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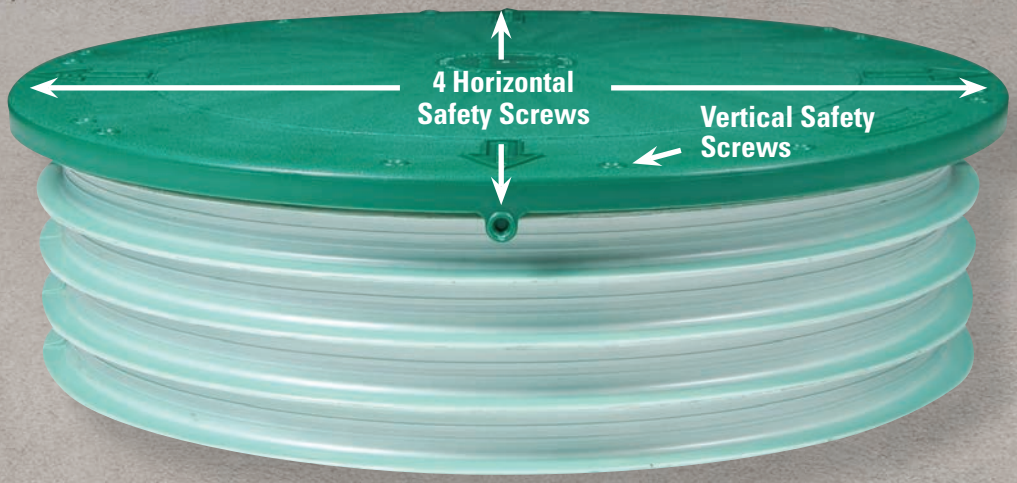

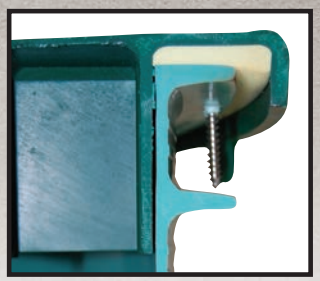

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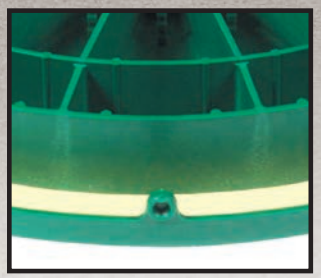

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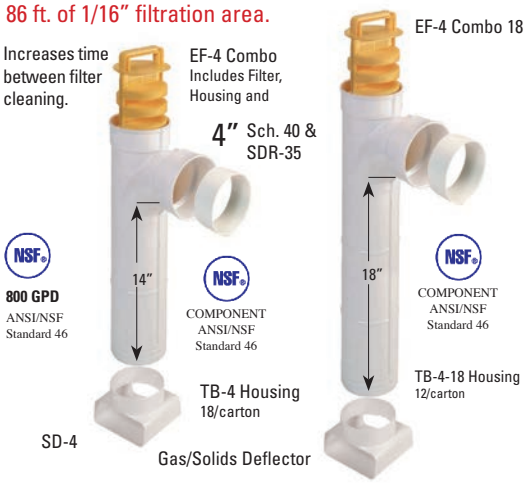

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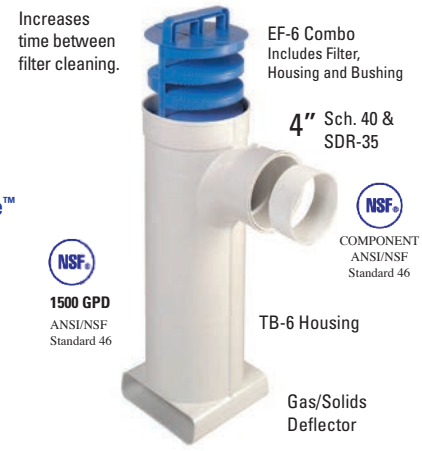

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A waterfront RV campground in Michigan posed great site challenges for the installers at Primrose Acres. Technician Nathan Kaat is shown inserting a 1.50-inch distribution lateral inside a length of 4-inch PVC pipe. EZset risers (Infiltrator Water Technologies) protect effluent sampling trays. Workers used a RL-H4C laser (Topcon Positioning Systems) to shoot elevations. (Photo courtesy of Primrose Acres)

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June 2020

Enjoy this issue!

Established in 2004, *Onsite Installer*™ fosters higher professionalism and profitability for those who design and install septic systems and other onsite wastewater treatment systems.

Jim Kneiszel

How Can You Inspect a Tank Without Pumping It?

A Canadian town council is set to weaken its inspection rules because some residents just don't want to pay for pumping

Send your comments, questions or opinions to Jim Kneiszel at editor@onsiteinstaller.com.

A year ago, I wrote with a sense of optimism about a forward-thinking onsite system inspection program started in a recreational lakes region north of Toronto. Homeowners in the municipality of Dysart et al, seemed uncharacteristically supportive of a program to comprehensively inventory and inspect their systems to protect the local environment.

Many retirees and summer cottagers enjoyed the pristine quality of the waterways that have not seen the issue of blue-green algae prevalent in some parts of the U.S., for example. Heading into the second year of these required inspections, Mike Rahme of HomePro Inspections was proud of the level of concern folks were showing about their onsite systems.

"There's a big emphasis on the educational component, and that's the angle I come at it from. If someone understands why the rule is what it is, they are more willing to move toward compliance," Rahme said at the time.

"You see a lightbulb come on and it's refreshing. You've made somebody aware, and that carries a whole lot more weight than a penalty the municipality has to enforce. Taking the time and providing an understanding is paramount in my mind to trying to get people thinking the right way and not just complying."

THAT WAS THEN

The story is looking a little different in 2020.

As it turns out, enough homeowners are refusing to comply with the inspections that local government officials appear to be giving up on an important requirement. According to a story in the *Haliburton Echo*, Dysart municipal councilors voted almost unanimously to drop preinspection pumpouts from the Level 4 inspection program. Why? Because 112 of the first 964 property owners in the program failed to complete the pumpouts or refused to submit a required third-party inspection report.

"Although this represents only 12% of properties, beyond issuing 112 orders to comply, dealing with even a quarter of these infractions is not possible with our current staffing," Karl Korpela, chief building officer, told the council. So Korpela asked the council to drop the pumpout provision, and the officials went along with him.

So let me get this straight:

The council had approved inspections with pumpouts in 2017 because they believed emptying the tank provided the best way to check on the functionality of septic systems. Homeowners complied with the program at first, but soon many decided to ignore the rules. Regulators complained about having to do their job by enforcing the rules. Rather than follow through with the inspection program they approved, councilors gave up on the inspections.

Got it. Just so I understand, a handful of people who thumb their noses at important environmental safety laws are now in control of what goes on in Dysart. That's right. Don't listen to the onsite professionals who make a compelling argument that an inspection isn't complete without emptying the tank to check on its condition. Rather, listen to people who aren't experts in the field.

FOR WHAT IT'S WORTH

For one, the newspaper reported that Korpela said, "based on his research, environmentally, 'There's no benefit to a mandatory pumpout." He told the council that pumpouts could still be required when deemed necessary by an inspector. But how is an inspector going to know a pumpout is necessary when he can't see the condition of the tank?

Apart from the pumping issue. Korpela also intimated that because homeowners were to choose a qualified inspector from an approved list, the inspectors "may therefore feel they have an obligation of helping the owner pass an inspection." Is he saying these licensed professional inspectors would forge their reports to help the homeowners? That's insulting to the onsite profession and a topic for another column.

Then there's Deputy Mayor Pat Kennedy, who exhibited his ignorance about wastewater when he questioned land application methods and said sludge is better left in the septic tank. "We're pumping out septage that's being looked after by a perfectly good septic system," he said, according to the newspaper.

So Kennedy is among the uneducated who don't realize septic tanks require periodic pumping to work properly? He is part of the same government that approved the Level 4 inspections in the first place and had to have been told about the importance of onsite system maintenance.

ROBUST PROCESS NEEDED

A year ago, Rahme told me it is critically important to check the wear and tear on many older concrete tanks in the lakes region.

"It's important when doing these inspections to be as robust as possible with our process, and the best way to do that is with a pumpout. It's the only way to check the integrity of the tank," he said at the time. "We have a very aged population on our lakes, a lot of retirees, and these people are taking a lot of medications and passing them through the septic tanks. They are corrosive to the tanks, and we're seeing a lot of deterioration, end walls being eaten out."

One homeowner who was on board with the inspection program a year ago is John Smith, a member of the Kennisis Lake association who was consequently elected as a councilor representing Dysart. At the time he was hopeful. "Most people want to do the right thing. Lots of people care deeply about the lake and want to do their part," he told me.

Smith was the only councilor who wanted to maintain the required inspections at this meeting. He argued it isn't fair to change the rules after many homeowners willingly paid for the pumpouts and a small percentage balked at the cost. "Four thousand dollars, people on an island paid for a barge, because Dysart said it was necessary," Smith said.

Rahme may have been forecasting a little trouble ahead with these inspections when he threw out a caution a year ago, but he then said he would counter misinformation through consumer education.

"Unfortunately money outweighs common sense in a lot of cases. Fast and cheap is the way of the world these days, and that's not always going to give you the best result," he said. "My personal endeavor is to show people if you spend more money now, you're going to get paid back in spades because it's not just your pocketbook you have to worry about. If we have one blue-green algae breakout in our lakes, your property value is going to drop by 30%. That hits home."

TAKE ANOTHER LOOK

Although the council voted for changes to the law, including ending the preinspection pumpout, the revisions must go before the Environment and Climate Change Committee for review and then return to the council for confirmation at a later date, the newspaper reported.

I hope Dysart officials ultimately summon the political courage to reaffirm the need for inspection pumpouts and find the capital to support proper enforcement. It's troubling to me to hear about states, provinces, counties or towns that require neither time-of-sale inspections nor mandatory periodic pumping and inspection.

To me, these are the foundation for proper septic system care and the flourishing of the onsite wastewater industry. Failure to convince local governments and septic system users about the need for regular maintenance risks the many recent advances made in the acceptance of decentralized wastewater as a suitable alternative to municipal sewers.

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TANK CONSIDERATIONS

Material Matters

There are three main types of materials used to make septic tanks. Precast concrete tanks have traditionally been used for onsite systems, and use of tanks fabricated from fiberglass-reinforced plastic and polyethylene is becoming more common. Each of these common septic tank materials has advantages and disadvantages you should consider carefully before each installation. Read up on them here. onsiteinstaller.com/featured

SEPTIC SERVICE TIMELINE

Required Maintenance

The suggested three- to five-year pumping interval is usually reasonable, but checking sludge levels at the time of service can provide a better estimate of the necessary pumpout interval. The most reliable method for determining the need to pump is regular inspection of the tank, including measurement of sludge and scum thickness. Read more about maintenance guidelines in this exclusive online article.
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SYSTEM PROFILE

The equipment track around the house to the drainfields is still visible. The tops of inspection ports and clean-outs mark the L-shaped drainfield at the Union River campground. (Courtesy of Ron Clexton, Portrait Design & Print Studio)

A Tight Fit Between Water and Woods

An onsite system using low-pressure dosing to sand filter modules saves an Upper Peninsula Michigan recreational vehicle campground

By Scottie Dayton

The owners of a RV campground in Ontonagon, Michigan, faced a complex situation when the onsite system serving the showers, restrooms and camper dump station failed.

Although the owners signed a pumping contract, the Ontonagon County Health Department wouldn't accept it until they hired an engineer to design a replacement system and a contractor to install it.

The site was too small for a standard pressure distribution mound, so the engineer suggested various alternative technologies. All were beyond the owners' financial situation. They wanted hard facts and figures, but contractors couldn't provide them without the design. The Health Department had to submit the design to the Michigan Department of Environmental Quality, but the agency wouldn't approve it unless it maximized the available space.

Using a Caterpillar 299C skid-steer and RL-H4C laser (Topcon Positioning Systems), workers from Primrose Acres build up the 12-inch-deep sand mound for the 58-by-36-foot-wide drainfield B. In the background is the 58-by-24-foot-wide drainfield A.

Keila Kaat (left) and Nathan Kaat shovel sand onto the geotextile fabric to hold it in place. EZset risers (Infiltrator Water Technologies) protect effluent sampling trays, one per zone.

System Profile

Location:	Ontonagon, Michigan
Facility served:	Recreational vehicle campground
Designer:	Chris Holmes, P.E., U.P. Engineers and Architects
Installer:	John Kaat, Primrose Acres
Type of system:	Low-pressure dosing sand filter mound
Site conditions:	Fine sandy loam to clay loam, loading rate 0.704 gpd per square foot
Hydraulic capacity:	2,450 gpd

On a recommendation, the owners contacted John Kaat, proprietor of Primrose Acres in Bruce Crossing. Kaat and associate Chris Holmes, P.E., project manager for U.P. Engineers and Architects, designed a low-pressure distribution system using geotextile sand filter modules (Eljen).

The tricky bit was limited space for the L-shaped drainfield. The horizontal leg ended against the house's deck, a U-shaped asphalt driveway enclosed two sides of the beds, and behind them was a 13-foot drop to the Union River.

Holmes wedged the fields into the space by eliminating 10 of the 50 campsites and receiving a 50-foot variance separation to the river's flood plain. Primrose Acres finished the install in time for the 2019 summer season.

Site conditions

Soils are fine sandy loam to clay loam with a loading rate of 0.704 gpd per square foot and the limiting layer 10 inches below grade. The property, in the foothills of the Porcupine Mountains, is bordered by Lake Superior and the river.

System components

Holmes designed the system to handle 2,450 gpd. Major components are:

- Existing 1,500-gallon septic tank at the campground
- Tank No. 1: 1,650-gallon combination precast septic/pump tank (Concrete Products) with LT-1/8 high-capacity effluent filter (Lifetime Filters), PE31M 1/3 hp pump (pumps from Goulds Water Technology, a Xylem brand), and PS Patrol control panel (SJE Rhombus)
- Tank No. 2: 1,650-gallon combination precast settling/pump tank (Concrete Products) with PL-525 effluent filter (Polylok), dual PE41M 4/10 hp pumps, and EZ Series duplex control panel (SJE Rhombus)
- V6605A distribution valve (Orenco Systems)
- 56 B43 GSF modules (Eljen) in drainfield A
- 84 B43 modules in drainfield B

"We dug backward from the second tank and parallel to the drive. **When we came alongside the old drainfield, effluent ran out. It made a bit of a mess, but drained nicely."**

John Kaat

Sam Grulke of First Supply (left) and Seth Kaat cement sticks of 4-inch PVC pipe for the geotextile sand filter modules (Eljen).

Tight quarters required all hands to help the Concrete Products' driver deliver the 1,650-gallon combination settling/pump tank for dosing the drainfields.

System operation

Effluent from the campground tank flows 322 feet through a 4-inch Schedule 40 PVC main paralleling the road to tank No. 2. Wastewater from the house flows 15 feet through a 4-inch lateral to tank No. 1. Its on-demand pump sends 140 gallons 198 feet through a 2-inch force main that tees to the campground main 4 feet behind the second tank.

Every 17.5 minutes, alternating pumps in the second tank send 140 gallons 82 feet to the distribution valve dosing five zones. Drainfield A has two zones of paired laterals and drainfield B has three zones of paired laterals, all on 6 foot centers. Both fields have 58-foot-long laterals totaling 3,480 square feet.

A 4-inch pipe tops each row of 48- by 36- by 7-inch-high modules. Sleeved inside these pipes are 1.50-inch distribution laterals with 3/16-inch orifices spaced 4 feet apart, four holes up and one down in sequence. Liquid discharges to 12 inches of washed sand over native soil.

Drainfield installation

Holmes and Sam Grulke, representing First Supply, an Eljen distributor, were concerned that the campground effluent would be too concentrated for the modules. Although the three-bedroom home and office had a functioning, grandfathered gravity system, they upgraded it, using the house effluent to dilute the campground effluent. The inflow from both would create sufficient turbulence to homogenize the liquids.

Kaat had his own concerns. "In this northwest region of the Upper Peninsula, snow melts in mid- to late-April and seasonal highway weight restrictions are sometimes in effect through May," he says. "The campground opens the end of May, leaving the first two weeks in June as the only window for the install."

When his crew arrived on May 31, the owners had cleared mature trees where needed for site work. "We had permission to begin the project before the permit arrived on June 6, so we scarified the soil and began building the 12-inch-deep raised sand beds," Kaat says.

In 26 loads, 536 tons of 2NS sand were transported from a quarry 90 minutes away. The distance enabled the crew to spread the material as fast as the trucks arrived, using a Caterpillar 299C skid-steer and RL-H4C laser (Topcon Positioning Systems). They also laid 4-by-8-foot ground cover mats (AlturnaMATS by Checkers Industrial Safety Products) for stabilization and floatation of equipment and materials through wet areas and to prevent damage to the asphalt parking lot.

"It's a beautiful facility with mature trees everywhere," Kaat says. "We wanted it looking as pristine as possible when we left."

The owners wanted an unobstructed sightline between the office and campground, but without the absorption area resembling a plateau. Kaat worked with Holmes and Grulke to contour the zones, blending them into the topography as it sloped 2 feet or more toward the river. "We stepped the whole bed: 6 inches between the two zones in drainfield A and 12 inches between the two fields," Kaat says. Grulke also helped install the modules.

Tank installation

The biggest challenge to setting the tanks was backing the truck between the dense trees. "It was tight quarters even for the Volvo ECR145CL zero-tail-swing excavator," Kaat says. "There was always the danger of dinging up the bark."

Ron Cleary, owner of Peninsula Septic Cleaning, pumped the tanks. The new house tank occupied the same location as the original concrete block septic tank. "The joints had eroded, and the tank crumbled to pieces as we exposed it," Kaat says.

Because tank No. 2 sat in a ravine, the seasonal water table was higher than the lid. To prevent the tank from flooding, the crew ran a drain tile discharging to the flood plain around the back of the excavation.

The 2-inch force main from tank No. 1 to tank No. 2 followed the contour lines at the bottom of the hill.

When digging the force main trench from the house to the second tank, the excavator operator followed the contour lines at the bottom of the hill, then went up the ravine as it rose 8 feet in elevation. Backfilling the EZset risers (Infiltrator Water Technologies) to grade required 3 feet of bank sand.

The supply line from the campground septic tank passed under the driveway to a distribution box dosing the saturated existing drainfield. To maintain gravity flow, the trench from the box to tank No. 2 fell 80.5 inches in elevation over 322 feet.

"We dug backward from the second tank and parallel to the drive," Kaat says. "When we came alongside the old drainfield, effluent ran out. It made a bit of a mess, but drained nicely."

Covering the drainfield modules, backfilling the tanks and grading required 278 cubic yards or 22 loads of clean bank sand from a pit 30 minutes away. Kaat brought in 266 cubic yards or 17 loads of screened topsoil from his quarry 45 minutes away. He used a John Deere four-wheel drive tractor loader and bale shredder for mulching the area after seeding on June 18.

Maintenance

Until the Health Department hires a maintenance contractor, Primrose Acres will sample effluent, check floats and ball valves, and flush the laterals annually. Pumping is on the same schedule.

In late summer, Kaat and Eljen representatives returned to check the system and found what appeared to be plastic scum on the effluent filters. "I've never seen it before, but it could be polymers," Kaat says. "Recent studies suggest that the plastic molecules used for fillers in cheap soaps and body washes will clog the Bio-Matt fabric (Eljen). If confirmed, discharge of polymers will have an adverse effect on all contractors and their clients using sand filter module systems."

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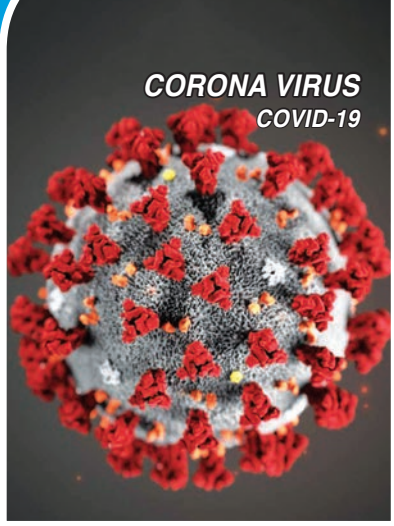

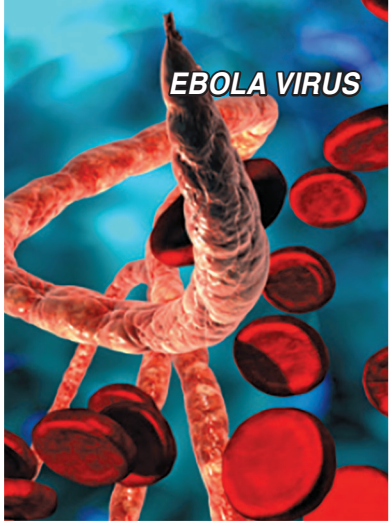

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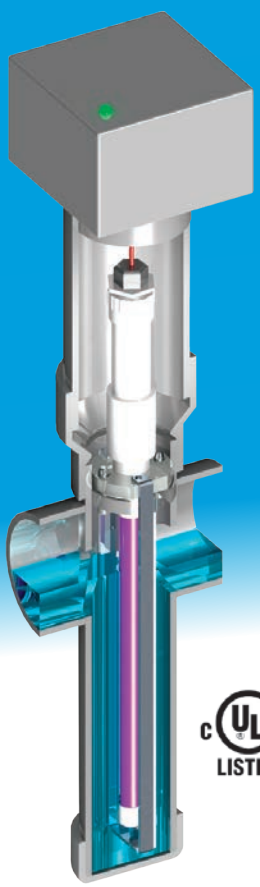

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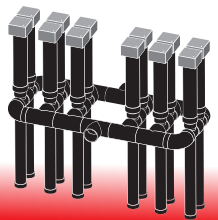

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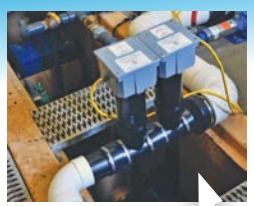

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Jim Anderson, Ph.D., and David Gustafson, P.E., are connected with the University of Minnesota onsite wastewater treatment education program. David is extension onsite sewage treatment educator. Jim is former director of the university's Water Resources 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.

Don't Underestimate the Importance of Clean Sand in System Design

The proliferation of mound systems in the 1970s built demand for carefully sized sand products free of contaminating fines

By Jim Anderson and David Gustafson

We get a lot of questions about clean sand. Most are related to the clean sand requirement for mound sewage treatment systems. However, we do get questions about using sand in either single- or multiple-pass sand filters and use of sand or other materials as fill or final cover for soil treatment systems.

In this column, we focus on clean sand for mound treatment systems. In Minnesota, there are more than 50,000 mounds in operation. When designed and installed correctly, these are effective and long-lasting systems. Some have been in continuous operation since the 1970s. This type of success requires use of proper materials — clean sand and clean rock being the most important. One of the biggest problems we have seen when troubleshooting failing mounds is use of sand that is not clean, resulting in premature failures.

Sand performs two functions in mound systems: It provides initial treatment of sewage tank effluent and acts to disperse the partially treated effluent over the soil treatment area for final treatment in natural soil. To provide these functions requires sand free of silt and clay-size particles, which can — over time — wash through the sand to the soil infiltrative surface, forming a restrictive layer and reducing movement of water into and through the natural soil.

Since the installation of the first mound systems in the early 1970s, the definition of clean sand changed as more was learned about which systems operated best and for the longest times.

Since the installation of the first mound systems in the early 1970s, the definition of clean sand changed as more was learned about which systems operated best and for the longest times. The first definition merely said that the percentage of sand needed to be at least 90%, leaving the possibility to have as much as 10% "fines" (silt and clay-sized particles). Later research led to the recommendation to allow only 5% fines and that less than 5% was better.

SAND STATS

The definition we use in Minnesota is "clean sand is a soil texture composed by weight of at least 25% very coarse, coarse and medium sand varying in size from 2.0 to 0.25 millimeters, less than 50% fine or very fine sand ranging in size between 0.25 and 0.05 millimeters and no more than 5% smaller than 0.05 millimeters."

Clean sand according to the Minnesota code is defined by the following sieve sizes and percent passing each sieve.

SIEVE NUMBER	SIEVE SIZE (MM)	PERCENT PASSING
4	4.75	95-100
8	2.0	80-100
10	0.85	0-100
40	0.425	0-100
60	0.212	0-40
200	0.075	0-5

A couple of points must be made. This definition is specific, so a "clean sand" fitting all of these criteria is difficult to find in nature; therefore, pit run sand, in most cases, will not meet the fines requirement, meaning the sand must be washed and sieved to achieve similar specifications. This increases the cost of the sand significantly, especially in areas where mounds are not built very often, so the volume of material with these specifications is low.

Our definition also includes a restriction on very fine and fine sands. This is because we have found through experience and research that these particles are very close in size to silt particles. If the percentage is too high, even though the material fits the sand size criteria, the soil will act more like silt in terms of permeability when septic tank effluent is added. When infiltration rates are reduced, a more resistant biomat can form at the infiltration surface, leading to mound failure.

WHAT ABOUT C33?

Because of the difficulty obtaining clean sand with these characteristics, some states have specified use of C33 sand as defined by the American Society for Testing and Materials. This is a material used in road construction and is widely available from suppliers. The problem is material meeting this standard can be variable. On the coarse end of what is allowed, the particles are larger and the percentages of fines are quite low, about 2%. This material certainly meets the definition of clean sand. At the lower end, the material could contain as much as 10% fines. When selecting sand, it is important to receive and look at the sieve analysis for the material purchased, because all C33 material is not the same.

To demonstrate differences in materials, below is the C33 sieve analysis to compare with the Minnesota definition.

SIEVE SIZE	CUMULATIVE PERCENT PASSING
4	95-100
8	80-100
16	50-85
30	25-60
50	10-30
100	2-10

Along with the sieve analysis, the supplier can provide a uniformity coefficient for the material. This tells how well-graded the material is: whether there is a wide range of sizes in the material or whether the material consists of mostly one size of particle. A uniformity coefficient of 1.00 means all the particles are the same size, while numbers larger than 1.00 indicate materials with less uniformity.

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SEPTIC TANKS

BRAND	MATERIAL	CAPACITY (GALLONS)	DIMENSIONS	WEIGHT (LBS)	COMPARTMENTS	INLET (ALL)/ OUTLET (BLL)	CERTIFICATION
CONCRETE TANKS							
Jet	Concrete	500 - 1,500	120"l x 59"w x 69"h	10,000	3	56"/53"	NSF 40, 245 & 350
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 31**							
National Precast Concrete Association 1320 City Center Dr., Ste. 200, Carmel, IN 46032 800-366-7731 khanson@precast.org To Access Our Tank Producer Search, Go To: www.precast.org/tanks **See ad page 25**	Various	Concrete	Varies with Producer	Varies with Producer	Varies with Producer	Varies with Producer	Varies with Producer
Wieser Concrete W3716 US Hwy. 10, Maiden Rock, WI 54750 800-325-8456 | 715-647-2311 winkler@wieserconcrete.com | www.wieserconcrete.com **See ad page 27**	Wieser Wieser Wieser	Concrete Concrete Concrete	1,600 10,000 (Hs20 rated) 40,000	84"l x 145"w x 53 1/4"h 120"l x 192"w x 126"h 168"l x 480"w x 140"h	10,250 base 6,350 lid 35,975/section 70,000/section	3 Adjustable Adjustable	Adjustable Adjustable Adjustable	NPCA Certified NPCA Certified NPCA Certified
POLY TANKS							
INFILTRATOR tanks	IM-540 IM-1060 IM-1530	Polypropylene Polypropylene Polypropylene	500 1,050 1,500	65"l x 62"w x 55"h 127"l x 62"w x 55"h 176"l x 62"w x 55"h	191 346 501	1 1 or 2 1 or 2	47/44 47/44 47/44	IAPMO IAPMO IAPMO
Infiltrator Water Technologies, LLC 4 Business Park Rd., Old Saybrook, CT 06475 800-221-4436 info@infiltratorwater.com | www.infiltratorwater.com **See ad page 3**								
Jet	Jet	Polyethylene	500 - 800	121"l x 62"w x 70"h	1,000	3	59"/56"	NSF 40, 245 & 350
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 31**								
Roth	Roth MultiTank	Polyethylene	300 - 1,500			1 or 2		NSF, CUPC, IAPMO
Roth Global Plastics PO Box 245, Syracuse, NY 13211 888-266-7684 | 315-579-3326 sales@roth-usa.com | www.RothMultiTank.com **See ad page 29**								

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TOUGH JOB

<< Sara Heger collects water samples at a Minnesota rest stop during a study of several of the roadside facilities. (file photos)

Are You Ready for Some Tough Jobs?

In this onsite challenge triple play, we review strategies to handle wastewater produced in three uncommon settings onsite installers may encounter

By Sara Heger

Controlling water softener-related chlorine levels in public bathrooms

Chloride levels in Minnesota surface water and groundwater resources are increasing, and maximizing efficiency of commercial water softening can reduce chloride discharge to the environment. A study was conducted to evaluate water softener settings and functionality at five Minnesota Department of Transportation rest area sites and to compare chloride levels in their septic systems. Sites included Marion Rest Area (RA), Blue Earth Westbound RA, Oakland Woods RA, Fuller Lake RA and Central Minnesota Travel Information Center.

Water treatment professionals inspected water softeners, and samples were collected to evaluate chloride levels in septic system lift stations. Additionally, water-quality tests were conducted to characterize drinking water iron, hardness and chloride levels. Water softener efficiency and chloride contributions from softeners and other major sources were estimated for each site based on water use and salt use records.

Chloride levels in the septic system lift stations were found to range from 488 to 1,730 mg/L (Figure 1), with the highest chloride levels found at sites with the lowest estimated softener efficiency. The highest wastewater chloride levels were observed in Blue Earth Westbound RA, where the water softener meter was broken and the softener was set to regenerate every few days instead of on demand. Water softeners were estimated to contribute between 77% and 92% of the chloride measured across the site septic systems, with the remaining chloride coming from human waste and drinking water chloride concentrations (Figure 1).

Brine from water softener discharge has very high chloride levels, and previous research has found that elevated chloride levels may have an inhibitory effect on microorganisms in septic tanks. The chloride levels observed across the rest area sites were high, indicating they may be impacting septic system performance and treatment. Reducing chloride discharge from softeners by increasing salt use efficiency is beneficial to septic systems.

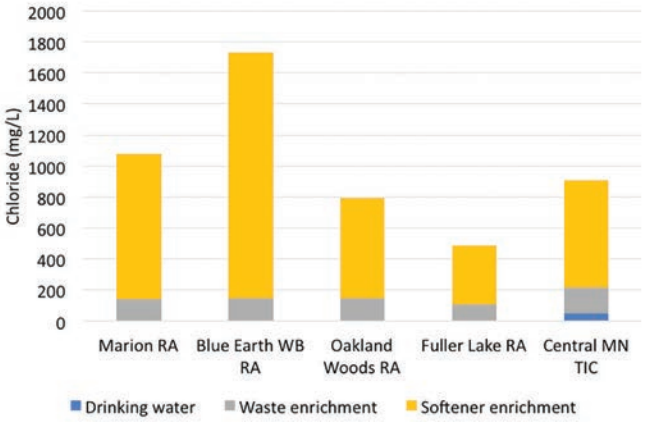

Figure 1
Chloride concentrations in rest area septic systems and estimated source contributions

Recommendations to maximize commercial softening efficiency include using demand-based, twin-tank softeners; periodically servicing softeners to check settings and functionality; keeping records of salt purchases and use; using iron filters in areas with high iron levels and routing discharge away from the septic system; and using results of laboratory water-quality tests to establish water softener settings.

If a home or facility has a water softener, it is wise to ensure it uses as little salt as needed or to direct the softener discharge away from the septic system.

Properly handling the wastewater load at a slaughterhouse operation

Slaughterhouse wastewater is not covered under most state septic regulations, as septic system sizing is based on research of typical flows and wastewater characteristics from domestic residences.

For small slaughtering facilities a decentralized onsite option for treating its wastewater may be the most cost-effective — particularly if connection to a wastewater treatment plant is not feasible.

A septic system receiving slaughterhouse waste is considered by the U.S. Environmental Protection Agency to be a Class V injection well system. Depending on the requirements of your state, county and/or local authorities, wastewater can be treated in various ways. Keep in mind that there is no one "best" wastewater treatment system. Different processors have different needs. Finding the right wastewater treatment system for the facility will depend on a number of variables.

1. First you will need to determine what type of activities will occur at the facility:
   - Slaughtering
   - Cut and wrap
   - Value-added processing
   - Sales room
   - Worker showers and/or laundry

   Each of these activities will add additional loading to the system.

2. Identify which species are being processed: hogs, sheep, goats, poultry, wild game, etc.

3. Estimate or measure the volume of wastewater output each day and wastewater characteristics. Measure or estimate the pH, total suspended solids, biological oxygen demand and FOG levels. For existing facilities, flow measurements should always be obtained. Tables (Figure 2) show flow

Figure 2

FLOW, GAL/ANIMAL	DETAILS	SOURCE	COMMENT
200	Flow is a permit value from a large plant; discharge is a 2-acre sprayfield	From Iowa Beef Processors, Wallula WA	Data reported in WA permit SWDP-8075 for Carefree meats/McCary Country Meats
51 veal	This is for a veal processor using a drainfield Flow based on 1,276 gpd, 6 days/wk, 150 calves	Lampaert Meats	Data reported in WA permit SWDP-3974 for Lampaert Meats (ZYK Meats)
50 beef 10 lamb	Separation of byproducts mandatory (including blood?)	Gabriel Claycamp new small plant in WA	From NMPAN
150-200 beef half that for lamb, goats, hogs	Strongly recommends blood separation	Arion Thiboumery Lorenz Meats, MN	From NMPAN
100 beef	This is a permitted value from NC	Debbie Bost	From NMPAN
100 on slaughter days 40 on nonslaughter	Blood can be separated and/or aerated but still goes to the sewer	Matthew Campbell	From NMPAN
45-60 lamb	Based on reported flow and design animal processing capacity of 3,000	Superior Packing, Dixion, CA	2011 data from submittals for CA Waste Discharge Requirements 97-100

BOD, mg/l	TSS mg/l	EC umho/cm	TDS, mg/l	TN, mg/l	TKN, mg/l	Cl, mg/l	Total Coliform org/100ml	COMMENT
2,500	900	1,100		100				WA Dep Ecology State Waste Discharge Permit 8075
127			375	93.2	93	58.6	650,000	WA Dep Ecology State Waste Discharge Permit 3974 blood and first rinse of blood sump are sent off-site
134-165	86-38			22-55	nitrate-N: 4-7			Purdue constructed wetlands study - first value is poultry processing, second is an animal shelter. Samples collected after septic tank treatment
1,020	396							Small plant in Midwest slaughtering red meat, and furthering processing grinds and cooked products. Other averages reported: pH - 7.2, oil and grease - 651 mg/L.

estimates and wastewater characteristics gathered by the Niche Meat Processor Assistance Network. It should also be determined if processing will be consistent or seasonal in nature.

Option 1: In general, if it is possible to connect to a municipal wastewater treatment plant, this is often a good option. If the facility is located within reach of these services, it will likely be worth paying the initial connection fees and monthly sewer costs rather than building and managing a small onsite wastewater treatment system. Before this decision is made, the facility should contact the local public works or municipal wastewater treatment facility to find out about connection fees and estimated monthly charges. With smaller towns or undersized wastewater treatment plants, the additional loading from a larger slaughterhouse may be a challenge.

Option 2: For smaller facilities, installing a holding tank that is pumped may be an option. The holding tank waste could be land-applied or taken to a wastewater treatment plant. This is also a good option for phased growth, where the system can start as a holding tank and then an onsite wastewater treatment system can be installed once the business is more established. The holding tank should have an alarm to indicate when it is 75% full.

Option 3: A typical/conventional septic system with only a septic tank and drainfield will not work for meat processing plants because of the high levels of BOD, TSS and FOG in the wastewater. If it is a larger facility, building an anaerobic digester, pond or lagoon system may be a good option, but for smaller facilities, a septic system with advanced treatment could be a good solution. The most likely design solution would be installation of an aerobic treatment unit after settling and oil and grease removal in septic tanks. With high-strength wastewater, flow equalization with time dosing should be considered, and flow monitoring is essential for proper management.

A typical/conventional septic system with only a septic tank and drainfield will not work for meat processing plants. ... For smaller facilities, a septic system with advanced treatment could be a good solution.

Other recommendations include:

- It is best to separate the animal processing wastewater from human domestic wastewater for bathrooms, showers and laundry. The domestic wastewater will need to meet all the local/state septic regulations, whereas the remaining wastewater will likely be governed by an industrial- or agricultural-related program.
- Use of cleaning chemicals should be kept to a minimum. Septic systems can deal with small amounts of cleaning chemicals, but if the amount is above typical domestic usage, system performance may be impacted.
- If animals are killed in the facility, all blood should be caught separately and used, rendered or taken to a treatment facility.
- All solid material should be dealt with as a solid waste. Fine grates should be put on all floor and sink drains to catch any small particles and hair.
- A commercial-size effluent filter (designed for high-strength waste) should be placed on the outlet of the last septic tank. A manhole should be located over this filter, as there will be a need for frequent maintenance and cleaning.
- A maintenance contract should be in place with a licensed onsite professional to assure the proper operation and maintenance of the treatment system.

After treatment, the remaining item for consideration is where the dispersal will occur. Depending on the quality of the effluent, size and climate, irrigation may be an option. In some areas, a subsurface drainfield may be a better option.

Developing a treatment plan for dog kennel and vet clinic wastewater flows

Wastewater from dog kennels and veterinary clinics is not included in most septic regulations. Septic system sizing in state and local regulations is based on research of typical flows and wastewater characteristics from domestic residences. In some jurisdictions, waste from these types of facilities may be covered under animal waste regulations or prohibited from going into a septic system.

A septic system receiving animal waste is considered a Class V system by the EPA. There are no specific EPA rules dealing with animal facilities whose wastewater goes into a septic system, although the EPA does require a Class V inventory form to be completed and mailed to appropriate agencies. State codes, along with local ordinances administered by counties, cities and townships, may have provisions regarding these facilities and must be consulted.

In rural areas, often the only option for treating the washdown water from these facilities is through a septic system. This wastewater typically has high levels of ammonia nitrogen from urine, along with large amounts of hair and sanitizer, all of which are challenging for septic systems.

Property owners should be encouraged to consider the following options:

Option 1: All waste could go into a holding tank and either be land-applied or taken to a wastewater treatment plant.

Option 2: Use an onsite septic system to treat the wastewater. If this is being done, consider following the recommendations below.

- Keep human waste from the facility separate in case there are problems related to the animal waste.
- A flowmeter should be installed to determine the design flow. Flow data should be collected at representative times (trying to target busy days) and over several months. If no facility exists or an expansion is planned, estimates should be made based on maximum occupancy, cleaning schedule and gallons used per washdown, and then include a safety factor (approximately 1.5 times estimated flow). A flowmeter should be installed to verify estimates.
- If existing septic tanks are in place, samples should be taken to determine the quality of the effluent. These samples should be taken from either the outlet baffle of the last septic tank or a pump tank if one exists. This effluent should be sampled for BOD, TSS and ammonia. If these levels come back high, a pretreatment unit should be designed to lower the levels to normal domestic strength levels. Typical normal levels of sewage leaving a septic tank are:
  - BOD less than 220 mg/L
  - TSS less than 65 mg/L
  - Ammonia less than 60 mg/L

- If no septic tanks exist or if it is a new facility, the wastewater characteristics must be estimated. Wastewater characteristics are hard to predict and should be sampled once the facility has been in operation for three months, and pretreatment should be designed to deal with known levels. It is critical that no hazardous waste enter any onsite septic system.
- The operators of the kennel or vet clinic should try to prevent medicine from entering the septic system, and the use of cleaning chemicals should be limited, including antibacterial soaps and quaternary ammonia. Onsite septic systems can deal with a small amount of cleaning chemicals, but if the amount is above typical domestic usage, the performance of the system may be impacted.
- All solid dog waste should be dealt with as a solid waste. This could be composted or landfilled.
- Fine grates or screens should be put on all floor and sink drains to catch any small particles and hair.
- Extra septic tank capacity should be installed (four times the design flow) to try to catch hair that will make its way through the system.
- A commercial-size effluent filter (designed for high-strength waste) should be placed on the outlet of the last septic tank. A manhole or hatch should be located over this filter, as there is a high potential for maintenance at this location.
- If pressure distribution is used to distribute wastewater, 1/4-inch orifices should be designed with a minimum of 5 feet of head.
- Clean-outs should be provided at the ends of gravity and pressure distribution lines in the event that hair does make it out to the distribution system. The lines should be evaluated at least once per year. Also, in the soil treatment area, inspection pipes should be finished above the ground surface and should be observed annually (at a minimum) for ponding.
- Provide space for a future ATU and additional soil treatment area.
- Recommend that the system be used under an operating permit.
- A maintenance contract should be in place with a licensed onsite professional to assure the proper operation and maintenance of the treatment system. ☐

Sara Heger, Ph.D. is an engineer, researcher and instructor in the Onsite Sewage Treatment Program at the Water Resources Center of the University of Minnesota. Heger is education chair of the Minnesota Onsite Wastewater Association and the National Onsite Wastewater Recycling Association.

Open Your Eyes and Ears and Network With Industry Experts

If only I'd sought educational opportunities sooner, I could have grown my business faster and at a younger age

Compiled by Betty Dageforde

In States Snapshot, we talk to a member of a state, provincial or national trade association in the decentralized wastewater industry. This time we visit a member of the Professional Onsite Wastewater Reuse Association of New Mexico and the Colorado Professionals in Onsite Wastewater.

Ralph Baker Dotson
president

Business: **AAA Allied Septic Service,** Santa Fe, New Mexico

Age: 52

Services we offer: Pumping, installation and maintenance of conventional, advanced, and alternative septic systems and wastewater reuse systems. We're a maintenance service provider and do real estate transfer inspections.

Years in the industry: 38. I started part time with my parents when I was 14.

Association involvement:

I've been in the Professional Onsite Wastewater Reuse Association of New Mexico, or POWRANM, for 13 years. I have served the last five years as president and have been on the board. I'm also a member of Colorado Professionals in Onsite Wastewater.

Benefits of belonging to the association:

Educational classes, collaboration with colleagues and keeping up to date and informed about rule changes. We're an affiliate of the National Onsite Wastewater Recycling Association, so we get its benefits as well.

Biggest issue facing your association right now:

Trying to get people to give their time and get involved is a big issue. Sometimes people join for the educational benefits but then don't participate.

Our crew includes:

My wife, Gina, is my business partner and office manager. She does scheduling and paperwork and runs the finances. I could not do it without her. Our son Gino is finishing college but works summers in all aspects of the business. He plans to eventually take over the company. Steve Sandoval, our lead technician, runs the pumping and inspection side of the business. Our customers love him. James Payne, our senior technician, is our excavator and installer. Oscar Tena is our newest technician. We're lucky to have a smart, ambitious guy like that.

Typical day on the job:

I start the morning at the shop, doing paperwork, scheduling and meeting with the technicians. Then I'm off to the New Mexico Environment Department getting permits or turning in transfer evaluations. I may go to a job site to prepare an estimate or work on a design, or be out in one of the septic trucks pumping or on a site installing. In between, I'm on the phone with POWRANM board members for our weekly conversations or with the Environment Department. Then, of course, there's always the unexpected emergency.

The job I'll never forget:

My dad passed away when I was 16, and I will always remember that first summer going out with a guy named Ed Fine who worked for my parents, really learning how to operate the backhoe. I was thrust into the work from this life-changing event, and he took me under his wings and taught me the business and helped me get a license. I'm grateful to him to this day because I learned a lot from him. With as many jobs as I've done that are tough and unique and fun — and I like to specialize in the hard stuff, the sites nobody else wants to touch or figure out — what sticks out is that summer and this man really being there and helping and teaching me.

continued >>

Multi-Tank Precast System Overcomes On-Site Challenges

Every job site has its own set of challenges. **Tight access, limited drain field space and protecting surrounding habitats** can further complicate the design and installation of any onsite wastewater project.

A new temple and cultural center development in the Midwest was faced with all three. The area was already congested, which left little room for the necessary onsite treatment. Plus nearby wetlands prevented use of a full-size drain field. To meet the facility's treatment needs within the small footprint of the site while also protecting the adjacent wetlands, **designers turned to precast concrete to provide a multi-tank solution using an advanced treatment system.**

The project featured a **3,000-gallon tank** outfitted with an effluent filter, a **12,000-gallon dosing tank** and another **12,000-gallon tank** complete with a membrane system. The precaster installed the air piping and discharge piping at the precast plant, allowing the contractor to **save on-site installation time**.

Whether you're dealing with challenging or tight site conditions, a deep bury, a high water table or you need a completely customized solution, precast concrete is your answer.

Workers install 12,000-gallon precast concrete tanks for a development in the Midwest.

By installing air piping and discharge piping at the plant, installation time was greatly reduced.

Photos courtesy of Wieser Concrete Products Inc.

Find local precasters at **precast.org/find**

Learn more at **precast.org/onsite**

PRECAST PROUD

NPCA
National Precast Concrete Association

My favorite piece of equipment:

Most of my equipment is my favorite because I'm a really strong believer that you have to invest in and purchase the right equipment to do the job correctly. But, having said that, the new septic truck we just purchased at the NOWRA conference in Colorado and my Caterpillar excavators are my favorites. The septic truck is a 2020 Freightliner built out by KeeVac Industries with a 2,500-gallon aluminum tank and a Challenger blower (National Vacuum Equipment). I have two Caterpillar 304E excavators. And I have one Caterpillar mini-excavator, which is a lifesaver for getting into small places and saving hand-digging and hard labor for me and the crew.

Most challenging site I've worked on:

There was a small lot in the resort town of Red River where we had to meet a setback to a national forest property, a creek, high groundwater and a river. The owners were selling the property and were told they could only have a holding tank; however, the loan institutions wouldn't loan on a resort property using a holding tank. We designed the site with an Eliminite advanced treatment system and a low-pressure pipe system. We literally made the setback by 1 inch. The state used it as a training site for inspections. They had about 10 inspectors to evaluate and measure setbacks. And the owners were able to sell house.

Oops, I wish I could take this one back:

I wish I could have been more open-minded when I was younger about the educational piece to the business. If I could go back in time and change something, it would be that instead of thinking I know a lot of things, I would have listened or sought education earlier because I think that would have grown my business faster and at a younger age and changed life for me and my family. Gene Bassett, who's been the president of National Association of Wastewater Technicians and a NOWRA member, opened my mind and pushed me in the right direction for education.

The craziest question I've been asked by a customer:

"Why can't you make the water go uphill without a pump?"

If I could change one industry regulation, it would be:

Requiring continuing education to renew your license. At one time it was in the regulations, but it got taken out because it was considered a dual licensing type of thing so it was never enacted. I think it would be a big benefit for everyone — for contractors in learning, for the state in having better-trained people in the industry and for the end-user consumer. One problem in New Mexico is the licensing side and the installing and pumping side of the industry are separated. The construction industry holds our license and the Environment Department issues our permits. The POWRANM has been working for years on trying to reconnect the two.

The crew at AAA Allied Septic Service includes, from left, Ralph Baker Dotson, Ramon Cardiel and Steve Sandoval. They are shown in the company yard with a 2006 Freightliner built out by Garsite/Progress with a 2,500-gallon aluminum tank and National Vacuum Equipment pump, as well as a 2020 Freightliner built out by KeeVac Industries with a 2,500-gallon aluminum tank and NVE blower.

Best piece of small-business advice I've heard:

I was visiting a plumber friend and he gave me the best advice I ever got — "Be honest and learn to say no when you have to. You can't help everybody in their time frame." He also emphasized "education, education, education."

Planning for the future:

The future for Gina and me is working with our son. He worked summers with us when he was in school, and then we really wanted him to go to college. He took some engineering classes for wastewater and is getting a degree in business so he could learn an aspect of the business that I didn't learn early on. He already has NAWT pumper and inspector certifications.

If I wasn't working in the wastewater industry, I would:

Growing up in the industry, I never thought about another career — although I did actually consider becoming a priest at one point. And if things had been different, I might have ended up being a lawyer.

Crystal ball time – This is my outlook for the wastewater industry:

There's a concern about the lack of younger people getting into the industry. We've discussed that at NOWRA and POWRANM. You've got a lot of great older guys like Gene Bassett, Ralph Macchio, Tom Ferrero and all these guys who have built some professionalism for this industry. But who's going to be there to carry that on? My concern for the future is if we don't get younger people into the industry and get them educated, trained and involved, how will this affect our industry and will we become less professional? It's not a glamorous industry, but it's needed. ◻

Would you like to see someone in your state or provincial wastewater trade association profiled in Snapshot?
Send your suggestions to Jim Kneiszel at editor@onsiteinstaller.com.

Survey Finds Support for More Water Regulations in Michigan

By David Steinkraus

A survey by a Michigan nonprofit group found strong public support for more regulation to protect water quality. Survey work was done last fall, and results were released recently. The magazine is owned by the Center for Michigan, which also commissioned the survey and describes itself as a "think-and-do tank."

The survey consisted of a formal poll done online by a consulting firm, an informal online poll of magazine readers, and community meetings where people could discuss issues. There were 20 questions covering general water topics and some specific ones, such as a proposed underwater oil pipeline between Michigan's Upper and Lower peninsulas and the sale of groundwater as bottled water.

Pumper looked at the broader water and onsite system questions. A copy of the report can be found here: www.bridgemi.com/sites/default/files/water_report_final.pdf.

One question noted that Michigan does not regulate the maintenance of private wells and septic tanks and asked whether the state should increase regulation. Of respondents in the formal poll, 63% say it should while 37% say it should not.

One question asked whether the state should generally have stronger regulations to protect water quality, and 77% of respondents in the formal poll say yes, while 21% want regulations to remain about the same and 3% say rules should be relaxed to promote economic growth.

Also in the formal poll, 68% of respondents say the general water quality of the Great Lakes is great or good, and 54% say the quality of inland lakes and rivers is great or good.

"It obviously shows people care," says Dendra Best, executive director of WasteWater Education in Traverse City. "It's a great start and opens the door to a more in-depth examination."

She applauded some of the questions for laying out a factual background. The one about bottled water, for example, noted Nestle pays the city of Evart $3.50 per thousand gallons of water, the same rate as any other business or residential customer. Yet in a question about whether farms should be required to reduce runoff in order to protect surface water quality, she says there seems to be an assumption that the state is full of small family farms. In reality, the state's ag sector is controlled by only four or five large companies, Best says.

The survey falls down in who it contacted, Best says. "If this is a road map for state policy, there are some pieces missing from this. It seems to be weighted toward the main centers of population."

Almost half of responses in the formal poll came from the heavily populated southeastern corner of the state that includes Detroit and the surrounding urban area. The next largest fraction of responses came from the area around Grand Rapids — the state's second largest city. These two areas combined account for about two-thirds of all responses. It's easier to get responses from people in urban areas, and those are the people who tend to join environmental groups, Best says.

Her part of the state — the northern half of the Lower Peninsula — accounted for only 8% of responses in the formal polling. There is a similar lack of representation of other rural areas, she says, yet it is these areas that the urban poll respondents go to for their water recreation.

Best also notes the absence of young people. Of formal poll respondents, 54% were age 55 or older. People 18 to 34 comprised 21% of respondents, yet these are the future policy wonks and researchers and should be reached, she says.

Also missing is minority representation. In the formal poll, 82% of respondents were white, but only 2% were African American (Flint is about 54% African American), and less than 1% were Native American, Hispanic or Middle Eastern. The largest minority response came from Asians at 9%. They comprise 3.4% of the state's population.

Another interesting result of the survey was the difference between the formal poll results and the community conversations, Best says. In the question about regulation of private wells and septic tanks, support for more regulation increased from 63% in the poll to 85% in the community conversations, and opposition dropped from 37% in the poll to 15% in the conversations. It shows what can happen when people have more time to think, Best says.

Eric Casey, executive director of the National Onsite Wastewater Recycling Association, looked at the report and focused on the question about onsite systems. "It's not that surprising to read about a survey where homeowners are looking for regulation on water infrastructure broadly," he says.

The water crisis that struck Flint and Michigan's lack of a statewide septic code (it is the only state without a statewide code) probably sensitize Michigan residents to those issues, Casey says. Yet their responses fit with surveys and other anecdotal evidence from other parts of the country, he says.

"There is a great desire to get more government involvement in providing infrastructure and regulating it as well," he says. For onsite systems, involvement mainly means funding for repairs and replacements because current sources of money are very limited. There is also support for more regulation among industry professionals, he says. For example, the Maryland Onsite Wastewater Professionals Association has partnered with other groups to push the legislature for stronger licensing.

Alaska

Cuts in the ferry system serving the islands of southeastern Alaska created a problem for residents: no access to pumpers. In the past, the city of Gustavus

could count on up to 18 visits annually from pumpers based in the capital city of Juneau. But ferry service to the island stopped in January, reports Alaska Public Media.

"The ferry system is the best way to get the trucks out there for these communities that don't have sewage treatment plants," says Trevor Richards, a co-owner of Juneau Septic Systems, which serves Gustavus. "The only other option is to go with the landing craft, which tend to be $500 per hour. [That's] the quote I've been given," he tells Alaska Public Media. That would lead to very large costs for customers, he says. Ferry round trips are about $800.

No 2020 ferry service for Gustavus was scheduled before this month.

Wyoming

As a result of his research on compliance with state and county water regulations, an environmental lawyer asked for a state investigation of two commercial septic systems in southern Teton County.

Dan Heilig, senior conservation advocate for the Wyoming Outdoor Council, says the systems at the Hoback Market and Hoback RV Park do not appear to have the proper permits. A records request to the Department of Environmental Quality produced a dead-end document and led to his request, he tells the *Jackson Hole News & Guide*.

"Here's a letter from DEQ saying, 'You need to be permitted under DEQ,' but there's no follow-up from DEQ," Heilig says. "The record just goes dark. What happened?"

Business owners say they have the required documents for their systems. Heilig says this is not personal, but he is looking at every septic permit in the county.

Wisconsin

Two bills in the State Legislature would extend the life of the Wisconsin Fund, which helps people pay to remedy failing onsite systems. Officials in Crawford County, in the southwestern part of the state along the Mississippi River, support the extension. The fund is scheduled to end in 2021, according to the joint newspaper website www.swnews4u.com. The bills would keep the fund going until 2023.

A sanitation and zoning technician says about 800 of the 3,600 onsite systems in Crawford County are not compliant with regulations. He anticipates submitting between 50 and 55 applications to the fund this year. If all are approved, county residents would receive about $300,000 to help remediate systems.

The Taylor County Board of Supervisors voted 15-2 to create a revolving loan fund to remediate failing onsite systems. The county, located in the central part of the state, has about 4,600 systems, and an estimated 2,000 of those do not have permits, news outlets report. The fund will be $300,000.

One of the supervisors who voted against the loan program says the county should not act like a banker and says he is concerned about what the county would do to people who do not or cannot repay loans.

Nation

NOWRA has been pushing an increase in the amount of money available for onsite system repairs, but that won't be happening this year, says Eric Casey, NOWRA's executive director.

Although there is $5 million available, it will all be used for wells because the U.S. Department of Agriculture did not have rules ready for the onsite grant program, he says. Those rules should be in place for the next fiscal year, which begins in October. But the money will not necessarily be available immediately if Congress does not pass the required appropriations bill before the fiscal year begins, he says. It is common for the appropriations bill to be late as lawmakers negotiate, and that is even more likely in this election year, he adds.

NOWRA and seven other organizations (Groundwater Foundation, National Association of Wastewater Technicians, National Environmental Health Association, National Ground Water Association, Rural Community Assistance Partnership, Water Systems Council, and Water Well Trust) have written to the Senate and House appropriations and agriculture committees asking for $20 million for wells and septics in the next fiscal year. This money would be distributed as grants to nonprofit organizations for revolving loan funds to help homeowners, Casey says.

NOWRA and the Rural Community Assistance Partnership have been working on a similar program through the U.S. Environmental Protection Agency, Casey says. Sen. Cory Booker, D-New Jersey, has introduced bipartisan legislation for this.

"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.

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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; 706-407-2552

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

Yankee Onsite Wastewater Association; 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

MISSISSIPPI

Mississippi Pumpers Association; www.mspumpersassociation.com, 601-249-2066

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; 740-828-3000

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; 409-718-0645

Education 4 Onsite Wastewater Management; www.e4owm.com; 713-774-6694

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; 888-782-6815

Wisconsin Liquid Waste Carriers Association; www.wlwca.com; 888-782-6815

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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Septic Tanks and Components

By Craig Mandli

SEPTIC TANKS

Den Hartog Industries low-profile septic tanks

Low-profile septic tanks from **Den Hartog Industries** are designed to provide safe and durable storage. The tanks are furnished with multiple fitting locations for a variety of plumbing configurations and two openings for buried lids or access/inspection risers. They are available with one or two compartments, with capacities of 1,000, 1,200 or 1,500 gallons. They may be backfilled empty and have sectional ribbing designed to sustain vertical soil pressures of up to 500 psf at a maximum soil depth of 36 inches. **712-752-8432; www.denhartogindustries.com.**

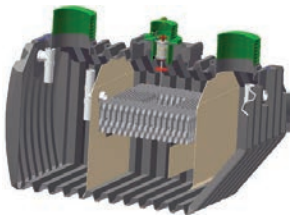
Front Range Precast Concrete watertight tanks

Watertight tanks from **Front Range Precast Concrete** include permanently attached anti-buoyancy collars that guarantee the tanks won't float. All tanks have uniform, heavy reinforcement and use a monolithic process, meaning there are no seams in the tank — top to bottom. They are in conformance with ASTM C1227. To ensure watertightness, the inner core mold is released by means of compressed air. If there are holes or cracks, the tank will not come off the mold. Tanks also go through a hydrostatic testing procedure. **800-783-3207; www.flxx.com.**

Infiltrator Water Technologies IM-Series Tanks

Injection-molded **IM-Series Tanks** from **Infiltrator Water Technologies** are available in multiple sizes including the IM-540 pump tank, IM-1060 and large-capacity IM-1530 septic tank. Lightweight, strong and watertight, the tanks enable shallow, multiple and serial tank installation options in septic and pump applications. All have integral heavy-duty lids that interconnect with the watertight click-and-lock EZsnap riser. The tanks also have structurally reinforced access ports, reinforced structural ribbing and fiberglass support posts to provide additional strength. The two-piece tank design nests for efficient shipping, and inboard lifting lugs make delivery and handling easier. The tanks frequently house advanced wastewater treatment systems such as the ECOPOD fixed-film bioreactor system or the ECOFILTER pump vault tank filtration system. **800-221-4436; www.infiltratorwater.com.**

Jet Inc. J-500-800PLT



The **J-500-800PLT** plastic tank from Jet Inc. offers a lightweight alternative to concrete J-1500 Series BAT Media Plants. Treatment capacity is variable from 500 to 800 gpd. They are rotational molded using lightweight polyethylene for a seamless tank with maximum strength and durability. They are easy to transport and install in difficult site conditions. **800-321-6960; www.jetincorp.com.**

Kistner Concrete Products precast concrete septic tanks

Precast concrete septic tanks from **Kistner Concrete Products** are available in sizes from 300 to 26,000 gallons. The tanks are designed and tested for structural capacity, as well as vacuum-tested for watertightness. All tanks are manufactured under the Green Tag Quality Standard Certification Program. The manufacturing plant is on the Precast Concrete Association of New York's Green Tag Tank Listing and is certified by the National Precast Concrete Association. **716-508-5550; www.kistner.com.**

Roth North America MultiTank

The **MultiTank** from **Roth North America** can be used for water cistern, pump, holding, rainwater or septic tank applications. This is possible due to its inner layer of FDA-approved virgin HDPE, two inside layers of polyethylene for improved stability, plus one outer layer of black and UV-stabilized polyethylene. Features include CSA, NSF and IAPMO certification, a COEX-4 multilayer co-extrusion process, a low-profile design that means less digging and avoidance of a high water table, lightweight construction, a multiport inlet/outlet that's convenient for field piping, the ability to enter and exit the tank on the ends or sides, two 24-inch manways to provide easy access for maintenance and service, a cylindrical shape that requires no water for backfill, a threaded riser system and watertight, seamless construction. **866-943-7256; www.rothmultitank.com.**

LIDS

BrenLin Seal-R

Seal-R septic tank lids from **BrenLin** create a strong seal between the septic tank and the riser, eliminating water infiltration between the tank and riser. They are made of durable materials, range from 12 to 42 inches and can be personalized with a service provider's company information. The 42-inch lid meets growing demand for bigger risers to accommodate new technology. **888-606-1998; www.seal-r.com.**

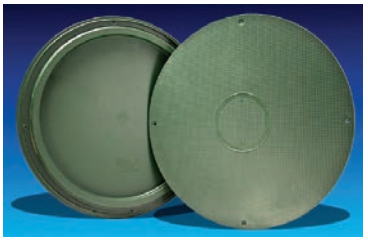
Fergus Power Pump Duel Power Lid

Duel Power Lids for septic tank installations or restorations from **Fergus Power Pump** are designed for new installations or to complete restoration projects by replacing a concrete lid. The lid is designed like the rafters in a house to provide structural durability and support a heavy wheel load without adding weight to the lid. The top is slightly domed to meet compliance throughout the U.S. Lids can be insulated with an R-value of 6 and are available in 18-, 24-, 30- and 36-inch sizes. **218-736-6772; www.ferguspowerpump.com.**

Hedstrom Environmental septic lids

Hedstrom Environmental septic lids are designed to eliminate riser systems. They are offered in 18- and 24-inch lids and adapter plates that are retrofit for standard corrugated I.D. drainpipe. The square-to-round adapter plate allows for quick conversions of tank risers to corrugated pipe. They are rotationally molded for strength with UV inhibitors to protect against color fade. Lids can be standard, foam-filled or sand-filled for additional strength. A gasket and safety screws are standard, along with optional custom nameplates displaying your company name and phone number. Safety nets are available upon request. **888-434-5891; www.hedstromenvironmental.com.**

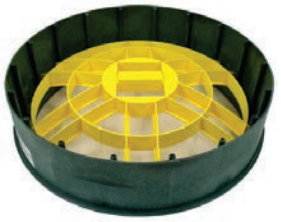
Orenco Systems DuraFiber Lids



Orenco Systems 24-inch **DuraFiber Lids** are made of resin-infused fiberglass fabrics for durability and damage resistance, with breaking strengths in excess of 20,000 pounds. They fit most ribbed PVC and HDPE riser pipe and weigh only 11 pounds. Lids have a flat-style flange, allowing flush-to-grade installation; a cored centering ring, providing an easily aligned, snug fit; and a urethane gasket, helping form a watertight seal. Lids include four 5/16-inch stainless steel flathead screws and a hex wrench. Optional insulation (2 or 4 inch) is available, which can be preinstalled at the factory or installed on site with a hardware kit. The lids have a nonskid surface with customizable center insert (for logos, etc.), along with a molded-in caution statement. In addition to the standard green color, they're available in three landscape patterns — grass, river rock and bark — to blend into surroundings. **800-348-9843; www.orenco.com.**

RISERS

Polylok Universal Safety Screens



Septic tank **Universal Safety Screens** from **Polylok** work with the company's 12-, 20- and 24-inch risers. The 24-inch unit works with PVC ribbed pipe, HDPE corrugated pipe and concrete risers. The Lid-Lok safety device works with the company's 20- and 24-inch riser covers. When used with the 20-inch Dual Safety Cover for a 24-inch riser pan, the secondary safety devices can help prevent accidents. **877-765-9565; www.polylok.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 the necessary mounting hardware, including safety screws. **800-382-7009; www.tuf-tite.com.**

SEPTIC FILTERS

BioMicrobics SaniTEE

SaniTEE effluent screening devices from **BioMicrobics** protect absorption areas from premature clogging and failure due to the release of nonsettleable solids and/or nondegradable flushed materials from the septic tank. Available in 4-, 8- and 16-inch-diameter sizes, the unit installs directly in the outlet tee of the tank. Its keyhole weirs provide consistency of flow despite surges. The angled slots resist blinding and prevent clogs inside the filter housing to extend the life of the system, reduce clogging material and improve flow conditions. It has easy slip-in installation and comes standard with a swabbing feature for clean-in-place maintenance. **800-753-3278; www.biomicrobics.com.**

Clarus Environmental WW4

The **WW4** effluent filter from **Clarus Environmental** is mounted in the outflow of the septic tank to provide protection from solids moving out of the tank and into the dispersal area. A secondary screen provides continued protection during servicing. When the primary cartridge is removed to be cleaned, the secondary screen blocks solids from sloughing off and traveling to the dispersal area. After the primary cartridge is cleaned, the secondary screen can be removed and cleaned. It can handle up to 4,000 gpd and can be assembled on site in a multifilter configuration for larger flows. **800-928-7867; www.clarusenvironmental.com.**

Sim/Tech Filter STF-100A2

The **STF-100A2** pressure filter from **Sim/Tech Filter** helps maintain proper and efficient year-round operation of mounds, sand filters and other pressurized distribution systems. The low-headloss (0.21 psi) pressure filter mounts on the discharge side of an effluent pump, acting as a last line of defense to prevent plugged holes and reduce effluent TSS. This mounting location also extends the time between servicing. The vortex action created by the pump scrubs the screen and the backflow through the filter after the pump shuts off, washing debris out. A single 2-inch filter can handle flow rates up to 83.8 gpm. It can be designed to handle almost any flow rate or load. Larger 3- and 4-inch filters are available. The standard screen filters to 1/16 inch, and optional socks allow for additional filtration to 0.024, 0.007 or 0.004 inch. **888-999-3290; www.simtechfilter.com.**

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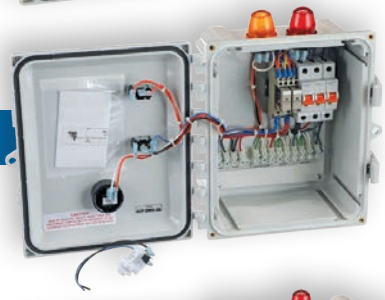

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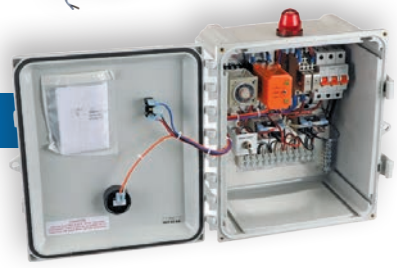

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