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Ontario Onsite Wastewater Association Newsletter

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Onsite
Ontario Onsite Wastewater Association Newsletter

To submit an article or place an advertisement contact Terry Davidson at **terry.davidson@rvca.ca**

The opinions expressed in this newsletter by contributing authors are not necessarily the opinions of OOWA's Board of Directors or the Association.

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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, *Onsite Installer*

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.

Continued on page 6

President's Message

I can't believe it is August already. It seems as though the conference was just the other week and yet we have seen more than three months fly by. The summer has been hot and dry and many of our members have taken the opportunity to enjoy a little piece of that, taking their vacations through the last few months. As I have traveled around the province it is good to see that our industry continues to prosper. Our members are busy in their perspective areas of expertise and there is a general positive feeling about the upcoming fall season.

The association has taken on many changes since the conference and as our members are all aware by now, our General Manager is no longer working with OOWA. We are in the midst of restructuring the management of the day-to-day operations of the Association and should soon have that mechanism in place. I would like to assure all of our stakeholders that the Association's activities, mandates, objectives and special projects are still moving along and industry stakeholders are well represented. I would like to thank all the Board of Directors and Committee members for stepping up and unselfishly contributing additional time and resources during this transition. I am confident that the new management structure will be organized, accountable and will help OOWA to be the professional organization that it is.

Please travel, work and play safe this fall and I look forward to seeing you I my travels.

Don Krauss
OOWA President

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Testing Your Equipment's Lifeblood

Oil and fluid analysis can provide important information about what's happening in your machines' engines and systems

by Ted J. Rulseh | Reprinted from *Onsite Installer,* August 2012

When you get your annual physical, blood and urine tests are usually part of it. Your doctor can tell a lot about your health by finding out what is in your vital fluids.

It's the same with your machinery: What's in the lube oil, coolant and hydraulic fluid can reveal vital information about your equipment's health. And it doesn't hurt to test your fuel, as well, to see if you're "feeding" your machines a suitable diet.

You don't need a big equipment fleet to make fluid analysis worthwhile, and you don't need a fancy local lab to take advantage of the service. Equipment manufacturers like Caterpillar and John Deere offer analysis service through their dealerships, and some independent entries, such as FRAM, provide it as well.

Not about the oil

One misconception about fluid analysis is that its purpose is to assess the condition of the fluid, such as to help decide how soon to change it out. It does serve that purpose, but on secondarily. The real purpose is to detect conditions in the fluid that indicate trouble with the equipment before premature wear or a breakdown can happen.

For example, high levels of metals in engine lube oil can indicate that premature wear is occurring. The analysis results can provide clues to the type of wear (corrosion, cavitation, abrasion) and exactly what parts are wearing. Similarly, the presence of silica (sand) in oil may indicate a defective air filter.

The results of an oil, coolant or hydraulic fluid analysis may help decide whether to extend or shorten the changeout interval, or keep it the same. But the more important outcome is to indicate a potentially serious issue that you can then diagnose and solve. When used effectively, fluid analysis can help you:

- Make your machines more reliable
- Save on maintenance and repair
- Schedule maintenance optimally
- Save fuel
- Sustain peak machine performance

Looking into the oil

The most commonly analyzed construction machine fluid is lube oil, simply because what happens to the oil can affect so many internal engine components. Here are some conditions that analysis can show you:

Contamination. Unwanted substances can get into the oil from inside or outside the engine and even from the oil itself. Wear particles from bearings and cylinder components can enter the oil and grind down either metal parts. Water and coolant can escape into the oil through worn-out seals or packings — antifreeze in oil is highly destructive. Sand and grit can enter through openings in the system. Contaminants even come from the oil itself in the form of soot or sludge.

Oxidation. At high temperatures, oil molecules will react chemically with oxygen, forming hard, abrasive particles and making the oil more viscous (thicker), so that it becomes difficult for the engine to pump it throughout the system.

Loss of additives. Quality oils contain alkaline additives that help neutralize destructive acids, along with rust and corrosion inhibitors and chemicals called dispersants that keep damaging substances in suspension until the oil is changed.

Acidity. Acid in oil will attack metal components and significantly accelerate wear. A typical oil analysis measures the acid content of the oil as well as the amount of acid-neutralizing additive remaining.

A basic oil analysis monitors the oil for wear and contamination. The report typically lists individual metals detected and their amounts, along with levels of water, viscosity, fuel dilution and soot. A more detailed analysis can add total acid number (TAN), total base number (TBN) and oxidation/nitration testing to see if the oil is suitable for continued use.

The analysis report typically includes observations about the oil's condition, the equipment's condition, and any maintenance and service recommendations.

Examining other fluids

Some equipment owners look beyond lube oil and have other vital fluids analyzed. Specifically:

Coolant. Coolant problems cause, by some estimates, as many as half of engine failures. If a coolant has the wrong chemical makeup for the temperature in which the machine operates, then corrosion, erosion, pitting and scale formation in the cooling system will accelerate. Corrosion can damage cylinder liners, heat exchangers, radiators, and other parts. The analysis detects conditions including metal corrosion, combustion gas leaks, contamination, overheating problems, and coolant chemical breakdown.

Fuel. Diesel fuel analysis can pinpoint possible causes of fuel filter plugging, engine smoking, power loss, poor injector performance, sticking valves, and other conditions. It can also determine whether the fuel sulfur content meets the machine maker's cleanliness specifications. If not, the machine warranty may be in jeopardy.

Hydraulic fluid analysis. Dirty hydraulic fluid can quickly wear down your machine's hydraulic system. Analysis helps make sure the fluid is clean and functioning properly and points the way to maintenance issues that need addressing.

Making a commitment

Oil or other fluid analysis is not something to be done once and forgotten. It constitutes a program to follow regularly so that you can detect trends in fluid and engine condition and, if need be, change maintenance and operating practices. Experts generally recommend oil analysis at each planned maintenance interval, coolant analysis at least once a year, and diesel fuel analysis as needed for winterizing the machines or checking the condition of storage tanks.

It is also essential to draw fluid samples properly. The dealership or laboratory you choose will provide instructions for taking samples without contaminating them, so that the lab tests deliver reliable results.

Fluid analysis is a useful program that can quickly pay dividends. Many users find they easily recover the modest costs of sampling and lab testing in better machine performance, longer machine life, and smaller repair and maintenance bills. ■

... from page 1

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 condition 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 these 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. ■

Reprinted from *Onsite Installer,* July 2012

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U of T third in Game of Thrones

Engineering team wins $40,000 in Gates contest

by Tim Alamenciak, Toronto Star

A team from the University of Toronto wiped out the competition in an international contest to design a new toilet, taking third place and scooping up $40,000.

Sponsored by the Bill &Melinda Gates Foundation, the challenge for the eight teams was to design a toilet that could run off the grid and be able to process human waste in 24 hours.

The Toronto Toilet runs on sustainable power, using a hand crank to process the solid waste, and sand along with a solar-powered UV light to disinfect the urine. The result is clean water and disinfected feces that could be used as fertilizer.

For Samuel Melamed, a recent mechanical engineering graduate from U of T, the project hit a personal note: He spent part of his childhood in Lagos, Nigeria, in an area with sewage problems.

"There would be a heavy rainfall and sewers would flood, and all of a sudden there would be really dirty, green, gross water flooding the streets," he said. "I looked at (the challenge) and knew, as a mechanical engineer, I could do something about it. I could use some of my passion, my design skill, to reinvent the toilet."

The new throne, initially funded by a $400,000 grant from the foundation, first separates urine and feces, then sends the latter through a series of conveyor belts that flatten and dry the poo to an easily combustible cake.

It's delivered into a smouldering chamber where previously ignited matter will set the feces aflame and continue the combustion.

"Once it's going it just keeps going," said Prof. Yu-Ling Cheng, leader of the 14-person team. "We've done some experiments (on how) to absorb the emissions from the smouldering. We're working on ways to capture the odour as well."

The winning design at the Reinvent the Toilet fair, from Caltech, nabbed the $100,000 grand prize with a toilet that generates hydrogen and electricity from human waste.

The number two spot, with a $60,000 purse, was snagged by Loughborough University in England for a toilet that converts feces into biological charcoal and recovers minerals and clean water.

According to the foundation, 1.5 million children die each year from diseases related to food and water tainted with fecal matter, and about 2.5 billion people don't have access to proper sanitation.

The U of T team has applied to the Gates Foundation to be part of phase two of the competition, where workable models of their toilet will be deployed into communities without sanitary facilities. ■

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Reprinted from The Toronto Star, Aug 15, 2012, page: A2, Section: News

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Technical Information

Pressure Distribution Layout and Design

Proper design and installation includes close attention to all of the basic components that work together to distribute effluent evenly

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

Reprinted from *Onsite Installer,* August 2012

For any aboveground system to operate correctly, a pressure distribution system is required. Any such system has four interdependent components: a pump tanks and pump, pump controls, pipes that deliver effluent, and orifices that discharge effluent into the treatment area.

For many years the pump made pressure distribution systems alternative or advanced technologies. Now, pressure distribution is used in subsurface trenches and beds, aboveground systems, and advanced media for filter systems. Because the use of all these systems is increasing, installers need to understand where to apply pressure distribution, how the components work together, and the keys to installing the systems properly. Pressure distribution is used:

- To achieve uniform application for better treatment
- To lift effluent to better soil
- To avid contamination of groundwater beneath excessively permeable soils
- To improve treatment performance and extend the life of the soil treatment unit or other component
- To reduce potential for seepage on slopes
- To distribute effluent to aboveground systems
- To disperse effluent evenly for larger drainfield systems

Evening the flow

The purpose of pressure distribution is to spread the daily flow out over the entire infiltrative surface of the soil treatment area, over the entire day. The goal is to have each square foot of bottom area receive the same amount during each dose, and at a rate less than the saturated hydraulic conductivity of the soil.

Pressure distribution substitutes for the biomat in gravity systems. The pump controlling the application can be installed to provide the doses either on demand or through a timer. Treatment is promoted by maintaining vertical unsaturated flow, which maintains an aerobic, oxygen-rich environment in the soil or media.

Another benefit of pressure distribution is that it ensures resting periods between applications, allowing the soil or the media to recover. Designs should allow for a number of resting periods. Typically, pressure distribution systems are designed with four dosing and resting periods per day.

Equally spaced applications allow resting between doses and more uniform application, resulting in more consistent oxygen transfer and better treatment potential. A time can further assist in spreading out the application of effluent. Demand dosing, on the other hand, turns the pump on whenever sufficient effluent is available.

Setting the dose

The most often discussed disadvantage of pressure distribution is that it needs a pump, pump tank, controls and an alarm. This means the owner has to pay for those added components as well as for electricity.

Another issue is that the distribution laterals are typically small-diameter pipe with small orifices that must be kept clear for the system to distribute effluent evenly. Septic tank effluent inevitably contains some solids that can plus the system. Effluent screens, which are now usually required, limit the size of solids that enter the pump tanks. Maintenance of the septic tank and distribution system is critical for long-term performance.

The distribution piping system includes supply pipe that carries effluent from the pump tank to the pressure distribution system and laterals, which actually distribute the effluent. The volume necessary to fill the pipe, which is the amount of effluent needed to charge the system before even distribution occurs, is an important variable.

The purpose of pressure distribution is to spread the daily flow out over the entire infiltrative surface of the soil treatment area, over the entire day. The goal is to have each square foot of bottom area receive the same amount during each dose, and at a rate less than the saturated hydraulic conductivity of the soil.

The dose volume (DV) must be at least five times the amount needed to pressurize the system. In cold climates, the volume in the pipe needs to drain back to the pump tank when the pump turns off. Drainback is necessary to prevent freeze-ups. However, if the drainback volume is too large, the system becomes less efficient, because the pump must move a significant amount of effluent fore than once.

Choosing and sizing pipe

The size and kind of supply piping determine friction loss, which affects the pressure requirement. Larger-diameter pipe has less friction loss and thus requires less total dynamic head, possibly allowing for a smaller pump. On the other hand, larger piping increases material cost for the system. The supply pipe diameter depends on the system flow rate. The pipe should be selected so as to achieve low headloss at the given flow rate.

The headloss also affects the sizing of the pump. After the main diameter is selected, compare it with the chosen manifold diameter. If the manifold is smaller than the supply pipe, the diameter of the manifold should be increased to match the supply pipe.

The supply line for pump systems must be properly bedded, and the connection between the discharge assembly and the supply line must be secure and stable. The supply line must be appropriately sized, and the pump capacity must be considered if changes are made.

The manifold connects the laterals and distributes the effluent to each lateral. Manifolds and supply pipes are usually PVC pipe with appropriate L or T fittings. The manifold pipe should be connected to the supply pipe from the pump and sloped toward the supply pipe. The manifold should be the same diameter as the supply pipe. The size and the position of the manifold and main will vary for each pressure distribution system.

Configuring the manifold

Depending on the site conditions and the design of the system, the manifold may be run along one end or down the center of the distribution system. The benefit of a center manifold is that it allows more orifices per lateral while maintaining the required minimum friction loss. The manifold must be installed level. If it is not level, effluent will flow by gravity to laterals at the lowest elevations during the filling and draining stages of the dosing cycle. Use proper bedding materials and techniques to ensure a stable installation.

The size of the taps or openings to the laterals affects the system flow. For a long manifold on a level site, the taps should be spaced to correspond with the lateral spacing, whether the manifold serves a series of laterals in a mound or a set of shallow, narrow, belowground trenches. This eliminates the friction loss that goes with the use of additional elbows to make the connection.

For Schedule 40 pipe, the laterals should be attached using reducing tees and joined to the pipe with appropriate adhesives. All burrs from drilling in the laterals should be removed. It is a good idea to flush the distribution network with clean water through the cleanouts to remove any debris. ■

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Wake Up Septic Industry — We have an opportunity

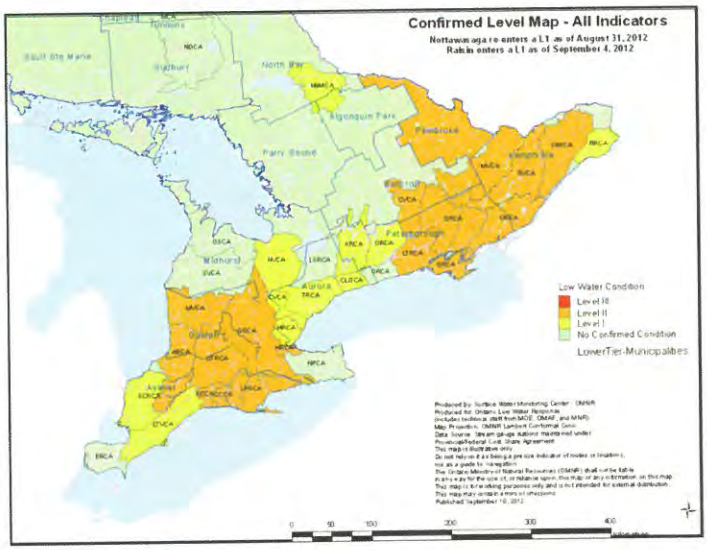
Letter from the Editor || by: Terry K. Davidson, Editor of the Ontario Onsite Wastewater Association Newsletter

As I was collecting information for this edition of the Ontario Onsite Wastewater Association Newsletter, I came across the following article on droughts and septic systems. The article, as you will read, indicates that septic systems are better for the environment in a drought situation, as they recharge the ground water. Hopefully by now you will have realized that a large portion of Ontario is in a Level 1 or Level 2 drought condition (see map).

When the door is open I usually walk-in and that's what you should be doing as a professional in the onsite industry. If you live in a municipality that requires sewage systems upgrades, do yourself, your community and the environment a favor by promoting onsite solutions.

Big pipe and centralized systems are your competition. We are all aware of the number of spills and overflows into watercourses from these systems (http://www.ecojustice.ca/publications/reports/flushing-the-truth/attachment). Along with this, centralized systems can translocate water from one watershed to another which disrupts the hydrological cycle. It is our time to speak out about the benefits of onsite wastewater treatment systems.

Who would have thought that a drought would bring an opportunity?



Drought Conditions Force Reassessment of Water Supply and Treatment Strategies Says Infiltrator Systems Inc. November 6, 2007

Drought is spreading fast across the US with 43 percent of the country now under drought conditions. The National Climate Data Center reported in mid-October that the drought parching the south and west has now spread to the Mid-Atlantic States. With these conditions expected to continue and some areas already in a water supply crisis, strategies for long term measures to protect and remediate our water supplies are critical.

One answer to the challenge of replacing the water we use is onsite or "decentralized" wastewater treatment as opposed to centralized sewers. Unlike central sewer systems, decentralized septic systems naturally treat and purify wastewater and replace 100 percent of the purified wastewater safely to the environment to recharge groundwater supplies. Currently, one in four households in the United States uses an onsite septic system to process household waste.

In a drought, a properly maintained septic system actually eases a water shortage by recharging local streams, ultimately returning water to reservoirs, according to Todd Rasmussen, a professor of hydrology at the University of Georgia in a recent article published in the Gainesville (Ga.) Times.

Continued on page 12

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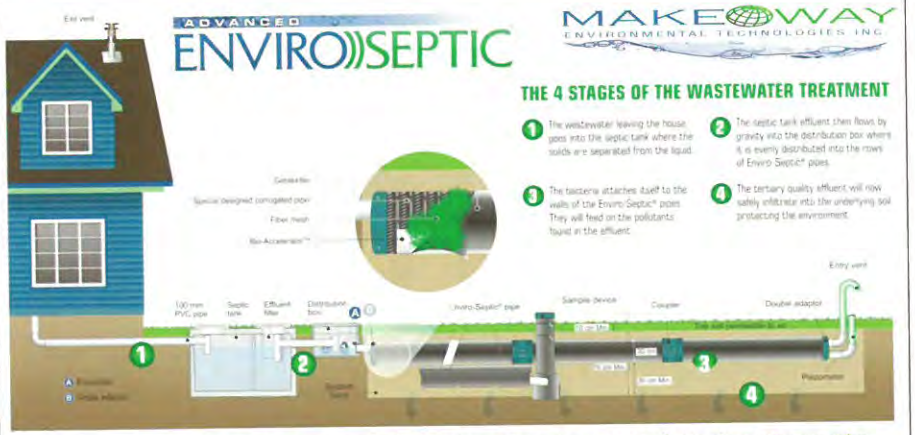

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PROTECTING OUR ENVIRONMENT

OOWA Scholarship

The Ontario Onsite Wastewater Association (OOWA) is sponsoring two annual awards to support students with a strong interest in onsite wastewater systems. The value of the university award is $1,200.00 and the college award is $600.00. Both are awarded annually.

The university scholarship is available to anyone enrolled in an environmental, chemical, or civil engineering program at an Ontario University. Participants can only receive the award once during their studies and must be conducting research which focuses on onsite wastewater issues.

For more information:
www.oowa.org/scholarship/index.html

ROB'S world

The opinions expressed herein are my own personal opinions and do not reflect the opinions of OOWA's Board of Directors or of the Association.

Shame on you Building Code Commission — shame on you all!

I want to begin this edition of Rob's World with a quick pop quiz. What is the Building Code Commission (BCC) and what is its mandate?

Answer: *The Building Code Commission (BCC) is an adjudicative tribunal, authorized under the Building Code Act. Its mandate is to resolve disputes concerning the sufficiency of compliance with the technical requirements of the Building Code, time period disputes for site inspections and time period disputes for processing permit applications. Parties to the BCC are typically builders, developers, architects, engineers, etc. as applicants and municipal plan reviewers, building inspectors, registered code agencies (RCAs) and health officials as respondents.*

With that answer in mind, I would like to draw your attention to a recent BCC ruling that came across my desk. The Ruling Number is 11-04-1277. I won't bore you with the specific details of the background of the ruling, but the basic summary is as follows: A homeowner was told that he had to upgrade his holding tank (apparently due to sizing issues) which has serviced a family cottage for the past 40 or so years. The homeowner obtained a Permit to Construct a Class 4 system on the site — not certain who obtained the permit-homeowner, installer, designer, regulator, etc. — but that isn't the important part. The important part is that the homeowner was told that the installation of a filter media bed to replace his existing holding tank would possibly result in the death of an old growth tree on the site. Also, the leaching bed would be partially raised as a result of high groundwater table issues and the driveway would run through part of the mantle. As a result, the homeowner tried to revise the permit to simply replace the holding tank. The Regulator said no as the conditions to install a Class 5 sewage system (holding tank) were not met on the site and a Class 4 system could be constructed. The homeowner appealed the decision to the BCC. That part seems straight forward enough.

However, the head scratching part of this situation comes from the fact that the BCC actually ruled in favour of the homeowner. They apparently bought into the idea that a tree, aesthetic appeal and possibly challenging construction conditions outweighed the needs of the environment.

There are those who would be quick to point out that the holding tank is environmentally friendly, especially along water courses, lakes and sensitive aquatic features. Yes, if the holding tank is properly designed and care and attention is taken to routinely pump them out, they theoretically could be more environmentally friendly than a Class 4 system (even advanced treatment systems). However, we all know what happens when the homeowners start seeing the true costs of holding tank operations. The pumping schedule become infrequent, greywater is diverted away to a "Class 2" sewage system (wink, wink, nudge, nudge) and things go downhill from there. This is why, in my extensive experience with waterfront landowners, they routinely try to install a Class 4 system even if Part 11 (Compliance Alternatives) needs to be invoked.

So while the industry is going in the direction of embracing Source Protection Initiatives to replace holding tanks with advanced wastewater treatment systems, the BCC is apparently is hitting the rewind button.

There was no mention in the BCC Ruling that suggested that the appellant was required to submit proof of routine pump out records for the existing holding tank. There was also no mention of whether or not alternative sewage system designs were considered which would address the appellant's rationale. Rather, the BCC's summation simply suggests that the evidence and testimony provided did not satisfy them that a Class 4 system could be feasibly installed on the site and that since the cottage had been serviced by a holding tank for the past 40 years that "the proposal to install a new
Class 5 sewage system to upgrade the old Class 5 sewage system provides sufficiency of compliance with the Code."

It is one of those decisions that you don't want to bring up as it can have disastrous impacts on the industry. Putting the obvious economic consequences aside, the simple fact that the BCC made this ruling shows the BCC may have become disconnected from the industry and in the concepts of Source Protection initiatives and a closer look at this quasi-government entity, and its' decisions are needed. This decision, although case specific, does open the door for others to try to skirt around having to spend the money to install a Class 4 sewage system in favour of a potentially quick fix solution.

Since when did it become acceptable to replace one holding tank with another larger one when a Class 4 system was shown to be technically feasible to be installed? I would urge the Regulator in this case, to require a strict contractual agreement for the pumpout schedule for this holding tank and check in on it frequently. Do not let the appellant off the hook in their financial and environmental responsibilities. This decision appears to be a direct affront to our industry and our industry's initiatives and I, for one, want an explanation. A Class 5 sewage system is meant to be a temporary solution to onsite servicing, not a long term solution. This decision is a tremendous setback to the efforts of the industry to move forward towards long term sustainable development on private servicing. I would urge other members of OOWA to write the Minister of Municipal Affairs and Housing asking for a Minister's review of the Building Code Commission and an immediate audit of their decisions regarding cases dealing with Part 8 of the *Ontario Building Code*. I also urge the BCC to give strong consideration, in future cases involving holding tanks, to the fact that holding tanks are not a permanent solution to onsite wastewater servicing and to not make the same mistake again. ■

... from page 10

According to the U.S. Environmental Protection Agency, "Properly managed decentralized wastewater systems can provide the treatment necessary to protect public health and meet water quality standards, just as well as centralized systems."

In most states, both onsite wastewater treatment systems and central sewers are used. The frequency of each depends on the area, population, and environmental concerns. Cost of a typical onsite system is between $2500 – $7500 to purchase and install plus around $250 every 3 to 5 years to maintain. This compares to around $20,000 per home over a 20 year period for a sewer hookup and usage fees.

"The public is getting misinformation about these wastewater workhorses," comments Mark Hooks, National Onsite Wastewater Research Association board member and regulatory consultant for Infiltrator Systems Inc. "What we want them to know is that septic systems actually help prevent drought and health issues and conserve energy — and, they don't overflow into our water bodies during power outages."

Infiltrator Systems Inc., based in Old Saybrook, CT, is a world leader in onsite wastewater treatment ■

BUILDING CODE INFORMATION BULLETIN

Qualifications for Maintenance Inspections of Sewage Systems – Information Sheet 2012-2

Building And Development Branch, Ministry Of Municipal Affairs and Housing

Question:
What are the required Building Code qualifications for inspectors who conduct maintenance inspections of on-site sewage systems?

Answer:
Building inspectors who are qualified under the requirements of section 3.1 of Division C of the Building Code and who are employed by the principal authority which has jurisdiction over Part 8 (Sewage Systems) of the Building Code, may:

- carry out sewage system maintenance inspections;
- sign inspection reports;
- issue orders (including unsafe orders and emergency orders to remediate dangerous situations); and,
- enter property to conduct an inspection.

The Building Code authorizes inspectors who are not fully qualified under the Building Code (such as intern inspectors) to undertake inspections of on-site sewage systems under mandatory and discretionary on-site sewage system maintenance inspection programs. However, these inspectors must be supervised by a Chief Building Official or qualified inspector and may not issue orders.

Principal authorities may also decide to accept from the property owner an inspection certificate prepared by a prescribed person, in place of an inspection by the principal authority.

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If you know someone that works in this industry — encourage them to join the Ontario OnSite Wastewater Association. The onsite industry is at the front line of environmental protection. Only as a team can we build the profile and recognition throughout Ontario this industry deserves. The onsite industry is composed of a diverse group of professionals including:

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Caring at Home

Home Dialysis and Sewage Systems

by Brock Cross, Gunnell Engineering

As our families age or succumb to illness it becomes important to assist them with their medical needs. Increasingly, these needs are being met in our homes with the assistance of family, friends and medical personnel.

One such medical treatment that can occur in the home is dialysis. In fact many dialysis patients prefer to undergo this procedure in the comfort of their homes as it allows them to receive the treatment more slowly and at their own convenience, limiting trips to a dialysis clinic and allowing for a more normal daily routine.

Generally, dialysis systems function by removing blood from the body and cleansing it of toxins, normally removed by healthy kidneys, prior to being returned to the body. In order to cleanse the blood of the impurities it is passed through a dialyzer (filter) that removes excess wastes and water and re-introduces clean water.

So how does this affect sewage system design?

The volume of water used during a treatment is specific to each machine and the required operating time. Flows generated can vary from 500 to 1000 litres during a single treatment. These treatments can occur multiple times each week, adding significant flows to the existing sewage system.

From a design standpoint it is important to first establish the flows generated by the proposed dialysis unit by speaking with the homeowner and understanding the treatment needs of the patient. It is also good practice to confirm if additional fixture units, bedrooms, or building additions have been added since the original sewage permit was issued.

After design flows have been established an assessment of the existing sewage system should be undertaken to confirm that it can accommodate the additional flows. The assessment should include an inspection of the septic tank and, if necessary, the pumping chamber. Are they sized appropriately? Are there any upgrades that may be required?

It may be possible to only need to increase the size of the septic tank or perhaps balance the additional flows by installing a pump chamber or replacing an existing pump chamber with a larger one, although the Municipality should be consulted to verify that balanced flows are permitted within their respective jurisdictions.

Additionally, an investigation of the disposal field should be undertaken to establish its health, by examining the stone and pipe for biomat build-up, or the stone and sand interface in the case of a filter bed or area bed. It should also be confirmed that the disposal field is sized appropriately for the increase in flows.

A common concern from Municipalities is the suspected release of contaminants into the sewage system, however the water required to complete the dialysis cycle needs to be free of chlorine and any contaminants. As such, a reverse osmosis process is employed. The bulk of the flows generated by each treatment is used in the pre-dialysis reverse osmosis filtration and is highly filtered and purified water.

The remaining water generated is spent dialysate effluent, which is formed after blood contact and consists of the filtered out impurities which can include nitrogenous metabolic wastes (urea), electrolytes, potassium, phosphates, calcium and creatinine. These wastes are typical of the wastes generated by healthy, functioning kidneys.

The dialysate can also contain acetate, sodium bicarbonate, and acetic acid based solutions used in the dialysis process. When these wastewaters enter the sewage system the concentration of chemicals are low due to dilution and generally have little effect on the treatment of the sewage. ■

Onsite
Ontario Onsite Wastewater Association Newsletter

To submit an article or place an advertisement contact Terry Davidson at **terry.davidson@rvca.ca**

OOWA has a new address and phone number!
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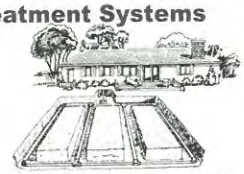

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