VOLUME 16 | ISSUE 1

Onsite

ONTARIO ONSITE WASTEWATER ASSOCIATION NEWSLETTER

treatment | technology | innovation | reuse | recycle

CONFERENCE EDITION 2016

INSIDE

Ontario Onsite Wastewater Association

Collaboration In Action to Support Ontario Water Technologies - The Southern Ontario Water Consortium

Rahim Kanji, SOWC's Manager, Industry Partnerships

Collaboration, the theme for OOWA's Conference, is a fitting one. The development and adoption of innovative technologies in the water sector can be a slow process, and the ability for organizations, associations and private companies to align their efforts is important as we make shifts toward decentralized treatment and incorporating more innovative technologies and approaches in our water infrastructure and services. Support along the commercialization pathway is critical to get new ideas through the development, demonstration, piloting and adoption stages.

The role of the Southern Ontario Water Consortium (SOWC) is to help companies by connecting them to relevant academic researchers across its 10 post-secondary partner institutions to accelerate and commercialize innovative water technologies. We help clients develop funding proposals and projects, and access real-world facilities to test and evaluate new products and services.

Recent support from the Federal Economic Development Agency of Southern Ontario (FedDev Ontario) has enabled SOWC to create a funding program for industry-led collaborative projects in the water sector.

The Advancing Water Technologies (AWT) program is a brand new catalyst for business-led collaborations in the water sector designed to help Ontario small- to medium-sized enterprises (SMEs) leverage world-class research facilities and academic expertise to develop and demonstrate water technologies for successful introduction to the market.

It's a major boost for the types of collaborations that SOWC facilitates and supports!

Our first approved project is with an OOWA member company.

The AWT program will help Renfrew-based Bishop Water Technologies advance its fixed film BioCord Reactor technology, which aims to improve the performance of active wastewater lagoons. AWT will help Bishop conduct a full-scale pilot demonstration project at a test site in the Township of Southgate in Dundalk, Ontario.

With help from SOWC, Bishop has a demonstration site, ministry approvals, a relevant research partner and now funding support to undertake the critical demonstration project.
(continued on page 3)

PRESIDENT'S MESSAGE

It is my continued honour and pleasure to welcome all the participants to our 17th Annual Education Conference and Trade Show. The event was coordinated in Kingston for 2016 to provide members in Eastern Ontario the benefit of a wonderful venue that is closer to home after several years of conferences in South West Ontario and the "Near North". Our association has been evolving and our staff and volunteers react quickly and responsibly to member feedback and suggestions. This is evident in the success of our events in 2015 including the continued growth of content and interest in decentralized wastewater management best practices and policy discussions. Our association membership directory includes the best professionals in the wastewater industry at any scale of project. Your professional connections through OOWA can and do provide substantial direct membership value through collaboration, knowledge sharing and referral networks. Setting aside all of the technology, innovation, systems, products and options in the marketplace, I am certain that people want to do business or refer work to other good people they can trust. Being a member of OOWA and participating in the professional community we represent, is a proven way to build your brand and find those opportunities we all need to continue our growth.

The improved Registered Professional Program is another substantial accomplishment for our association. We have set out the aptitudes, qualifications and experience required to be Registered as a Professional by OOWA. This is raising the bar for all practitioners in our industry and will be used to promote and market our members to the general public. Equally important, the program has set up and continued our partnerships with the best technical training providers to direct and connect our members to great content and teaching resources to meet our widespread provincial needs.

The future of water resource management will be shaped by the ideas and actions of passionate people contributing their best efforts for more sustainable infrastructure options. Progress may be difficult to measure some days, but I can assure you that OOWA members are shaping that future, keep up the good work.

Rick Esselment
President

Onsite
Ontario Onsite Wastewater Association Newsletter

To submit an article or place an advertisement contact the editor at **info@oowa.org.**

Collaboration In Action to Support Ontario Water Technologies - The Southern Ontario Water Consortium

- Continued from page 1 -

"Prior to connecting with the SOWC, we had already spent 18 months approaching municipalities to set up a demonstration site, but had not been successful," says Kevin Bossy, CEO of Bishop Water Technologies. "The SOWC is the reason we are at this stage now."

The BioCord Reactors are modules containing up to 14400 square meters of looped cord that are installed directly into the wastewater lagoons. The cords work by maximizing the surface area that is available for existing bacteria in the water to latch onto.

"The bacteria that naturally breaks down the organic matter in wastewater lagoons is often just free floating," says Bossy. "But when this bacteria can attach itself to something, it will grow in greater quantities, which means there is more bacteria to break down and remove the organics in the water."

Having these modules means municipalities can easily upgrade the efficiency and capacity of their wastewater lagoons without costly infrastructure, adds Bossy.

Currently, there are a number of smaller municipalities across Canada with outdated lagoons that are no longer adequate because of increased development and recent, more stringent, changes to wastewater treatment standards.

"Municipalities are faced with having to add capacity as well as upgrade to modern standards," says Bossy. "Instead of expanding their lagoons or building a costly mechanical plant, the BioCord Reactors are an easy and inexpensive solution that works with what they already have."

However, like any new technology, before municipalities will buy into it they need to know that it works, which is why conducting a full-scale pilot demonstration in an active lagoon is so important to the commercialization process, adds Bossy. It's another aspect where collaboration can be key.

"Having the SOWC with us at the discussion table with the municipality was extremely valuable because it helped the municipality view the demonstration as an opportunity to evaluate a potential solution rather than view it as just a sales pitch."

The company has grown to 11 full-time employees in the past few years, up from three. This year, it reported revenue growth of 15% over last year. Bossy credits a supportive innovation ecosystem in Ontario, including assistance from the Water Technology Acceleration Project (WaterTAP). As a result of this full scale pilot, if successful, Bossy expects much more significant increases in revenue in the coming years.

Projects like these would not be possible without the collaborative relationships brokered through the Southern Ontario Water Consortium. Industry, academic, government, and end-user collaborations are fundamental drivers of the development and adoption of innovative technology in the water sector that benefit us all.

View of test bays in SOWC Guelph Wastewater Facility.
PHOTO CREDIT: *SWOC*

CONFERENCE WELCOME

Greetings and welcome to OOWA's 17th Annual Conference and Trade Show. OOWA is excited to be in Kingston this year and looks forward to connecting with our large Eastern Ontario membership base. The theme for this year's conference is 'collaboration'. Over the past year OOWA has partnered with a number of organizations, associations and member companies to extend the reach of our education and professional development efforts. We wanted to recognize these partners and the successes of these collaborative efforts by including as many of them as possible in our agenda and trade show. With representatives from the Ontario Environment Industry Association, the Ontario Society of Professional Engineers, Fleming College, WaterTAP, the Ontario Ground Water Association, the Ontario Association of Sewage Industry Services and the Federation of Ontario Cottagers' Associations all addressing topics of shared interest and concern to OOWA, we are sure that you will see how these partnerships will benefit our association and our industry.

The significant efforts that the organizing committee volunteers invested into delivering the conference reflect their dedication to the association and to the overall goals of OOWA. Thanks to them for their hard work again this year!

We hope that while you are with us that you take advantage of attending the other events we have planned. The OOWA Young Professionals, a task group of the Membership Committee, welcomes all young people just starting out in our industry to its career information session on Saturday night at the Queen's University Club from 5:00-7:00pm. This year, we are offering our exhibitors increased profile by hosting Supplier Presentations on Sunday afternoon in the Ontario Room from 2:00-4:00pm. Also new, is the extended Town Hall panel discussion (Sunday, 7:00pm-9:00pm) that will feature representatives from affiliated organizations and other provincial wastewater associations. We will also be highlighting our newly revamped Registered Professional Program as part of this open forum Town Hall meeting.

So come out and take advantage of the multiple opportunities to network and to promote your products and services. We're sure this conference will be a productive one for you professionally and will also be an enjoyable time away to learn and to have a great time.

Thanks for joining us and we'll see you all on the trade show floor!

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CONFERENCE SCHEDULE - DAY 1

SUNDAY MARCH 6, 2016

11:00 am to 7:00 pm	**Registration Desk Opens**	Atrium
12:00 pm to 6:00 pm	**Exhibitor Setup**	Ambassador Ballroom
2:00 pm to 4:00 pm	**Supplier Presentations**	Ontario Room
6:00 pm to 7:00 pm	**Welcome Reception**	Ontario Room
7:00 pm to 9:00 pm	**OOWA Registered Professional Program Announcement, Town Hall and Affiliated Association Panel Discussion**	Ontario Room

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CONFERENCE SCHEDULE - DAY 2

MONDAY MARCH 7, 2015

7:45 am to 8:30 am	**Breakfast & Registration**	Atrium
8:30 am to 4:30 pm	**Tradeshow Hours**	
8:30 am to 8:45 am	**Opening Remarks** *Ed Gardner, KFL&A Public Health*	Ontario Room
8:45 am to 9:45 am	**KEYNOTE ADDRESS:** **Where Onsite & Decentralized Fits in Ontario's Push for Clean Technology** *Alex Gill, ONEIA*	Ontario Room
9:45 am to 10:00 am	**A Call to Action to the Wastewater Community:** **Is Ontario Missing the Boat on Decentralized Solutions?** *Trish Johnson, R.V. Anderson*	Ontario Room
10:15 am to 10:45 am	**Networking/Tradeshow Break**	Exhibit Hall
10:45 am to 11:45 am	**How to Effectively Manage Your Business Cash Flow** *Colin Sprake, Make Your Mark*	Ontario Room
11:45 am to 1:00 pm	**Neworking Lunch**	Ontario Room
1:00 am to 1:40 pm	**Type A Dispersal Bed Design** *Brady Straw, Waterloo Biofilter*	Ontario Room
	OOWA Best Practices for Pump Chambers and Filter Beds *OOWA Onsite Technical Committee Members*	Regal Room
1:40 pm to 2:20 pm	**The Fetherston Mobile Park: An Ongoing Case Study in Innovation** *Wilf Stefan and Gillian Dumencu, Clearford Water Systems*	Ontario Room
	Wastewater Treatment System Research Updates *Kevin Wong, Canadian Water Quality Association*	Regal Room
2:20 pm to 2:30 pm	**Balancing Break**	
2:30 pm to 3:00 pm	**Cost Effective Onsite Wastewater Treatment – Cartwright Springs Brewery** *Raymond Boyd, Premier Tech Aqua*	Ontario Room
	Cold Weather Best Practices *Chris James, Waterloo Biofilter*	Regal Room
3:00 pm to 3:30 pm	**Onsite Sewage Program Management in Nova Scotia:** **A Public-Private Partnership** *Leah Boutilier, Nova Scotia Environment*	Ontario Room
	Winter Residential Septic System Inspections *Greg Keith, Matrix Home Inspections*	Regal Room
3:30 pm to 4:00 pm	**Ontario's Building Code Commission** *Ministry of Municipal Affairs and Housing*	Ontario Room
	Case Study: Legumier Du Madawaska Project - Fixed Film Treatment for Industrial Wastewater *Rene Hawkes, Bishop Water Technologies*	Regal Room
4:00 pm to 4:30 pm	**Networking/Tradeshow Break**	Exhibit Hall
4:30 pm to 5:45 pm	**OOWA Annual General Meeting**	Ontario Room
6:30 pm to 7:30 pm	**Pre-Banquet Reception**	Atrium
7:30 pm to 9:30 pm	**Banquet Awards Dinner**	Ontario Room
9:30 onwards	**OOWA Hospitality Event**	Rideau Room

CONFERENCE SCHEDULE - DAY 3

TUESDAY MARCH 8, 2016

7:45 am to 8:30 am	**Breakfast & Registration**	Ontario Room
8:30 am to 8:45 pm	**Opening Remarks**	Ontario Room
8:45 am to 9:45 am	**SORA's Interaction with Industry and Government on Contemporary U.S. Decentralized Wastewater** *Gerald Iwan, State Onsite Regulators Alliance*	Ontario Room
9:45 am to 10:30 am	**Installation and Design Relationships: Challenges and Solutions** *Dave Gustafson, University of Minnesota Water Resource Centre*	Ontario Room
10:30 am to 10:45 am	Tradeshow Break	Exhibit Hall
10:45 am to 11:30 am	**Aligning Company and Regulator Interests to Increase Acceptance of Onsite Wastewater Systems in Ontario** *Lesley Herstein, WaterTAP*	Ontario Room
11:30 am to 12:15 pm	**Types of Wells for Onsite Installers** *Craig Stainton, OGWA*	Ontario Room
12:15 pm to 12:45 pm	**Cottage Associations: Your Connection to 250,000 Septic Systems** *Terry Rees, FOCA (Federation of Ontario Cottage Associations)*	Ontario Room
12:45 pm to 1:00 pm	**Conference Closing Remarks**	Ontario Room
1:00 pm to 3:00 pm	**Networking Lunch**	Ontario Room

CONFERENCE SPEAKERS

KEY NOTE SPEAKERS

Alex Gill

Alex Gill is the Executive Director of the Ontario Environment Industry Association (ONEIA), the organization representing the interests of the province's $8-billion environmental business sector. ONEIA's members include companies working in a range of diverse fields, from waste and recycling to water, environmental consulting and clean technology.

Prior to joining ONEIA in 2005, Alex spent more than a dozen years as an executive at a number of large nonprofits and associations. He currently works as a part-time professor in Ryerson University's Department of Politics and Public Administration and serves as that university's first Social Innovator in Residence. He also moderates the G20 Young Entrepreneurs' Alliance and speaks around the world on the issues of innovation and entrepreneurship. In 2015 Alex was named one of Canada's 30 social justice "all stars" by This Magazine.

Trish Johnson

Trish Johnson is the Senior Environmental Consultant and Small Solutions Strategic Advisor for RVA. She has worked for over 30 years in public, private and non-profit environmental management focusing on water and wastewater issues. Her specialties include land use impacts on water quality and 'value for money' environmental policies. She does environmental program development and new program implementation for all levels of government.

Based in Ottawa, She currently serves as a Senior Advisor for two small municipalities and has also works extensively for Aboriginal Affairs and Northern Development Canada (AANDC) assessing water and wastewater needs for Canada's First Nations. She is a passionate promoter and advocate for onsite & decentralized servicing solutions and alternative water & wastewater technologies. Trish is seasoned and energizing public speaker and has made over 40 professional presentations on environmental topics in Canada and the US.

Gerald R. Iwan Ph.D.

Dr. Gerald R. Iwan was the Director of the National Environmental Services Center (NESC) at West Virginia University from 2008 to 2015. NESC works closely with the USEPA and USDA and has for over 35 years been providing drinking water and wastewater publications, information, training and assistance to our nation's small and rural communities.

NESC has also hosted the State Onsite Regulators Alliance (SORA) since 1999 and Jerry served as Executive Director since 2008 for this national organization of State regulators responsible for decentralized wastewater treatment and regulation.

As a previous drinking water administrator for NYC and the State of Connecticut, Jerry had been a member, committee chair or Board member for AWWA, ASDWA, Water ISAC, and US DHS GCC. He has also a fellow of the NY Academy of Medicine

Ed Gardner

Ed Gardner is Director of the Infectious Disease Prevention and Environmental Health Division at Kingston, Frontenac and Lennox & Addington Public Health. He began his career in public health as a health inspector 28 years ago in Renfrew County. Ed has worked in other health units in Ontario including Sudbury and District and York Region. He has undergraduate degrees in biology and environmental health and a graduate degree in health studies. Ed has collaborated with Laurentian University, Queen's University and Public Health Ontario to conduct research in diverse topics such as: Blue-green algae and human health, West Nile virus surveillance, and E. coli contamination of drinking water wells in Eastern Ontario. Recently, Ed co-chaired the Great Lake Water Festival for students across the Kingston region. He is also a qualified septic inspector with powers and duties of Chief Building Official. Ed resides with his wife near the quiet village of Camden East in Stone Mills Twp.

Brady Straw

Brady is on the OOWA Membership Committee and was elected to the Board in 2015. Brady has been in the onsite industry since joining Waterloo Biofilter in 2006. As the lead onsite sewage treatment and disposal designer, Brady assists installers, engineers, and regulators on designs for a range of facilities; from individual houses to communal systems and large commercial facilities. Brady is a graduate of the University of Guelph with a bachelor's degree in Environmental Science (Environmental Economics & Policy).

Colin Sprake

Colin is a #1 selling author presently with 3 #1 Bestsellers to his name with "Entrepreneur Success Recipe – The Key Ingredients That Separate The Millionaires From the Strugglers", "Stand Apart co-authored with Dan Kennedy", and his latest success "Power Principles For Success – Colin Sprake & Brian Tracy". Colin's articles and interviews have appeared in many local and international print media including The Globe and Mail, Vancouver Sun, Seattle Times and Reno Gazette. Colin has also appeared on many channels as a guest business expert: Global, MSNBC and CTV to mention a few.

A highly sought after keynote speaker and trainer, Colin guarantees his audiences will walk away from his presentations, no matter how long or short, with practical tools and strategies they can use immediately in their lives and businesses to achieve greater success and make a positive impact in the world. He also teaches that success is attainable in both family and business without sacrificing one for the other.

CONFERENCE SPEAKERS

Giallan Dumencu

Gillian Dumencu is a senior engineer at Clearford Water Systems in Ottawa. Since joining Clearford in 2013, she has advanced research and development related to Clearford's decentralized wastewater collection and treatment offering, as well as managing the company's intellectual property and supporting business development efforts in Ontario. She is a member of the team that recently completed the Fetherston Mobile Park project. As project engineer, she guided the project through all stages, from environmental assessment to detailed design and approvals to construction and startup. Before joining Clearford, she worked on environmental, municipal and land development projects at J.L. Richards & Associates in Sudbury and Ottawa. She attended Laurentian University and graduated from the University of Ottawa in Civil Engineering. Gillian is a member of PEO, OOWA, and the Algonquin College Environmental Management and Assessment Program Advisory Committee.

Will Stefan

Wilf Stefan has worked in the decentralized wastewater treatment industry for over 10 years, initially with a packaged water and wastewater treatment plant equipment manufacturer and currently as CTO and V.P. of Engineering with Clearford Water Systems which provides full municipal wastewater collection and treatment solutions. He has worked in various industries including mining, oil and gas exploration, food processing and high-tech manufacturing and development. He has lived and worked overseas in a number of industrialized and developing countries and brings this international perspective to Clearford's activities in India and South America. Wilf leads a diverse team of enthusiastic engineers who are determined to successfully execute projects with Clearford's unconventional small bore sewer collection network. He has a BSc in Mechanical Engineering from the University of Saskatchewan and an MBA from the University of Ottawa, and is a member of OOWA, WEF, PEO and the Canadian Ski Patrol.

Kevin Wong

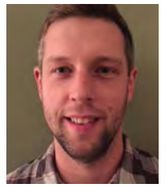
Kevin Wong is the Executive Director of the Canadian Water Quality Association. His responsibilities include the execution of the association's strategic plan, and interface with regulatory bodies. Previous to joining the CWQA, Kevin worked with Cimatec Environmental Engineering and Jacques Whitford Environmental. Currently Kevin sits on the National Standing Committee for Plumbing and HVAC (the National Plumbing Code). He participates on various standards development technical committees related to the industry.

Raymond Boyd

Mr. Raymond Boyd, P. Eng. holds a Bachelor's degree of Science in Engineering from the University of Guelph. He has worked in the wastewater treatment and environmental regulation industry for 15 years.

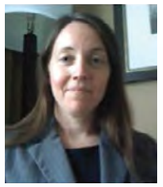
In the early 2000s, Mr. Boyd acted as an Ontario Building Code (OBC) Part 8 Inspector for the Rideau Valley Conservation Authority. He reviewed on-site sewage system applications, installations and participated in facilitating the Ministry of Municipal Affairs and Housing (MMAH) training courses offered for certification and licensing of septic system installers practicing in Ontario.

Mr. Boyd is currently Premier Tech Aqua's Regional Coordinator for Eastern Ontario, a position he has held since 2009.



Chris James

Chris is a graduate of Sir Sanford Fleming College. Chris has brought his previous experience installing various kinds of septic systems to lead the operation and maintenance department at Waterloo Biofilter, where he works with engineers and installers to ensure systems are designed and installed to operate in cold climates. Growing up in Northeastern Ontario Chris works extensively in cold regions in the Ontario north as well as in Manitoba. Another aspect of Chris's work is to develop sewage treatment products and processes, mainly focusing on nutrient removal applications, for which Chris is a co-author on multiple papers.



Leah Boutiller

Leah Boutilier is an Environmental Engineer who has been working for the Province of Nova Scotia's Department of Environment as the On-site Services Program Coordinator since 2012. Her role as the NS On-site Coordinator includes program, regulation and policy development, internal training, and industry education and certification. Leah maintains a strong connection with Dalhousie University's Centre for Water Resources Studies' on-site wastewater research program. Leah's previous experience includes wastewater treatment and wetland assessment in Nunavut, on-site sewage system design and research on treatment performance and hydraulics. Additional experience includes surface water quality and watershed assessment, industry association government liaison, technology review, facilitation, and project management.

Leah completed her doctorate degree through Dalhousie University's Centre for Water Resources Studies in 2009, her research focused on E. coli kinetics in constructed wetlands used for dairy and domestic wastewater treatment. Leah's graduate work and additional research on wastewater treatment has been published in leading peer reviewed journals in the field of water, wastewater, and wetlands research.

Greg Keith

Greg received his degree in civil engineering in 1997 from the University of Ottawa and is a designated Professional Engineer PEO. Greg has a diversified background including work as a civil/structural engineer, general and subcontractor.

Since obtaining his BCIN in 2008, Greg has been a full time private inspector specializing is residential presale septic system inspections.

Dave Gustafson

Dave Gustafson, PE is a registered Engineer working in the Water Resource Center at the University of Minnesota. He has been dealing with sewage for over 25 years in municipal scale systems and backyard treatment technologies. He has been educating and assisting onsite treatment professionals in MN, nationally and internationally for over twenty years. His position allows him to be active in the troubleshooting and evaluation of systems in MN and Nationally. He has learned through the years that we can learn from each other and getting your hands dirty helps to keeps your thoughts clear.

Craig Stainton

Craig Stainton is the Executive Director of the Ontario Ground Water Association.

Aside from 7 years in Toronto from 1977 to 1984 (consumed by the marketing course at Humber College and retail work experience), "his world has been water". Grandfathered into the licencing program when it was instituted by the M.O.E. Craig is a Licenced Well Technician in Classes 2, 3, and 4.

Craig joined the Board of Directors of the OGWA in 2003 and after moving through the chairs of first and second vice president served as President from 2007 to 2009. Craig also served as chair of the Staff Liaison Committee for many years. Just a few months shy of starting his 10th year on the Board; he resigned to accept the post of Executive Director.

Terry Rees

Terry Rees is the Executive Director of the Federation of Ontario Cottager's Association.

Terry leads one of Ontario's largest landowner networks, representing over 500 member associations, including over 50,000 waterfront landowner families. Terry is a Leadership Committee member on the Stewardship Network of Ontario (SNO), a Member of the Trent Conservation Coalition Source Water Protection Committee, the Ontario Biodiversity Council, a member of the North American Lake Management Society, and the Ontario Onsite Wastewater Association. Terry sits on the Provincial Policy Statement - Rural and Northern Ontario Review Committee, and the Ministers' Mining Act Advisory Committee.

Part of Terry's role is to contribute to sound public policy with respect to waterfront property owners' interests.

Terry was recognized by Water Canada magazine as a person making a significant contribution to Canada's waterscape in their 2012 Water's Next feature.

Rene Hawkes

Rene started with Bishop Water Technologies as a summer student in 2011, putting together the first BioCord Pilot system in Eganville, Ontario. After graduating from Carleton University with a degree in Environmental Engineering in 2013, he joined Bishop Water Technologies full time, continuing to develop the BioCord Reactor system for municipal and industrial wastewater.

Rene's experience and expertise is in biological treatment systems, as well as civil engineering aspect of wastewater treatment and project management and implementation. He has developed numerous research project with several universities, including Carleton and the University of Ottawa. These projects have successfully demonstrate the use of BioCord Reactors for nutrient removal in municipal wastewater.

Lesley Herstein

Lesley Herstein has a range of water experience. She has worked for a water technology start-up, spent time in India working on a water-related health project, and most recently, she completed a PhD in Civil Engineering at the University of Toronto on the topic of complexity and innovation in state and provincial water sectors.
As WaterTAP's Manager of Policy, Lesley applies her research and analytical skills, engineering expertise, and knowledge of the water sector to inform policy recommendations, create tools for the water sector, work with companies on research and development projects, and to better understand how to align the needs of the public sector, the private sector, and the public in promoting water innovation in Ontario.

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Gerry & Amy Knoop

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SERVICE AREA
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NUMBER OF YEARS IN OPERATION
40

What got you started in the onsite wastewater industry?
In the early seventies I started a small landscape business in order to help support my parents. It was just something you did. During the 1980's I left to pursue other ventures. By 2001, my Dad retired and I found myself back in the family business. With the acquisition of a local pumping business our company began to evolve within the septic industry. Now, as the need of the customer changes so does our current business.

Give us one reason/secret for your success.
We work closely with family and our employees; this makes open communication and commitment important. In serving our customers we continuously work on building a solid, professional reputation and then stand behind our own work.

Where do you see the onsite industry going?
With more efficient and environmentally friendly waste treatment systems now available we will see less discharge of contaminants into our lakes and rivers. Better management and the acceptance of industry best practices will ensure the environment is protected for all.

THE KNOOPS

What can the onsite industry do to improve?
Better management and the acceptance of industry best practices will ensure the environment is protected for all. We must never lose sight of what is important is the protection of the environment. The wastewater industry must be able to offer affordable products and services to the people who need them so that together we continue to protect our environment.

GETTING FAMILIAR WITH THE IDEA OF THE PERFORMANCE BOUNDARY

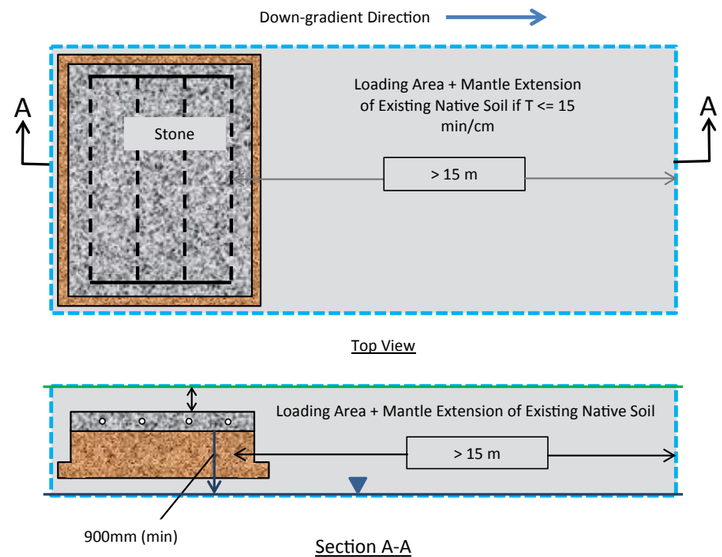
Katherine Rentsch, P. Eng., R.J. Burnside & Associates

The treatment capabilities of soil absorption systems have always been a hotly debated issue in Ontario. Although most agree that soil absorption systems are capable of some treatment, debate about where and how to measure performance has been on-going. Compounding the issue is the lack of clarity from the Ontario Building Code on the treatment expectations of soil absorption systems, and where that treatment is expected to have been completed.

Although most agree that treatment should be measured at the "bottom" of the system, the question about where the "bottom" is becomes open to interpretation. Do we measure from the ground level, or from the bottom of the trenches? Do we measure to the bottom of the filter sand (750 mm) or to the limiting layer (900 mm)? Do we measure performance for fill-based systems only at the end of the mantle?

In the last couple of years, the concept of the "performance boundary" has made its way into the conversation in Ontario. The term was incorporated into the CSA B65-12 Installation Code for Decentralized Wastewater Systems (CSA B65), and according to the definitions, the performance boundary is "the limits of a treatment system, as indicated by the vertical separation and horizontal setback distances where the treatment objectives have been met". It must be noted that the soil absorption system is considered a treatment system, and this is defined elsewhere in the CSA standard.

So what is that supposed to mean? Well, it basically means that the treatment that is expected from a soil absorption system (and yes! The standard also has explicit treatment objectives for soil systems, although that is perhaps best left to another article) should be completed by the time the effluent reaches the limits of both the vertical and horizontal distances legislated by the code. This is perhaps best illustrated by a figure.



As illustrated, both the vertical and horizontal distances incorporated into the design of the system delineate the performance boundary (the dashed blue outline). So the treatment provided by an in-ground filter bed with a mantle composed of the native soil, should be completed by the time the effluent reaches the vertical separation distance i.e. 900 mm below the stone, and for effluent travelling in a horizontal direction, by the time it reaches the end of the 15 m mantle. For fill based systems raised above the natural grade, the same performance boundary applies, and it could perhaps be argued that the horizontal component becomes much more important. It should be noted that in some cases, an increased vertical separation distance is required by CSA B65.

Reviewing the definition, one could argue that horizontal setback distances to sensitive site features such as wells and surface water bodies could also be incorporated into the performance boundary. Although there may be some debate about that, I would find it difficult to argue against. We must assume that the minimum horizontal setback distances imposed by the code are to protect public health and the environment. This would imply that some "treatment objective" can be met within that treatment distance, which would by extension imply that the performance boundary extends to those setback distances.

Looking to the future, how can we incorporate the performance boundary into Ontario's onsite sewage system industry and our regulations? Well, we can begin by using it. The more that people get familiar with the idea, the more it will become an accepted part of the industry. The word mantle doesn't appear in our code, but that doesn't seem to stop anyone from talking about mantles, or understanding what they are. The current code utilizes CSA standards in numerous places, so it would seem to be a natural fit to point to this standard, or specific parts of it, for definitions of the performance boundary, and by extension, treatment expectations for soil absorption systems. Perhaps this is something that we can work towards.

Sanitation Reinvented

Clearford One™ by Clearford Water Systems delivers a new, better approach to sanitation. The key to enabling the efficiencies of Clearford One™ is removal of sewage solids through distributed primary and partial secondary treatment using ClearDigest™ smart digesters. Liquid effluent is then transported in the ClearConvey™ small-bore-sewer network to the ClearRecover™ optimized treatment package for final treatment and water recovery.

Clearford One™ is more efficient, less expensive and longer lasting than conventional systems. Clearford's Pay-for-Performance (P4P™) delivery model provides financing for the system to qualified municipalities and developers.

CHECK OUT "The Fetherston Mobile Park: An ongoing case study in innovation" presented by Clearford Water Systems at 1:40 pm - 2:20 pm on March 17th.

SILVER SPONSOR

WATERLOO BIOFILTER

Phosphorus Removal System

The patent-pending Waterloo EC-P™ permanently removes phosphorus from residential and commercial wastewater streams using natural iron electro-chemical processes. Rather than separate and concentrate P in the septic tank where it must then be pumped out and treated elsewhere, the EC-P mimics nature by forming Fe-P minerals in different filtration media, where they remain highly stable and resistant to dissolution.

These small units are ideal for retrofits and new installations, and can be used with filtration treatment units or conventional soil-based beds. The system requires no chemical addition, does not increase sludge production, and uses very little energy, about $40 per year for a standard house. The unit below fits between the septic tank and the filtration unit, with electrodes typically lasting 2 – 3 years before replacement. With the Waterloo EC-P system, more than 98% of phosphorus is removed before entering groundwater resources.

MEMBER PROFILE

Robert Palin

North Bay-Mattawa Conservation Authority

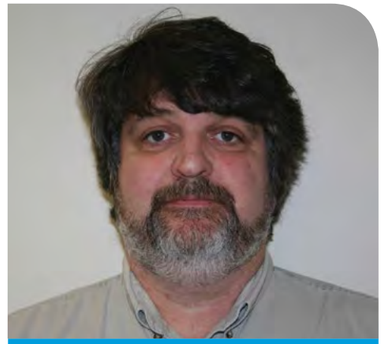
SERVICES
Environmental Protection

SERVICE AREA
Nipissing District and Parry Sound District

NUMBER OF YEARS IN OPERATION
44 years

What got you started in the onsite wastewater industry?
While working on 4 month contracts (for 4.5 years) for the Ministry of the Environment, Charlie Murray, London District MOE offered me another contract doing septic system inspections; the London Middlesex Health Unit had decided to give up the septic permitting program and the responsibility fell onto the MOE. I conducted inspections in Middlesex County and the City of London. The MOE worked out a contract with the Upper Thames River Conservation Authority and I was successful to become the septic program manager at the UTRCA. I supervised inspectors at the UTRCA, KCCA, ABCA and the SCRCA. Seven years later G-Met Environmental Services came calling and I became the Southwestern Ontario Regional Sales Manager for Ecoflo Ontario (7 years). After leaving Ecoflo Ontario I worked with Glorayne Construction for 1.5 years assisting in the design and construction of sewage systems for Wayne and Gloria McLaughlin of London. Then I heard the call of the north, I was successful getting the position of On-Site Sewage Program Manager at the North Bay-Mattawa Conservation Authority where I remain today. I also became a certified MMAH trained Facilitator and I teach septic related COWI courses all over Ontario.

Give us one reason/secret for your success.
My secret to success is to listen. Many people in the industry and OOWA have given me valuable information over the years that have made me into some degree of expert in this wastewater industry.



ROBERT PALIN

Where do you see the onsite industry going?
We need to convince the Ontario government to think of on-site systems as a viable solution for servicing. Gone are the days of publicly funded big pipe solutions.

What can the onsite industry do to improve?
We need to bring in young people to carry our flame into a bright future of responsible reclaiming of our waste streams. Clean abundant sources of water are the key to our future.

OOWA'S BEST PRACTICE DOCUMENTS

Anne Egan, OOWA Onsite Technical Committee Co-Chair

OOWA's Onsite Technical Committee has been busy creating the first in a series of Best Practice documents to provide guidance to practitioners in the industry. The first two documents available are the Pump Guidance Document for Onsite Sewage Systems, and Sand Filter Beds: Best Practices for Design & Installation.

While at our 17th Annual OOWA Conference in Kingston, be sure to join us as we will be presenting more detailed information from both of these documents. Best Practice documents will be available to OOWA members through the OOWA website. If you have an idea for a best practice document, or would like to volunteer on the Onsite Technical Committee, please let us know!

Pump Guidance Document for Onsite Sewage Systems

This document provides guidance for different types of pumping systems (e.g. raw sewage pumping, effluent pumping) and the best practices for design and construction of these systems.

Specific Design Considerations that are covered in this document include:

- pump chamber location and sizing
- system redundancy
- type and size of pump
- discharge piping
- floats and controls
- dosing
- alarms
- electrical considerations

Construction and maintenance considerations are also included.

Sand Filter Beds: Best Practices for Design & Installation

This best practice document is intended to improve the consistency with which Section 8.7.5 of the Ontario Building Code is applied across the province. OOWA members provided input to the main issues or inconsistencies they see in practice, and this information was collated into six main themes, which form the basis of the document. A brief overview of the history of the Filter Bed is provided, and the six main inconsistencies are explained, including the best practices for each of them:

1. Filter Sand Compliance
2. Even Distribution
3. Loading Rates
4. 75% Rule
5. Proper Backfilling Practices
6. Life Expectancy

INFILTRATOR WATER TECHNOLOGIES OFFERS TOTAL APPROACH TO WATER QUALITY

Going Green with Infiltrator Products

As the largest septic products company in the industry, Infiltrator Water Technologies LLC offers a total approach to water quality. The company manufacturers and sells multiple product lines that meet stringent environmental and regulatory decentralized wastewater treatment requirements. Through its subsidiary Champion Polymer Recycling, Infiltrator is a leading purchaser of "green materials" including post-consumer and post-industrial recycled plastics used in the manufacture of Infiltrator products at their ISO-9002 certified manufacturing facility in Winchester, Kentucky. The Infiltrator family of products includes Infiltrator Chambers, EZflow, engineered geosynthetic aggregate, IM-Series Plastic tanks, and Aquaworx IPC Controller. Infiltrator funded a quantitative research study to evaluate the environmental impacts of both conventional septic systems consisting of a concrete septic tank and stone/pipe drainfield and systems using recycled thermoplastic tanks and chambers. It was determined that even when transporting the recycled thermoplastic systems 950 km to Toronto, ON and conventional systems only 50 km, the recycled systems reduced electricity consumption by 89%, fuel consumption by 77%, water consumption by 97%, and carbon emissions by 48%.

For more information visit Infiltrator's website at www.infiltratorwater.com or call 1.800.221.4436.

SUCCESSION PLANNING FOR BUSINESS OWNERS

Jennifer East, ONIDA Family Advisors Inc.

"If I die." This is one of the most common things I hear from business owners when talking about the future. There seems to be something magical about entrepreneurs, as they consider themselves immune from the natural rhythms of life.

In reality, some day everyone will need a plan for our personal and professional affairs. The question no one knows the answer to is … when will that be?

For business owners, the need for a solid estate plan (for your personal affairs), and succession plan (for your business) is very high. A useful framework when thinking about this type of planning is to develop a strategy for a short term, unexpected event (you are hit by a bus, or incapacitated in some way), and a long term plan for your retirement and/or the time when you pass away.

Set Goals

The first thing you – and your partner/spouse – need to do is set clear goals. Do you want to retire? Die at your desk? Travel the world? There aren't any right answers to these questions. What won't work is continuing with your business without making **any** plans.

You'll also need to develop a clear financial plan. What kind of lifestyle do you want to maintain, and how much annual income will that require? If you pass on your business to the next generation, will you need income from the business? These are key considerations in order to make solid plans for your future.

Communicate

The single biggest factor that contributes to the demise of family businesses (and the personal relationships that underpin them), is a lack of communication. I've met business owners who have developed complex estate and succession plans involving their children, but who had never spoken to their kids about them.

If you're comfortable talking to your children or other family members about their intentions about the business, start a process of regular family meetings. Get their input prior to each meeting about the agenda, take minutes and follow up on what you agree to do.

Many families hire a third party to assist with these conversations. Outsiders offer an objective voice to facilitate challenging discussions. A third party can also assist in determining whether family members have the right skills to take over the business (and if they don't, what training and development is required).

Stick to a Timeline

The most successful transition plans outline a clear process so that everyone understands what will happen, when and by whom. In many cases, founders start taking time off from the business gradually, so they get used to the idea of being away from their business, and the next generation of leadership can "practice" while the founder is still available for advice.

One of the most important parts of your transition plan is to evolve the business away from you. This will take time, so that your employees, customers, suppliers and other stakeholders develop relationships and trust with the next generation of leadership.

Owners vs. Managers

It's useful to remember there are two key transitions that will happen in your business … the change in management (who runs your business), and a change in ownership (who owns your business). To date, those two have likely been concentrated in one or two people. The skills and responsibilities of being a manager and those of an owner are distinct. Even if one or two people continue to own and run your business, it's important to break down the roles and responsibilities.

In a scenario where several of your children own a business, while only one or two work in it, defining clear rights and responsibilities for owners and managers is a key part of a successful transition.

Get Outside Help

I just read a quote by Larry Rosen, second generation leader of luxury men's retailer Harry Rosen, who said "the process of transitioning a family business is not one that is left to the family. It is imperative that you bring in outside experts". Just as you are an expert in your business, there are experts in transitioning a business. Hint … that's not you.

Your accountant, lawyer and insurance provider will be important parts of your team. You may also need to consult other experts like estate lawyers, tax accountants, leadership coaches, business valuators, management consultants etc.

If this sounds like an expensive undertaking, you're right. Transitioning your business is a process that involves your time and money. You need to ask yourself… what is this business worth? Not only in dollars and cents, but also in terms of the contribution you make to your employees and your community, and to you and your family's legacy. Smart business owners recognize that succession planning is an important investment in the future.

MEMBER PROFILE

Marie-Christine Belanger

Premier Tech Aqua

OWNERS
Bélanger Family from Rivière-du Loup

SERVICES
Environmental Technologies Group

SERVICE AREA
North America

NUMBER OF YEARS IN OPERATION
14 years at Premier Tech Aqua – total of 24 years

What got you started in the onsite wastewater industry?
Back in the early 90's, I pursued a Master's degree in Chemical Engineering in wastewater treatment process at the École Polytechnique de Montréal. My thesis subject focused on modeling the hydrodynamic properties of a peat filter-based media bed. This research project was funded, among others, by "Tourbière Premier", which is known today as Premier Tech.

After my Master's degree, I worked for few years as a wastewater treatment process engineer for a consultant firm where I was closely involved with the R&D team. Following this first professional experience, I wanted to see other things and live new experiences. So, for a little more than five years, I worked as Project Development Director for a consortium of six companies specialized in complementary sector of the waste management industry. We were working at developing and implementing Integrated Waste Management Programs in emerging countries. September 2001 was really detrimental for our group as most of our projects were in areas of high instability. Thus, after a few months of trying to pursue our projects and raising additional funds, it was decided to terminate our activities. Interestingly, Premier Tech Aqua was part of that consortium. Out of the six companies involved, four offered me to join their team. I decided to return to my "premières amours" and join the PTA team and continue my career at protecting the valuable resource that is water.

Initially involved with the R&D team for the development of new filtering media, I took over the development of the US market and products approval/certification for North America. Over the years, my role has evolved to Product Director, which involved guiding teams in the orientation of their strategic positioning in terms of development and optimization of our products and services. My functions have also brought me to play key roles on several steering and advisory committees throughout North America, namely with the BNQ, CSA, NOWRA, NSF, local provincial and state organizations. My current role at PTA thus includes the responsibility of all US and Canadian product certifications and approvals.

Give us one reason/secret for your success.
I believe that the key to my success is that I listen well and take the time to better understand the issues at hand. I like to think that my personal skills are also an asset as I am able to mobilize people behind an issue and can be convincing when a consensus is called for.
My presence on several advisory committees and scientific panels has provided me with invaluable information thanks to my many exchanges with renowned experts and key industry people. This has been key to increasing the depth of my knowledge; and I now possess a wide diversity of skills and the vast know-how required to offer expert advice and counsel.

Where do you see the onsite industry going?
I certainly believe that we need to convince authorities, to various degrees, that on-site and decentralized systems are a viable solution for servicing. Publicly funded big pipe solutions are no longer sustainable and reflect less and less how communities have chosen to expand and where families decide to live. The

MARIE-CHRISTINE BELANGER

industry can now confidently stand behind certain technologies as many have been in use and installed for decades. Their performance and durability have been fully demonstrated, and they have proven to be just as reliable and even offer advantages over conventional systems. There is no reason why technologies should still be perceived as non- conventional.

What can the onsite industry do to improve?
All stakeholders must focus their actions on ensuring the proper management of resources. Existing and new systems should be adequately followed to ensure that our water resources are well protected. The past several years have brought incredible technological advances, and the interest for sustainable solutions and environmental stewardship will drive a continued growth. Our future will undoubtedly include rain water harvesting, water reuse, reclamation of our waste stream and much more.
Our industry must prepare for their arrival and remain ahead of these trends. Regulations will thus need to adapt accordingly by moving forward with responsible and sustainable integrated water resources management that looks to long-term solutions for water preservation.

Sustainable Solutions for Lagoon Based WWTPs Receiving Hauled Wastes

Harpreet S. Rai, PhD, PEng, BCEE, RV Anderson Associates Limited

INTRODUCTION

Hauled wastes (HW) can be difficult to treat even in mechanical Wastewater Treatment Plants (WWTPs). They also can be particularly challenging in lagoon based systems especially with the increasingly stringent regulations and environmental concerns with total ammonia nitrogen (TAN) in the treated effluents. This has become an ubiquitous challenge in the Province of Ontario which has over 150 lagoon-based WWTPs.

HAULED WASTES

Table 1 summarizes the typical characteristics of the three types of hauled wastes commonly encountered, including Holding Tank Waste (HTW), Portable Toilet Waste (PTW) and septage. Figure 1 shows the loading sensitivity of WWTP influents to varying volume contributions of different types of hauled wastes. As can be seen from this chart, while a 10% influent flow contribution by septage can double the TKN loading, the same contribution by PTW can increase it by six (6) times. In addition the septage and PTW are frequently toxic and can shock the biological treatment systems due to both loading as well as toxicity.

CHARACTERISTIC	HW TYPE		
	HTW	SEPTAGE	PTW
Age	4-6 weeks	4-12 months	1-2 weeks
Strength relative to sewage	3-4 X	10-20 X	25-50 X
Biological activity	High	High	Low (chemically inhibited)
Level of digestion	Low	Moderate	Low (chemically inhibited)
Odour	Moderate	Strong	Low (chemically inhibited)
Toxicity potential to biological treatment	Low	Moderate	High (toxic chemicals)

TABLE 1 – CHARACTERISTICS OF HAULED WASTES

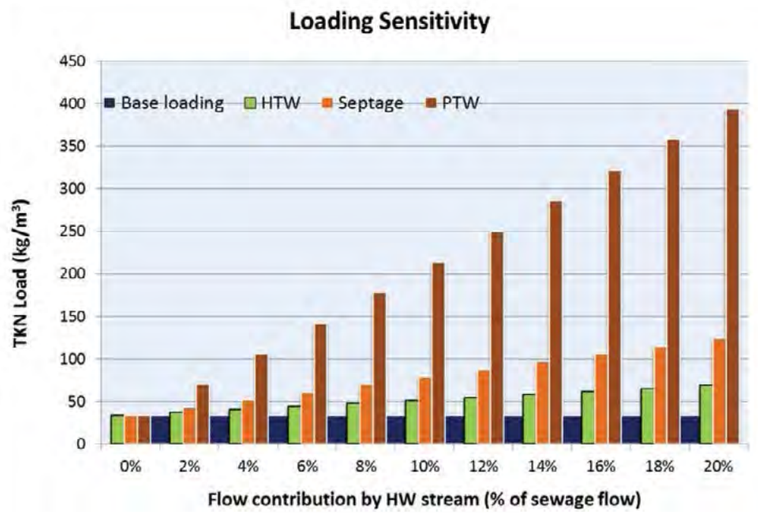


FIGURE 1 – INFLUENT LOADING SENSITIVITY TO HW CONTRIBUTIONS

CASE STUDY

A LAGOON BASED WWTP IN ONTARIO

Figure 2 shows the process schematic of one such lagoon based WWTP recently investigated by RV Anderson.

Like several other lagoon based systems in Ontario, the WWTP consists of a flow-through aerated lagoon, followed by a facultative stabilization lagoon. The WWTP was operating at 75% of its rated volume capacity at the time of investigation. However in spite of a significant residual capacity available, the effluent from the WWTP was exceeding the seasonal compliance limits for total ammonia nitrogen (TAN).

In order to identify the potential causes leading to TAN exceedances, a process investigation was carried out by RVA. The investigation revealed three key factors behind the effluent non-compliance for TAN.

Aeration capacity limitation under peak loadings

The influent flows and characteristics were analyzed to determine average and peak organic and nutrient loadings. Based on the influent cBOD5 and TKN loads, the theoretical oxygen demand was calculated for average and peak loadings. The demand for the TKN loading was considered to the extent of the effluent TAN limits of 8 mg/L in summer and 15 mg/L in winter. These calculations indicated that while the aeration capacity of the mechanical aerators was sufficient to meet the oxygen demand of the current average loads, it was only 50% of the air required during peak loading months.

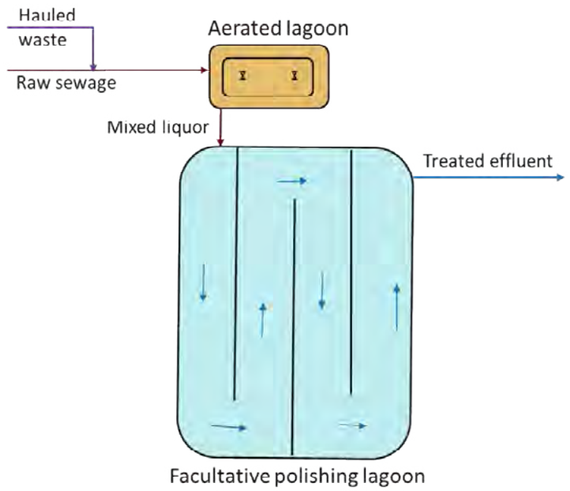


FIGURE 2 – PROCESS SCHEMATIC OF THE LAGOON BASED WWTP

Degree of nitrification inhibition	Effluent TAN at current and design peak loadings	
	Existing system at current peak loading SRT = 2.7 d DO = 1.0 mg/L	Proposed system at design peak loading SRT = 15 d DO = 2.0 mg/L
0%	1.8	0.31
10%	2.8	0.37
20%	6.23*	0.45
30%	42.0	0.59
40%	47.3	0.84
60%	47.4	1.49
70%	47.9	5.62*
80%	48.0	51.1

* Values in red indicate onset of nitrification loss

TABLE 2 – BIOWIN ANALYSIS OF PLANT PERFORMANCE AT CURRENT AND FUTURE PEAKS

Hauled wastes loads and toxicity

The current average plant flow indicated that the WWTP was operating at about 75% of its rated capacity and therefore carried residual treatment capacity. As such, the operating staff found it hard to reconcile with the fact that a plant could be limited in its treatment efficiency while operating well below its rated capacity. The investigation revealed that the plant received hauled wastes from various sources. These wastes were introduced into the collection system with no monitoring of their volume, nature or characteristics. As such, the municipality had no information on the organic and nutrient loading contributed by these wastes at the WWTP. The fact that such extraneous wastes can be up to 50 times as strong as typical domestic sewage, and that the plant was frequently non-compliant for effluent TAN, indicated that the plant had potentially reached or exceeded its treatment capacity from an organic loading viewpoint, and/or its treatment efficiency was potentially compromised by the typical biological inhibition caused by hauled wastes.

Limited SRT with a flow through lagoon system

Solids retention time (SRT) is another critical operating parameter for nitrifiers and needs to be typically above 5d in summer and 10d in winter to effect nitrification in biological treatment systems in Ontario. The aerated lagoon being a flow through system with no sludge recycle had its SRT equal to the Hydraulic Retention Time (HRT)which was less than 3d at the current flow. Therefore the systems nitrification efficiency was not only limited by potentially low DO levels and inhibition by hauled wastes but also low SRT.

Remedial Upgrades

Based on the above limitations, addition of secondary clarification with RAS recirculation to the aerated lagoon, and aeration upgrades to fine bubble system were identified as the most sustainable solution to address the issues. The secondary clarifier upgrade was geared towards providing a system SRT in the range of 15-20 d which would help mitigate toxicity and improve nitrification in general. The polishing lagoon downstream of the aerated lagoon allowed the secondary clarifiers to be designed for average instead of peak flows, thereby keeping the upgrade cost under control. The estimated life cycle cost of the proposed upgrades was $2.0 M which was lower by an order of magnitude than the conventional mechanical plant options ranging from $6 to $30 M.

The validity of the theory of the above three factors impacting the plant nitrification performance, and the effectiveness of the recommended measures was confirmed by BioWin analysis under the current conditions and with the proposed upgrades. Table 2 summarizes the effect of inhibition and SRT under the current and proposed operating conditions.

The Following key observations were made from this analysis:

- The existing aerated lagoon, operating at an SRT of 2.7 d has enough capacity to nitrify at current loading peaks, but is quite sensitive to inhibition. There is a significant loss of nitrification at 20% inhibition and near complete loss of nitrification at 30%.

(continued on page 33)

MEMBER PROFILE

Goulet Septic Pumping & Design

OWNERS
Rene & Brenda Goulet

SERVICES
We pump, design, evaluate and repair septic systems. We are licensed to install septic systems but quit doing the installs about 15 years ago when we stopped doing excavation. We have a driver on a pumper truck and we do septic system design and evaluations. My wife takes care of the office.

SERVICE AREA
Our service area is around Green Valley and the surrounding areas of Alexandria, Cornwall, Hawksbury. We try to work close to home because while you're travelling you are not earning.

NUMBER OF YEARS IN OPERATION
25 years

What got you started in the onsite wastewater industry?
After quitting the dairy farm In 1982 I got into excavation by buying a used backhoe, small dozer and a gravel truck. We did excavation work like removing stone fences, ditching and selling mixed topsoil. We started getting requests to install septic systems and as I was not licensed, I would install it with a licensed plumber. I got my license to install septic systems in 1987. In 1991, we got licensed to pump septic and holding tanks. MOE approved a few fields on my farm for a septage spreading site. At that time, I would spread the sewage directly on the field and the following year I would plant corn. In 2002, we installed a double liner lagoon for storing septage and holding tank waste during the winter. In 2005 we planted evergreen trees in our buffer zones as we have to stay away from property lines by 30M. I have a farm on each side of a side road. In 2005, we got involved with Chris Kinsley from Alfred College/University of Guelph and the MOE in experimenting with reed beds for the treatment of septage. We are still using the reed beds and it is working fine. Using reed beds is a way of separating the sludge from the liquid and the sludge composts itself and turns to a peat moss type of matter. If MOE decides it is an acceptable way of treatment, then we will expand. During this time we have planted all MOE approved sites (8 small fields) with about 58,000 Hybrid Popular trees. These trees suck up nutrients a lot faster than a crop of corn. We installed a PTO pump at the lagoon and about 7000 feet of irrigation pipes in the plantation and use 3 irrigation guns to spread the effluent throughout the plantation. When it times to move the guns we use a 4 wheeler to move the guns as they are on wheels.

Give us one reason/secret for your success.
I think honesty, taking time to listen the home owner's concerns and educating them is the way to go, as well as doing a good job for a fair price.

Where do you see the onsite industry going?
I think being in the onsite industry is a very important place to be. Years ago we didn't have the respect we have today. We are professionals, licensed through the government as designers, installers, maintenance providers and haulers. We

RENE GOULET

are educated in the treatment of sewage which has to be properly treated before being disposed of. People need our help and guidance to design and install proper sewage treatment systems. We used to look at a septic system as being an expense, but now you have to look at it as being a part of the building -which is a significant investment. If you don't have onsite sewage treatment, the building cannot be used. We need to treat our sewage properly as the treated effluent will eventually be sent back into the natural environment. We need to keep our waters clean for future generations. We also need to educate the public on why we need to treat sewage because they don't realize that we will be drinking that water again –they are not making 'new water'.

What can the onsite industry do to improve?
We need to encourage those of us that don't go to meetings or conferences to learn about the new systems on the markets and to learn the new Code regulations. I find every time I go to a meeting I learn something if not from the meeting itself then from somebody who has had a different experience.

JOIN AN OOWA COMMITTEE!

Want to really make an impact in the industry?
Why not contribute to our collective efforts in getting onsite and decentralized recognized as viable and critical rural infrastructure? OOWA is looking for enthusiastic and engaged individuals to help move the industry forward.

Contact Mike Gibbs to find out how to join our ranks!
outreach@oowa.org

Alternative Regulatory Pathways to Innovation

Dr. Lesley Herstein, Manager, Policy, WaterTAP Ontario

Though they can offer attractive and disruptive benefits, innovative (or non-traditional) onsite wastewater technologies and solutions are not always easy to implement. New ideas can be difficult to sell, but they can often be difficult to navigate these new technologies through the regulatory approval process.

This article discusses two ways in which regulators can treat innovative technologies when it comes to approvals. This work is part of a larger ongoing project at WaterTAP to examine global approaches and best practices to review and approve new treatment technologies.

The first approach is to provide an alternative pathway for innovative technologies. For example, in Ontario, the regulatory framework governing Ontario's onsite wastewater systems for flows of less than 10,000 litres per day that do not discharge directly into surface water are linked to the Building Code Act, 1992, and its associated Ontario Building Code regulations. The challenge is that the permit-based Building Code is highly prescriptive. While installations of standard certified technologies prescribed within these regulations are approved by certified and registered building officials, innovative technological designs must be validated by applying to and undergoing a review by the Building Materials and Evaluation Commission.

The second way is to adopt a regulatory framework that treats innovative and traditional designs equitably. In this approach, both types of designs must demonstrate their capacity to adhere to specified performance requirements, rather than prescriptive, design-based technological requirements.

Onsite Wastewater System Innovation in British Columbia

The British Columbia Sewerage System Regulation (SSR) is the regulatory framework that governs approvals of onsite wastewater systems in the province. Before the SSR was adopted in 2005, system approvals were governed by the Sewage Disposal Regulation, which was a prescriptive regulatory framework. Much like the regulations based on the Ontario's Building Code Act, 1992, the Sewage Disposal Regulation outlined the design and installation specifics for onsite wastewater systems.

Instead of focusing on the design and installation specifics of onsite wastewater systems, the SSR provides a set of performance standards that the system must meet. This approach allows for acceptance of a wider range of designs through the regulation achieved by relying on the expertise of trained and certified individuals who are authorized to construct and maintain onsite wastewater systems. Further accountability is ensured by requiring that these authorized individuals establish maintenance requirements and keep system records.

The SSR is the result of a collaborative effort. The regulation falls under the jurisdiction of the Ministry of Health through the Public Health Act. The Ministry of Health administers the SSR, while authorized installation and maintenance personnel must meet the training and certification requirements set by the Applied Science Technologists & Technicians of British Columbia (ASTTBC). Moreover, in response to issues that arose with implementation, a Sewerage Systems Working Group was established through a Memorandum of Understanding in 2007 between the Union of British Columbia Municipalities and two ministries. The work of the Working Group led to amendments to the SSR in 2010 that addressed issues such as the cost to homeowners.

Moving Forward in Ontario

This type of regulatory shift is possible in Ontario. For example, Ontario could shift to an outcomes-based regulatory framework for onsite wastewater systems as occurred in British Columbia. Ontario's onsite wastewater systems are currently governed by the Ministry of Municipal Affairs and Housing (MMAH) through the Ontario Building Code. Although the Ontario Building Code is prescriptive, the last two editions of the code include objectives and functional statements that are more general and these are then linked to prescriptive elements of the code. This approach demonstrates an understanding by government of the link between objectives and outcomes, which could serve as a starting point for an eventual move toward an outcomes-based Building Code. The deadline for change submission for the next edition of the Building Code has passed, so there is little chance of influencing the coming Building Code edition, but it may be possible to engage MMAH in a demonstration pilot for performance outcomes-based regulations for the section of the code that applies to sewage systems. Although MMAH does not normally engage in such regulatory pilots, the ministry may be able to draw upon the experience of the Ministry of the Environment and Climate Change with its Showcasing Water Innovation (SWI) program. For example, one of the SWI projects involved piloting a new approach to regulating phosphorus loading to receiving waters.

Engaging MMAH in a demonstration pilot would require a collaborative stakeholder effort and the leveraging of existing competencies in the sector that could support such a pilot. For example, MMAH's examination and registration program could be formally complemented by the Ontario Onsite Wastewater Association's Registered Professional Program (RPP).

The SSR is only one example of a potential regulatory framework. There are a host of other frameworks being implemented in Canada and around the world. We can learn from the successes and limitations of these frameworks and attempt to apply the lessons offered by these frameworks to Ontario to match the current and desired regulatory outcomes and policy objectives. In this way, we can foster innovative solutions that have the potential to maintain and in many cases, enhance the protection of public health and the environment.

(continued on page 33)

Complete Wastewater Resuse: The Ultimate Solution for Onsite Wastewater Treatment

By Thomas W. Bain, P.Eng. & Allan Hazelton, Great Lakes Clean Water - L.P.

Wastewater Reuse was a hot topic at the recent National Onsite Wastewater Recycling Association's

(NOWRA) first Onsite Wastewater Mega Conference in Virginia Beach, VA, November 4-6 2015.

This report will give you an update on both the conference and some facts to review when considering Wastewater Reuse.

The United States Federal Government and representatives from all State Governments attended the conference. The Governments of Canada and the Province of Ontario, to the best of our knowledge, did not attend.

The Ontario Onsite Wastewater Association (OOWA) was well represented by President Rick Esselment, and Directors Anne Egan, P.Eng., Jane Zima, Marie-Christine Bélanger, P.Eng., and Allan Hazelton. As well, presentations were made by Dr. Craig Jowett. P.Eng. (Waterloo Biofilter Systems), Marie-Christine Bélanger, P.Eng. (Premier Tech Aqua), Dominic Mercier, P.Eng. (Enviro-STEP Technologies) and Thomas Bain, P.Eng. (Great Lakes Clean Water - L.P.).

Sheila Frace, Deputy Director, USEPA Office of Wastewater Management, gave a keynote address on "The Role of Decentralized Treatment within U.S. Wastewater Infrastructure."

Dr. Lynn Broaddus, Principal of Broadview Collaborative, gave a keynote address on "New Opportunities in Decentralized/ Distributed Wastewater Treatment and Re-use." Dr. Broaddus reviewed a wide range of offerings for treatment and reuse from small individual systems in a rural/residential environment, to very large systems in an urban/commercial environment.

For some of the Benefits of water recycling we can reference the US EPA; "In addition to providing a dependable, locally-controlled water supply, water recycling provides tremendous environmental benefits. By providing an additional source of water, water recycling can help us find ways to decrease the diversion of water from sensitive ecosystems. Other benefits include decreasing wastewater discharges and reducing and preventing pollution. Recycled water can also be used to create or enhance wetlands and riparian habitats."

The big question, yet to be answered, would appear to be:
Would a structure utilizing a complete wastewater reuse system, need to be connected to a septic or sewer system?

Thomas Cassidy, Esq., of Counsel, Eckert Seamens, LLC, and NOWRA Chief Lobbyist in Washington, is seeking a positive answer to this question. Conversations with other attendees suggest that in urban locations the water and sewer utilities do not want to miss out on the revenues from buildings that are deploying complete wastewater reuse.

(continued on next page)

INFLUENT REQUIREMENTS

PARAMETER	GREYWATER TEST WATER CONCENTRATION LAUNDRY AND BATHING WATER (30 DAY AVERAGE)	RESIDENTIAL WASTEWATER TEST WATERCONCENTRATION (30 DAY AVERAGE)
	REQUIRED RANGE	REQUIRED RANGE
TOTAL SUSPENDED SOLIDS (TSS)	80-160mg/L	100-350mg/L
5 DAY CARBONACEOUS BIOCHEMICAL OXYGEN DEMAND ($CBOD_5$)	130-180mg/L	100-300mg/L
TEMPERATURE	25-35 °C	
pH	6.5-8.0	
TURBIDITY	50-100 NTU	
TOTAL PHOSPHORUS (P)	1-3mg/L3	
TOTAL KJELDAHL NITROGEN (TKN)	3-5mg/L	
CHEMICAL OXYGEN DEMAND	250-400mg/L	
TOTAL ORGANIC CARBON (TOC)	50-100mg/L	
TOTAL COLIFORMS	10^3-10^4 cfu/100ml	
ECOLI	10^2-10^3 cfu/100ml	

In non-urban sites where onsite septic systems are usually installed, the building officials are reluctant to embrace this new concept.

We posed the question to Amad Sharaf, P.Eng. of the Ministry of Municipal Affairs and Housing, in respect to the Ontario Building Code. His answer, based on Part 8 of the Ontario Building Code, was that a septic s stem would still be required. This answer was not unexpected.

Additional research shows that the National Sanitation Foundation (NSF) has developed new American National Standards NSF/ANSI 350 and 350-1 for "evaluating and approving water reuse treatment technologies."

NSF/ANSI Standard 350: Onsite Residential and Commercial Water Reuse Treatment Systems

NSF/ANSI Standard 350-1: Onsite Greywater Treatment Systems for Subsurface Discharge

"These standards encompass both residential and commercial applications divided into those that treat all the waste-water flow from a building and those that treat the greywater portion only. While both standards are appropriate for non potable water use, Standard 350 has more restrictive effluent quality requirements than those of Standard 350-1."

"Both Standards 350 and 350-1 are based on 26 weeks of continuous testing with regularly scheduled sampling throughout, typically three days a week. The purpose of such a lengthy test with high volume of sampling is to assess the reliability of the product over time." ref. Thomas Bruursema – NSF.

In addition to the noted influent require-ments on page 31, there are loading sequence requirements for greywater treatment systems and daily loading requirements for wastewater treatment systems for full performance evaluation.

Two wastewater reuse systems have already been tested, certified, and listed under NSF/ANSI 350. They are the NEXtreater by Nexus eWater Pty. Ltd. and the BioBarrier® MBR by Bio-Microbics Inc.

The NEXtreater is listed for greywater treatment (laundry and bathing) for both residential and commercial applications. It is an above ground unit using an aeration chamber process where the size of bubbles are carefully controlled. It uses low concentration ozone for reduction and a GAC filter for polishing – odour and colour removal.

Final finishing is accomplished by a 0.5 micron polypropylene gradient filter and disinfection by UV 254nm completes the process. The system has a processing capacity of 200 USG/day (731L/day).

The BioBarrier® MBR is listed for wastewater treatment for residential applications. It is an in ground unit which can be incorporated into new or existing septic tanks. A SaniTEE system is used to attenuate flow to improve settling and solids retention in the primary chamber. An above ground blower pumps large volumes of air into an aeration system in the secondary chamber.

A flat sheet membrane cartridge is also located in the secondary chamber. Air bubble are vigorously forced upward through the membrane plates scouring and cleaning the membrane and providing oxygen for improved aerobic digestion. The flat sheet membranes have pore sizes between 0.3 – 1.3 microns using both micro and ultra filtration to block bacteria and other solids. Aeration from the bottom creates upward flow between the membrane allowing treated water to pass through for reuse. High quality treated water exits the unit using an in tank pump.

Greytor Systems Inc is the process of creating a greywater (laundry and bathwater) recovery and reuse system.

There were no details available regarding the technology employed or how the system operates at the time of this writing. They do however expect to have production units ready for testing by the late spring of this year. NSF/ANSI 350 certification testing is scheduled to begin at the Centre for Alternative Wastewater Treatment at Fleming College in Lindsay Ontario by early summer of this year. They expect to be in a position to deliver the product to the marketplace in early 2017.

The WATERCLEAN™ wastewater washing machine by Great Lakes Clean Water - L.P., treats greywater and blackwater for reuse. It employs advanced oxidation technology for the disinfection of a wide range of pathogens and the reduction of CBODand TSS.

It efficiently transforms and mineralizes both organic based and synthetic phar-maceuticals and personal care products. It was tested in 2015 at the Centre for Alternative Wastewater Treatment, and the test results (n=40) suggest compliance with NSF/ANSI 350 however, no decision to proceed with NSF/ANSI testing and certification has been made at this time. Opportunities for both onsite greywater, and complete wastewater recovery and reuse systems, are more significant in regions with water shortages and warmer climates.

Those areas have a real need today and can take advantage of processed water storage tanks that can be buried or easily maintained without freezing. Opportunities for these systems are less significant in regions where water is plentiful and where the climate is colder.

In these regions, potable water cost savings and environmental conscience will be the driving factors. The big opportunity will open up when complete wastewater recovery and reuse is viewed as the ultimate solution for onsite wastewater treatment, and a connection to the sewer system or a septic system is no longer required. Discussions on greywater reuse and complete wastewater reuse are already well underway in the United States and elsewhere. It will be very interesting to see how fast these new ideas are adopted here in Ontario.

Note: The Logos used is this article are for reference purposes only, are owned by the respective companies. The use here is not intended to imply any authorization or sponsorship of those companies.

EFFLUENT CRITERIA

PARAMETER	NSF 350				NSF 350-1
	CLASS R		CLASS C		
	OVERALL TEST AVERAGE	SINGLE SAMPLE MAXIMUM	OVERALL TEST AVERAGE	SINGLE SAMPLE MAXIMUM	OVERALL TEST AVERAGE
5 DAY CARBONACEOUS BIOCHEMICAL OXYGEN DEMAND ($CBOD_5$)	10mg/L	25mg/L	10mg/L	25mg/L	25mg/L
TOTAL SUSPENDED SOLIDS (TSS)	10mg/L	30mg/L	10mg/L	30mg/L	30mg/L
TURBIDITY	5 NTU	10 NTU	2 NTU	5 NTU	
ECOLI (MPN/100ml)	14	240	2.2	200	
pH	6-9	NA	6-9	NA	6-9
STORAGE VESSEL DISINFECTION	≥0.5 - ≥2.5 $(mg/L)^3$	NA	≥0.5 - ≥2.5 $(mg/L)^3$	NA	
COLOUR	MR	NA	MR	NA	MR
ODOUR	NON-OFFENSIVE	NA	NON-OFFENSIVE	NA	NON-OFFENSIVE
OILY FILMED FOAM	ND	ND	ND	ND	ND
ENERGY CONSUMPTION	MR	NA	MR	MR	MR

NA = not applicable
ND = non detectable
MR = measured and reported
MPN = most probable number
NTU = national turbidity unity

Alternative Regulatory Pathways to Innovation

Continued from page 30

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Sustainable Solutions for Lagoon Based WWTPs Receiving Hauled Wastes

Continued from page 27

• On the other hand, the proposed system, due to its ability to operate at high SRT (15 d or above) and adequate DO (2 mg/L), is much more robust, with nitrification loss becoming significant only at 70% inhibition and complete loss occurring at an inhibition level as high as 80%. Thus, the proposed system provides a significant buffer for influent inhibition which is not available with the existing system.

CONCLUSIONS

• Hauled wastes are common in small communities and can significantly impact the performance of the WWTPs. Monitoring and control of these wastes in the collection systems or at WWTPs can help mitigate their negative impact on the treatment processes.
• The existing flow-through lagoon systems in small communities are not designed for nitrification and often struggle to meet the stricter TAN limits prevalent today in Ontario. This limitation is worsened by the introduction of hauled wastes into the influent wastewaters.
• Lagoon systems do not have to be replaced with costly mechanical wastewater systems in order to address these issues. They are great resources with significant inherent features that can be exploited beneficially for cost effective and sustainable upgrades to address their treatment limitations.

FLUSHABLE WIPES CAUSE WOES FOR ONSITE WASTEWATER SYSTEMS

The National Environmental Services Center

With the help of well-crafted advertising, disposable wet wipes—a product once used mainly for wiping baby bottoms—are now increasingly being used on adult bottoms. Although they are frequently labeled as "flushable," the problems adult wet wipes have created for municipal sewer systems are well documented. Their increasing presence in sewers has created a major surge in clogged lines and sewage pumps for municipal wastewater utilities. The effect of flushed wipes on septic systems has received less attention, but problems are also being widely reported.

Disposable wet wipes are one of many types of nonwoven fabrics, manufactured by entangling fibers in a sheet or web structure, and bonding them mechanically, chemically, or thermally. The fibers are not knitted or woven as conventional fabrics are. Nonwoven fabrics have many uses, of which wipes are just one. There are also many different types of wipes including baby wipes, personal hygiene wipes, cosmetic removal wipes, and household cleaning wipes for many types of surfaces. Besides disposability, one of their attributes is their durability—compared to paper products they are less likely to fall apart when being used. This durability, however, can create problems after disposal.

But the Label Says I can Flush Them

Things get confusing for homeowners because some wipes are labeled as flushable and some aren't—baby wipes and surface cleaning wipes, for example, were never intended to be flushed. However, for those wipes that claim to be "flushable" or "septic safe," it is debatable to what extent that may be true.

INDA, the Association of the Nonwoven Fabrics Industry publishes the document, "Guidelines for Assessing the Flushability of Disposable Nonwoven Products," which provides the criteria that may be used to identify wipes that can be labeled as flushable. The guidelines use seven different tests to determine the compatibility of wipes with both sewers and septic systems. The guidelines have been subject to criticism, however. They only apply to INDA members and even for INDA members they are voluntary. As a result, there is no assurance for consumers that a product labeled as being flushable was tested using the INDA criteria.

Also, many wastewater officials feel the guidelines are not sufficiently rigorous. Analysis of clogs of sewers and sewage pumps show that the materials causing clogs are usually a mixture of different types of wipes—both flushable and non-flushable—plus other items such as paper hand towels and feminine hygiene products. However, these analyses also show that wipes, including those labeled as flushable, do not break up after flushing as often advertised, but tend to stay in one piece.

The Federal Trade Commission (FTC) agrees that the claim of flushability for some wipes has not been adequately proven. Under a settlement with the FTC, Nice-Pak Products, Inc., a manufacturer of wet wipes, agreed in May 2015 to stop advertising their wipes as flushable and septic safe until those claims could be substantiated. The FTC decided the tests that Nice-Pak used to determine flushability did not reflect real-world sewer and septic system conditions. Nice-Pak markets their wipes under in-store brand names at Costco, CVS, and Target, and other retailers.

The effects of flushed wipes on septic systems is not as well documented as they are for sewer systems. However, septic tank pumpers and service providers report problems as well. Wipes tend to clump into masses that can block the line to the tank or block the tank inlet. This can potentially result in wastewater backing up into the house—something no homeowner wants to deal with.

Wipes can also clog the vacuum hose that service providers use to pump the tank. Removing clogs, whether they are in the tank or the vacuum hose, makes routine servicing of septic tanks take longer. Longer service times means greater costs for the pumper—costs that naturally get passed on to the homeowner.

Service providers also report problems with wipes clogging septic tank outlets and effluent filters. Because the primary function of the tank is to allow solids to settle to the bottom, clogging of the outlet end of the tank calls into question just how well wipes settle in an actual septic system environment rather than in an artificial testing environment. People who service advanced onsite wastewater treatment systems also report problems with wipes. These include clogging of pumps, wipes that wrap around and cling to moving parts, and wipes that get deposited on the top of media filters, which affects how wastewater is distributed through the treatment medium.

A septic system, whether it is a conventional or an advanced treatment system, represents a significant investment for a homeowner. It is in the homeowner's interest to prevent any conditions from occurring that might cause the system to malfunction. Manufacturers of wipes, with prodding from the wastewater industry, have been working to make wipes that are intended to be flushable more flushable and to more clearly label wipes that are not intended to be flushed. For homeowners, however, the safest, easiest course of action is to keep all wipes out the wastewater system—whether it is a septic system or a sewer system—by disposing of them with their regular solid waste.

What to flush for septic system owners

Your toilet may seem like a convenient way to get rid of certain unwanted items—you flush it and they disappear. However, toilets are only intended to get rid of three basic items: poop, pee, and toilet paper (and on occasion—puke). Everything else you might be tempted to flush should usually be bagged and disposed of with your regular garbage.

What not to flush for septic system owners

- wet wipes of all types
- disposable diapers
- facial tissue
- paper hand towels
- tampons, applicators, and sanitary pads
- hair
- dental floss
- incontinence pads
- condoms
- bandages
- disposable toilet brush heads
- cigarette butts
- bandages
- kitty litter
- unwanted medication

For More Information

This Consumer Reports video shows how easily toilet paper breaks apart in comparison to flushable wipes: **www.consumerreports.org/cro/video-hub/home--garden/bed--bath/flushable-wipes/16935265001/22783507001/**

The National Association of Clean Water Agencies has a demonstration showing the resistance of wipes to disintegration: **blog.nacwa.org/the-proof-is-in-the-flushing/**

The Water Environment Federation provides this article about the problem of non-dispersibles: **news.wef.org/stop-dont-flush-that/**

Public Works magazine has an article about the effect of disposable wipes on municipal sewer systems: **www.pwmag.com/wastewater/strangled-by-disposables_1.aspx**

INDA, the organization for the nonwoven fabrics industry, offers this perspective on flushability: **www.inda.org/issues-advocacy/flushability/**

This information was developed by the National Environmental Services Center (NESC) at West Virginia University and is used with their permission.

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