

Onsite

ONTARIO ONSITE WASTEWATER ASSOCIATION NEWSLETTER

Education | Engagement | Leadership

INSIDE

| | |
|---|--------------|
| Cover: Social Media Reshapes Business..... | Cont'd on 35 |
| President's Message..... | 1 |
| Convention Schedule..... | 2-3 |
| Convention Sponsors | 4 |
| Convention Exhibitors..... | 5 |
| Convention Speakers..... | 6-12 |
| The Case Against Flushables..... | 14-15 |
| Mac Taylor Retirement Notice..... | 16 |
| Installer's Corner..... | 18-19 |
| Karen Holt Member Bio | 21 |
| New & Renewed Members Listing | 22-23 |
| OOWA Membership Benefits | 24-25 |
| Throwback Article | 26 |
| WCOWMA Update | 27 |
| Student Scholarship Profile..... | 29 |
| Growing The Membership..... | 30 |
| Minimizing Ground Pressure During Installations | 31-32 |
| Carolyn Chan Member Bio | 33 |
| Barging for Waterfront Projects | 35-37 |
| High Strength Treatment Challenges ... | 41-44 |



Ontario Onsite
Wastewater Association

Ken White Construction Uses Social Media to Reshape Third Generation Business

CONEXPO-CONAGG 365

Based in Carp – a rural community – in Ontario, Canada, Ken White Construction recently took an innovative approach to building its business: It combined a new branding campaign with a heavy use of social media platforms.

“The move has really been paying off,” says Taylor White, the company’s director of business development. “Social media has completely reshaped our business and gotten our name out to heights and places that it never would have been otherwise. It is also helping us attract employees.”

Ken White Construction is a third generation, family owned and operated business. It was founded in 1968 by Ken White, Taylor’s grandfather.

The mission of Ken White Construction “is to provide integrated construction services to residential and commercial clients to the highest standards of quality, service and customer satisfaction,” Taylor states. Those services include septic systems, foundation excavations, road construction, demolition and site preparation.



Ken grew up on a farm. In his twenties, he started doing some trucking on the side. He then bought a track loader and began doing construction work. Over time he added trucks and equipment and eventually formed his company.

Ken’s son David grew up working in the family business. In 2000 he became its president and owner. Sadly, Ken died in 2001.

David’s son Taylor also grew up working in the company. After some college, he left the company for a time. He moved to Alberta, Canada, to work in the oil patch. Taylor came back to Ken White Construction about six years ago and was tasked with helping grow the company.

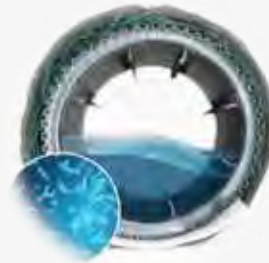
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President's Message and 2022 Convention Welcome

After a successful 2021 virtual convention, we are looking forward to once again delivering a great online experience in 2022 on Monday February 28th and Tuesday March 1st (with some early content available).

On Monday morning Barry Orr will deliver a pre-recorded Keynote address on the problem of flushable wipes with a live Q&A immediately following the presentation. Tuesday morning includes the always engaging live Part 8 Panel Discussion with a fresh group of panelists ready to share their insights.

Each day after the first session, the convention agenda is filled with pre-recorded regulatory updates, technical information, and case studies. You can view the presentations in any order you like but we recommend watching the one in the live Q&A you plan to attend. The live Q&A sessions start at noon each day, with three presenters grouped together. Come ready with questions!

The live Q&A sessions will be recorded and posted online shortly after the convention is over. These recordings as well as all the other presentations will be available to view for the rest of the year through the Pheedloop platform.

Anytime throughout both days check out our sponsors and new this year chat with the exhibitors in the virtual hall.

The live Annual General Meeting on Monday will provide updates on how the association has been working for its members this past year and what the volunteers have been doing in our various committees. The OOWA Board of Directors has an unprecedented nine board positions available to be filled this year. We are looking at this as an opportunity to inject some new blood into the association and hope to see some of our young professional members join the ranks. Please consider nominating someone who would make a valuable contribution or even think about throwing your own hat in for consideration. Joining a committee is also a great way to get involved. Our shared industry can't keep moving forward without the engagement from professionals like you!

After the AGM we are hosting a virtual beer tasting event where an expert will guide the attendees through four recommended beers and provide a history of beer, the brewing process, proper tasting technique, and trivia. Come thirsty!

Make sure to thank someone on the 2022 convention planning committee for delivering this great event. It was a difficult convention to plan, after much discussion it was originally planned as a hybrid in-person & virtual event only to be forced to quickly pivot to an online only one. Without the hard work and dedication from the committee this convention would not be possible.

Looking forward to 2022, OOWA is watching what is happening with the nationalization of the Ontario Building Code with interest and understand that there will be a consultation opportunity for Code changes in the fall. We are assembling a task group that will consider providing some suggestions. Let's have some discussions on how Part 8 can be improved, and we encourage all members to submit code change suggestions to the Ministry directly. Our membership committee will continue to promote membership to contractors and those just getting into the industry for the first time. We will also continue reaching out to our regulator members with resources and webinars on specific topics.

We hope you register for and enjoy our virtual convention this year and stay engaged with us as we head into another prosperous year for our industry and our association.

Sincerely,

Brady Straw, President

9:00 am - 10:00 am **Keynote Address: Stopping Fatbergs!** Barry Orr, *City of London*
(▶ 45 min pres, ● 15 min Q&A)

9:00 am - 10:00 am ● **Part 8 Panel Discussion:** Mike Varty (*EnVision Consultants Ltd.*), David Finch (*Wes Finch & Sons Excavating*), Robin Allen (*NBMCA*), Moderated by Mike Gibbs (*OOWA*)

| | Track One | Track Two | Track Three | | Track One | Track Two | Track Three |
|--------------------------|--|--|---|--------------------------|--|---|--|
| 10:00 am - 12:00 pm | ▶ Update to CSA B-66 Standard for Septic Tanks Don Krauss <i>Infiltrator Water</i> | ▶ Unconventional Approaches in a Conventional Industry: Utilizing Social Media to Grow and Attract Workers Taylor White <i>Ken White Construction</i> | ▶ Ultra-low Nitrogen Treatment Using MBBR Technology Miles MacCormack <i>Bergmann North America</i> | 10:00 am - 12:00 pm | ▶ Complete ECA Submissions for Onsite Sewage Works Khalid Hussain, Yuefeng Zhang <i>Ministry of the Environment, Conservation and Parks</i> | ▶ Approaches for Evaluating Septic System Effluent Inputs to Surface Waters Clare Robinson <i>Western University</i> | ▶ Property Inspections in a Seller's Market Leigh Gate <i>Ontario Association of Home Inspectors</i> |
| | ▶ Excess Soil Disposal - What you Need to Know About Ontario Regulation 406/19 Onsite and Excess Soil Management Jim Walls <i>R.J. Burnside</i> | ▶ Training Session Permitting Process for Regulators: A Brief Overview Eric Kohlsmith, <i>Ottawa Spetic System Office</i> EARLY RELEASE (Feb 21) | ▶ Improving Phosphorus Removal and Reducing Sludge Production for Onsite Wastewater Systems with ClariPhos™ Rare Earth Coagulant Marc Rancourt <i>Bishop Water</i> | | ▶ Frontenac County and Communal Services Approvals – the End of the Beginning Joe Galivan <i>County of Frontenac</i> | ▶ An Onsite Wastewater Treatment Research Testing Facility Jennifer Andersen <i>Centre for Advancement of Water and Wastewater Technologies at Fleming College</i> | ▶ Waiving a Real Estate Inspection Results in Expensive Water and Sewage System Repairs: A Case Study Geanine Zuliani <i>Waterloo Biofilter Systems</i> |
| | ▶ The OSSO's Experience with Maintenance Agreements Terry Davidson <i>Ottawa Septic System Office</i> | ▶ Domestic Strength, Really? Dominic Mercier <i>Eljen</i> | ▶ Bench Brewing Company High-Strength Process Washwater Goes Back to the Land Andrew Hellbust, Eric Rozema <i>Rivercourt Engineering</i> | | ▶ Stormwater & Rainwater Management Installs: A Business Opportunity? Roddy Bolivar <i>Make-Way Environmental</i> | ▶ Coagulant Optimization for Phosorous Removal at a Communal Wastewater Facility Chris Kinsley <i>University of Ottawa</i> | ▶ Septic Tanks: Specifications, Manufacturing Basics and Site Considerations Doug Bingham <i>Newmarket Precast</i> |
| 12:00pm - 12:30pm | ● Track One Q&A with Don Krauss, Jim Walls and Terry Davidson | ● Track Two Q&A with Taylor White, Eric Kohlsmith and Dominic Mercier | ● Track Three Q&A with Miles MacCormack, Marc Rancourt, Andrew Hellebust and Eric Rozema | 12:00pm - 12:30pm | ● Track One Q&A with Khalid Hussain, Yuefeng Zhang, Joe Galivan and Roddy Bolivar | ● Track Two Q&A with Clare Robinson, Jennifer Andersen and Chris Kinsley | ● Track Three Q&A with Leigh Gate, Geanine Zuliani and Ryan Weddell |

5:00pm - 6:00pm Annual General Meeting
6:00pm - 7:00pm Social Hour - Virtual Beer Tasting

* this agenda is
subject to change



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2022 Conference Exhibitors



2022 Conference Speakers



Andrew Hellebust

Andrew Hellebust is President at Rivercourt Engineering and Senior Engineer at Canadian Shield Consultants. He designs on-site and distributed water infrastructure ranging from non-potable urban water systems to advanced wastewater treatment systems for remote sites. He has also consulted on environmental assessments for soil contamination, spill clean ups and remediation. Andrew has participated in the development of non-potable and on-site sewage code regulations, serving with the Canadian Standards Association (CSA B128 committee on non-potable water systems), the International Association of Plumbing and Mechanical Officials (IAPMO technical subcommittee on Reclaimed Water Conservation Systems) and the Ontario MMAH Building Materials Evaluation Commission (BMEC), where he is currently Vice-Chair. He has worked for 20 years with Aqua Treatment Technologies, an installer of constructed treatment wetlands.



Barry Orr

Barry Orr is the Sewer Outreach and Control Inspector for the City of London, Ontario with over 25 years of experience in environmental and wastewater fields. He is an active member and spokesperson for the Municipal Enforcement Sewer Use Group in Ontario, is a member of the Canadian Water and Wastewater Association, the Water Environment Association of Ontario and a voting committee member on Grease Interceptors B481 with the Canadian Standards Association. He is the author of many articles published in Water Canada's Magazine, Environmental Science and Engineering Magazine, WEAO's Influent Magazine and a co-author of the Ryerson University report: Defining "Flushability" for Sewer Use. He is also one of the sewer professionals featured in Canadian newspapers and media networks like CBC, CTV, and Global featuring segments on "not flushable" and Fatbergs.

The Standards Council of Canada and the International Organization for Standardization appointed Barry as an expert representative on their "flushable" workgroup in May of 2014. Barry has also been named as the Canadian representative/spokesperson on the International Water Services Flushability Group.



Chris Kinsley, Ph.D.

Chris Kinsley is currently an assistant professor in the Department of Civil Engineering at the University of Ottawa. Previously, Chris worked with the Ontario Rural Wastewater Centre at the University of Guelph since its inception in 1998 and was instrumental in the development of the centre. Chris has developed and delivered several training courses in the agri-food and decentralized wastewater sectors, both within Canada and overseas.

2022 Conference Speakers Cont.



Clare Robinson

Dr. Robinson is the Canada Research Chair in Water Quality and an Associate Professor in Civil and Environmental Engineering. Dr. Robinson completed her Ph.D. at University of Queensland, Australia and a post doctoral fellowship at Ecole Poly technique Federale du Lausanne, Switzerland before starting at the University of Western Ontario in July 2009. Dr. Robinson is an expert at examining the sources and transport of pollutants in watersheds at large and small-scales via field investigations and computer modeling. Over the last five years she has done extensive research on evaluating the potential inputs of septic system effluent to surface waters including the pathways via which septic effluent may be transported from a septic tank or drainage field to surface waters.



Doug Bingham

I started in the precast industry 15 years ago with Newmarket and spent some time in manufacturing. Switched sectors within the building trade for 7 years and found myself back with Newmarket 5 years ago. Currently my scope of work within the company encompasses large project site support and contractor site and product support.



David Finch

David Finch from Wes Finch & Sons Excavating Ltd. located in Bracebridge serving the Muskoka area, running a 3rd generation family business. Received Bachelor of Business from Wilfred Laurier University, has 30 years' experience in onsite industry. David has been a OOWA member for 18 years with 3 years on OOWA Board of Directors. David is also a director with the Muskoka Shrine Club.



Don Krauss

Don has been involved with the Ontario Onsite Wastewater Association since 2006 donating time on committees as well as a Board of Director for 12 of those years. He also participates on the Technical Advisory Committee for standards development and is a member of the Canadian Standards Association (CSA) for the B-65 Standard for onsite wastewater systems. Don has been the Eastern Canadian Sales Manager for Infiltrator Water Technologies for 18 years covering Ontario, Quebec and the Atlantic Provinces.

Don holds an installer license in 3 provinces including his BCIN in Ontario. He has actively participated in advisory groups for change and development of provincial onsite wastewater regulations in many provinces. He most enjoys working in the field with installers to better understand how he can help them. Outside of work, he enjoys traveling with his wife and seeing all the beauty that Canada – and the world has to offer.



Dominic Mercier

With a degree in Civil Engineering and a Master Degree in Environmental Engineering, Mr. Mercier has been working for more than 22 years in Onsite Wastewater Treatment design and product development. He is the founder and president of Enviro Neptune a firm dedicated to research and development of Onsite Technologies as well as Enviro-STEP Technologies a company distributing, manufacturing and commercializing wastewater treatment processes for the Canadian Onsite industry.



Eric Kohlsmith

Eric has been a Part 8 Building Official for the Rideau Valley Conservation Authority since 2008 working in Tay Valley Township in eastern Ontario. Over the last 10 years he has administered sewage system re-inspections programs in up to 5 local municipalities, and is a member of the OBOA Golden Triangle Chapter Part 8 Committee. Eric was instrumental in developing OOWA's regional meeting template and was part of the initial organizing committee. Eric is also an instructor with the Ontario Rural Wastewater Centre delivering courses related to onsite sewage systems and is also a member of the Technical Advisory Committee for the last round of proposed code changes for Part 8.



Eric Rozema

Eric Rozema has been a designer for Rivercourt Engineering since 2016. He works on a wide range of projects from single house septic systems to large onsite systems treating high-strength wastewaters like process water from wineries, breweries, and distilleries, landfill leachate, agricultural washwaters, etc. Eric specializes in the design of constructed wetlands connecting back to his time spent studying environmental science at the University of Guelph where he obtained his Masters of Science. Eric is interested in sustainable water management, green technology, and environmental conservation.



Geanine Zuliani

Geanine is a customer service specialist and the Sales and Marketing Coordinator for Waterloo Biofilter. Previously, Geanine has worked in both the Engineering and Operations and Maintenance Departments. Her career in the wastewater industry began at an industrial wastewater treatment plant during a college co-op. She has been with Waterloo Biofilter for nearly 12 years now. Recently, Geanine began creating case studies regarding the onsite wastewater community covering a difficult access site, Waterloo's Phosphorus removal technology, and now a residential real estate transaction gone wrong.



Jennifer Andersen

Jennifer Andersen is the Manager of the Centre for Advancement of Water and Wastewater Technologies (CAWT), at Fleming College. With an MSc in Environmental and Life Sciences from Trent University and 10 years of experience in the management of environmental programs, combined with an acumen for business development, Jennifer has been integral to the growth and expansion of the Centre. She has experience in all aspects of the research and development process, and her portfolio includes several publications in refereed journals as well as presentations at national conferences. As the Manager of the CAWT, Jennifer is responsible for overseeing all aspects of operations, business development, and securing funding for clients whenever possible.



Joe Gallivan

Joe Gallivan is the Director of Planning & Economic Development for Frontenac County and a member of the County Planning Directors of Ontario. He has over 30-years' experience in planning with municipal, regional, and provincial governments in both Nova Scotia and Ontario. Joe has a Master's Degree in Urban and Rural Planning from Dalhousie University.



Jim Walls, B.Sc., P.Geo., QP_{ESA}

Jim is a Geoscientist, Qualified Person (QP_{ESA}) and V.P. Environment with R. J. Burnside & Associates Limited. He has over 25 years of environmental and hydrogeological experience, both domestically and internationally. His experience includes, environmental site assessments and remediation projects involving contaminated soil and groundwater, hydrogeology and groundwater supply, and the management of excess soil from source sites to receiving sites. Jim represented municipalities as part of the MECP Stakeholder Group for Ontario Regulation 406/19 On Site and Excess Soil Management. He was a contributor to Best Management Practices for Aggregate Pit and Quarry Rehabilitation in Ontario, March 2021, with the Ontario Society of Professional Engineers (OPSE). Jim fills the role of Municipal Peer Reviewer and QP for a variety of municipalities including Town of Whitchurch-Stouffville, Town of East Gwillimbury and Township of King. His public sector and private sector excess soil management experience gives him an understanding of the needs of both private industry, municipalities, and regulators.



Khalid Hussain, P.Eng.

Khalid Hussain, P.Eng. is a Professional Engineer, and Senior Engineer and licensed Provincial Officer with Ontario Ministry of the Environment, Conservation and Parks. He has approximately 30 years of experience in civil and environmental engineering specializing in water/wastewater projects. Mr. Hussain has worked in York Region as a water/wastewater engineer and with MTO in the area of drainage management. Currently Mr. Hussain is part of the MECP's Permissions Branch which manages Sewage Works Permissions in the province of Ontario. MECP Permission team serves a broad client base with a variety of projects involving industrial and private sewage works, and supports related areas like environmental assessment, compliance, policy and modernization. Mr. Hussain has worked on many significant projects in the area of municipal sewage treatment, septage receiving stations, leachate treatment, composting sites, subsurface disposal, contaminated sites, industrial sewage, renewable energy, solar farms and biogas plants. Mr. Hussain graduated in Civil Engineering in 1992 and completed a master's degree in the year 2000 with water resources project in the province of Andalucía, Spain in the final term.



Leigh Gate

Leigh has been a full time, professional home inspector for nearly a decade, serving the Central Ontario region. Leigh joined the Ontario Association of Home Inspectors in 2013, and has been volunteering in various capacities since 2015. Leigh has earned the association's highest designation, "Registered Home Inspector" and currently serves as Association President. In addition to home inspections, Leigh is certified to perform level one WETT inspections and basic septic inspections.



Miles MacCormack

Miles MacCormack is the Co-Founder and President of Bergmann North America Inc. (BNA). BNA is a company created to offer innovative environmental solutions with a focus on decentralized wastewater treatment and controls with remote management.

Miles specializes in water and wastewater treatment, having over 20 years of experience in the evaluation, design, installation, and operation of wastewater, water, and industrial treatment systems. Furthermore, he has a wide variety of expertise in regulatory compliance, environmental assessment, monitoring, analysis, and reporting. This experience has been developed over a wide variety of sectors and projects including, municipal, residential, parks, commercial, and industrial from ultra-pure and drinking water to process and wastewater applications. Miles' passion is designing and implementing high quality, cost effective, and ecologically sound wastewater treatment systems using state-of-the-art and emerging technologies.

Prior starting BNA, Miles worked in various roles starting out as a brewer at Sleeman brewing and progressing through several water related engineering positions including 10 years in consulting on rural servicing projects. Miles has been an OOWA member since 2004.



Marc Rancourt

Marc Rancourt's diverse role with Bishop involves sales and account management, laboratory testing, project specifications and ongoing support for Bishop Water's core product offerings, which include chemical treatment systems, solids management and biological nutrient removal. Marc also contributes significantly to the development of integrated onsite treatment solutions for key industrial and commercial markets.

He began his career in the water industry in 2006 managing chemical water treatment programs and gained a broad base of knowledge and experience. His diverse application expertise spans many industries including municipal water/wastewater, agriculture, mining, metal finishing, food and beverage, packaging, industrial laundry, aerospace, automotive and more.

Marc holds a Bachelor of Science degree from St. Francis Xavier University.



Michael Varty

Michael Varty is the Director of Rural Development Services at EnVision Consultants and has worked in the field on on-site wastewater engineering for 20 years. Michael's technical career has spanned projects related to the design, construction supervision, inspection, and monitoring of large and small on-site wastewater disposal systems for residential, commercial, and industrial applications; completion of rural servicing studies for rural subdivision developments; peer review services for lower and upper tier municipalities; hydrogeological investigations for rural water supplies and water balance studies; groundwater mounding studies; and lake capacity assessments.

Michael is an active member within the Ontario On-Site Wastewater Association (OOWA) and is a former member of its Board of Directors. He has delivered numerous presentations throughout Ontario on a wide array of onsite wastewater topics, including at OOWA annual conferences and regional meetings. Michael has functioned as a guest speaker for Ryerson University's Wastewater Treatment Systems course, which is part of the Occupational and Public Health Program. Michael has also been recognized as an expert witness relating to decentralized wastewater by the Ontario Municipal Board (OMB) on multiple occasions.



Roddy Bolivar, P.Eng.

Roddy Bolivar, P.Eng. has worked in the onsite wastewater and stormwater management industries for 30 years as a designer, project manager, municipal official and independent consultant. Recently, Roddy joined MakeWay Environmental and now promotes their EnviroSeptic and Graf lines of products. Roddy is a long time OOWA Board member and currently the OOWA Treasurer.



Terry Davidson P.Eng.

Terry K. Davidson, P.Eng., graduated in Engineering from the University of Guelph in 1987. Currently as Director of Engineering & Regulations at Rideau Valley Conservation Authority (RVCA), his responsibilities include Chief Building Official for Part 8 (Sewage Systems) for the City of Ottawa and Tay Valley Township; Director for Section 28, Conservation Authorities Act and Director of Engineering in the RVCA watershed. Prior to joining the Conservation Authority, he was employed with OMAFRA as a Soil Conservation Engineer. He came to the RVCA in 1990 as Manager of the Clean-Up Rural Beaches Program (CURB), a program run in association with the Ontario Ministry of the Environment, Conservation and Parks. Terry was appointed Director of the septic approvals program in 1995 within the City of Ottawa and transitioned to CBO for Part 8, OBC in 1998. He has also served as the Ottawa Manager of the Ontario Rural Wastewater Centre, an industry learning and training centre set up in co-operation with the University of Guelph at the RVCA's Baxter Conservation Area. Terry was instrumental in forming the Ontario Onsite Wastewater Association and was the inaugural President. Terry was a key author and technical advisor for the development of Septic Smart I & II that provides provincial wide information on the function, care and maintenance of septic systems for landowners.



Taylor White

Taylor is a 26 year-old, third generation business owner who is growing his family business with the help of the new technology we have today. He is also a new father to his beautiful daughter Cara Hailie White. His favourite thing to do besides working is to spend time with her and his fiancée Gillian.



Yuefeng Zhang, Phd. P.eng., Pmp

Dr. Zhang has been working as a senior wastewater engineer in Ontario Ministry of the Environment since 2014, and he is also the coordinator for the Wastewater Unit at the Approval Branch. He also worked as a project manager on policy development program in the Ministry. Prior to joining the Ministry, he worked as a senior project manager and design leader at AECOM Canada Ltd. for seven years. He worked on many large projects in GTA and Vancouver, including Clarkson Wastewater Treatment Stage 2 Expansion, Duffin Creek WPCP Stage 3 Expansions, Duffin Creek WPCP Stages 1 &2 Upgrade, Smithville Pump Station Upgrade, Odour Control Strategy for Highbury Interceptor Twinning at Metro Vancouver etc. He also worked as the Team Lead in R&D on biofiltration for Biorem Technologies Ltd. Dr. Zhang obtained his Ph.D. from the University of Toronto at the Department of Chemical Engineering, researched on biofiltration process for pollution control.

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Barry Orr stress tests a “flushable wipe”.

Not As Advertised: The Case Against Flushable Wipes

Jonathan Jarry, M. Sc.

Office for Science and Society, McGill University

Are flushable wipes flushable? You may be retorting, “Is the sky blue?”, but there is reason to be skeptical. On-going media coverage tells us that so-called flushable wipes should not be disposed of down the toilet. So I was surprised to see one of the biggest science channels on YouTube get a sponsorship deal with a company that claims that their wipes truly are flushable. I decided to look at the turbulent history of flushable wipes, often sold for the vague purpose of “personal cleaning.”

The core of a flushable wipe is made of pulp, which can be treated in a variety of ways to strengthen it, such as using specific polymers as binders or by creating webs of additional fibres for support. By comparison, toilet paper is made by cooking small pieces of wood with chemicals, yielding a wood pulp that is combined with water to create paper stock. Water is removed from this stock and the resulting mat is rolled through heated cylinders and, voilà, toilet paper is born.

There are environmental concerns with flushable wipes, chief among them that the plastic they often contain end

up in waterways. You may not have known that many of these wipes contain plastic because manufacturers don't typically disclose the materials they use for their wipes, which led a team of UK scientists to bring 6 flushable and 7 non-flushable wipes into the lab to figure out what they were made of. Polyester, a synthetic fibre that comes from petroleum, was detected in all non-flushable wipes, while some of their flushable counterparts contained plastics like high-density polyethylene. These human-made materials are thought to be added to wipes to make them more durable, but they can break down into microplastics that are known to pollute the environment and that might (the jury is still out) cause health issues in animals and humans.

You may be wondering at this point what distinguishes a flushable from a non-flushable wipe. The answer seems to be: not much, if anything at all. It turns out that, in a laboratory analysis of 58 wipes from around the world, flushable and non-flushable wipes were similar in terms of how thick they were, the volume they took up, how

much individual sheets weighed, and how they reacted to moisture. In fact, the authors went so far as to conclude that their results supported “the absence of any technical basis that separates flushable wipes clearly from non-flushables.”

The reason may have a lot to do with the fact that “flushability” is not standardized and enforced. I reached out to Barry Orr, a spokesperson for the Municipal Enforcement Sewer Use Group (MESUG) in Canada, who told me that there was no Canadian standard for flushability but that MESUG and the Canadian Water and Wastewater Association are working to get one in place. Meanwhile, product manufacturers have developed guidance documents for flushability, but it is not obvious if these documents are being followed by their own industry. Case in point: a research group at Ryerson University in Toronto recently tested 101 products available in Southern Ontario, half of which were marked as flushable, by recreating a toilet and private drain connection in the lab, and the results were not pretty. One thing they tested for was dispersibility, which is how easily the product breaks down in smaller pieces, an important criterion to prevent toilets and drain lines from clogging up. Only 11 products fully disintegrated and they were all samples of toilet paper. The team found no evidence of disintegration for the baby and cleaning wipes they tested. And while bathroom tissue took on average fewer than two flushes to clear the line, cleaning cloths required four, with some baby wipes needing more than five. Their conclusion? “It is evident that none of the products other than bathroom tissue are ‘flushable’.”

Even newer claims should be met with skepticism, though there is hope.

What about newer wipes claimed to have been developed in collaboration with a sewage treatment service in Jacksonville, Florida and to thus be truly flushable? I remain unconvinced. First of all, water and hardness temperatures vary between Florida and Canada, for example, so what's good for the Floridian gander may not be good for the Canada goose. Also, I am left wondering why the very same sewage treatment service reminded people very recently to think twice before flushing anything but toilet paper and to avoid flushing down wipes even when made with “safe flush technology.”

And if you see a wipe that is claimed to be made without synthetic materials and thus more easy to degrade, be skeptical. As Orr reminded me, flushable wipes can contain regenerated cellulose. It's when a manufacturer takes the cellulose from plants and treats it with chemicals to create a fibre that, while made up of a natural material, is artificially spun into a much stronger product than would be found naturally. So any wipe must be tested for dispersibility regardless of the basic materials out of which it is made.

Canadian cities are reported to be spending hundreds of millions of dollars a year to remove blockages where the main guilty party are wipes. These wipes can absorb sand, clay, food waste and other products in the sewers, turning

free-running wastewater into sewer solids and so-called “fatbergs.”

Will wipes ever be flushable? It turns out that some are, but they have not made their way across the pond. The lead researcher behind the Ryerson University study, Dr. Darko Joksimovic, tells me that since the publication of their report, they have tested wipes that fall apart almost as quickly as toilet paper, including one from Japan.

“Currently, in North America,” Barry Orr tells me, “we haven't seen wipes disperse rapidly enough to meet the International Water Services Flushability Group criteria, and therefore we would discourage anyone from flushing them down the toilet. Put them in the garbage.”

North American flushable wipes are not flushable. Yet.

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RETIREMENT Notice

Mac Taylor, an onsite wastewater system installer, contractor and OOWA volunteer, has decided to hang up his hard hat.

Mac's career began in 1966. He installed his first septic system (a tank and trench bed) at the age of 17. Mac did the install alone, with the help of a JD450 Crawler with a backhoe attachment. The bed was constructed using clay tile and the permit consisted of a handshake from the local health inspector. While a permit was required back then, there was no permit fee associated with it. A site inspection was required, which generally consisted of a brief discussion of what the install plan was, closing with a handshake. Fast forward 55 years and one can see how much the industry has evolved.

Mac estimates that he has installed in the neighbourhood of 2000 septic systems during his career. His experience has taken him all over Grey and Bruce Counties, into Simcoe County, as well as the GTA. He has also enjoyed the opportunity to network with some amazing professionals from across Canada along the way.

Mac's greatest concern for the industry is that septic installation is still not considered a skilled trade. Finding the right employees, who are skilled equipment operators, with knowledge of Part 8 of the Ontario Building Code, can generally only be accomplished by dedicated training and development. While Mac has trained some



excellent staff over the years, keeping up with building booms and changing best practices is difficult without the support of the postsecondary education sector.

After dealing with a back injury this past summer, Mac has had lots of time to consider his next steps. Since then, he has sold his construction and service equipment, and has been mentoring others in the industry. In his retirement, Mac plans to spend time with family and friends, travel our beautiful country and maybe even do some septic design and consulting work.

What Mac's Colleagues Have to Say

As someone who has made a positive impact on the industry and our association over the years, we asked a few folks about what it was like to work with Mac and here's what they had to say.

"I've known and done business with Mac for over 20 years now, and always found him to be not only a highly knowledgeable and professional industry innovator/leader, but also one heck of a great guy to deal with."

Gary Deppe - Territory Sales Manager Representing with Polylok

"Mac has been a pleasure to work with. He is an educator, problem solver and an all-around professional. The industry is losing a great champion. I wish him all the best in his retirement."

Tammy Dobie - Deputy Chief Building Official with the Municipality of Meaford

"Mac has always impressed me with his honesty and his kindness in every interaction he encounters. His professional and supportive attitude creates an environment of learning and advancement for our industry. It has been my pleasure to work closely with Mac Taylor Corporation."

Marianne Wilson - Technical Sales and Field Support person with Waterloo Biofilter

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Installers Corner

Paul Bruinsma, Bruinsma Excavating



For this edition's installment of our 'Installer's Corner' feature we invited Paul Bruinsma of Bruinsma Excavating to give us his two cents on what he thinks are the three most technical issues that contractors are dealing with and how, from their own perspective, they could be addressed. We also asked Paul for any advice he might have for new contractors and how OOWA could help to improve the industry. We also wanted to hear what Paul does to communicate to homeowners about the need for ongoing maintenance and management of new systems. Thanks to Paul for taking the time to respond to our questions.

Part 1 - Three Most Technical Issues

1. Sand inconsistency

Obtaining sand reports from suppliers in the Spring can mean very little in the middle of the season or later in the year. In fact, where a truck gets loaded at a pile of sand can change silt levels drastically.

2. Municipality and inspector inconsistency from region to region

Different municipalities require different soils or engineers' reports. Some require systems to be engineered and others do not, depending on lot size or location.

3. Homeowners designing the house of their dreams on a small lot

Not really a technical problem, but a common issue is homeowners designing the house of their dreams on a small lot. All designers have seen the drawings come through of a massive house on a small lot. Then the phone call that they want a pool in the backyard and a possible garage in the one back corner. Now we have to talk to the homeowner that has worked the past 6 months to get their drawings completed that a septic will not fit on their lot or the pool is not an option in the future.

Part 2 - How Might These Be Addressed

1. Dedicated septic sand

Unless you are working on a large-scale septic project, most sand is a byproduct or a type of bedding sand. Suppliers could start to make a septic sand dedicated to installers.

2. Standardized forms used across all regions.

Possibly a page outlining local requirements that differ for their region like engineered drawings for properties less than an acre or along a shoreline or nitrate studies for certain environmental areas. This would help new contractors also.

Part 3 - Advice For New Contractors

For new contractors wanting to enter into the industry I would recommend these options. First, talk to your local inspectors. Ask them questions about where to find and how to fill out their forms. Ask them to list a few suppliers of tanks, pipe or sand if they are willing. Establish a rapport. We are here to work together to provide a better product and solution for the client. Second, talk to suppliers and ask for price lists and if they can deliver and/or set tanks. Nothing worse than a truck delivering a tank with no crane to set it. Lastly, join OOWA. Read their guidance documents and find suppliers around your area.

Part 4 - Most Impactful Thing OOWA Could do to Improve the Industry

Homeowner education.

I think OOWA needs to be more of a presence. Attending Home and Garden shows or sending out mail to homeowners. Education to homeowners that a properly working septic that has been installed by a licensed contractor and inspected by the Municipality is the only way. Too many times I hear that the neighbor has a steel barrel or that so and so installed theirs on a weekend and now they are trying to do it properly and they are getting penalized.

Part 5 - What Do You Do to Inform Homeowners About the Need to Manage their Newly Installed Septic System?

Personally, after an install is complete, I print out OOWA's 'A Homeowners Guide to a Healthy Sewage System' brochure that is available on OOWA's website. I then set up a time that I can meet and go over their new septic. Explain to them what can and cannot go into a septic. What

each tank does if there are more than one. What the pump controls are and to never touch them but to silence the alarm. The importance of notifying either the installer or the maintenance contractor after there has been an alarm.



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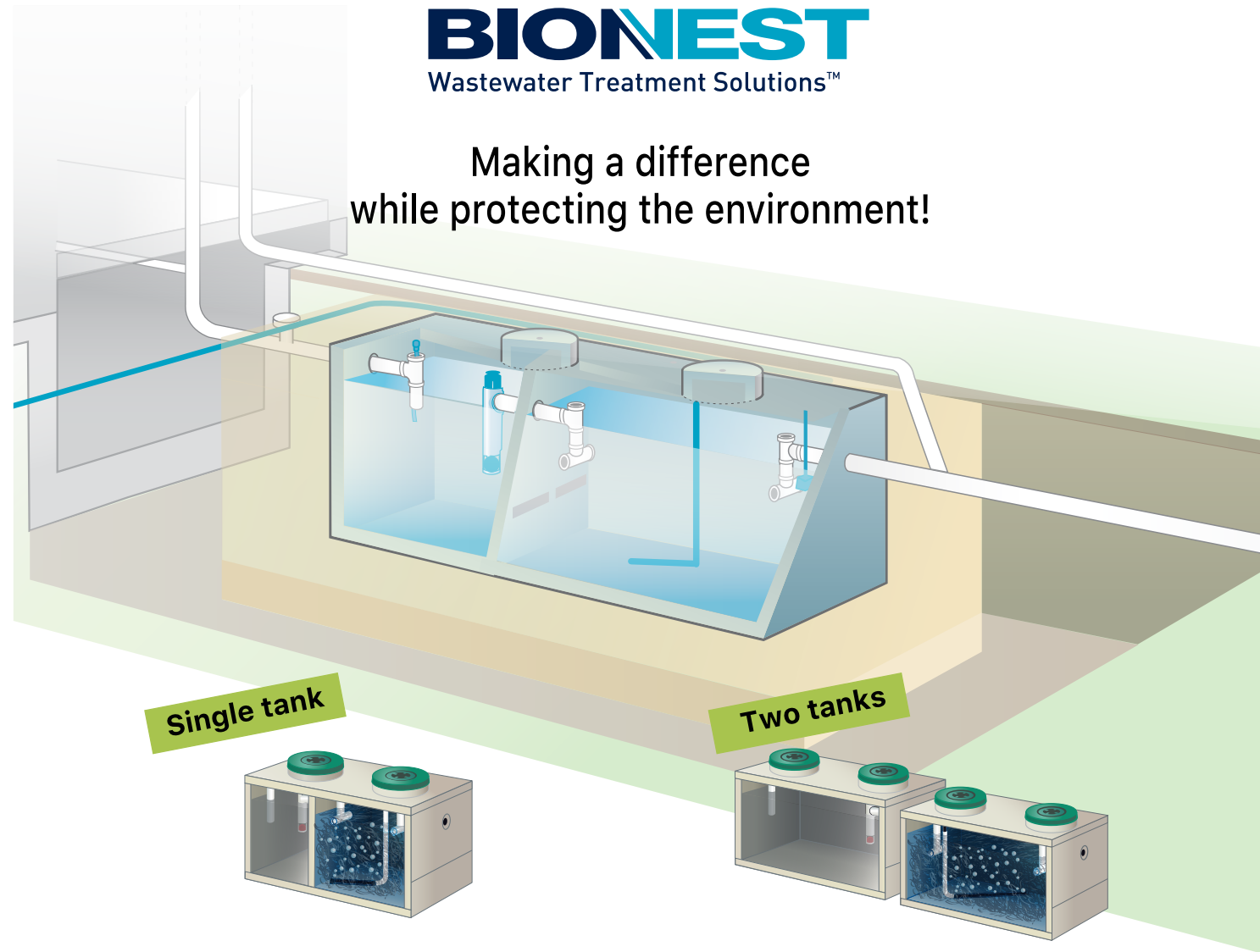


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MEMBER PROFILE

Karen Holt

Deputy Chief Building Official

Name of Organization: Municipality of Grey Highlands

Owners: Governed by a 12 member Board of Directors appointed by the Councils of its 10 member municipalities

Services/Mandate: Plans review, compliance with applicable laws, Inspections, Maintain septic records post installation.

Service Area: Regulatory agency and compliance with Municipality of Grey Highlands

Number of Years in Role: Municipal Administration 38 years, Building official 6.5 years.

What got you started in the onsite wastewater industry?

I have worked in various administrative roles for a rural municipality for over 44 years with the last 21 years in the Building Department. I started as a Coordinator, then after five years of formal education courses was appointed a Building Official in June 2015. I conduct plans review, ensure compliance to applicable law such as setbacks, conservation authority approvals and, through our administrative support, of septic and wastewater records. I have always found onsite wastewater handling an interesting challenge and have seen many ways it works well for the property owner, the neighborhood and the environment.

Give us one reason/secret for your success.

I believe in being an active listener – providing timely customer service and building relationships with property owners, contractors, and the public. My continual following of the current and emerging technologies and styles of design helps build an awareness for myself to meet the know-how of the builder. I work with property owners and contractors toward their compliance. So, I want to have knowledge of what is possible to best answer their presented plans from a perspective of potential according to the latest technology while still observing all required standards. I find the advances in onsite wastewater management fascinating to follow.

What was the most challenging onsite job you worked on or participated in?

As an inspector I am not involved with onsite work directly. Challenges arise in coordinating compliance with levels of approval. Doing this in an atmosphere of potential financial



KAREN HOLT
Deputy Chief Building Official

limitations for the owner to meet specific needs like lot constrictions. I am not in a role to recommend, so can't guide them along, they must find the route to compliance themselves or with third-party assistance. I have seen very tight lot sizes and various setbacks require creative designs to address compliance requirements. The trial here goes to the permit holders as they must source customized advice and research new technology like Waterloo Biofilter to sort issues, especially with extenuating (waterfront, wetland incursion, setback confines) restrictions due to location.

If you could change one thing about the onsite/decentralized industry, what would it be?

One beneficial change would be more consistent guidelines to assist homeowners and contractors through the process for requirements for design and build. We need more widespread understanding of the reasons for the rules in an easily accessible tool for onsite reference. Many onsite contractors like Mac Taylor are able to provide great advice and top-notch designs. In the 40 years I have known him, and more recently interacted onsite, I have seen Mac and his wife Marilyn become industry leaders in the field of wastewater. He has shared so much knowledge and they are such good community people. Happy retirement!

Where do you see the onsite industry going?

I believe the onsite sewage industry's technical and engineering challenges will lead to new innovations. These will come onstream as more alternate types of housing become available beyond generic single-family models. As an example, a potential tiny home rural community concept with a self-supporting, onsite sewers. New technology and environmental science are developing compact and eco-friendly options to service infill on tight lots and could support potential co-housing models. These providers will develop communal systems that work for the environment, occupants, health and safety and community. We will need to address non-typical sustainable communities which could potentially support multiple separate units on a single innovative septic.

New & Renewed Members Listing

For the period of November 26th, 2021- February 9th, 2022

NEW MEMBERS:

Miguel Almassy, DBO Expert
Brandon Aubin, WSP / Golder
Madison Bateman
Carley Beukeboom, Fleming College
Aaron Corbiere, E. Corbiere and Sons Contracting
Brian Corley, Township of Wellington North
Kevin Cortez, McIntosh Perry
Michael Courtemanche, I-TEAM Home Inspections
Laurie Cox, DK Excavating Ltd
Bruno Cuscuna, Ionica Excavation
Suzanne Cwalino, E. Corbiere and Sons Contracting
Thomas Czerlau, Township of Centre Wellington
Alen Dautovic, FlowSpec Engineering
Janet Dea, Rivercourt Engineering Inc.
Brandon Dinan, Northern Property Solutions
Jessica Doherty, Crozier Consulting Engineers
Colin Driscoll, DW Land Development Services Inc
Evan Finbow, Crozier Consulting Engineers
Kira Fry, Ministry of the Environment, Conservation and Parks
Shaun Gallagher, Rouge Valley Renovation
Erich Ganter, E.Ganter Const.
Enrico Giovannozzi
Nick Ippolito, Township of Severn
Natalie Jackson, Township of Wellington North
Scott Jeffrey, Peto MacCallum Ltd.
Darren Jones, Township of Wellington North
Martin Kennedy, MK Landworks
Alexandra Laleva, Crozier Consulting Engineers
Jennifer Lavoie, Pete Stroeder Contracting Inc
Janice Levangie, Rivercourt Engineering Inc.
Nathan Martin, Mississippi Rideau Septic System Office
Shawn McCormick, Shalena Enterprises
Mitch McGrath, MK Landworks
Lauren McGregor, University of Waterloo
Connie McVeigh, McVeigh Construction
Curtis Melanson, McIntosh Perry
Glen Mulvihill, Mulvihill Contracting Inc.
Mark Ongarato, Gunnell Engineering Ltd
Robert Passmore, WSP / Golder
Louise Pattenden, Township of Centre Wellington
Zach Powell, Powells Landscapes
Grace Rabb, RVCA
Terry Rainone, Terrain Construction Management Inc.
Mackenzie Riddle, M. Riddle Excavating
Jamie Rocci
Aaron Ryckman, Township of Southgate
Tom Sibbald, SiteWorks Construction
Charlene Small
Tracey Spragg, SepticCheck.ca/Robinson Enterprises
Dylan Squier, M. Riddle Excavating
David Start
Kathryn Stasiuk, WSP / Golder
Jason Steele, Tri County Inspection
Mohan Subramaniyam
Lisa Thompson, Allto Construction Services Ltd.
Robert Trepanier, MK Landworks
Marcel Veillette, E. Corbiere and Sons Contracting
Scott Wales, Scott's Excavation and Land Management
Patrick Welch, DW Land Development Services Inc
Erin Williams, McIntosh Perry

RENEWED MEMBERS:

Bassim Abbassi, Ontario Rural Wastewater Centre
David Adams, Adams Brothers Construction
Matthew Aldom, Town of Bancroft
Debbie Anderson, Municipality Of Grey Highlands
Imad Aouli, WSP Canada Inc
Angelo Avolio, Town of Amherstburg
Lorne Bagshaw, Lorne Bagshaw Excavating
Clark Ballantyne, Corporation of the City Of London
Dominic Bauer, Gunnell Engineering Ltd.
Andy Bauman, FlowSpec Engineering Ltd
Gord Bell, SiteEx Inc.
Chris Bentham, Tyson Construction
Jeff Binnie, G.E. Binnie Haulage & Excavation Inc.
Bruce Blackburn, B. Blackburn Ltd
Jeff Blackburn, B. Blackburn Ltd.
Jamie Blakely, Blakely Property Services
Avelino (Rex) Bondad, Gunnell Engineering Ltd.
Sandy Bos, Township Of Muskoka Lakes
Randy Bossence, Township of Centre Wellington
Isaac Botchwey, McGill University
Anthony Boyko, City of Markham
Bruce Brisbois, Leroy Construction
Mark Brosowski, Weber Environmental Services
Jarett Brown, Southpaw Contracting
Paul Bruinsma, Bruinsma Excavating Ltd.
Martin Burger, Groundwork Engineering Limited
Frank Charlebois, S Charlebois Haulage And Excavating LTD
Dorian Chlopas, Rowan Environmental Consulting Inc.
Stephen Cobean, Cobide Engineering Inc.
Howard Cook, Howard Cook Drainage
Jean-Pierre Corriveau, DBO Expert
Quinn Corvino, Weber Environmental Services
Charles Courchesne, Guy Courchesne Excavation Ltd
Clay Crepin, Gerry Crepin Cartage
Brock Cross, Gunnell Engineering
Michelle Dada Ortiz, MNT Consulting Group Inc.
David Denstedt, Muskoka Barging & Construction
Bob Dickie, Flue To Footing Home Inspections
Tammy Dobie, Municipality of Meaford
Glenn Dryden, Dryden Excavation Inc.
John Duffy, Van Harten Surveying Inc.
Kathryn Dukelow, Ricor Construction
Anne Egan, R.J. Burnside & Associates Limited
Anne Elmhirst, City Of Kawartha Lakes
Fritz Enzlin, Norfolk County
Marc Ethier, E2TECH Services
John Faris, Faris Excavating Ltd
Bev Fisher, Township of Southgate
David Fonddevilla III, FlowSpec Engineering Ltd
Laura Freeland, Durham Region Health Department
Peter Froehlich, Brooklin Concrete Products
Mike Fulton, Near North Supply
Nilou Ghazi, E3 Laboratories Inc.
Annette Gilchrist, Twsp of Bonnechere Valley
Andrew Girouard, Greater Napanee
Paolo Giust, Honeywell Works Inc
Doug Godin, Town of Huntsville
Bill Goodale, Tatham Engineering Ltd.
Susan Gordon, Novatech Engineering
Roger Gostlin, R. Gostlin & Son Sand & Gravel

New & Renewed Members Listing

For the period of November 26th, 2021- February 9th, 2022

Rene Goulet, Goulet Septic Pumping & Design
Jessica Goulet, Goulet Septic Pumping & Design
Brent Green, Township of Centre Wellington
Steve Greer, GB Excavating
Stefan Gruescu, Claramy Designs Incorporated
Eric Gunnell, Gunnell Engineering Ltd.
Daniel Hagarty, Township of Centre Wellington
David Harsch, K Smart Associates Limited
Irene Hassas, Aslan Technologies
Jeremy Hein, Groundwork Engineering Limited
Andrew Hellebust, Rivercourt Engineering Inc.
Cliff Hobbs, Can-Mech Agencies
Karen Holt, Municipality Of Grey Highlands
Evan Hughes, Evan Hughes Excavating
Denise Johnston, Township of Centre Wellington
Keith Karl, Caledon Excavation & Grading
Thomas Keane, Gunnell Engineering
Willis Kerr, Willis Kerr Contracting Ltd.
Josef Kloepper, Gunnell Engineering
Natasha Lacasse, Lafarge
Paul Leahy, Leahy Excavation
Kevin Lehan, Town of Gravenhurst
Elizabeth Lew, Gunnell Engineering
Adam Lohonyai, Eximius Engineering Ltd.
Kevin MacLellan, Moose Creek Precast Inc
Rob MacLellan, Moose Creek Precast Inc
Andrew Maguire, L.M.Ent Water
John Martin, Cromar Advanced Septic Systems
John (Curtis) Martin, Town of Huntsville
Justin McDonald, Van Harten Surveying
Lloyd McMillan, Lloyd McMillan Equipment Ltd
Troy McMillan, Lloyd McMillan Equipment
Kim Millen, Norfolk County
Greg Miller, Town of Collingwood
Gerry Mitchell, Peto MacCallum Ltd
Adrian Molloy, Molloy Contracting Inc
David Morlock, FlowSpec Engineering Ltd
John Moudakis, JM Consulting
Andre Moura, Tatham Engineering Limited
Caroline Newby, Caroline's Septic Designs
Nico Nirschl, Liberty Pumps
Justin Noort, Self
Dave O'Malley, Brooklin Concrete
Gary Pearson, Pearson Engineering Ltd.
Stacey Pennington, Township of Centre Wellington
Duane Porter, J.A. Porter Holdings Ltd
Jim Rabe, Municipality of Grey Highlands
Michael Rahme, Home Pro Central Ont. Inc
Doug Rankin, Slagter Construction
Katherine Rentsch, Crozier Consulting Engineers
Bill Robinson, SepticCheck.ca/Robinson Enterprises
Scott Robinson, Unit Precast
Robert Robinson, Robinson Haulage Inc
Stephen Ropp, Percon Excavating Inc
Eric Rozema, Rivercourt Engineering Inc.
Brian Rudak, Rudak Excavating Inc.
Robert Rudak, Rudak Excavating Inc.
David Ruppert, Ruppert Haulage Inc.
Stuart Saville, Zoeller Canada
Zachary Savoie, Gunnell Engineering Ltd.
Brad Schildroth, FlowSpec Engineering

Phil Schram, Township of Southgate
Glen Sharp, Francis Thomas Contracting Company Ltd
Mike Smith, Smith Excavating, Grading & Septic Services
David Smith, Herns Sand & Gravel
Edward Smith, Ted Smith Construction
Nick Snyder, Township Of Muskoka Lakes
Craig Stainton, Ontario Ground Water Association
Clayton Stokman, Township of Guelph/Eramosa
Ryan Strachan, Brooklin Concrete
Paul Studholme, Professional Home Inspections
Sandra Swanton, K Smart Associates Limited
Mac Taylor, Mac Taylor Corporation
Marilyn Taylor, Mac Taylor Corporation
John Teixeira, Teixeira Construction
Keith Thomas, Francis Thomas Contracting Company Ltd
Scott Thompson, MTS Environmental Inc.
Bob Thomson, Valley Sanitation Services
Simon Thoume, James Thoume Construction Ltd
Barrett Tinney, Tinney's Septic Service And Construction
Michael Tinney, Tinney's Septic Service & Construction
Terry Tompkins, Township of Tay
Travis Toms, Township Of North Kawartha
Claus Trost, Laurentian Valley Twp.
Mark Van Alstine, Herns Sand & Gravel
John Vanden Hoven, JVH Consulting
Steve Walmsley, Township Of Tay
Danielle Ward, Adams Brothers Construction
Eric Watkin, Tatham Engineering Ltd.
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OOWA has redeveloped the Registered Professional Program (RPP) to include an 'In-Development Stream' that addresses the needs of ongoing training and continuing education demands from our members. OOWA Professional Designations include: Wastewater Service Technician, Designer, Installer, Private or Regulatory Inspector, Residuals Hauler, Project & Administrative Professional and Technical Sales Consultant.



OOWA collaborates with other associations in communicating to government with one united voice on issues that are of mutual concern to our industries. OOWA is proud to inform our members know that you can access membership rates for events and resources provided by our association partners:



- The Ontario Association of Septic Industry Service
- The Ontario Building Officials Association
- The Ontario Ground Water Association

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This article originally
appeared on page 5 of
Volume 1, Issue 2, in 2000.

Frequently Asked Questions — About Sewage Systems and the Building Code

Q ▶ Does the OBC require that a "qualified supervisor" be on site for the entire installation of the septic system?

A ▶ Clause 2.12.4.6.(1)(a) stipulates that supervision is required for the installation of a sewage system.

The intent is that, the qualified supervisor be on site to provide direction to other staff at critical points in the installation and to meet with the inspector to ensure that the project is progressing as planned. As with any other type of construction project, he/she does not have to be on site throughout the project.

Q ▶ Section 8.7.3.3.(2) OBC requires that the stone covering the distribution pipe be covered with untreated building paper or a permeable geotextile fabric. Which one is better?

A ▶ The purpose of this separator is to prevent soil or leaching bed fill from entering the stone during backfill. Thus, neither is actually better than the other for this purpose.

However, the untreated building paper may decompose within a few months compared to the geotextile which will last the life of the tile bed.

Q ▶ I am a licenced septic installer starting to construct a septic system. After starting site preparations I realize the plans that were provided will not work on this lot. What are my responsibilities?

A ▶ It is the installer's responsibility to make sure that the constructed tile bed meets the OBC requirements. Therefore, the installer must contact the designer and the regulator before making any changes or alterations to the approved plans and specifications. Any changes made to the design after a permit has been issued must be approved by the Regulator before implementing the changes.

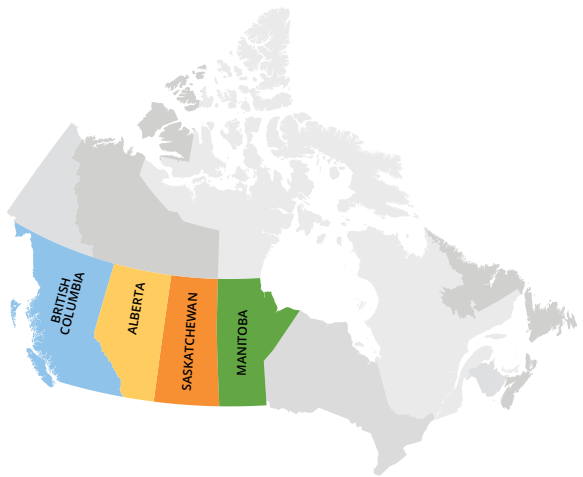
Further information on septic systems can be obtained by visiting the Housing Development and Buildings Branch's home page at <http://obc.mmah.gov.on.ca>.

WCOWMA Update



Leslie Desjardins
Executive Director, WCOWMA

The four Western Provinces are continuing to provide certification training through a virtual medium for those people wishing to design, install, maintain, and inspect onsite wastewater systems. Each province has specific requirements for certification, however all the Western Provinces, with the exception of Saskatchewan, mandate training in order to work in this discipline. Saskatchewan does not mandate training per se; however, they require you to prove that you are 'qualified', which determination is at the discretion of Environmental Health Officers, and typically proof of certification training moves contractors into the qualified category in that Province.



Early winter is when each of the provinces host either a full-scale convention and trade show or a series of Education Days combined with an Annual General Meeting. The Alberta Onsite Wastewater Management Association (AOWMA) is hosting their convention and trade show on February 15, 16, & 17th in Red Deer, AB this year. This event is being planned as a hybrid show, which means reduced in-person attendance and a smaller 'live' trade show enhanced by a virtual trade show and the ability for delegates to participate in the presentations on a virtual platform. Should public health mandates change, the program can easily switch to a fully virtual platform.

The WCOWMA Onsite Wastewater Management Association of BC (WCOWMA-BC) is hosting an in-person convention and trade show in Abbotsford, BC on March 2, 3, & 4th. This program too has the ability to switch to a completely virtual platform should gathering restrictions change.

The Saskatchewan Onsite Wastewater Management Association (SOWMA) and Manitoba Onsite Wastewater Management Association (MOWMA) will host their Education Days and Annual General Meetings in April. Dates to be determined.

Currently, training curriculum is being updated in both Alberta and Manitoba. Alberta released an updated Standard of Practice at the end of 2021, which requires the certification training material to be updated to the new Standard. That process should be completed shortly. As well, all those holding a Certificate of Competency in Private Sewage in the Province of Alberta must participate in a two-day Standard of Practice Update training program, which is being developed and delivered by the AOWMA.

As noted above, the Certification Training Program in Manitoba is being updated at the present time with a goal to begin training to a new Manitoba Standard of Practice in April 2022.

As is the case worldwide, access to materials and supplies is an issue for our industry; hopefully we will see supply constraints ease up in 2022.



Western Canada Onsite Wastewater
Management Association

James Arambarri

– Azura Associates

Recipient of OOWA's 2021 Graduate Student Scholarship

I was extremely grateful to be the recipient of OOWA's 2021 Graduate Student Scholarship. Since receiving the scholarship, I successfully defended my Master's thesis from the University of Guelph. My thesis topic was based on the design and evaluation of a novel benchtop continuous electroflotation (EF) treatment system for high-strength microbrewery wastewater. Many decentralized wastewater generators who discharge raw or partially treated effluent to the sewers commonly struggle to meet the strict discharge criteria used to calculate the municipal surcharge fees. Primarily, the EF treatment system targeted the removal of suspended solids, however, effective removal of Phosphorus (P) and BOD was also demonstrated. The concentrations for all three of parameters (BOD, P, TSS) are normally determined through municipal sewer sampling and the subsequent results are used to calculate the monthly surcharge fees. Considering that municipal population growth is only expected to increase alongside more stringent discharge criteria, it is becoming increasingly important for decentralized generators (breweries, distillers, slaughterhouses, restaurants, food processing plants, etc.) to manage their wastewater loading to the municipal system through source reduction, water recycling, or other best practice measures.

Later in August 2021, I accepted a job offer from Azura Associates, a boutique consulting firm specializing in industrial wastewater treatment and anaerobic digestion. This felt like a natural next step for me considering the overlapping nature of anaerobic digestion and wastewater treatment. At Azura, I get to work on some of the most challenging problems in the wastewater industry that many consulting companies do not want to touch. We believe that better testing generates better data and helps drive better decisions.

As Optimization Lead, I use my expertise to help our clients with process debottlenecking, technical due diligence, sewer bylaw compliance, and optimization of anaerobic digesters. Since joining Azura, I have gained experience



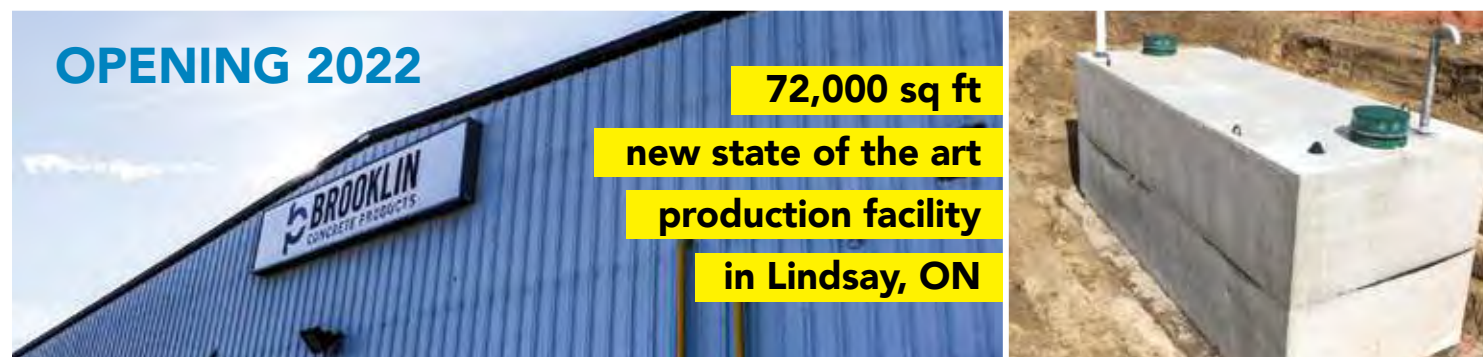
JAMES ARAMBARRI - Azura Associates

working with several unique wastewater generators such as: slaughterhouses and rendering plants, breweries and distilleries, beverage manufacturers, among others. I am thrilled to have simultaneously gained in-depth exposure to decentralized and industrial wastewater applications, alongside many anaerobic digestion and waste-to-energy projects.

Moving forward, I am excited to remain involved in the wastewater space furthering both my skills and experience. I am also looking forward to further develop my existing relationships with OOWA members, and more broadly, with those in the industrial wastewater and anaerobic digestion industry.



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Thanks to all of our participating education partners for prompting this initiative and for promoting the association!



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Equipment Considerations to Minimize Ground Pressure During Septic Installation

By: Sara Heger, Ph.D.
Onsite Installer Magazine, January 03, 2022

Often your choice of equipment for installing an onsite system is predetermined by the equipment your company owns. It is important, however, to understand the limitations of different pieces of equipment and recognize when renting or leasing equipment will facilitate effective and efficient system installation.

It's important to select the right piece of equipment for the job; the size of job and impact on the site must be considered. For example, it is often more cost-effective to rent a track hoe for a day than to dig for a week with a backhoe. Likewise, a skid-steer with tracks often has less compaction potential than a man's boot print.

The key issues for an installer to consider regarding equipment are:

- Equipment currently owned
- Range of site conditions where work will occur (reach of equipment, accessibility, wet soils, slopes, etc.)
- Application — what type of technologies you plan to install
- Tasks you plan to perform related to the types of technologies
- Speed required for installations
- Matching equipment to the size of the crew
- Ground pressure and compaction

If you are considering buying new equipment, most suppliers will let you demo a machine before you purchase it. You can then determine if this equipment is essential to your day-to-day operations or if a rental is a better option.

For efficient installations, the speed of the machine and the skill of the operator typically dictate the crew size. Another important variable that impacts the crew size is site constraints. If you only have a small space to operate the equipment, one ground laborer may be all that is needed to keep up with the equipment operator. Membership in a professional association offers good opportunities to discuss equipment choices and issues with other installers.

Ground pressure

Ground pressure is one key issue to consider with the equipment you own or when you are making a purchase. Ground pressure is the pressure exerted on the ground by the tires or tracks of a motorized vehicle and is one measure of its potential mobility, especially over soft ground. Ground pressure is measured in pounds per



Ground contact area for wheeled versus tracked equipment

square inch. It can be calculated with the formula:

Loaded weight ÷ Ground contact area

Increasing the size of the contact area, or footprint, on the ground in relation to the weight decreases the ground pressure. The ground pressure of motorized vehicles is often compared to the ground pressure of a human foot,

which can be 9 to 12 psi while walking. A wheeled all-terrain vehicle may have a ground pressure of 35 psi while a tracked all-terrain vehicle has 0.75 psi.

Ask the dealer about the ground pressure of a particular machine. The ground pressure of all equipment on the site must be considered during construction particularly those delivering the tank and materials, but also from other contractors who may be on the construction site. The property owner should also be advised that traffic over the system should be avoided over the long term to minimize damage to the system.

Another issue to consider is that a loaded bucket can shift the weight to the front of a piece of wheeled equipment and change the ground pressure of the machine.

Wheels vs. tracks

Wheeled equipment has greater ground pressure than tracked equipment, as shown in the figure, due to the reduced ground contact area and therefore should not be used in areas where compaction is a concern. Wheels do provide quicker movement and do not damage paved roads as much as tracks, but they provide less traction in muddy soils.

Tracked equipment has lower ground pressure due to the larger footprint of the tracks. Tracked equipment is more stable, particularly on steeper slopes, and can be driven over a small spoil pile, whereas the material has to be moved out of the way with wheeled equipment.

- There are multiple types of tracks:
- Low ground pressure tracks versus standard tracks
 - “True” tracks versus those added to wheeled equipment
 - Steel versus rubber
- LGP equipment causes less compaction than narrow/standard tracks due to their greater width. Tracks can be added to equipment that is wheeled, but these are not as effective as “true” tracked equipment. Steel tracks last longer and are therefore more economical particularly on large equipment, but rubber tracks have better traction and cause less damage to pavement and grass.
- Whenever possible you want to avoid compaction of the soil treatment area and choosing the correct equipment is a great step to meeting this goal.

This article first appeared online at OnsiteInstaller.com on Jan. 3, 2022, published by COLE Publishing, Three Lakes, Wis. It is reprinted by permission

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MEMBER
PROFILE

Carolyn Chan
Project Engineer, Partner

Name of Organization: GM BluePlan Engineering Ltd.

Owners: Employee Owned

Services/Mandate: On-site wastewater system design, approvals, inspection, and operations support – alongside many other Civil Engineering and Infrastructure Planning-related services for both municipal and private clients.

Service Area: GMBP has seven offices located across Southwestern Ontario. Staff specializing in the design of small wastewater systems are based in Guelph, Listowel and Owen Sound, with our clients typically located within a 3-hour drive from one of these offices.

Number of Years in Role: 6 years

What got you started in the onsite wastewater industry?

While studying Civil Engineering at McGill University I caught the wastewater bug and decided to specialize in wastewater treatment design, for systems both large and small. A summer term working at the Ontario Rural Wastewater Centre in Alfred, Ontario introduced me to the Ontario On-site community and gave me an appreciation for the importance of on-site systems and the basics of their design, permitting, installation and maintenance. Through my Master’s studies at University of Guelph (studying small constructed wetland systems) I stayed connected, and my first consulting job out of school came from a connection I met at the OOWA conference!

Give us one reason/secret for your success.

Curiosity and enthusiasm! I find this field fascinating with something new to learn from every project and connection I make.



CAROLYN CHAN
Project Engineer, Partner

What was the most challenging onsite job you worked on or participated in?

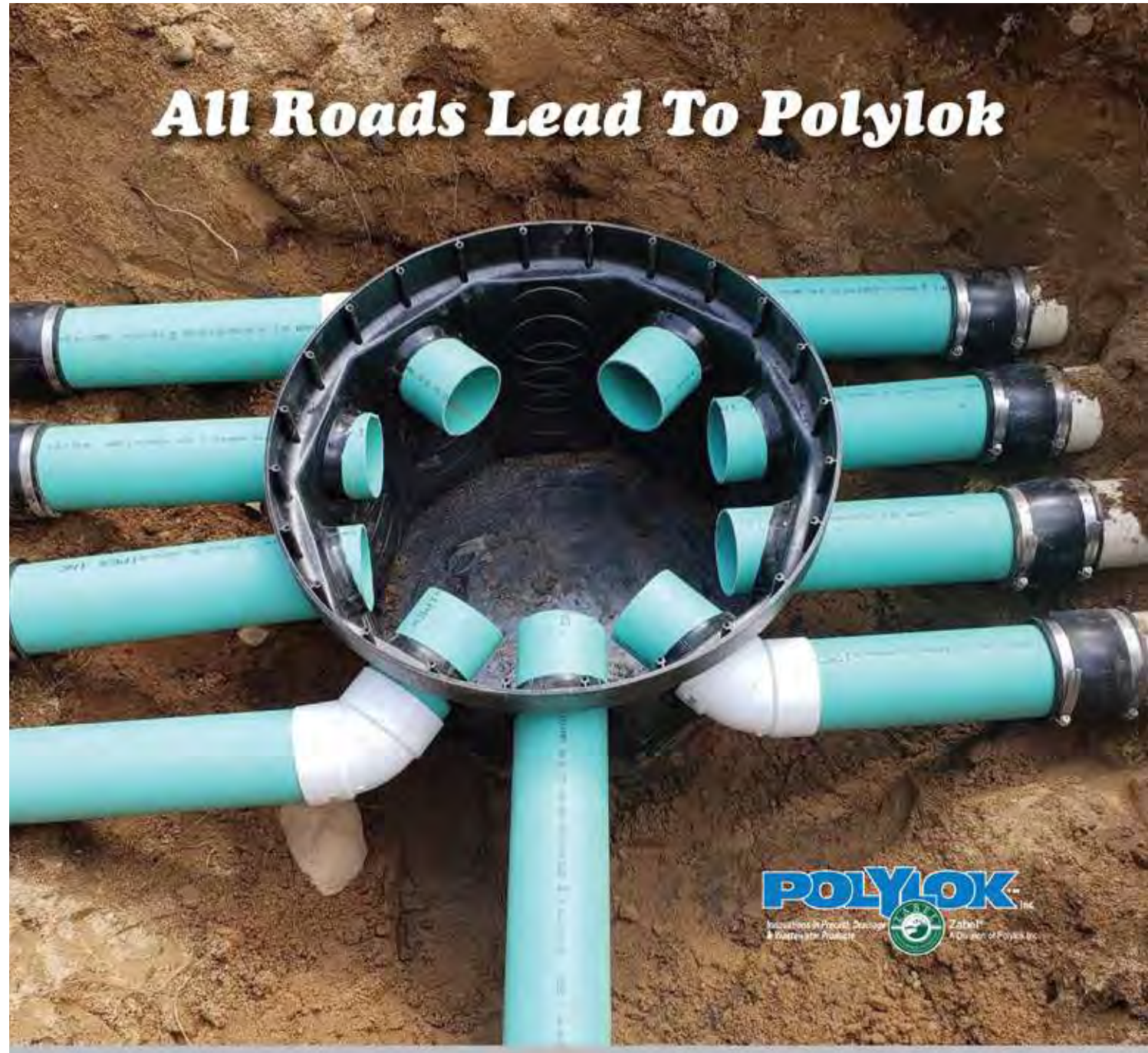
One job that comes to mind is a seasonal campground which had been flagged by the Ministry for operating without an ECA. The owner hoped to get the existing system inspected, documented, and approved – but when we came to site, the system was breaking out and found to be severely undersized. Poor soils, space and grading challenges, high strength waste, proximity to property line – that site had it all! We supported the client through the assessment and approvals process, and were able to develop a design appropriate to the situation that was approved by the Ministry.

If you could change one thing about the onsite/ decentralized industry, what would it be?

For the general public to have greater knowledge and appreciation for this critical infrastructure.

Where do you see the onsite industry going?

I could see growth in rural areas potentially driving new conversations, conventions, or regulatory changes around on-site and communal systems.



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A Three-Generation Family Company Perfects Barge Service for Hard-to-Reach Waterfront Projects

Canada's Coulson Brothers Scow Service specializes in complex onsite systems for island homes in the upscale Muskoka Lakes region.

By: Ted J. Rulseh,
 Onsite Installer Magazine, December 2021



THE LAKE COUNTRY

Coulson Bros. specializes in systems for island homes in lakes Muskoka, Joseph and Rosseau, a combined roughly 100 square miles of water about two-and-a-half hours north of Toronto. The area, known as Muskoka Lakes, has become a worldwide visitor destination.

Around the turn of the 20th century, industrial titans from Pittsburgh built summer homes there. "Then they started putting up massive hotels," says Coulson. "It became a tourist area, and everyone wanted their little piece of Muskoka. People call these places cottages, but they are borderline estates. It's not uncommon to see a 7,000- to 8,000-square-foot cottage."

Installing onsite systems for these homes is a logistical challenge few contractors face. All equipment and materials have to cross the lakes in barges pushed by tugboats. Coulson and his brother Keith custom-built most of those conveyances. There are 10 barges, on average 25 by 75 feet, fabricated from 5/16-inch steel plate.

The eight tugboats average 33 feet long with a 10-foot beam, and draft about 40 inches of water. They are powered by 300 hp Caterpillar or Cummins diesel engines.

"We started the first tugboat in 1989 and finished it in 1992," Coulson says. "It was patterned after an old steam tug that plied the lakes way back at the turn of the century. We didn't just build boxes; we tried to add some flair. Each of them has some personality. They all have names with some significance to us personally."

A wealthy gentleman about to close on the purchase of an island in a Canadian lake wanted to be sure there was room for a 4,000-square-foot house and a septic system.

The real estate agent called Arnie Coulson and asked him to go to the island and investigate. About 20 minutes later, to the buyer's amazement, Coulson called back with an answer.

"It just happened that I was in between tasks and it was a beautiful sunny day," says Coulson, co-owner of Coulson Bros. Scow Service in Milford Bay, Ontario. "It was a two-minute drive down to the dock to get in my float plane. The flight took about four minutes. I did a bunch of measuring, and 15 minutes later I called the real estate agent and said, 'Yes, we're good.'

"The gentleman had a hard time believing I was on the island because the drive up there would have taken an hour, and then you would have to find a boat. He said, 'You're going to be doing all my work from now on.'"

The man bought the island, and Coulson Bro. installed a 7,500 liter-per-day (2,000 gpd) onsite system with a Waterloo Biofilter treatment unit, along with steel docks and all landscaping on the property. It's the kind of customer service that has made this third-generation, family-owned company a fixture in its territory for more than 50 years.

PROUD HERITAGE

Ken Coulson, Arnie's father, started the business in 1969 after serving in the Royal Canadian Navy and living for a few years in Hamilton, Ontario. "He moved back, bought a barge, and the rest is history," says Coulson. "He figured out what he was going to do, and the timing was good. This area became more and more desirable. With proximity to Toronto and its financial sector, it became the go-to place to have a cottage."

The elder Coulson was among the first to install what is known as a Whitby Class 4 filter bed on an island, working under Ministry of Environment supervision. The system is similar to the Wisconsin mound; it's built with a grade of

sand found near Whitby, Ontario, that passes a sieve test for fines. “You basically dig a hole or create a pocket and add 30 inches of Whitby sand,” Coulson says. “You layer it in and level it. Then then you put a 12-inch layer of free-draining stone on top and suspend the pipe in it. That is followed by filter cloth, sand, and a topsoil cover.”

Arnie and Keith began working for the company during summers while in high school, then joined full-time. In 1992, their father retired and they took ownership; they worked in the field while their sister, Donna Robinson (not active with the company but still part owner), ran the office.

“When we took it over, our dad had two barges, and we had four employees,” Coulson recalls. “My brother and I ran with it. We started taking on larger projects. We bought our first tracked excavator around 1993. Until then it had been just backhoes. From that point, we kept building.” The company now has more than 40 employees; a steel dock division keeps the team members busy during the winters.

LAKE ACCESS

The company’s tugs and barges travel throughout the three lakes. Lakes Rosseau and Joseph are connected by a canal. Lake Muskoka is connected to the other two by a large lock and a small lock; the barges are sized to go through the large lock.

Coulson Bros. has its own commercial landings on Lake Joseph and on Lake Muskoka and can use various public landings. Each barge has two 4-foot-by-20-foot independently hydraulically operated ramps at the front for loading and unloading.



Alternative systems are more the rule than the exception on the islands. “It’s a unique area,” Coulson says. “We have a lot of pine trees and a lot of bedrock. Soil conditions aren’t necessarily the greatest. It has always been a challenge developing these properties, and the complexity of the systems has increased over the years. Everything is dictated by flow rates, which are determined by the sizing of the cottages and the number of fixture units.”

A typical system requires more than one barge load. “If we’re

doing a little two-bedroom system,” says Coulson, “we can just about get it all on one barge. But if we’re into clay soils or the site is mostly bedrock, and we have to import a lot of sand fill, that’s different.” The largest barge can carry as much as eight 20-ton loads of sand, delivered on Western Star tri-axle trucks from another company subsidiary, Muskoka Disposal.



The barges also carry a wide variety of machinery, including excavators as heavy as 45 tons.

Onsite systems mainly use plastic septic tanks supplied by Roth Global; drainfield media is stone; piping is PVC. Where conditions call for advanced treatment units, the Coulsons prefer Waterloo Biofilter units; they also install Ecoflo (Premier Tech Water and Environment) peat and Aqua-Aerobic Systems products depending on site conditions. Coulson sees and welcomes a trend toward more systems with treatment units.

Waterloo Biofilter modular flatbed systems are built with lightweight fiberglass shells that contain the filter media. The Coulsons typically install systems no smaller than 800 gpd, up to 2,641 gpd. Any system larger requires engineering and permitting through the Ministry of Environment.

STAYING COMPLIANT

Coulson Bros. enjoys close relationships with regulators in the various jurisdictions. The Ontario Building Code dictates the minimum septic system design standards, but townships have their own requirements as well.

In a typical case, Coulson drills test holes to evaluate the soils, calculates the system flow and the soil percolation rate, creates the design and sends a permit application to the township. Next comes a meeting at the site where he and the local regulator review soil conditions and discuss the design. Assuming all is agreeable, the permit is issued and

the project is placed on the work schedule.

Setbacks from the water can pose challenges on some sites. The Ontario Building Code specifies a 50-foot setback, but several townships in the Muskoka region increased that to 100 feet at the request of the lake association and out of environmental concern. Where site conditions make it impossible to meet the setbacks, property owners can appeal to the town council.

Townships also seek to minimize phosphorus discharges to the lake; that generally means limiting impervious surfaces to help prevent runoff. “If we’re landscaping with flagstone rock, we leave the joints between the flagstones open, so that when rain comes it percolates down and dissipates into the soil,” Coulson says.

To no surprise, these island septic systems are costly; prices generally range from \$25,000 to \$85,000 (Canadian dollars). The work also requires creativity: “We’ve tried to be very progressive. Because we’re in such a unique field of work, we’ve had cases where the equipment we needed wasn’t available, and we made our own.

“We converted a fleet of John Deere log-skidders by adding boxes to them, so they are like miniature off-road articulated dump trucks. We have six of them with 5-cubic-yard boxes. We dump all the soil on the barge, we go to the island and we have a John Deere skid-steer on the barge that loads the skidders. On the job site, we scoop the material out with an excavator.”



“It’s not like the equipment drove the development of the business. The development drove the equipment,” Coulson explains. “We’ve had to scale our barges up a little bit to keep up with the equipment needs of these projects.”

The equipment fleet includes:

- 23 excavators, 1.5 to 23 tons, mainly John Deere, Caterpillar and Kobelco
- 12 John Deere skid-steers on tracks and wheels
- 6 John Deere skid trucks
- 6 tracked dumpers (Yanmar and Canycom)
- 2 Western Star tri-axle roll-off trucks
- Freightliner truck

TAKING FLIGHT

Coulson’s float plane, which he flies mainly for pleasure, plays no small part in the equipment fleet. It’s a fully restored 1964 single-engine Cessna 180 Coulson has owned for 10 years. It helps him save time, especially when there’s a need to respond to a customer, or help a work crew that has experienced an equipment breakdown or some other problem on a site.

In one case, an architect, a homeowner and a building contractor were meeting on a site; they called to ask a question. “I said it would be better if I was there,” Coulson recalls. “They said, ‘OK, we’re going to be here for a couple of hours figuring this out.’

“I jumped in the airplane, and I was there in seven minutes. I landed, and the owner came down and said, ‘I have never in my life experienced this type of customer service.’

“It’s not that the plane gets used for work a lot, but when your whole business revolves around water-access properties, it’s a great convenience.”

And it’s a convenience for customers to have a company like Coulson Bros. to provide wastewater treatment for their island getaways.

This article first appeared online at OnsiteInstaller.com December, 2021, published by COLE Publishing, Three Lakes, Wis. It is reprinted by permission.



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Ken White Construction Uses Social Media to Reshape Third Generation Business

Story continued from cover...

MAKING THE MOST OF SOCIAL MEDIA

While the worker shortage continues to be problematic for the construction industry, it is not an issue for Ken White Construction, notes Taylor. "One of the most effective ways we have been able to attract workers is the use of social media. Everybody we have hired in the past two years has come from social media."



Along with spotlighting its vehicles, machines and workers in action, social media is used to show that "family is the foundation of our business and all employees are treated like family," he points out.

"Our social media targets a young demographic. I show our company culture, demonstrate that Ken White Construction is a fun place to work while getting things done and doing it safely. I also show how we keep employees interested and engaged. All that helps us retain employees."

Taylor launched the Ken White Construction YouTube channel about two years ago. Shortly thereafter he began posting on both Instagram and TikTok.

"We have created a following of more than 150,000 people on all three platforms combined," noted Taylor.

TAKE THAT NAYSAYERS

At an early age, Taylor had a love for filming and editing and was always filming his friend doing things, like riding dirt bikes. "When YouTube came out, I wondered how I could use it to market and grow Ken White Construction. I created a video niche to basically showcase our jobs and equipment, and I post regularly."

When Taylor began using social media, many of Ken White

Construction's competition in the rural Carp area were questioning the move. They thought it made no sense.

"I didn't care about what people thought," he says. "I knew what I was doing would work and was in the best interest for our business."

"The exposure we have received has been amazing. Believe it or not, we sell merchandise to Slovakia, Germany and Russia. I wish my grandfather were around to see that."

"Businesses in the construction industry need to understand that social media is a huge force," asserts Taylor. When a company posts to social media, those who like or follow the company often share the posts. All of this creates attention and increases visibility for the company's brand and business.

A STRATEGY FOR DIFFERENTIATING

Ken White Construction recently did a branding makeover to more effectively make itself known to the public, stand out from competitors and attract employees.

The purpose of the new branding was twofold, says Taylor. It was designed to create – at first glance – eye-catching machines and trucks. It was also intended to create a stand-out business.

"The idea was to have a brand that would attract people and make them want to come to work for Ken White Construction before they even knew about the company and what it did," he explains. "What I started doing was making things cooler and more aesthetically pleasing."

All the company's machines and trucks are painted a shiny black. The trucks are decked out with chrome accessories.



"This attracts people because it is something they do not see very often. People that come to work here do so because they want to run the really cool-looking equipment and trucks."

Ken White Construction has a workforce of 18 men and women. “Our 10-year goal is to have 100 employees, says Taylor. “We are making certain that everyone understands the path the company is on.”

SAFETY IS A TOP PRIORITY

There is a strong emphasis on safety at the company, points out Taylor. “Safety is always a top priority and we are constantly improving our safety training and safety standards.”

The company recently switched over to cloud-based services for safety training, especially for its tailboard meetings – held every morning at jobsites – and its weekly safety meetings. The company continually invests in programs to help employees understand the hazards, work procedures and specific precautions associated with the jobs they do.



LEVERAGING TECHNOLOGY

Like many companies in the construction industry, Ken White Construction is “particularly interested in technology that makes our everyday tasks quicker and more efficient, reduces costs and increases safety and productivity, Taylor says.

An emphasis has been on technology that simplifies and automates information capturing and integrating data into company systems in real time. The company recently brought on board ClockShark, a time tracking and scheduling software that tracks employees time and locations while out on the jobsite and runs payroll quickly and accurately.

Workforce efficiency has been improved by issuing iPads to its mobile workers, he adds. This enables workers to upload completed safety compliance sheets, jobsite photos, plans and other information and send it directly to the office.

Within the next year, the company plans to incorporate GPS technology on its machines.



KEEPING UP WITH INDUSTRY TRENDS

To remain a successful business in the construction industry, Taylor stresses the importance of keeping up with new trends, developments, equipment, vehicles, software and technology. This, he notes, can be a daunting task.

He says industry trade shows, like CONEXPO-CON/AGG, help him stay “on top of things.” There are always a variety of educational sessions, plenty of opportunities to see the latest product, technology and equipment innovations, plus participate in product demonstrations. Additionally, there are many opportunities to network.

This article originally appeared in CONEXPO-CON/AGG 365 at news.conexpoconagg.com

Considerations and Challenges of Treating High Strength Wastewater Treatment – Comparing Different Approaches

*By: Marie-Christine Bélanger, M.A.Sc., Product Director North America; Yan Gilbert, Ph.D., Wastewater Treatment Process Expert; Martine Séguin, P.Eng., Application Engineering Manager.
- Premier Tech Water and Environment.*

INTRODUCTION

Most states have not taken high strength wastewater characteristics into consideration when proposing guidelines and regulations for designing onsite sewage treatment and disposal systems. Various factors can cause high strength wastewater:

- High inputs of BOD, TSS, FOG, Nitrogen
- Lack of dilution from low waste strength inputs – use of low flow water fixtures
- Upset of the septic tank (hydraulic, chemical, sludge, etc),
- Operation and maintenance issues

However, the focus is put here on the commercial and non-residential buildings that can use water for different purposes than typical residential use, which can lead to unusual or high wastewater strengths.

A number of states are now recognizing that effluent BOD5, TSS, and FOG concentrations in excess of domestic septic tank effluent may need to be addressed in a different manner. Many pretreatment possibilities exist. To what extent these “pretreatment” alternatives reduce high-strength wastewater is yet to be completely understood. The Environmental Protection Agency (EPA) and National Sanitation Foundation, International (NSF) are working on a testing protocol that may assist in determining the treatment capacity of these “pretreatment” alternatives.

HIGH STRENGTH WASTEWATER MAIN CONTRIBUTORS

Onsite wastewater treatment system design and sizing is typically based on wastewater design flow with the assumption that the wastewater strength is within standard ranges for domestic (residential) strength wastewater. While many applications are within the low or moderate strength ranges (table 1), many non-residential or commercial establishments may produce higher wastewater strengths or may include chemicals that may harm or reduce treatment performance.

| Table 1 | | | |
|------------------|--|------------------------------------|--------------------------------|
| Parameters | Domestic/Low strength (Raw wastewater) | Moderate strength (Raw wastewater) | High strength (Raw wastewater) |
| BOD ₅ | 100 - 300 mg/L | 300 to 1,000 mg/L | > 1,000 mg/L |
| TSS | 100 - 350 mg/L | > 350 mg/L | > 350 mg/L |
| TKN | 40 – 60 mg/L | 60 – 100 mg/L | > 100 mg/L |
| FOG | 50 – 150 mg/L | > 150 mg/L | > 150 mg/L |

Designers and owners of various non-residential or commercial enterprises should be aware of some unique and potentially damaging wastewater characteristics that may be encountered in the waste stream. These establishments may produce wastewater with high strengths (characterized by high BOD, TSS, and Fats, Oil

and Grease influent numbers); while others may contain harsh chemicals used in processing or cleaning activities. Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Fats, oils and grease (FOG), and Total Suspended Solids (TSS) are parameters that can indicate the wastewater strength and its biodegradability.

Among the types of establishments that may produce non-domestic or high-strength wastewater, there are:

- Food Establishments - Restaurants, fast food restaurants, coffee shops, deli's, convenience stores, cheese makers, breweries, wineries, bakeries, food courts;
- Hotels, motels, campgrounds, churches;
- Hospitals, nursing homes, dental offices, schools;

Laundromats, funeral homes, taxidermy operations, slaughterhouses, pet kennels, beauty salons.

ORGANIC MATTERS

BOD is directly related to the amount of food products in wastewater. Unused coffee, dairy products, soda pop, juices or other high sugar content beverages have a high BOD concentration that can adversely impact a treatment/ disposal system if not taken into account when the system is designed. Few examples are presented in the table 2 below.

| Table 2 | | |
|---------------|-------------------------|-----|
| Food Products | BOD ₅ (mg/L) | pH |
| SODA | Up to 79,500 | 2.4 |
| BEER | Up to 80,000 | |
| WHOLE MILK | 104, 600 | |
| SKIM MILK | 67,000 | |
| ORANGE JUICE | 7.85 lb/100 lb | |
| POTATOES | 4.20 lb/ 100 lb | |
| POTATO CHIPS | 1.25 lb/ 100 lb | |

Ref: Carawan, R.E., NC State University, Water and Wastewater Management in Food Processing (1979)

Obviously, efforts should be made to limit the amount of food wastes going to in-sink garbage disposals; removing leftover food and any oil and grease from plates and cookware before washing them. BOD5 is directly related to the amount of food products in the wastewater.

To add to the complexity, not all restaurants are created equal. Table 3 below presents a summary of a sampling campaign performed in 2013, for a study conducted by the Harris county Public Infrastructure Department, on different types of restaurants.

| Table 3 | | | | |
|---------------------------|---|--------------------|--------------------|--------------------|
| Restaurant Type | n | Average BOD (mg/L) | Average TSS (mg/L) | Average FOG (mg/L) |
| FAST FOOD | 6 | 2,136 | 233 | 102 |
| PIZZA | 1 | 1,856 | 321 | 183 |
| CHINESE | 4 | 1 364 | 448 | 241 |
| MEXICAN | 9 | 1 254 | 668 | 190 |
| AMERICAN | 1 | 1063 | 297 | 147 |
| AMERICAN BUFFET | 1 | 792 | 195 | 63 |
| STEAKHOUSE | 2 | 601 | 160 | 77 |
| SEAFOOD | 3 | 555 | 229 | 47 |
| Typical Residential Range | | 100-400 | 100-350 | 10-65 |

In addition, unusual waste streams like breweries, wineries, cheese makers, and slaughterhouse wastes, if mixed with domestic wastewater, should be carefully evaluated to understand the characteristics of the waste stream. Sometimes these wastewaters are deficient in nitrogen, phosphorus, or even bacteria which are all needed in order to begin to treat the wastewater (University of Minnesota Onsite Sewage Treatment Program <http://septic.umn.edu/>). Consideration to collecting and disposing separately those wastewaters from domestic wastewater source should be given.

FOG

Although conventional grease traps are supposed to prevent grease from entering the septic tank or sewer line, high grease loads, emulsified grease, undersized grease traps, poor maintenance, and surges in the wastewater flow may cause grease and oils to escape the grease trap. Problems can occur when oil and grease liquefy at the high-water temperatures used to wash dishes and then congeal when it cools. The congealed oil and grease can then accumulate in sewer lines or in/on the onsite wastewater treatment systems, creating variety of issues depending on the type of system. The problem is exacerbated when highly efficient detergents, enzymes, and/or bacteria are used to emulsify the oil and grease keeping it in suspension until it reaches a point where it starts to cause issues. Emulsified oil and grease have been broken up into very small droplets and occurs either by mechanical, biological, or chemical action.

Biologically and chemically emulsified oil will take a longer time to separate increasing the risk of carrying it to downstream components unless long quiescent periods are available to allow separation.

But what is the difference between fats, oils and greases.

Fats - Animal fat is relatively easy to hold in a tank and quite sensitive to temperature. It becomes a solid at 25°C and wastewater temperature is usually less than 25°C in the exterior tankage, ranging around 16°C. Animal fat will break down through a biological process but it takes four times more energy to break down than the organic matter typically measured by BOD. Fat is added to the system from cooking, clean up, and dish washing so commercial systems will typically have higher levels of fat than residential systems. If a system is supplied with a lot of animal fat, it will typically stay in the grease trap or septic tank. If it is contained in the grease trap or septic tank, it may not be observed in FOG measurements in downstream components.

Oils - Vegetable oil is not as sensitive to temperature as fat and can pass through grease interceptors or septic tanks more readily. Oil can also be broken down through a biological process but it takes 12 times more energy than the organic matter typically measured by BOD. There are many different types of oils used but vegetable is the most common. Vegetable oil is often used in the liquid form but it can also be solid shortening. The liquid form is harder to hold in a tank. The ability of the oil to separate is influenced by temperature and by how the oil was generated and used.

Grease - Grease is petroleum-based and can be toxic to a system. Because grease is petroleum-based, it is difficult to break down but it can be separated. Grease comes from lotions, hair products, and soaps. Typically, there will be a higher percentage of grease in the FOG from residential systems when compared to most commercial systems. Grease can build up over time coating components and inhibiting treatment of other constituents in the wastewater.

EMERGING CONTAMINANTS

Little is known about contaminants of emerging concern and their possible impacts on system performance. These include groups of products such as pharmaceuticals, personal care products, and manufactured by-products.

Harsh cleaning chemicals can harm septic tanks and treatment performance especially the use of quaternary ammonia and other harsh chemicals. Quaternary ammonium compounds or "QUATs" are chemicals that are used in a variety of different personal care products.

They are used as conditioning agents to give skin and hair a smooth feel. They make clothes feel softer after being washed so they're also a common ingredient in fabric softeners. The foodservice industry uses QUATs as a disinfectant. The cleaning habits and kitchen practices of commercial facilities can differ significantly from domestic practices, and in fact can differ significantly from commercial facility to commercial facility. Restaurants are especially difficult because health and safety is paramount in the operations. Most restaurants adhere to strict cleaning procedures to meet health requirements, which if not met, can mean that the business is forced to shut down. QUATs can be found also in shampoos, toilet cleaners, hand soap, shaving cream, baby wipes, body wash, sunscreens, moisturizers, disinfectant sprays, liquid fabric softeners, anti-cling dryer sheets, etc. Quats are formaldehyde releasing toxic chemicals that have been associate with multiple health risks including:

- Allergies & irritation (skin, eye, lung)
- Contact dermatitis – Studies estimate that between 13% and 34% of contact dermatitis cases may be linked to quats.
- Asthma
- Fertility Issues
- Birth Defects

Also, pharmaceuticals will likely be present in the waste stream due to the fact the majority of these compounds will be excreted by patients with the impact that can be observed on performance of septic systems.

TEMPERATURE

The temperature of wastewater is typically warm enough to encourage biological activity needed for treatment. Commercial dishwashers can be set at very high temperatures which may impact treatment and/or the ability of fats, oils, and greases to solidify in the grease and septic tanks.

pH

pH can be affected by cleaning chemicals and certain food wastes. If the pH is out of the normal range (typically 6.4 to 8), it can impact biological activity that is part of the treatment process and will contribute to put back in solution precipitated of Ptot when conditions become acidic.

Alkalinity, which is a property that stabilizes the pH in a solution, is also important particularly in the nitrification/ denitrification process. Lack of alkalinity may inhibit nitrification process which is consumed in a 7 alkalinity to 1 N ratio. Alkalinity in water can vary quite a bit from one

region to another one depending on its source (surface or groundwater) and soil geology. It is recommended to maintain a minimum residual alkalinity of 50 mg/L to prevent acidification of treated water and to maintain favorable conditions for the wastewater treatment process.

Flow


Flow variations can have an important effect on treatment if they are not taken into account and well assessed during the design phase of a system. There are numerous terms used to define hydraulics and flow that needs to be understood in the design and operation of an onsite system:

- Average daily flow rate: average volume of wastewater in a 24-hour period; calculated from values measured over a period of time;
- Daily flow rate: measured volume of wastewater generated from a facility in a 24-hour period; expressed as a volume per day;
- Daily design flow rate: estimated peak volume of wastewater for any 24-hour period; parameter used to size non-residential systems;
- Design flow rate: estimated volume of wastewater per unit of time for which a component or system is designed; commonly called 'design flow' – usually it is based on theoretical values extracted from local jurisdiction's regulation;

- Hourly peak flow rate: highest flows measured for a one-hour period;
- Instantaneous peak flow rate: highest recorded flow rate occurring within a given period of time;
- Surge flow: flow of effluent greater than average and occurring for short periods of time.

Depending on the application, flow can vary quite a bit during a day (restaurants) or a period of time (churches). Flow equalization is a treatment system component that includes sufficient effluent storage capacity to allow for uniform flow to a subsequent section of the treatment despite variable flow from the source. For systems with significant flow variations, flow equalization can be utilized to dampen the effect of peak flows.

Go to the 'Latest News' tab on OOWA's website to continue reading this article:
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