

Onsite

ONTARIO ONSITE WASTEWATER ASSOCIATION NEWSLETTER

Education | Engagement | Leadership

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Ontario Onsite
Wastewater Association

What's New in the CAN/BNQ 3680-600/2023 Standard?

By Anne Egan

P.Eng., Manager, Onsite Wastewater, R.J. Burnside & Associates Limited

The new version of the CAN/BNQ 3680-600 standard (Onsite Domestic Wastewater Treatment Systems) was released in January 2023. This updated version replaces the previous 2009 version of the standard and technologies seeking to be certified will now be tested according to the new version. The Standards Development Committee for this updated version included manufacturer representatives, as well as regulatory representatives from several provinces, and other interested groups such as the Ontario Rural Wastewater Centre (ORWC), the Western Canada Onsite Wastewater Management Association (WCOWMA), and the Ontario Onsite Wastewater Association (OOWA).

There are many changes in the 2023 version of the standard, ranging from wording updates and clarifications to more substantive changes, such as new classes of treatment for water reuse applications, and an entirely new Annex to better define the concept of a "model" for the purposes of the standard. The new standard also allows for increased flexibility for influent supplementation or dilution to meet the influent concentrations required by the standard, which will reduce testing delays and extra costs that some manufacturers have previously experienced as a result of influent at the test facility that is outside the required concentration ranges.

One of the most significant changes to the standard is the incorporation of the annual field performance tests directly into the standard. Previously, companies that completed their testing at the BNQ facility in Quebec were required to follow CAN/BNQ 3680-900, which is the certification protocol that outlines the procedures and administrative requirements associated with the testing and certification process. However, companies that completed their certification to the CAN/BNQ standard at an approved NSF facility (such as the former Alfred College site, or the new Minden test site) would have been required to follow NSF protocols. The CAN/BNQ certification protocols contained a requirement for annual field audits of installed systems as part of maintaining the certification for a given product. These field audits are not contained in the NSF protocols and as a result, companies that tested at NSF facilities have historically not been required to undergo the annual field performance tests associated with the CAN/BNQ protocols.

Story continues page 24

Land Acknowledgement

The Ontario Onsite Wastewater Association (OOWA) represents members from across the Province of Ontario and beyond. We respectfully acknowledge that Ontario's lands and waters are the traditional territories of many First Nations, including the Anishnaabeg, Cree, Haudenosaunee, Huron-Wendat, Mississauga, Odawa, and Petun.

Our office in Nogojiwanong, or Peterborough, Ontario, is on the traditional territory of the Treaty 20 Michi Saagiig and Chippewa Nations, collectively known as the Williams Treaties First Nations, which include Curve Lake, Hiawatha, Alderville, Scugog Island, Rama, Beausoleil, and Georgina Island First Nations.

OOWA acknowledges that the First Nations have been and continue to be the stewards and caretakers of these lands and waters in perpetuity, and that they continue to maintain this responsibility to ensure their health and integrity for generations to come.

As onsite wastewater professionals, we have a role in protecting our waterways and human health by following industry best practices and promoting the regular maintenance of onsite wastewater systems.

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President's Message Convention 2023



Did we make it? Are we at Deerhurst for the convention? After two years of virtual conventions, it is great to be in-person together. Together is better.

But why are we here? Technical and training resources as well as networking opportunities are the top reasons members join and stay with OOWA.

In the spirit of creating value for our members, the convention agenda is packed with technical and training resources. Sunday includes three in-depth training sessions on Biological Health & Safety, Soil Characterization, and a course intended for Regulators. The Monday and Tuesday breakout sessions cover a wide range of technical and product information that will interest those in our industry. Both keynote speakers are sure to engage, inspire, and entertain.

Our exhibitors are excited to network with OOWA members once again. Drop by each booth to see what they have to offer and earn points for prizes. More casual networking is available at the welcome reception (with board games, beer sampling, and trivia), banquet (with dinner, awards, and entertainment) and hospitality suites. Take these opportunities to catch up with old friends and meet new ones.

For those who are unable to attend in person, there is a virtual access only option. This includes access to the virtual platform, networking, gamification, and mobile app during the live event and recordings of a selection of the presentations after the fact. The recordings will be made available to those who attended in-person as well. No more wishing you could be in two places at once!

Although the convention is our biggest event of the year, we are bringing technical and training resources and networking opportunities to members year-round, including the following:

- Fall Regional Meetings,
- Training courses,
- Online videos,
- Guidance documents,
- Weekly social media posts,
- Pre-recorded presentations,
- Member forum (planned for 2023), and
- Social event (planned for 2023).

Come to the Annual General Meeting on Sunday, March 26 to hear more from each OOWA committee on how they have delivered these and other initiatives for members in 2022 and what they have planned for 2023.

Be sure to thank the OOWA staff, Kelly and Jenn, as well as the Board & committee volunteers for delivering the convention and everything else they do during the year to make your membership worth it.

Enjoy the convention!

Brady Straw, President



Ontario Onsite Wastewater Association
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www.oowa.org

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

OOWA COMMITTEES



Communications



External Relations



Onsite Technical



Events



Membership Services



Professional Development

OOWA
NEEDS YOU!

WHAT’S IN IT FOR ME?

Are you an engaged professional looking to expand your knowledge and expertise? Do you care about improving the onsite wastewater sector? Do you want to collaborate with some of the industry’s leading experts? Consider joining one of our volunteer committees or board of directors to grow your influence in the industry.

WHAT IS EXPECTED?

Our committees and board meet once a month (or as needed) via ZOOM to discuss, plan, and implement initiatives stemming from our Strategic Plan. You don’t have to commit right away - come as a guest to a meeting to test the (waste)water!

info@oowa.org
1-855-905-6692



CONVENTION SCHEDULE - DAY 1

Sunday March 26 | Deerhurst Resort Huntsville, Ontario



| | | |
|-------------------|--|--|
| 10:30am - 11:30am | OOWA Board Meeting | JEH Macdonald Room |
| 12:00pm - 4:00pm | Registration Desk Open | Guest Service Foyer |
| 12:00pm - 6:00pm | Exhibitor Set-Up | Legacy Hall |
| 1:00pm - 4:00pm | Training Sessions (See page 15) | |
| 4:15pm - 5:15pm | Annual General Meeting | Waterhouse Room |
| 5:15pm - 6:45pm | Guests to have Dinner | Eclipse and Compass Restaurants open for service |
| 7:00pm - 9:00pm | Welcome Reception: Trivia, Games, Sawdust Brewery Sampling | Legacy Hall |
| 9:00pm Onwards | Hospitality Suites | |

*Note that the Convention agenda is subject to change.

Thank You To Our 2023 Annual Convention & Expo Sponsors

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CONVENTION SCHEDULE - DAY 2
Monday March 27 | Deerhurst Resort Huntsville, Ontario



Table with 3 columns: Time, Activity, and Location. Rows include: 7:30am to 8:45am Networking Breakfast (Legacy Hall), 8:45am to 9:00am Convention open and welcoming remarks (Peninsula Room), 9:00am to 10:00am KEYNOTE ADDRESS by Jill Heinerth (Peninsula Room), 10:00am to 10:20am Networking Break and Exhibit Hall, 10:20am to 11:20am Session 2A and 2B (Waterhouse 1-3 and 4), 11:25am - 11:55am Session 3A and 3B (Waterhouse 1-3 and 4), 12:00pm - 12:30pm Session 4A and 4B (Waterhouse 1-3 and 4), 12:30pm - 1:40pm Networking Lunch & Exhibit Hall (Legacy Hall), 1:40pm - 2:10pm Session 5 (Peninsula Room), 2:10pm - 2:40pm Session 6 (Peninsula Room), 2:45pm - 3:45pm Session 7 (Peninsula Room), 3:45pm - 4:00pm Networking Break and Exhibit Hall (Legacy Hall), 4:00pm - 6:00pm Self Directed Onsite Activities, 6:00pm - 7:00pm Pre-Banquet Reception (Rotunda), 7:00pm - 9:45pm Annual Awards Banquet and Entertainment (Peninsula Room), 9:45pm Onwards Hospitality Suites.

CONVENTION SCHEDULE - DAY 3
Tuesday March 28 | Deerhurst Resort Huntsville, Ontario



Table with 3 columns: Time, Activity, and Location. Rows include: 7:30am to 8:55am Networking Breakfast (Legacy Hall), 8:55am to 9:00am Opening Remarks (Peninsula Room), 9:00am to 10:00am KEYNOTE ADDRESS by Chris Magwood (Peninsula Room), 10:00am to 10:30am Networking Break and Exhibit Hall (Legacy Hall), 10:30am to 11:00am Session 2A and 2B (Waterhouse 1-3 and 4), 11:05am - 11:35am Session 3A and 3B (Waterhouse 1-3 and 4), 11:40am - 12:10pm Session 4A and 4B (Waterhouse 1-3 and 4), 12:10pm - 1:10pm Networking Lunch & Exhibit Hall (Legacy Hall), 1:10pm - 2:10pm Session 5 (Peninsula Room), 2:10pm - 2:40pm Session 6 (Peninsula Room), 2:40pm - 3:10pm Session 7 (Peninsula Room), 3:10pm - 3:30pm Conference Closing Remarks, Prizes and Announcements (Peninsula Room).

*Note that the Convention agenda is subject to change.

2023 Keynote Speaker



Jill Heinerth

Explorer-in-Residence

The Royal Canadian Geographical Society

2023 Keynote Speaker



Chris Magwood

Author, Researcher and Teacher, Co-Founder

The Endeavour Centre | The Sustainable Building School

MON. MAR 27
9AM - 10AM

Cave diving: learning through discovery, and practical insights for collaboration, risk management, and safety culture

More people have walked on the moon than have been to the places Jill Heinerth has explored right here on Earth. Instead of following maps, she has blazed a trail into the planet exploring lava tubes beneath the ocean floor, submerged caves inside icebergs and even stormwater conduits in urban settings. She has followed the connective path of water through the environment working with scientists in countless disciplines from hydrogeology to archaeology.

Heinerth will share what it takes to rise beyond expectations, challenge the unknown, and overcome fear. She tells remarkable stories about lessons learned in the deadly arena of extreme underwater exploration and adventure filmmaking, applying her practical knowledge to provide lessons on risk management, safety culture, discovery learning, failure, and collaboration.



TUES. MAR 28
9AM - 10AM

Exploring life cycle planning and embodied carbon for the onsite wastewater industry

The connection between the work we do and the climate is not always obvious. Life cycle assessment of systems and materials can help to make these links more visible, and show us how we can reduce our climate impacts. With our climate in trouble, even those of us who aren't aware of our climate impacts will need to respond if we are going to meet the minimum requirements of the Paris Agreement.

I set out in 2011 to understand the climate impact of the “green” building project I was working on, and what I found changed my approach to building and design profoundly. I had seen the need for energy efficiency and reduced waste, but I was shocked to realize that the carbon footprint of building materials outweighed many decades of operational emissions from a building. This began a “deep dive” into life cycle assessment in the construction industry and a growing awareness of what needs to be accomplished to bring the industry into line with Canada’s climate goals. I now help governments, developers, builders and material manufacturers figure out how to get the industry to zero carbon emissions by 2050.

The same kind of analysis can be used in any industry. In this presentation, I will share an overview of what I’ve learned from building construction and show how the same lessons and insights can be used in the wastewater sector. We’ll look at a few key points:

What is life cycle assessment (LCA) and how does it work?
What does LCA show us about the wastewater sector?
How can designers and installers use this new information to reduce impacts?

I hope that this session will provide you with the same kind of “aha moment” that changed my approach to building and that you’ll never see your work in the same way again.

2023 Convention Presenters



Marie-Christine Bélanger

Marie-Christine Bélanger is the current Product Director and Government Relations at Premier Tech Aqua (PTA). Ms. Bélanger joined PTA in 2002. Her functions at PTA have brought her to play key roles on several steering and advisory committees throughout North America, namely with the BNQ, CSA, NOWRA, NSF, local, provincial and state organizations. She has taken part in the development and advancement of industry-wide regulations and standards leading to better protection of the environment and the public's health. Ms. Bélanger holds a Physics Engineering degree from Laval University and a Master's degree in Chemical Engineering from L'École Polytechnique de Montréal.



Jasper Belding

Jasper graduated from Mohawk College with a diploma in Chemical Engineering Technology and now works for Waterloo Biofilter Systems as a Technical Sales and Field Support Representative. Through ten years in various roles within the wastewater industry, he has gained experience in procurement, manufacturing, design, on-site installation, maintenance, and repair of residential and commercial onsite sewage systems.



Lars Bergmann

Lars Bergmann, Dipl.-Kfm., is the Co-Owner and CEO of Bergmann North America Inc. Being in the onsite industry for 20 years, he developed and promoted wastewater products and services in 28 countries. Working with international and multicultural teams in Germany, in Eastern European countries, Scandinavia, Asia and North America, Lars was able to learn about alternative approaches, local conditions and requirements regarding water and wastewater management. In October 2022 he was approached by the Helmholtz Centre for Environmental Research to take over the project lead to develop an "Institute for Distributed and Resilient Infrastructure" in Germany.



Roddy Bolivar

Roddy is the Make-Way Environmental Technologies Customer Service representative in Eastern Ontario. Starting his career with undergraduate degrees in both Biology and Engineering, Roddy has kept the environmental impacts and benefits of the onsite industry foremost in his work. With over 30 years of professional practice, Roddy's experience includes design and supervision of onsite and communal systems installations, regional planning for wastewater management and writing water policy documents such as Official Plans. Since 2020 Roddy has taken a leadership role in business planning for the company's new Graf line of stormwater management and rainwater management products.

2023 Convention Presenters



Colin Côté

Colin Côté, M.Sc.A., BDI, ADIQ., is a Senior Industrial Designer at Premier Tech Water and Environment. He has acquired extensive experience in industrial design over the past 15 years. He has contributed to the success of World class Design companies and his projects have received several Design awards. Born in Montréal in 1979, I hold a master's degree in Design and Complexity from the Faculté de l'aménagement of the Université de Montréal and am now working at the School of Design at Laval University in Québec. I worked as a research assistant with CIRAIQ and the Laboratoire Ecodesign of the Université de Montréal. This was part of a project led by the Potidesign group, in Brazil, to introduce eco-design to small businesses in the province of Rio Grande do Norte. I also wrote publications on simplified life cycle assessment tools. In 2004, I worked as an eco-designer and adviser on various eco-design projects at an agency in the Rhône-Alpes region of France, as well as wrote an eco-creation guide for the Centre de création conscience. In September 2006, I taught at the École de design industriel of the Université de Montréal, where I supervised and trained third-year students in the field of eco-design. I started my professional career in 2005 by joining the Design Studio of Claude Mauffette and in 2008 I joined the Design Studio of Michel Dallaire. During this period I was involved in the design of one of the most renowned Public Bike Sharing System that is installed in New York, Chicago, London and 30 other cities around the world. I joined the design studio of Steelcase, where I had the opportunity to lead different projects: Ology bench NA, Mackinac Adjustable Height Work Surface, Active touch controller for Ology (Linak), High-density storage and exploration of the smart and connected object. I joined the PTWE IR&D team in 2020.



Terry Davidson

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. In his "spare" time Terry is a Director with the Ottawa-Carleton Soil & Crop Improvement Association and operates a cash crop farm (corn, soybeans, wheat) near Kinburn in the City of Ottawa.

2023 Convention Presenters



Gerry Dignard

Gerry Dignard is the CEO at Canadian Shield Consultants. In 1996, Canadian Shield Consultants first became involved in environmental consulting during the diversion of wastewater regulations from the Environmental Protection Act to the Ontario Building Code sensing a need for service delivery between the regulatory framework and the public. Canadian Shield Consultants sells and services on-site wastewater and water treatment systems for clients in mining, forestry, tourism, business, industrial, residential, and commercial industries. The firm engineers, designs, manufactures, installs and maintains the systems, including self-contained systems which are primarily used in remote areas inaccessible by road or sites with limited access. Canadian Shield is continually researching technologies for treatment of all types of wastewater strength. We have completed research in the treatment of landfill leachate, winery wastewater, high strength kitchen waste, mine tailings ponds, and others. Born and raised in St Charles, located just east of Sudbury and north of the West Arm of Lake Nipissing, the French Canadian family name "Dignard" is well known for its agricultural roots and love of all things Northern Ontario. Hockey, snow shoeing and timber harvesting are just a few of the activities that keep Gerry away from the office and in touch with the outdoors.



Hank Dubee

SGT Hank Dubee has been an Enforcement Officer for the Ministry of Transportation for 32 Years. Specializing in vehicle safety, traffic rules/regulations and the Transportation of Dangerous Goods, SGT Dubee is a Provincial trainer/instructor for both the MTO and OPP. He looks after multiple platoons for the area patrol and scale operations in the Central Region, including York Region, Metro Toronto, Simcoe County, and Caledon Region. SGT Dubee's dedication to the safety of Ontario highways shows by sharing his knowledge with the general public through discussions and public presentations.



Rick Esselment

Rick is the President and Founder of ESSE Canada, a water resource management firm providing warranty, operation, maintenance, inspection and management services for drinking water and wastewater treatment clients in Ontario and Nova Scotia. He is a Past President of OOWA and has held a Director position with the Association for the past 8 years, serving as Chair on several committees. Rick has a Bachelor of Science in Microbiology, Bachelor of Applied Science in Public Health, Post-graduate Diploma in Occupational Health and Safety, and is a certified public health inspector.



Don Ford

After a 15-year career in environmental consulting on projects across Canada, the US, and the Caribbean, Don joined Toronto and Region Conservation in November 2002. He now manages the Hydrogeology group and is the practice leader for hydrogeology and the technical lead for drinking water source protection work under the Clean Water Act. Toronto and Region Conservation works with the province, municipalities, and private landowners to protect and enhance our natural environment. In particular, the Hydrogeology Group helps ensure that groundwater resources are identified, characterized, and protected in terms of both quality and quantity. He has spoken about hydrogeology and drinking water to a wide variety of audiences across Canada and in France. When he isn't working, he can usually be found at his cottage near Parry Sound, which has an on-site sewage system.

2023 Convention Presenters



Liam Hand

Liam Hand is a graduate of the Civil Engineer Technology program at Georgian College. He began his career with quality control in the road industry. In his current role with Coulson Bros. Scow Service, he is part of the estimating team as well as a project coordinator. Liam works with a team of individuals to help design the most efficient onsite sewage systems for island properties on the Muskoka Lakes.



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.



James Hotchkies

With over 35 years of experience in the water sector, Jim Hotchkies has held senior management positions with many of the industry's leading firms around the world, including ZENON, GE Water, Toray, Ostara, and others. Jim has led the development of decentralized treatment solutions at many of these firms and has been an advocate for advanced on-site treatment across the industry. Jim is a graduate of McMaster University and, after 15 years of overseas experience in Australia and Europe, is now based near Fort Erie.



Julie Ingram

Julie Ingram is currently the Manager of Environmental Health with Peterborough Public Health (PPH). She has been involved in the onsite sewage system industry since 2012 as an Inspector and Chief Building Official for Part 8 in the areas served by PPH. Julie is a devoted advocate for environmental and community health. Climate change is a personal and professional passion of Julie's and she is thrilled to be working on PPH's strategic goal of ensuring that people most vulnerable to the health impacts of climate change are supported in adapting to and reducing negative health impacts. Julie identifies herself as a proud member of OOWA and currently sits on OOWA's Membership Committee.

2023 Convention Presenters



Chris Kinsley

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.



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-inspection 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.



Howie Pearson

Howie leads the research and development team and problem solves for Quorum, an environmental consulting firm, manufacturer, and service provider for wastewater treatment and collection system operations. An avid environmentalist with a strong desire to improve the natural beauty of our small Earth, he implements these ideals through scientific analysis and development in private industry. Howie has gained experience in chemistry, electrical engineering, and mechanical engineering through rigorous training and experience in the United States Marine Corps, in addition to post-secondary academic studies. His approach is to follow the scientific method diligently and maintain complete transparency throughout the problem-solving process.



Katherine Rentsch

Katherine joined Crozier in 2020 as a Senior Project Manager. She is a professional engineer with over 20 years of experience in consulting engineering. Katherine works closely with the land development team across all offices. She specializes in the design of onsite sewage servicing and disposal for residential, commercial, and industrial developments. She is also a mentor to many women in the workplace through her involvement with the Crozier Women's Initiative. Over the past 15 years, Katherine has provided workshops and courses specializing in onsite sewage systems to the members of the Ontario onsite wastewater industry through the Ontario Rural Wastewater Centre at the University of Guelph. She is also a board member of the Ontario Onsite Wastewater Association, where she shares her expertise and experience with the Association's members.

2023 Convention Presenters



Rebecca Turner

Rebecca Turner is the Regional Sales Manager at Industrial Flow Solutions (IFS) for the country of Canada. She joined IFS in 2021 and has enjoyed traveling across Canada in this role. She is a 2005 graduate of the University of Iowa with a degree in Chemical Engineering. Outside of pumps, her activities include gardening, estate sales, trying new foods, and attending live theater & concerts.



Kevin Warner

Kevin manages the Water & Wastewater Group at Cambium. He holds degrees from the University of Waterloo (B.E.S Honours) and McMaster University (M.Sc.). Kevin has been practicing as a hydrogeologist and wastewater system designer since 2000 and is a registered geoscientist with the PGO and a qualified wastewater designer and inspector through the Ministry of Municipal Affairs and Housing. He has managed and directed numerous hydrogeological assessments and impact studies for various residential, industrial, commercial and municipal developments with on-site servicing for water supply and/or wastewater disposal, and is experienced obtaining Permit To Take Water (PTTWs) for water takings for water supply or dewatering as well as Ontario Building Code or Environmental Compliance Approvals (ECA's) for wastewater systems.



Jack Veitch

Jack Veitch is the Manager of Community Engagement and Education with the Canadian Mental Health Association, Haliburton, Kawartha, Pine Ridge Branch. Jack has worked with his local CMHA branch for over fifteen years in a variety of roles including; Housing, Community Support, Intensive Case Management and Forensic Case Management. In his current role, Jack teaches a variety of certificate courses including safeTALK, Applied Suicide Intervention Skills Training, Mental Health Works, Mental Health First Aid, Living Life to the Full and is a Certified Psychological Health and Safety in the Workplace Advisor. Jack was a part of the team that helped to create the Ontario Hockey League/CMHA Ontario Talk Today program, in which he currently works as the Peterborough Petes Mental Health Coach.

Day 1 Training Sessions

TRAINING SESSION # 1
Biological Health & Safety
Rick Esselment
ESSE Canada
Waterhouse 1-3

TRAINING SESSION # 2
Regulator Course
Eric Kohlsmith
Ottawa Septic System Office
Waterhouse 5

TRAINING SESSION # 3
Introduction to Soil Characterization
Kevin Warner
Cambium Consulting and Engineering
Waterhouse 4

2023 Convention Exhibitors

2023 Conference Exhibitors



No septic?

Modern and environmentally friendly toilet solutions

Looking For Dealers
In Your Area

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TOILETS INC.**



The Best Alternative to Composting Toilets!

The Cinderella incineration toilet is an easy to use, easy to install plumbing-free solution. Just like being at home.

No waste handling, only one teacup of ash after one weeks use of four people



Safe for children



High capacity | 4 visits per hour



No odour



No frost protection needed



Water supply & drainage connections not required



Requires little space



Electric and propane models available



MEMBER PROFILE

Steve Ott

Owner - Ottawa Valley
Home Inspections Ltd.

Name of Business/Organization: Ottawa Valley
Home Inspections Ltd.

Services/Mandate: Provides home & septic
inspections

Service Area: Serving Ottawa and surrounding area.

Number of Years in Operation/Role: Inspecting Septic systems
since 2010

What got you started in the onsite wastewater industry?

I was a home inspector first. When inspecting a house one day the realtor said they could not find enough septic inspectors. Having grown up in a rural house on a septic system and having a cottage that was on a septic I was quite familiar with them. I thought it was a great idea as I was interested in septic systems so I took the part 8 course outside Ottawa and have been inspecting them ever since.

Give us one reason/secret for your success.

I love what I do and I listen to my customers. But education is the biggest part. Most rural house purchasers know little to nothing about how a septic system works. Out of sight, out of mind. So explaining to them how it works and the maintenance that must be regularly done is my main priority after accessing the condition of the system.

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

Inspecting a septic system in the winter is the hardest part of the job. Digging up a tank that's two feet down and digging in the leaching bed when it's minus 20 C out is a challenge. But that's what my clients want and need.

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

I would change the criteria required to install a new system. It doesn't matter how many plumbing fixtures are in a house or how many square feet it is. The only thing that matters is how many people are in the house. So it should be based on bedrooms only. Keep it simple!

Where do you see the onsite industry going?

Climate change. Water shortages. Less groundwater. The supply will be hit much harder than the treatment of it. Canadians have the second highest water consumption in the world. All this water used must be treated. So we need to reduce consumption to make the treatment easier. Hopefully the industry will adapt.



Steve Ott
Owner - Ottawa Valley Home
Inspections



Photo Credit: Eric Kohlsmith

About OOWA's Registered Professional Program

The Ontario Onsite Wastewater Association (OOWA) Registered Professional Program (RPP) is a streamlined pathway to formal designation, recognizing our members' continuing education and skills development. RPP participants receive special recognition and additional training options, increasing their marketability to public audiences in our website's Directory of Professionals (<https://www.oowa.org/business-directory-map/>).

By promoting uniform standards for professional qualifications, technical aptitudes, and safety training, the industry's ongoing growth and development is supported by well-trained professionals representing the various roles within our trade.

Registered Professional Program Application

Application for the Registered Professional Program (RPP) is made up of four modules of requirements, which are all to be submitted at the same time in your completed registration package. These four modules consist of:

- 1. Membership & Provincial Qualification
- 2. Health & Safety Training
- 3. Education & Technical Aptitudes
- 4. Professional & Industry Referrals

Once you have identified your desired designations and reviewed the above explanatory documents you can begin completing your application package, on our website here: https://www.oowa.org/wp-content/uploads/2020/07/OOWA_RPP_ApplicationForm_2019.pdf.

If you are still developing the basic requirements of the registered professional program, check out OOWA's In-Development Program, which will help get you there!

In-Development Professional Program

OOWA's In-Development Program is designed for professionals currently building their experience and expertise. Eligibility requirements are simple: have an OOWA membership in good standing. Enrolment is renewed annually for up to three terms (3 years).

The program's design is intended to build upon the experience and formal education and training identified in the Registered Professional Program (RPP) designation requirements. Following the completion of a professional's In-development term, a participant is eligible to apply for a designation within the RPP.

Once you have identified your desired designation and have ensured your OOWA membership is in good standing, you can enroll in the development program immediately, here: https://www.oowa.org/wp-content/uploads/2020/07/OOWA_RPP_ApplicationForm_2019.pdf.

Note that along with your In-Development Application, you can also submit any relevant information including course completion certificates.

Here's what Brenda Burrows-Rabb, of Rabb Construction Ltd, OOWA Director and member, of has to say about the RPP:

The OOWA's RPP was promoted several years ago when I submitted my qualifications to be considered a Registered Professional in the On-Site Wastewater Industry in Ontario.

Our business receives many calls from all over Ontario, looking for a Professional to help with septic design to installation.

Perhaps this is the time to submit to become a Registered On-Site Wastewater Professional - I need some help!

I simply cannot handle all Ontario calls by myself!

Care to join me?

This content has been edited from OOWA's website, here: <https://www.oowa.org/training/registered-professional-program/>.



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From Inspectors on Key Inspection Points Produced by the OOWA Onsite Technical Committee

Overview

This Frequently Asked Questions (FAQ's) document has been prepared to provide some information and clarification of the intent of the OBC regarding some common questions that have been brought forward by our members. These questions are primarily from building inspectors and relate to key inspection points during the installation process. We hope this document provides some clarity and consistency on these items.

Question

Is a base cut inspection necessary? (Base cuts vs test pits)

Answer

The OBC requires an inspection at "readiness to construct". This may be interpreted in different ways by different municipalities. The intent of the readiness to construct inspection is to confirm that the subsurface conditions are suitable for the proposed installation. A Subgrade (base cut) inspection will help the inspector confirm that the dimensions, elevations, slope, scarification, clay seal (if applicable), and loading area requirements of the proposed leaching bed are met. They can also help the inspector confirm that the assumptions used for design, such as T-time or elevation of groundwater, are appropriate.

Some municipalities may choose to supervise the excavation of test pits to satisfy the readiness to construct inspection required. Information collected during a test pit inspection may be used to determine if a further subgrade or base cut inspection is required, such as:

- Percolation rate (greater than 15 min/cm),
- Soil type (smearing, structure, fill soils, complex/ varying soil, etc.),
- Amount of soil (less than 250 mm)
- Separation distance to limiting layer (bedrock, high ground water, impervious soils).

Where none of these conditions are present, the inspector may be satisfied with test pits at the "readiness to construct" stage. Municipalities should develop their own protocols for satisfying this critical first inspection stage.

Question:

How many inspections should be completed?

Answer:

The OBC requires a minimum of three inspections of a sewage system to be completed as follows:

- Readiness to construct the sewage system,
- Substantial completion of the installation of the sewage system prior to backfill, and
- Completion of construction of the sewage system. (OBC Division C, 1.3.5.1.(2).)

Readiness to construct a sewage system is commonly referred to as a base cut or subgrade inspection and is completed after the base of the leaching bed has been excavated and prepared but before any fill is placed. Some municipalities may choose to complete test pits to satisfy the readiness to construct stage, refer to Question 2.0 in the guidance document online for further discussion on this item.

A substantial completion inspection of the sewage system is conducted when all of the components of the system have been installed but before they are backfilled. Refer to Question 3.0 in the guidance document online for details on what items should be reviewed during this inspection stage.

A completion of construction inspection is required to permit the issuance of an occupancy permit. The installation must be complete for this final inspection and the sewage system must be operational. This means that all components should be plumbed, backfilled, seeded and/or sodded, and pumps if present should be wired and operational.

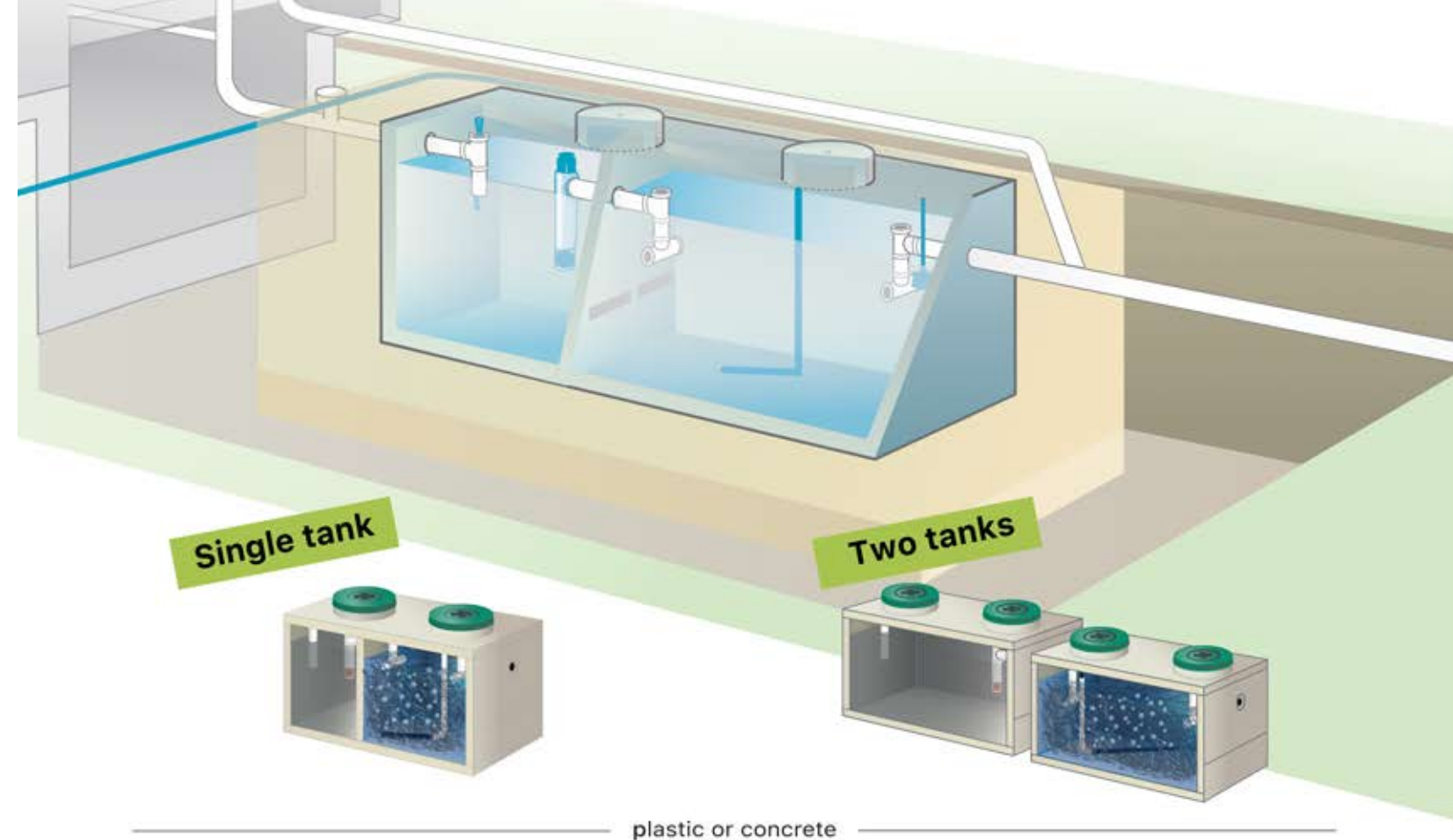
Additional inspections can also be added if a bylaw is passed by the authority having jurisdiction. A common inspection that is added is a test hole inspection that is completed prior to the issuance of a building permit to ensure the design meets the requirements of the OBC.

You can access the complete guidance document on OOWA's website here: <https://www.oowa.org/industry-resources/guidance-documents/>

Disclaimer: This communication is intended to provide general information only and is not intended to provide legal or professional advice, or to be relied on in any dispute, claim, action, demand or proceeding. OOWA does not accept liability to any damage or injury resulting from reliance on this information.

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Sustainability - Good for business

By Natalie Stephenson, Director of Programs at GreenUP

Members of Green Economy Peterborough gather to network and share their sustainability actions. Photo Credit: Jessica Todd

Many of our local communities have declared a climate emergency, identifying the pressing need to substantially reduce greenhouse gas emissions by 2030. In order to achieve this target, all community stakeholders must be a part of the solution. Meeting our goals will require big contributions from our governments, citizens, and businesses of all sectors and sizes.

What role do businesses have to play in climate action?

When we ask members of Green Economy Peterborough - a business sustainability hub based in South Eastern Ontario - what drives them to pursue sustainability in their businesses, their top response is that they want to “do the right thing” and align with the values of their leadership. The second most common response? They’d like to save money.

Reductions in energy and fuel emissions, water use, or waste can reduce overall operating costs, as well as bringing other benefits to your organization. Climate action can result in increased revenue and market share because both suppliers and end users seek out products and businesses that align with their own values. Sustainable practices can also increase employee engagement and retention, brand credibility and competitiveness, and risk mitigation.

“If a typical company were to simply implement the best practice sustainability approaches that have already been used by real companies, it could improve its profit by at least 51% to 81% within three to five years,” says corporate sustainability expert, Bob Willard, in his book New Sustainability Advantage, “while avoiding a potential 16% to 36% erosion of profits if it were to do nothing.”

Those best-practice approaches include:

- Creating a sustainability action plan for your organization that is linked to key performance indicators
- Dedicating staff and time to sustainability efforts
- Leveraging your sustainability work in your marketing and sales strategy, and
- Developing sustainability initiatives that engage your employees and community.

When an organization begins to make that sustainability action plan, we recommend looking at the readily available data found on utility bills to assess the business’ environmental impact. You can monitor this data as you make changes to your operations.

Creating a more comprehensive greenhouse gas inventory can help you identify areas of impact to focus your action plan on, and determine a baseline upon which to compare your progress.

A greenhouse gas inventory always includes emissions related to energy and fuel consumption, but can also include emissions related to water use, waste, business travel, and other operational activities.

Despite a strong business case for sustainability, and the drive to take action, even the most passionate business leaders can lack the time, knowledge, or resources to reduce their organization’s environmental impact. Hubs in the Green Economy Canada network are poised to support local organizations to take steps toward these goals.

Members of organizations like Green Economy Peterborough are guided and supported to measure their impact, make an action plan, and work towards reduction targets. The program encourages members to share best practices and lessons learned, explore emergent business opportunities related to the low-carbon economy, mentor new members, and celebrate successes.

If you are part of a business in the regions of Peterborough, Kawartha Lakes, Hastings, Haliburton, and Northumberland, and interested in sustainability, connect with Green Economy Peterborough to learn more at www.GreenEconomyPeterborough.ca.

Natalie Stephenson is the Director of Business & School Programs, at GreenUP. Natalie has a degree in Environmental Resource Studies and Sociology from Trent University. She is passionate about the intersections between social and environmental problems, and about finding solutions.



Above: Assessing how your business uses electricity and fuels can help you identify actions to help improve efficiency. Photo Credit: Ben Hargreaves



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What's New in the CAN/BNQ 3680-600/2023 Standard?

Continued from Cover Page

As part of the recent updates to the CAN/BNQ 3680-600 Standard, the field performance audits are now incorporated into Annex B of the standard. This means that regardless of whether the testing is completed at the BNQ facility or an NSF facility, certified technologies will be required to undergo the annual field performance tests, with a minimum of 80% passing. These field tests do create additional costs for manufacturers, but the benefit of this change to the standard is that all technologies will now have the same ongoing requirements to maintain their certification, regardless of where they undergo the certification testing.

Thanks to the significant efforts of the individuals involved, the 2023 version of the standard has certainly evolved and adapted to keep up with the ever-changing landscape of our industry. The robust testing requirements are maintained, but the new standard provides better clarity and flexibility that were not present in the previous version.



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Did you know that OOWA has a growing online presence on social media? It's true, we're on Twitter, Facebook, Instagram, and YouTube! We post weekly Homeowner Hints on Tuesdays, and Industry Insights on Thursdays, plus regular updates about our events, including our Annual Convention and Expo. For the 2023 Convention and Expo, we're using the hashtag **#OOWAtogetherisbetter**.

We are always looking for new ideas for content; please share your best industry photos with us, and any suggestions that we can share as Homeowner Hints. If there are industry related updates that you'd like us to share, let us know: Perhaps you're posting a job for a new hire, holding a training seminar, or have a regulatory update that you'd like us to share. Please send this our way, by emailing info@oowa.org.

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Managing the Contractual Risks of Ontario's New Excess Soils Regulation: An Overview and a Flow-Chart Guide for Owners, Contractors and Excavation Trades



Rob Kennaley
February 10, 2023

The first phase of Ontario's new regulation for On-Site and Excess Soil Management, Regulation 406/19, (passed under Ontario's Environmental Protection Act) came into force on January 1, 2021. Intended to ensure that excavated soils are treated as a resource to be beneficially re-used wherever possible, unless a section 2 exemption applies, the Regulation applies to all "projects" (broadly to include among other things "any form of development or site alteration"), virtually any type of construction and the removal of liquid solid from a "surface body of water". Further, any soil or soil mixed with rock which is removed from a project area is defined as "excess soil" and is deemed to be a "waste" and which cannot be reused, stored, transported or disposed of except as specified. The Regulation then sets out a complete code for the excavation and movement of excess soils between properties, imposing requirements for soil testing, transportation, temporary storage at processing sites or transfer facilities, the interim clean-up of soils, data tracking, re-use (on-site or at other sites) and disposal at a landfill or dump.

We have written on the structure and technical requirements of the Regulation elsewhere (see our website or search canlii.org in that regard). Accordingly, our focus in this article will be on how the risks associated with the Regulation can and should be assessed and managed in contracts and subcontracts. We have also prepared a 2 page flow-chart guide, available here or on our website, which can be used as a filter to access the Regulation's application and associated risks, from the project-planning stage through to the final placement of excess soils. If downloaded in pdf. format, that guide includes hyper-links to the various applicable statutes, sections, authorities and resources referenced. This article can be read in tandem with the guide to elaborate on the points made. We hope it will be helpful.

The starting point for risk assessment lies in determining whether or not the Regulation applies. [Section 2](#) provides that it does not apply in respect of excavations subject to [O.Reg 347](#), certain pit or quarry operations, topsoil excavations permitted under the [Aggregate Resources Act](#), certain peat extraction operations and “the final placement of excess soil on the bed of a surface water body”.

More significantly, perhaps, the Regulation only applies to soil (or soil mixed with rock) to be removed from a “project area” (being a “property or adjoining property on which the project is carried out”). Project planners and contractors might accordingly consider options to reduce or eliminate the need to remove soils, including alternative excavation methods (such as hyrdovac and trenching) or design options. Reuse of soils on site, however, will remain subject to other applicable legislation including the [Building Code Act](#), the [Environmental Protection Act](#) (inc. O.Reg. 347), the [Planning Act](#), the [Aggregates Resources Act](#), local municipal site-alteration by-laws and other site-specific instruments.

Particular care should be taken in relation to site alteration by-laws. This, because the authority of municipalities to pass such a by-law goes well beyond the scope of O.Reg 406/19: they can prohibit or regulate the placement of fill, the removal of topsoil, the altering of grades and the rehabilitation of a project site, (even where O.Reg. 406/19 would otherwise allow the activity). Furthermore, the terms and conditions of site alteration by-laws can vary widely across municipalities and many have been recently updated to (in part) manage the issues associated with O.Reg 406/19.

Accordingly, site alteration by-laws might impose much more restrictive requirements on the reuse or placement of materials on a project or disposal site. Significantly, for example, they might limit the options available to retain soils at the project site (through berms, etc.) or limit or negate the placement of any materials at a potential storage, processing or re-use site. In addition, however, site alteration by-laws and other municipally passed site specific instruments can, in some cases, lessen the impact of O.Reg. 406/19 by allowing for the placement of large quantities, or lesser quality materials, then would be required by the Soil Standards established under the Regulation. Section [s.4](#) of the Regulation more particularly establishes tables that essentially provide that the site by-laws or instruments will trump O. Reg. 406/19 as regards the quantity an

d quality of soils that may be placed at a re-use site.

While [s. 2](#) provides exemptions to the entirety of the Regulation, other exemptions apply to various aspects of the Regulation. The most significant of these arise under [s. 8\(2\)](#), in relation to the requirement that a Notice be filed with the [Excess Soil Registry](#) in accordance with [s. 8\(1\)](#) of the Regulation. To recall, the filing of the Notice kickstarts the intensive assessment, reporting, materials tracking and record keeping requirements of O.Reg. 406/19. Pursuant

to [s. 8\(2\)](#), however, no Notice needs to be filed where the circumstances set out in [Schedule 2](#) of the Regulation apply or where a project leader entered into a contract for the management of excess soil from the project prior to January 1, 2022.

Compliance with O.Reg. 406/19 can be expensive and time consuming. Accordingly, where a [s. 2](#) or [s. 8\(2\)](#) exemption applies, significant time and money can be saved. In addition, where a site alteration by-law or other site specific instrument applies, the applicable soil related obligations might be significantly increased, or decreased, depending on the terms and requirements of same. A failure to identify a [s. 2](#) or [s. 8\(2\)](#) exemption or applicable by-law or instrument can therefore lead to delays, increased costs and claims. Important questions accordingly need to be addressed at the tender preparation, bidding and contracting stages: Who is responsible to determine if exemptions or site-specific instruments apply and when will the determination be made? Prudence dictates that the responsibility for, and timing of, these determinations be understood and set out in the Contract Documents. Prudence also dictates that, if an exemption is known to apply, this also be set out in the Contract Documents.

The importance of any possible [s. 8\(2\)](#) exemption is highlighted when we consider the significance of section [s. 8\(1\)](#)’s Notice filing requirement. Where no [s. 2](#) or [s. 8\(2\)](#) exemption applies, and where excess soils is to be removed from a project area, [s. 8\(1\)](#) requires that the “project leader” file a Notice containing the information set out in [Schedule 1](#) with the [Excess Soil Registry](#). This information includes the project leader’s declaration that (among other things) she/he/it will “**develop and apply all necessary procedures to ensure that all necessary steps are taken to ensure that this Regulation is complied with” and “ensure that excess soil from the project area will be disposed of in compliance with this Regulation”**”.

The “project leader” who files signs the declaration must accordingly be prepared to assume an enormous amount of responsibility. **There can, however, be more than 1 project leader**, which is defined as “the person or persons who are ultimately responsible for making decisions relating to the planning and implementation of the project”. Determining who will file the Notice and sign the declaration to take on the responsibility to ensure the Regulation is followed is accordingly critical to sound planning and cost control. No-one wants to find out others expected them to take on the responsibilities, at their cost. Prudence accordingly dictates that the determination of who must file the Notice and make the declaration be made early and set out in the Contract Documents to avoid confusion and delay.

The project leader who makes the declaration in the Notice must ensure that all necessary assessments, testing and reporting is undertaken by a qualified person. Subject to certain exceptions (set out at [s.11\(2\)](#) , [12\(3\)](#) and [s.14](#)), a qualified person (as defined under O.Reg 153/04) must be retained to prepare and/or oversee and update the following, in accordance with the [Rules For Soil Management and Excess Soil Quality Standards](#), (the “[Soil Rules](#)”): a [s. 11](#) assessment of past uses of the project area, (unless a phase one ESA under O.Reg 153/04 has already been prepared), a [s. 12](#) sampling and analysis plan, a [s. 13](#) excess soil destination report and a [s.15](#) report of any “immediate conditions” encountered.

Those responsible for planning should be aware that the requisite assessment, sampling, analysis and technical reporting will take time and money. Practically, much of it will have to occur pre-excavation. In addition, there may (and will most likely be) a shortage of available QPs to accommodate the new requirements on particular projects, given the increased workloads they will face in that regard. Prudence accordingly dictates that QP(s) are lined up and retained under contracts early, and that sufficient time and money for the requisite steps is allowed for.

As discussed elsewhere, and subject to limited exceptions, excess soils must be assessed and processed (if necessary), so that they will no longer be waste and then deposited for (no more than) a beneficial purpose at a suitable reuse site. Prior to final placement, they may at times be stored and/or processed and managed, on-or off-site. A “[Beneficial Reuse Assessment Tool](#)” (or “BRAT”) is available to assist in the determination of how marginally impacted materials might be used at a re-use site.

The project leader who makes the declaration accordingly assumes substantial responsibility for the testing, movement and placement of excess soils, from excavation through storage, processing, transport and placement, in accordance with the Regulation and the [Soil Rules](#) which are incorporated by reference: [s.3\(2\)](#) establishes the conditions that must be met for excess soils to no longer be waste, while [s.16](#) requires a tracking system and [s. 28](#) requires records retention. Section [s. 23](#) governs excavation, [s.24](#) governs storage, [ss.17 and 18](#) govern transport, [s. 21](#) addresses off-site soil management and processing, [s.20](#) governs the BRAT Tool, [s.22](#) governs placement at landfills or dumps and [s.25](#) governs processing at a waste transfer facility. The [Soil Rules](#) impose further, more detailed requirements in relation to all of the above. They also set out the standards that are to be applied (with some exceptions) in determining what soils can be placed where, and in what quantities, for a beneficial purpose.

Significantly, all of these responsibilities of the project leader can be assigned to others in contract, and then assigned to subtrades down the construction ladder. Confusion and contractual gaps, in relation to who-is-responsible-for-what, will lead to delays, claims and costs. No contractor or subcontractor wants to learn, post-bid, that others are relying on them to undertake any of these steps. Prudence accordingly dictates that who is responsible for which of these steps be set out clearly in the Contract Documents, and that the documents be consistent from the top of the ladder on down. Owners may wish to prequalifying contractors to ensure they have the teams in place to manage the new requirements in a cost-effective way.

In addition, the overarching goal of the Regulation needs to be kept in mind. Towards keeping excess soils out of landfills, they are to be treated as a resource with a goal of ‘cleaning or drying them up’ through processing them (either on site or at a storage or

processing site) and depositing them at re-use sites where they are needed for a beneficial purpose (only). Indeed, disposal of excess soils at a landfill will not be allowed come January 1, 2025 (subject to minimal exceptions). Clearly, if excavated soils have nowhere to go, there will be delays and potential claims. Again, demand may (and likely will) exceed supply. Prudence accordingly also dictates that storage, processing and reuse disposal sites be lined up and locked down, in contract, by whomever is responsible to locate them, as early in the process as is possible. In addition, of course, identifying who is responsible for these steps should be set out in the Contract Documents.

Finally, with the new Regulation comes both opportunity and an invitation to creative thinking. Given that the demand for QPs, storage sites, processing sites and re-use sites will continue to climb drastically, there are opportunities for service providers to meet those needs. Some will no doubt offer storage and processing services, while others will integrate those services into their own operations, toward vertical integration and a more streamlined, efficient, process. Others will no doubt re-imagine projects to keep soils on site or to create the need for imported soils from other projects as a ‘beneficial uses’ (through elevated grades, for example), perhaps at a fee and subject to other legislation including site alteration by-laws. In addition, there will be increased opportunities for hydro-vac and trenching contractors whose methods can reduce excess soils. Finally, municipalities and contractors / local associations might work together to draft site alteration by-laws or site specific instruments which will provide increased flexibility for the placement of materials in accordance with the Regulation.

**Rob Kennaley,
Kennaley Construction Law**



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Experience the End of Ragging with DERAGGER Technology

By Rebecca Turner
Regional Sales Manager for
Industrial Flow Solutions

As part of an independent review performed by the Water Research Centre Limited (WRC) in conjunction with the UK's United Utilities and Wessex Water, the DERAGGER Intelligent Pump Monitoring technology was studied in the UK starting in 2017. While there were numerous aspects of the technology being analyzed, one of the most important was to understand if reducing or even eliminating blockage maintenance was a realistic outcome for particularly challenging pump stations.



Figure 1: Typical pump blockage

One installation was particularly prone to blockages where Wessex Water hoped using DERAGGER could reduce reactive maintenance to clean/derag the pump. During the first ten weeks of the study, after manually cleaning the dry well pump, the DERAGGER software was connected for monitoring/datalogging purposes, without activating the anti-ragging functionality of the technology. During those ten weeks, the pump required manual cleaning on seven separate occasions. After performing a manual cleaning at week ten, the DERAGGER anti-ragging function was turned on. During the following six weeks of the study, zero manual cleans

were required. Throughout that time, the DERAGGER recorded 75 automatic clean cycles had been initiated, indicating the DERAGGER successfully prevented blockages from occurring. It is not a surprise that this number is higher than the seven maintenance events, because the cleaning cycle is initiated at the first sign of debris impeding the pump, instead of waiting until a blockage event has occurred.

In addition to eliminating reactive maintenance, the site reported an efficiency improvement of 5% across the entire pump station which included a total of 5 pumps, only one of which had the Deragger technology activated.

While reporting one installation may seem inconsequential, the basis of the study included several pump stations, ranging from 4 to 40 HP which all experienced benefits from DERAGGER installation and activation – ranging from reduced energy consumption to improved flow efficiencies. In addition to the scientific investigation performed by WRC, Clearwater Controls, the parent company of DERAGGER, has global users of the technology with similar experiences – many instances resulting in zero clogs for years after installation.

Blocked pumps account for an estimated 80-90% of all unplanned work carried out at pumping stations. There is evidence to show that blockages and the buildup of rags prior to blockages increases pumping energy costs. Running a pump partially ragged is likely to cause significant additional pump wear, due to the unbalanced impeller and potentially unstable current.

Clearwater Controls' DERAGGER is designed to reduce the problem of pump blockages and the associated increased pumping costs resulting from running partly ragged pumps.

Story continues on next page.



Figure 2: DERAGGER product portfolio

The DERAGGER intelligent pump control anti-ragging device aims to answer the age-old problem of wet-wipe type ragging of wastewater pumps. Existing solutions only detect/address the blockage once it has already started to form, by which time it is too late. Reversing a pump once a blockage has already formed leads to rags being knitted together and thrown back into the well. This modular device can be retrofitted into existing pump control panels or built into new panels paired with almost any type of pump.

The DERAGGER aims to deliver a solution with a unique technology that monitors in real-time the wave form of the power to the pump. This wave form analysis allows the device to immediately detect the instant that even a single wet-wipe starts to impede the pump impeller. By facilitating this real-time detection, the DERAGGER can slow and stop the pump the instant that an impediment forms, then briefly reversing the pump to dislodge the impediment and allowing it to be passed in suspended flow through the system, preventing the creation or build-up of rag-balls.

Clearwater Controls is a wholly owned subsidiary of Industrial Flow Solutions, a pump and controls company based in New Haven, Connecticut, USA.

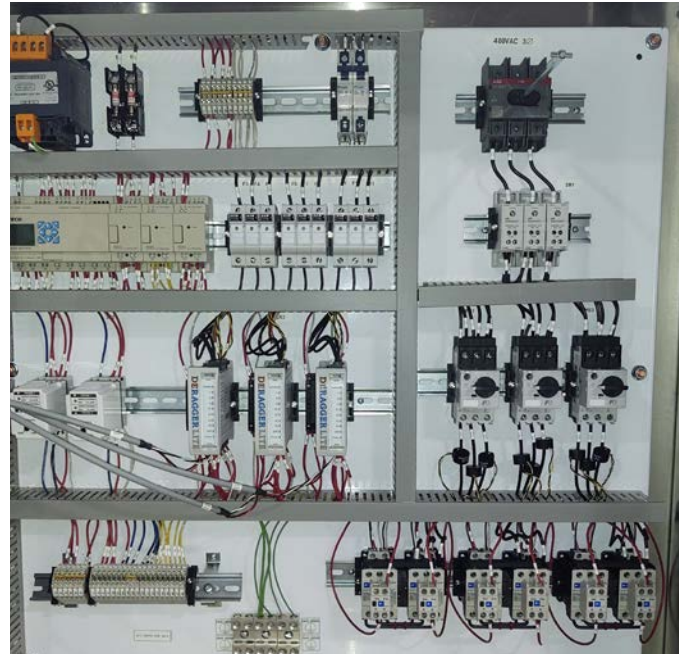
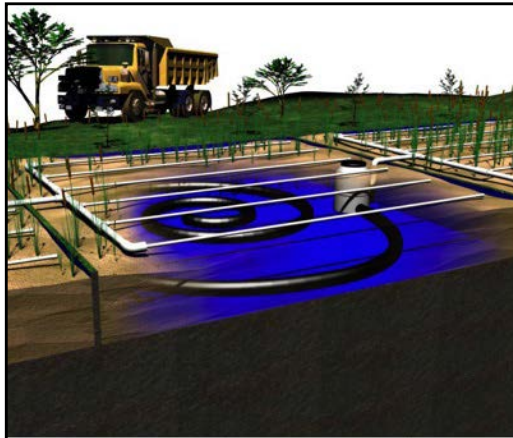


Figure 3: Triplex control panel including DERAGGER modules.



Rebecca Turner is the Regional Sales Manager at Industrial Flow Solutions for the country of Canada. She joined IFS in 2021 and has enjoyed traveling across Canada in this role. She is a 2005 graduate of the University of Iowa with a degree in Chemical Engineering. Outside of pumps, her activities include gardening, estate sales, trying new foods, and attending live theater & concerts.

You can contact Rebecca Turner at rturner@flowsolutions.com, or 203-492-9956.



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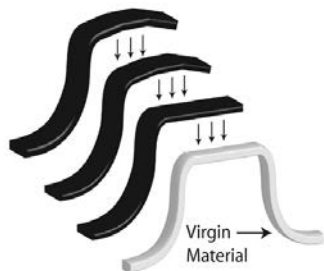
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OOWA's Engagement in MMAH Consultation Processes, and Advocacy for Our Industry

By Jenn McCallum

Programs and Outreach Coordinator, OOWA

In the fall of 2022, the Ontario Ministry of Municipal Affairs and Housing (MMAH) held a Phase 3, public consultation process including proposed changes to the Ontario Building Code (available at: <https://www.ontariocanada.com/registry/view.do?postingId=42888&language=en>). OOWA supported three of the proposed changes, which were the following:

- B-01-03-01: Update edition of referenced Standard CSA B66 "Prefabricated Septic Tanks and Sewage Holding Tanks" in Articles 8.2.2.2. and 8.2.2.3.
- B-08-04-01: This proposed code change would allow increased flexibility for the construction of Class 2 greywater systems.
- B-08-07-05: Provide clarity with respect to the installation of distribution piping within filter beds as well as remove redundant reference to Appendix A.

This winter, the MMAH was accepting comments until February 17 towards ERO number 019-6433, Discussion Paper: Future Enhancements to the Qualification Program for Ontario's Building Practitioners (<https://ero.ontario.ca/notice/019-6433>).

OOWA submitted comments to the MMAH on behalf of our members. Our comments included the following feedback:

- There is currently an internship program for building inspectors laid out in the code. OOWA suggests making this program more accessible and easier to pursue so that more candidates can use this as their path towards certification. The Ontario Building Code already specifies that individuals do not require certification for maintenance inspections only, so this could be extended as a graduated certification program (Reference: Division C 3.1.4.4 and 3.1.4.3).
- OOWA supports training and education for professionals working within the industry. We view mandatory training as beneficial, and would increase the pass rate for exams. We recommend ongoing training after passing the exam.
- We agree that this it is necessary for professionals to remain current within the industry, and we support the requirement to have ongoing professional development, such as attending conferences and training workshops.
- Beyond amendments to the Ontario Building Code, there should be ongoing requirements for current industry practices, notably in specialized areas (such as HVAC and onsite sewage systems).

We support the action to allow more time for candidates to write OBC exams, while ensuring that there are enough representative questions to indicate qualification, and properly evaluate candidates' knowledge.

OOWA supports the use of the digital Ontario Building Code (OBC) during exams.

OOWA suggests implementing a graduated system where candidates work for a while shadowing qualified professionals, before writing their exams, as an apprenticeship style of learning.

By Jenn McCallum
Programs and Outreach Coordinator, OOWA

From November 11 to 13th, OOWA exhibited at the Fall Cottage Life Show at the Toronto International Centre, and engaged 450 individuals in important conversations surrounding their onsite sewage systems. Cottagers were interested in our Professional Directory webpage (<https://www.oowa.org/business-directory-map/>), as a resource for locating qualified professionals in their regions. We also distributed copies of our Homeowner's Guide to a Healthy Sewage (Septic) System (<https://www.oowa.org/wp-content/uploads/2020/05/HomeownersGuide-FINAL.pdf>), and directed cottagers to our YouTube channel for practical tips for maintaining their systems. One additional outcome was meeting Don Ford, Hydrogeologist with the Toronto and Region Conservation Authority, who was in attendance at the Cottage Life Show. We asked Don to submit a presentation proposal for our Annual Convention and Expo, and we are looking forward to hearing more from him at the event.



Jenn McCallum at the Fall Cottage Life Show.
Photo credit: Jenn McCallum

Additionally, I presented at the Rekindle the Spark conference, which is an annual gathering of educators from Ontario's conservation authorities. The event was held at Ganaraska Forest Centre on November 17-18, and my presentation was entitled *Stewarding Our Wastewater, in Urban and Rural Places*. The presentation included the science of onsite wastewater treatment, homeowner best practices for system maintenance, and suggested a mapping activity that educators can use to engage youth in understanding where their drinking water comes from, and where their wastewater goes after home or school use. I also used a tabletop sewage system model to demonstrate the travel of wastewater from a home to the onsite sewage system, including the septic tank and leaching field for primary and secondary treatment.

On January 19th, I presented to Fleming College Environmental Technology students about the science of onsite wastewater treatment, job opportunities within the industry, and OOWA's post-secondary education scholarships (<https://www.oowa.org/training/annual-education-scholarships/>). The college students were engaged in the presentation, asked some excellent questions, and several became OOWA student members afterward. I will be presenting at the College again on February 24th, and am excited to connect more with Ontario's post-secondary institutions about industry opportunities and collaboration. Stay tuned at our Monday evening banquet at the Annual Convention and Expo, as the scholarship award winners will be announced then!



Above: Delegates at the Rekindle the Spark conference on November 17, 2022.
Photo credit Keren Bromberg.

Right: OOWA's tabletop model septic system, used at public outreach events for demonstrating the movement of wastewater from the house through the septic tank and into the leaching field. This model was created during the fall of 2022.
Photo credit: Jenn McCallum.



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System Site Plans: Calculating Costs for an Installation Job Bid

It's important to consider many aspects of system construction while developing a bid

By Sara Heger, Ph.D.

After a thorough evaluation of the system, the next step in the planning process is developing a bid for the installation.

Keep in mind that you do not have to bid on every plan that you review. An installer should not bid a project if he or she does not feel comfortable with the design, owner, or designer. During the review process an installer may identify factors or details related to the system that may make the system not desirable to bid. Installing the system exactly according to plan does not eliminate the installer from liability if the system has problems after construction. Several aspects of the system construction will need to be calculated to determine the cost of system installation.

Material takeoff

To determine the overall cost of the components and materials associated with the system, a material takeoff is developed. A material takeoff or bill of materials is simply a list of all necessary items that are needed for a job. The quantity of materials needed varies from job to job. The bill of materials generally becomes more accurate as the installer gains experience.

Some installers choose to only include the "big ticket" items in the bill of materials as they have a stock of pipes, glue, prep materials, screws and nails that can be allocated to a job depending on its size. Big-ticket items may include the septic tank, innovative and alternative components of the system treatment train (including control panels and accessories), and any chambers, stone, media, fill and cut requirements used in the soil treatment area. Installers that have a yard available for storage have the advantage of purchasing greater quantities of pipe, media or other items at a discounted bulk price and using them as needed. Other installers spend more time on the material takeoff process to estimate more accurately what the material list will be. There are several stand-alone and plug-in computer

programs that may help the installer list the materials and formulate a bid for a job.

Media (sand, crushed stone, gravel, etc.), fill (soil, loam, gravel, etc.) and cut requirements need to be calculated for the installer to quantify them in the bill of materials. Cost for transportation needs to be added to the costs of the materials for the bid offering. Cut volumes and soil that may be replaced by media or components need to be transported out of the construction site; those costs are also important and need to be included in the bid.

Once the material takeoff is finished, the installer can identify where to purchase the items, if the items are available as prescribed in the design plans, and restock miscellaneous items if needed. Once a cost is added to the material takeoff list, the installer has a good estimate of the materials cost for a job. It is common practice for installers to add a markup to the material takeoff to cover installation costs and sometimes to cover all aspects of the installation business. This markup can be as much as 100% or more of the material takeoff in some cases when covering for all aspects of the installation. This, however, is a personal business decision. Other installers choose to calculate the actual installation costs depending on the size of the crew, equipment needed, estimated time at the site, transportation and delivery of materials and equipment, indirect costs, etc.

Labor

Personnel and machinery time are components that greatly influence a bid. Experienced personnel are not easy to find or to keep, but experienced personnel usually require much less supervision and keep the job moving forward even during a setback or unforeseen event. The installer must weigh experience and costs when choosing a crew; the less that is spent on labor, typically the more supervision the job entails. Personnel costs can be directly included in the estimated time required to build and install an onsite wastewater treatment system.

Site restoration

Restoration costs for improvements identified during the interview should be included in the bid. The installer can plan to do the restoration if qualified or can subcontract the work. When a subcontractor is used, the installer may mark up the costs somewhat to cover liability and coordination time. Subcontractors should understand the system installed and the importance of protecting it from damage during restoration work.

Special equipment

The installer may need to rent or acquire special equipment in areas with high groundwater tables or steep slopes or if construction is planned during the wet season. Special equipment may include tracked equipment that can better deal with steep slopes or pumps to dewater an excavation. The installer may also need special equipment to clear land, cut trees and remove stumps. Special equipment may also include those that the installer does not use on a regular basis such as concrete mixers, asphalt layers or larger sized compactors that are needed for restoration of existing improvements. In addition, the safety plan for the specific site may require special safety equipment. Special equipment costs need to be considered in the bid. Required machinery should be included in the bid. The total time the machines spend on the site directly impacts the amount of money that machine is allocated in the bid. Acquisition costs, fuel costs, transportation, service and repair time, and replacement costs need to be included.

Subcontractors

Subcontractor costs are an important component of the bidding process. Electricians are typically needed, especially for innovative and alternative technologies. A good relationship with any subcontractor is desirable to avoid conflicts during scheduling or miscommunication problems that can add additional expenses to a project. Knowing the subcontractor will give the installer a good idea of how much a job can cost. Costs of all work by subcontractors need to be included in the bid. As stated above, the installer may choose to mark up these costs to cover liability on the job.

Regulatory issues

Regulatory issues can increase costs on an installation job. Some states may require all onsite wastewater treatment systems to be approved by a central agency. However, at the county or town level there may be additional requirements such as larger tank requirements or more stringent setback requirements that may increase the costs of an installation. The installer needs to be aware of special requirements for the area where the installation is going to occur and analyze any impacts on the installation and costs for that site.

Site-specific items

Other site-specific items that are not regulatory driven may include special homeowner requests, homeowners'

association rules, or special scheduling efforts that may increase the costs or time spent on the job. During construction, depending on the site, dewatering may become an issue. Also, boulders that need to be hauled off the site or even ledge blasting and removal are other items that are specific to the site.

Another site-specific item can be working with a new designer or a problematic designer. Sometimes personality problems put a strain on the installation and can delay construction. This should be considered when putting together the bid. Insurance costs either in general or specific to the project must also be factored in.

With these key items quantified, the other item to consider is profit. Installation companies should all be in the business of not just covering costs but also making a good living and saving for retirement. How and when to include this in your final bid amount can vary but is as important as all the other calculations.

About the author

Sara Heger, Ph.D., is a researcher and educator in the Onsite Sewage Treatment Program in the Water Resources Center at the University of Minnesota, where she also earned her degrees in agricultural and biosystems engineering and water resource science. She presents at many local and national training events regarding the design, installation and management of septic systems and related research. Heger is the President of the National Onsite Wastewater Recycling Association and she serves on the NSF International Committee on Wastewater Treatment Systems. Ask Heger questions about septic system design, installation, maintenance, and operation by sending an email to kim.peterson@colepublishing.com.

This article is part of a series on site planning:

- An Overview of Onsite System Site Plans for Installers
- System Site Plans: Soil Evaluation, Loading Determination and Treatment Train Components
- System Site Plans: Site Review of Topography and Existing Conditions
- System Site Plans: Review of Soils and Site Layout
- System Site Plans: Site Layout Details and Owner Interview
- System Site Plans: Calculating Costs for an Installation Job Bid
- System Site Plans: Next Steps After You Win a Bid
- System Site Plans: Media Volume Calculations
- System Site Plans: Completing the Installation

This article first appeared online at [OnsiteInstaller.com](https://www.onsiteinstaller.com) (<https://www.onsiteinstaller.com/online-exclusives/2022/07/system-site-plans-calculating-costs-for-an-installation-job-bid>) on July 5, 2022, published by COLE Publishing, Three Lakes, Wis. It is reprinted by permission.

MEMBER PROFILE

Anne Elmhirst Supervisor – Part 8 Sewage Systems

Name of Organization: City of Kawartha Lakes

Services/Mandate: As a regulatory agency, our division works with the public, sewage system professionals, and other legislative groups to safeguard our environment and public health through compliance with the Ontario Building Code.

Service Area: City of Kawartha Lakes

Number of Years in Role: 19 years

What got you started in the on-site wastewater industry?

I have been passionate about safeguarding the environment, and in particular our water resources, since I was young. While completing studies in Public Health and Environmental Science, I became fascinated with the process of wastewater treatment and the effects it could have on our natural water resources. I was able to take my knowledge and interest and turn it into a career to support the preservation and conservation of our environment, one sewage system at a time.

Give us one reason/secret to your success:

I believe that success is achieved through hard work, a willingness to listen and learn from others, and the ability to take on new challenges. I consider every situation as an opportunity to learn and develop. Whether it is reviewing an atypical system design or engaging in thought-provoking discussions, they all have something to offer.

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

I have been involved in many challenging sites throughout my career. However, I find that the biggest challenges come from unrealistic expectations for property development. Structures continue to grow in size, and become more plentiful, yet the property sizes haven't or can't grow to suit these needs, which means we have less and less space to locate a sewage disposal system. As a regulator, my job is to enforce the legislation, and to ensure the protection of the environment and public safety. I pride myself on being respectful, patient and consistent in these situations, which has allowed me to work successfully with our sewage system professionals to find solutions that are not only code compliant but also environmentally sound.

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

I believe we need to work towards consistency in the regulatory delivery. As with any piece of legislation, the Building Code Act and Ontario Building Code are open to interpretation, which leads to various different requirements throughout Ontario. I think it is important to be consistent with interpretation to ensure sewage system professionals are bound by the same rules everywhere they work. We, as regulators, need to support each other to create a unified approach as well as advocate to the MMAH for clarifications and changes.

Where do you see the onsite industry going?

As concerns for both drinking and recreational water resources escalate, demands for legislative maintenance inspection programs continue to rise. I see this as positive initiative for the industry. These programs offer a great opportunity to educate homeowners on sewage system maintenance, operation, and responsibility. When homeowners are provided with the knowledge and understanding of the value of their system, they become stakeholders, along with all of us, in the protection of the environment.



Installed septic tank
Photo Credit: Arlene Quinn



OOWA's Membership Recruitment Rewards Program

OOWA is the onsite wastewater industry's voice.
The power of our association lies in the high degree of professionalism of its members and in its ability to sit at tables where individuals cannot.
There is power in numbers.
Be counted as one – and go get one more.



OOWA Members that recruit new members are eligible for the following rewards:

1. For every new Primary, Associate, or Young Professional member recruited, receive a \$20.00 Tim Horton's gift card
2. For every 10 new Primary, Associate, or Young Professional members recruited, receive a \$150 gift cards to The Keg Steakhouse

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- courtesy of OOWA!**

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Mackenzie Riddle, M. Riddle Excavating
Bill Robinson, Robinson Enterprises/SepticCheck.ca
Robert Robinson, Robinson Haulage Inc
Scott Robinson, Unit Precast
Jason Rogers, The Rideau Group
Stephen Ropp, Percon Excavating Inc
Will Rounds, Corporation of the City Of London
Eric Rozema, Rivercourt Engineering Inc.
Lloyd Rozema, Aqua Treatment Technologies Inc.

Victoria Rozema, Aqua Treament Technologies Inc.
Brian Rudak, Rudak Excavating Inc.
David Ruppert, Ruppert Haulage Inc.
Aaron Ryckman, Township of Southgate
Tim Salter, CMT Engineering Inc.
Stuart Saville, Zoeller Canada
Zachary Savoie, Gunnell Engineering Ltd.
Brad Schildroth, FlowSpec Engineering
Phil Schram, Township of Southgate
Doug Schultz, Township of Whitewater Region
Kevin Scott, Sunnyside Campground
Kevin Scott, CopperWood General Contracting Inc
Glen Sharp, Francis Thomas Contracting Company Ltd
Paul Sharp, CONSTRUCTBUILT Inc
Brian Shepherd, George Burnett Ltd.
Tom Sibbald, SiteWorks Construction
Edward Smith, Ted Smith Construction
Mike Smith, Smith Excavating, Grading & Septic Services
Nick Snyder, Township Of Muskoka Lakes
Ken Sommer, Shirecrest Homes Inc
Tracey Spragg, Robinson Enterprises/SepticCheck.ca
Jason Steele, Tri County Inspection
Connor Steer, Gunnell Engineering
Wilf Stefan, Clearford Water Systems
Clayton Stokman, Township of Guelph/Eramosa
Ryan Strachan, Brooklin Concrete
Brady Straw, Waterloo Biofilter Systems Inc.
Paul Studholme, Professional Home Inspections
Sandra Swanton, K Smart Associates Limited
Keith Thomas, Francis Thomas Contracting Company Ltd
Scott Thompson, MTS Environmental Inc.
Bob Thomson, Valley Sanitation Services
Simon Thoume, James Thoume Construction Ltd
Michael Tinney, Tinney's Septic Service & Construction
Terry Tompkins,
Claus Trost, Laurentian Valley Twp.
Numair Uppal, OASIS
Mark Van Alstine, Herns Sand & Gravel
Brent Van Herk, BVH Excavating & Septic Inc
John Vanden Hoven, JVH Consulting
Andrew Vangerven, Van Gerven Excavating
Andrew Vitaterna, Clearford Water Systems Inc
Mathew Walters, Walters Custom Works Inc
Danielle Ward, Adams Brothers Construction
Eric Watkin, Tatham Engineering Ltd.
Ryan Weddel, Newmarket Precast Concrete Products Ltd.
Patrick Welch, DW Land Development Services Inc
Kyle Wetherall, Waterloo Biofilter Systems Inc.
Shawn Wheatley, CMT Engineering Inc.
Erin Williams, McIntosh Perry
Marianne Willson, Waterloo Biofilter Systems Inc.
Lindsay Wolfenberg, Clearford Water Systems Inc
Jazmyne Woolley, R.J. Burnside & Associates Limited



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OOWA's **Registered Professional Program (RPP)** includes an 'In-Development Stream' that addresses the needs of ongoing training and continuing education demands from our members. Professional Designations include: Wastewater Service Technician, Designer, Installer, Private or Regulatory Inspector, Residuals Hauler, Project & Administrative Professional and Technical Sales Consultant.



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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 that you can access membership rates for events and resources provided by our association partners:



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- The Ontario Building Officials Association
- The Ontario Ground Water Association

To get more information on these member benefits please visit our website at: www.oowa.org/about/join-oowa/



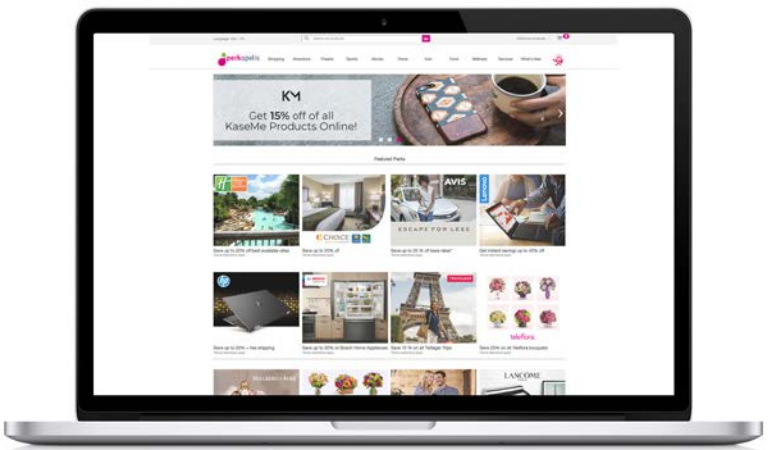
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A Call for Microplastic Samples

By Nancy Goucher, University of Waterloo

Have you collected plastic samples from the environment? We would be happy to take it off your hands!

Members of our researcher team are looking for a large variety of plastics collected from the environment that can be used to strengthen a microplastics fingerprint library. In particular, they are looking for plastic samples that have been degrading in the natural environment. Variety is the key – exposure to sunlight, water, or farmers fields all affect the plastic and we are interested in analyzing samples with diverse histories. The more information you can provide regarding each individual sample, the better!

The team requires these samples of diverse plastic to perfect their methods of detection and analysis. The intent is to speed up the workflow process for sampling, screening, fingerprinting and quantifying microplastics. This will allow any research team to gather and process more samples in a timely manner. We will eventually be able to get a better handle on the true extent of microplastic pollution across our watersheds, track their source and develop mitigation strategies that address the issue from manufacturing through to waste disposal.

If you think you might be able to help us out, please contact Nancy Goucher, at nancy.goucher@uwaterloo.ca. We are happy to coordinate the transportation logistics to make this as easy as possible.

Thank you for your help.

This article first appeared online Friday, February 25, 2022, at: <https://uwaterloo.ca/microplastics-fingerprinting-research-project/news/call-microplastic-samples>.



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LEGO Product Idea: Engaging Kids and Adults Alike in Water and Wastewater Issues

Did you know that individuals can submit product ideas to LEGO? This proposal was submitted by a user who calls themselves "MOCingbird", on September 11, 2022, entitled "Sewer Heroes: Fighting the Fatberg." Their product idea has 10,000 supporters, which means that this product idea has now moved into the review phase (as of January 2023), wherein LEGO is evaluating the proposal and will consider it as a future product offering. The review phase is likely to take many months, and if approved, this proposal will move into the development phase, which is also likely to take many months.

This product idea is intended for municipal wastewater treatment, but perhaps knowing the LEGO accepts product ideas might one day inspire an onsite sewage model as well? In fact, if you're feeling inspired, you can submit a product idea to LEGO yourself!

The text that follows was written by "MOCingbird", and the text and photos are available online here: <https://ideas.lego.com/projects/d6531232-a0f6-4675-a6d3-0f6788d1dd3d>.

Turning the Spotlight on Water & Wastewater

Millions of professionals around the world are involved in designing, constructing, operating, managing and maintaining our cities' crucial water & wastewater infrastructure - keeping the water cycle running smoothly at all times. But despite their essential contributions to society, the people working in the water & wastewater industry in hundreds of different types of indispensable jobs usually remain invisible to the public, not getting the amount of recognition they deserve - both in real life and in our LEGO cities. About time for a change!

While it's impossible to squeeze the entirety of this complex topic into just one LEGO set, you can still start somewhere: Being dedicated to all the water & wastewater professionals out there, "Sewer Heroes: Fighting the Fatberg" turns the spotlight on the urban underground in a way never seen before in LEGO form - playfully bringing into focus one of the biggest problems of our sewer systems infrastructure: the infamous fatberg!



Think before you flush!

Used cooking grease, food, wet wipes and lots of other rubbish that does not belong in the sewer system is a huge problem, which both private households and commercial kitchens contribute to. Using drains and toilets as rubbish bins causes sewer blockages, plastic pollution in the sewage and other issues which are a serious threat to our wastewater infrastructure and the environment.

Over time fat, oil & grease (FOG) and all kinds of rubbish accumulates in pipes and sewers, starting to form big lumps that eventually develop into monstrous fatbergs. While getting bigger and bigger, a fatberg clogs the sewage flow more and more, which can result in flooded streets and pollution of the environment even before the sewer gets blocked completely. While only the biggest fatbergs make it into the news, millions of other sewer blockages caused by FOG and "unflushables" (like wet wipes, cotton buds, plasters, nappies, dental floss and many more) occur every year all over the world. By the way, the biggest fatbergs grow to well over 100 meters in length and more than 100 tonnes in mass.

Exploring the urban underground

Playfully educating kids and adults about what's going on beneath our cities' streets, this 360-degree underground cutaway display & play set is starring the dauntless members of a fatberg removal team at work: Recently a big fatberg had been discovered in the main sewer nearby the mixed-use residential/commercial building with the "Burgers & Fries" restaurant on the ground floor and residential units above. Now the "Sewer Heroes" have been called to take care of this indelicate situation before it's too late.

In the model's front section LEGO fans accompany the sewer workers on their tough mission, learning some things about the challenges of the profession and helping them to fight the fatberg to unblock the sewer. Meanwhile, turning the set around enables kids and adults to backtrack the stream of FOG and other "unflushables" to their (possible) entry points at the back of the model - raising awareness of the direct connection between the sewer blockage at the front and the problematic things that are being flushed down the house's wastewater pipes shown at the back of the set. However, it will take further investigations to find out which connected house(s) all the FOG (fat, oil & grease) and rubbish that resulted in the formation of the fatberg really came from.

This monster is real!

Because the fatberg has become rock-hard already, it will probably be too difficult and time-consuming to tackle this disgusting monstrosity using only pickaxes and shovels. That's why our "FOG Busters" have also brought their

heavy-duty fatberg removal machinery to this operation: A state-of-the-art jet/vac truck armed with high-pressure water-jetting equipment and a powerful vacuum pump - these will be used for breaking the fatberg up and sucking it into the truck's tank piece by piece. Should the pieces still be too big or too hard, they'll eventually get winched out in buckets. Later on the removed mass will be recycled and converted into biofuel, by the way. The sewer workers are just about to start fighting the fatberg any minute now, facing a time-consuming and expensive removal process which will take several days or even weeks as the giant lump continues far into the sewer (with the model only showing a fraction of the entire obstruction).

The model

The type of sewer depicted in the model is a "combined sewer" where the system of pipes & tunnels is used to transport sewage and urban runoff together to a sewage treatment plant. Nowadays this gravity sewer design can be found primarily in older cities. In contrast, modern separate sewer systems transport rain water and sanitary sewage separately, with only the latter being carried to a wastewater treatment facility. Walkable sewers as shown by the model are rare overall (but they provide the best play & display value for a LEGO set). The best-known sewerage systems of this kind can for instance be found in big European cities like Berlin, Paris, London or Vienna.

Features of the model:

- The 360-degree cutaway build reveals the urban underground in a unique way never seen before in LEGO form
- Accompany the sewer workers fighting the fatberg to unblock the sewer, and learn something about their challenging profession
- The detailed walkable sewer can be accessed through the (functioning) manhole in the street
- Drive the jet/vac truck & operate its high-pressure water jetting & vacuum equipment to help tackle the fatberg
- Backtrack the stream of FOG (fat, oil & grease) and other "unflushables" to their (possible) entry points at the back of the model
- The mixed-use residential/commercial building features a "Burgers & Fries" restaurant with a kitchen on the ground floor and a residential unit with a kitchen and a bathroom above
- Discover the secrets of the house's basement
- The model is compatible with the new LEGO Road Plates, so you can connect the set's street directly to the roads of the rest of your LEGO City layout



If you don't feel like fighting the fatberg anymore you can modify the set for stand-alone use or for your LEGO City layout and make it a subway station, train/road tunnel, underground garage, hideout, bank robbery scene or spooky movie setting for instance

Features 8 minifigures and 2 birds

Measurements: 27 x 22 x 27 cm (approximate W x D x H)

Mass: 2649 g

Total part count: 2521 (including the figures' pieces)

The Figures:

- Sewer Heroes: The Boss (always puts on his serious face when it comes to blockages)
- Sewer Heroes: Jet/vac truck operator (would have loved to have this LEGO model when she was a kid)
- Sewer Heroes: Veteran sewer worker (has seen everything in the sewers. Everything!)
- Sewer Heroes: Apprentice sewer worker (is still wondering whether her veteran coworker has actually seen everything in the sewers)
- Restaurant Guest (has ordered a burger and a milkshake)
- Waiter (is serving the burger and the milkshake)
- Chef (will immediately check if his kitchen's "grease trap" is still working properly)
- Pyjama Guy (has woken up late, now getting ready in the bathroom - hopefully not flushing any "unflushables" down the drains)

Note:

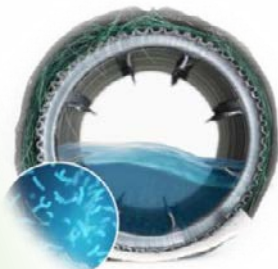
When entering sewers, all professionals have to follow complex health and safety procedures. But in order to retain the set's play & display value, not all of those measures are being depicted in the model. In reality the team members would also be equipped with gas monitors to warn them of poisonous or explosive gases, just to name one example.

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