

OPERATOR DIGEST

SPRING 2021 | NUMBER 148



Quarterly Newsletter of the
Environmental Operators
Certification Program – BC/Yukon

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OPERATOR DIGEST

The **Operator Digest** is the official newsletter of the **Environmental Operators Certification Program**.

Submissions for publication in the Digest are welcome. Please email them to the EOCP office at eocp@eocp.ca

Changes of address, annual dues, Continuing Education Requirements, exam applications, as well as general inquiries about the program should be addressed to:

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Publications Mail Agreement No. 41498030

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OPERATOR PROFILE

Bob Gresiuk

CWP CWWP Operator, Nakusp

How did you become an Operator?

I started working for the Village of Nakusp in 2003 as a casual employee in the Public Works department while working full time as a ferry Operator on the Arrow Park Ferry. While working on the ferry I took Operator training correspondence courses through California State University Sacramento. A full-time position for the Village of Nakusp in the Public Works department was posted in 2003 and I was the successful applicant. I left my job on the ferry and became a full-time Operator.

How long have you been an Operator?

I have been an Operator for 18 years. My first certification was WD Level I. Over the years I have worked my way up and am now have certificates in WD Level III, WWT Level II, WWC Level II, and WT Level III which I achieved in 2020. In my 18 years since my first job as a casual with the Village of Nakusp in 2003, I have continued to work my way up the ranks to the position I hold now as Public Works Foreman/Chief Operator at the Village of Nakusp.

What are your core functions?

I oversee all operational aspects of the municipality's water and wastewater systems and operations. We have numerous infrastructure projects on the go, and I am responsible for project management on behalf of the municipality. I set the operational and capital budgets for the Public Works department. I also must ensure that the CAO, Mayor, and Council are aware of what is taking place within the department. This requires staff reports and presentations, and regular attendance at council meetings.

What is your typical day? This is difficult to answer! My priorities are always shifting due to numerous influences and factors. I try and spend as much time as possible with the staff in my department as I feel it is important to build a strong team. A strong team helps ensure exceptional service delivery. With the multiple capital infrastructure projects, we



have on the go, I have been off-site often, coordinating with contractors, engineers, and the public to guarantee Nakusp's best interests are taken into consideration.

What do you most enjoy about the work?

The one thing I love the most about the Public Works department including water and wastewater is the unpredictability. You just never know what is going to happen daily. Water breaks, backed up sewer mains, equipment failures, even heavy snowfalls are things I see as opportunities. Challenges like these make you think on your feet to deal with issues as quickly and efficiently as possible.

What are some challenges you face?

Some of the challenges I face include aging infrastructure and wondering how we finance its replacement. Another challenge is the population growth in our rural area and making certain there is adequate water supply as more and more demands are placed on the water system. This has led to stringent water restrictions within the municipality. Another challenge has been the retirement and recruitment of 'jack of all trades' Operators. Recruiting certified Operators to a rural community that also have experience operating and maintaining equipment is a challenge.

'Operator Profile' continued on page 8

MESSAGE FROM THE DIRECTORS AND STAFF



Chris Lawrence

Kalpna Solanki

Well, we thought the pandemic would be over by now, and yet here we are...going through the third wave. But, we will persevere, and using a quote from a message last year:

We are Canadian.
We pull together.
We look after each other...
...and together we will get through this, too.

Despite the pandemic, it is essentially 'business as usual' for the EOCP, albeit with a whole lot of safety protocols in place. The office is open daily, we are administering exams at the office, and at various locations across BC and YK. Where a facility is not available, EOCP team members have been traveling to ensure exam sessions can be held.

Along with our usual day-to-day responsibilities, we have been working on several initiatives:

1. We are working with the PHO's office to increase the priority level of water and wastewater Operators to get vaccinated against COVID-19. The vaccination team responsible for identifying priority front-line workers will include water and wastewater Operators in the program once it resumes - currently the program is on hold and the AstraZeneca vaccine being used in this program is limited to those aged 55 and older while the safety signal is being investigated. We will keep you apprised of any developments as they occur.
2. We had surveyed Operators in 2016, and a recent 'pulse check' survey was conducted to see how we were doing, and what we need to focus on. The results of the survey are on page 12. A draw was held to win a \$100 gift card, and the winner was Avery Collison from Old Massett.

3. Work continues with the Ministry of Municipal Affairs and Housing to assess the demographics of the Operator workforce, and the potential to attract more newcomers to Canada to the industry. Phase II of the project will involve the completion of a Competency Framework where we will be calling on Operators for their input.

- a. Water
- b. Wastewater
- c. Transport
- d. Leadership

Registration will open on the 1st of May

6. Last, but by no means least, we continue to struggle with some Operators who are removing their masks part way through an exam session. This rule is in place to enable us to provide exams in a safe manner. Masks protect us and all of you as well. We recognize that they are not comfortable, but we also know that they are more comfortable than intubation. Please note that failure to keep a mask on during an exam session will result in the examinee being asked to leave, getting an automatic fail on the exam, and having to reapply for a subsequent exam session. Please work with us on this.



Chris Tucker with his new iPad

4. We also had a one month long 'check/update your contact information' on the CRM, with the winner eligible to win a skookum iPad. Close to 1,200 of you logged in and checked or updated your profiles. The winner of this draw is Chris Tucker who is with the Regional District of the North Okanagan.

Thank-you to all of you, for being there during the pandemic.

5. Work also continues on our 2021 Conference, #EOCP2021 with the theme 'Promote - Protect - Evolve'. We are unsure about the status of the pandemic and using caution will be holding a virtual conference again. Similar to the 2020 conference, there will be four streams:

For making it feasible for us to wash our hands with clean drinking water, and for the provision of safe wastewater disposal.

Please Be Kind, Be Calm, Be Safe.

Chris Lawrence, Board Chair
Kalpna Solanki, President and CEO

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2020 VIRTUAL CONFERENCE FEEDBACK

“ The EOCP has this modern-day energy emitting from it. You're onto something really good with how you're doing business... Very happy to be part of this Team. ”

“ Keep up the great work and very slick delivery of this virtual conference. ”

“ This virtual conference has exceeded my expectations. It is very well done and easy to navigate! ”

“ The operators in my community enjoyed the conference and thank EOCP for all its efforts ”

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WHO'S ON THE MOVE

Ron Enns shows off the new Sapperton Pump Station.

Exterior landscaped area of Sapperton Pump Station



By Kalpna Solanki, CPHI(C) BSc MBA

Finding out about a dedicated and tireless Operators Without Borders volunteer making a career change, I had to visit him to see his new 'digs'!

Ron Enns gave me a tour of Metro Vancouver's Sapperton Pump Station that was constructed in 2020. The site, tucked away close to the railway crossing also has in place the old pump station. The entire site has been beautifully designed incorporating plantings and a playground area as well as odour control measures – one would never think the building housed pumps for wastewater!

The new pump station has 6 large pumps that pump up to approximately 3,500 Litres/second – the limiting factor is the sewer main, not the pumps! As the population of the Lower Mainland increases, and the sewer main capacity is increased, the pumps will be ready to pump the increased volume. The pump station handles wastewater from the

Tri-Cities area and New Westminister and pumps the wastewater to Annacis Island for treatment.

With the projected increase in the population in the Lower Mainland, there is approximately \$370 million in infrastructure projects just within Liquid Waste System in Metro Vancouver.

Ron Enns beside the new pumps

The pump station has an intricate array of controls to run the facility 24/7 with battery packs to provide backup for the electronics in the event of a power failure, as well a diesel-powered generator to provide backup power for the pumps.



Battery packs to provide back-up power for electronics



Generator to provide back-up power for pumps

I also got to ask Ron some questions about his career path...

What was your first job?

'Computer Programmer' was my first job hired straight out of High School if you can believe it, but for the last 19 years I have dedicated my life to my passion in water and wastewater operations and education.

What was your path to becoming an Operator?

After realizing at a young age that I was not built for the office, I started looking for work outdoors and this led me to work as a Sewer Operator in the City of Vancouver.

How did you pivot from your last position to your current one?

I spent over 13 years with the City of Vancouver in many positions leaving as an Acting Superintendent to move to Kwantlen Polytechnic University where I built new education programs in Low Voltage, Water and Wastewater and Utility Locating. After my 5-year commitment at the University ended, I returned to Sewer Operations in the position I was hoping for with Metro Vancouver and joined them in January as a Supervisor of Liquid Waste Services.

What advice would you give to someone who is currently an Operator or considering becoming one?

Set up your profile on the EOC's Customer Relationship Manager, and start your path to becoming an OIT or Operator. Volunteer and work on committees and you will meet some of the best, brightest, and most passionate people in the industry.

What are some of your goals in your new position?

I am lucky to be a part of a great team of skilled Operators supported by a professional supervisory team. My key focus is to support my team giving them the tools they need so they can continue to maintain the system's efficiency delivering liquid waste to our Treatment Plants. I am also expecting to commission over \$370 million in new assets such as odor control facilities, pump station replacements, and main upgrades over the next few years.

What has the impact of COVID-19 been on your organization?

It has been very stressful for us all, we have added pressure to ensure we have



proper protocols in place to protect us and the public while still maintaining the system. Our front-line operators are very committed and passionate about what we do, and they have all earned each other's respect as well as mine.

What do you do in your spare time?

I love the outdoors; camping, fishing and spending it with my family and looking forward to traveling again - Mexico, Disneyland, Portugal and beyond!



CYBER ATTACKS STAYING OUT OF THE NEWS!

By Rob Wilson, ISA 62443 Industrial Cybersecurity Expert

Hacking and defending

The City of Dawson Creek, the City of Cranbrook, the Municipality of Whistler, the District of Summerland, the City of Campbell River, the District of West Vancouver, the BC government... These are a few of the BC organizations that have made the news over the last couple of years by being victims of cyber-attacks or 'hacking'. And the list goes on, and the cyber-attacks continue.

Hacking is easy. In the same way that a photographer can download and install 'plugins' for Photoshop software, hackers can download and install 'exploit modules' for Metasploit software. These free exploit modules or 'exploit plugins' take advantage of well-known vulnerabilities in the software that you use in your home, your office, and your plant. They could allow unskilled hackers to gain access to your computers, your data, and your plant operations. But as demonstrated by the recent Florida Water Treatment system hack, it can be even easier than that.

Defending against hackers isn't quite as easy as hacking. Ideally your systems will be 'secure by design', but today that's not common with Industrial Automation Control Systems (IACS). Most IACS have been in place for some time and were not designed to be secure. But whether your systems are legacy, or you've modernized them, it's a never-ending job: you need to keep your guard up constantly and you need to continuously review and revise your defenses. And while it's true that you get what you pay for, cybersecurity defenses cost no more than you're willing to spend. And in some cases, the cost of significant improvements might surprise you.

The Florida water treatment system hack

One news story that everyone has surely heard of by now took place in a water treatment system in Oldsmar, Florida, a small town of about 14,000 residents. A hacker took control of the sodium hydroxide level, adjusting it to more than 100 times the normal level. Whether the hacker made this adjustment randomly, for their amusement, or whether they intended to do harm, it's hard to know. But clearly, it was (and is) a cause for concern.

The operator noticed the intrusion the second time it happened, and so the facility was able to stop the attack, and prevent any harm to health, safety, and environment. It turned out that the intruder had accessed the system through TeamViewer software, a common method of providing remote access for support and operations personnel. But the plant's use of the TeamViewer software had been discontinued several months prior to the event. Unfortunately, the software was not removed from the system as it should have been.

In terms of a 'hack', this intrusion barely fits the definition. There may have been no vulnerability exploited at all, other than a leaked password. The skill level of the attacker may have been ridiculously low. The attack succeeded because the level of the plant's defense was also ridiculously low.

Remote access

Most of the cybersecurity incidents that make the news involve the use of remote access services to gain unauthorized access to the plant systems. So why not just get rid of remote access? We need it, of course: to respond to alarms without having to get in the truck; to get assistance from remote

technicians and engineers; to keep us assured that everything is okay.

Remote access and modern networking technologies are here to stay. If the risks that they present you are higher than you can afford, it's because they've been implemented without regard to your risk tolerance, without an assessment of the risk they present to your plant and without an overall 'secure by design' approach to engineering and securing your critical infrastructure.

Remote access can be implemented securely. International standards such as the ISA/IEC 62443 series of industrial cybersecurity standards clearly define requirements, potential mitigation, and processes for designing and implementing a remote access system that is safe and secure. Ask your integrator or control systems vendor about these international cybersecurity standards, how they meet them, and how they can help you meet them.

The cyber-physical nature of Operational Technology

Operational Technology (OT) is different from Information Technology (IT). We've all heard that before, and if you work in a plant, you know the difference first-hand. No-one became ill after credit card information was stolen from Target. There was no environmental damage resulting from malware inserted into the SolarWinds network management software.

But when hackers start changing the lye dosing level of a water treatment center and when they start attempting to disable safety systems, stop Ultraviolet (UV) and chlorination processes, we have a different problem. Hackers are targeting Industrial

Automation Control Systems (IACS). A real solution is needed.

The real cost of the real solution

Asking “How much does it cost to implement an effective Cyber Security Management System (CSMS)?” is like asking “How long is a piece of string?”. If you knew the string was going to be used as a shoelace for your running shoe, you could come up with a good estimate. If you knew the Cybersecurity Requirements Specifications for your plant, along with inventories, drawings, and related documents, you could get a good estimate for the CSMS implementation too.

A risk assessment process performed according to the ISA/IEC 62443 standards will deliver a risk-focused plan to ensure that the risks that you face are tolerable by your own measures and will allow you to direct your resources to the areas that will benefit most.

This risk-focused approach works well for your modernization initiatives as well. A ‘Risk-Based Modernization’ strategy looks not at modernizing the most outdated equipment in your plant, but instead at those areas that are of highest risk, in engineering terms, and which would benefit the most from modernization efforts and funds.

How to improve your cybersecurity posture on a budget

Here are some things that Florida plant operations and management team could have done, at little or no cost, to prevent that attack from being successful, or from even occurring in the first place:

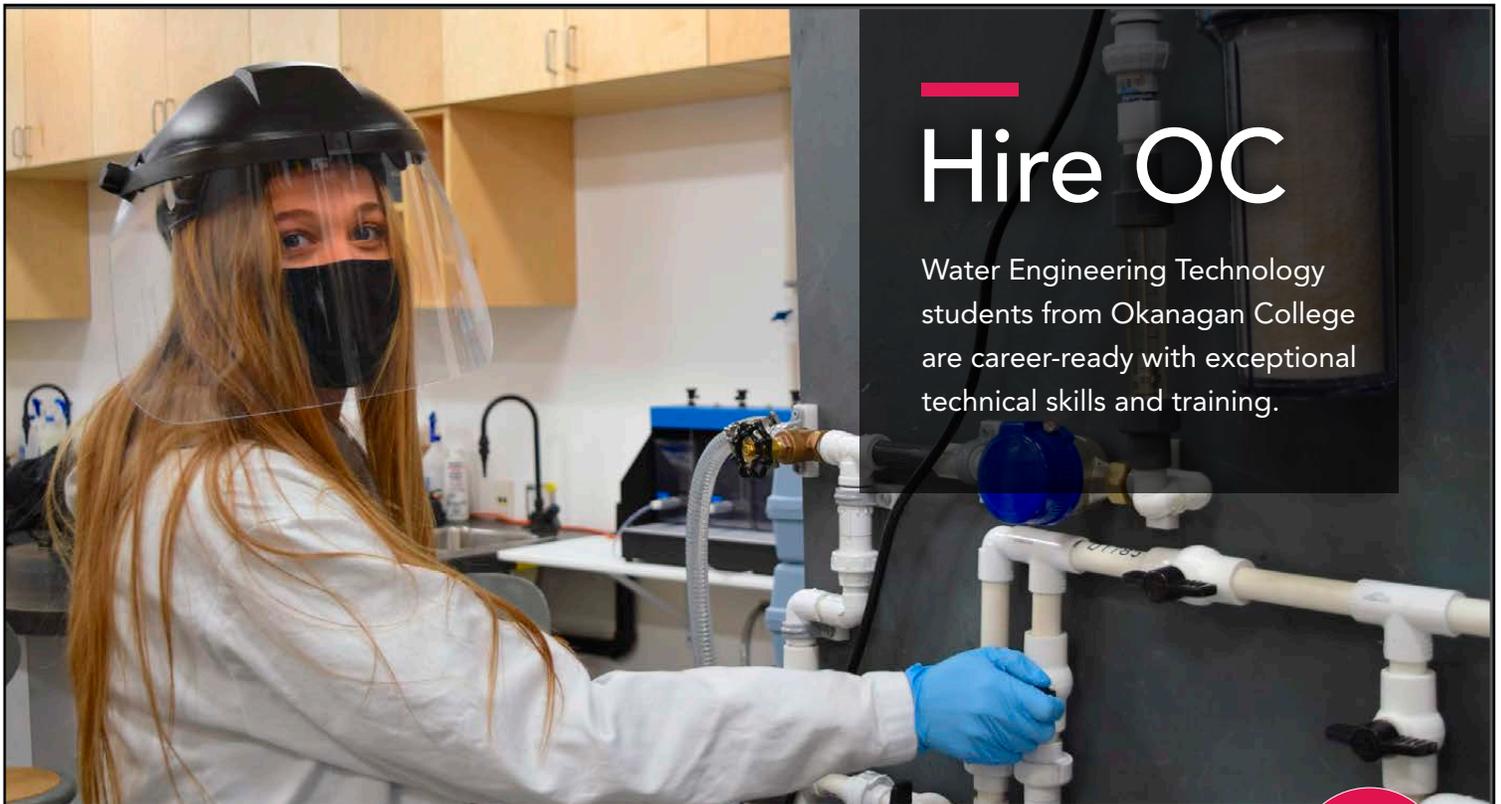
1. Remove the unused TeamViewer software from the computer.
2. Do a better job of managing passwords – use complex passwords, use a password manager, use passphrases instead of passwords.
3. Use two-factor authentication.
4. Disable remote access except when required for support or maintenance.

If you want to immediately improve on your plant’s cybersecurity posture, you should really consider starting with an ISA/IEC 62443 industrial cybersecurity risk assessment. But on a limited budget, you would be well served to address these five areas first:

1. Ensure that all passwords on all IACS equipment are set to a complex password or passphrase and are NOT still set to the manufacturer’s default password.



2. Un-install unnecessary software.
3. Establish an accurate inventory of all the IACS equipment.
4. Review firmware levels of all equipment and put together a plan to update the firmware on a regular basis.
5. Examine your remote access solution and seek guidance from a cybersecurity expert to assess the solution and to minimize your chances of being the next cybersecurity news story.



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'Operator Profile' continued from page 2

What advice do you have on how to have a successful career as an Operator? Never stop learning. Things in our world change so fast that is always best to stay informed. We must keep in mind that we are safeguarding public health and the environment. It takes a special person to become an Operator and take on those roles and responsibilities.

What do you do when you aren't working? You can find me in my garage restoring my '68 Pontiac Firebird and spending as much time as possible with my granddaughter.

What else can you tell us about working as an Environmental Operator? Working as an Operator has been the most rewarding part of my career. I constantly learn new things and appreciate all the education, training, and conference opportunities. I hope to continue to meet and learn from as many Operators as I can in the future.

Whom would you recognize as a mentor? I recognize Domenic Castellano, a former Director of Public Works at the Village of Nakusp as my mentor. Domenic had a great deal of experience and was willing to share everything he knew to help me become a better Operator. He was also very encouraging when it came to my training. Domenic played a pivotal role in the development and success of my Operator career. I am thankful I had the opportunity to work and learn from Domenic.



Bob Gresiuk by the SCADA System

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The Impact of COVID-19 on OPERATOR TRAINING

Right from when the pandemic was declared in March 2020, we started getting enquiries about whether the CEU requirements for Operators would be relaxed or waived. A discussion was held at the board level and the decision was made to not make any changes, for several reasons:

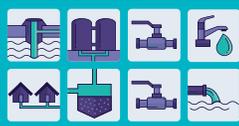
1. Operator training is a fundamental tenet of the Operator certification program across North America;
2. Completion of the necessary CEUs ensures that you continue to be competent in your profession. The number of CEUs need for maintaining Operator certification is lower than for some other professions – some have a minimum requirement of 30 hours per year;
3. Most professions require professional development and most

have not relaxed this rule. In fact, many organizations say that the number of online training options have increased significantly since the pandemic began;

4. Ensuring Operators have access to ongoing training has been a hard-won battle, and relaxing of these requirements would require many years of discussions to ensure reinstatement;
5. Between conferences and the training organizations providing courses across BC and YK, there is no shortage of opportunities to get the CEUs needed by the end of this reporting period which ends on the 31st of December 2021.

We therefore reached out to training organizations to find out what they were doing to provide training during the pandemic, and this is what they had to say...

Growing through adversity



Yukon Water and Wastewater
OPERATOR PROGRAM

~ Submitted by Yukon University

Faced with the challenges of COVID-19, the Water and Wastewater Operator Program at Yukon University has expanded online offerings to reach more students than ever before.

In January, Alex Cross, a facility maintenance worker with the Comox Valley Regional District on Vancouver Island, was seeking to gain Water Treatment Levels One and Two certification. His work in his community's recreation and aquatic centres has parallels with that of a water operator and Alex wanted to gain flexibility in his career going forward by expanding his skillset and training.

Looking at the course offerings available, Alex saw that Yukon University offered what he needed through an online format that included real-time classes led by an experienced instructor. "I was a little apprehensive, as you don't know how it will go when working with an institution for the first time," said Alex. "Alison Anderson, the program coordinator, was great to work with. Very responsive to my questions and concerns. It was simple and straightforward to enroll."

The classes themselves also impressed Alex. "I was surprised by the number of students in the course. It was a good mix of newbies and experienced operators who were generous in sharing their insights. The instructor kept things moving and engaged everyone... I definitely plan to take more courses through YukonU and would recommend them to others."

Alex is not alone. More and more students from BC are enrolling in Water and Wastewater Operator courses at Yukon University—over 15 so far in the 2020-21 academic year.

Alison Anderson, program coordinator, says, with overall enrollments up 40 per cent since 2018-19, YukonU is on track to have the biggest year so far for the Yukon Water and Wastewater program (YWWOP).

"Almost half our students are attending courses remotely this year, which is more cost-effective for students and employers,"

Pivoting during the pandemic to continuously provide Operator training

~ Submitted by MTS

The world changed abruptly in early 2020 when COVID-19 began to ravage the entire globe and presented us with exceptional challenges that affected everyone. Our immediate and primary focus was the physical and psychological health of our staff, family, students, and clients. Upon the horrible realization that the pandemic would be a way of life for an unforeseeable amount of time, we set our sights on the future of our business.

At MTS, the concept of online training had been under consideration for years. However, our training style and philosophy caters to the hands-on learner, so we were reluctant to adopt this delivery method. With the sudden, mandatory, COVID-19 restrictions of isolation and travel bans, it became necessary to adapt our delivery methods to include virtual classes and we committed to make that concept a reality over a very short period of time.

Always keeping in mind our demographic of in-field, hands-on Operators and our commitment to hands-on training where applicable, we researched many different platforms and technologies. We needed to ensure that we could keep the water and wastewater Operators engaged by providing course delivery with a real-time instructor while allowing students the ability to interact with the instructor and other classmates during class. This format needed to be user-friendly for both instructors and students, avoiding the unnecessary downloading of programs, and be cost effective. We discovered a great platform and immediately began orienting our team members and instructors.

As we reorganized our training delivery, we recognised the need to make more internal adjustments. We reached out to our students and provided them with the key information and materials that they required when attending our classes virtually. Within just 7 days after complete shutdown due to COVID-19, we deployed our very first one day instructor-led virtual course on March 26th, 2020. Once we determined that the delivery method

'Yukon' continued on page 10

'MTS' continued on page 10

'Yukon' continued



Alison Anderson, program coordinator, Yukon University

said Anderson. "Online offerings also ensure our courses are more dependable. We're able to run online courses more often and with fewer students compared with in-person classes."

Anderson is also seeing a shift in the types of students accessing YukonU training.

"Historically, our students have been operators continuing their training, but more and more we're seeing students, like Alex, who are building on skills they already have and seek to enter the water industry full-time."

At the same time, YWWOP is engaging existing operators with new courses. Courses covering disinfection, Water Treatment Level 3&4, cross connection control awareness, project management, and operator tools are five developed and introduced this year.

Anderson says students are responding well to the online courses. "Our classes are taking place in real-time, with knowledgeable instructors who bring real-world experience and can bring learning to life for students. We wouldn't achieve the same response by offering book and quiz learning with limited instructor contact."

Anderson's own background as a professional engineer with specialization in water systems also helps students feel at ease talking through challenges they're facing and offering ideas for future courses. "Students often call up to brainstorm solutions to operator situations. They're also comfortable requesting we look at offering courses they're interested in because they know we're nimble and responsive with solutions that meet their needs."

One solution students have asked for is a water system to train on. Regardless of whether training takes place in the classroom or online, it's all theoretical—unless students have access to an actual system to apply their knowledge.

In March, Yukon University took delivery of a mobile water treatment plant. Made possible with funding from the Canadian Northern Economic Development Agency and YWWOP, donations from the City of Whitehorse and Government of Yukon, and a discount from the manufacturer, BC-based BI Purewater, the mobile plant includes a complete automated water treatment system housed in a winterized 24-foot trailer. This industry-quality system will provide hands-on training in communities across Yukon and northern BC.

"We're very fortunate to have had very low COVID-19 cases in the North. Alongside our expanded online offerings, we're able to get out into communities beyond Whitehorse and provide in-person courses to small numbers of students," said Anderson.

"This mobile treatment plant is a gamechanger for water operator training in Yukon. It alleviates pressure on community water plants which, until now, were the only place for students to gain their required practical training hours and work experience."

Whether based in BC or a small Yukon community, online and in-person water industry training options are flowing steadily at Yukon University, with plenty more room to grow.

"People just need to tell us what they need. We're ready to get to work providing it."

'MTS' continued

was well received by the instructor and the attendees, our MTS team went on to convert a majority of our other courses into this delivery platform, from our accredited half-day CEU courses to our 4.5-day exam-prep courses. When the EOCP was able to start offering exam sessions again, we began to offer virtual study sessions to water and wastewater Operators looking to refresh their memories before writing their exams.

As the pandemic was becoming more understood and restrictions began to loosen, we continued to deliver virtual courses. However, we also recognised other capabilities that could be implemented to better suit our students needs. After much testing, we began to offer a hybrid technique of combining online virtual delivery with in-class sessions to a limited number of students. Both delivery methods now allow us to be extremely flexible with the fluctuating guidelines and regulations due to the pandemic while maintaining strict safety protocols and guidelines. We are able to efficiently revert to virtual class delivery when necessary, allowing students to continue to take classes without having to cancel or reschedule to an unknown date in the future.

While the planet continues to struggle with the challenges that COVID-19 presents, virtual contact has become a fundamental necessity for many individuals and many businesses. MTS recognises that while technology offers many advantages in a virtual world, it does not replace a physical classroom with a hands-on learning environment. We feel blessed with the strength and ingenuity of all our exemplary employees and instructors here at MTS and have been inspired by these technological adaptations. We look forward to a future where we can get back to looking across a full classroom and see smiling faces, hear the sounds of laughter, witness the unwavering camaraderie of operators, and fulfill a fun and meaningful learning experience. We remain committed to provide our services through these difficult times and remain available to the water and wastewater Operators for their training needs. Be safe, be happy, and see you in class!

BOARD ELECTIONS

The EOCB's Nominations Committee is pleased to present the candidates for the 2021 Board Elections.

Three Directors are needed as per the EOCB's Constitution and Bylaws.

Please visit <https://eocb.ca/> to find out more about each of our candidates.

ONE POSITION is to be filled by a person who is, or has been, employed in an administrative capacity in a local, regional, provincial or federal government agency directly involved in the water, waste, or wastewater operations field. The acclaimed candidate is Rob Birtles.



ONE POSITION to be filled by a person who is or has been a faculty or staff member at a post-secondary education institution whose major field of activity is in the training of water, waste, or wastewater Operators.



a. Allison McMillan
(incumbent)



b. Mike Firlotte

ONE POSITION to be filled by member who is an EOCB certified Operator.



a. Krista Derrickson
(incumbent)



b. Guillaume Ferland



c. Tara Macrae

Voting will begin at 8:00 a.m. on the 19th of April and will end at 4:00 p.m. on the 26th of May. Successful candidates will be announced to the membership at the EOCB's AGM which will take place at 11:00 a.m. on the 17th of June. Please note that only EOCB certified Operators are eligible to vote.

To vote, please use the link sent to you in your email and vote via the Customer Relationship Manager.

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NEW SURVEY RESULTS

We asked, you responded, we have been listening...

By Kalpna Solanki, CPHI(C) BSc MBA

The EOCP completed a survey of its membership in 2016, and the response was tremendous, with more than 450 responses. More recently, another survey was conducted to do a 'pulse check' as it were, with an equally high number of responses.

The chart at right compares the results from 2016 and 2021.

Whilst most of the survey comprised of close-ended questions, there were some open-ended questions as well. Some questions and responses are noted below:

Question	Very Satisfied or Satisfied		Neutral		Dissatisfied or Very Dissatisfied	
	2016	2021	2016	2021	2016	2021
How satisfied are you with how the EOCP represents your professional interests?	68%	75%	25%	20%	7%	5%
How satisfied are you with the responsiveness of the EOCP?	71%	79%	23%	17%	6%	4%
How satisfied are you with the quality of the services of the EOCP?	71%	79%	21%	16%	8%	5%
Overall, how satisfied are you with the EOCP?	71%	77%	27%	17%	2%	6%

ON EXAMS

1. Allow access to incorrect exam questions to help understand weak areas and avoid the same mistakes again.

- The majority of the exams used by the EOCP are under license from the Association of Boards of Certification (ABC). There are strict rules regarding these exams to ensure exam integrity. The EOCP does not have the ability to determine which answers are incorrect, nor does it have the permission or ability to share exam questions details with examinees. However, each examinee is provided with an individual scores outline:

Objective	Points Earned
Area 1 - Lab	17 of 20
Area 2 - Equipment E&M	12 of 15
Area 3 - Equipment Operation	17 of 20
Area 4 - Treatment MEA	32 of 35
Area 5 - Safety, Admin, Etc.	7 of 10
Summary:	85 of 100 Pass

2. Remove the 10 extra questions from exams.

- We are here again limited by the rules from ABC related to the 10 extra questions. The downside is that Operators have to answer 10 extra questions that are interspersed throughout the exam (we do not know which questions comprise the extra 10). The upside is that those 10 extra questions will be evaluated for future exams, thus making future exams even better.

3. More exam location options.

- There are currently only three jurisdictions in Canada continuing to provide exam services. In most areas of Canada, there are currently no exams being offered. The EOCP strives to provide exams in as many locations as possible, and as frequently as demand warrants. In areas where the usual colleges/universities are closed, the EOCP team has been travelling to and invigilating exams in person. In 2020, the EOCP provided 279 exam sessions – that is more exam sessions than any other jurisdiction in Canada.

4. Consideration of Operators who may have a disability affecting their ability to write exams.

- The EOCP has implemented several accommodations for Operators which can be reviewed at <https://tinyurl.com/7xu7db>
- In addition, the EOCP has all of its own exams (SWS, SWWS, BWD, BWS, and OIT) available in audio formats.
- The EOCP continues working with the ABC to develop options for alternate methods of delivery for the ABC exams and as of the 15th of May, the ABC exams will be available to Operators in audio format as well via an eReader tool. However, due to equipment limitations at some facilities, these accommodations are only available at the EOCP office and when booked in advance.

5. More study materials.

- The EOCP regularly updates the

materials available at its own website at <https://tinyurl.com/cv5jtw8v>. In addition, Page 9 of the Operator Digest available at <https://tinyurl.com/75zfcjrf> lists resources recommended by Operators, and Page 11 of the Operator Digest available at <https://tinyurl.com/tyxpznwu> has additional resources.

COURSES AND CEUS

1. Hands-on training courses, more courses, and training courses outside the Lower Mainland.

- The EOCP is a named in legislation as an organization that classifies facilities and certifies Operators. The EOCP does not provide training. Even at its annual conference, the EOCP facilitates a gathering of training providers rather than provision of training by EOCP staff.

2. More conferences, and conference events outside the Lower Mainland.

- The first EOCP conference was held in 2018. The format of the conference and its location was determined based on the feedback from a survey of Operators in 2017. The EOCP puts on the annual conference without hiring extra staff, and additional events are not feasible at the moment.

3. Edit the SWS and SWWS courses.

- The EOCP provides Need To Know (NTK) criteria, however courses are not provided by the EOCP. Training providers use the NTK criteria to develop course material.

7. In your experience, what benefits does the EOCB membership best provide? You may choose more than one answer.



Skipped: 7 Answered: 289

Increases recognition of my training	71%	204
Reciprocity with other provinces	21%	62
Is an advocate for Operators	52%	150
Flexibility with exam locations	30%	88
Career planning	30%	87
Other (please specify)	5%	15 >

4. Streamline courses across the province.

- Training providers submit for review courses to the EOCB and the EOCB's Subject Matter Experts review the courses. All training providers have been advised to use the most up to date NTK criteria when developing courses.

5. Get more Operators involved in EOCB training.

- The EOCB does not provide training. However, there are several Operators either running their own training companies or working for training providers.

6. Increased repercussions for those not completing CEUs

- As of 2017, Operators need to have valid membership with the EOCB and need to have completed the necessary CEUs to remain certified. The EOCB has been working with the relevant ministries to increase the level of compliance.

7. Ability to 'carry over' CEUs to the next reporting period

- The restriction related to carry-over CEUs is in adherence with the best practices of the Canadian Water and Wastewater Operator Certification Committee. All Canadian jurisdictions have agreed to adhere to this restriction.

8. Relax CEU rules during the pandemic.

- This was discussed extensively at an EOCB board meeting. Considering that there are numerous conferences and other training opportunities available online, and in some cases,

Survey questions and responses continued...

in person with safety protocols in place, the decision was made to not relax the CEU rules. The current reporting period started on 1 January 2020 and ends on 31 December 2021. Many Operator have already completed their required CEUs, others who still need CEUs can do so over the next 8 months via the aforementioned options.

- A review of the number of online courses available shows that the offerings have increased significantly since last year due to more training providers pivoting to this method of training.

9. Stop the CEU requirements.

- The water and wastewater industry is constantly undergoing change necessitating that Operators stay up to date with these changes. Similarly, the need for ongoing professional development is a requirement of maintaining certification for many professions, and this requirement for CEUs is a fundamental tenet of the best practices of the Canadian Water and Wastewater Operator Certification Committee. All Canadian jurisdictions have agreed to adhere to the requirement for CEUs.
- If the EOCB abandoned the CEU requirements, reciprocity would be impacted severely.

clear on this one, and work is currently underway to provide CRM functionality via cell phone or tablet for the most often used aspects of the CRM. This work will be completed within the next few weeks.

OTHER QUESTIONS

1. Use a better call centre.

- The EOCB does not use a call centre and calls are handled by EOCB staff. During the pandemic, with more calls coming in, the phone lines were routinely tied up. To alleviate this problem, additional lines have been added.

2. Better reciprocity with other provinces.

- The EOCB already has a reciprocity agreement in place with provinces via the Canadian Water and Wastewater Operator Certification Committee, of which I am currently Chair. Formed in 1979, this committee has 19 best practices in place which oversee aspects of facility classification and Operator certification that make reciprocity between the provinces and territories as seamless as possible:

1. Classification for Water and Wastewater Facilities/Systems
2. Certified Operator Requirements for Facilities/Systems
3. Small Drinking Water and Wastewater Certification
4. Education
5. Exam Policies
6. Experience Policies
7. Remote Process Control
8. Direct Responsible Charge
9. Substitutions for Experience
10. Operator in Training (OIT)
11. Conditional Certificates
12. Renewal and Reactivation
13. Continuing Education
14. Entry Level Training/Courses
15. Appeals
16. Agreement on Internal Trade
17. Suspension or Revocation of Certification
18. Foreign Credentials
19. Bulk Water Delivery

THE CUSTOMER RELATIONSHIP MANAGER (CRM)

1. More user-friendly Customer Relationship Manager.

- The EOCB's Customer Relationship Manager (CRM) is considered best of class in North America, and every change undergoes User Acceptance Testing (UAT). However, I recognize that such systems, despite the extensive UAT, may not be intuitive for everyone. The EOCB has several recorded webinars available for users, including this one called 'CRM Basics': <https://tinyurl.com/4p6v5mdu>. In addition, the EOCB staff team is happy to work with you to navigate the CRM.

2. Customer Relationship Manager (CRM) access via mobile device.

- We have heard you loud and

Survey questions and responses continued...

3. Create a mentor/mentee program.

- The EOCP has a Operator Peer Network with more than 100 matches already made. If you are interested in being a mentor or mentee, please reach out to me at ksolanki@eocp.ca

4. Encourage employers to ensure Operators are professional and ethical.

- The EOCP has developed a Code of Ethics and Standards of Practice for Environmental Operators. Any Operator applying for an exam needs to confirm they have reviewed and will abide by the Code. By Q3 2021, every Operators accessing the CRM will need to review and agree to the Code.

5. More enforcement of facilities where Operators are no longer certified.

- The EOCP works closely with the regulators in BC and YK to ensure facilities are staffed by certified Operators. This process, started in 2017, has significantly increased compliance with the applicable regulations.
- The EOCP is also working closely with the BC Government on the recommendations put forward in the BC Provincial Health Officer's Drinking Water Report as well as the Auditor General's Report on Drinking Water.

6. Make DRC plans mandatory.

- Once the EOCP's new facility classification models were implemented within the CRM, the next step has been to chase down DRC plans. Work continues on this front and we expect to have a lot more facilities with DRC plans in place by the end of 2022.

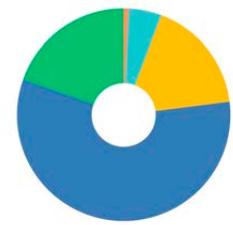
7. Better classification systems for small systems based on complexity.

- The EOCP has been working on new small system classification models, and anticipates they will be available for online completion by early 2022.

8. I have 40 Operators working for me and the EOCP has never asked me what it can do to help.

- The survey completed in 2016 provided us with a great deal of feedback on what was important to Operators – at all levels. As per the title of this article 'We asked, you responded...we have been listening', and we have. Over the past five years, we have delivered on the following:
 - a. An Operator conference - we had our very first conference in 2018 with almost 300 delegates, and our 2020 conference had more than 400 delegates. Our next conference will be on the 14th and 15th of September.
 - b. More exam sessions - we routinely have more than 200 exam sessions per year, and in 2020, despite a pandemic, we had 279 exam sessions (that's more exam sessions than any other jurisdiction in North America).
 - c. A quarterly newsletter - we have been publishing the Operator Digest on a quarterly basis with a focus on new technology, Operator profiles, and industry updates.
 - d. A new, more user-friendly database - through 2016 and 2017 we worked on our Customer Relationship Manager. The CRM has been the most ambitious project ever undertaken by the EOCP, and we have been able to launch a CRM that is considered to be the 'best in class' in the industry.
 - e. A new website - soon after deployment of the CRM, the EOCP website also underwent a massive overhaul that includes the ability to log in to the CRM directly from the website.
- However, if you feel you have not been heard, please do reach out to us. Board Directors can be contacted via the office at eocp@eocp.ca, and I can be contacted via ksolanki@eocp.ca.

9. Overall, how satisfied are you with the EOCP?



Skipped: 0 Answered: 296

Very satisfied	20%	58
Satisfied	57%	170
Neutral	17%	51
Unsatisfied	5%	15
Very unsatisfied	1%	2

Overall, the feedback, despite the impact of the pandemic, shows that more of you are very satisfied or satisfied with the work the EOCP does on your behalf. Thank-you to everyone who participated in the survey – your feedback is valuable and will help the EOCP better meet the needs of its stakeholders.

To wrap things up, occasionally, we get feedback like this which really makes our day:

“ I kinda fell into wastewater and water work in '92, first certified in '94, and I wanted to thank you for all the times you personally, and the others there too, have helped me over the years. I'm retiring next year, so the CEUs you just handled for me will likely be my last.

The voices on the phone at EOCP have been comforting and helpful over the last two-three decades when I was stressed about having enough CEUs – especially when worrying someone more qualified might be hired over me as our systems got more complicated.

The responsibilities of my wastewater and water work since 1992 can at times feel daunting – but there's something about the way the staff at the EOCP office turn our courses and experience into a concrete confidence that we are on track in our service – that I have appreciated so very much over all these years.”

RESILIENCE PATHWAYS

A NEW PROJECT:

Co-Creating Knowledge and co-designing the path forward for Understanding Disaster and Climate Risk and Resilience in BC

Resilience Pathways is a knowledge-sharing initiative that recognizes that everyone—all of society—has a role in designing our resilience to disaster and climate risk. Resilience Pathways will be a comprehensive collection of articles that share knowledge and insights from organizations and individuals active in resilience planning in BC. Contributors to Resilience Pathways include a wide range of practitioners, researchers, and authorities across any and all sectors engaged with disaster and climate risk.

The final report will consist of articles that will be related to multi-hazard and risk, EQ, Flood, Tsunami, Landslide, Wild Fire, and Climate Change and may cover topics such as Emergency Planning, Climate Change Adaptation, Recovery and Build Back Better Planning, Business Continuity and Enterprise Risk Management, Development and Land Use Planning, Community Resilience, Insurance and Financing, Engineering and Building Design).

Short articles will be co-authored by experts from the EOCP, Municipal, Regional, Provincial, and Federal governments, Indigenous communities, Private Sector (Insurance and financing, Capital Investment, Large-Medium-Small Enterprises), Critical Infrastructure Operators (public and private), Science, Technology and Engineering (Academia and Private Sector), Building Owners and Tenants, Civil Society, Media. Learn more about the initiative and the proposed list of articles see www.drrpathways.ca



Photo: English Bay, Vancouver BC. Credit: Mike Benna on Unsplash

GET INVOLVED! In order to have a more inclusive and comprehensive process, a call is open to receive expressions of interest in contributing to Resilience Pathways 2022 by May 15th, 2021.

This open call is intended to identify interest from any public, non-profit, private organizations, or individuals that have experience in disaster and climate risk resilience activities. The Expression of Interest should be related to one of the following:

- Indigenous Knowledge
- A case study or pilot project that has been innovative, sparked change, and has the potential for replication or scaling up across the province or the country
- A challenge that is impeding risk reduction or resilience planning, along with evidence
- A recommendation for reducing risk or increasing resilience, along with the rationale for the recommendation and the change/impact it can have
- An international example of excellence in resilience activities
- An inspirational idea or a 'wild card' for disruptive change of the status quo



Those who are interested in contributing to Resilience Pathways should make a submission using the Expression of Interest form available at <https://tinyurl.com/5b2jyrp7>

Resilience Pathways is commissioned by Natural Resources Canada and funded by Canadian Safety and Security Program. Sage on Earth Consulting Ltd. is leading the technical design and coordination, and Uncover Editorial + Design is leading the editorial and design process.



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THAT FOUR LETTER WORD

EXAM-PART 3

By Kalpna Solanki, CPHI(C) BSc MBA

Every January, using a new level of functionality that has been implemented in the EOCP's Customer Relationship Manager, there is an evaluation of the pass/fail rates of exams written by Operators during the preceding year.

The results for 2020 for Bulk Water Delivery, Small Systems, and OIT exams (EOCP exams) are:

Discipline	Pass Rate
BWD	100%
SWS	97%
SWWS	68%
OIT	94%

And for Levels I to IV (Association of Boards of Certification (ABC) exams):

	MU	WT	WD	WWC	WWT
I	74%	95%	86%	90%	68%
II	88%	96%	66%	75%	64%
III		100%	78%	91%	52%
IV		56%	38%	75%	30%

At any time when there is a pass rate below 50%, an inquiry is conducted as to the possible cause/s of the low pass rate.

Some of the queries are:

1. How are other jurisdictions using the same exam faring?
2. Is the exam too difficult?
3. Did the instructor use the most up to date Need To Know (NTK) criteria?
4. How did the Operators writing the exams prepare for them?
5. Which sections of the exams did Operators have difficulty with?

In response to the questions above:

1. Other jurisdictions
 - a. For WD IV, another jurisdiction had a pass rate of more than 60%
 - b. For WWT IV, another jurisdiction had a pass rate of more than 50%

2. In terms of the level of difficulty, these exams have been compiled by Operators who have a great deal of industry knowledge. Speaking with some of them, they indicate that Level IV exams across the board are difficult; specifically, WWT IV is the most difficult, and has the most math. However, they all are in agreement that whilst the exams are difficult, they are fair.

3. Need To Know (NTK) Criteria

- a. The EOCP advises training providers of any changes to the NTK criteria well in advance of changes taking place, and again after changes have been implemented. Training providers have assured us that they do update their training materials in congruence with changes in the NTK criteria.

- b. Due to the complexity of the Level IV exams, Operators have been advised that taking only a course will not prepare them for an exam. A great deal of additional work needs to be done. Some previously mentioned resources are at the EOCP website at <https://tinyurl.com/cv5jtw8v>. In addition, Page 9 of the Operator Digest available at <https://tinyurl.com/75zfcjrf> lists resources recommended by Operators, and Page 11 of the Operator Digest available at <https://tinyurl.com/tyxpznwu> has additional resources.

4. Math is hard. Invariably, in almost every exam situation, we find that Operators have the most difficulty with math. The EOCP has therefore provided several math only resources at its website, and will provide additional links as they become available: <https://tinyurl.com/cv5jtw8v>

We recognize that failing an exam can be discouraging, especially when a great deal of effort has been expended to prepare for them. We have had several discussions with ABC regarding the low pass rate of some exams, and ABC will:

1. Provide revised Need To Know Criteria
2. Provide more sample questions
3. Have its psychometrician conduct a detailed exam analysis to ensure the exams capture the necessary material

In the meantime, the EOCP will provide in each issue of the Operator Digest an exam question sample, and will keep you apprised of changes in NTK criteria and/or other exam related issues as they come develop. This issue's math question, **Math for Wastewater - Solving for the Sludge Volume Index (SVI)** is on the following page.

Math for Wastewater – Solving for the Sludge Volume Index (SVI)

By Chris Kerman, ASCt PO CWWP

Wastewater Treatment exams are reputed to be the most difficult of the array of exams offered at the EOCP. In an effort to provide Operators preparing for exams, in every issue of the Operator Digest there will be an exam question. This first one is related to wastewater treatment, but there will also be exam questions related to water treatment in subsequent issues.

The sludge volume index is a way of determining how your mixed liquor suspended solids (MLSS) will settle in your secondary clarifiers. It can give you some insight to how dense or fluffy your sludge blanket will be. In order to complete the calculation, you need the results from both a MLSS and the Settled Sludge Volume (SSV30) after a 30min settleability test. The formula to solve for the SVI is below.

$$\frac{(SSV_{30}, \text{mL/L}) (1,000\text{mg/g})}{\text{MLSS}, \text{mg/L}} = \text{mL/g}$$

For the settleability test you will need a volume of mixed liquor, a calibrated settleometer, and a timer. For our example we are using 2L of mixed liquor in our settleometer. Pour the 2L of Mixed Liquor into your settleometer and start your 30min timer. When your timer

goes off record the settle volume. In our example the settled volume is 100. For our settleometer this means we have 100mL/L of solids.

While our sample was settling, we ran a MLSS test by weighing a filter paper, passing a volume of MLSS sample through it, drying the sample and reweighing the filter paper and dry solids. For this test we need a filter paper, a volume of MLSS in a graduated cylinder, a scale with 4 decimal places, a vacuum apparatus to suck the sample through our filter, and an oven to dry the sample in. We select a filter paper large enough and a sample volume appropriate for the solids content and the filter paper size.

When we weighed our filter paper, we got 0.4225g. We use 50mL of MLSS in our example. We pass the sample through the filter and then we place the filter in the oven to dry. After the sample has dried 30-60mins we take it out of the oven to cool to room temperature. We then weighed the filter paper and dried solids. We got 0.5325g. To obtain the dry solids weight we must subtract the filter paper weight from the filter paper with dry solids.

Filter and dry solids	0.5325g
Filter	- 0.4225g
Dry solids	0.1100g

We ran a 50mL sample and the solids portion came in at 0.1100g. We need our MLSS results to be in mg/L. We will convert from g/mL to mg/L by canceling out our units.

$$\text{MLSS} = \frac{0.1100\text{g}}{50\text{mL}} \times \frac{1,000\text{mg}}{1\text{g}} \times \frac{1,000\text{mL}}{1\text{L}} = 2,200\text{mg/L}$$

We now have the two inputs of information we need to calculate the SVI. The final result is required to have mL/g as the units. Let's run the calculation and cancel out our units:

$$\text{SSV}_{30} = 100\text{mL/L} \quad \text{MLSS} = 2,200\text{mg/L}$$

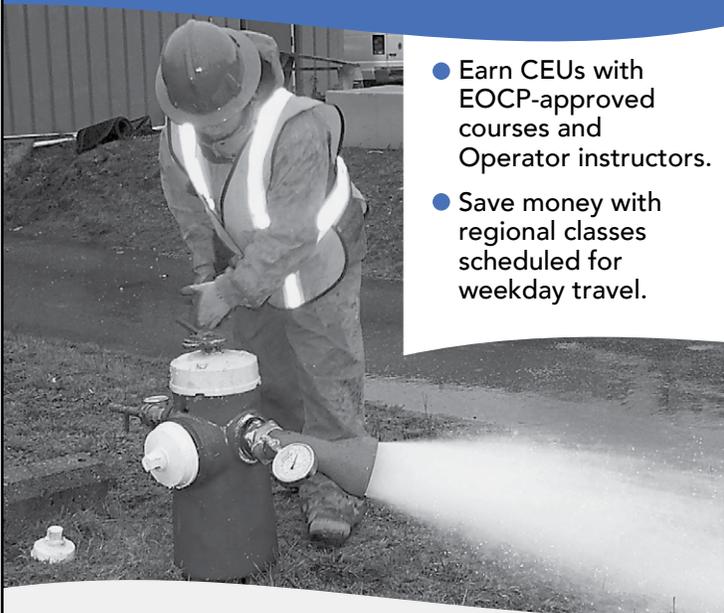
$$\frac{(\text{SSV}_{30}, \text{mL/L}) (1,000\text{mg/g})}{\text{MLSS}, \text{mg/L}}$$

$$\frac{100\text{mL}}{1\cancel{\text{L}}} \times \frac{1\cancel{\text{L}}}{2,200\text{mg}} \times \frac{1,000\text{mg}}{1\text{g}} = \frac{45.45\text{mL}}{1\text{g}} \quad \text{or simply} \quad 45.45\text{mL/g}$$

How do operators use this result? It might be helpful to trend your SVI with your final effluent TSS. You can then have a better idea of what final effluent TSS result you will get with different SVI numbers. Hopefully, you will find that you get better effluent results when your SVI is in a certain range. This could allow operators to target that SVI range to produce predictable final effluent TSS results.

Until next time, Happy Operating!

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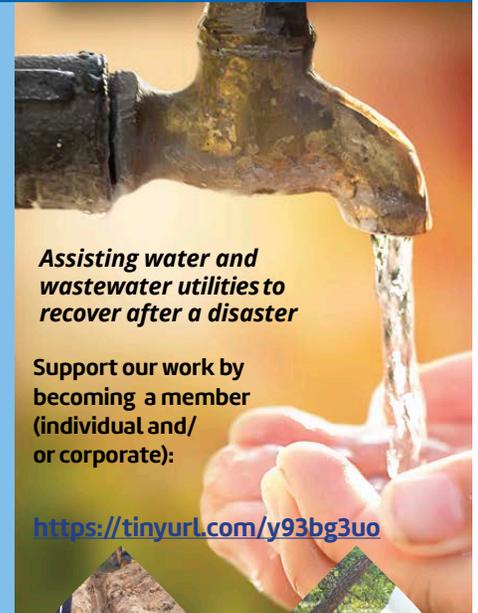
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STATISTICS

1st January to 31st March 2021



EOCP

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Certification Program

EXAM STATISTICS



277 exams taken

107 exam sessions

FACILITIES



61 facilities re/classified

CONTINUING EDUCATION UNITS (CEUs)

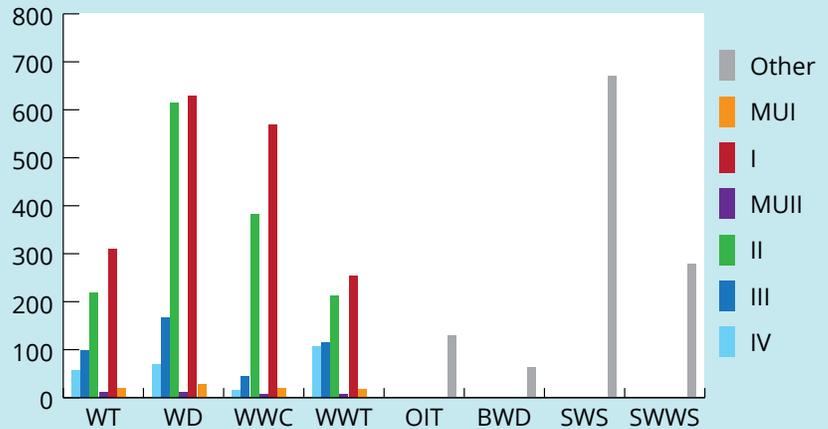
569 Operators submitted CEUs

1,048 CEUs were earned

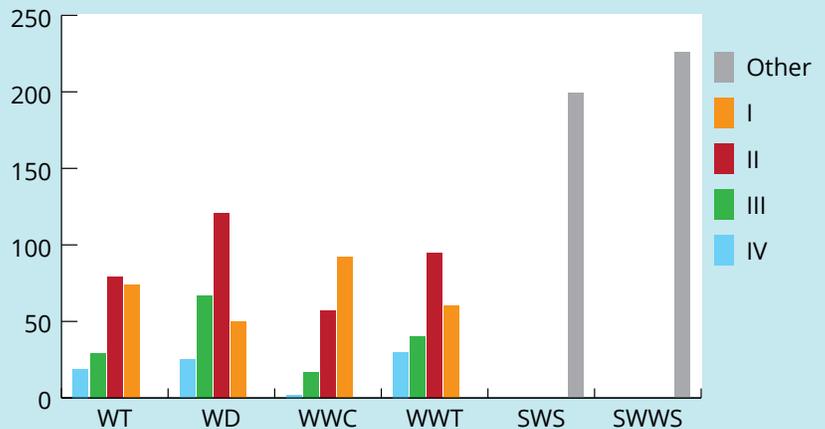
DEFINITIONS

- WT Water Treatment
- WD Water Distribution
- WWC Wastewater Collection
- WWT Wastewater Treatment
- OIT Operator In Training
- BWD Bulk Water Delivery
- SWS Small Water System
- SWWS Small Wastewater System
- MU Multi Utility

Operator Certification (Jan. 1 – Mar. 31 2021)



Facility Certification (Jan. 1 – Mar. 31 2021)



You can check your Operator status by logging into your profile at <https://crm.eocp.ca/> and clicking on **ACCOUNT** to see if your 2021 dues have been paid, and **CEU** under the LEARNING STATUS tab to see if your CEUs have been met for the 2018-2019 reporting period. The current CEU reporting period runs from January 1, 2020 to December 31, 2021.

If your CEUs have not been met for the 2018-2019 reporting period, or your 2021 dues have not been paid your status will be red flagged and you will be listed as not certified.

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This past year we encountered unprecedented challenges in the water sector, but it was also a year of unmatched cooperation and adaptation. While many industries and services were shut down to slow the spread of the pandemic, water sector utilities continued to operate and deliver essential services to their communities. This year's theme for the 2021 BCWWA Annual Conference & Trade Show showcases how the water industry has heroically risen to the challenge, creatively collaborating and innovating in new ways, and working together to promptly adapt to changes within the sector brought on by the pandemic.

This event is an opportunity for water and wastewater professionals to come together virtually and reflect. Our aim is to help you discover and apply the lessons learnt from past and current challenges, to ensure the water community can continue to overcome any obstacle to deliver safe and reliable water services.

BCWWA 49TH ANNUAL CONFERENCE & TRADE SHOW

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