer 20" and 24" riser safety screens that provide a secondary layer of protection.

POLYLOK™ Inc.
Innovations in Precast, Drainage & Wastewater Products
Zabel® A Division of Polylok Inc.

Flexibility and Safety without Aggravation!!

12" x 12" Riser | 12" x 6" Riser | 20" x 6" Riser | 20" x 12" Riser | 20" Riser Pan | 24" x 3" Riser / Riser Pan | 24" x 6" Riser | 24" x 12" Riser Pan

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