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- Machine Matters: Fluid analysis provides vital machine information
- Basic Training: Pressure distribution system layout and design
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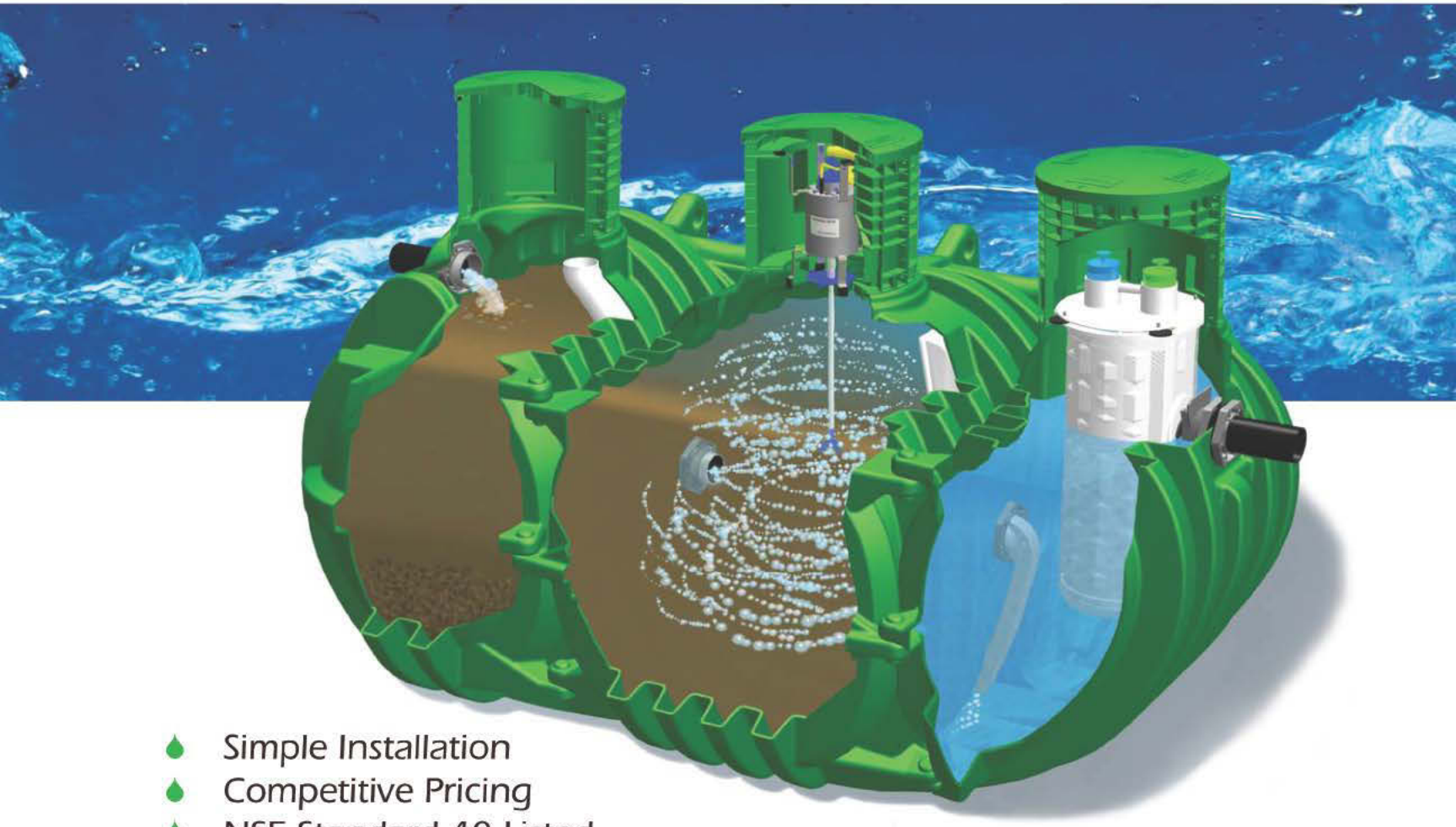

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A Wake-Up Call

A reader's comment brings up an essential point about people's right to safe and sanitary homes and the value of the onsite treatment profession

By Ted J. Rulseh, Editor

Sometimes it takes a comment from a reader to jar an editor out of his typical thought patterns. My attitude generally has been that *Onsite Installer* is a technical publication to help treatment professionals expand their knowledge and skills.

That means we haven't veered much into human interest stories, although we have reported occasionally on Habitat for Humanity projects or other initiatives involving charitable work in the onsite field.

Political will is perhaps the toughest part because in the end that comes down to spending public money — not a popular activity. I guess in this as in other cases it comes down to deciding what kind of country and what kind of people we want to be.

Taking notice

Then in April we published a story about the Alabama Onsite Wastewater Association (AOWA) and its efforts to install onsite systems for families in the state's impoverished Black Belt region. It's a worthy project of course, but just how worthy did not hit me until a reader commented:

What a disturbing article. It's hard to believe that in this day and age people are being forced to live like they did back in the 1700s and 1800s, or in the slums of South America or Africa. And what's even more disturbing is that once again the lawmakers on both sides of the [US/Canada] border sit on their hands and either spend very little or nothing at all to ameliorate the problem. And yes, it happens in Canada, as well.

You would think that two of the richest nations in the world, who have worked together to put men on the moon and explore space beyond the wildest expectations, could put something together so that sewage treatment and availability of safe potable water is in every single household.

It seems ludicrous that along with the infrastructure failures all over North America, now we have people getting sick from being poisoned by raw sewage, and then being forced to pay for their own medical care, which they really cannot afford either.

Worse than ludicrous

And that made me sit up straight. The Black Belt of Alabama is far from being the only place in the country where rural sanitation is poor because residents' septic systems are failing or nonexistent. We've reported on such conditions elsewhere. And it *is* ludicrous – shameful in fact – that as a wealthy nation we allow them to exist.

When you think of it, proper sanitation is just as basic a necessity as food, shelter, clothing and medical care. Yet we allow people who can't afford those things – let alone a costly septic system – to live in conditions that endanger their own families' health and public health in general.

My aim here is not to assign blame. It's to ask that we as an industry acknowledge a blind spot our society has. It's certainly not possible, economically or otherwise, for the onsite sector to undertake to correct such a big and serious problem on its own. It is possible, though, for the industry to advocate more aggressively for government policies that would help right these wrongs.

Solutions at hand

On one hand we have a significant public health issue. On the other we have an industry – of designers, installers, manufacturers, regulators and service contractors – that collectively knows how to solve it, technically at least. What's missing is broad awareness of the problem, genuine concern about it, and the social conscience and political will to invest in solving it.

Political will is perhaps the toughest part because in the end that means spending public money – not a popular activity. I guess in this as in other cases it comes down to deciding what kind of country and what kind of people we want to be.

What are your experiences with sanitation issues in poor rural areas? Have you, or has your association, taken steps at the local level to help make things better? What do you think should be done to move us in the direction of a country where healthful sanitary conditions are available to everyone?

Please share your stories by sending a note to editor@onsiteinstaller.com or by calling me at 877/953-3301. I promise to respond, and we will publish a sampling of comments in a future edition. Let's take a little time and shine a spotlight on this issue. It's important to our country, and it's a chance for the onsite industry to demonstrate its value – so often unappreciated by so many. ☐

lettertotheeditor

Great Glossary

To the Editor:

I just got my May copy of *Onsite Installer* and read your article about the Decentralized Wastewater Treatment Glossary from the Consortium of Institutes for Decentralized Wastewater Treatment ("Onsite Esperanto," Breaking Ground column).

As always, you have hit the nail on the head. This glossary is a wonderful piece of work, and I have encouraged the State of Missouri to include it when they update their state code (I am on the committee that is working with them on the rewrite). I included it when I revised the Randolph County Onsite Wastewater Treatment System Ordinance.

If you ever get pulled into a legal battle over a wastewater situation, this glossary will provide a wonderful reference and concise meaning for all of those terms that we deal with every day. Kudos to the Consortium members who put so much time and energy into writing this.

Janet Murray, R.E.H.S.
Environmental Health Supervisor
Randolph County (Mo.) Health Dept.
President, Missouri Smallflows Organization
Treasurer, Missouri Board of Certification

Equipment operator Manual Casas excavates a site for a septic tank with a Tramac 300 Hydraulic Hammer. (Photography by Cathy Monroy de la Garza)

Understanding THE MARKET

Paul Swoyer Septics and its employees thrive in a niche built on treatment systems for large, luxurious homes in Southwest Texas

By Gil Longwell

In a booming regional economy, Paul Swoyer Septics has tapped into a limitless market with innovative construction, compensation and marketing.

An upscale, high-value market for 4,000- to 20,000-square-foot homes provides this area installer, based in Canyon Lake, Texas (near San Antonio) with opportunities as broad as the horizon. Here, Paul Swoyer enjoys conditions found in few other localities.

Building systems matched to outsized homes and the lifestyles makes Paul Swoyer a sought-after contractor. "I love to go to work," says Swoyer, who has worked in the area for eight successful years.

Paul Swoyer Septics, Canyon Lake, Texas

OWNER:	Paul Swoyer
YEARS IN BUSINESS:	8
EMPLOYEES:	8
MARKET AREA:	250-mile radius
ANNUAL REVENUE:	$2.9 million
SPECIALTY:	High-value custom-home market
AFFILIATIONS:	Greater San Antonio Builders Association, Canyon Lake Area Chamber of Commerce
WEBSITE:	www.paulswoyerseptics.com

"We are focused. We excel at certain things — our areas of strength — and will not go outside these areas."

Paul Swoyer

Swoyer has pioneered an unusual approach to installations that, combined with local opportunities, brings better-than-average paydays to his employees and his bottom line. "We are focused," Swoyer says. "We excel at certain things – our areas of strength – and will not go outside these areas." To do so would reduce his efficiency and earnings. It is not a matter of what his crew can do; it is about what they can do best.

Toward strength

"I am not a septic guy," says Swoyer. "I am not an operator. I am not an

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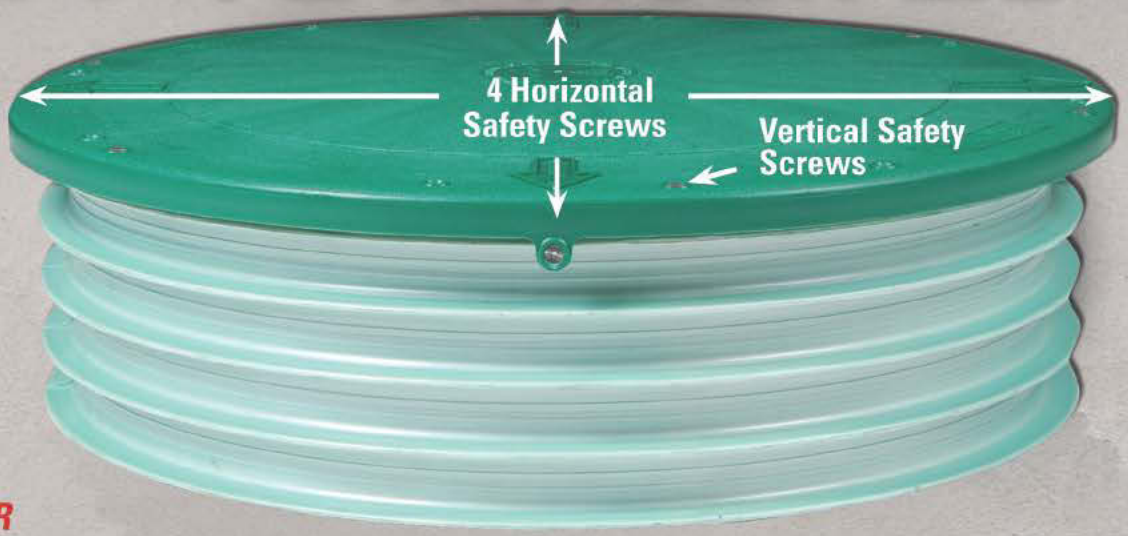

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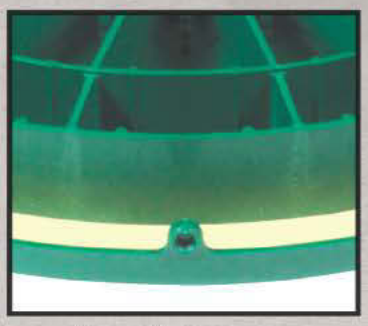

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installer. I am not a maintenance provider." His success flows from business acumen, not an understanding of system microbiology. Of course, he can do the work, and explain to a homeowner how the components interact to produce a well-treated effluent.

"After recovering from a car wreck, I worked for my brother-in-law's installation business as a day laborer earning $50 per day," Swoyer says. "For him, for two years, I did every task that needed to be done." This gave him insight to what must be done – along with when, why and how – to complete a successful installation.

In November 2003, Swoyer set out on his own. His goal was to build a successful enterprise based on his understanding of the onsite business. He sees himself as a businessman rather than an onsite guru. "The successful guy will be the one with the better network of industry contacts, not the guy with the nicest, newest or most varied equipment inventory," Swoyer believes.

Today, 75 percent of his business comes from new residential systems on virgin sites and 10 percent from complete replacement systems. The balance comes from repairs, inspections for property sales, and installation of commercial systems.

Field worker Anselmo "Chemo" Juarez Jimenez uses a Hydra Wheel rock saw from River City Mfg. to break up the ground for a septic system job.

Controlling costs

Part of being a businessman is watching the dollars. "I take every discount I can get," he says. "It benefits everybody – me, the vendor and my customer." He earns discounts by paying bills promptly and buying items in volume. That way, when a special request arrives or a project calls for expedited delivery, the vendor will step up.

He used to buy tanks from multiple vendors, but he found that by consolidating all of his purchases with one, he receives better pricing and service. He asked all precasters to quote for his entire array of needs for a year. They showed their appreciation by offering lower prices.

Twice a month, on the first and 15th, he pays in full every invoice for materials, supplies or services. This helps him qualify for the most generous discounts and welds relationships. Component makers and precasters refer business to Swoyer because they can count on him for top-notch, next-day service. Swoyer patronizes those who reciprocate with loyalty and referrals – and loyalty matters more than price.

"We are the most expensive installer in this marketplace, yet we are the most sought-after as well. Our quoted price is the final price. Customers appreciate the certainty and peace of mind that a guaranteed price and an extra year of maintenance provide."

Paul Swoyer

Where customer relationships are concerned, Swoyer is big on first impressions – and on billboards, literally and figuratively. In his service area are at least 10 billboards along major highways listing his personal cellphone number. "I want to be the first person to talk to a potential customer," says Swoyer. "I am a call screener." He then directs calls to the appropriate person on his team, usually office administrator Marisa Kane.

Long before their systems are installed, customers understand what they will be getting and Swoyer's operation and maintenance obligations.

(continued)

Employees Are Assets

Paul Swoyer sees employees as assets and as partners who can profit from superior performance and a shared respect for the more traditional list of corporate assets – equipment.

As with a versatile equipment fleet, Swoyer builds versatility in his team. "I train each person in every task," he says. "This makes them more valuable to me, while making them more valuable as individuals."

If need be, Swoyer jumps on a piece of equipment to demonstrate exactly what he is talking about. "Some employees are surprised the first time they see me operate a machine; they do not know how I started in this business," he says.

For training that is not available in-house, the company relies on Texas Onsite Wastewater Association conferences and other events. All employees take part in workplace safety training. "Safety training is important for the business, but it is far more important for each employee," Swoyer says. All of his field workers hold, at minimum, a Texas Commission on Environmental Quality apprentice license.

Texas Engineering Extension Service training also helps build employees' skills and knowledge. Swoyer values each employee: "We have a great team."

LEFT: Field supervisor Miguel Casas excavates and beds a hole for a septic tank. BELOW LEFT: Ryan Seidensticker (left), manager with Block Creek Concrete Products, and Miguel Casas place a BioRobix B-550 aerobic treatment system from Enviro-Flo.

The state requires a two-year maintenance agreement, included in the purchase price.

"It's important that customers know what to expect and who to call if troubles arise," says Swoyer. "Every one of our systems comes with a three-year maintenance agreement." The incremental cost for the extra year is a fraction of the value of the entire job, and it is an easy, customer-friendly way to add value without adding work.

Strategic choices

While many build system maintenance and management businesses as regulatory requirements spread, Swoyer chooses not to – he values peaceful weekends and holidays without emergency calls. "I'm perfectly happy leaving the management work to my vendors," he says. "They have the skills and understanding. Not doing management lets me focus on installation."

Installations can be challenging enough. Systems in his territory are often installed in conditions some would consider unsuitable. "The excavation for nearly every treatment tank we install must be hammered into the hard native limestone," says Swoyer. "Each of our excavating machines has a hydraulic hammer for that purpose. Usually, the hole for the tank can be cut out in about five hours, but if I see that we can't keep on schedule because of highly resistant rock or other issues, I'll rent the necessary equipment and operator to ensure that we stay on schedule. That frees my skilled employees for more critical tasks they are better suited to perform."

"I want to be the first person to talk to a potential customer. I am a call screener."

Paul Swoyer

For absorption areas on a leveled rock surface, Swoyer uses sandy loam, drip tubing, more loam and a cover layer of suitable soil. He can install a complete system in about three days. When advanced treatment is needed, his system of choice is the BioRobix B-550 aerobic treatment unit (Enviro-Flo).

Swoyer analyzes every detail of every job for its contribution to a successful and cost-effective installation. Faced with the choice of sowing grass seed on a completed system or placing sod, Swoyer chooses sod every time. Grass seed, he believes, is too unpredictable.

Different drummer

Swoyer says that his success comes in part from understanding who his boss is: "The customer is my boss. Our best customers and loudest advocates are the customers who were the most challenging to satisfy. We are the most expensive installer in this marketplace, yet we are the most sought-after as well. Our quoted price is the final price. Customers appreciate the certainty and peace of mind that a guaranteed price and an extra year of maintenance provide."

The Paul Swoyer Septics team includes, from left, owner Paul Swoyer, equipment operator Manual Casas, field supervisor Miguel Casas, sales representative Steve Nelson, field worker Anselmo "Chemo" Juarez Jimenez, backhoe operator Clarence "DJ" Hinds Jr., and field worker Juan Gabriel Casas.

Owners of large homes, while not frivolous spenders, are willing to pay for systems designed to meet their lifestyles and expectations. Even Swoyer's employee pay scale is unique in an industry noted for hourly pay or a fixed salary.

"We pay our employees based on the task," he says." Hammering a tank hole, installing a drip field, and sodding an otherwise complete site each have assigned values." An employee who finishes a hole in three hours can go home – his day's work is done; his skill and proficiency have earned a kind of bonus. If the hole takes longer, the worker stays until the job is done.

The company's equipment includes Case 580 tractors with Tramac 300 hammers, a Case 440 skid-steer, a Bobcat T300, and an RT 560 rock saw (River City Mfg.). A fleet of Ford F-250 and F-350 trucks is available as needed. The company provides employees with all heavy equipment and covers all routine maintenance and operating costs.

Damage is another matter: Employees know there is a shared responsibility. "We sometimes see new, eager employees push the equipment beyond its limits," Swoyer says. "When they break it, we split the repair cost 50/50." He believes this arrangement builds employee-business partnerships.

Swoyer divides employees into two groups: office/administrative and installation. The installation team members are fully cross-trained and can do all tasks that go with a project. Swoyer and three other workers sell and support the nine-person field crew.

Lasting impressions

Putting customers first leaves a lasting impression. Swoyer nurtures each first contact into a part of his growing network of friends, advocates, colleagues, collaborators and customers. He treats competitors as resources and allies rather than opponents.

Swoyer puts others' needs ahead of his own, using a business model he built from the ground up. By choosing to put himself last, he has put himself first in his chosen industry.

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System Malfunctions: Why, Wherefores and Fixes

There are many possible reasons for onsite system failures. A thorough inspection can pinpoint the root cause and help identify the best remedy.

By David Lentz, P.E.

Various factors affect the lifespan of an onsite wastewater treatment system. To better understand the lifespan and what causes malfunctions, some states and drainfield media manufacturers have performed independent investigations.

These studies point to homeowner usage habits, siting, and septic tank function as the most frequent causes. In many instances, the factors affecting drainfield performance are independent of the type of drainfield media.

Drainfield "malfunction" is often defined broadly, going beyond an investigator's visual observations to include the homeowner's observations and experiences. To assess the root cause properly and identify a remedy, it is necessary to differentiate between media-related and non-media-related malfunctions.

Manufacturers, regulators, system owners, pumpers, installers, scientists, and engineers, all want to understand why systems malfunction and define best practices for investigating and correcting issues. New technology development is based on these assessments, as are enhanced system designs, installation techniques, and maintenance recommendations.

Gray, lumpy material had partially filled the drainfield media, restricting effluent exfiltration. The homeowner would not acknowledge discharging a substance that would have led to this condition.

SOLUTION: Adhere to septic system discharge best practices, such as avoiding the release of paints, chemicals, and other deleterious substances. (Photos courtesy of Jennifer Forbes)

Roles and responsibilities

Each investigation is unique, and participants vary based on project specifics. Typical participants include:

Regulator. If there is a compliance issue or a notice of violation, the regulatory agency will likely be part of the investigation. The regulator may also need to approve the remedy and so should be present to understand the cause of the malfunction and the rationale for the solution.

Owner. The property owner can provide essential information for determining the source of a malfunction, such as water use habits, number of occupants, and laundering patterns. They also open the home for inspection of the plumbing system and specify the problems encountered.

Pumper. A professional pumper inspects the septic tank to measure scum and sludge levels, inspects the distribution box and drainfield, and may pump the tank and drainfield.

Installer. The installer's role is to excavate areas suspected as sources of malfunction, including the distribution box and drainfield media. If the tank has infiltrating groundwater, the installer may need to excavate parts of the tank, piping connections or risers to enable repairs.

Soil scientist. A soil scientist may need to evaluate system siting and the drainfield location. The evaluation verifies that the soil type and limiting conditions found during site characterization were accurate and that the drainfield is sized appropriately for the soil type.

Engineer/designer. Based on information gathered about the malfunction, the engineer or designer frequently leads development of the remedy.

(continued)

Investigation principles

Diagnosing the source of malfunction is the first step in determining the remedy. System usage, siting, and maintenance are often key areas of investigation.

Owner usage habits. The malfunction may result from the owner's wastewater generation patterns. For instance, if the home operates as a day care center and the drainfield is sized for three bedrooms, the malfunction may be caused by hydraulic overload. Another common source of malfunction is laundering one day a week: A large volume of water reduces residence time in the septic tank, allowing solids to pass through, clogging the soil pore matrix in the drainfield and reducing its hydraulic capacity.

System siting. The drainfield's position on the property may affect performance. If it is at a topographic low point where runoff collects or the water table is shallow, receives roof runoff, or is seasonally inundated, its hydraulic performance may be compromised.

House plumbing. Leaky plumbing fixtures continuously send water into the onsite system. In such instances, a malfunction can occur because the drainfield is undersized for the excessive flow being discharged. Leaks can be detected by having the homeowner turn all fixtures off and then checking the inlet tee on the septic tank for wastewater flow. If the inlet has no flow, but the outlet is flowing, groundwater infiltration is likely the issue.

A basement utility sink was coated with up to 1/4 inch of dried latex paint. The drainfield showed evidence of a sealed infiltrative surface, likely from paint discharge. The homeowner admitted operating a painting business and regularly washing brushes and rollers in this sink.

SOLUTION: Avoid the release of paints and chemicals.

Manufacturers, regulators, system owners, pumpers, installers, scientists, and engineers, all want to understand why systems fail and define best practices for investigating and correcting issues.

Vegetation. Deep-rooted vegetation or plants with an affinity for water near the drainfield may indicate root intrusion into piping or the distribution box. Also, the presence of stressed vegetation at the ground surface may indicate saturated soil or shallow groundwater encumbering drainfield function.

Tank condition. The septic tank may be the cause or a component of drainfield malfunction. Excessive sludge levels can significantly affect tank operation, reducing tank working volume and hydraulic residence time. Excessive sludge accumulation blocking the bottom of the inlet or outlet tee will affect discharge of wastewater into or out of the tank. If sludge obstructs the bottom of the outlet tee, the liquid level will rise to the top of the tee, allowing scum to discharge to the drainfield, possibly clogging the soil pore matrix. Excessive scum accumulation may allow scum to overtop the outlet tee, again discharging solids to the drainfield.

Distribution box. The condition of the distribution box can indicate certain malfunction conditions, including impaired hydraulic capacity and changes in outlet pipe invert elevation.

The presence of excessive solids indicates that the septic tank is not adequately separating solids and liquid and that the soil pore matrix in the drainfield may be clogged. A distribution box that is disturbed during or after installation can change pipe invert elevations, leading to overloading of one or more trenches and impeding flow to others.

CASE IN POINT

The North Carolina Department of Health and Human Services conducted what is probably the largest field performance assessment of drainfields in the United States, evaluating 912 total systems in 2005.*

The study, including about 300 gravel, chamber, and EZflow (Infiltrator Systems) media drainfields, aimed to identify any significant differences in malfunction rates among the various media. The systems evaluated ranged from two to 12 years old. The gravelless drainfields were installed at a 25 percent trench length reduction versus conventional gravel drainfields.

All told, 303 chamber, 306 EZflow, and 303 gravel and pipe systems were randomly chosen in six counties within the state's three physiographic provinces. The study found no statistically significant difference in malfunction rates between the gravel and gravelless drainfields.

The overall rate of system malfunction of about 8 percent for all system types was higher than the department predicted, but "malfunction" or "failure" was defined broadly. For example, any reported backup of plumbing in the house was deemed a malfunction. The malfunction rate for all systems was highest in coastal areas (11.7 percent) and lowest in the mountains (3.9 percent).

The elevated malfunction rate may have been due to the state's 12-inch minimum vertical separation between the infiltrative surface and limiting condition. This is supported by the higher rate of malfunction in coastal areas, where groundwater is shallow, compared to the mountains, where the depth to groundwater is greater and the sloped land helps move water away from the system. Many other states require 24 to 48 inches of separation, and the 12-inch limit may in effect reduce a safety factor during the identification of the seasonal high groundwater position during site characterization.

* Uebler, R.L.; Berkowitz, S; Beusher, P.; Avery, M.; Ogle, B.; Arrington, K.; and Grimes, *B. Performance of Chamber and EZ1203H Systems Compared to Conventional Gravel Septic Tank Systems in North Carolina,* 2005.

Checking drainfield issues

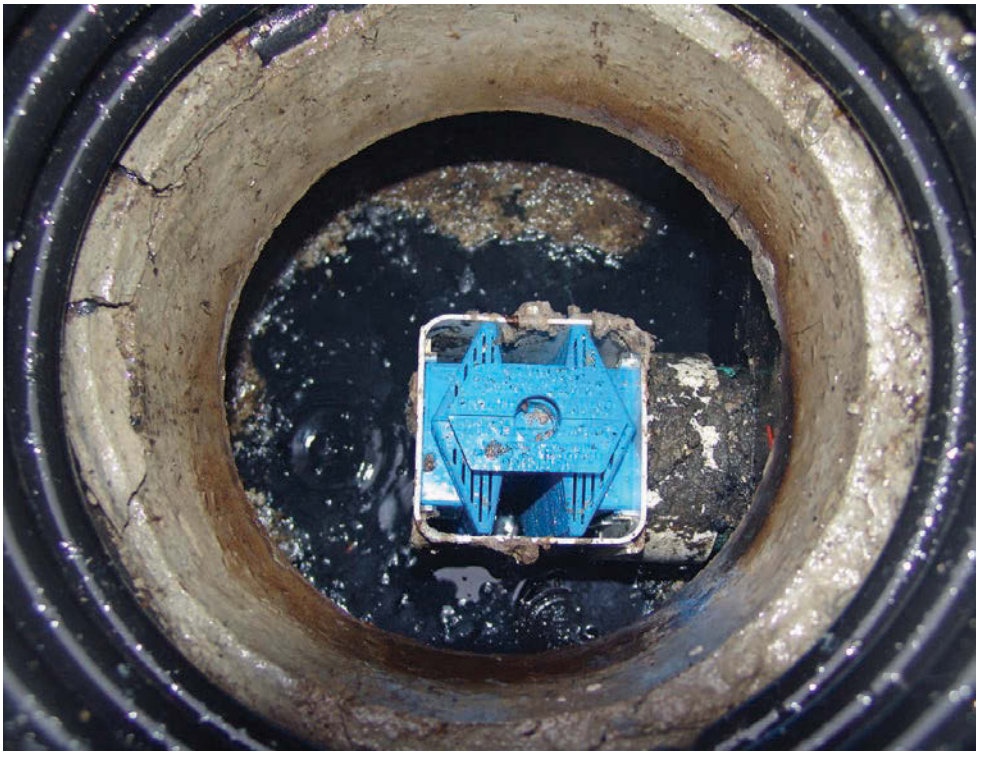
The drainfield media should be exhumed for inspection of the media, infiltrative surface, and underlying soil. This may require pumping of effluent from the media.

Presence of detrimental materials. Solids, oil, and grease discharges to the drainfield media can reduce hydraulic capacity by clogging the soil pore matrix at the infiltrative surface. Effluent is then restricted from exfiltrating from the drainfield. The infiltrative surface should be inspected to identify detrimental materials, which may appear as a thin veneer (as from oil or latex paint discharge), up to a substantial layer that has accumulated over time.

Infiltration through the trench bottom. The investigator should use a shovel to remove a cross-section of the interface between the biomat and soil and visually inspect the biomat/soil contact and underlying soil strata. Where soil under the drainfield has received effluent flow, it is typical to see staining and discoloration, usually gray to black. If there is no discoloration, the soil pore matrix may be clogged.

Soil type. The soil type in the drainfield may have been mischaracterized. For example, if the drainfield is sized for loam, but the soil is silty loam, the drainfield is undersized for the daily design flow. The inspector should compare the soil type identified during soil characterization with the soil type observed to verify proper system sizing. The inspector also should check the design calculations and effluent loading rate in the local regulations to verify that a sizing calculation error has not resulted in an undersized drainfield.

Structural condition. If the media is susceptible to structural failure, the inspector must verify that the media is open along its entire axis and can convey and disperse effluent.



Solids on the top of the outlet tee and effluent filter show that the liquid level in the septic tank rose above the top of the outlet tee. This may have resulted from a clogged effluent filter or excessive sludge accumulation on the bottom of the septic tank.

SOLUTION: Maintain the septic tank through regular effluent filter cleaning and septic tank pumping.

Malfunction remedies

While basic best practices will prevent many malfunction conditions, varied remedies exist for malfunctions that do occur. Of course, each site is different, and no given remedy fits all cases. Any remedy must comply with state and local regulations.

Improper siting. If possible, relocate the system to a higher elevation or raise the system far enough above the water table to allow proper functioning. Divert sources of water such as roof drains, basement sump pump discharges, sprinkler systems, and normal rainfall runoff.

Clogged infiltrative surface. If clogging resulted from solids, grease or oil, the drainfield may have to be expanded or replaced. It is then critical to eliminate future discharge of those substances.

Incorrect soil characterization. Expanding the system to account for the actual site soil conditions will provide the proper capacity.

Malfunctioning septic tank. The tank can be pumped to remove accumulated solids and repaired to eliminate infiltrating groundwater. The effluent filter should be cleaned and piping and distribution box blockages removed. Old tanks may require replacement.

Hydraulic overload. The homeowner should repair leaky fixtures and alter water use habits to spread discharges over time. Sump pump and water softener discharges should be eliminated from the onsite system, and the drainfield can be expanded if there are too many occupants in the home.

Old system/excessive biomat. Installation of an aerobic bacterial generator will reduce biomat accumulation and restore the system's hydraulic capacity.

Conclusion

A proper inspection can identify the root cause of a malfunction, leading to a remedy that restores the system. Issues like fixture leakage and homeowner water usage habits are simple to address. More challenging remedies involve vertical separation, siting, mischaracterized soil, excessive biomat accumulation, collapsed soil pore networks, and solids and other materials blocking the soil pore matrix.

Many states, municipalities, and manufacturers have embarked on studies to learn more about system malfunctions and to improve the technology and application of onsite treatment. Copies of reports are available at www.infiltratorsystems.com/onsite/links.asp. Moving forward, the industry needs to continue learning how best to prevent malfunction and must further educate system owners and operators on proper care and maintenance. ☐

ABOUT THE AUTHOR

David Lentz, P.E., is regulatory director with Infiltrator Systems in Old Saybrook, Conn. He has 19 years of experience with soil and groundwater systems, holds bachelor's and master's degrees in civil engineering from the University of Connecticut, and is a registered professional engineer. He can be reached at dlentz@infiltratorsystems.net.

"Rules and Regs" is a monthly feature in *Onsite Installer*™. We welcome information about state or local regulations of potential broad interest to onsite contractors. Send ideas to editor@onsiteinstaller.com.

New Jersey Rules Require Cesspool Abandonment and Set New Onsite Standards

By Scottie Dayton and Doug Day

The Department of Environmental Protection adopted rules requiring the abandonment of cesspools when any correction is needed or when the property is sold. Additional new requirements include NSF/ANSI Standard 46 effluent filters in septic tanks, risers to grade, watertightness testing of tanks after installation, and a protocol for inspecting systems during transfers of property. The rule also provides for drip dispersal and reduced-size dispersal fields when NSF/ANSI Standard 40 and 245 devices are used.

The department also adopted a rule allowing officials to waive environmental legislation that produces unreasonable, unfair, or unintended results that undermined the goal of the regulations. An example cited was a Hunterdon County store owner who wanted to improve his outdated onsite system, but the permitting process was so onerous that he never submitted the application. Requests for waivers begin Aug. 1.

Alabama

Counties would be barred from instituting sewer fees on properties not connected to their sewage systems under a proposed bill. A similar measure passed the House of Representatives last year but did not get through the Senate. Republican Rep. Dickie Drake has re-introduced the measure in the House, saying it's not fair to charge people for something they don't use.

Minnesota

The Minnesota Pollution Control Agency ruled that licensed pumpers may store up to 50,000 gallons of septage in registered underground tanks without a state disposal system permit when fields are inaccessible for land application. The agency is drafting a general permit for businesses that need to store more than 50,000 gallons. The agency will limit permitting to larger storage and treatment facilities. The Program Management Decision on Septage Storage is at www.mowa-mn.com.

Georgia

A septage disposal bill (SB 467) in the Senate allows pumpers to dewater septage, return the recovered liquid to onsite systems, and dispose of the solids in landfills.

An amendment to the waste management bill (SB 110) in the Senate would postpone implementation of the Department of Natural Resources land application rules from July 2012 to 2014. According to state representatives, the rules are so extensive and expensive that no one would be able to comply.

The proposed Septic Tank Owners Protection Act would prevent municipalities and counties from forcing single-family property owners or farms with functioning onsite systems to connect to sewers.

Michigan

Rep. Ken Goike of Michigan has succeeded in passing House Bill 4578, which makes it mandatory for communities to provide a septage processing facility if they ban land application of septage. Goike is owner of Goike Trucking and Excavating and past president of the Michigan Septic Tank Association. The bill was signed into law by Gov. Rick Snyder on March 6.

Florida

Lawmakers repealed a 2010 law mandating septic tank inspections every five years. It requires counties and municipalities with large springs (first-magnitude springs) to have a local evaluation program, but local governments can opt out of the state regulation. Gov. Rick Scott was expected to sign the bill.

New Mexico

Bernalillo County commissioners postponed a decision until September on a program requiring the inspection, repair, or replacement of the oldest onsite systems in the county. The proposal would have required systems at least 30 years old and on lots 0.75 acre or smaller to be inspected. About 450 systems would have been subject to inspection immediately, and about 750 systems would have been affected by 2020.

Wyoming

The House of Representatives passed legislation (SF85) allowing the Department of Environmental Quality to sidestep a court ruling and continue issuing blanket general permits for septic tanks and wastewater discharges. The permits cover an entire area of a project rather than requiring permits for individual systems. Last year's court decision said general permits had to go through the rulemaking process, which requires approval by the state Environmental Quality Council, the secretary of state, and the governor. The legislation would amend the law so that general permits are not considered rules.

Ohio

The Stark County Health Department instituted regulations requiring more than 4,000 homeowners to hire a company registered with the agency to inspect and service onsite systems. Owners can do the work themselves provided they notify the department. Of the 583 systems the county inspected last year as part of its property transfer program, 101, or 17 percent, failed the inspection.

Rhode Island

The state Department of Environmental Management revised regulations for onsite systems in salt pond areas, allowing most homeowners to increase the footprint of their homes by 600 square feet without installing previously mandated denitrification systems. The regulation, scheduled to expire in November 2014, also invites vendors with denitrification systems

approved in other states to test their technologies in Rhode Island without first being re-evaluated.

Indiana

Owners of about 30 homes destroyed by a tornado in early March in Clark County may need new septic systems to get permits to repair or rebuild. County officials say more effective septic systems are needed because the soils don't support the systems that were in use. Most homes will probably need mound systems, but some of the lots may be too small for mounds. County officials will explore ways to help the homeowners.

Jim Anderson and David Gustafson are connected with the University of Minnesota onsite wastewater treatment education program. Dave is Extension Onsite Sewage Treatment Educator. Jim is former director of the university's Water Resources Center and is now an emeritus professor, as well as education program coordinator for the National Association of Wastewater Transporters. Readers are welcome to submit questions or article suggestions to Jim and Dave. Write to ander045@umn.edu.

Mound Installation Steps

The right materials, the right slopes, and the use of inspection ports are among the keys to a properly installed mound system

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

In previous articles we have discussed how to prepare the natural soil surface for installation of an aboveground system, whether an at-grade or mound. Last month we defined what is required of clean sand for a mound installation. This month, we will take you through the rest of the installation steps.

Only a crawler- or track-type tractor should be used for these steps. The clean sand fill should be placed around the perimeter of the scarified soil area. This way, when the fill is moved over the soil treatment area, the tractor does not always follow the same path. This helps reduce the potential for compaction.

Moving sand with care

As the fill is moved over the area, at least 6 inches of sand should be kept beneath the tracks to prevent compaction of the original soil. The sand should be placed to the depth required by the design. It is easier to do this if the area is staked, indicating the levels of fill, rock and finishing material. The operator then can easily see if the fill is being placed to the proper depth.

Where the mound is to be placed on a sloping site (with a site greater than 1 percent), the upslope edge of the level absorption bed must be placed on the contour. The absorption bed is best formed by a small track-type machine with a blade – often a mini excavator. A large backhoe that can reach from the perimeter to the bed area can also be used, although reaching all areas in this way can be a problem, depending on the absorption area needed.

Traffic over the infiltrative surface of the bed should be minimized, and that includes foot traffic as well as equipment. Make sure the depth of sand over the original soil surface is at the proper depth and that the sand reaches to the top of where the distribution media will be placed.

Choosing the right rock

If rock is used as the distribution media, it should be durable and decay-resistant. It should be 3/4 to 2 1/2 inches in diameter (typical drainfield rock), with no more than 5 percent by weight passing a 3/4-inch sieve and no more than 1 percent passing a No. 200 sieve.

Similarly, rock larger than 2 1/2 inches should not exceed 5 percent by weight. Limiting fines to less than 1 percent is important so that when effluent passes over the rock, fines are not washed off to accumulate at the infiltrative surface, effectively sealing the surface. Large rock is undesirable because it is hard to work with and hard to level for placement of the pressure distribution laterals. At least 9 inches of rock should be placed under the distribution piping and 2 inches above the pipe. That means the rock bed depth is just over 12 inches.

The mound layout with a septic tank, pump tank, supply line to the distribution network and the pressure distribution system in the rock bed.

Rock should be durable and clean. The rock shown here is dirty and is not suitable for use.

If chambers or some other alternative distribution media is used, you should hand tamp where the chambers will be located. The leaching chambers and pressure distribution piping should be installed as instructed by the manufacturer and the pressure distribution design.

When pressure distribution laterals are placed on rock, the orifices can be pointed down, or up with orifice shields. Whichever method is used, it is important to make sure all of the effluent drains out to the distribution laterals when the pump shuts off. Typically, this means drilling an orifice of the same size as the other orifices three-fourths of the way up the end cap to allow air to flow into the pipe when the pump shuts off.

The purpose of the crown in the center is to allow the mound to shed excess water off the top. The reason for specifying sandy loam is to avoid compaction of the cover material, which would limit the movement of water vapor and air through the material.

Often, we see at least two orifices pointing up instead of down in a distribution lateral to provide for pipe drainage. This gives an added measure of assurance that if one of the holes gets plugged, the pipe will still drain.

When using rock, it must be covered with a durable, nonwoven geotextile fabric strong enough not to rupture during installation. In addition, the fabric must permit the passage of water without allowing the soil backfill to filter through to the absorption bed.

Providing for inspection

Most permitting authorities require the placement of inspection ports. Even if they do not in your area, you should include inspection ports anyway. They enable maintenance personnel to evaluate how the system is working in the future.

Inspection ports extend from the infiltrative surface to a point at or above finished grade. The portion of the pipe below the distribution pipe is slotted, while the portion above the distribution pipe is solid. The inspection port can be placed in a valve box for protection. Alternatively the pipe can be cut off at grade and capped.

If a slip cap is used, it must be slotted to facilitate removal easier and to ensure that the inspection pipe does not come out when the cap is taken off. The inspection port should also be secured using rebar, a toilet flange or a pipe tee at the infiltrative surface to prevent unintended removal. For chambers, the inspection ports are attached; for other alternative products, follow the manufacturer's requirements.

Creating the slopes

The final aspect of the installation is to cover the mound. Sandy loam soil should be placed over the absorption bed with a 10:1 slope from the center of the media. This means the material is crowned 12 inches in the center and feathers out to a 6-inch depth at the edges of a 10-foot-wide rock bed.

The purpose of the crown in the center is to allow the mound to shed excess water off the top. The reason for specifying sandy loam is to avoid compaction of the cover material, which would limit the movement of water vapor and air through the material. Sandy loam provides pore space so that water and air can move freely.

At least six inches of the cover material should be topsoil borrow suitable for growing vegetation. In arid areas, the entire 12 inches should be sandy loam, and the mound should be protected from erosion using decorative rock or desert landscaping materials. Do not plant bushes or shrubs over the top of the mound.

Side slopes of 4:1 (four feet horizontal to one foot vertical) or lower are suggested. The gentle slope allows for easier mowing and vegetation control. If the area is limited, a 3:1 side slope can be used, but nothing steeper.

Next month we will take a closer look at the pressure distribution system. ☐

Get Off the Phone

A federal cellphone ban for commercial drivers carries hefty fines and is likely to be adopted at the state level, as well

By Doug Day

Talking on most cellphones is being banned for drivers of all commercial vehicles in the United States – all 4 million of them. If the law doesn't apply to you right now, it will within three years, according to Bob Kolvey, safety director for Motor Carrier Compliance & Safety Company.

Since Jan. 3., it has been illegal in most instances to use a mobile phone while operating a commercial vehicle involved in interstate commerce (across state lines). The rule will eventually apply to all commercial drivers. All states have three years to adopt the rule. Many states have adopted it or already had banned use of phones while driving. So it is important to know the regulations in your state and others where you operate.

Other changes have been made to regulations covering commercial driver's licenses (CDLs), including changes to medical card requirements.

Supported by industry

The crackdown on distracted driving by the U.S. Department of Transportation is supported by the American Trucking Association. "Studies have shown that actions like texting and dialing a phone can greatly increase crash risk," says ATA president and CEO Bill Graves in a news release. "Taking steps to curb these behaviors holds great promise to improve highway safety."

Tim Frank, president of the National Association of Wastewater Transporters and retired owner of Tim Frank Septic Cleaning Company of Huntsburg, Ohio, says NAWT hasn't taken a position on the law, but stresses that people need to be aware of it. The association sponsored an Education Day seminar about the new laws at the Pumper & Cleaner Environmental Expo last February.

Frank says NAWT may offer a full-day or half-day seminar at the 2013 Expo covering the cellphone restrictions and other new rules related to CDLs. For instance, CDL laws don't just deal with the weight of the vehicle being driven. They include the combined weight of the truck and equipment towed or carried.

"We just bought a new jetter, and we have to get the pickup driver a CDL to pull it," Frank says. "Many people don't realize they may not need a license plate for a jetter, but when you hook it to a commercial truck, you may need a CDL for the driver."

"Studies have shown that actions like texting and dialing a phone can greatly increase crash risk. Taking steps to curb these behaviors holds great promise to improve highway safety."
Bill Graves

Severe penalties

The new cellphone law does not require companies running commercial trucks to have a written policy or training programs, but the owners are responsible for drivers' conduct. Employers may not allow or require drivers to use handheld phones.

The fine for violating the new cellphone regulation is $2,750 for the driver and $11,000 for the employer, per violation. Drivers convicted of violations twice in three years will be disqualified from operating for 60 days, and for 120 days for three convictions in three years. States can also suspend CDL licenses for multiple violations.

The new law applies only to cellphones – not to company radios or CB radios. In essence, it bans the use of cellphones, including hands-free devices, if the driver has to push more than one button to make or answer a call. "If you have something like Bluetooth that answers and hangs up the phone with one button, then you can use it," says Kolvey. "They want you keeping your eyes on the road."

The law also bans reaching for or holding a phone while driving or dialing a phone, unless it is a hands-free device with voice-activated dialing. Push-to-talk phones, which allow use of cellphones like walkie-talkies, are not allowed because they require pushing a button more than once.

CHECK IT OUT

CDL and commercial vehicle laws vary from state to state. Consult your state laws for more specific information.

The new cellphone regulations are amendments to the Federal Motor Carrier Safety and Hazardous Materials regulations. They were adopted by two agencies of the U.S. Department of Transportation: the Federal Motor Carrier Safety Administration and the Pipeline and Hazardous Materials Safety Administration.

Learn more about distracted driving at www.distraction.gov.

"They want cellphones out of all automobiles, too," notes Kolvey. Though the U.S. DOT doesn't have that power, he expects all states eventually to have similar cellphone bans. The ATA also supports such a ban. "While the federal government cannot enact such bans for drivers of passenger vehicles, ATA urges all states to follow the lead and take steps to ban these dangerous activities for all drivers," Graves says.

Life-saving initiative

U.S. Department of Transportation secretary Ray LaHood announced the ban last November, noting that when drivers of large trucks, buses, or vehicles carrying hazardous materials take their eyes off the road for even a few seconds, the outcome can be deadly. "I hope that this rule will save lives by helping commercial drivers stay laser-focused on safety at all times while behind the wheel," LaHood says.

The Federal Motor Carrier Safety Administration points out that distracted-driver studies have had mixed results, but they do show that commercial drivers are three times more likely to be involved in a crash or other incident when reaching for an object, such as a phone, and six times more likely while dialing a handheld phone.

The National Highway Traffic Safety Administration reports that more than 5,400 people died in distracted-driver crashes in 2009, another half million were injured. It says 16 percent of traffic fatalities in 2009 were related to distracted driving.

Medical card changes

In addition to the cellphone rules, changes to CDL medical card requirements became effective on Jan. 30. Whether intrastate or interstate drivers, all CDL holders now must self-certify to the state by Jan. 30, 2014. "Interstate drivers must also submit a copy of their medical card so their state Bureau of Motor Vehicles has it on file," says Kolvey.

The new regulations require most interstate CDL drivers to submit the medical card for new, renewal, upgrade, duplicate and state-to-state transfer license applications. The U.S. DOT also hopes to have that information available in a federal database. CDL drivers fall into one of four categories with different requirements:

- Interstate commerce and subject to Part 391 requirements – must provide a federal medical card to your state DMV.
- Interstate commerce and excepted from Part 391 requirements (certain farming and beekeeping activities, school buses, and several others) – do not need a federal medical card (your state may require it, however).
- Intrastate commerce – must have a federal medical card.
- Excepted intrastate commerce – do not need a federal medical card (your state may require it, however).

All CDL licensees should have received or will receive the proper forms from their state.

From Lavatory to Lawn

A graywater recycling system meets California standards for bacteria content, enabling use for landscape irrigation

By Scottie Dayton

A couple wanted to build a 22,000-square-foot mansion in Brentwood, Calif., and recycle the shower, bath, and laundry water on the 3.75-acre lot. The general contractor consulted Buzz Boettcher, CEO of Water Recycling Systems in Redondo Beach.

"Finding a place for the components wasn't exactly a challenge, but it certainly was interesting when we had to move everything from the original location," he says.

The fully automatic high-capacity residential system uses filtration, UV disinfection and ionization to meet state Health Department Title 22 standards for bacteria content in recycled water, which is used for landscape irrigation.

System components

Boettcher sized the system based on 11 people occupying the eight bedroom suites, taking a shower upon arising and another after working out in the gym, and washing their laundry. After rounding the number, he added a safety factor of 200 gpd for a total design of 1,000 gpd. The components are:

- 120-gallon fiberglass sump basin. All tanks made by TOPP Industries.
- 1 hp effluent pump from Goulds Water Technology
- Two 20-inch-diameter fiberglass filter tanks 37 inches high from Trident Filtration
- 18-inch-diameter fiberglass filter tank 33 inches high, Trident
- Sterilight Cobalt UV system from VIQUA - a Trojan Technologies Company
- Model 1200 ionization system from Carefree Clearwater
- 750-gallon fiberglass storage tank with 4-inch D Series Pentair Water/STA-RITE delivery pump and 1/2 hp Liberty effluent recirculation pump
- 19-gallon pressure tank teed to the delivery pump
- GM40AVE time switch from Intermatic
- Makeup water valve from The Toro Company

System operation

Graywater gravity flows from 15 sources in the house through 2-, 3- and 4-inch ABS pipe to the sump basin. On demand, the pump transfers 50 gallons to the skid-mounted filter array to treat the water.

The coarse filtration unit traps hair, soap chips, and laundry lint in a combination of gravel, silica sand, and proprietary experimental media.

The partially backfilled storage tank sits in front of the skid-mounted filter array. Workers are still installing the underground plumbing lines. (Photos courtesy of Water Recycling Systems)

SYSTEM PROFILE

Location:	Brentwood, Calif.
Facility served:	Single-family mansion
Designer/Installer:	Buzz Boettcher, Water Recycling Systems, Redondo Beach, Calif.
Type of system:	Residential graywater recycling, Water Recycling Systems
Hydraulic capacity:	1,000 gpd

(continued)

ABOVE: Burying the 750-gallon storage tank beside the footpath made room for a wall to the right. On demand, the delivery pump sends recycled water from the tank to the irrigation network. RIGHT: The expansion tank with the disinfection systems and electrical components on a 4-foot-square panel for easy mounting.

"Washing clothes produces a huge amount of lint that acts almost like paste," says Boettcher.

The 5-micron filtration unit uses anthracite coal to trap remaining particles. Activated carbon in the third filter removes clothing dyes and polishes the water. Retention time through the array is one to two minutes.

Each filter has a top-mount, seven-position valve and pressure gauge. "When the pressure increases 10 psi or more above the startup level, the filter is dirty," says Boettcher. "The backwash cycle involves flipping a lever on top of the unit, closing two valves, and flipping a switch to reverse the flow." The water goes out the backwash drain and into the city sewer.

From the filters, treated water flows through the wall-mounted UV disinfection chamber to the anode generating copper, silver, and zinc ions. "The combination gives us a better kill rate to prevent bacterial, fungal, and algae growth while controlling odors in the charged irrigation network," says Boettcher. "Without it, the water would stagnate in the pipes during rainy spells."

"Once in the storage tank, our product is no longer graywater. It's recycled, treated water, but regulators have yet to recognize the difference."
Buzz Boettcher

The UV system has a lamp-life indicator that beeps when it is time to replace the bulb. The ionization system has an intensity level control that Boettcher monitored and adjusted at startup. An indicator tells when to replace the anode.

After disinfection and ionization, the water flows to the storage tank. On demand, the delivery pump sends 30 gpm to the irrigation network. A bladder inside the expansion tank expands as the pressure increases. A pressure switch automatically shuts off the pump as the delivery lines to the sprinklers reach 50 psi. The expansion tank eliminates water hammering at the beginning and end of the irrigation cycle.

When the irrigation timer opens the zone valves, the bladder contracts and pushes out the water. At 40 psi, the pressure switch activates the pump to supply water for the 20-minute irrigation cycle. After the timer turns off, the pump continues running to recharge the lines.

During periods of low flows, such as when the family goes on vacation, a makeup valve supplies water to the irrigation network. When the level in the storage tank decreases to 150 gallons, a float switch opens the valve to the municipal waterline. If the family generates more graywater than the irrigation system needs and the level in the tank reaches 675 gallons, an overflow drain sends excess to the sewer.

State Health Department code does not allow graywater to be stored for more than 48 hours. "Once in the storage tank, our product is no longer graywater," says Boettcher. "It's recycled, treated water, but regulators have yet to recognize the difference."

To keep the system compliant, the recirculation pump in the tank runs for 90 minutes every 24 hours at 2 a.m., sending all the water back through the treatment train. The irrigation lines do not drain back for recycling.

Installation

Other contractors excavated tank holes and laid the underground plumbing. They set the storage tank where Boettcher indicated, close to the location for the filter array and an exterior wall. On the other side of the wall was a 5,000-pound generator bolted to the concrete foundation.

An inspector told the contractor that the generator needed three feet of clearance around it. He would have to move the wall. "That put it right on top of the storage tank," says Boettcher. "His crew demolished the wall, ripped out the storage tank, rebuilt the wall, and moved the tank to its present location beside the footpath."

Boettcher chose a central point under the home's crawl space for the sump basin. "It was probably the nicest crawl space I've ever worked in," he says. "The floor was concrete and I had four feet of headroom."

The contractor had poured the floor around the excavation. To reach it and bring in supplies, Boettcher's team used creepers to roll under the house. They padded the hole with 12 inches of gravel to raise the 48-inch-high by 36-inch-diameter basin to elevation, plumbed it, and backfilled with more gravel.

Clockwise from left, 1/2 hp Liberty effluent recirculation pump, 4-inch D Series Pentair Water/STA-RITE pump to irrigation network, and Toro make up water float switch inside the storage tank.

The skid-mounted 5- by 3-foot filter array arrived already plumbed. The disinfection system and electrical components came mounted on a 4-foot-square panel that attached to the wall.

"We spent a day installing the plug-and-play units," says Boettcher. "It would have gone quicker, but just before our arrival the landscapers planted a tree where we wanted to set the filters."

The team moved the array beside the footpath and next to the storage tank. They also connected the irrigation lines to the delivery pump via a cleanout. The system fit in an 8- by 10-foot footprint. To prevent sunlight from deteriorating the fiberglass filter tanks and Schedule 40 PVC pipes, workers covered them with UV-protective paint that matched the color of the wall.

Maintenance

The system has a one-year maintenance agreement. Boettcher visited the site weekly during startup to gauge water flow, then returned every three weeks to test the water, check the pressure on the filters, and backflush them when necessary. □

MORE INFO:

Carefree Clearwater, Ltd.
800/364-5710
www.carefreeclearwater.com

Goulds Water Technology
866/325-4210
www.completewatersystems.com/brands/goulds

Liberty Pumps
800/543-2550
www.libertypumps.com
(See ad page 5)

Pentair Water/STA-RITE
800/472-0884
www.pumps.com

TOPP Industries, Inc.
800/354-4534
www.toppindustries.com

VIQUA - a Trojan Technologies Company
800/265-7246
www.viqua.com

NOWRA
National Onsite Wastewater Recycling Association

ABOUT THE AUTHOR
Tom Fritts is vice president/president-elect of NOWRA and co-owner of Residential Sewage Treatment Services Company in Grandview, Mo. For more information about NOWRA or to join, visit www.nowra.org or call 800/966-2942.

Telemetry: Dream or Reality?

Remote monitoring helps build homeowner confidence in service providers, and helps providers make cost-effective service decisions

By Tom Fritts

Many have heard me describe our onsite industry as similar to the computer industry of 30 years ago. Remember your first computer? Remember your first email? Now think how rapidly things have developed and changed in computers and email since then. Smartphones, tablets, Facebook – how exciting!

The same thing is happening in the onsite industry on many fronts, and one of those is telemetry. This technology is attaching itself to the computer rocket with surprising success. In 1912, the City of Chicago, Ill., installed a telemetry system using the city's phone lines to transmit the performance of power generating plants to a central control station. In July 1997, the Sojourner spacecraft analyzed the makeup and temperature of the surface of Mars and transmitted it back to the Jet Propulsion Laboratory in Pasadena, Calif.

Similarly, the onsite industry began using phone lines to transmit the most basic data points of an onsite system. Usually, this was nothing more than notification of a high-water condition transmitted via copper wire to a phone on the other end.

As this technology became more and more affordable, we were thrown a curve ball. Copper telephone lines started to disappear in newly constructed homes. The wire on which it had become so easy to transmit conditions about the onsite system is going away. Just as demand creates supply, several manufacturers reached out to the computer industry to create an alternative to the copper wire. The wireless Internet fills this gap.

Why telemetry and monitoring?

The reason behind telemetry is simple: It lets you stay in a convenient location – your office with your computer, or in the field with your laptop or cellphone – while monitoring what is taking place in an inconvenient location.

One reason this technology has gained popularity is the rising complexity and cost of onsite systems. We have all heard the story about grandma's septic tank that *never* needed pumping. Grandma didn't want or need telemetry. Grandma would have been violating the most basic investment rule: Don't spend a dollar to save a dollar.

But today's systems require homeowners to invest so much more money that it makes sense to monitor their systems to help prevent costly failures.

With the cost and complexity of today's systems comes the added need for operation and maintenance. As a maintenance provider, being able to monitor a system benefits the homeowner in several ways. The service provider receives and responds to alarms directly – the phone call comes from the service provider to the homeowner, not the other way around. This instills confidence in the homeowners of your ability to manage an expensive system that probably wasn't even in their construction budget.

The more you know about a system while sitting at your office, the less money you will spend servicing that system. The severity of an alarm should dictate your response time. There is no need to send a technician out on overtime for a problem that could wait for straight time. Telemetry can help you make those decisions.

Decision-support tool

This is just the very basic use of telemetry. What if you could see patterns developing that would indicate a possible future failure? Now the call is to the homeowner *before* the alarm. In my neck of the woods, alarms always come at about five o'clock on Friday afternoon before a family reunion weekend.

What if you were able to notify a homeowner of an unusually large amount of water being used – something that could have a long-term effect on the soil treatment area? The alarm would not only prevent that problem but also enable the owner to rectify a leak in the home.

Creating a mindset with the customer that you as a service provider are on top of things is a great benefit and sales tool when trying to convince people to buy your service. But there is another benefit, and it falls to the service provider: The more you know about a system while sitting at your office, the less money you will spend servicing that system. The severity of an alarm should dictate your response time. There is no need to send a technician out on overtime for a problem that could wait for straight time. Telemetry can help you make those decisions.

I know what you are thinking even as you read this: Who is going to pay for the telemetry system? Did you know there are manufacturers who already provide some types of remote monitoring at little or no cost?

Telemetry technology is coming at us fast. Just search around the Internet and check out all the manufacturers now taking advantage of

monitoring and telemetry in the onsite wastewater industry. You might be surprised. But the most exciting part is what is just around the corner. What could it be? Let your imagination wander and understand that these may not be dreams of what might come, but rather prototypes already being tested.

Alarms, Controls and Monitor Systems

By Briana Jones

Versatile alarm

The Versa'larm from **Alderon Industries** is an expandable multizone alarm with two sets of auxiliary contacts. Multiple indicator lights allow users to differentiate between alarm conditions such as high water or a plugged effluent filter. The alarm can be expanded to monitor other flood-prone areas such as sump pits, floor drains, washing machines or water heater and condensate overflow pans.

Any combination of float switches, effluent filter switches or water sensors can be mixed and matched for complete coverage. An auto-dialer option will call up to four phone numbers when any of the sensors are activated and notify the operator of the alarm condition. The alarm can be connected to an existing building automation system (BAS) or security system. A two-channel auto-dialer can create two different messages to differentiate between specific alarm conditions. 218/483-3034; www.alderonind.com.

No-float sensor

No Float control panels from **Clarus Environmental** offer a variety of options in one panel. The panels use a no-float sensor that detects the liquid level in the tank and send a signal back to the panel, where it is digitally displayed in inches inside the front cover. The sensor takes the place of up to four floats and has an operating range of up to 40 feet.

Pump activation and alarm levels are easily adjusted in the panel. Mechanical float switches can be added for redundant off and high-water alarm conditions. The panels are available in simplex and duplex configurations. The simplex panel is easily programmed in the field and uses a timed-dose panel, while the duplex panel is for demand-dose applications only. 800/928-7867; www.clarusenvironmental.com.

Subdoor control panel

The RK Series control panel from **CSI Controls** has a NEMA 4X panel design incorporating standard features into the circuit board, subdoor and raised back panel. Located on the subdoor, the float indication lights allow the user to see the status of each float and flash should a float fail. The subdoor control center features control and alarm circuit power, high level, lag pump on, lead pump on, alarm, pump run, test/silence pushbutton, hand/run pushbutton, and digital display for viewing system information (optional).

Standard features include lockable latches, a flashing red alarm light with an electronic horn, a touch-to-silence pad, circuit breakers, start components, contactors, and a terminal strip. Single-phase and three-phase simplex and duplex models are available. The panels are UL/cUL listed. 800/363-5842; www.csicontrols.com.

Pump control panel

The Aquaworx IPC panel from **Infiltrator Systems** provides a cost-effective approach to pump control. Easy to install and use, the panel monitors liquid levels, controls pumping time intervals, and logs events in real time. No tape measures or stopwatches are required. The panel features an embedded microprocessor in the pump controller and a floatless pressure transducer in the pump chamber that leverages simple pressure transducer technology to enhance performance.

Using a mountable and removable controller (MARC) to collect system data, the IPC panel monitors multiple types of system events with a date-and-time stamp, liquid level at the time of the event, and the event type. It can store up to 4,000 events including doses, power up, power down, manual run, and alarm events. Data is transferred from the MARC to PC-based applications using an SD card. The MARC allows the option of removing the unit for use on multiple IPC panels. If the MARC is removed from the panel, unauthorized users cannot change or override panel settings. 800/221-4436; www.aquaworx.com.

Pre-wired panel

Model 195 Econoline pre-wired electrical control panels from **Jet Inc.** are designed to monitor operation of the system aerator, as well as the function of a pump for various pressure distribution system applications. The panels are designed for cost-effective demand- or timed-dosing spray systems with integrated controls and high-water alarm circuits. Standard features provide complete system operation and monitoring when combined with optional equipment for each specific installation. 800/321-6960; www.jetincorp.com.

Easy install alarm

The LB50 indoor/outdoor 115-volt alarm from **Ohio Electric Control** features normally open or normally closed control switches and offers easy installation. The unit is fused for circuit protection and includes a three-position toggle switch (operate/test/silence), to select visual and audible alarms. The alarm is designed for home sewage systems, as a remote alarm for commercial systems or lift stations, and for alarming an auxiliary contact. It can be used in holding tanks to detect high and low water. 419/289-1553; www.oecinc.net.

Four-in-one panel

The four-in-one MVP-S1/2DM control panel from **Orenco Systems** supports numerous electrical configurations and dosing schedules in a single control panel. It

can be configured in the field for timed or demand dosing. While the control circuit operates on 120V power, the pump is dual-rated for 120V or 240V power.

The control panel has a programmable logic unit with multiple timing intervals for changing flow conditions and a built-in elapsed time meter and counter. The PLC displays float position and has a float error indicator. A reference chart appears inside the unit to assist with troubleshooting during installation and testing. The control panel is compatible with many types of systems, from new installs to older panels needing replacement. 877/488-3594; www.orenco.com/controls.

Indoor alarm

The **Polylok** PL-WTA (septic tank) or PL-WSA (effluent filter) indoor alarm system provides audio/visual warning of potential threatening liquid level conditions in lift pump chambers, sump pump basins, effluent filters and other water applications. It features a battery-operated wireless transmitter that is placed in the tank up to 150 feet away from the alarm.

When the alarm float switch activates, the transmitter sends a signal and sounds the indoor alarm, warning of a potentially threatening level condition. The horn can be silenced, but the alarm light remains on until the condition is remedied. Once the condition is cleared, the alarm will automatically reset. 877/765-9565; www.polylok.com.

Aerator timer

The P101FA-2 timer from **Septic Services** is designed for Flagg-Air 340 hp aerators and can be used for any application that requires 7-amp shut-off capability. The lightweight, compact unit is designed for indoor and outdoor use and is constructed with weather-resistant high-impact plastic.

The 24-hour timer prevents overload on the aerator motor if the aerator becomes obstructed with debris and is adjustable in 15-minute increments to meet local codes for aerator operating procedures. The 115-volt, 7-amp unit is easy to install and use. It has a three-position toggle switch (on/auto, off, continuous), warning light and reset button all located on the front of the unit. The unit weighs 3 pounds and measures 6 inches by 8 inches by 4 3/4 inches. 800/536-5564; www.septicserv.com/store.

Exterior pump control

The JJ1CB 120-volt exterior pump control with exterior alarm from **Septronics** only needs one line of power. A mini break is located in the junction box, allowing the alarm to continue functioning if the pump shorts or fails. The alarm can be silenced and the light will stay illuminated until the condition is resolved.

All components sit up on a high-impact poly pedestal to protect the wiring and provide a convenient area to connect through to the tank. The pipe nipple and locknuts are included. Wires can be brought up through the cord seals (included) into a sealed junction box. The exterior alarm comes with a control float switch, which is wired into the terminal strip. 262/567-9030; www.septronics.com.

System programming

The EZ Series In-Site CL control panel from **SJE-Rhombus** is designed to control one or two 120/280/240V single-phase pumps in water and sewage installations. It features a Modbus port located on the inside door to quickly connect to a Windows-based PC to download system events, including pump run times, pump cycles, alarm conditions, HOA settings, power outages, and service calls. The included software automatically formulates system data, up to 4,000 events, creating easy-to-read reports.

The control panel features a NEMA 4X weatherproof enclosure, lockable latch, audible/visual alarm, external alarm test/silence switch, auxiliary alarm relay, circuit breaker, transformer, pump run and tank level indicators, control and alarm power indicators, and a large terminal strip. The panel uses the floatless C-Level sensor and is available for simplex and duplex, demand-dose and timed-dose applications (it can be converted in the field). An optional mounting post features a removable access for easier wiring and can be mounted directly into the ground, over a 4x4, or conduit. Each panel is UL/cUL listed. 888/342-5753; www.sjerhombus.com.

High-water alarm

The Observer 200 from **SPI – Septic Products Inc.** is an indoor high-water alarm. Features include a durable thermoplastic enclosure rated for indoor use, red alarm light, green power-on light, 85 decibel horn, auxiliary dry contacts, and alarm test and horn silence buttons. A battery backup allows the alarm to continue working during power outages. An external quick-connect terminal block allows for easy alarm float installation (a mechanical float with 15-foot cord included). 419/282-5933; www.septicproducts.com.

associationnews

By Scottie Dayton

Onsite Installer™ invites your state association to post notices and news items in this column. Send contributions to editor@onsiteinstaller.com.

CALENDAR OF EVENTS

Aug. 2-4

Florida Onsite Wastewater Association Convention and Trade Show, Ocean Center, Daytona Beach. Contact FOWA at 321/363-1590 or www.fowaonsite.com.

Aug. 24-25

Georgia Onsite Wastewater Association Conference at Stone Mountain Park Memorial Hall, Atlanta. Call Bruce Widener at 678/646-0369 or visit www.onsitewastewater.org.

TRAINING & EDUCATION

Alabama

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

- Aug. 9-10 – Continuing Education Class, Guntersville
- Aug. 15-17 – Advanced Installer II Class
- Sept. 13-14 – Continuing Education Class, Florence
- Sept. 19-21 – Basic Installer Class

The first day of Continuing Education classes is for installers and the second day is for pumpers and portable restroom operators. Call the training center at 205/652-3803 or visit www.aowatc.uwa.edu.

California

The California Onsite Wastewater Association has an Operations and Maintenance Level 1 class Sept. 13-14 at Mill Valley. Call Kit Rosefield at 530/513-6658 or visit www.cowa.org.

Georgia

The University of Georgia's Center for Urban Agriculture is offering Onsite Wastewater Management classes on:

- Sept. 7 – Dalton
- Sept. 21 – Macon
- Sept. 28 – Athens

Contact the Continuing Education Center at 770/229-3477, conteduc@uga.edu, or www.ugaurbanag.com.

Iowa

The Iowa Onsite Wastewater Association has a Site Evaluations and Soils course on Aug. 17 at Charles City. Contact Alice Vinsand at 515/225-1051, execdir@iowwa.com, or visit www.iowwa.com.

Minnesota

The University of Minnesota Water Resources Center has these classes:

- Aug. 7 – Soils Continuing Education, Willmar
- Aug. 10 – Soils Continuing Education, New Ulm
- Aug. 21-24 – Service Provider, St. Cloud
- Sept. 6 – Sampling, Cloquet
- Sept. 13 – Soils Continuing Education, Iron Mountain
- Sept. 25-27 – Advanced Design and Inspection of Onsite Systems, Part 1, Mankato

Call Nick Haig at 800/322-8642 or visit www.septic.umn.edu.

Missouri

The Missouri Smallflows Organization has these CEU courses:

- Sept. 12 – Media Filters, Mt. Vernon
- Sept. 13 – Earthen Structures, Mt. Vernon
- Sept. 25-26 – Operations and Maintenance, Camdenton

Call Tammy Trantham at 417/739-4100 or visit www.mosmallflows.org.

Nebraska

The University of Nebraska-Lincoln Extension has a state-approved Operations and Maintenance course on Sept. 7 at Scottsbluff. Call the extension at 402/472-9390 or visit www.deq.state.ne.us/WasteWat.nsf/pages/OnsitePDH.

New England

The New England Onsite Wastewater Training Center at the University of Rhode Island in Kingston has these courses:

- Aug. 9 – Surveying Basics for the Onsite Wastewater Contractor
- Sept. 6 – Conventional Onsite Wastewater Treatment Basics for Installers
- Sept. 13 – Innovative and Alternative Technologies
- Sept. 19 – Conventional Onsite Wastewater System Inspection
- Sept. 19-20 – Conventional Onsite Wastewater System Inspection and Field Training
- Sept. 27 – Innovative and Alternative Technology Field Training, Peckham Farm

Call 401/874-5950 or visit www.uri.edu/ce/wq.

North Carolina

North Carolina State University has the following courses:

- Sept. 11 – Introductory Installer, Mills River
- Sept. 18 – Subsurface Wastewater System Operator, Mills River

Call Joni Tanner at 919/513-1678 or visit www.soil.ncsu.edu/training.

The North Carolina Pumper Group and Portable Toilet Group has a septage management training and land application seminar on Sept. 22 in Asheville. Call Joe McClees at 252/249-1097 or visit www.ncpumpergroup.org or www.ncportabletoiletgroup.org.

The North Carolina Septic Tank Association has an Installer Inspector class on Sept. 10-11 at Swansboro. Call 336/416-3565 or visit www.ncsta.net.

Oregon

The Chemeketa Community College has an Installer class on Aug. 15 at Salem. Call 503/399-5181 or visit www.chemeketa.edu/busprofession/ccbi/customizedtraining/deq/classes.html.

Pennsylvania

The Pennsylvania Septage Management Association has a Basic and Advanced Onlot Wastewater Treatment System Inspection course Sept. 11-12 at Montoursville. Call 717/763-7762 or visit www.psma.net.

Utah

Utah State University has these On-Site Wastewater Treatment Certification renewal workshops on:

- Sept. 6 – Level 3, Logan
- Sept. 24-26 – Level 1, Vernal
- Sept. 27 – Level 2, Vernal

Alarms, Controls and Monitor Systems

By Scottie Dayton

VALVE MONITOR CONFIRMS COMPLIANCE

Problem

The wastewater treatment system at Lakeview Estates in Columbia, Md., failed to comply with state Department of Environment requirements. The owners hired Hydro-Terra Group to design the upgrade that included a low-profile treatment plant and subsurface drip irrigation dispersing to a sand mound.

Solution

The engineers chose a mechanical distribution valve from K-RAIN paired with an IVM6000 intelligent valve monitor from Dynamic Monitors.

RESULT

The data from the valve monitor confirmed compliance and sent an alarm if a valve malfunctioned. Maryland regulators now require valve monitors on all large onsite systems using mechanical distribution valves. 888/747-7645; www.dynamicmonitors.com.

Call Ivonne Harris at 435/797-3693 or visit http://uwrl.usu.edu/partnerships/training/classes.html.

Wisconsin

The Wisconsin Onsite Wastewater Recycling Association has a Private Onsite Wastewater Treatment System Evaluator Certification course Aug. 16-17 at the Lakewoods Resort in Cable. The course carries 16 CEUs. Call 608/441-1436 or visit www.wowra.com.

productnews

Clarus Environmental pump controls, alarms

High-water alarm systems from Clarus Environmental feature no-float pump control technology for tight spaces, including STEP systems. The 10-3067 high-water alarm box is designed to remain watertight. Features include LED alarm light and touch sensor molded into the front cover. The control panels enable users to enter or change set point elevations on the digital display. 800/928-7867; www.clarusenvironmental.com.

SJE-Rhombus Oil Spotter control panel

The SJE Oil Spotter control panel for elevator sump applications from SJE-Rhombus is designed to provide pump and alarm notifications of potentially threatening water and oil levels in simplex pumping applications, including elevator sump basins, transformer vaults, leachate well applications, garages or any applications requiring ASME A17.1 compliance. Features include factory-installed Oil Water Switch with four probes (start level, stop level, high-water level and reference from ground) and a mechanical high oil alarm float. 888/342-5753; www.sjerhombus.com.

Goulds STS sump pumps

Model STS21 (1/4 hp) and STS31 (1/3 hp) sump pumps from Goulds Water Technology feature a stainless steel enclosure and low amp draw for energy efficiency. The pumps have a discharge pipe connection for continuous operation at very low water levels while providing full motor cooling. Other features include 1 1/2-inch NPT discharge, 38 gpm capacity, 25-foot maximum head and 3/16-inch solids handling. 315/255-3378; www.completewatersystems.com/brands/goulds.

CEAttachments EDGE in-cab backhoe

The EDGE in-cab backhoe for skid-steers from CEAttachments enables the operator to control all backhoe functions, including vertical stabilizers, side-shift, boom extension, swing, dipper and bucket, as well as being able to move the machine as needed, without having to leave the cab. The backhoe attachment has a digging depth of 9 feet, 4 inches, extended reach of 10 feet, 11 inches, pivot rotation of 180 degrees and 206-degree maximum angle of bucket rotation. The attachment fits most Gehl and Mustang skid-steers and comes with auxiliary hydraulics, hoses and flat face couplers. 866/232-8224; www.ceattachments.com. ☐

industrynews

Ditch Witch presents service, Chestnut awards

The Charles Machine Works, manufacturer of Ditch Witch underground construction equipment, presented the Superior Service and Support Excellence Award for 2011 to Kelly Clark and the Harold Chestnut Award to Jimmy Creecy, parts manager of Witch Equipment Co. The Chestnut award is presented annually to the parts marketing manager who best exemplifies the enthusiasm, dedication and creativity that Harold Chestnut brought to his profession for 30 years.

ADS purchases Quality Culvert pipe assets

Advanced Drainage Systems purchased the high-density polyethylene (HDPE) corrugated pipe assets of Quality Culvert. Production will be relocated to various ADS manufacturing facilities.

SJE-Rhombus buyer receives SPSM certification

Brenda Houts

SJE-Rhombus buyer Brenda Houts received the senior professional in supply management (SPSM) certification, completing interactive online courses in purchasing fundamentals, analysis and spreadsheets, contract law, negotiation, best practices and sourcing.

W. Virginia approves Anua Platinum system

Anua's Platinum submerged aerated filter system received approval from the West Virginia Department of Health and Human Resources. The approval allows for Platinum SAF treatment systems to be installed in West Virginia under the same circumstances as Standard 40 Class I certified home aeration units. ☐

ONSITE installer classifieds

Place your ad online at: www.onsiteinstaller.com

AERATORS

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

ENVIR-O LINEAR PUMPS are designed for aeration in onsite septic systems/residential sewage treatment units. Used by manufacturers of NSF certified systems. UL APPROVED.
www.bluediamondpumps.com
770-831-1122 PI08

BUSINESSES

FOR SALE: Septic pumping and portable toilet business in north central MN. Includes 2 vacuum trucks, 3,000 gallon Tandem and 2,000 gallon, single axle, portable toilet service truck, 1 ton service van, 6 place portable toilet trailer, and 59 portable toilets. Asking $215,000. Home: 320-676-8638. Cell: 320-630-3640. (P07)

Unique septic treatment and remediation business for sale: Owners retiring, unlimited potential, ATTRACTIVE negotiable terms. Call Pat: www.saberseptic.com. (I08)

Family owned portable toilet business. Owner with health issues forces sale. 500+ units, 4 service trucks, located in beautiful Sacramento, Calif. area. 16 years established business, loyal customers. Serious inquiries only. Leave message; will return calls. 916-343-3326. (PBM)

Expand your existing business in the special event market. Exclusive PortaJane distributorship available. Call for details. PortaJane... "Because John Can't Aim!" 888-810-5535. (P07)

BUSINESSES WANTED

WANTED: Looking to acquire septic businesses in Massachusetts. All inquiries will be confidential. 508-868-7627. (PIBM)

DRAINFIELD RESTORATION

Soil Shaker 2000. Universal skid steer attachment for drainfield restoration. Buy factory direct $6,250. www.soilshaker.com or call 320-293-6644. (P1-12)

HAND TOOLS

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

JETTERS-TRAILER

Jetters by General: J-2900C gas jetter, 11 hp, triplex pump, 3,000 psi, 200' of 3/8" hose, JN 50 nozzle set (never used), J-1600 electric jetter, 1-1/2 hp motor, 115v, 13 amp with GFI triplex pump, 1,500 psi, 1.7 gpm, 115' 3/8"-hose, JN20 & JN0 nozzle set (used once), CR-300 cart with 150' 1/4"-hose (never used), all carts has pneumatic tires, pressure gauges, rubber gloves, tool box, hose guard, remote foot pedal, spray wand, and a manual. Price: $4,300. Contact Les @ 413-297-1513, MA. (P08)

PUMPS

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

SEPTIC TRUCKS

2003 Sterling L7500 Vac Truck: Cat 3125 @ 315 hp, A/T, 55K miles, spring susp., 2003 Vac-Con V390LHAD, 3 compressor fans, 10' telescopic boom, HS drive, articulating hose reel, hi-dump debris tank..... $99,500
715-546-2680 WI BM

WANTED

Wanted to Buy: Vactor 2100s and late model Guzzlers. Cash. Phone 800-336-4369. (CPBM)

NEW! 2012-2013 Pumper Services & Supplier Directory

Are you a regional or national provider of contracted, rental or specialized wastewater services looking to promote your business to other contractors?

The **October 2012** issue of *Pumper*, which annually includes our Supplier Directory, has now been ***expanded*** to include a services section. For as little as $295 you can list your company under industry-specific categories that you provide. The **October *Pumper*** will reach more than **36,000** contractors, municipalities and organizations that utilize contracted and rental services. Make sure they know who you are!

Please **fax (715.546.3786), mail** or **email** this form back no later than ***September 10, 2012.***

☐ **Yes,** I would like my company to appear in the *2013 Pumper Services and Supplier Directory* at a cost of $295 for my **alphabetical listing** and up to **10 categories.** Each additional category over 10 is $25 each.

☐ **Yes,** for an additional $50 per placement, I'd like my **full-color logo** to appear in the categories I've marked below.

☐ **Yes,** for an additional $199 I'd like to **highlight** my company in the alphabetical listings.

☐ **Yes,** for an additional $99 per placement, I'd like to add a **QR code** to appear in the categories I've marked below.

Company _____

Contact Person _____

Address _____ City _____ St ____ Zip ____

Toll Free _____ Phone _____

Cell _____ Fax _____

Web _____ Email _____

CC _____ V Code ____ Exp ____

Name on Card _____

Signature _____

Complete this form online at www.Pumper.com/2013services

CATEGORY	LOGO	QR
☑ Alphabetical Listing	☐	☐
☐ Consulting	☐	☐
☐ Dewatering Services	☐	☐
☐ Dealer of _____	☐	☐
☐ Directional Drilling/Boring	☐	☐
☐ Distributor of _____	☐	☐
☐ Engineering	☐	☐
☐ Excavating/Grading	☐	☐
☐ Grease Disposal	☐	☐
☐ Grease Transport	☐	☐
☐ Grease Treatment	☐	☐
☐ Hazardous Vacuum/Cleaning	☐	☐
☐ Hydroexcavating	☐	☐

CATEGORY	LOGO	QR
☐ Jetting - Drainline	☐	☐
☐ Jetting - Mainline	☐	☐
☐ Non-Hazardous Vacuum/Cleaning	☐	☐
☐ Oilfield Disposal	☐	☐
☐ Oilfield Treatment	☐	☐
☐ Oilfield Transport	☐	☐
☐ Pipe Bursting	☐	☐
☐ Pipe Rehabilitation/Relining	☐	☐
☐ Plumbing/Heating/Cooling	☐	☐
☐ Portable Restroom Service	☐	☐
☐ Portable Restroom Rentals	☐	☐
☐ Portable Restroom Trailer Rentals	☐	☐
☐ Portable Office Trailer Rentals	☐	☐

CATEGORY	LOGO	QR
☐ Roll-Off Container Rentals	☐	☐
☐ Septage Disposal	☐	☐
☐ Septage Transport	☐	☐
☐ Septage Treatment	☐	☐
☐ Septic System Service	☐	☐
☐ Septic System Installation/Repair	☐	☐
☐ Site Service Rentals (Fence, Lighting, Barricades, etc.)	☐	☐
☐ Solid Waste Services	☐	☐
☐ Temporary Liquid Storage	☐	☐
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