



# Winter 2023

# Onsite Informer

The official publication of the Western Canada Onsite Wastewater Management Association



CPC Pub. # 42887518

**INSIDE:**  
The Art of Organization  
University of Minnesota Study on Septage  
Managing Commercial Strength  
Wastewater  
Nitrate Loading from Onsite and Permeable  
Reactive Barriers for Renovation





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## A Message from WCOWMA

Here we are in late November and the installation season is still going strong. An extremely mild fall in the Prairies has extended the installation season significantly, while dry weather on the coast in BC has extended their season as well. A couple of members have actually said they are looking forward to the snow so they can slow down.

Work in the Association office is also very busy, with two conventions and a series of Education Days to plan and implement.

One of the things we are hearing from members is a desire for more practical training. Typically, practical training is offered in the installation season as that is when we can perform live demonstrations, however the convention programs will offer increased practical, hands-on opportunities for delegates. Business programs and information sessions will be available as well.

The AOWMA hosts their convention and trade show February 13 – 15, 2023 in Red Deer. WCOWMA-BC's event is March 14 – 16, 2023 in Kamloops. There will be a lot to see and do at the 2024 conventions, so we hope to see you there.

SOWMA and MOWMA will host a series of Education Days in mid-April. Members are encouraged to attend one of these events to catch up on industry news and information and gain technical knowledge to take into the 2024 installation season.

On top of training and education, the Association is always looking for opportunities to add to our member benefit program. New partnerships with NAPA Auto Parts and Merchant One will be available to members beginning in 2024, which will provide significant savings for business operations and repair and maintenance.

A significant member benefit that more and more members are taking advantage of is the ability to contact the Association office and get help and resources for system design, installation, and maintenance. If you have questions on permitting or filing, or want to have a design reviewed, we can help with that.

The Association and its Boards are always happy to hear from members. If you have questions or concerns, reach out to us. We will do our best to support you in your work.

Charles Hallett



# What's Happening in Western Canada

Your Association has had a pretty busy summer and fall, and is heading into an equally busy winter. Here is a summary of some of the Association activities.

## British Columbia

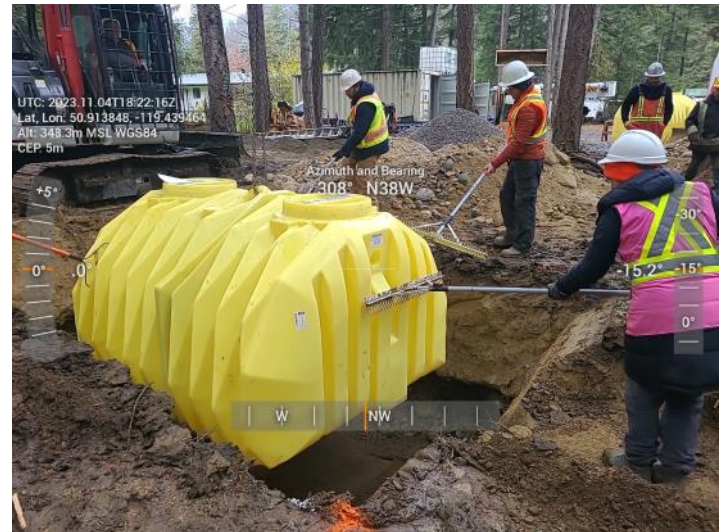
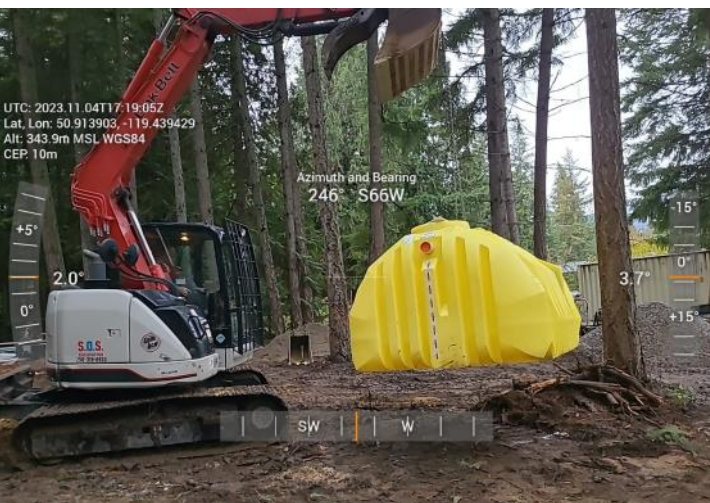
### Training Events

Site and Soil Days along with an installation day were the focus of Association activities over the installation season. While Site and Soil field days are fairly easy to organize, installation field days prove much more of a challenge, however they are critical opportunities for people new to the industry to gain experience installing onsite wastewater systems.



The Association was fortunate to have the sponsorship and support of some of our member manufacturer and supplier base for an installation field day held in Scotch Creek in early November.

The system installed was a seepage bed using pressure distribution to service a five-bedroom home. The home



has not yet been constructed. While planning the event, the Association received a call from John Richardson of Premier Plastics offering to help with tankage as his company is celebrating their 30<sup>th</sup> anniversary this year and wanted to mark that event by supporting industry activities such as the installation day. Tanks provided were an STS 1350D and an STS900. As well, John noted that Premier Plastics was interested in gauging the ease of installation of a new CTDS system: Geomat. This CTDS system is NSF 40 certified and therefore acceptable under the SPM. With that in mind, the seepage bed was redesigned to meet both the SPM and the manufacturer specifications for the CTDS. The seepage bed was initially designed as a Type 1 system, and so the area of infiltrative surface was maintained for Type 1 even though the CTDS achieves Type 2 treatment. The goal was to see whether the installation of the components was easy and uncomplicated.

Liberty Pumps also supported this event and provided a Model EFFL 1.5 HP 230 V 1 PH MN pump for the pressure distribution system while Delta Water Products sponsored both the freight for the tanks and CTDS components to Kamloops as well as supplying an SJE Rhombus Simplex panel with C-level.

The training day was not without its challenges as the site was heavily treed, meaning access to various points on the site was restricted. This was a good opportunity for new installers to see how site topography and vegetation can impact system installation, and how to accommodate those challenges both in time management and pricing.

The site also had challenging soils, which impacted the efficiency of excavating space for the tank installations. Butch Bouchard of SOS Sewage Onsite & Excavating stepped up by providing a larger excavator and his excavation services.

The Association would like to thank Premier Plastics, Liberty Pumps, Delta Water Products, and SOS Sewage Onsite & Excavating for help with this installation workshop. Without this type of support and sponsorship, these events would not be

possible. Thanks to David Van Oirschot for providing the installation site and to member Tim Witzke of Black Dragon Contracting for helping with final installation tasks. Trainers for this project were Liesbeth Glotze and David Zacharias of Simple Sewage Solutions. Additional pictures from our training events can be found on Instagram (@wcowma.septic).

**Thank you to one of our manufacturer sponsors:**

Thank you to SJE Rhombus for supplying a Simplex Panel for our training program in BC!



**Lack of Receiving Facilities in the Fraser Valley Regional District**

There has been a lot of discussion and lobbying to find a solution to a lack of receiving facilities in the Fraser Valley Regional District. Pumpers in the Chilliwack area are struggling to find facilities to receive the septage they are hauling. As of October 1, 2023, the City of Chilliwack began enforcing their bylaw that limits access to those within the city limits. This has left several communities without access to this essential infrastructure. Currently Chilliwack is the only facility with the capacity to accept out of region wastewater, with the exception of Annacis island, which limits out of region wastewater to those with a certificate. Hauling to Annacis Island from Chilliwack and points east is not really an option even if a certificate is available due to the added time and cost involved in hauling septage that distance.

Despite significant discussion and publicity about this problem the City of Chilliwack has now doubled down and is limiting the number of loads per day from pumpers even within the city limits. Not only does this cause the potential for illegal dumping, but it will price homeowners out of this essential service and put pumpers out of business.

**WCOWMA-BC Convention & Trade Show**

Plans are underway for the 2024 Convention and Trade Show taking place in Kamloops, BC from March 14 – 16, 2024. Registration for exhibiting at the trade show is currently open and information and registration for delegates opens in December. Make sure you save the dates on your calendar. On top of the valuable education and networking that takes place, this event will typically provide you with about twelve CPD Points if you are a ROWP and the equivalent of one point per hour of engagement for Professionals.

**Alberta**

**Out and About in Alberta**

AOWMA’s Executive Director Charles Hallett was out and about in Alberta this season introducing himself to supplier and manufacturer members of the Association and promoting the upcoming AOWMA Convention and Trade Show. Charles was able to stop in and visit Western Pump Ltd. /Jet Inc. (Edmonton & Calgary), Seago Industries (Edmonton & Lethbridge), Alberta Wilbert Sales - (Edmonton & Calgary), Arndt Motor & Pump, Tanks-A-Lot, Aquateck West (Edmonton, Calgary, & Lethbridge), ATEK Ltd., MoveWater, Pembina Concrete Products, Westcon Precast Inc- (Calgary & St. Albert), Metro Pump, Bashaw Concrete, Spectrum Sales Agency, The Fiberglass Shoppe, Down to Earth Labs Inc., E.D. Marketing Ltd., and Southern Irrigation.



In addition to networking with members over the fall months, the Association hosted a trade show booth at the Rural Municipalities Association (RMA) fall trade show in November. This event allows us to promote good land use practices and the Septic Sense program to rural councillors.





Charles Hallett attended the Safety Codes Council Summit in Red Deer in October. Creating and maintaining positive relationships with regulators and provincial representatives helps the Association to advocate for the onsite wastewater industry and our members.

## Training Events

The AOWMA hosted several Site and Soil Field Days this past season, with sites provided by members in Nisku, Okotoks, Rimbey, and Strathcona County. These training field days are not only a requirement of the training program, they are invaluable as continuing education opportunities for those designing onsite wastewater systems in the Province.

The AOWMA is always looking for installation sites in order to provide needed practical training for installers. Members with sites they are willing to host an installation training day on should contact the AOWMA office.

## AOWMA Convention and Trade Show

The 2024 AOWMA Convention and Trade Show takes place from February 13 – 15, 2024 at Westerner Park in Red Deer, AB. Make sure you mark your calendars for this event. Registrations for exhibitors are open and registration for delegates will be open by the time you receive this publication!

The focus at the AOWMA event is practical, hands-on education and experience. This theme is in keeping with feedback from industry that more practical training is much needed. We hope members and other stakeholders will take advantage of this valuable opportunity to learn and network.

## Combined Treatment and Dispersal Systems Come to Alberta

Although combined treatment and dispersal systems (CTDS) are common in the other Western Provinces, they have not typically been installed in Alberta. While the systems are typically NSF 40 and/or BNQ 3680/600 certified to produce secondary treated effluent, their passive distribution has been outside the Standard of Practice.

Looking to open the door to new technologies however has led to one of these systems being installed under provincial variance in the Westlock area. Alberta Municipal Affairs issued the variance and was on hand to witness the installation of an Enviro-Septic System. The system was installed with testing

mechanisms in place for periodic testing of the effluent quality produced.

There are several CTDS technologies available in North America and it is likely we will see more and more of them in Alberta if site conditions are appropriate.



## Saskatchewan

### Out and About in Saskatchewan

The Association was represented at the annual Canadian Institute of Public Health Inspectors, Saskatchewan Branch (CIPHI) in October. Charles Hallett and Adrienne French hosted a booth and engaged with provincial health inspectors on permitting and qualifications for installers in Saskatchewan.







During the same time period Charles Hallett took the opportunity to stop in and tour member Progressive Yard Works facility in Saskatoon.



Adrienne French represented the Association at FRP Manufacturing's annual customer appreciation barbecue in September and then at the Saskatchewan Water and Wastewater Trade Show in November.

Attending these events gives the Association an opportunity to engage with its members and encourage others to join the membership.

### Education Days

SOWMA will host its annual Education Days throughout the Province during the week of April 8, 2024. Locations will be announced in early 2024.

The Annual General Meeting will be held at the Saskatoon event.

### Manitoba

#### Training Events

Training was the focus this past installation season in Manitoba as well. The Association co-hosted an installation field day in Winnipeg on a site provided by members Denis and Ian Keating. An Eljen combined treatment and dispersal system was installed as part of the installation day.

There were over 30 registered and 27 confirmed attendees,



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including MOWMA representatives and several Environmental Officers.

Derek Smith from Manitoba Environment and Climate Change provided a review regarding the permitting of the system and Hugh Bonner, EMCO Corporation explained how the Eljen system functions. Denis and Ian Keating led the installation of the system. The Association received positive feedback from all those in attendance.

Sponsors to the event were Duracon industries, who had provided the septic tank on the project, and EMCO Corporation.

### Education Days

MOWMA will host its Education Days in both Winnipeg and Brandon in mid to late April 2024. A full day of educational presentations will be available to attendees. Following the presentations in Winnipeg, the Association will hold its Annual General Meeting.



## Connect with WCOWMA

[www.wcowma.com](http://www.wcowma.com) is your access point to the Association, including the four provincial Associations, and all its activities. The website gives visitors instant access to training information, upcoming news and events, WCOWMA membership benefits, and other industry resources.

In addition, the website provides easy access to professional installers in each of the four Western provinces. This ensures that when homeowners are looking for qualified companies to do their work, they'll find everything they need to know on the website. The "Locate A Pro" feature allows homeowners to choose their province, and then further narrow down their choices to sub-categories such as installers, designers, maintenance providers, pumpers, and inspectors. From there, homeowners can choose their specific location and then they are taken to a page listing of all the WCOWMA members offering the services required.

Becoming a WCOWMA member ensures that your name and contact information is at the fingertips of those homeowners who need your services. Join the 1250+ onsite wastewater professionals in this handy online go-to guide.

For more reasons to join, please contact WCOWMA directly or visit [www.wcowma.com](http://www.wcowma.com)



# Core Values

By Pamela Morgan, Key Instincts CEO

We all want to work with organizations that represent exemplary core values. We either want those values to reflect who we are personally or who we are aspiring to be.

So why is it a challenge for many organizations to establish or maintain that core value alignment? The answer to this can prove to be more complex than you may initially think.

*We know that core value alignment is critical to the success of everyone—internal and external stakeholders are equally at risk when the wheels fall off the bus.*

Contrary to how we instinctively look at resolving or investigating problems, inconsistencies, and the “falling of Rome,” which is to work from the bottom up in our search for answers, I want to challenge you to work from the top down. This will give you a different perspective and will allow for you to be disciplined and organized in selecting and removing possible constraints and obstructions that may have attributed to core value inconsistencies.

Now, I know what you’re thinking: core values are the *foundation* of a company. Yes, this is true! But think for a moment of everything that is added to that foundation: employees, customers, R & D, Alliance partnerships, time constraints, leadership disciplines, marketing strategies, succession plans, team development, social awareness, and the list goes on.

## Is the Leadership Lagging?

Let’s start at the top, shall we? Strong, consistent, effective

leadership is essential to the overall success of any company. You can fake it for a while if you are an ineffective leader, longer than a non-compliant employee, but eventually the cracking and slow crumble will begin.

As a leader, you need, more than ever, to surround yourself with others that share your values, disciplines, and vision. Not only will you grow and flourish, but your company will as well, in every aspect. You need to be sensitive to whom you have in positions of authority who will continue to support and maintain these values consistently.

There is, at times, the misguided belief that once you’re the boss, you no longer need to find inspiration, have a mentor, or remain flexible. You need to capitalize on this more than ever; you and your company are growing at rapid speeds in multiple directions, and it can be a bit of a juggling act. Therefore, flexibility and innovation is key.

If we know the leader is actively engaged, practicing what they preach, embracing their core values, engaging others effectively, teaching, and holding others accountable, we can move forward with confidence that the issues are within the organization’s network.

## One Bad Apple

Taking a pragmatic approach in analyzing your internal stakeholders, assessing hiring decisions will tell you so much regarding who is attributing positively and negatively to the company’s success or struggles.



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Who is executing hiring decisions, development, evaluations, and employee/employer resolutions?

Are they qualified?

Are they invested in the success of the company?

Are they engaged and developing themselves?

These are all important questions to consider when you are placing a key person in charge of your most valuable assets: your people!

It only takes one bad apple—one individual who is disengaged or disgruntled—to spread their dismay throughout the company, which eventually will bleed into external alliances and customers' perspectives.

Therefore, constant communication with all employees is vital to the health of an organization. Depending on the size of the company, putting checkpoint processes in place to consistently have your thumb on the pulse of the company will allow for clear understanding and accountabilities.

### **A Sense of Belonging**

Involving your employees in building, redefining, implementing and practicing your core values creates a buy-in and self-accountability. Creating an environment where your core values are embraced as daily practices will become part of the organization's DNA and strengthen your employees' personal core values, which should be reflective of the company's values at point of hire.

Employees who know and see a company's core values practiced consistently are more apt to join in and participate in practicing these value strategies than be the odd man out. We want to belong, and we want to belong where our own values can be fostered.

### **We Attract Who We Are**

Whether you are hiring, creating alliances, or building your customer portfolio, you attract who you are. Remaining disciplined with your core values will minimize less than favourable connections.

If you have alignment in all aspects of internal stakeholders, you will find your external stakeholders fall into place and you will effectively create a reputation that will be attractive to join and participate with.

Processes, strategies, developmental practices, retention, productivity, and company growth will be supported in the overall success of the company and with individuals who have duly invested in it.

## **The Big Picture**

There is much more involved in establishing a successful business than a great product and a few people to sell it.

Your foundation's strength relies on your cornerstones, or what are commonly known as *core values*. Taking the necessary time to build and maintain those core values is essential to long term success and company evolution.

It isn't as easy as throwing a few catch phrases or buzz words together; creating core values is or should be well thought out.

Core values are the fundamental beliefs of a company. They represent who you are, why you do what you do, and the goals you hope to achieve. They should be reflective of your company's objectives and who you want to attract. Representing a platform of social awareness within your values and fulfilling on this commitment is strongly recommended.

Implementing those values and creating accountability processes, such as hiring practices, evaluations, strategic planning, and culture mapping, will support employer and employee alignment in core values and the organization's overall success.

Consistent follow-up and effective communication throughout the organization's network will support core value alignment and the overall culture of the company.

### **Focus on Talent**

Who you hire represents your core values. Therefore, it's important to create a process for the way you search for and hire your new team members. Do you have a process? Have you thought about it in this way before? Where are you looking? How are you looking? What's the interview scenario like? Are you asking basic questions or are you diving into thoughtful questions to see if the person aligns with your core values and will be flawless in representing them. How does this person align with your current team? Do you truly have the time to do this correctly?

At Key Instincts, talent acquisition is our specialty. We dive into the core of the person because we take the time to learn the core of your company.





# University of Minnesota Study on Septage

By Dr. Sara Heger, University of Minnesota

The Minnesota Department of Transportation (MnDOT) maintains a system of safety rest areas (SRAs) and travel information centers (TICs), many of which rely on onsite septic systems for the treatment of their wastewater. These systems are often under concentrated loads due to the source of the wastewater, which is primarily toilet flushing and hand washing, especially in facilities with low-flow fixtures. The data in this study may be representative of other facilities where the primary source of wastewater is toilet flushing with low amounts of graywater production. While the septage produced at these sites is known to be different from residential septage, minimal research has been conducted regarding its actual characteristics. Existing research has focused primarily on residential septage with little data available for these type of commercial systems.

This project sought to provide data on characteristics of the septage generated at Minnesota's rest areas. Septage samples were collected from the septic tanks at 25 rest areas throughout Minnesota during the scheduled system maintenance, when the tanks are emptied by vacuum pump. Well-mixed, representative septage samples were sought; accordingly, all samples were taken from the septage pumped out of the first tank and load of the system. Sludge and scum depth measurements were also taken at most locations before the tanks were pumped. The time since the tanks had last been pumped at the time of sampling varied from 7 months at the shortest to 36 months at the longest, with an average interval of 15 months. The results for a variety of wastewater characteristics are shown in the table below.

Analyte	Mean Concentration [mg/L unless otherwise noted]	Standard Deviation [mg/L unless otherwise noted]	Sites Sampled
BOD	5167	6031	24
COD	16765	19240	24
TSS	16712	21234	24
Nitrogen, Ammonia as	160	111	23
Nitrogen, Total Kjeldahl	479	445	24
Phosphorous, Total	90	103	24
Oil and Grease	748.0	1163.2	24
PFAS	209 [ng/L]	360 [ng/L]	4
Arsenic	0.05	0.16	11
Cadmium	0.003	0.006	11
Chromium	0.03	0.07	11
Copper	1.24	2.38	11
Lead	0.04	0.10	11
Mercury	0.69 [µg/L]	1.53 [µg/L]	12
Molybdenum	0.03	0.06	11
Nickle	0.05	0.11	11
Selenium	0.01	0.02	11
Zinc	5.93	10.1	11
pH	6.5 [units]	0.68 [units]	24



The EPA Guide to Septage Treatment and Disposal provides concentrations of wastewater components considered typical for general septage, which were used for comparison with the results of this study. All biochemical oxygen demand (BOD) values identified by this study were lower than the maximum given by EPA. Mean BOD values were slightly lower than the EPA mean, while the lowest BOD values identified were below the EPA minimum. All identified chemical oxygen demand (COD) values were within the range given by EPA. The highest identified phosphorus concentrations were lower than the EPA maximum. The mean concentration phosphorus was lower than the EPA mean, and the minimum was lower than the EPA minimum. Maximum and mean oil and grease values identified in this study were lower than the mean but higher than the minimum EPA values. The minimum identified concentrations were significantly lower than all other available grease concentrations, including the EPA minimum.

The acidity of septage samples collected varied considerably, from pH 5.3 at the most acidic to 7.4 at the most basic. Most samples were acidic, but all values were between the minimum and maximum given by EPA. Total Kjeldahl nitrogen (TKN) concentrations also varied greatly, from 28.8 mg/L to 1430 mg/L. The greatest TKN values exceeded the EPA maximum, while the minimum values were lower than the EPA minimum. The maximum and mean ammonia concentrations identified by this study were higher than the EPA maximum ammonia nitrogen concentration, while the minimum identified ammonia concentration was four times the EPA minimum. The maximum total suspended solids (TSS) concentration identified by this study approached the EPA maximum. Mean values from this study were greater than the EPA mean, and minimum values were greater than the EPA minimum.

Out of the five sites tested, PFAS were detected at two: Grand Portage Visitor Center and St. Croix TIC. PFAS was not detected at another two sites, Fishers Landing and Oak Lake SRAs, and samples from the fifth site, Goose Creek SRA, are currently under analysis. The concentrations were much higher at St. Croix than at Grand Portage; this is expected because the groundwater around St. Croix TIC is known to contain PFAS from nearby contamination.

Samples from 12 sites were tested for arsenic, cadmium,



chromium, copper, lead, mercury, molybdenum, nickel, selenium, and zinc. Arsenic and cadmium were detected at only two sites, lead, mercury, and molybdenum at three each, chromium, and selenium at four each, and nickel at six. Copper and zinc were detected at all 12 sites. No metal concentration exceeded the EPA maximum and only one zinc concentration and one copper concentration exceeded the EPA mean. In general, the concentrations were very low, which was expected based on the source.

Some general trends were observed in the solid's accumulation data. Slight correlation was observed between scum thickness and concentrations of BOD, TSS, and oil and grease. A correlation with oil and grease in particular was expected, since these compounds form a significant part of the scum layer.





There was also a slight correlation between scum thickness and septage acidity. Nearly half of the sites had wipes, needles, clothing, or other inappropriate trash; therefore, garbage cans and sharp containers are recommended to be added in the bathrooms.

The second tank in series typically had at least half as much, and sometimes nearly as much, sludge accumulation as the first. On the other hand, the last tank in series (typically the pump tank) tended to have no sludge or scum accumulation at all, except in those systems that had gone the longest without

maintenance. Finally, it was observed there was usually little to no scum accumulation in subsequent tanks, even when accumulation in the first tank was quite heavy.

The general takeaway from this study is that the septage from rest areas is very similar to the septage from normal domestic tanks.

For a complete copy of the report see:  
<https://septic.umn.edu/research>





# Worst Job

By WCOWMA Administration

We asked to hear your worst experiences on the job site, and Chad's takes the prize!

## **Submitted by Chad Widmer:**

I was new to the industry, and I was performing a service on a septic tank, pump, and filter.

I arrived and started the service.

I removed the cap from the Simtech filter and cleaned the filter. Then I wanted to check the floats. So I pulled out the float mast and had to replace a float.

Plugged everything back in and dropped the float mast back into the tank. My head was right above the open Simtech filter housing in the tank.

When the floats hit the water it engaged the pump and I got a full strength stream of water from the pump that launched the Simtech cartridge out of the filter and into the side of my face. It knocked my sunglasses and hat right off my head, and I took a full shot of effluent into my eyes, mouth, nose, etc. My hair was dripping wet. I could taste the salty effluent.

I'm glad no-one was home because it was embarrassing. I doused myself in hand sanitizer and did the best I could to rinse off my hair and face with the garden hose. Then tried to find my hat and sunglasses and the filter cartridge that were all now in the bottom of the tank.

While I was kneeling beside the tank trying to fish out my hat, sunglasses, and filter, I noticed I was kneeling in dog crap. I jumped to get out of it and my cell phone slipped out of my shirt pocket and into the tank as well.

It was not a good day! I had a very, very long shower when I got back home.

In case you are wondering, Chad decided to leave the cell phone at the bottom of tank.

We hope this \$100 gift card from Mark's is a small consolation, Chad!

Keep an eye out on social media for more contests like this one.

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WE ASKED:

## What has been your most pleasant surprise on a jobsite?

YOU ANSWERED:

Getting paid....? - Lainey L.

This year? I would have to say good soil conditions! - Aleena P.

A well maintained and functioning onsite wastewater system. 1 in 50 from my pleasant surprise. - Richard L.

A circular logo in the bottom right corner of the graphic, depicting a stylized landscape with blue mountains, a yellow sun, green trees, and blue wavy water.

# Business Corner:

## Computer Tips

By WCOWMA Administration

### Adjust the Screen's Lighting and Brightness

The brightness of a monitor determines more than just how much light the screen emits. It also influences the color representation and the impact of ambient light on your monitor.

The best brightness for your monitor depends on your usage situation. A brightness of 300 nits is considered to be the best average. It offers good visibility, makes colors pop on the screen, and prevents strained eyes. The most important tip is to adjust the screen brightness to your surroundings. If your surroundings become brighter, increase the brightness. If it gets darker, lower it.

Do you know about dark mode? How about night mode?

**Dark mode** is a setting or theme that changes the background color of the operating system desktop or home screen, and some applications, to dark gray or black.

**Night mode** is a feature on a computer or smartphone that reduces eye strain from blue light. It does this by lowering the amount of cool-colored light emitted from the screen. It takes

these blue, green, or violet tones, which can cause strain to the human eye, and replaces them with warm tones like red and orange to reduce their intensity.

You can adjust your lighting to either dark mode or night mode on most devices. Give it a try and see what you think!

And don't forget to turn the screens off before bed. The light from screens can impact your sleep, so read a book, or work on a puzzle, any activity away from blue light.

### Make a Copy of a File by Dragging It

If you need to make a copy of a file and save it in another location, here's a quick and easy way to do it. On a Mac, hold the "Alt" key and then click and drag the file. If you're using a Windows PC, hold the "Control" key and then click and drag the file. This will make a copy that you can drop anywhere you want by unclicking.

### Undo. Everywhere.

You're probably familiar with "CTRL + Z," the keyboard shortcut that can undo mistakes in programs like Word.

***Did you know that shortcut works other places as well?*** It's true.

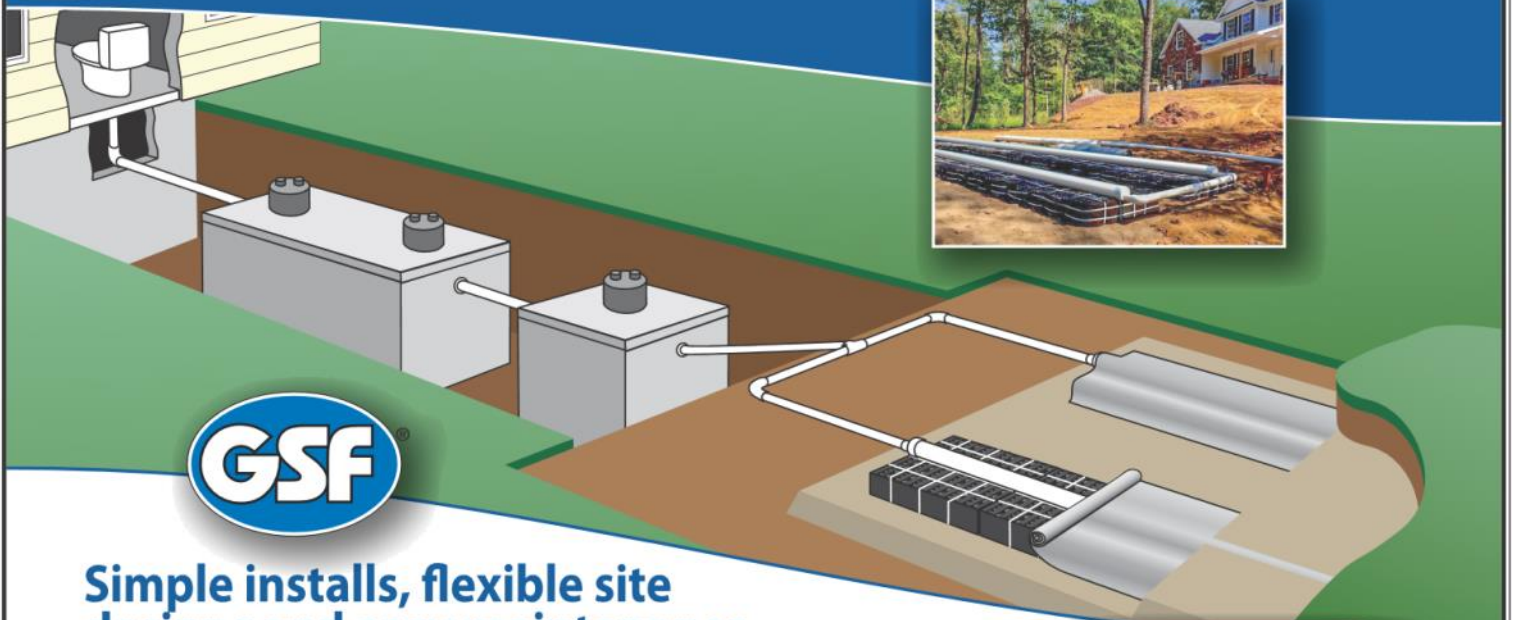
Here are a few examples: Typing in a browser window and accidentally delete some text you wanted? Moved the image in your publication a little too far? Deleted a file from a folder by accident? Try "CTRL + Z." (Note: this last one doesn't always work on shared servers.)

And of course, don't forget "CTRL + Y," which will redo whatever you just undid.





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## Print to PDF

If you've ever needed to send a PDF to a client or wanted to save a PDF to your computer and had trouble, this tip is for you.

**First of all, what's a PDF?** The letters stand for Portable Document Format. Essentially, the format is used when you need to save files that cannot be modified but still need to be easily shared and printed.

**So, how do you make one?** There are a few ways, but the simplest method is to "print to PDF." Once your document is complete, use CTRL-P or select the print option as normal. Now, before you hit "print," use the drop down to change the selected printer. Find the one that includes the letters "PDF" and select it. When you hit "print" you will get a pop-up screen that allows you to select where you'd like to save this PDF, and what you want the name of the file to be. Voila!

**Looking for more computer tips?** We share some each month in our newsletter, which is sent directly to our members on the 1<sup>st</sup> of each month.

We're also pleased to be offering business courses at the WCOWMA-BC Convention & Trade Show in March. Join us there and take your computer skills to the next level!



# Nitrate Loading from Onsite and Permeable Reactive Barriers for Renovation

By Bryer Manwell, Hydrogeological Engineer, M.Sc., P.Eng.

Reducing nitrate contaminations throughout the world is a United Nations global initiative for sustainable development goal (SDG) to achieve clean water and sanitation. Human activities, on the global scale, have doubled the natural cycle of nitrogen in the environment. One in three people do not have access to safe drinking water and groundwater has been considerably damaged by human activities. UN SDG Goal 6: Clean Water and Sanitation includes the following aspects, that relate to the onsite wastewater industry:

- 6.3 By 2030, improve water quality by reducing pollution;
- 6.5 By 2030, implement integrated water resources management at all levels;
- 6.6 By 2030, protect and restore water-related ecosystems; and
- 6.7 By 2030, expand international cooperation and capacity - building support for wastewater treatment, recycling and reuse technologies.

Nitrate contamination in the environment is derived from anthropogenic (human) sources, including agriculture, fisheries, blasting (mining), industrial, wastewater, municipal (biosolids) and private sewerage disposal (onsite wastewater) systems. Documented onsite wastewater contamination of near-surface groundwater and surface waters in western Canada are widespread. Long-term (chronic) nitrate loading [greater than 3 mg/l in hyporheic waters (near-surface groundwater as it enters surface waters)] from onsite have been quantified by the author in the following locations in BC and Alberta:

- Near Golden - Nicolson Aquifer (sand and gravel aquifer)
- Near Williams Lake - Dog Creek Aquifer (bedrock aquifer)
- Kettle River at Grand Forks
- Cold Stream Creek
- Swan Lake (Vernon BC)
- Okanagan Lake (Naramata and Summerland, etc.)

- Shuswap Lake (Sunnybrae, White Lake, Blind Bay / Sorrento, etc.)
- Galiano Island
- Christina Lake
- Bragg Creek and Spring Bank

Factors affecting onsite wastewater nitrate loading to surface waters include population / land-use density, hydrogeological setting, vertical and horizontal separations, depth to groundwater or rate limiting layers, and annual fluctuations of the water table. In practice, alternative septic system design considerations which address nitrate renovation are critical for reducing potential harm to human health or the environment. In environmentally sensitive areas, with high groundwater tables and in close proximity to surface waters, each aspect of the onsite wastewater system process (i.e. planning, installation and maintenance) should address potential nitrate contamination and performance based monitoring.

To better manage the potential environmental impact from onsite effluent near lakes and rivers, regulators will often stipulate advanced onsite treatment (Type 2 or Type 3). However, effluent performance criteria for Type 2 and Type 3 treatment does not specifically address nitrate renovation. Further, if nitrate reduction is not addressed in the design, moving to Type 2 and Type 3 systems can create higher rates of nitrate loading to the environment, due to a justified increase in the hydraulic loading rate (HLR) with treatment of BOD and TSS.

Over the past ten years, Ms. Manwell has been researching and quantifying the effectiveness of permeable reactive barriers (PRB) as passive nitrate (and pathogens) treatment for onsite wastewater effluent, prior to reintroduction to the environment. For challenging sites in sensitive environments (i.e. small lots near surface waters) adding a carbonaceous material (i.e. zeolite or hog fuel) to the sand component of the dispersal area (i.e. trench, seepage bed, or sand mound) is a



particularly effective solution to address environmental nitrate loading. The engineered material must be designed to allow for adequate hydraulic loading rate over-time (no clogging or biofouling), while providing passive treatment for nitrate (and pathogenic bacteria). Validation of the polishing (PRB) effectiveness comes from completing prescribed performance-based monitoring over-time.

Long-term performance-based monitoring locations to be sampled must consider the effluent treatment system and the receiving environment. System locations to be monitored will typically consist of the following, at a minimum: effluent from ATU, point of application (i.e. pan lysimeters below dispersal area), and environmental monitoring i.e. near-surface groundwater sampling and nearby groundwater wells. The Maintenance Plan will provide the locations, parameters, and annual frequency of the prescribed performance-based monitoring. Parameters will typically include the following:

- System Monitoring from the ATU (i.e. 5-day biochemical oxygen demand (BOD), total suspended solids (TSS), nitrate, chloride, total alkalinity, electrical conductivity, pH); and
- Environmental Monitoring to assess fate of effluent (i.e. nitrate, chloride, sulphate, total alkalinity, electrical conductivity, pH, and temperature).

After years of working within the onsite industry, Ms Manwell has noticed there are a few procedural changes that could aid in ensuring compliance of the Maintenance Plan. During system installation, closing the loop between the septic system planner and the maintenance provider could improve successful implementation of the performance-based monitoring designs and allow for a better feedback process. By planning to have the maintenance provider at the site during the designer's field review of the installed system, a smoother transition into the Maintenance Plan prescribed performance-based monitoring can occur.

Further, we suggest a third requirement within the B.C. provincial filing process, a Record of Maintenance (RoM) and provincial well reports that state if an onsite system is present at the site the well is drilled. The recommended RoM would be a requirement within a 'living filing document' housed within the health authorities' databases and updated after each maintenance visit by the maintenance provider. To help the public better understand risk to B.C. aquifers, the Record of Sewerage Systems should be added to the B.C. Ministry of Environment and Climate Change Strategy (ENV) managed groundwater WELLS database, the reports are spatially referenced and accessible by public. These database sharing

strategies would require improved communication between government regulating bodies (i.e. ENV and the 5 provincial health authorities). However, these procedural changes could have lasting consequences for improved Maintenance Plan execution, thereby reduce the potential deleterious effects of onsite wastewater on the environment.

Recognizing the need for continued education on emergent topics, Bryer Manwell M.Sc., P.Eng. (CaulWell Engineering and Geoscience Ltd, Salmon Arm) and Krista Podwin, M.Sc., P.Eng. (KSP Septic, Rossland) are currently working on a series of educational manuals for the onsite wastewater industry. Manual topics will include use of PRB's to reduce loading of onsite derived nitrate and pathogens, designing and managing cost effective performance-based monitoring plans, and modeling mounding of onsite effluent beneath dispersal areas.

Human derived nitrogen loading to the environment is considered a global issue. The primary parameter of concern from onsite wastewater impacting foreshore environments in BC is nitrate and there are many examples in BC of aquifer and shoreline contamination (greater than 3 mg/l long-term). By adding passive polishing (PRB) to an onsite wastewater plan (design), nitrate loading to the environment can be significantly reduced. Consistent performance-based monitoring is required to prove system design effectiveness over-time.



*Ms. Manwell is currently President of CaulWell Engineering and Geoscience Ltd. (CaulWell). For the past 12 years Ms. Manwell has been a Principal and Senior Hydrogeologist for boutique hydrogeology consulting firms operating in western Canada. She holds a*

*master's degree in environmental engineering from the University of Calgary, with specialization in hydrogeology. She is a professional engineer registered in BC and Alberta.*

*Bryer specializes in assessing groundwater supplies, designing, and implementing environmental monitoring programs, designing onsite wastewater systems, and facilitating regulatory compliance in areas related to hydrogeology. Bryer was a member of the core groundwater team who completed the groundwater resource assessment for the Okanagan Basin Water Board Groundwater Study.*

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# Upcoming Events

**January 24—27, 2024**

## **WWETT Show**

**Where:** Indianapolis, IN

**Organization:** Water & Wastewater Equipment, Treatment & Transport

**About:** The WWETT Show is the world's largest annual trade show for wastewater and environmental service professionals. The event offers an unmatched educational program, a full slate of live demos, an array of networking opportunities, and an extensive expo floor where buyers and sellers come together to see and experience the latest product innovations and technology.

**Website:** <https://www.wwettshow.com/>

**February 2—3, 2024**

## **Septic Con**

**Where:** Tacoma, WA

**Organization:** WOSSA

**About:** SEPTIC-CON is the Western United States largest tradeshow and conference for the On-Site Septic Construction, Installation, Operations & Maintenance, Pumper and Design industries and consumes the entire Greater Tacoma Convention Center for two full days.

**Website:** <https://septiccon.org/>

**February 13—15, 2024**

## **AOWMA Convention & Trade Show**

**Where:** Red Deer, AB

**Organization:** Alberta Onsite Wastewater Management Association

**About:** This year's theme is: Getting Hands On. Attend workshops and presentations, network with others in the industry, and attend the trade show!

**Website:** <https://aowma.com/convention/>

**March 3—5, 2024**

## **OOWA Convention & Expo**

**Where:** Huntsville, ON

**Organization:** Ontario Onsite Wastewater Management Association

**About:** This annual event brings together all categories of professionals within the onsite and decentralized industry

**Website:** <https://www.oowa.org/>

**March 14—16, 2024**

## **WCOWMA-BC Convention & Trade Show**

**Where:** Kamloops, BC

**Organization:** WCOWMA Onsite Wastewater Management Association of BC

**About:** This year's theme is: Raising the Bar. Attend workshops, presentations, and the trade show, network with others in the industry, and earn those CPD points!

**Website:** <https://wcowma-bc.com/convention>

**April 8—12, 2024**

## **SOWMA Education Days**

**Where:** Locations TBA

**Organization:** Saskatchewan Onsite Wastewater Management Association

**About:** SOWMA will host its annual Education Days throughout the Province during the week of April 8, 2024. Locations to be determined.

The Annual General Meeting will be held at the Saskatoon event.

**Website:** <https://sowma.ca/>



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 Port Moody, BC V3H 4L7  
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April 22 & 23, 2024

MOWMA AGM & Education Day

**Where:** Winnipeg, MB and Brandon, MB

**Organization:** Manitoba Onsite Wastewater Management Association

**About:** MOWMA will host its Education Days in both Winnipeg and Brandon on April 22 & 23, 2024. A full day of educational presentations will be available to attendees in each location. Following the presentations in Winnipeg, the Association will hold its Annual General Meeting.

**Website:** <https://mowma.org/>

September 16—20, 2024

Septic Awareness Week

**Where:** Online

**Organization:** Western Canada Onsite Wastewater Management

**About:** The purpose of this initiative is to promote proper operation and maintenance of onsite wastewater systems.

October 20—23, 2024

NOWRA Mega-Conference

**Where:** Spokane, WA

**Organization:** NOWRA

**About:** Hosted by NOWRA, VOWRA, SORA & NAWT, this mega conference features multiple concurrent sessions on technology, research, policy and management.

**Website:** <https://www.nowra.org/>



# Managing Commercial Strength Wastewater

By Miles MacCormack, P.Eng., Bergmann North America Inc.)

Every jurisdiction has its own set of wastewater standards; however, many do not address wastewater quality (strength or concentration of key parameters such as organic load, solids, or nutrients). This oversight often leads to a mismatch between design flow (hydraulic loading) and required sizing of treatment plant components to address the actual strength of the wastewater in question. This is especially critical in rural and decentralized applications where treatment is limited to a single source of wastewater that may be much different than typical domestic or municipal wastewater. The Alberta Standard of Practice fortunately addresses certain situations as per the excerpts below; however, it is important that the designer review each situation independently to assess if these or other standards are applicable:

## Alberta Private Sewage System Standard of Practice, 2021 (SOP)

- ✦  $< 5.7 \text{ m}^3/\text{d}$  [SOP 1.1.2.(3)], strength  $>$  domestic
- ✦  $> 5.7 \text{ m}^3/\text{d}$ , and effluent reuse for irrigation; *complex onsite wastewater treatment system*
- ✦ Septic (cBOD<sub>5</sub>/TSS = 150/100 mg/L) vs. Package Sewage Treatment Plant (secondary treated effluent, Level 2, 3, 4)

High strength wastewater (exceeds *typical* wastewater), must include features to treat [SOP 2.1.1.10]

- Institutional (schools, nursing/retirement homes, hospitals, etc.)
- Retail/Office
- Work Camps
- Industrial (e.g., manufacturing, composting/landfill, etc.)

Based on our experience, some typical wastewater strengths of different applications are shown in the table below. It should be noted that certain types of restaurant facility may have wastewater that is 8 – 10 times the organic strength (BOD) of typical domestic wastewater, whereas others may have elevated nitrogen, oil & grease, or pH/toxicity issues that would need to be addressed in the system design.

## TYPICAL WASTEWATER STRENGTHS

Parameter	Domestic (typical)	School	Campground	Restaurant	Tim Hortons	Meat Processor	Brewery
BOD <sub>5</sub>	220	150	300-400	800	2000	600-3000	4000
TSS	220	100	300	500	500	4000	3000
TN	50	120	120	80	100	150	100
OG	<50	25	25	300	300	300	100
pH	6 - 9	6 - 9	6 - 9	6 - 9	4 - 9	5 - 12	0 - 14

Some challenges that arise when dealing with commercial treatment systems are the high variability of hydraulic flows along with high fluctuations of organic and inorganic loads. Flows are highly dependent on the amenities / facilities present and how they are used. The designer must account for any nutrient reduction requirements as well. This means that no standardization is possible, and each project should be treated as unique. It should also be kept in mind that qualified personnel for operation, maintenance, sampling, and reporting may be required.

One common application that is often not considered high-strength, but should be, is the RV campground, although day-use campgrounds come with their own issues as well. RV wastewater tends to be very concentrated, generally 1.5 – 3 x

Non-Residential development	Minimum Projected Wastewater Strength, mg/L
Restaurant	600 BOD <sub>5</sub> ; 400 TSS; 200 Oil & Grease
Work camp	600 BOD <sub>5</sub> ; 400 TSS; 200 Oil & Grease
Campground with RV dump station	600 BOD <sub>5</sub> ; 400 TSS; 70 Oil & Grease

Examples of high strength non-domestic applications may be:

- Restaurants (diners, coffee shops, fast food, etc.)
- Recreational (campgrounds/RV parks, marinas, hotel/resort, golf courses, sport facilities, etc.)
- Food Processing (abattoir/meat processor, brewery/winery, dairy, bakery, etc.)

strength of domestic wastewater due to low water usage fixtures. Additionally, where the campground system processes dump station wastewater, this can have a huge impact on organic and nutrient loadings and may contain high concentrations of toxic disinfectants. Campgrounds can also have very high total nitrogen which results in excess oxygen demand, may incur alkalinity limitations (pH drop), and must be considered if there are any nitrogen limits. Flows are another key consideration, with campgrounds subject to extremely variable flows/loadings, infiltration/inflow, peak flows on long weekends / holidays. low flows in early / late season, and no flows during the shutdown period. For these reasons, we always recommend influent equalization (flow balancing) to meter consistent flow to the treatment system having a storage volume between 18 hours up to multiple days in some cases.

Restaurants should always be considered high strength applications; however, the type and usage of the facility must also be accounted for. Any restaurant wastewater will have elevated BOD, TSS, total nitrogen (both organic and ammonia), and oil & grease. Grease interceptors are normally required under most jurisdictional building codes, but are recommended in any case, and a safe assumption would be to use multi-chamber units with a minimum volume of 24 hours storage of the kitchen drainage flow for separated sewers. The design of a treatment system must incorporate measures for diurnal (intra-day), weekend, and weekly flow fluctuations which can normally be addressed with influent equalization (18 – 24 hours minimum storage recommended). It is a useful idea to consider the concept of loading equivalency for these types of systems to gauge the size and cost; for example, a 50 seat Tim Hortons restaurant has a design daily loading equivalent to about 50 homes or 200 persons. Restaurant systems in particular are also subject to the impact of low pH and cleaners, so the system specified must be resilient to potential toxic shock.

Going back the Alberta SOP, though these concepts are useful in any application, the following requirements are noted for commercial systems:

- ✦ Prohibition on the use of prescriptive designs for commercial, industrial, abattoir, etc. [SOP 2.1.2.6.]
- ✦ Design to peak daily flow, recommends equalization for variable flows [SOP 2.2.1.4./7.]
- ✦ Equalization volume PDF or 1.5 x ADF [SOP 2.2.2.5.]
- ✦ High level alarms, control system are required to achieve functionality, operation and monitoring, including electrical/

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mechanical failure alarms, and flow monitoring with 30 day minimum data storage [SOP 2.4.1.2./3./5./6.]

- ✦ Requires management of flow volumes, e.g., equalization [SOP 2.4.1.8]
- ✦ Dose tank required for soil infiltration systems [SOP 2.1.1.5.]
- ✦ Package sewage treatment plant shall demonstrate capacity to treat organic loading of wastewater to required effluent standard [SOP 5.2.2.2.]
- ✦ Manufacturer documentation required for package system capacity to treat high strength influent [SOP B5.2.2.2.]
- ✦ Secondary treatment required for pressure distribution systems and/or to reduce soil vertical separation [SOP 8.1.1.5./8.], or LFH at-grade system [SOP 8.6.1.3.]
- ✦ May be additional requirements for nutrient impacts (e.g., multi-lot subdivisions) or sensitive receivers

Surface water discharge is regulated by Alberta Environment, not covered by SOP



Effluent quality is regulated by each individual standard depending on jurisdiction. Any commercial treatment system design must be able to meet the required effluent criteria while also accounting for the differences in influent quality.

To summarize the recommended planning and design approach for commercial and/or high-strength systems, one must determine an accurate flow/load characterization looking at population equivalents in addition to flow, and include measures for elevated organic, solids, grease and nitrogen loadings. It is recommended to design for maximum day worst case flow/load, equalize inflow with consideration for diurnal flow or multiple day balancing, and account for infiltration/inflow if necessary. Further details to consider would be off season / start-up / shutdown planning, or potentially timing due to permit review.

An assessment of design flow is an integral part of any wastewater treatment specification. This process will need to assess flows vs. local regulatory guidelines noting that real flows may differ significantly from standards. For existing sites looking to upgrade or expand, it is recommended to get actual site data by starting to monitor/record flows as soon as possible, or use real data from similar facilities, by way of water use records, verified flow pump counters, or flow metering systems. The design should assess all wastewater sources separately (trailers, comfort stations, dump stations, amenities), assess peak facility usage, and review infiltration & inflow (I&I) impacts. The objective is to define maximum daily design flow, average flow; and weekend/weekly flow maximums if possible. It is noted that most regulators want 1 – 3 years data if using real flows that differ from the standard.

Moving on to treatment system specifications based on the requirements for high-strength commercial wastewater, it is clear that a robust, resilient, and operationally flexible system is necessary. An example of this is a commercial moving bed biofilm reactor (MBBR) system:



This type of system incorporates primary treatment in the first stages with a dedicated sludge storage zone (high-strength systems generate significant sludge that needs to be managed), staged secondary mechanical (aeration) treatment, sludge recirculation, and other process elements as needed depending on the application and effluent requirements. The advantages of this type of biofilm system,

which would be applicable to any system considered for commercial wastewater, are compact treatment size, cost efficiency, ability to reach Level 4 effluent quality (10 mg/L CBOD<sub>5</sub> and 10 mg/L TSS), efficient operation even in cold temperatures, resistance to hydraulic and shock loadings, rapid treatment recovery after seasonal shutdown, flexible design / operation, ease of service / low maintenance, and the ability to add operational control elements such as dissolved oxygen control or remote management.

For complex commercial systems, especially in rural and decentralized applications, a system of remote management is highly recommended to facilitate real-time monitoring and prompt operational response without the need to necessarily be onsite. A comprehensive remote management system would include a control panel platform that integrates hardware, flexible programming and remote access (two-way communication), can control all required equipment such as pumps, blowers, valves, filters, disinfection, etc., can measure levels, switches, flow meters, and various sensors, can monitor alarms, power and events (see SOP 2.4.1.), and provides feedback notifications such as data logging and e-mail notification.



Lastly, operation and system management needs to be considered. For most commercial systems, some level of qualified local operator will be required to perform regular scheduled maintenance (monthly – quarterly for example), as well as emergency maintenance / repair. Sampling (effluent, influent, environmental) will be required per the approval, which may be done by the owner, operator, or third-party consultant. Flow monitoring and annual reporting / review may also be stipulated, which could be done by the system operator, or third-party consultant/engineer, with the regulatory review likely done by the jurisdictional regulatory authority. For long-term operation, someone will also be responsible for ongoing troubleshooting and process review as required, which could involve the operator, engineer, and/or equipment supplier.

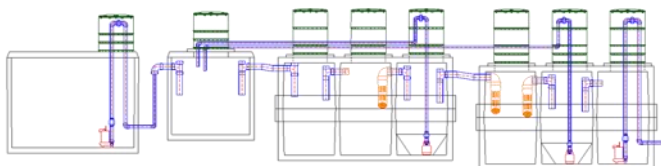
Some examples of commercial or high-strength treatment systems are provided here.

PROJECT: **Small Campground**

DAILY FLOW: <math><10\text{ m}^3/\text{day}</math> (<math><50</math> sites)

INFLUENT: 250-700 mg/L BOD<sub>5</sub>,  
200-600 mg/L TSS,  
60-200 mg/L TKN

EFFLUENT: 10mg/L CBOD<sub>5</sub>, 10mg/L TSS

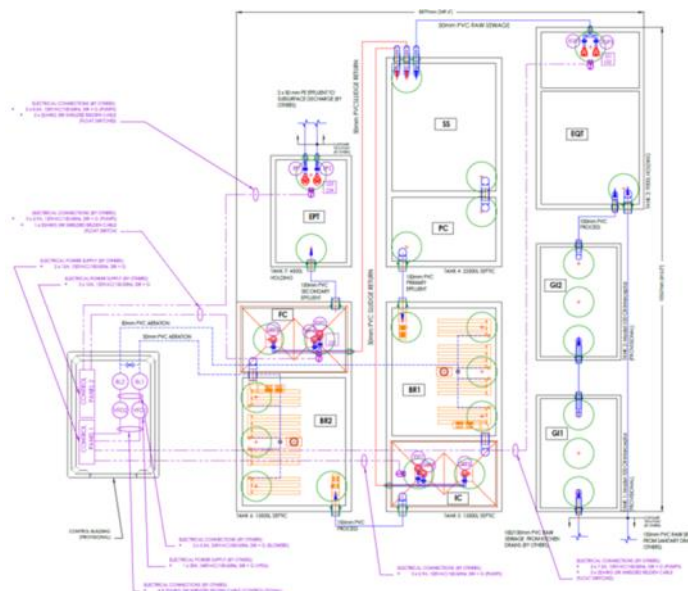


PROJECT: **Restaurant (Service Centre / Tim Hortons)**

DAILY FLOW: 10 m<sup>3</sup>/day

INFLUENT: 2,200 mg/L BOD<sub>5</sub>,  
450 mg/L TSS,  
100 mg/L TKN

EFFLUENT: 10mg/L CBOD<sub>5</sub>,  
10mg/L TSS



## The WCOWMA Store

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PROJECT: **Large Campground, 533 Trailer Sites**

DAILY FLOW: 150 m<sup>3</sup>/day (1,000 population equivalent)

INFLUENT: 400 mg/L CBOD<sub>5</sub>, 250 mg/L TSS, 130 mg/L TKN

EFFLUENT: 10mg/L CBOD<sub>5</sub>, 10mg/L TSS, 25mg/L Nitrate+Nitrite



## INSTITUTIONAL WW TREATMENT

PROJECT: Northern Fire Station  
(150 Person Camp)

DAILY FLOW: 34 m<sup>3</sup>/day

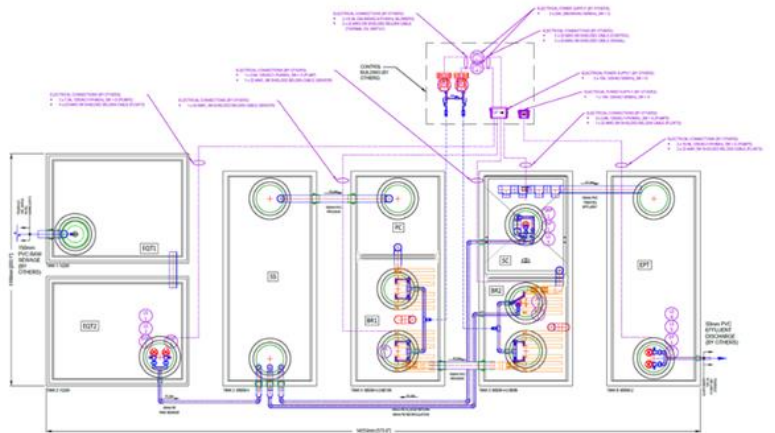
INFLUENT: 300 mg/L BOD<sub>5</sub>

300 mg/L TSS

80 mg/L TKN

EFFLUENT: 10mg/L CBOD<sub>5</sub>

10mg/L TSS



## Whose Job is it Anyway?

The association office often receives concerns from members about sites where the crew installing the system is not certified or does not hold a ROWP Stamp and the authorized person (certified contractor or ROWP) is not present.

Remember, your responsibility as an authorized person is to supervise the work being done under your authority.

Ultimately, if an error is made on an installation and the authorized person is not supervising the work appropriately, insurance may not cover the error.

Check with your regulatory authority to find out what your responsibilities are as the person whose name is on the paperwork.

# The Safety Corner

## Series: Safety Includes Mental Wellness

*By Ernest Cremers NCSO*

It has been a privilege to write this ongoing series for the WCOWMA Onsite Informer over these last publications.

I do not often write about my own experiences as the focus is on the subject not the individual.

This year however, the challenges that our company has faced illustrate what mental wellness can be about. Our company has gone from eleven employees and subcontractors to me, and the work scope has had to change with that. It has taken a tremendous toll on my mental wellness.

Emotional safety is no less important than physical safety.

Change management is constant and this is no different than most companies as they try to manage in these challenging times.

There have been doubts to the strategy implemented to ensure solvency for the company and many sleepless nights have been encountered. The change in our business strategy has kept me on the road and dealing with business demands of our clients.

This has meant more effort to maintain both healthy business and personal relationships.

As this year ends there are more changes coming. There is a recognition that “burn out” is a distinct possibility and steps are being taken that a better work-life balance strategy will be implemented for next year. These discussions and decisions have not been easy but they needed to be had in order to identify deficiencies and implement the appropriate changes.

It is important not to bottle up inside the frustrations, doubt, and angst, but to have discussions with mentors, or individuals you can trust, to allow these feelings to be released in a controlled

manner. The uncontrolled release of these volatile emotions can cause damage to business and personal relationships.

By facing these issues and emotions in my difficult year, while not always successful, the end results are: renewed direction, closer relationships, and better understanding of what steps have to be implemented moving forward.

“Everyone to go home safe every day” has so many different facets to it, and I’ll say it again: emotional safety is no less important than physical safety. It takes courage to recognize that one may not be as emotionally well as one should be. Getting help is the first step to improving one’s quality of life.

Have a safe and prosperous year end and new year.

*Ernest Cremers NCSO, is a safety consultant and the owner of Cremers Safety Ltd.*

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# The Art of Organization:

## Unlocking Efficiency for Onsite Wastewater Professionals

By WCOWMA Administration

In the fast-paced world of onsite wastewater management, being organized isn't just a good practice; it's a critical factor for success. James Stiksma, owner and operator of Canadian Septic Inc, shared valuable insights at the 2023 WCOWMA-BC Convention in Nanaimo, shedding light on the numerous advantages of maintaining a well-organized approach on the job site. This article breaks down the key lessons from Stiksma's presentation, demonstrating how effective organization significantly improves the efficiency and effectiveness of onsite wastewater professionals even when the pressure is on.

### 1. Increased Efficiency: The Backbone of Onsite Wastewater Success

There's a good chance you've woken up in the middle of the night panicked over if you ordered a part you needed. "We've all pulled up to the jobsite with our fingers and our toes crossed hoping this time, the supplier picked the right amount of parts and the correct parts for the job," says Stiksma.

When it comes to organization, Stiksma is honest. "I'm not an organization expert, I haven't read any books by Marie Kondo, and I don't own a 6 Sigma Belt. However, I do believe that being organized is crucial for both personal and professional success." He stresses that understanding the "how" and "why" of things is key to improving efficiency through organization, and he's not afraid to admit that there are lots of people with much more experience in the onsite world than him or his team.

At the heart of Stiksma's insights lies the immense value of enhanced efficiency on the job site.

The cornerstone of organizational excellence is assigning specific places for tools, equipment, and materials. Stiksma stressed that this simple practice has profound implications for workflow. When every item has a designated spot, the time spent searching for tools or materials is drastically reduced. This streamlined approach ensures professionals spend more time on productive tasks and less time on unnecessary searches. It also reduces material waste by completing work in a logical order, minimizing mistakes and costly errors.

Efficiency goes beyond tools and materials; it involves optimizing human resources. Stiksma highlighted the importance of tracking tools, equipment, and materials to ensure effective resource utilization. An organized approach allows for better workforce management, reducing downtime and ensuring each team member engages in tasks aligning with their skills. This meticulous resource management enhances overall project efficiency, minimizing waste, and reducing costs. Notably, this organizational excellence also helps avoid unplanned trips to suppliers due to oversight or errors in orders.

**\*Why It Matters:\*** Increased efficiency not only propels projects forward but also frees up time. This time can be channelled into accomplishing more work and generating additional revenue. Alternatively, it reduces stress levels, and allows professionals to spend more quality time with their families or pursue personal hobbies, contributing to a healthier work-life balance.

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## 2. Enhanced Workmanship: Precision at Every Step

Stiksma emphasized that organization isn't just about where tools are placed; it's about fostering a culture of precision and quality in every aspect of the job.

Workmanship excellence begins with having all necessary components readily available. Stiksma pointed out that having everything on hand mitigates the temptation to skip essential steps or resort to makeshift solutions. Whether resisting the urge to use utility locate tape as a temporary fix or avoiding the 'make it work' approach, having all components available fosters a commitment to doing things correctly the first time. Organization extends beyond tool placement to the overall work environment. Stiksma highlighted that an organized and dry workspace serves as the canvas for professional artistry. It allows professionals to keep components clean and provides a suitable space for assembling them with correctly cured solvent welds. This attention to detail not only prevents contamination but ensures every connection and assembly is executed with precision, contributing to the longevity and effectiveness of the wastewater system.

The right tools are crucial for achieving superior workmanship. Stiksma's insights emphasize that organization isn't just about having tools; it's about knowing where they are and how to use them effectively. Whether using a pipe shear for cutting pressure lines or employing a Sawzall for 4" drain in the field, having the right tool for the right job enhances accuracy and efficiency in every task.

**\*Why It Matters:\*** A well-organized job site presents a more professional image to clients, visitors, and employees. It can also help to instill confidence in the workforce, leading to better quality work and improved customer satisfaction. It can also help streamline workflows and ensure that work is completed in a logical order, reducing the likelihood of mistakes or delays.

## 3. Elevated Professionalism: Beyond Tools and Equipment

In onsite wastewater management, professionalism goes beyond technical expertise. Stiksma highlighted that the organizational finesse displayed on a job site plays a pivotal role in shaping the overall professional image of a team or company.

First impressions matter, and a well-organized job site projects an image of professionalism. The visual impact of a tidy and well-structured work environment goes beyond the current project; it contributes to a lasting impression of the company's overall professionalism. Customer satisfaction isn't just a byproduct; it's a strategic outcome of organizational excellence. Stiksma pointed out that an organized job site significantly contributes to client satisfaction. Timely project completion, efficient communication, and a commitment to order all contribute to



*Pipe racks installed on the lower portion on both sides of the work trailer, with shelving and a trough above that on one side. The setup also includes a work bench with plenty of storage for extra batteries.*

positive client interactions. The result is not merely the completion of a project but the establishment of enduring client relationships based on trust and satisfaction.

An organized job site becomes a standard-bearer for professionalism within the onsite wastewater industry. Companies and professionals that prioritize organization set the bar for others in the field. This not only benefits individual projects but raises the overall standards of professionalism within the industry.

**\*Why It Matters:\*** Elevated professionalism not only elicits confidence from customers but also drives referrals. Clients are more likely to recommend a well-organized and professional team, contributing to sustained business growth and a positive industry reputation.

## 4. Improved Safety: A Cornerstone of Organizational Excellence

A safe workspace is essential. Safety is not just a priority; it's non-negotiable.

Safety should be paramount on any job site, and being organized can help promote a safer work environment. When all tools and equipment are stored in their designated place, it helps prevent tripping hazards or injuries. Additionally, an organized job site promotes better awareness of the work area, making it easier to identify potential hazards and prevent accidents.

Having designated locations for PPE and a place to stay dry and warm up can go a long way with employees. Seeing to jobsite safety keeps your employees safe, healthy, and able to go home to their families. It's also going to help you retain workers, and keep Worksafe rates & premiums down.

**\*Why It Matters:\*** Improved safety ensures everyone goes home healthy and safe. Additionally, it minimizes the financial impacts of WorkSafe claims and fines, contributing to the



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Pressure	1.7PSI (12kPa)	2.2PSI (15kPa)		2.6PSI (18kPa)		2.9PSI (20kPa)	
Outlet Pipe	13mm (external dia. 18mm)				20mm (external dia. 26mm)		
Weight	11 Lbs. (5.0kg)					20 Lbs. (9.0kg)	
Power Consumption	30W	37W	51W	74W	93W	115W	155W
Noise level	37dB		39dB	40dB	41dB		43dB

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overall well-being of both the workforce and the organization.

### 5. Improved Profitability

By reducing the time it takes to complete a project, preventing errors or delays, and improving safety, an organized jobsite can ultimately lead to increased profits. By keeping track of tools, equipment, and materials, it's easier to ensure that resources are being used efficiently, minimizing waste, and reducing costs.

Many companies subcontract parts of the job, especially when it comes to big machines, but it can affect your bottom line. "When an excavator is charging by the hour," Stiksma explains, "every minute counts, and wasting time looking for tools or supplies can be costly."

Getting organized can be a huge undertaking. Stiksma spent days using Autocad to try to figure out the best way to store all the material his company needed for any given install into the trailer. There were a few bumps in the road, including some frustration from family when his garage remained cluttered for



the better part of a couple of months.

Stiksma stresses that an organized workspace is

going to improve the quality of work. "When tools, equipment, and materials are organized, you don't have to worry about Mcgyvering something together on a Friday afternoon because you don't want to come back. It's easier to prevent errors and

rework. Workers are less likely to make mistakes or overlook important details, leading to faster, more efficient work and better overall quality."

There are a lot of ways to get yourself organized, and ultimately you have to find the system that works for you. When it came to a new jobsite trailer, there were some things Stiksma knew he wanted. "I had Garage Zone Fraser Valley apply an epoxy coating to the floor of the trailer and up the side roughly eight to twelve inches. This allows us to hose down the floors."

It can be a bit of trial and error, and Stiksma admits there are some things he'd change if he could do it over, including adding an awning for some dry work space outside the trailer. He'd also purchase a trailer with more clearance. "I'm still undecided if I'd have preferred barn doors at the back instead of the ramp." Overall, Stiksma is pleased with the end result.

While sorting out his jobsite trailer was a big investment, it's paying big dividends in the long run. "The saved time can be spent with family, or the time could be spent doing more work and being more profitable.

"Why it Matters" the well-organized jobsite trailer ensures that everything has a designated place, and all tools and equipment are easily accessible, work can be completed faster and more efficiently. This reduces delays in completion time with a resulting reduction in costs.

### 6. Keeping Track of it All

Stiksma uses a simple spreadsheet to keep track of each job. While it is critical to have an organized, professional, safe working environment, having the tools available to track all the materials, people, and other factors involved in a project are

Trips to the Supplier				
Trips	Time (HR)	Hourly Rate	Wages to Pick Up	Fuel
1	2	\$ 40.00	\$ 80.00	\$ 12.00
Cost of gopher runs per install				\$ 92.00

Material Shrink/Waste				
	Item	Unit Shrink Count	COG per Unit	Total Cost of Shrink
Pipe	4" PVC	8	\$ 5.00	\$ 40.00
	2" PVC	6	\$ 3.00	\$ 18.00
	1.5" PVC		\$ 2.50	\$ -
	1.25" PVC	14	\$ 2.00	\$ 28.00
	1" PVC		\$ 1.50	\$ -
Fittings	4"	1	\$ 8.00	\$ 8.00
	2"	3	\$ 3.00	\$ 9.00
	1.5"		\$ 2.50	\$ -
	1.25"	2	\$ 2.00	\$ 4.00
	1"		\$ 1.50	\$ -
Misc	Glue/ Primer	0.25	\$ 40.00	10
	Filter Fabric ft	20	\$ 1.20	24
	Orifice Shields	3	\$ 3.25	9.75
	Screws	10	\$ 0.30	3
Cost of shrink per install				\$ 153.75

Worksafe Savings	
What are your total wages paid out per year	\$ 250,000.00
What is your current Worksafe insurance rate	1.99%
Increased Rate by	0.50%
Additional Annual Cost	\$ 1,250.00

Opportunity Lost	
How many days out of the year can you do installs?	140
How many installs do you complete in a year?	25
How many days does it take to complete a typical install?	5
How many days can we save on an install by being organized?	0.5
How many extra days would that create?	12.5
How many extra installs would you be able to complete?	2.5
How much money do you make per day on an average install?	\$ 2,000.00
How much money do you make per day doing service work?	\$ 1,000.00
Total potential install PROFITS	\$ 25,000.00
Total potential Main/Repair PROFITS	\$ 12,500.00

Wages Paid	
How many hours of overtime do you payout per year?	100
How much does overtime cost you per hour?	\$ 60.00
How many overtime hours could we save?	50
Total reduced overtime wages	\$ 3,000.00

Potential Increased Profitability			
* Total saved by eliminating the gopher run	\$ 2,300.00		
* Total saved on shrink	\$ 3,843.75	SPEND LESS	
* Total reduced overtime wages	\$ 3,000.00		
* Total potential install revenue	\$ 25,000.00		
Total potential main/repair revenue	\$ 12,500.00	BILL MORE	
Increased Worksafe Premiums	\$ 1,250.00	KEEP MORE	

critical to professional and financial success.

Stiksma shared the tracking spreadsheet he uses to stay on top of project costs. This spreadsheet is available for members on the WCOWMA-BC website.

**\*Why it Matters\*** At the end of the day, if a company isn't profitable, it isn't in business long. Tracking each aspect of a project, while time-consuming, ensures that you are aware of the profitability of your business and can make adjustments along the way to improve your business management over time.

### Final Thoughts

In conclusion, Stiksma's emphasis on organization as a transformative element in onsite wastewater management goes beyond the logistical advantages. It is a powerful tool for shaping a professional image, instilling confidence in the workforce, enhancing customer satisfaction, and ensuring the health and safety of everyone involved.

Stiksma hopes his story inspires others to learn how to stay organized, even under pressure. "In my experience, having a designated place for everything in my work life has made a

significant difference in how smoothly things run. It's a simple concept, but it can make a big impact on our productivity and efficiency."



*Clockwise from above:*

*Canadian Septic's new trailer.*

*The interior of the new trailer, completely organized.*

*The interior of Canadian Septic's previous truck.*

*The exterior of their old vehicle.*





# Operators Without Borders

*Excerpt from the Operators Without Borders Report*

Operators Without Borders is a registered charity, and probably the only charity in the world with a sole focus of assisting water and wastewater utilities recover from disaster through free technical and disaster related training.

Much has happened since the beginning of 2023, and it has been a year of exponential growth for OWB. We resumed in-person training, which is almost always more effective, and have delivered many in-person workshops.

One of our biggest projects in 2023 has been providing assistance to Ukrainian Vodakanals (Water Utilities). Valerie Jenkinson and volunteer Ian Mcilwham, often joined by Greg Solecki, sit on the Water Quality Technical Advisory Group of Ukraine as they come up with recommendations for Ukraine Water Standards in the war situation. OWB is working very closely with these Committees. Ian Mcilwham authored a paper on decentralized systems which outlines the pros and cons of these systems and what to look for when purchasing. This will guide Ukraine water utilities who are hoping to utilize these systems in the future. The two big initiatives that OWB undertook were led by Greg Solecki and Ian Mcilwham, who, together with Janine De Boer developed and delivered a two-day CBRN workshop that was attended by over 110 Ukrainian water sector personnel. The initiative was to develop a strategy and training workshop for water quality issues in the

case of chemical warfare or nuclear contamination. OWB worked closely with the Ukraine Water Association and the Centre for Disease Control in the US. Within days of receiving the training, the Nova Kakhovka dam in Russian-held Ukraine was destroyed, threatening 80 towns and villages and draining the Kakhovka reservoir, which is crucial to the Zaporizhzhia nuclear power plant. Ukrainian respondents who attended Greg's training seminars employed ICS principles in the evacuation of thousands of people in response to the water surging down the Dnipro River.

The Nakuru Water and Sewerage Company (NAWASCO) was selected as the pilot for Kenya for Exam Prep and Certification as part of our collaboration with the Global Wastewater Initiative (GWI) which is part of UNEP, headquartered in Nairobi, Kenya and Water Professional International. Volunteer Stacy Passaro delivered two virtual sessions to determine the depth of participant knowledge in order to customize the training.

Volunteer Ian Mcilwham joined Valerie Jenkinson to deliver in person Exam Preparation Workshops – which involved one week of wastewater treatment training and one week of wastewater collection. At the end of the training, participants sat the Certification Exam. For most of the 16 participants the exam was considered a practice test as they came from the



*Ukrainian participants at the ICS workshop in Gdansk.*



*Participants in the Nakuru pilot wastewater training Kenya.*

water division and had no previous experience in wastewater. Two participants passed their Wastewater Collection Exam to become the first (to the best of our knowledge) operators to be certified in Africa. OWB will be delivering further water and wastewater training in Nakuru and then plan to roll out to other major utilities in Kenya and Uganda.

Board member Madeleine Butschler continues to take a lead role in our collaboration with Rotary International's HANWASH (Haiti National Clean Water, Sanitation and Hygiene Strategy) initiative to bring safe drinking water to all Haitians. Madeleine has assisted on the Monitoring and Evaluation Committee and is a member of teams working on various initiatives including community engagement in hygiene/sanitation, as well as early explorations of community science development related to Recharge Mapping for Aquifers. She is also working with a resource panel on seeking what may be culturally effective templates for Standard Operating Procedures and other technical documentation.

After almost two years' hard work the Standard Operating Procedures (SOP) Committee, ably led by last year's OWB Volunteer of the Year award winner Marcel Misuraca, launched at the Caribbean Water and Wastewater Association Conference (CWWA) over 225 SOPs. Already several utilities, have requested access to the SOPs they need.

OWB was honoured to be named one of three Charities of Choice by the Water Environment Federation (WEF) and the Charity of Choice by the Environmental Operators Certificate Programme (EOCP) who have been supporting OWB from the start.

Other valued supporters are: Water Professionals International (WPI formerly ABC); the Canadian Water and Wastewater Association (CWWA); the Western Canada Onsite Wastewater Management Association (WCOWMA); Wastewater Education Organization and the Water & Wastewater Equipment, Treatment & Transport Show.

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# Septic Awareness Week

By WCOWMA Administration

WCOWMA in partnership with the Ontario Onsite Wastewater Association (OOWA) hosted its annual Septic Awareness Week from September 18 - September 22.

In addition to a social media campaign and newsletters about proper operation and maintenance of onsite wastewater treatment systems, each provincial chapter of WCOWMA provided webinars for homeowners throughout the week. Two Septic Sense webinars were hosted by WCOWMA-BC, two were hosted by AOWMA, one by SOWMA and one by MOWMA. A total of 184 homeowners registered for the various webinars.

Homeowners in Alberta have the opportunity to participate in live or virtual presentations hosted by their Municipal District or County throughout the year. This opportunity is available in all Western Provinces; call your rural district or municipality and request a presentation.

Stay tuned for information on Septic Awareness Week 2024!

## Septic Awareness in the Capital Regional District

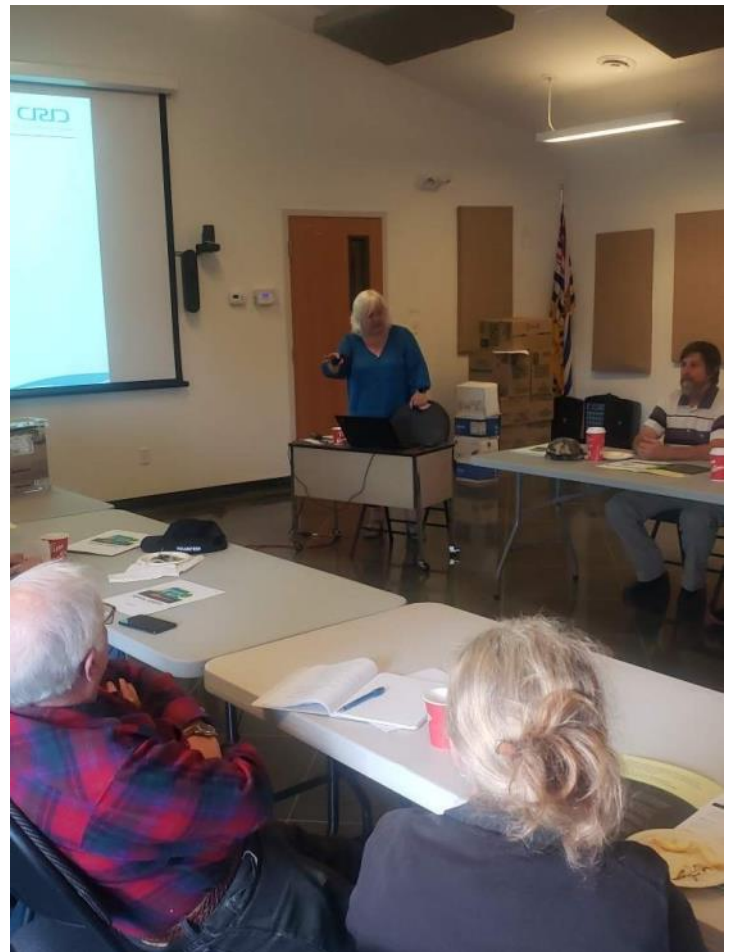
During Septic Awareness Week, WCOWMA-BC collaborated with the Capital Regional District on the delivery of four Septic Savvy presentations.

In-person presentations were held on Monday, September 18, in Sooke and Tuesday, September 19, in Esquimalt, while a webinar was held a week later on September 26. As well, a pre-recorded video was completed for access through the CRD's website.

The focus for these particular presentations was operation and maintenance of onsite wastewater treatment systems and the CRD's Maintenance Bylaw 3479, which requires regular servicing of septic systems in Saanich, Langford, Colwood, and View Royal. The presentations on September 18 and 26 were geared towards residents in these municipalities who utilize septic systems for their wastewater infrastructure, while the presentation on September 19 was focused on those working in the municipalities that follow Bylaw 3479.

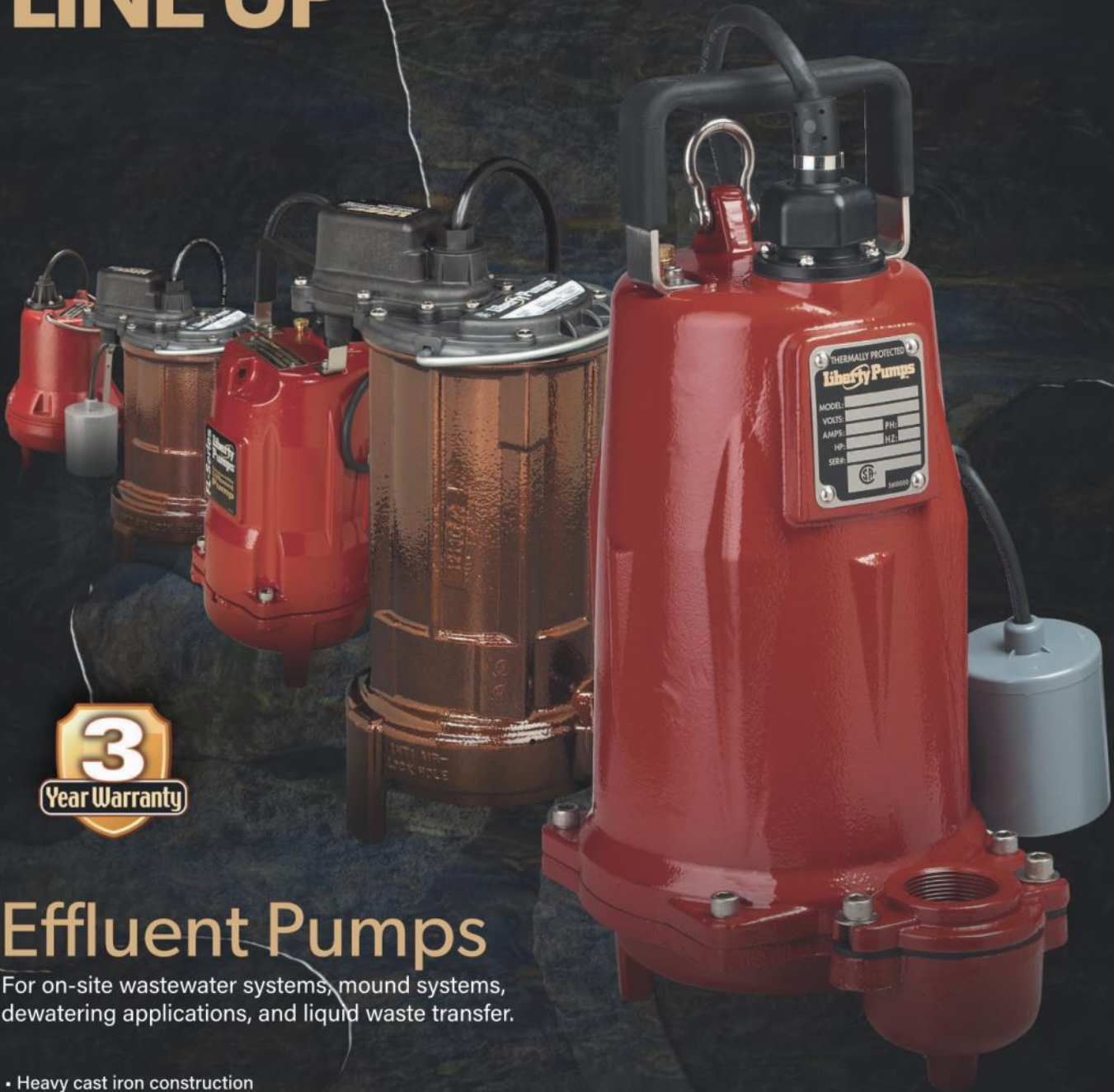
The September 19 presentation also provided a platform to discuss the Maintenance Bylaw in more depth with two other municipalities who are considering adopting the bylaw: Sooke and North Saanich.

For more information on the Septic Savvy Program, contact Zoe Cilliers, Environmental Stewardship Specialist, [zcilliers@crd.bc.ca](mailto:zcilliers@crd.bc.ca)



*Above: WCOWMA's Lesley Desjardins assisted with the Septic Savvy presentations in the Capital Regional District.*

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