Winter 2022, Vol. 52, No. 4

New York Water Environment Association, Inc.

ClearWaters

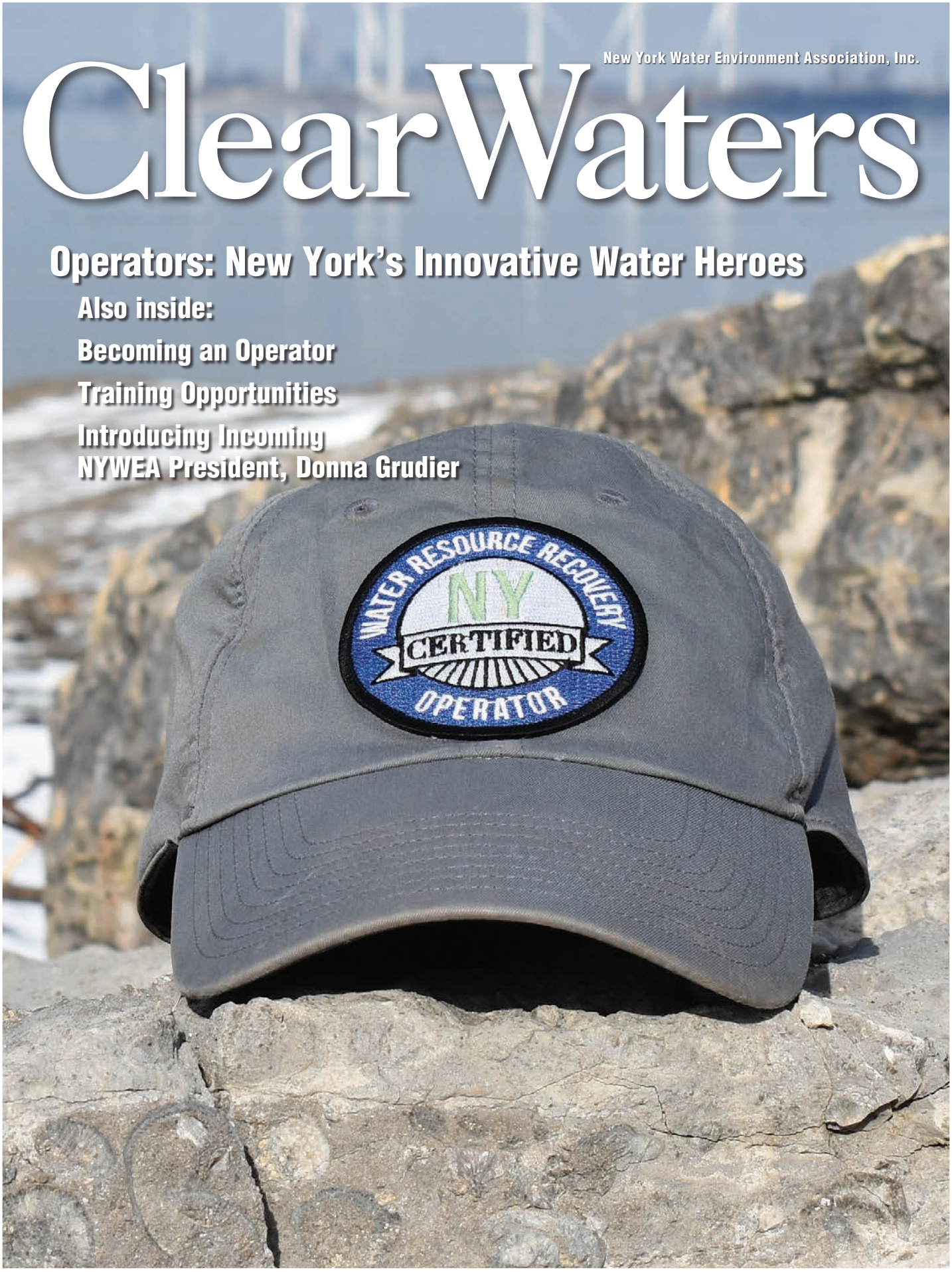
Operators: New York's Innovative Water Heroes

Also inside:

Becoming an Operator

Training Opportunities

Introducing Incoming NYWEA President, Donna Grudier



Winter 2022, Vol. 52, No. 4

Clear Waters

New York Water Environment Association, Inc.

Cover: Individuals who become certified as water resource recovery operators in New York State receive an embroidered patch. Dan O'Sullivan from Buffalo Sewer Authority got creative with where he put his patch and his hat! *photo, Daniel O'Sullivan*

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NYWEA

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President's Message | Winter 2022

I'm writing this message to you for the last time as NYWEA's president! It's been a great year and I'm looking forward to our 95th Annual Meeting back in person this February! Hope to see you all there!

Our Operators

While my presidential theme has been the Year of the JEDI (Justice, Equity, Diversity and Inclusion), I'm happy to be ending my year with an issue of *Clear Waters* focused on *Operators: New York's Innovative Water Heroes.* It cannot be said enough how important the work of these NYWEA members is, how vital clean water is for our communities and how quickly our collective quality of life would diminish without their important work.

So this issue, in some ways, represents my hats off to the folks who serve their communities in ways that the day-to-day impacts and nature of their work I think many just don't understand. In an effort to demonstrate my respect for the work of NYWEA operators, my co-author Madison Quinn and I wrote *Outstanding Operators of the Year: Profiles in Excellence,* highlighting a few of last year's award winners. I look forward to shaking the hands of those who win that award this year during the 95th Annual Meeting awards luncheon.

I found especially timely the discussion in Howie Robinson's article, *Operators: Life Blood of the Water Industry,* as well as *WRRF Operator – It's Not Just a Job, It's an Adventure!* written by Rick Kenealy. These articles show the value of a career in WRRF operations while also showing that the need to bring folks into the industry is immediate and necessary.

With that immediacy comes the need to look at how we bring people into the water workforce and where we do our recruiting. And as far as recruiting goes, there is no silver bullet and no one path into and through a career as a WRRF operator, as discussed in Roscoe Hill's article *An Unexpected Career Path* and Jim and Mike Keyes' article *Passing the Wastewater Torch*. And Water Ambassador Bob Adamski's article, *Wisdom for Young Professionals,* provides sage advice on how to attract young people into careers as operators.

Clem Chung's article on Monroe County's DES Diversity Action Plan highlights just one effort that I think jives nicely with the work of NYWEA's Diversity, Equity and Inclusion (DE&I) committee, not only in terms of diversity and inclusion but also in terms of working with local and state Civil Service agencies to streamline the process, as Tim Murphy wrote in *Join the Movement! Streamlining the Civil Service Process for Certified Operators.*

Looking Back at 2022

As I round out my year as NYWEA president, I just wanted to highlight a few things I've tried to do to demonstrate my enthusiasm for the Year of the JEDI and for NYWEA! I was able to attend six chapter events. I attended WEFTEC in New Orleans and hosted NYWEA's reception at the Great American Alligator Museum, in honor of Bob Adamski's collection there. He was overjoyed and so was I. In support of our Operations Challenge teams, I joined the awards dinner as well and celebrated their successes!

I hosted the NYWEA Spring Conference and moderated the opening session focused on JEDI. Also in June, I co-hosted, with Lauren Livermore, the virtual Women in Water networking event.

Whenever it was possible and appropriate, I wore my figurative NYWEA hat and my physical NYWEA shirt, not only as a reminder of my affiliation but as a reminder to others of the presence of NYWEA and an invitation to talk to me about the great work NYWEA and its volunteers do. As an example, I represented NYWEA at the Buffalo Sewer Authority's groundbreaking in October. Finally, on Nov. 15, as both Environmental Finance Center director and NYWEA president, I co-hosted NYWEA's first-ever JEDI Training event with the DE&I committee. It was held both in-person and virtually and had more than 40 attendees.

In closing, ending as I have begun (as every good English major should), the Year of the JEDI is not just an annual presidential theme, it is a principled approach to how we interact with each other, conduct business and grow our workforce. As evidenced by several of the efforts highlighted above, and in the spring issue of *Clear Waters* focused on water equity, my keynote address at the Greater Buffalo Environmental Conference, the opening session of the Spring Conference, every one of my presidential messages in *Clear Waters,* and the opening session of the upcoming 95th Annual Meeting, I expect that NYWEA's JEDI force will live on in all of us, well beyond my presidential term.

Khristopher Dodson
NYWEA President

In December, Khris Dodson spoke about grant writing at the Elected Officials Roundtable in the Town of Chenango, New York.

Celebrating Our Operators

For those operators reading this, we hope this issue inspires and enlightens you! As we think about the public perception of the good work you carry out 24/7, there are a few schools of thought. The first, of course, is that the facility is out of sight and out of mind – it's a good thing when we are not in the news! The other thought (and preferred in my mind) is visibility, outreach and transparency. The good work that is carried out by our operators and utilities should be understood and celebrated by our communities' ratepayers. The more that people understand that delivering and cleaning our water is complicated and costly, the more appreciation they will have for the dedicated team of people that it takes to make it happen! The articles in this issue of *Clear Waters* illustrate how challenging yet rewarding these clean water jobs are. NYWEA supports operators and students through several scholarships, and the application period is now open. See page 62 for more information.

What's on the Horizon?

In addition to NYWEA's 95th Annual Meeting there are several notable events coming down the pike! Thanks to Edmund Lee, chair of NYWEA's Environmental Science committee, we have been invited to the United Nations 2023 Water Conference to accelerate global momentum toward Sustainable Development Goal 6, Clean Water and Sanitation, through multi-sector partnership commitments to action on water resiliency. We are honored to be granted special accreditation to attend and participate in this event that will take place March 22-24, 2023, in New York City.

Work in Water Program – 2023 Summer Internships

Since receiving the Water Environment Federation Grant in 2020, we have had five students take advantage of the program. We have three $2,500 grants left in program for use in the summer of 2023. Please consider this an invitation to participate! It's a great way to create a pipeline to water careers. Our goal is to have one of these interns turn into your full-time employee! For more information visit *nywea.org*.

Joint NY-NEWEA Spring Technical Conference and Exhibition

If you've never been to a Spring Meeting, here's one not to miss! This year we have teamed up with our sister organization in New England to bring you a fantastic meeting jam packed with three days of technical presentations. The team effort that has gone into the planning for this conference, under the leadership of NYWEA's Water Ambassador and now Conference Management chair William J. Nylic III is remarkable. In addition to a strong technical program you'll find the largest Regional Operations Challenge competition we believe ever coordinated by Member Associations – boasting more than 15 teams! There will be fun social events and maybe even a golf outing. Please mark your calendar for June 5-7, 2023 (Wednesday-Friday format) and come to Saratoga Springs to network with fellow environmental professionals from across the Northeast.

Patricia Cerro-Reehil, pcr@nywea.org

On Wednesday, Feb. 8, 2023, Donna Grudier Will Become NYWEA's 95th President.

Donna is a lifetime resident of Long Island and has always been an active part of the community. Donna was invited to join this profession by another woman in the business in 2009 and has learned from past female presidents at NYWEA how to help the industry become more equitable for either gender.

Donna began her service to NYWEA in 2009 when she joined the Long Island Chapter O&M Committee. She worked her way up first as secretary, then as chair. She was elected to the Long Island Chapter board of directors in 2015, the same year that she became Operator Representative to the state board and is ecstatic and grateful to be where she is now. Donna hopes to continue being an example to other operators about the growth that can be achieved with the right dedication.

When asked about her views on becoming president, Donna discussed her focus on essential workers as her presidential initiative, "After the pandemic hit, I was struck by how little focus was on water and wastewater professionals in terms of the importance of our work. The country rallied around so many other groups (rightfully so) but our community was woefully underrepresented. I want to remind our members and the public at large that the work we do is essential to the health and well-being of our communities." Donna wants to celebrate the workers through the conferences organized through NYWEA, scholarship and training opportunities, as well as overall expansion of the Operations Challenge Program.

Donna has continued her good work through inspiration. She attributes her desire to achieve through her parents who taught her so much growing up about how to be a leader and have positive values to always challenge things. Donna learned to think outside the box and always ask questions. As an adult, she feels connected to growing through the support of her stepfather, Joe Massaro, who has always given solid advice and encouragement to become a part of NYWEA. Donna also has the support of her husband Dale Grudier, who can be seen at her side through each of NYWEA's events and conferences. Joe and Dale are proud of Donna's numerous awards such as the Operator of the Year (2012), Long Island Chapter David Flaummenbaum Safety and Training Award (2015), Long Island Chapter Bob Caballeria Distinguished Service Award (2017), William D. Hatfield Award (2018) and most recently the NYWEA Milton T. Hill Award (2020). Donna has been a part of the Select Society of Sanitary Sludge Shovelers since 2014 where she has been given countless insight from her peers and will always feel grateful to have these people in her life.

Donna and her husband Dale on their wedding day.

Donna succeeds Khristopher Dodson who steps down as NYWEA's president on Feb. 8, 2023.

Water Views | Winter 2022

Successful Training Partnership

Wastewater treatment staff are central to protecting and improving water quality. Operators, the first line of defense against waterborne diseases and poor water quality, are both environmental and public health professionals. NYWEA's and NYSDEC's collaboration on wastewater treatment plant operator training and certification is essential to ensuring that treatment facilities and systems are successfully managed.

New York regulations (6 NYCRR Part 650) require that municipal wastewater treatment plants (WWTP) be supervised by a state-certified operator. The regulations define eight levels of certification (Grades 1, 1A, 2, 2A, 3, 3A, 4, 4A) that ascend in qualifications, training and experience rigor associated with the increasing size and complexity of WWTPs. Prior to receiving a certificate, an individual operator must meet education requirements that include the completion of NYSDEC-approved training. Individuals must also possess relevant operational experience and pass a certification exam. Each operator certification must be renewed every five years. Over 2,600 individuals are certified.

NYSDEC managed this program until 2011. Thereafter, professionals at NYWEA stepped in to assist with operator certification and certificate renewal in a highly effective and professional manner. NYSDEC remains responsible for the program's regulatory aspects and approval of pre-certification and renewal training courses. NYWEA processes certification applications, approves operators to sit for the certification exams, and provides essential certification-renewal training. Training events typically focus on such matters as safety, operation and maintenance of mechanical equipment, and treatment process optimization.

While about 315 applicants were approved to take an operator certification exam in 2021-2022, the total number of operators approved for certificate renewals has dropped. Today, there are more vacancies in New York than certified operators to fill them. It is plain that we need to recruit, train, and support new operators for career success and to protect the public health and environment. NYWEA's program is preparing the next generation of operators – and we at NYSDEC are grateful.

New York depends on our knowledgeable, experienced WWTP operators. Thank you NYWEA for your assistance with the Wastewater Operator Certification Program. Our successful collaboration since 2011 ensures that wastewater treatment facility personnel have the training and experience to succeed in our clean water mission.

NYSDEC's Wastewater Treatment Plant Operation webpage: *https://www.dec.ny.gov/chemical/8464.html*

NYWEA's Operator Careers webpage: *https://www.nywea.org/SitePages/Operator-Certification/Information/default.aspx*

– James Tierney, Deputy Commissioner for Water Resources
New York State Department of Environmental Conservation

Focus on Safety | Winter 2022

Health & Safety Issues: Aging Workforce

As we live longer and healthier, older people are an increasing proportion of the workforce. Aging is inevitable, but productivity and performance can stay high. Most jobs don't require our full capacity, even if we work closer to our limits than younger workers might do. In some ways, older workers are the most skilled and productive employees, but they can also be the most vulnerable.

Intelligence does not decrease with age nor does the quality of our decisions. Older adults make decisions more slowly – our brain's database has more memories from experience, so there is more information to consult. At work, our surroundings remind us of what to do and how to do it. We can help this along by using signage, "cheat sheets" and "to-do" lists (I call these my "external memory"). To develop new skills, we can play to our strengths by using hands-on practice and refreshers, and getting enough sleep so the brain can store new learning.

Older workers are safer workers but can tire faster and heal slower. Our strength and endurance can be improved with strength training, aerobics, stretching, and other forms of exercise. Reducing the musculoskeletal risks of a job is valuable for the entire workforce (discussed in the summer 2022 issue of *Clear Waters*). Many older workers begin to have balance problems, risking injuries from trips and falls. It could be helpful to add handrails along travel routes, use slip-resistant walking surfaces, repair uneven floors, keep floors dry and reduce clutter.

As vision ages, we can lose depth perception and the ability to focus on near objects, discriminate colors, or transition between lighted and dark areas. General workplace lighting could be increased, task lights added, and lighting transitions made gradual rather than abrupt.

Aging can bring changes to hearing; background noises can interfere with hearing sounds or understanding someone's speech. Noise can be even more damaging to hearing when we are older. OSHA's noise regulation requires an employer to provide a hearing conservation program for noisy environments that includes annual hearing tests and the use of the hierarchy of controls to reduce risk.

Aging can also affect how our bodies respond to extremes of heat and cold. We tend to have less tolerance of heat stress, especially if we have heart or kidney problems or other risk factors. We also can experience changes to our skin's sensation/awareness of hot and cold. Workplaces need good hazard assessments with appropriate heat and cold alert programs, including hydration, scheduling, acclimation, breaks, and rest areas for people to cool off or warm up as needed.

As workers retire, they can take valuable, often critical, information and experience with them. We can use tools, such as process hazard/failure analysis and vulnerability analysis, to capture this knowledge. When people solve potential workplace problems and evaluate risks and solutions together, important information and experience can emerge and be documented.

– Nellie J. Brown, MS, CIH, ILR School, Cornell University

Outstanding Operators of the Year: Profiles in Excellence

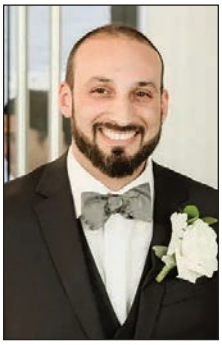
by Khristopher Dodson and Madison Quinn

NYWEA's Outstanding Operator of the Year award recognizes front-line Operations personnel who have demonstrated extraordinary dedication in the day-to-day operation of a water resource recovery utility, and/or successful solution to a problem, and/or contributions to the wastewater field. Nominations are open to operators from municipal, industrial, or contract operational facilities. Eligible candidates include those working in general plant operations, biosolids, collections, engineering, lab operations and maintenance who have demonstrated their ability to mitigate operational challenges beyond the staff's control.

For NYWEA's inaugural Outstanding Operator of the Year award, one operator from each of NYWEA's seven regional chapters was honored at the virtual awards ceremony during the 94th Annual Meeting. The winners included a lineup of exemplary operators:

- James Behr, Suffolk County Department of Public Works
- Douglas Fialkoff, Westchester County Department of Environmental Facilities
- Michelle Hess, City of Canandaigua Water Resource Recovery Facility
- Tyler Masick, Albany County Water Purification District
- Marra Salomon, New York City Department of Environmental Protection
- John Waite, City of Rome, New York

Now, without further ado, please read on to meet our inaugural Operators of the Year!



James Behr
Matt Gelfman

James Behr, Operations Crew Chief

James Behr has served as an employee of the Suffolk County Department of Public Works since 2007. He secured his 2A, 3A and 4A operator certifications in 2015, 2016 and April 2022 respectively. He is currently an Operations crew chief at the Bergen Point treatment facility.

James has an array of duties that make him stand out at the facility. His wastewater process knowledge shines through during process upsets. He is set apart by his knowledge of the process and ability to brainstorm, experiment, research and evaluate the plant to determine what can be adjusted to solve a problem or optimize the process. Even in positions above him, fellow operators look to him to answer questions about the process.

James has also been an active member on the Operations Challenge team, Long Island Brown Tide, for the past six years. The Operations Challenge is the water sector's premier skills competition that brings together operators from around the world to compete in events designed to test the diverse skills required for the operation and maintenance of water resource recovery facilities, collection systems and laboratories. His knowledge and dedication in the field of water resource recovery has directly contributed to the success of the Long Island Brown Tide Operations Challenge team.

James' commitment at the facility is shown on a day-to-day basis through hard work, dedication and going the extra mile. Whether it is making difficult decisions during emergency situations at the facility or coming in at one in the morning for plant shutdowns in 20-degree weather, or even spending 48 hours straight at the facility during hurricane-like storm events, his commitment exceeds expectations and sets the bar high for those following in his footsteps, learning what it means to be an excellent operator.

Douglas Fialkoff, Supervisor of Operations

Douglas Fialkoff

Douglas Fialkoff has worked for the Westchester County Department of Environmental Facilities since 2006, when he was hired as a wastewater treatment plant operator trainee. After completing his first year, during which he attained his Grade 1A operator certification, he was promoted to wastewater treatment plant operator at the Yonkers Joint Water Resource Recovery Facility (WRRF). He received 2A operator certification in 2008 and 3A certification in 2011. In 2012, he was promoted to process control technician at Yonkers Joint WRRF, received his 4A operator certification in 2015, and was promoted to supervisor of Operations at New Rochelle WRRF in 2017.

Douglas has proven himself as an exemplary operator. While in the position of process control technician at Yonkers Joint, he was responsible for making process decisions for a 120-million-gallon-per-day (mgd) activated sludge wastewater treatment plant including dissolved air floatation, gravity belt thickening, gravity thickening, anaerobic digestion and centrifuge dewatering. He was instrumental in optimizing the sludge handling process. He was also responsible for ensuring all permit and process samples were collected and sent to the lab for the proper analysis. Douglas would then interpret lab results to make the correct process adjustments to maintain state permit compliance. He was responsible for all data collection and would also perform process control tests when needed.

As supervisor of Operations at New Rochelle WRRF, Douglas continued to excel as an operator. New Rochelle WRRF is a 20.6-mgd liquid oxygen activated sludge wastewater plant with Biostyr biological nutrient removal (BNR) process and ultraviolet disinfection. He was again instrumental in optimizing the BNR process in order to meet the consent order for Westchester County Long Island Sound plants. Douglas adjusted setpoints to optimize chemical usage while still maintaining a high level of nitrogen removal. He performs all the same duties as his previous position as well as taking on more supervisory roles. He is responsible for ensuring the plant is meeting all chemical bulk storage regulations as well as coordinating all chemical deliveries.

MichelleHess, *Kimmy Blanks Photography*

Michelle Hess, Chief Operator

Michelle Hess has always been a committed steward of the environment. After earning her bachelor's in political science, she worked for the American Red Cross' disaster relief efforts in Louisiana. Experiencing what a "dead zone" looked like on the Gulf

continued on page 10

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continued from page 8

Coast and the devastating economic and social impacts it has on communities led her to search for a career protecting the environment.

Michelle is a New York state Grade 4A certified wastewater treatment plant operator and a Grade 4 voluntary collection systems operator. She is an extremely hard-working and dedicated operator. Since the start of her wastewater career in 2016, she has not only earned her certification, but she has also advanced from an operator trainee with Monroe County Pure Waters to become the chief operator of the City of Canandaigua's WRRF.

Michelle finds the most rewarding part of her job to be working with other operators who have the same passion for their work as she does. She takes pride in knowing that the work they do at the WRRF has a direct and meaningful impact on both the community and the environment every day. She is a proud advocate for the importance and impact of water resource recovery operations and engaging future operators to learn about the opportunities available in the water resource recovery field.

Michelle is a past recipient of the Lucy Grassano Operator Scholarship and has been a regularly active NYWEA member at the chapter and state level. She previously competed in the Operations Challenge with the Genesee Valley Chapter's Water Recyclers team. She served as team captain from 2018 through 2020. She led the Water Recyclers in competing at the state Operations Challenge as well as the national competition at WEFTEC. Michelle is also a champion for diversity, equity and inclusion initiatives. She currently serves as the vice chair of NYWEA's Diversity, Equity and Inclusion Committee and has been a leading advocate for strengthening operator engagement within NYWEA.

Tyler Masick

Tyler Masick, Superintendent of Operations

Tyler Masick serves as superintendent of Operations for the Albany County Water Purification District. He graduated with a Bachelor of Science degree in civil engineering from the Rochester Institute of Technology (RIT) in 2011. After graduation, Tyler began his water resource recovery career at the Gloversville-Johnstown Wastewater Treatment Plant as their wastewater engineer. In October 2015, he joined the Albany County Water Purification District as the superintendent of Operations. In his role as superintendent, he is responsible for the operations and management of the district's 29-mgd South Plant and 35-mgd North Plant. Both plants serve combined sewer systems and accept a combination of domestic and industrial waste streams. In addition to managing the plant staff, he also acts as the district's safety officer and is responsible for conducting training classes and overseeing safety programs at both facilities.

Tyler has dedicated himself to the protection of the environment and advancements in water resource recovery since he started his career in 2011. While at Gloversville-Johnstown, he was responsible for the operation of the anaerobic digester process and the electricity-generating combined heat and power system that produced 90% of the plant's electrical needs. Tyler has brought those experiences to the Albany County Water Purification District to advance cost-saving measures since he started at the district in 2015.

Confronting the challenge of operating two separate WRRFs during the COVID-19 pandemic, Tyler has been instrumental in the development of COVID safety protocols that are currently being used at both facilities. He has been able to maintain adequate staffing levels despite employees being quarantined for extended periods of time. Additionally, he has been able to successfully recruit new process operators and overcome staffing issues, ensuring the performance of both facilities. Tyler has also been directly involved in assisting in the development of the district's capital plan for the upgrade of critical unit processes that will ensure the performance of each plant in the future.

Tyler serves on the board of directors for the NYWEA Capital Chapter and serves as a leader on NYWEA's Certification Committee where he is heavily involved in the development of operator education. He has risen to every challenge in front of him and continues to demonstrate his commitment to the quality of plant operations and has proven to be a valuable asset to the district.

Marra Salomon
NYCDEP

Marra Salomon, Lead Maintenance Sewage Treatment Worker

Marra Salomon began his career at the New York City Department of Environmental Protection (NYCDEP) Jamaica WRRF in 2014 and has exemplified excellence in both operations and maintenance ever since. The Jamaica WRRF has a design flow of 100 mgd and has been upgraded for nitrogen removal. Sewage Treatment Worker (STW) Marra came to NYCDEP with a plumbing background and quickly learned all aspects of mechanical repairs. He also became proficient in mechanical troubleshooting and repair and became the anchor of the maintenance staff at Jamaica WRRF.

Whenever a repair is needed requiring an expansive skill set, the maintenance engineer on-site turns to Marra. He was the lead mechanical operator on a variety of maintenance jobs, including:

- Installation of additional waste line, including design and layout of the piping installation, which allows the facility to better control aeration tank solids inventory
- Installation of actuators for the surface wasting weirs, replacing old wheel actuators, after which the aeration tanks showed a reduction in surface foam and froth
- Repair of primary and aeration tanks, where STW Marra is always the lead mechanic
- Gravity belt thickener maintenance, where Marra is the lead mechanic.

Because Jamaica WRRF has no backup belt thickener, the fact that the gravity belt thickener unit has operated consistently since 2014 is a testament to the quality of repair work STW Marra performs.

Marra is Jamaica WRRF's lead maintenance STW. He is also proficient at performing operations duties. He is always willing to step up to challenges and his co-workers value and respect him. Marra is hard working, conscientious and a team player. He contributes significantly to the state of good repair at Jamaica WRRF, where all the internal supervisors have recognized his dedication to his craft.

John Waite, Chief Operator

John Waite
Marcia Kotary-Waite

John Waite began his career in the water resource recovery industry when he was hired by the City of Rome, New York, as a laborer in May 2000. He was promoted to maintenance by November of the next year. As he continued to hone his mechanical skills, he learned the process side of wastewater treatment and began taking the classes and training necessary to become a certified operator. Within five years of his promotion to maintenance, John acquired his New York state operator certification and was promoted to wastewater treatment plant operator in January 2006. In October 2011, he obtained his 3A wastewater operator certification and was promoted to shift operator. He proceeded to get his 4A certification in 2014.

John has a knack for process control and is detail-oriented, which contributed to his appointment as lab director in 2014. Along with running the laboratory, he was also safety coordinator for the Rome WRRF. With all his skills and vast facility experience, John was the logical selection to become the chief upon the retirement of his predecessor. He was promoted to chief operator of the Rome WRRF in March 2020.

John was an integral part in several facility awards, including the 2006 NYSDEC first place Operations & Maintenance Award for Large Advanced Facilities; the American Public Works Association Environmental Projects of the Year awards for 2005, 2009 and 2015; and the 2010 NYWEA Municipal Achievement Award.

John was promoted to chief operator during a $15 million digester and high-strength waste upgrade that would utilize combined heat and power (CHP) to propel the Rome facility to "net zero" electricity and fuel. John oversaw the construction of a new high-strength waste receiving station for dairy waste and other viable wastes to be received and fed consistently to the new digesters, creating electricity from the biogas produced. The CHP equipment creates enough electricity to take the Rome facility off the electric grid and send excess power back to the grid. Adapting to this upgraded technology and the effects of high-strength waste and co-digestion, John developed a robust sampling and analysis protocol for his staff to follow. This allows them to monitor and fine tune this new way of doing business.

John managed, coordinated, and led the facility and its workers during the height of a global pandemic. His leadership through this challenging and unprecedented time further revealed his passion for excellence and his outstanding contributions to the operation and maintenance of his WRRF.

Khristopher Dodson is the associate director at the Syracuse University Environmental Finance Center (SU-EFC) and 2022 NYWEA President, and may be reached at kadodson@syr.edu. Madison Quinn is the communications manager and scholarship program administrator for the New York Water Environment Association, Inc., and may be reached at madison@nywea.org.

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Become a New York State Certified Wastewater Operator: A How-To Guide

by Carolyn Steinhauer

Are you a wastewater operator who aspires to become certified? Follow these steps ***(Figure 1)***!

Step 1. Determine the Grade of Certificate You Seek

The required certification grade for a facility's chief operator and assistant chief/shift operator positions is determined by your facility's point score. The point score is determined by the New York State Department of Environmental Conservation (NYSDEC) based upon the facility's treatment processes and design flow ***(Table 1)***.

For all other positions, your employer's policies and/or Civil Service requirements will dictate by when (and for what grade) a wastewater operator needs to obtain certification.

Step 2. Meet the State's Certification Requirements

To become certified as a wastewater operator in New York state, an operator must meet the state's education, training, and practical experience requirements, and then pass the appropriate Association of the Boards of Certification (ABC) exam. The minimum formal education requirement for certification is a high school diploma or equivalency diploma.

Pre-Certification Training Courses

Table 2 illustrates the pre-certification training courses you will have to complete for each certification grade. All are either developed or approved by the NYSDEC.

For information on the various pre-certification course providers that teach NYSDEC-approved courses, see *Pre-Certification Course Training Opportunities Expanded in 2022* on page 19.

Required Experience

To qualify to sit for a certification exam, operators also must have operating experience at a wastewater treatment plant with a State Pollutant Discharge Elimination System (SPDES) permit. For Grades 2/2A and above, operators must have this experience in combination with approved operating experience. Approved operating experience is experience at a plant with a SPDES permit having the same or higher point score for which certification is being sought. For both types of experience, a minimum of 50% of the work experience must include hands-on operation of all unit processes at the wastewater treatment plant.

Additional formal education beyond high school can shorten the amount of operating experience required ***(Table 3)***.

Step 3. Apply to NYWEA to Sit for the Exam

Since Sept. 1, 2011, NYWEA has administered operator certification and certificate renewal for the New York State Wastewater Operator Certification Program. The NYSDEC is responsible for

Table 1. Required Operator Certification Grades Based on the Facility's NYSDEC Point Score.

Total Facility Point Score	30 and less	31–55	56–75	76 and greater
Grade of Chief Operator Required	1/1A	2/2A	3/3A	4/4A
Grade of Assistant/Shift Operator Required	1/1A	1/1A	2/2A	3/3A

Table 2. Pre-Certification Training Courses to Complete for Each Certification Grade.

Pre-Certification Training	Grades							
	1	1A	2	2A	3	3A	4	4A
Home Study Introductory Courses: Sacramento Water Programs *Operation of Wastewater Treatment Plans Vol 1 & 2* or *Small Wastewater System Operations and Maintenance Vol 1 and 2*	✔	✔						
Basic Operations Course (60 Hours)	✔*	✔*	✔	✔	✔	✔	✔	✔
Activated Sludge Course (24 Hours)		✔		✔		✔		✔
Basic Laboratory Course (30 Hours)			✔	✔	✔	✔	✔	✔
Supervision and Technical Operations Course (30 Hours) or Sacramento Water Programs Home Study Course (45 Hours) *Manage for Success: Effective Utility Leadership Practices* and Technical Operations module course (8 Hours)					✔	✔	✔	✔
Management Course (18 Hours)							✔	✔

** Optional for this level*

Table 3. Total Years of Operating and Approved Operating Experience Required Based on Education Level and WWTP Score.

			Years of Experience Based on Education			
Grade	**Types of Experience**	**Facility Type**	***B.S. Degree****	***Approved A.A.S.*** **	***A.A.S.**** **	***High School***
4A	Operating Experience	May be acquired at any WWTP.	1.5	3.0	6.0	
	Approved Operating Experience	Must be acquired at an activated sludge WWTP with a point score of 76 or greater.	2.0	2.0	2.0	2.0
		Total ****	**2**	**3.5**	**5**	**8**
4	Operating Experience	May be acquired at any WWTP.	–	1.5	3.0	6.0
	Approved Operating Experience	Must be acquired at a WWTP with a point score of 76 or greater.	2.0	2.0	2.0	2.0
		Total ****	**2**	**3.5**	**5**	**8**
3A	Operating Experience	May be acquired at any WWTP.	–	–	1.5	3.0
	Approved Operating Experience	Must be acquired at an activated sludge WWTP with a point score of 56 or greater.	1.5	1.5	1.5	1.5
		Total ****	**1.5**	**1.5**	**3**	**4.5**
3	Operating Experience	May be acquired at any WWTP.	–	–	1.5	3.0
	Approved Operating Experience	Must be acquired at a WWTP with a point score of 56 or greater.	1.5	1.5	1.5	1.5
		Total ****	**1.5**	**1.5**	**3**	**4.5**
2A	Approved Operating Experience	Must be acquired at an activated sludge WWTP with a point score of 31 or greater.	1	1	1	1
2	Approved Operating Experience	Must be acquired at a WWTP with a point score of 31 or greater.	1	1	1	1
1A	Approved Operating Experience	Must be acquired at an activated sludge WWTP.	0.5	0.5	0.5	0.5
1	Approved Operating Experience	May be acquired at any WWTP.	0.5	0.5	0.5	0.5

* Bachelor of Science (B.S.) degree must include 30 credit hours of math and/or science; Bachelor of Arts (B.A.) Degree with 30 credit hours of math and/or science is considered equivalent to a B.S. degree.

** See *Detailed Certification Requirements – Education* for "Approved A.A.S. Degrees"

*** Associate of Arts (A.A.) with 30 credit hours of math or science or Associate of Science (A.S.) degree with 30 credit hours of math or science is considered equivalent to an Associate of Applied Science (A.A.S.) degree.

**** Applicant must meet the combined experience requirements listed as Operating Experience plus Approved Operating Experience.

the program's regulatory aspects, and NYWEA regularly consults with NYSDEC officials on regulatory matters.

To apply to sit for an examination, you must first assemble an application packet to submit to NYWEA. Required forms and specific application packet instructions for each grade of certification are available on the NYWEA website, on the certification page.

Each application packet should contain:

1. A completed Application for Approval of Qualifications document. Make sure you list current email and cell phone information so you can be efficiently contacted if necessary.
2. A completed Statement of Experience document. If operating experience was acquired at more than one facility, a Statement of Experience form must be submitted for each facility. For example, if you need to apply 4.5 years of experience and you worked at two different facilities during that timeframe, you will need to furnish two separate Statement of Experience documents. Also, if you have a non-operator title, you will need to provide documentation of your hands-on operator activities (and corresponding hours spent on these tasks).
3. A copy of your high school diploma, high school equivalency or college diploma.
4. A copy of the grade's required pre-certification training course completion certificates.
5. A method of payment. Checks or money orders should be made payable to NYWEA.

Complete application packages should be mailed to NYWEA, 525 Plum Street, Suite 102, Syracuse, NY 13204.

Online credit card or debit payments are also accepted and may be entered via a payment portal on our website's certification page. Under Application Fees, click on "New/Upgrade". You will automatically receive a receipt and NYWEA will receive notice of payment and will match your payment with your application packet.

Step 4. Respond to NYWEA Requests for Additional Information

Due to the volume of applications that we receive, the typical turn-around time for a new application to be thoroughly reviewed is three to four weeks. During this time, please check your email. NYWEA may need to request additional information from you by email based on your application contents.

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A candidate takes an exam at the PSI computer testing center. *PSI*

Step 5. Receive Approval and Schedule Your Exam

If NYWEA approves your application, you will receive an approval letter in your postal mail along with detailed instructions on how to schedule your exam at a PSI computer testing center.

Step 6. Prepare for Your Exam

New York State Wastewater Certification Exams are exams prepared by the ABC. ABC study materials including Need to Know Criteria, formula/conversion tables, exam references, study guides, sample exam questions, a web-based testing demo and an overview of what to expect when you take a computer-based exam are available at the website *http://abccert.org/testing_services/certification_study_resources.asp.*

Step 7. Take Your Exam at a PSI Testing Center

Once you have taken your exam, you will receive a score report at the exam center. There are two possible outcomes: a passing score and a non-passing score.

If you received a passing score, you will receive your Certificate, Wallet Card and Renewal Instructions in your postal mail by the 10th of the following month.

If you did not receive a passing score, your score report will highlight the content areas you need to review. Review those areas in-depth and schedule your next exam date. PSI will automatically apply a 90-day wait period in-between exams.

Your NYWEA Contact

I joined NYWEA as the Operator Certification Administrator in August 2021. I enjoy assisting operators as they work to seek and retain their wastewater certifications. I am happy to answer any questions you have. I can be reached at *carolyn@nywea.org* or by phone at 315-422-7811, x4.

Carolyn Steinhauer is NYWEA's operator certification program administrator and may be reached at carolyn@nywea.org.

Become a New York State Certified Wastewater Operator

STEP 1.
Determine the Grade of Certificate You Seek

STEP 2.
Meet the State's Certification Requirements
- Pre-Certification Training Courses
- Required Experience

STEP 3.
Apply to NYWEA to Sit for the Exam

STEP 4.
Respond to NYWEA Requests for Additional Information

STEP 5.
Receive Approval and Schedule Your Exam

STEP 6.
Prepare for Your Exam

STEP 7.
Take Your Exam at a PSI Testing Center

PASSING SCORE **STEP 8.**
Receive Your Certificate and Wallet Card

NON-PASSING SCORE **STEP 8.**
Review the Score Report for Content Areas You Need to Review

90-DAY WAITING PERIOD TO RETAKE EXAM.

Figure 1. Steps to become an operator.

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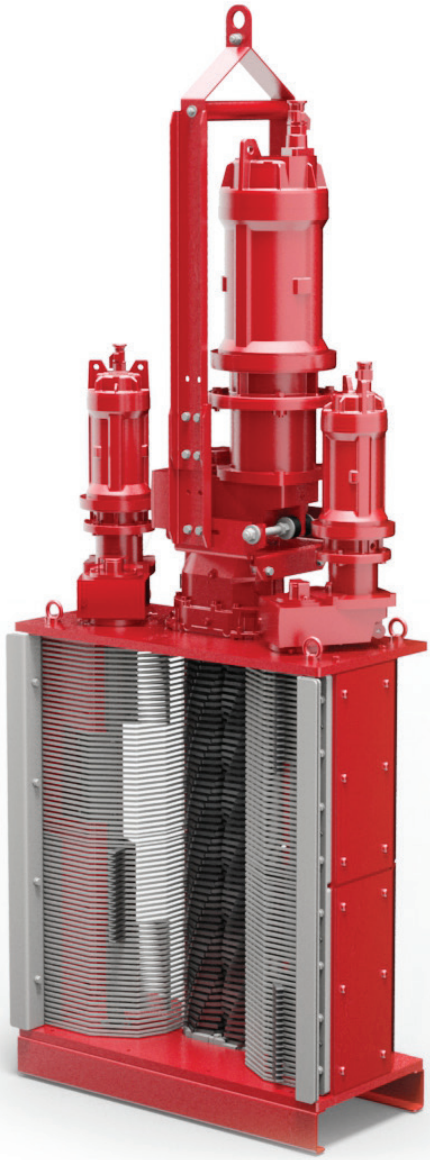

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Pre-Certification Course Training Opportunities Expanded

by Carolyn Steinhauer

To enable Wastewater Operators to complete the required pre-certification courses on a timely basis, additional educational institutions stepped into the pre-certification training ring in 2022 and early 2023.

SUNY's North Country Community College in Saranac Lake and Jamestown Community College learned of demand in their respective areas and completed the New York State Department of Environmental Conservation's (NYSDEC's) approval process to offer the Basic Operations Course.

Hudson Valley Community College in Troy, a previous provider of pre-certification training, received Basic Operations approval as well.

Recently Buffalo State College and a previous training provider have received approval to offer basic operations, basic laboratory and activated sludge courses this Spring.

Currently, New York state operators have eight training provider options from which to choose for their pre-certification courses. Seven of the eight providers offer courses in person, with the eighth offering their training virtually ***(Table 1)***.

See the NYWEA website at *https://www.nywea.org/SitePages/Operator-Certification/Certification/precert.aspx* for current course offerings scheduled by these providers. Contact information and registration links are available for each offering. Bookmark this page as courses are added regularly!

Carolyn Steinhauer is NYWEA's operator certification program administrator and may be reached at carolyn@nywea.org.

Table 1. List of Current Pre-certification Training Providers (alphabetical order).

Training Providers	New York	Location	In-Person	Virtual
SUNY Institutions				
SUNY Adirondack Continuing Education	Adirondack Community College	Queensbury	✔	
Buffalo State The State University of New York	Buffalo State College	Buffalo	✔	
Hudson Valley Community College	Hudson Valley Community College	Troy	✔	
JCC Jamestown Community College SUNY Workforce Development	Jamestown Community College	Olean, Dunkirk and Niagara Falls	✔	
Environmental Training Center at SUNY Morrisville	Morrisville Environmental Training Center	Morrisville	✔	
NC North Country Community College	North Country Community College	Saranac Lake	✔	
SUNY Ulster	Ulster County Community College	Stone Ridge		✔
Non-SUNY Institutions				
NYWEA Leading the Way in Water Quality Management	NYWEA at Cedar Creek Water Pollution Control Plant	Wantagh	✔	

Join the Movement!
Streamlining the Civil Service Process for Certified Operators

by Tim Murphy

If you are like many operators in the industry, your facility experienced, is experiencing, or will be experiencing a lack of qualified operators. You may have experienced the "silver tsunami" of many employees reaching the age of retirement all at once. If so, you might want to "join the movement," to implement some significant changes that will help our industry fill operator positions more efficiently.

In addition to retirements over the past several years, many conditions have led to a tremendous loss of certified operators in our industry, including a lack of ability to recruit and maintain certified operators for what are considered coveted jobs. We need to figure out how to draw people to fill these vacancies. Most of these positions are government jobs on a municipal level because we are a service industry that must provide communities one of the basic, essential qualities of life: clean water.

The Clean Water Act requires communities to manage wastewater treatment. Every household must either have a septic system or, where available, must connect to a collection system that conveys its discharge to a wastewater treatment plant. In most cases, treatment plants are also able to treat commercial and industrial wastewater to the levels necessary for the plants to meet their State Pollution Discharge Elimination System (or SPDES) permits without the need for pretreatment. Since the 1970s, nothing has been more effective in restoring water bodies across the country than wastewater treatment facilities. A great deal of knowledge is necessary to operate a treatment plant.

Not only are we fortunate to have these treatment plants, but the equipment manufacturers have developed products that make these plants more efficient. In publications such as *Clear Waters,* you will see these equipment providers advertising new innovations, which in many cases require a greater depth of knowledge to operate and maintain. It's not a matter of simply turning pumps on and off anymore.

The Problems We Face

We can categorize our challenges to filling operator vacancies into three areas:

- Recruitment and retention in the face of budgetary constraints
- Cumbersome Civil Service exam process
- Difficult and lengthy certification process

Recruitment and Retention

For years we recruited and filled positions by touting to candidates the generous benefits afforded employees. Overtime is almost always available. Upon retirement many employees receive a state pension and health care benefits for life, not just for the employee but also for their spouses.

However, these benefits have become a burden on the state and communities to maintain in the long run. While benefits are still very good, changes that reduced benefits have worked against us as we try to attract new candidates, causing many communities to rethink these changes.

We find ourselves struggling to get people interested in the wastewater industry. We see employees gain a little experience and then move on to the private sector that may offer a better salary, better opportunities and faster promotions. Qualified operators are in such high demand that it also causes facilities to poach operators from other facilities to see if they want to "jump ship."

Civil Service Exam Process

For a number of years our industry talked about succession planning. NYWEA went as far as to form a Succession Planning Task Force to research and develop solutions and submit a white paper for members back in 2002. Facilities across New York implemented many of the ideas suggested in the paper, yet we're still dealing with the same problem – lack of qualified operators entering the field.

When filling vacancies resulting from retirements or promotions, most facilities struggle with the constraints found in government such as:

- creating budgets to establish training positions in order to prepare employees to fill vacancies
- creating job titles for each training position
- getting approval to fill vacant positions provisionally
- calling for Civil Service exams
- holding the Civil Service exams
- getting results of the exams
- interviewing eligible candidates from the Civil Service list
- appointing employees to the position

Then the process of filling the position vacated by the promoted employee starts the whole process over again. For large facilities, this process could occur three or four times for one retirement. Personally, I have seen it take well over a year to complete this process when a chief operator retires. Ouch. Sound familiar? You are not alone!

Depending on the community you serve, even if you have a certified operator available to fill a vacancy, as a government-run facility that operator must pass a Civil Service exam before they can be permanently appointed to that position. What happens when we appoint someone provisionally to a position and call for a Civil Service exam for that position? We all know it can take months – if not years if the exam was recently given – for the exam to be scheduled. Think about how many exams New York State Civil Service (NYSCS) and our local Civil Service agencies have to manage each year and you will understand why it can take so long.

Lengthy Certification Process

The New York State Department of Environmental Conservation (NYSDEC) requires all treatment facilities to be operated by a certified operator with the certification relative to the size of the facility. This means the largest facilities must have a 4A operator at the helm; not as common but allowed, a higher-level operator can operate a lower-level plant.

The certification for operators is a very rigorous and time-consuming process. Certification requires an operator to complete a number of courses (up to five for a 4A) at an approved college that has submitted its course program to NYSDEC for approval. Not only must operators complete the courses, but they must also have an equal or higher level "certified operator" sign off that the "candidate" operator has the experience in the various elements

of the operation specific to the certification level they're working to achieve. This takes years to accomplish.

After course completion and demonstrated experience, the candidate operators must take an examination to demonstrate their knowledge of the industry. All operators will tell you how hard it is and how proud they are to finally achieve certification. It doesn't stop there. While quite the achievement to get certified, every five years each operator must have a number of continuing education credits (up to 80 for a 4A) to renew their certification. This helps keep operators up to date on the evolution of our industry.

This is an excellent program and provides our industry with knowledgeable, qualified operators that have put in the time and carry a desire to do these jobs, but it adds to the difficulty of finding these people.

If this doesn't seem complicated enough, let me throw one more element into the problem: union requirements. Can we train employees for advancement without it appearing that we're asking them to work out of title? If we elevate an employee from a position that does not require operator certification to a certified operator position using the Civil Service exam process, do we have time to get them certified before we have to permanently appoint them, or will we have to move them back to the position they held prior in the event they don't become certified within the time frame Civil Service requires?

As stated previously, the certification process can be challenging. In many cases operators will need to take the exam more than once to pass and must wait up to three months before they are eligible to take it again.

Potential Solutions

Now that we have defined many of the problems we face, and I probably missed a few, ask yourself what can we do to streamline the process? As individual facilities we have all recognized these problems but didn't have a pathway to address them on a state level. Our Civil Service agencies have always been there, helping us by decentralizing exams where possible to issue exams more frequently, but again with so many vacancies it does not seem to be enough.

Working Together: NYWEA and NYSCS

Fortunately, organizations like NYWEA represent the wastewater treatment industry here in New York and enable us to reach out to many facilities and quickly get feedback on ways facilities are handling these issues. Can we consolidate the number of job descriptions that require exams? Can we minimize the number of

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Representatives from NYSCS, Albany County Civil Service, ACWPD and NYWEA meet to discuss the operator certification program and the physical process that takes place at water resource utilities across the state. *ACWPD*

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exams that need to be given? Can consolidation of titles reduce the number of exams and allow an increase in the number of times exams could be given each year to keep the eligibility list more robust and up to date?

In 2017, the Albany County Water Purification District (ACWPD), reached out to NYSCS, and also invited NYWEA to join a round table to explain these problems to see if there was something that could be done to assist wastewater treatment facilities in filling these gaps and make it easier for certified operators to advance to higher levels. NYSCS was so interested in helping us all that an impressive number of them took the time to tour a facility to better understand the problem and the operation of a wastewater treatment plant.

NYSCS works very closely with local Civil Service agencies across the state. They provided us with some great insight into how the Civil Service system works and differences on the local level throughout New York state. They help provide local Civil Service agencies ways to navigate through the many issues described previously.

NYSCS suggested NYWEA establish a Task Force to gather data to find out what changes can be made to help wastewater treatment facilities advance and fill these positions. Ideas such as using "Trainee" positions will help uncertified operators advance in the ranks while allowing them the time to work on getting certified.

Training Experience Exam

Most importantly, NYSCS suggested establishing a Training and Experience (T&E) exam to eliminate the need for a certified operator to have to take a multiple choice Civil Service exam, since a certified operator has already demonstrated they have the training, knowledge and experience to meet the requirements for the job.

Certified operators will be able to apply for the T&E exam through their local Civil Service agencies providing a streamlined approach for employees. The specific details of the T&E will be defined by NYSCS when implemented, but basically it will allow for certified operators to be ranked based upon training and experience already acquired. Facilities will be able to fill positions faster and certified operators won't be waiting in provisional positions to take yet another exam in order to be made permanent. This is a great incentive for operators to become certified.

The NYWEA Task Force began working on the process to determine if implementation of these suggestions would work for wastewater treatment facilities.

Input from Subject Matter Experts

An additional problem experienced at the ACWPD was that the entry level exam was not providing the district with candidates who were able to advance through the operator ranks as positions opened up. It was discovered that while becoming a certified operator had become more technically challenging throughout the years, the entry level exam was not modified to keep up with the knowledge set needed to provide candidates with the ability to advance through the operator job levels.

To address this, NYSCS requested the NYWEA Task Force provide "subject matter experts" to sit with examiners to review exam questions and make changes to help resolve this condition. NYWEA provided subject matter experts to review the entry level position exam and changes were made. These changes and increases in recruitment in Albany demonstrated an immediate increase in the number of eligible candidates on the Civil Service list for the entry level position. These candidates have been able to advance through higher level operator positions after gaining some experience.

NYSCS has suggested that NYWEA provide subject matter experts that could review other exams to provide updates where necessary, which will help us ensure we keep exams relevant to industry changes and to continue to employ qualified people.

Here's Where You Can Help!

In November, NYWEA sent out a survey to develop information on the organizational structure and job titles used at wastewater treatment facilities in New York state. The information gathered from this survey will help determine if facilities can consolidate job titles and/or whether opportunities exist to limit the number of exams Civil Service will need to give. Additionally, it allows facilities to comment on the job duty and knowledge sections of the various job descriptions to ensure examiners are preparing the best possible exams relevant to the jobs for which applicants are applying.

We ask that if you receive a survey, please complete it. This will also allow you to comment on areas you feel the Task Force missed and/or should include. If you didn't receive a survey via email, you can request one, by reaching out to Carolyn Steinhauer at *carolyn@nywea.org*.

This is an opportunity to participate in a very important project that will benefit our agencies and employees. It provides an incentive to operators to become certified. For years we discussed the problems stated here but lacked the pathway forward. Thanks to NYSCS and our local Civil Service agencies, we have the opportunity to make things a lot easier.

So, join the movement! Have your voice heard, have your input make a difference. Let's try to consolidate job titles so certified operators can apply for more positions across the state with the same job duties but slightly different titles. Let's help certified operators receive permanent status faster without having to risk being in a provisional appointment possibly for years waiting to take another exam on subject matter they have already demonstrated their ability to perform through the stringent certification process.

Our Water Heroes

Just when you thought things couldn't get any worse, COVID-19 hit us all. Let's give a resounding "THANK YOU" to all our essential workers! Wastewater treatment operators are the silent heroes in our communities. We always like to say, "If you never hear about wastewater treatment plants in our communities, it means they're doing their jobs." Thank you also to all the supporting industries that kept our plants running as the pandemic hit the supply chains as well.

During the pandemic nobody talked about the fact that they had to show up each day to perform an important service to our communities that without treatment would have caused an environmental and health care disaster. Day in and day out we saw our employees show up to work as a sense of duty to their communities. We need to make it easier for our certified operators to advance in their careers, where eligible.

Tim Murphy is the retired executive director and presently working part time as a project developer with the Albany County Water Purification District. He may be reached at tim.murphy@albanycountyny.gov.

Three! Two! One! BEARS!
Benefits of Competing in the Operations Challenge

by Angel French

The Operations Challenge has brought more positive aspects to our small community in upstate New York than I could have ever imagined. We started our team, the Watertown Water Bears, after attending NYWEA's spring conference in 2019 at Saratoga Springs, New York. Watching the speed and accuracy of these "professional" teams sparked a fire inside me that continues to burn. Not only was the competition exciting to watch, but one thing really stood out for me. As I watched a new team compete, struggling with the equipment and not understand everything they needed to do, a more senior team started coaching them during the competition. The senior team was directing them on their next move during the event even though they were competing. Their teamwork propelled me to want to get our facility involved in this amazing event.

Team members of the Water Bears have expanded their knowledge base, experiences and overall have become more well-rounded water resource recovery operators since our involvement with the Operations Challenge. Our municipality has gained experience, network connections, new equipment, media exposure, and recognition from our elected officials for the work we are doing at our treatment plant. Other communities have been able to increase their knowledge of water resources because of the media coverage stimulating them to reach out to us to take tours of our facility and ask questions to improve operating procedures at their facilities.

How It Started

Our team was made up of junior operators, me and a coach. Not including the coach or myself, the remaining three team members – Jay Slate, J-R Lacey and Seth Foster – combined had less than five years in water resource recovery.

We started preparing for NYWEA's 2020 spring competition after attending NYWEA's 2019 spring conference. I reached out to the network of people that I met who could assist me in preparing my team qualifications so they could compete.

The Operations Challenge consists of five events:

- Process Control
- Laboratory
- Collections
- Safety
- Maintenance

All these events have specific equipment and rules listed on the Operations Challenge resource page *(https://www.rmwea.org/oc.php)*. We only had a few of the items on the equipment list, but what we did have was the drive to improvise and overcome the hurdles.

A benefit of starting our team in Operations Challenge was learning training skills and test-taking abilities. Our operators are considerably new to water resource recovery operations and want to attain higher certification, so this was a huge impact for us. Training and test-taking skills help the operators who want to learn more.

After reviewing all the events I was convinced we could start with the Process Control event. The Process Control event is a written test and a computer simulator of a water resource recovery facility. Team members must manipulate the computer simulation to make the facility comply within the given limits of a specific scenario. In comparison, the written test is harder than the highest achievable (4A) certification test in New York without being able to use the ABC Formula Sheet (an eight-page formula and conversion table filled with water resource recovery and laboratory formulas necessary to calculate most required equations in our industry). Our participating team members consisted of two 2A certified operators, one 4A certified operator, and a member who had less than eight months at our facility as a trainee. We worked through the test questions utilizing the answer key because these are in-depth, scenario-based, multistep math questions.

Shortly after we started practicing for the Process Control event, the trainee team member enrolled in a Basic Operations precertification course. I asked him how the course went. He responded that it was good, "but, Angel, the math you were teaching me was like sending a wastewater facility rocket into outer space compared to the math in that course."

Pulling It Together

An advantage of participating in the Operations Challenge was learning about new equipment, which has been a huge benefit to our treatment facility. All the events have specific equipment to be used. We researched the equipment to see what our facility has that is comparable to what they used in the events and to figure out if we could budget to improve the efficiency of our facility. For example, based on the requirements for the Laboratory event, we replaced our old method to analyze total suspended solids with the funnel utilized in the Operations Challenge, which has saved us three to four man-hours a week.

The ultimate benefit we attained from having a team in the Operations Challenge is the teamwork that comes along with competing. The teamwork we have witnessed is a two-part package. Not only do we as competitors have teamwork within the society of the Operations Challenge community, but we have also improved teamwork within our facility. Operators at the City of Watertown Pollution Control Facility joined together to build needed practice/training areas. Work shifts were adjusted to accommodate the team traveling out of town to compete. If not for the teamwork and support from our co-workers, there would not have been a Water Bears team.

Lab funnel utilized in Laboratory event saves many man-hours a week.

Angel French

As the team came together, the operators built a platform for the Safety event and tables for the Collections event. Not only did the Water Bears now have a place to practice, but the crew gained a lot from this experience. Like most other treatment facilities, the operators have diverse backgrounds. We were able to combine staff that had carpentry aptitudes with those who haven't had much experience with building. The

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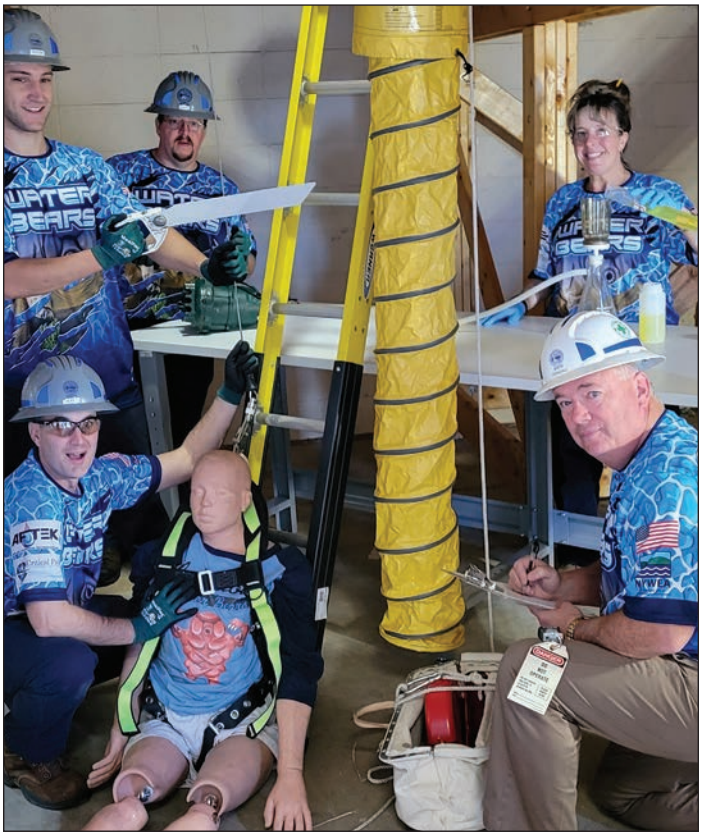
Safety Event platform being utilized as confined space training for the City of Watertown Water Department. *Angel French*



Water Bears trying to figure out all the events at once (l-r, Seth Foster, Jay Slate, J-R Lacey, Mark Crandall, Angel French). *Josh Satchwell*

teamwork helped enhance everyone's skills. We now use the safety platform for confined space and fall protection training for our crew and other departments within the city are using it for training as well.

Ready to Compete!

Our first-in-person event took place in New Rochelle, New York, at the NYWEA spring conference. However, the conference was virtual in 2021 so the event consisted of just Operations Challenge personnel (no vendors or spectators). Most of the equipment utilized at the competition we had never touched before. The other

NYWEA Spring Conference 2021 Operations Challenge teams. *Donna Grudier*

Water Bears at WEFTEC 2021 (L-r, Seth Foster, Jay Slate, Mark Crandall, Angel French, J-R Lacey). *unknown participant at WEFTEC*

Water Bears receiving first place in Division 3 for the Laboratory Event at WEFTEC 2021. *Tanya Jennings*

teams taught us some of their tricks of the trade, allowing us to gain a lot of information and new techniques in a short amount of time.

When we competed in WEFTEC 2021 in Chicago the other NYWEA teams supported us, as we did them. Teams we never met before October 2021 supported each other, by helping, guiding and giving their lessons learned for each event.

Raising Community Awareness

An old axiom – at least at the two treatment facilities where I have been employed – states that if nobody is talking about the treatment plant, then we must be doing our job. It seems the opposite is true. The more people who know about our process, the more that knowledge increases their interest. This allows us to communicate to them more effectively the needs of our facility because they have a greater understanding of the work we do.

The media exposure has been extremely important for us to get the public sector more interested in what we do as operators. The Watertown city council recognized our team for their performance at WEFTEC 2021 and they agreed to come and watch us practice on our facility. Every member of city council, the mayor and the city manager attended; the press was also invited. Our local news station WWNY TV 7, highlighted a portion of every event of the Operations Challenge during the demonstration for the city council. Syracuse Spectrum News 1 put together a clip, not only highlighting the success of our Water Bears team but focusing on the importance of our profession and how dangerous some of the environments are that we work in daily. In addition, the local newspaper, *Watertown Daily Times,* published an article of the demonstration we performed for the city council.

What Have We Learned?

During our team travels, we have been afforded the opportunity to tour other water resource recovery facilities and meet new people who share our passion in the water industry. Each treatment facility is unique and each one we toured had something to amaze us in our travels. Although every treatment plant is different, we also face the same difficulties every day. All facilities have confined spaces, sewer gases, pumps, safety precautions, the community surrounding them, etc. Increasing our network within our professional field allowed us to share ideas and new ways to attempt to tackle the same problems.

I discovered most of the employees at a water resource recovery facility share one common trait, ingenuity. It is predominant among the Operations Challenge teams. For example, we did not have any of the equipment for the Maintenance event when we started. We did have a 55-gallon drum (substitution for the wet well), some PVC pipe with floor drain plugs (replacement for guide rail and bushings), and an old submersible pump. We learned the rules and went through the motions. This mimics a daily occurrence in operations and maintenance. Most equipment at a water resource recovery facility is old and parts are hard to find so you improvise. Seeing what other facilities have done allows us to bring resourcefulness back to our facility.

Why "Water Bears"?

A Water Bear, also known as a tardigrade, is a microscopic invertebrate of the phylum Tardigrada with four pairs of stout legs that typically live in water or damp moss. The tardigrade is one of the most resilient creatures on earth, hence the namesake of our Operations Challenge team. The Watertown Water Bears start with the Operations Challenge was a little rough because we are from a smaller community than most other teams and we created a team during a pandemic. The supply chains had slowed, so we did not get a lot of equipment until after we competed at WEFTEC in Chicago. So, we figured out how to utilize the resources we had. We utilized everything we had learned since being part of the Operations Challenge community. The City of Watertown's investment into their operators by supporting the Water Bears has rewarded them with some truly dedicated treatment plant operators who are excited to come to work because they know they make a difference in the way people perceive water resource recovery.

The Operations Challenge is more than just old and new friends getting together a couple of times a year to show off their skills, it's a family! We mentor, learn, assist, and challenge each other to be the best water resource recovery operators we can be.

Angel French is a Grade 4A chief operator with the City of Watertown Pollution Control Facility in Watertown, New York, who may be reached at afrench@watertown-ny.gov.

Operations Challenge: A WEFTEC Reflection

by Carolyn Steinhauer

Flying down to New Orleans for WEFTEC in October 2022, I had no idea what to expect. I had helped behind the scenes for my first-ever NYWEA Operations Challenge at the June Spring Conference in Syracuse and was bitten by the Ops Challenge bug. I found it to be an amazing professional development event through which operators can sharpen their skills, build camaraderie and network with other operator professionals. I headed down to New Orleans to experience the national competition in person. It was a big year to do just that: for the first time, five NYWEA teams qualified for WEFTEC. I found out just how unusual this was when I proclaimed this fact at my first member association staff meeting to kick off the conference. Other member association staff oohed and aahed (except Texas, which declared that they too had five teams). Texas always has the most teams, someone tells me. Not this year, I think!

Everyone told me that there was nothing like the national competition. They were absolutely right. It was more than impressive. A huge section of the mammoth Convention Center was dedicated to multiple equipment setups for each event: Safety, Collections, Maintenance and Laboratory, and team tables as far as the eye can see for the Process Control exam. As event judges prepared and the trophy display beckoned, the air was filled with the hunger of 45 teams determined to distinguish themselves.

In this pressure cooker of competition, NYWEA teams stepped up and performed well. But the thing that struck me most was just how supportive our teams were of each other. When not at their own events, I saw NYWEA teams rallying around other NYWEA teams shouting words of encouragement and affirmation. Some teams would literally have to run off to make it to their next event in time, but they thought it important to offer a friendly face for their NYWEA Challenge colleagues amid the throes of a challenging event. I have to say I did not see this from other member association teams, although it may have taken place and I just did not witness it. This type of support goes on behind the scenes as well. For example, the Watertown Water Bears, in only their second year of competition, shared their Maintenance event equipment with NYWEA's newest team, the Onondaga County Mixed Liquors, who did not have this equipment to practice on. Also, at this past fall's Watershed Conference, the Bowery Bay Coyotes met with interested operators who were looking to re-start a Lower Hudson Valley team. The Coyotes answered questions about their Operations Challenge experience and demonstrated a Collections event. The interested operators have since jumped onboard and have formed a team for the 2023 Joint Spring Meeting with NEWEA.

As I had stated, NYWEA performed well in New Orleans. Long Island Brown Tide captured third place in the Division 1 Laboratory event; the Watertown Water Bears earned second place in the Division 2 Process Control event; and the Onondaga County Mixed Liquors won first place in the Division 3 Safety and Pump Maintenance events, second place in the Laboratory event and first place overall in Division 3. All our teams made us proud, and I look forward to supporting our teams in whatever way I can for future Operator Challenge competitions.

Carolyn Steinhauer is NYWEA's Operator Certification Program administrator and may be reached at carolyn@nywea.org.

Operations Challenge team members at WEFTEC 2022 with NYWEA President Kristopher Dodson and Onondaga County Commissioner of Water Environment Protection Shannon Harty. *Carolyn Steinhauer*

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Operator Innovation: Balancing Odor Control and Flow

by Ken Skibinski

The Herkimer County Sewer District wastewater treatment plant (WWTP) is a plant that I started up when it was new in October 1981. The plant is a 6.1-million-gallon-per-day design activated sludge plant that uses mechanical aeration. The plant has two primary settling tanks, two aeration tanks, two final settling tanks and two chlorine contact tanks.

In my time as a Grade 4A operator with the Herkimer County WWTP, my staff and I solved many challenging problems. I remember one problem that we were able to solve with creative teamwork.

Overhead view of the Herkimer County Sewer District WWTP with primary settling tanks (left), aeration tanks (center) and final settling tanks (right). *Robert Critser*

Birdseye view of the Herkimer County Sewer District WWTP showing the pump station (upper right), the District Office (lower right) and a storage barn (center left). Chlorine contact tanks are barely visible in the upper right corner adjacent to the pump station. *Robert Critser*

What Was the Problem?

While the plant had been in operation for several years and was easily meeting State Pollutant Discharge Elimination System (SPDES) permit limits, the effluent trough after the aeration tanks ***(Figure 1)*** was producing odors. The odors were not terrible, nor traveling off-site, but we wanted to remove them as best we could anyhow.

Only one aeration tank was used at a time, as the plant influent five-day biochemical oxygen demand (BOD5), total suspended solids (TSS) and flow were all below design parameters. The mixed liquor suspended solids (MLSS) flowed over the outlet weir into the effluent trough. The trough level was controlled by the final settling tanks V-notch weir elevation in the final settling tanks with valves at each end of the trough, which were deep valves using long shaft operators. This was the cause of the floating solids as there was no way for the solids to escape as the valves were submerged about 12 to 14 feet down (***Figure 2)***.

Our first attempts to remove the floating solids involved pulling up some of the gratings and hosing the solids down. This effort proved unsuccessful time and again. There was no way for the agitated solids to escape the trough due to the depth of the valves at each end.

This led to some discussions of theories. My theory was that if a weir were created in the trough at each end, the floating solids could then be removed to the final settling tank where the skimmer could deal with them. So, we devised a plan.

Plan A: Install the Effluent Trough Weirs

The effluent trough had a center stop plate with a wheeled operator on it ***(Figure 1)***. We closed the center plate, shutting off flow to one of the final settling tanks temporarily and used a submersible pump to lower the liquid level. We hosed clean the area we intended to work and got to it!

We installed two pieces of angle iron on each side to create a space to hold pressure-treated lumber ***(Figure 2)***. We designed it to be higher than the "normal" observed trough level. After most of the boards were installed, we opened the center stop plate and allowed flow to return to normal.

The next step was more complicated as we could not work on the other end of the trough with flow coming over the aeration tank weir! So, we began the long, multiday process of switching

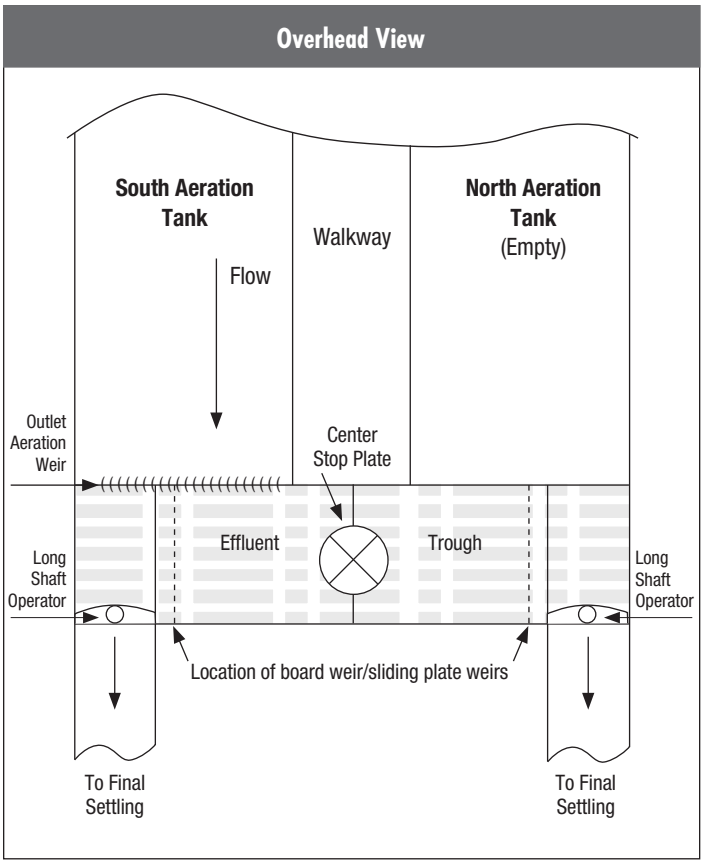

Figure 1. Overhead view of the aeration tanks, the effluent trough, and the locations of the weirs. Not to scale. *Ken Skibinski*

over aeration tanks. The plant policy had been to operate one side for two years, then switch sides. There was no fast way to accomplish this. We would first fill the empty aeration tank with primary effluent. When the tank was full, we would change the return sludge solids flow into the new tank and start the three mechanical aerators. Most of the primary effluent flow would be sent to the new tank using a large butterfly valve with a small portion going into the old tank. Using the existing valves did not allow for precise settings, but the option was there for us to accomplish what we needed to do. This process diluted the solids level in the old aeration tank to below the 1,600 milligrams per liter (mg/L) it had previously been. Over a few days, the old tank became paler, and the new tank easily picked up the slack for proper treatment. Then we would shut off the primary effluent flow to the old tank, shut down the aerators and begin the process of draining and cleaning the tank.

The center stop plate could then be closed once again and the trough pumped out and cleaned. We then installed the angle iron and pressure treated boards. This time, we added a board to make the trough depth a couple or inches higher than "normal" trough elevation. When we completed this side, we added the same height board to the other end of the trough, easily done as the angle iron track was higher than the water level.

Immediately, we saw success! The floating solids now had a "weir" to flow over. The turbulence created by going over the weir served to mix the MLSS enough to move the floating solids to the final settling tanks where the skimmer could deal with them. We were happy, problem solved.

Or so we thought!

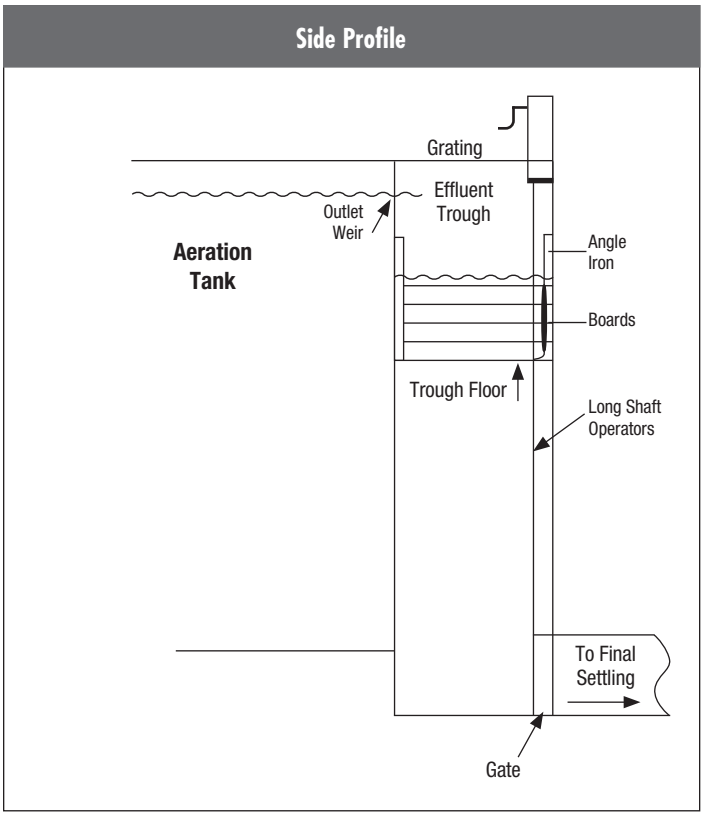

Figure 2. Side profile view of the aeration tanks, the effluent trough, and the locations of the weirs. Not to scale. *Ken Skibinski*

A New Problem?

A complication arose in that the aeration tank weir was long enough that a portion of the MLSS flow fell directly into the trough AFTER our weir. This was creating a flow imbalance. If the South aeration tank was operated, the South final settling tank was receiving more flow, visually, as evidenced by the flow through the final settling tank V-notch weirs. So, it was back to the drawing board.

Plan B: Adjust the Effluent Trough Weirs

We determined that the solution would be to adjust the newly constructed board weirs to uneven heights or elevations. So, a higher top board was added to the aeration tank side that was in service and a lower board was added to the offline side. Our efforts were aided by one of the operators who had surveying experience. We borrowed the surveying equipment from the Herkimer County Highway Department and used this equipment throughout the project.

Once again – SUCCESS!! Odors from the floating solids were eliminated as there no longer were floating solids and the flows to the final settling tanks were balanced. The plant was operated in this fashion for many years with great success.

Upgrading the Trough Weirs to Stop-Plate Gates

Over time, though, and having attended NYWEA annual and spring meetings and a WEFTEC or two, I became aware of stop-plate type gates that had a fixed bottom section and a moveable top portion, adjustable with a removable "T" handled operator on top.

During the next annual budget cycle, I gathered information and costs about these stop-plate gates. The project to upgrade the weirs to these stop-plate gates was submitted to the Sewer District Board during the budget approval process and got approved. The new stop-plate gates were ordered.

During the following summer, plant staff went through the same process as with the initial weir installation, where the board apparatuses were removed and the new gate installed on the offline aeration tank side first, then the aeration tanks were switched over, and then finally the second gate was installed.

Once again, we had to relearn how to set these gates to achieve a balanced flow to the final settling tanks. This time, it was more easily accomplished by recording valve turns instead of removing and adding boards.

Recognizing the Team

This project was done completely "in-house" by a competent staff, each of whom added something to the effort. It's easy to dream projects up, but sometimes not so easy to actually do them! My thanks to the staff I worked with who always got the job done and right. I heard it said many years ago by a supervisor that "a supervisor is only as good as his employees make him look." I still remember those words and again thank my staff for making me look good!

Ken Skibinski is a Grade 4A operator who retired after more than 43 years. Ken was the 2004 NYWEA president and continues to maintain his certification #6933. In his retirement, Ken provides industrial pretreatment consulting and operator of record services at several facilities. He may be reached at kskibinski@aol.com.

My Road to Becoming a Water Resource Recovery Operator

by David Hinds

I am a lifelong resident of the Village of Cleveland on the north shore of Oneida Lake in the Town of Constantia in Central New York. With an area of about 1 square mile and about 730 residents, it fits the definition of "a quaint small village."

Cleveland has had municipal water since 1897, and a municipal sewer system since 1992. Both are operated by the Department of Public Works (DPW) who also take care of the streets, the parks and the village cemetery.

The village has four full-time employees (a DPW supervisor, two DPW laborers and a village clerk), and a part-time employee who helps with water and sewer billing. We have a forward-thinking mayor who is supportive and understands the village's water and sewer systems are a large capital investment that requires continual maintenance.

How I Joined the DPW

For 20 years I worked at a casino 25 miles from home as their lead surveillance inspector. My job was to protect my employer's assets by ensuring employees were following regulations, policies and procedures and to ensure our guests were following our rules. We worked closely with department heads and outside agencies including local, state and federal police agencies.

After 20 years I was burned out and needed a change. One of my best friends, Shaun House, who was working for the village, told me about an opening at the DPW and encouraged me to apply.

My wife and I discussed the pros and cons and the fairly large pay cut but decided that it was the right move. Lower paychecks were offset by the chance to have weekends and holidays off (barring a sewer or water emergency) and having a one-minute commute to work, as opposed to a 30-plus minute commute to the casino.

On June 21, 2021, I was hired as a laborer for the Village of Cleveland DPW. Shaun, my friend who helped me land the job, was now my boss. That relationship dynamic was not necessarily new though, because Shaun was the fire chief at the Cleveland Volunteer Fire Department where I was an assistant chief.

My Work at the DPW

The month I started was at the beginning of the construction phase of a water system upgrade, which included some new mains and replacing our aging water tower with a ground tank. We were also in the early engineering phase of a sewer plant upgrade. The sewer plant upgrade is part of the Town of Constantia's sewer project, where they are putting in a pressure sewer system, including two pump stations to transport sewage to the Cleveland plant for treatment. The town sewer district will serve the residents of the town that live along the lake and spans about 8 miles. Our current wastewater plant averages 30,000 gallons a day, and the new plant's average flows are expected to be 180,000 gallons when the town comes online.

My first summer working at the DPW was busy. We had our day-to-day tasks, like mowing lawns, paving roads and working at the wastewater treatment plant. We also had to locate utilities for the contractors as they replaced water mains. I got to see the contractors tie into and tap mains, install curb stops and anything else a water main replacement involves. It was a great education.

In the fall, our DPW supervisor left for a job with the county. Shaun was promoted to supervisor, and I was his lone employee. Shaun started working for the DPW a year before me but worked for the town and county highway departments previously. Shaun had just completed his 2A wastewater class at Morrisville and had

Digging up the stairs to the old school while looking for a water leak in the village park. *David Hinds*

Cleveland DPW Supervisor Shaun House locating a fire hydrant in the woods. *David Hinds*

already earned his C and D water certification. Since Shaun didn't have his wastewater certification yet the village hired the Camden Group to help operate our plant. We learned a lot from them and still have them on retainer as consultants for the new sewer plant.

Shaun and I had a mountain of work ahead of us, but we had fun getting it done. One day in October, while digging in the park to determine why a sink hole was forming, we dug up the front steps to an old schoolhouse that sat nearby; it had been decommissioned and burned down in the 1960s. There were three steps made of cement and stone, measuring about 16 feet long. Along with dirt, they had been used to cover an old clay drain that was still flowing water. We removed the steps and tied the old drain into a nearby drain.

On another October day, while following up on a possible water leak outside the village with the New York Rural Water Association staff, we found an original 1890s fire hydrant. It was located in the woods, about 100 feet off the road, and was still live and leaking underground. There weren't any valves to shut the 4-inch sub-main off that fed the hydrant. We later hired a contractor who helped to dig it up and cap it off, stopping the leak. No day is ever the same, and that makes this job all the more interesting!

That winter was spent snow plowing and dealing with issues at the plant. One subzero night our equalization tank floats malfunctioned, causing it to fill up and pour over into our aeration tank. This led to a clarifier drive bearing failure, causing the chain driving the clarifier arm to jump off, which led to the clarifier partially freezing. At around 3:00 a.m., while still dealing with the aftermath of the clarifier freezing, the return spring adjuster on the plow wing broke. As we didn't have the replacement parts on hand, we did what we could until Home Depot opened, then bought the parts to cob it back together and continued plowing.

DIY rag collection project (inset) in the headworks. *David Hinds*

Left to right, Cleveland DPW Supervisor/Operator Shaun House, Cleveland DPW operator David Hinds, laborer Tyler Rice, and Camden Group's Tom Bullard. *Tom Bullard*

On another winter night our plow wing cable snapped during a snowstorm. We had the replacement cable to fix it, but having never done it before, it proved to be particularly challenging. Again, no day is ever the same. Later that winter we hired our third employee, Tyler Rice. Tyler is another village resident who is also in the fire department.

In early spring I took my Class C and D water classes in Morrisville and was later awarded my C and D certification by the county. I also went to a two-day training class at Environment One in Niskayuna, New York, to learn how to troubleshoot and repair grinder pumps. This past summer I completed my wastewater classes in Morrisville and passed my 2A ABC test a few months ago.

During my short tenure, I have learned that innovation is key to keeping things running at the plant. For example, our bar screen was not catching enough rags, so we have been experimenting with different ways to catch them to include buckets with holes drilled in them to wire baskets that hold mesh clam bags that catch the rags. So far, the bags have worked great for our plant. Once a day we throw the old bag in a bin and drape a new one in the basket.

I was raised by parents who are involved in the community and work to make a difference, I guess some of that might have rubbed off on me.

Shaun, Tyler and I are working hard every day to help keep our little village on the north shore a great place to live. Even though the three of us could be making more money elsewhere, we value working closer to home in jobs that allow us to spend more time with our young families. Lately, we have had other job offers in the water/sewer field, but we don't give them a second thought. I always tell people that I love my job and that my worse days here are better than the best days back in casino surveillance. If you are reading this and you ever find yourself in our area, please stop by. Bring some steel toe boots though, because we will probably be knee-deep in something, and will more than likely put you to work.

David Hinds is Grade 2A operator with the Village of Cleveland Department of Public Works and may be reached at drhinds23@gmail.com.

An Unexpected Career Path

by Roscoe Hill

To be honest, I never intended to pursue a career in wastewater treatment. In 2015 I found myself in the midst of an employment transition. One day while I was visiting my city's Department of Labor, I saw a posting on the wall for an upcoming Wastewater Treatment Operator I civil service exam. Looking over the posting I saw that I met the basic requirements and decided to give it a shot. In all fairness my background in education gave me an advantage when it came to test taking and allowed me to score high enough to be called in for an interview despite a lack of relevant experience. During the interview process I became intrigued with the important yet unrecognized role that the wastewater treatment process plays in the functioning of our city.

On my first day, during the tour of the facility, I admit I was a little overwhelmed. How was I going to learn how everything worked when it would take so long just to learn where everything was? The days marched on, and I was shuffled between different stations as needed. Soon my placement became more stable as I was stationed with an experienced operator three days per week. One day another new hire was questioning the operator we were sent to assist about why he was making a certain adjustment. He responded with some advice that would have more impact on my future than any other that I had or have been given. "Before you learn how to be a 'II,' learn how to be a 'I'" It wasn't directed toward me, but it did resonate with me. From that day forward instead of trying to absorb and learn everything, I began focusing and becoming more efficient at my specific job duties. As time passed, I became more proficient at my assigned task. This then freed up time for me to observe, understand and ask more relevant questions. Over the few months the operator began to trust me with more responsibility. I focused on those tasks, and everything was beginning to come together.

Around my ninth month, due to certain circumstances, I found myself working a station alone during a heavy rainstorm event. It was officially sink or swim time. Applying what I learned and observed, I was able to swim. That gave me the confidence to know that I could do this job. Now it had become time to drill down on specifics and learn the ins and outs of the process, the equipment and the facility. This is still an ongoing process.

Within the next year I was promoted to a provisional II. Before I even realized, this was shifting into a career and not just a job. Over the next few years, I became more comfortable with the different aspects of operations, by learning from those with more experience and adapting to the unexpected challenges that arise rather frequently. A few years passed and the exam to become a permanent Wastewater Treatment Operator II was given. After passing that exam it became time to pursue my certification.

I enrolled in the Environmental Training Center at SUNY Morrisville. The instruction that was provided by Stephen Sanders and team was pivotal, not just for it being a requirement but for the knowledge and perspective they provide. While I was becoming more knowledgeable and proficient with my responsibilities at my plant, I was still isolated and did not comprehend the vastness of the wastewater treatment field until taking these courses. Upon completing my required course work, I was able to take and pass the exam for my 3A certification in July 2022.

Having my certification has given me a sense of satisfaction. While I am currently content with what I do and can see myself finishing my working career here, the knowledge that I have the ability to pursue other opportunities in the field add a level of comfort that I had not previously anticipated.

Roscoe Hill is a wastewater treatment plant operator with the Buffalo Sewer Authority and may be reached at rhill@buffalosewer.org.

Wisdom for Young Professionals

by Robert E. Adamski

With more than 50 years' experience in the engineering profession, I've been asked to bestow some wisdom on the young professionals.

First, I would suggest you learn to manage your career yourself. Unless you join the military, no one will care about you. In doing this be comfortable and happy with what you do. You'll be doing whatever you choose for a long time so make sure you enjoy it. Keep in mind how a job title is important *(Mercer 2022)*.

As much as you can, do what you want. This may be difficult until you retire and then do what you want and not what someone else wants.

Stay connected with your colleagues and be aware of your surroundings. The best way to do this is to be involved in professional organizations like NYWEA. In addition to making friendships, you will see and meet senior people who can become mentors and role models. You may also find out about other opportunities for advancement.

Stay qualified whether with a P.E. license, BCEE or other certifications. Be smart about your training choices – don't take courses or pursue certifications/credentials just for the sake of getting them. Make sure the qualifications are ones you desire and are valued by your employer. While your current position might not require a particular credential, you don't know what a future position might require.

Don't be afraid to move on by changing jobs or accepting new assignments. Again, in the military you will change assignments about every three years. I unconsciously did this and wound up having over 12 different assignments, usually each one a step up from the one before.

When you move on don't burn your bridges behind you because you'll never know when you might want to return. While you may think you won't, you never know. I wound up going back to one consulting engineer twice and returned to the New York City Department of Environmental Protection (and its predecessors) three times.

Find ways to give back. Whether in a service organization like a church or civic organization or a professional one like Engineers Without Borders, being involved both increases self-worth and expands your network.

Robert E. Adamski, P.E., F.SAME, F.ASCE, has retired from his work with the New York City Department of Environmental Protection and may be reached at gatorbob85@gmail.com.

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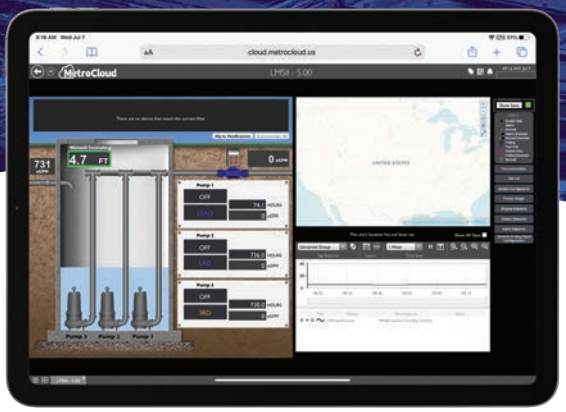

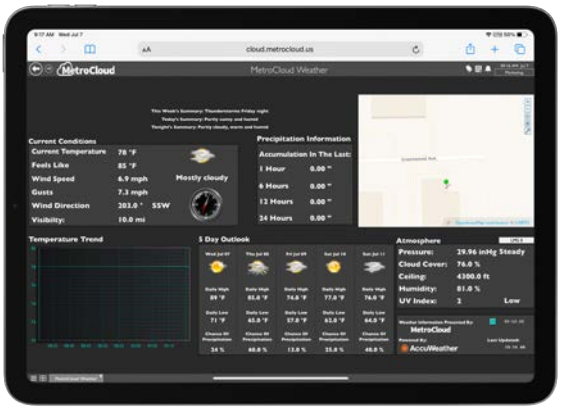

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Passing the Wastewater Torch: Jim and Mike Keyes

by Carolyn Steinhauer

Amid the declining numbers of operators nationwide arise inspirational stories of career-focused operators throughout New York state. One Western New York father and son, Jim and Mike Keyes, despite a shared wastewater experience, took different paths to get there.

Jim Keyes has 38 years of experience in the wastewater field and plans to retire soon from his position with the New York State Thruway Authority. Jim's son Mike has been working in wastewater for about three years and will become a chief operator when his father retires. Both men talk about how they came into the wastewater field and reflect on their experiences.

Father and son Jim and Mike Keyes on site at the Thruway Authority's Pembroke Service Area. *Jeremy R. Lysek*

Jim Keyes

Thirty-eight years ago, you entered the wastewater field. Why?

I was working as a machinist like my father. After several years it wasn't for me. I went to automotive school, graduated and started working for Honda. Both fields were good jobs, but something was missing. A friend of mine told me there was an opening at the city wastewater plant, I applied, got the job and never looked back. It was June 1984.

Describe your wastewater experience.

Through the years I have worked at many different plants ranging from 33 million gallons per day down to 0.00005 million gallons per day. I have a strong maintenance background encompassing all aspects of the operation and maintenance of wastewater plants. Most of my experience is activated sludge, I know and operate fixed film plants (rotating biological contactor, trickling filters).

What changes have you witnessed?

I have witnessed many different changes. In the early years most of the equipment was analog. Digital started being the new thing on the block along with automation. This is the reason I went back to school and received a diploma in electronics.

What do you like most about your career?

One of the best things about my career is all the people I met along the way. I worked in three different states, Massachusetts, Florida and New York. I still have contact with all my friends from all three states.

Any regrets?

I have absolutely no regrets.

You plan to retire from your Thruway Authority position soon. What are your post-retirement plans?

I am currently writing the curriculums for Buffalo State College to teach the basic operations course, basic laboratory course and the activated sludge course. Once approved by the New York State Department of Environmental Conservation, we hope to be up and running in early 2023.

Mike Keyes

What were your interests when you were growing up?

Growing up I loved sports. I played baseball, football, soccer, ice hockey, floor hockey and basketball.

Did you ever picture yourself working in wastewater?

No, I didn't. I have been on several field trips to plants where my father worked with school and the Boy Scouts. After high school I went to welding school and was certified. I worked for several local companies.

What changed your mind?

I loved welding but what I didn't like was after we finished a project we were laid off until the next project came. At that time, I had a two-month-old daughter and needed steady work. My father suggested I take a chance and come work with him in wastewater. I was hired and he was my trainer.

What was your biggest surprise about working in wastewater?

I was totally overwhelmed with all the different things that went on in running a wastewater treatment plant. My father told me not to worry, he would teach me all of it. And he did.

Earlier this year, you passed your Grade 2 exam. What advice do you have for other operators taking the exam?

Keep studying and read each question carefully. If I didn't keep reading, I would have never passed.

Where do you see yourself in one year? Five years? Ten?

I've been working in wastewater for three years now. When my father retires, I will become the chief operator. Over the next couple of years, I plan on taking classes in electrical, HVAC and plumbing. I plan on taking the supervisor's test and eventually moving into supervision.

What would you say to a person considering entering the wastewater field?

It is a great field to be in. Take it seriously, and don't get discouraged with all the different things you have to learn.

Carolyn Steinhauer is NYWEA's operator certification program administrator and may be reached at carolyn@nywea.org.

Update: NYSDEC approved the curricula Jim wrote for Buffalo State College, and wastewater instruction begins March 2023.

Monroe County DES Diversity Action Plan

by Clement Chung

The Monroe County Department of Environmental Services (DES) is a multidisciplinary public works department with responsibility for four distinct, yet integrated, divisions. It was created in 2003, when Facilities Management and Fleet Maintenance joined the previously amalgamated departments of Engineering, Pure Waters and Solid Waste. DES also acts as the logistics arm of Monroe County government, providing labor and expertise as needed. Overall, DES is home to over 330 staff from a range of different career backgrounds, including accountants, clerks, construction laborers, engineers, environmental chemists, janitors, mechanics and electricians, planners and, of course, water resource recovery and sewer collection operators.

Monroe County Seal.
Monroe County

Despite the range of occupations represented in our workforce, our demographic diversity has not always matched our functional diversity. Data provided by the Monroe County Department of Human Resources and Civil Service showed significant disparities in race/ethnicity and gender between DES staff and U.S. Census statistics for Monroe County ***(Figure 1)***. While there is nuance within the overall data, some of the differences were stark enough to elicit a conversation about diversity within the organization.

To address these and other related issues, the Department of Diversity, Equity and Inclusion (DDEI) was created by Monroe County Executive Adam Bello, along with the appointment of the county's first chief diversity officer, Dr. Deanna Kimbrel. Over the course of several months, Dr. Kimbrel and her team met with senior leaders across the county to lay out the mission of DDEI, get to know the nature of the work performed by each department, and what would be expected to advance an organization adhering to diversity, equity and inclusion principles.

One of the first tasks assigned by DDEI to all departments was to create an annual Diversity Action Plan (DAP) specific to their operations. DDEI provided a template for a generic plan deliberately designed for flexibility, which recognized broad differences between departments in staffing levels and available resources – some departments had fewer than 10 employees, others had over a thousand. The deadline to submit the initial DAP was February 2022.

Each department was also required to designate a DEI leader; in DES, I was assigned this responsibility. I already had an interest in this space as I had volunteered to serve on NYWEA's Diversity, Equity and Inclusion Committee, giving me access to resources to develop a rich DAP that went beyond the original expectations set by DDEI. At the 2022 NYWEA Virtual Annual Meeting, Katie Porter of Brown and Caldwell presented on the California Urban Water Agencies (CUWA), a nonprofit corporation of 11 major urban drinking water agencies serving approximately two-thirds of California's population. In September 2021, CUWA published a DEI Toolkit compiling "best practices from member agencies and provides guidance on implementation of DEI policies and practices with the intent of assisting others in developing their DEI programs." The toolkit included example DAPs from the Los Angeles Department of Water and Power (LADWP), the San Francisco Public Utilities Commission (SFPUC), and the Santa Clara Valley Water District (SCVWD).

After reviewing these DAPs, elements relevant to DES were incorporated into a key list of action items, grouped into the following categories:

- Recruitment and Hiring
- Development, Promotion and Mobilization
- Inclusion, Culture and Belonging
- Community Engagement and Support

Action items that were not specifically or fully under DES' control (e.g., human resources policies that applied across the entire county) were excluded. The key list was then refined into a DAP for 2022,

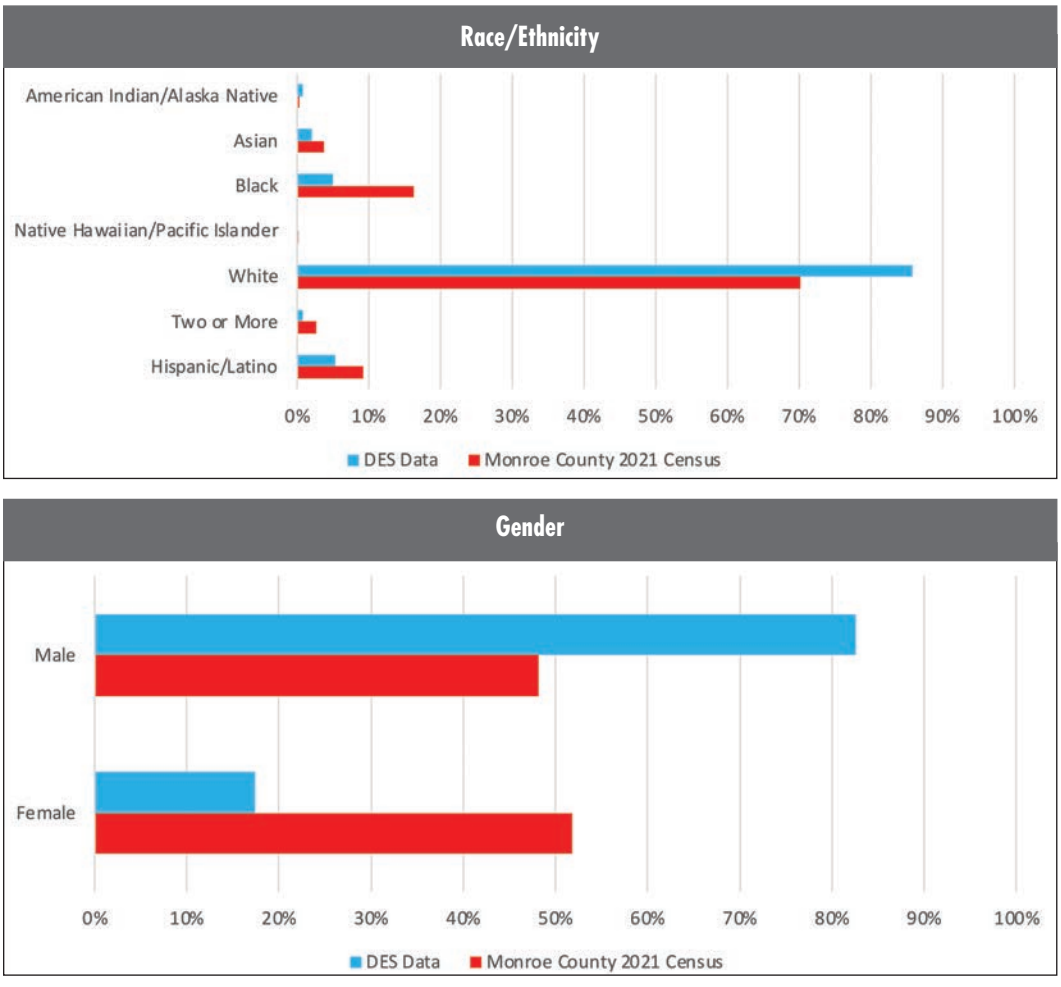


Figure 1. DES Demographic Comparison with Monroe County Census Data. *Clement Chung*

accounting for the constraints of budget, the nascent management structure to support implementation, and general unfamiliarity with DEI concepts and terminology within the department. Actions were chosen based on DES' anticipated ability to successfully complete items within the calendar year, and whether the action would lay the groundwork for future activities. Some key early action items included the following:

Kinra Johnson and Jennifer Brokaw of Monroe County DES. *Clement Chung*

1. **Create a DES Diversity Committee.** Staff were requested to volunteer as representatives from each functional group to facilitate two-way communication. Non-supervisors were preferred so that their peers felt comfortable discussing DEI issues without worrying about potential disciplinary implications (which are covered under a separate process). Committee members would also lead other DAP action items as their interests allowed.
2. **Update the DES Vision Statement, Mission Statement and Statement of Values.** One Diversity Committee member was given the responsibility of ensuring DEI was embedded in our foundational documents. Not only would this help guide the department moving forward, but it also showed how we empower rank-and-file staff members in shaping our organization.
3. **Establish a time code and budget for DEI activities.** To signal how important DEI is to the organization, the senior leadership team allowed Diversity Committee members to allocate some of their work hours to their efforts. Tracking this metric could also help determine our program's effectiveness and whether additional resources would be necessary. Ultimately, our aspiration is that DEI is fully integrated into our daily operations and no longer needs to be separated out.
4. **Establish initial diversity targets for DES.** While the overall county DEI goal is to employ a workforce that reflects the broader community, recruitment efforts would likely be limited by the diversity of the available labor pool in each industry. DES set an initial objective of at least matching these diversity statistics for each functional group, understanding that the longer-term goal would require partnerships to develop a more equitable workforce pipeline.

In order to be successful, it was important for the DAP to be subject to a continuous improvement cycle. This ongoing development process includes an annual review by the Diversity Committee to determine whether the goals set for the preceding year have been achieved. From this, the committee will recommend incomplete action items to be carried into the following year, completed items to be removed, and new actions added from the key list as capacity allowed. These recommendations will be reviewed by DES senior leadership and DDEI for adoption in the following year's DAP.

At the time of writing, the Diversity Committee is about six months into its work. Six out of the 19 action items in the DAP have been completed, and significant progress has been made on another six. This has happened while the committee members have been getting to know one another; DES' work locations are distributed across the county, so it is quite possible for some employees to never meet their colleagues in a different division. Not all functional groups are yet represented; interestingly, it is the groups that I feel are the least integrated that are not fully participating. We recognize that there is still a long way to go, but as the saying goes, you have to start somewhere. We are confident our plan puts us on a path toward success.

Clement Chung is deputy director of Monroe County Department of Environmental Services, and he may be reached at ClementChung@monroecounty.gov.

Monroe County Emerging Diverse Leaders Development Program 2022 participants. *Clement Chung*

NEIWPCC: Providing Regional Training in the Northeast

by Victoria Helle

NEIWPCC is a regional commission that helps the states of the Northeast preserve and advance water quality. To achieve this goal, we are organized around the core principle of service to, and collaboration with, our seven member states – Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont – and are actively engaged in five key areas of work:

Connections: We engage and convene water quality professionals and other stakeholders across the Northeast to collaborate on clean water and environmental science challenges across shared regions, ecosystems, and areas of expertise.

Protection: We conduct research into water-related topics, monitor environmental factors, and fund such work by others. We also implement and fund environmental restoration and other on-the-ground projects.

Training: We develop, coordinate, and conduct training courses that serve water quality professionals regionally and nationwide.

Education: We fund and/or staff programs that engage the public through events, exhibits, web and print publications and other outreach activities.

Engagement: We actively represent the interests of member states at meetings with federal and state officials and in regional and national water and wastewater associations. Specific to wastewater we develop, coordinate, and conduct training courses that serve water quality professionals regionally and nationwide.

Commissioners

Since NEIWPCC's formation in 1947, our commissioners have played a critical role in setting NEIWPCC's priorities, evaluating staff programs and projects, and representing their states' interests.

There are 35 commissioners – five from each member state – that oversee NEIWPCC. Each commissioner is appointed by their state governor. A state's delegation typically consists of the heads of its environmental and health agencies, who generally designate representatives to attend NEIWPCC meetings on their behalf, supplemented by three highly experienced individuals from outside state government. This approach provides NEIWPCC with diverse, expert leadership.

The number of commissioners from each state may vary from year to year due to the gubernatorial appointment process. We currently have three commissioners representing New York:

Carol Lamb-LaFay is the New York State Department of Environmental Conservation (NYSDEC) commissioner and is currently the acting director of the NYSDEC Division of Water.

Daniel Lang is the New York State Department of Health (NYSDOH) commissioner and is currently the deputy director for DOH's Center of Environmental Health.

Richard Lyons has worked for the Albany County Water Purification District (formerly the Albany County Sewer District) for over 40 years. In June 2015, he retired as executive director and now works part-time as a project manager.

Water Program Priorities

Every five years, NEIWPCC reviews the work that needs to be accomplished in our member states and establishes priorities that serve as a roadmap for our commission to follow to help advance water quality. Our current water program priorities, identified in 2020, are:

- Contaminants of emerging concern
- Watershed planning and waterbody protection
- Infrastructure improvements
- Clean Water Act modernization
- Training and certification for wastewater and other environmental professionals

In addition, we also recognize that all of NEIWPCC's work is completed on a backdrop of a changing climate and, as such, this is more of a cross-cutting priority. Each of the five identified program areas has its own considerations that are linked to the impacts of climate change and to resiliency.

Furthermore, NEIWPCC realizes that communities with lower socio-economic status and those with larger minority populations are disproportionally those that contend with serious water quality issues and threats to their access to clean and safe water. This underscores all of our work, as NEIWPCC understands that we are not achieving our mission and realizing our vision until all of our communities have access to clean and safe water.

In addition to celebrating the 50th anniversary of the Clean Water Act, this year marks the 75th anniversary of NEIWPCC. As we look back, we can see how far our training program has come in helping operators clean New England and New York waters.

History of Training at NEIWPCC

The collection and cleaning of human waste has a long and storied history and, despite playing a critical role in society, has sometimes been viewed as a dirty and undesirable profession. Before municipal sewer systems, urban areas relied on "night soil" collectors, men that traveled from cities collecting human waste in buckets. As technology developed, treatment plants began to appear and the profession of being a wastewater operator came to life. It was not easy being an operator during the 20th century. Environmental concerns were the last thing on the public's mind, and most did not care to know what happened after they flushed a toilet.

In the 1960s, environmental activism brought awareness to government officials about the public's demand for clean water. To advance water quality, the government funded an additional 1,800 operators and technical staff to operate treatment plants across the region. Qualifying candidates were hard to find due to the low pay and the lack of recognition. As a result, 70% of these wastewater treatment plants were being operated by staff with little or no technical training. To combat this issue, NEIWPCC's wastewater subcommittee created a training program that covered the same core content NEIWPCC offers today – basic math, hydraulics, and laboratory procedures.

To help with training future operators into the industry, NEIWPCC was aided by two $25,000 planning grants from the New England Regional Commission. The first grant was used to create a twelve-week pilot program and the second grant was used to convert part of the Southern Maine Community College facility to accommodate NEIWPCC's New England Water Institute. Though it was a small program, it was a success.

As the nation adopted the Clean Water Act of 1972, NEIWPCC expanded its training to include a mobile training facility (MTF). This MTF traveled to wastewater facilities around the region, providing 21 hours of instruction at each site. In this first year the

continued on page 42

continued from page 41

MTF was able to visit six out of the seven NEIWPCC member states' wastewater facilities.

Throughout the 1980s, after years of fundraising and help from the U.S. Environmental Protection Agency (USEPA), NEIWPCC established its own training operation on the Southern Maine campus. This training operation incorporated nine months of training for new operators and technical short courses when the nine-month program was not in session.

Present Day NEIWPCC Training

Although much has changed, NEIWPCC's mission has remained the same: "To advance clean water in the Northeast through collaboration with, and service to, our member states."

Prior to COVID-19, NEIWPCC mainly offered in-person courses in New York and New England. Some of the courses we provided were *Train the Trainer,* NYWEA exam prep, and other technical water and wastewater classes. In 2020, our dedicated training staff quickly pivoted our in-person course offerings to a virtual format so operators could continue to receive training during the pandemic.

Today we offer basic, intermediate, and advanced courses to train all levels of operators and prepare them for certification exams. Classes cover all aspects of the job, from wastewater treatment chemistry and microbiology to equipment safety and lab procedures, as well as more specialized options like brewery treatment or environmental surveillance for COVID-19. The program typically conducts 50 to 70 courses per year that attract more than 1,500 students.

On October 19 and 20, 2022, we hosted our first ever Pump-a-Palooza event. This two-day regional event included virtual training on pump basics, followed by a full-day, in-person training in Westford, Massachusetts, that included pump demonstrations and hands-on exhibits, as well as face-to-face networking. NEIWPCC invited pump manufacturers and representatives from across the industry to bring and display as many different types of pumps as possible.

We continue to offer online virtual courses and in-person training courses. In the future, we plan to provide different types of courses including adding self-paced training. You can check out our training calendar for our latest class offerings.

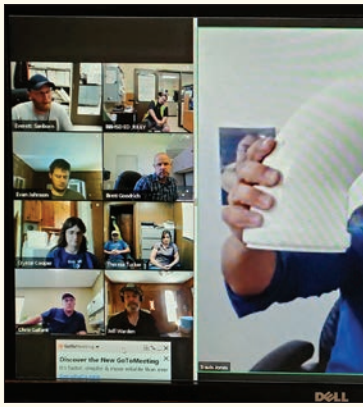
Technical Report-16 (TR-16)

The TR-16 is NEIWPCC's most-requested document. *The TR-16: Guides for the Design of Wastewater Treatment Works* guide discusses the important elements that must be considered in the design of wastewater treatment works. The guide is written for engineers who design wastewater treatment plants, state regulators who review and approve designs, and municipalities that are soliciting professional design services for wastewater treatment facilities. In May 2016, the guide was revised to reflect the need for resiliency in the face of storm surge and extreme weather. It is available in print or USB drive. We are currently beginning to work on the next revision of TR-16 and are seeking volunteers. If you would like to be involved, please reach out to Jennifer Lichtensteiger *(jlichtensteiger@neiwpcc.org)*.

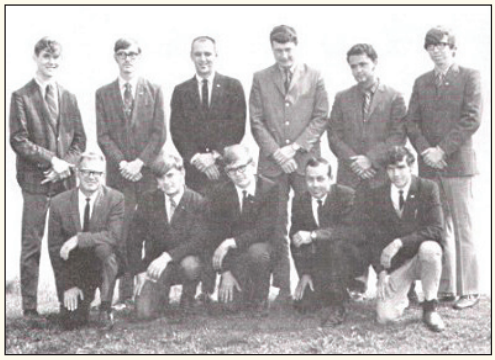
We also produce other technical guidelines and reports, such as *Preparing for Extreme Weather at Wastewater Utilities*. This guide is for wastewater managers tasked with planning for extreme weather events who face challenges both critical and difficult. This guide can help, with a description of the central issues and with tips and stories gleaned from the experience of wastewater professionals in

NEIWPCC original wastewater instructors in front of the mobile training facility that provided training to operators in the region in the 1970s. *NEIWPCC Archives*

NEIWPCC's mobile training facility and interior. *NEIWPCC Archives*



Above: Travis Jones helps NEIWPCC pivot to live virtual training at the start of COVID-19. *NEIWPCC-JETCC Training Staff*



The New England Institute first graduating class from the 12-week pilot program at the Southern Maine Community College in 1971. *NEIWPCC Archives*

Right: Paul Dombrowski teaches NEIWPCC's Hands-On Wastewater Nutrient Removal Using Process Control Simulators course. *NEIWPCC Training Staff*

the Northeast. The goal of this publication is to orient the reader to the problem of emergency preparation and to offer many points of departure for further information. The material is organized generally by time period, starting with pre-storm planning and ending with post-storm assessment and repair.

Educational Programs

NEIWPCC continues to pursue solutions to the labor shortage issue that are becoming a reality for wastewater treatment facilities in the Northeast and around the country. This has been a topic of discussion in wastewater community for many years. In fact, in a survey NEIWPCC conducted in 2005, facilities reported that over 50% of employees in the region were middle aged or older. If that was the situation in 2005, it can be assumed that the issue is amplified today. NEIWPCC works hard to bring new talent into the wastewater field, whether it be by working with our local career centers and colleges, or through our longstanding participation in USEPA's Youth and the Environment programs.

In collaboration with USEPA Region 2, NEIWPCC administers funding to the national Partnership for Environmental Technology Education (PETE) for a seven-week youth program in New York City. The program was designed to help increase the water and wastewater workforce and environmental awareness in New York's inner-city youth, ranging from ages 14 to 22. The program achieves these goals by exposing youth to potential career paths in the water and wastewater field, awareness to environmental justice issues, and understanding of how wastewater treatment facilities create water quality and public health protection in their communities. Past projects have proven to keep participants in school, seek higher education and securing full time occupations in New York. Not only has this program contributed immensely to the New York City Department of Environmental Protection (NYCDEP), but participants have been considered for full time employment from the NYCDEP and several have been encouraged to apply for paid internships. This program continues to be a success, with an increase of participants every year!

Thank you to all our commissioners, member states, and operators for making the past 75 years a success. We look forward to future collaborations with NYWEA, NYCDEP, NYSDOH and NYSDEC. Please feel free to reach out to NEIWPCC with any ideas on future courses or other things we can do to benefit the wastewater community *(training@neiwpcc.org)*.

Victoria Helle is an environmental analyst with NEIWPCC and coordinates virtual and in-person courses by hosting classes, providing technical support to students and trainers, maintaining course materials, and assisting with the development of upcoming training opportunities, initiatives, and resources. She may be reached at vhelle@neiwpcc.org.

Above: Michelle Jenkins (left), information officer for the Wastewater and Onsite programs, and Victoria Helle at Pump-a-Palooza event. *Michelle Jenkins*

TR-16 Guides for the Design of Wastewater Treatment Works. *NEIWPCC Communications Staff*

Patricia Chesebrough, program manager of the Wastewater and Onsite programs division, talking at Pump-a-Palooza event. *Victoria Helle*

Patricia Chesebrough, program manager of Wastewater and Onsite programs, introducing the Pump-a-Palooza event. *Victoria Helle*

New York Rural Water Association Apprenticeship Program for Operators

by Kevin Maine

Many trades have apprentice programs (electricians', plumbers' and carpenters' unions). These professions have recognized the need for training. Unfortunately, our industry has been somewhat behind the times. With the increasing regulatory environment and advancements in treatment technologies, the National Rural Water Association and the New York Rural Water Association have recognized the need for recruiting and hands-on training, keeping pace with these advancements.

We are answering the call. In November 2019, the New York Rural Water Association received accreditation from the New York State Department of Labor for two registered apprenticeship programs – Water Systems Operation Specialist and Wastewater Systems Operation Specialist. Registration began for apprentices that same month. As we all know, COVID-19 hit in early 2020, delaying the in-person training for a short time. Groups were kept small along with social distance protocols and eventually we are returning to normalcy.

These are a few of frequent questions we receive about the program.

What is the requirement to become an apprentice? Are there any requirements of the employer?

Yes, to both questions. Each prospective employer is required to fill out an application form that is submitted to the Department of Labor for review and approval. Each apprentice applicant is interviewed. Upon a successful interview, an application is completed and filed with the Department of Labor for final registration.

Does it cost anything for the employer or the apprentice?

No. textbooks for the drinking water and wastewater programs are provided by New York Rural Water Association. The wastewater program uses California State University at Sacramento textbooks. The drinking water program uses American Water Works Association Operator Training Handbooks. Classroom training schedules usually are once per month. There are several training pods across the state and each apprentice is expected to travel to classes on the monthly schedule. The employer is expected to have a mentor available to guide the apprentice through the day-to-day operations at their facility, completing the on-the-job training requirement from the New York State Department of Labor.

How long is the program?

The on-the-job training is two years or a minimum of 4,000 hours. During this time, the apprentice is required to have a minimum 288 hours of classroom or what is referred to as "related instruction" as well. Both the drinking water and wastewater programs have common classes, and there are some unique classes for each. ***Table 1*** lists the class topics for both drinking water and wastewater programs.

There is more than just seat time in a classroom. During the construction, design and inspection training, tours are taken at several drinking water and wastewater treatment plants. These tours allow the apprentice to see different types of treatment options in operation, other than their own system.

Are there any other employer requirements?

Yes. The employer is required to pay a minimum wage of $15 per hour during the first year of the apprenticeship. During the second year the employer is required to pay a minimum wage of $16 per hour. However, most employers are already paying over the minimum required wage. Secondly, the employer is expected to provide training in the following areas: sexual harassment and violence in the workplace and standard CPR, AED and first aid certification (American Red Cross or another approved program).

What is a mentor?

The employer is required to have a mentor-to-apprentice ratio of one to one. A mentor is there to guide their apprentices in navigating our world of drinking water and wastewater and pass on their skills. The apprentices should benefit from the counsel of more experienced professionals.

Each apprentice is issued a "blue book" provided by the New York State Department of Labor in which to keep records of their progress. The blue book is a record of five classifications in

Table 1. Class Topics in Common and Unique to the Drinking Water and Wastewater Programs.

Common Class Topics for Both Drinking Water and Wastewater	
• Basic math for operation specialists	• Security and emergency response
• Construction design and inspection	• Advanced operational math
• Chemical feed systems	• Confined space safety
• Ethics	• Basic hydraulics
• Sampling and record keeping	• Introduction to utility management
• OSHA 10-hour certification course	• Basic environmental chemistry
• Pump and motor maintenance	• Hazard communications

Drinking Water Class Topics	Wastewater Class Topics
• Water utility safety	• Basic laboratory and microscopic examination
• Corrosion control treatment optimization	• Dissolved air flotation
• Grade "A" compliant laboratory class	• Wastewater collection systems
• Surface water production I	• Wastewater treatment
• Chlorinator systems and chemical handling	• Membrane treatment of wastewater
• Drinking water filtration, A-Z	
• Water system design	
• Operation and maintenance	

Table 2. Work Process Classifications in the Apprentice's "Blue Book."

Work Process Classification	Topic	Recommended Hours/Month	Number of Categories
A	Tools, equipment and workplace safety	10	7
B	Vehicles and heavy equipment (excluding operation of heavy equipment)	17	6
C	System operations and maintenance	80	6
D	Quality control	40	4
E	Logistics, reports and supervision	20	4

the work process. The apprentice enters the daily hours for each classification then the mentor reviews it monthly and signs off on each month's activity. An additional advantage of the blue book is keeping an accurate accounting of work or hands-on hours needed toward certification. ***Table 2*** lists the classifications and recommended monthly hours for each classification.

What is the advantage of the apprenticeship program?

As mentioned, almost 30 years ago initial certification training across New York was somewhat chaotic varying greatly in both drinking water and wastewater. The apprenticeship program provides standardized training, resulting in a well-trained employee with up-to-date regulatory knowledge and advanced technical skillset of current and advanced process and process controls.

To date all apprentices that have taken their certification exams have past the first time! We are very proud of this accomplishment. It should be noted that the apprenticeship DOES NOT replace initial certification. All apprentices must successfully complete an approved initial certification course(s), pass the final exam and – in the case of wastewater – pass the ABC exam.

Some ask why would we enroll new hires in the apprenticeship program if they still need to complete the initial certification requirements? Good question. We believe the successful completion of the apprenticeship program, related instruction courses and on-the-job training, provides a more well-rounded operator with more "time-based" training that allows them to practically apply what has been learned. Apprentices typically are more advanced upon completion than trainees who only follow the traditional certification process. Lastly, apprentices are more likely to remain in our industry for the course of their career. We are here to help recruit, train and retain the next generation of water and wastewater operators.

If you would like more information, please email me at *maine@nyruralwater.org* or call at (518) 828-3155 extension 140.

Kevin Maine is the deputy director and apprenticeship manager for the New York Rural Water Association. He may be reached at maine@nyruralwater.org.

New York Rural Water Association apprentices tour the City of Hornell Water Pollution Control Plant. *Kevin Maine*

WRRF Operator – It's Not Just a Job, It's an Adventure!

by Richard Kenealy

I have been an operator in the water resource recovery industry for over 30 years and to say it has been incredibly rewarding would be an understatement.

Building the Foundation

I started out as a laborer in the late 1980s. After seeing that I wanted to make this my career, I began the process of obtaining my operator certification, through a combination of hands-on experience, correspondence courses, and in-person classes at Morrisville College. Attending the classes and touring other facilities, studying numerous reference materials, and learning the process of my local treatment plant prepared me to succeed at passing the required tests and become an important part of the team at my home facility.

A few lessons I learned during my educational journey was that all facilities are not created equal. What you learn during the schooling process and what you read in the books is only the framework for what you will actually be doing when you become a certified operator. The facility I started at, the Rome Water Resource Recovery Facility (WRRF), was a 12-million-gallon-per-day (mgd) facility and had a secondary process of activated sludge; it was considered a medium-size facility. During a few facility tours while I was attending my classes, I found that there are smaller facilities and a lot larger facilities that utilize different processes to treat their waste. I realized what I had learned in my facility may or may not apply to any of the other facilities.

I became aware early on that what I read in the books and learned in the classes were only the building blocks and the basis to what an operator needs to be successful in this industry. The real education happens every day while operating a facility. One of my early educators told me that the best tools an operator has are their senses, mainly using sight (eyes), sound (ears) and smell (nose). To really understand how your facility is operating, you need to know what things should look like – for example the color of the aeration tanks. You should know what sounds normal – like the sound of a bearing or a motor running in normal operation. And you need to use your sense of smell – from the smell of your headworks building to the smell of the secondary process. Understanding all of these in normal circumstances helps to catch problems before they become major issues.

I know the topic of this edition of *Clear Waters* is about operator innovation and you are probably asking yourself, what does all this have to do with innovation? I feel that to become a modern day Columbo when things aren't running quite right requires operators to apply the building blocks that they learned to get certified, together with their hands-on experience and their senses, to be successful at innovating solutions. These tools will help them to become champions of their facility.

On a side note, for you younger individuals who have never heard of Columbo, he was a TV detective from the 1970s and was most famously known for the line "Just one more thing." When something isn't quite right, we need to channel Columbo and ask just one more question or dig just a little deeper.

Putting Knowledge into Practice

Now that I have hopefully tied things together, I will segue into a problem that I had and how using what I have learned, the experience I have gained, my senses and my inner-Columbo to try and solve the problem.

After working 34 years in Rome, New York, I began working for the Town of Webster WRRF that had a treatment capacity of 5 mgd. This was a different facility with different issues, and I needed to use the basics I have learned as well as be open to the fact that

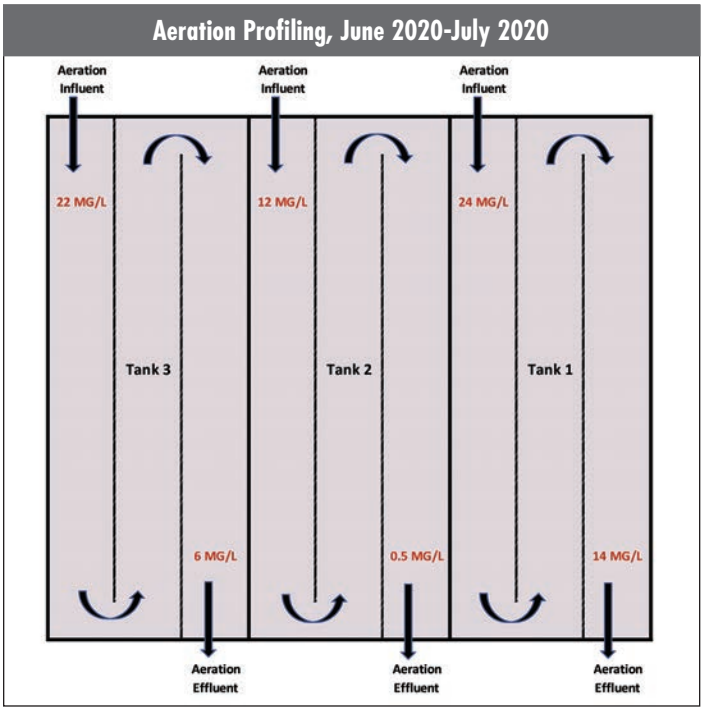


Figure 1. Aeration tank profiling of three tanks with ammonia concentrations, June through July 2020. Unequal distribution of influent leading into the three aeration tanks resulted in uneven effluent concentrations of ammonia. *Richard Kenealy*

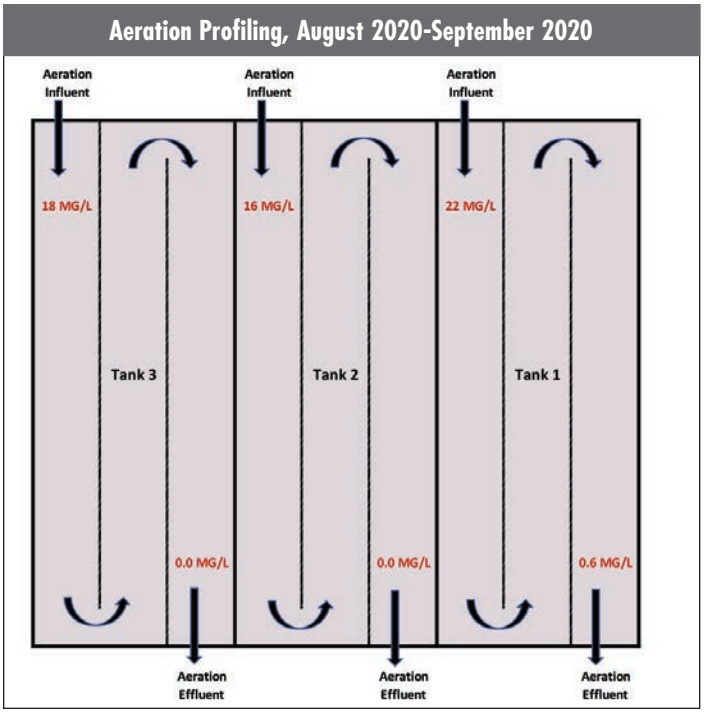


Figure 2. Aeration tank profiling of three tanks with ammonia concentrations, August through September 2020. Unequal distribution of influent leading into the three aeration tanks was corrected, resulting in improved ammonia removal across the three tanks. *Richard Kenealy*

things may run differently here.

The facility was in the final stages of an upgrade project that was replacing their old traveling bridge final clarifiers with three new circular final clarifiers. In May 2020, there was one new final clarifier operational, the second one was just brought online, and the third was under construction. There had been a delay putting the second one online because of a flood at the facility. A plug that was allowing bypass pumping from the aeration to the new final clarifier deflated overnight and the flow filled the second new final clarifier that was not online yet. I note that issue because it becomes relevant later on.

The facility was excited to have these new final clarifiers online and operational because the old traveling bridges were maintenance nightmares and had been causing permit violations. The early returns with the new final clarifiers were looking good, effluent looked very good, and we were meeting permit, but that seemed to gradually change. We started to see a rise in effluent ammonias and actually began to approach our effluent limits, even exceeding on occasion. This gradual rise continued throughout 2020 and into 2021.

Part 1 – Aeration Tanks

I began a robust secondary profile utilizing in-house testing equipment in early summer of 2020. I needed to see where the ammonia issue was materializing and why. We began by analyzing our activated sludge process by measuring for ammonia, nitrates, alkalinity, and dissolved oxygen. The first issue I found was the unequal distribution leading into the three aeration tanks ***(Figure 1)***. After adjusting the inlet gates to the aeration tanks, we saw a more equal distribution throughout the three tanks and improved overall ammonia removal ***(Figure 2)***.

While we were measuring ammonia in the aeration tanks, we were measuring alkalinity and nitrates to verify if we were nitrifying, and we were running parallel testing on our final clarifier effluent ammonia. We were finding an increase in our ammonia numbers in our final effluent results. This was very confusing since we were getting great ammonia removal in the aeration tanks only to see a drastic increase in our final clarifier effluent ***(Figure 3)***.

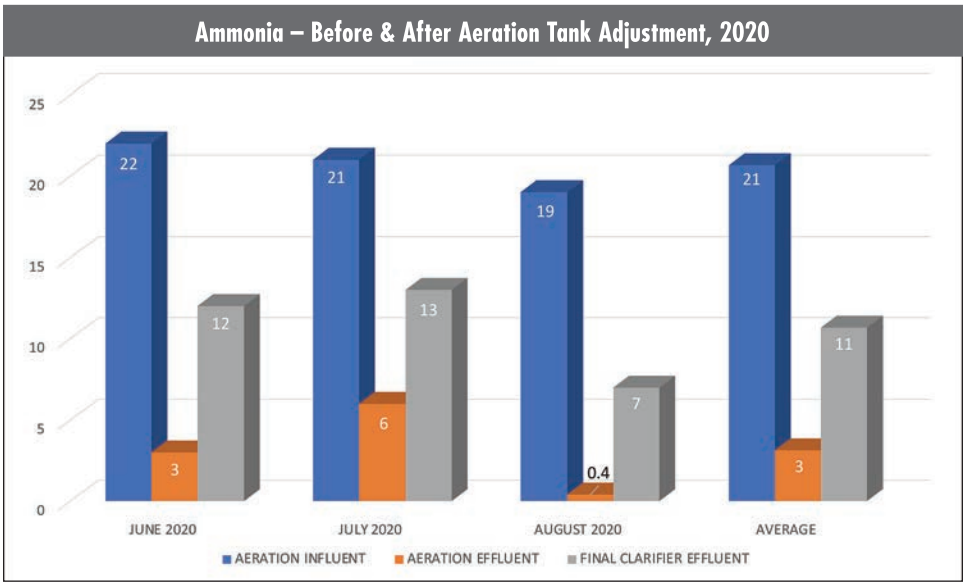


Figure 3. Ammonia concentrations in aeration tank influent and effluent, and final clarifier effluent, for the period June, July and August 2020. While the aeration effluent showed improvement in ammonia removal after the correction in influent distribution in the aeration tanks in July, the final clarifier effluent remained puzzlingly high. *Richard Kenealy*

Photograph 1. Construction stone found at the bottom of FC#2 (July 30, 2021). *Richard Kenealy*

Part 2 – Final Clarifier

During the first several months of operation, we were hearing some abnormal noises coming from the collector on the new final clarifier (FC#2, the second one to be brought online). Originally, we felt it may be just a breaking-in period and would work itself out. So, while we were trying to decipher our continuing ammonia issue in early 2021, we felt we would take the final clarifier down to investigate the noise. What we found was unexpected: there was a substantial amount of construction stone in the bottom of the tank ***(Photograph 1, Photograph 2)***.

I will now refer back to the plug deflating and the flooding issue. When the plug released, the flow flooded the 20-inch pipe that was to feed the new final clarifier, filling it with stone and FC#2 with water. After fixing the issue and pumping down FC#2, the construction company completed construction of the tank and put it online. The problem was the stone that was still sitting in the 20-inch pipe ***(Photograph 3)***. When they began filling the tank, the stone got forced into the bottom of FC#2. The stone was causing not only the noises in the collector, but it was also blocking the suction holes that allow the sludge to be removed from the bottom. The sludge was remaining in the tank too long and denitrifying, which resulted in our increase in ammonia. During the summer of 2021 FC#2 was cleaned out, all the lines purged of any stone, and put back online in mid-September. We saw an immediate improvement in our ammonia numbers ***(Figure 4)***.

A Bonus Outcome

There was another surprising outcome to this story; it involved finding another unexpected item in FC#2 other than the stone.

In 2020, when FC#2 was put online, I was taking pictures of the clarifier trying to catch the noise issue. As I was leaning over the railing, my gold chain and cross got caught on the railing. The chain broke, and I watched my gold cross descend into

continued on page 48

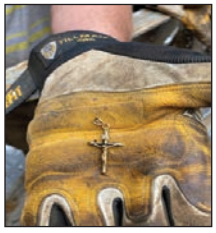
continued from page 47

Photograph 2. Workers cleaning the construction stone from the bottom of FC#2 (July 30, 2021). *Richard Kenealy*

Photograph 3. View of the remaining construction stone in the 20-inch pipe (Aug. 9, 2021). *Richard Kenealy*

the tank. It was a surreal moment; I had worn the gold cross longer than I had been an operator.

Fast-forward to the summer of 2021 when we had taken down FC#2 and found the stone in it. As the construction workers began to remove the stone from the tank, I jokingly said, "Hey, while you guys are down there, keep an eye out for a gold cross!" I seriously never imagined it would actually be found after a year in the clarifier. Well, to my surprise, I received a text ***(Photograph 4)*** from one of the workers in the tank. They had found my cross!



Photograph 4. A text message received from the workers who found the lost cross pendant among the stones being cleaned out of FC#2 (Aug. 10, 2021). *Rob Dantler*

Be Innovative!

I would now like to bring this back to topic and operator innovation. Innovation does not mean to just invent something, it also means to be creative, original and clever. An operator can be all these things by using the tools they have acquired becoming an operator, to not only operate a facility, but to solve the everyday issues that are the normal occurrences in this industry. Every day we run into different scenarios and circumstances that make us problem solvers and sometimes innovators. What makes our day at a WRRF normal is that there really is no "normal."

I would like you to be very observant the next time you visit a WRRF. You may see a gadget that was created by the staff to make a certain job easier. You will hear how one of the operators found a better way to do a certain task, or how, through sheer creative ability and being clever, they were able to diagnose a problem and come to a result that benefits their facility, public health and the environment. And isn't that what it's all about?

Richard Kenealy is the chief operator with the Town of Webster WRRF. He may be reached at rkenealy64@gmail.com.

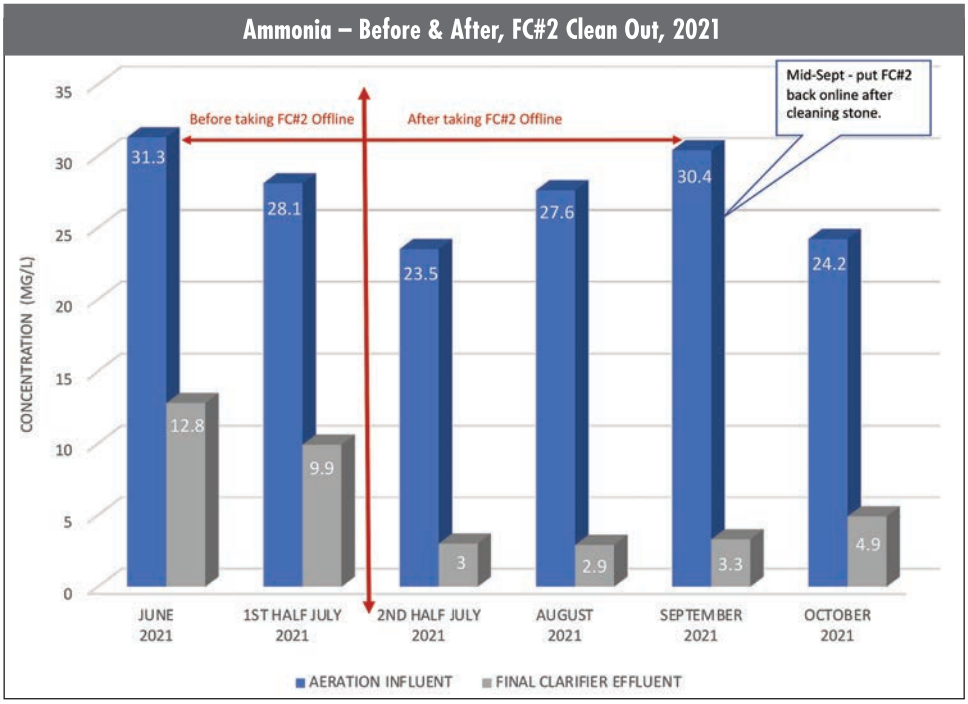


Figure 4. Ammonia concentrations in the final clarifier effluent showed an immediate improvement after FC#2 was taken offline in July 2021 and the stones were cleaned out. *Richard Kenealy*

Architectural/Engineering Services Procurement for State Revolving Fund Projects Receiving Federal Funds

by William A. Brizzell Jr.

Overview

The Infrastructure Investment and Jobs Act of 2021, frequently referred to as the Bipartisan Infrastructure Law (BIL), provides $43.4 billion nationally to the Clean Water and Drinking Water State Revolving Funds (CWSRF and DWSRF, respectively). New York state, through the Environmental Facilities Corporation (EFC), is expected to receive over $1.3 billion for the CWSRF and nearly $1.2 billion for the DWSRF over five years. New York state's water infrastructure needs are substantial, and the funding is welcome. Along with this funding there will be additional programmatic requirements that municipalities must abide by as they undertake projects with BIL funding.

One of the requirements for certain SRF financings is the need to procure architectural and engineering (A/E) services in accordance with federal qualifications-based requirements. The qualifications-based federal procurement process aims to get the best value for municipalities while enhancing access, competition and fairness.

Recognizing that federal procurement of A/E services is new to many municipalities and engineering firms, EFC is implementing this requirement for the SRF programs over the current federal fiscal year. Some contracts must meet federal A/E procurement requirements, depending on when the A/E contract and EFC financing agreement are executed and the type of financing provided, as follows:

1. For the CWSRF, Engineering Planning Grants, and DWSRF projects involving federal grants, all A/E contracts executed after Oct. 1, 2022, must comply with federal A/E procurement requirements.
2. For CWSRF financings that do not include federal grants and execute a financing agreement with EFC prior to Oct. 1, 2023, EFC will accept A/E contracts executed before Oct. 1, 2022, that were not procured in a federally compliant manner. This exception also applies to EPG grant agreements.
3. DWSRF projects that do not include federal grants will not need to procure A/E services in a federally compliant manner.
4. Clean water and drinking water projects that receive WIIA or IMG grants and do not receive any other financing from EFC will not need to procure A/E services in a federally compliant manner.

Certain types of projects need federally compliant A/E procurement right away and for others we can ease into implementation. For example, if the project is just for CWSRF base financing (no federal grant and not an equivalency project) or an Engineering Planning Grant and the municipality executed a contract before Oct. 1, 2022, that was not federally compliant, we can still close on the financing this federal fiscal year. Starting Oct. 1, 2023, however, those A/E contracts executed before Oct. 1, 2022, will not be acceptable for CWSRF base financing or an Engineering Planning Grant.

For projects with an EFC financing executed prior to Oct. 1, 2022, the contract(s) for engineering services executed prior to Oct. 1, 2022, will remain valid when amending an existing short-term financing or converting to a long-term financing.

Significant contractual amendments, however, are subject to the A/E procurement requirement. Significant contractual amendments are amendments to existing contracts that have a value greater than $100,000 and introduce a new scope of work or task.

Types of Services That Must Meet Federal Procurement Requirements

The types of services that must meet federal procurement requirements include contracts for program management, construction management, feasibility studies, preliminary engineering, design, engineering, surveying and mapping, as defined in 40 U.S.C. 1102(2) (A-C):

(*A*) *Professional services of an architectural or engineering nature, as defined by state law, if applicable, that are required to be performed or approved by a person licensed, registered, or certified to provide the services described in this paragraph.*

(B) Professional services of an architectural or engineering nature performed by contract that are associated with research, planning, development, design, construction, alteration or repair of real property.

(C) Other professional services of an architectural or engineering nature, or incidental services, which members of the architectural and engineering professions (and individuals in their employ) may logically or justifiably perform, including studies, investigations, surveying and mapping, tests, evaluations, consultations, comprehensive planning, program management, conceptual designs, plans and specifications, value engineering, construction phase services, soils engineering, drawing reviews, preparation of operating and maintenance manuals, and other related services.

The Procurement Process

The federally compliant procurement of A/E services is a qualifications-based process. The goal is to select the most qualified firm based on knowledge and experience with similar projects, and then negotiate a fair price for the services. The process is not a bid. The procurement process is detailed in 40 U.S.C. 1101 *et seq.* In general, the required steps are as follows:

(i) Public announcement of the solicitation (e.g., a Request for Qualifications).

(ii) Evaluation and ranking of the submitted qualifications statements based on established, publicly available criteria (e.g., identified in the solicitation). Evaluation criteria should be based on demonstrated competence and qualification for the type of professional services required (e.g., past performance, specialized experience, and technical competence in the type of work required).

(iii) Discussion with at least three firms to consider anticipated concepts and compare alternative methods for furnishing services.

(iv) Selection of at least three firms considered to be the most highly qualified to provide the required services.

(v) Contract negotiation with the most highly qualified firm to determine compensation that is fair and reasonable based on a clear understanding of the project scope, complexity, professional nature, and the estimated value of the services to be rendered. If a contract cannot be negotiated with the most highly qualified firm, negotiation continues in order of qualification.

Other Considerations

Compliance with these requirements will be considered met when a municipality submits to EFC an executed "Environmental Facilities Corporation Certification for Architectural/Engineering Services Procurement for Federally Funded Projects." The Certification must be executed by an authorized representative of the municipality. It cannot be signed by a hired contractor or consultant. Documentation evidencing completion of the procurement steps outlined above is required to be kept on file by the municipality for the term of the EFC financing plus six years. The documentation should not be submitted to EFC but must be made available for inspection upon EFC's request.

Additional guidance regarding procurement of engineering services and the Certification for A/E Services form are available on EFC's website at *https://efc.ny.gov/forms-tools*. Municipalities are encouraged to discuss the requirements with their legal counsel.

EFC is committed to helping municipalities, engineering firms, and others understand the federal procurement process. Questions not addressed through the guidance available on EFC's website may be submitted to EFC at *CWSRFinfo@efc.ny.gov*.

William A. Brizzell Jr., P.E., is the director of the Division of Engineering with the New York State Environmental Facilities Corporation. He may be reached at william.brizzell@efc.ny.gov.

Operators: Life Blood of the Water Industry

by Howard Robinson

As a preface to this article, I would like to say, "Thank you." Thank you to all the hard-working, critically essential wastewater and water operators out there.

The Importance of Operators

When you get to the end of your career and look back, there are two things that stand out: people and projects. It really comes down to how much of an impact you have had on your co-workers and the environment.

In this day and age of mutated diseases and advanced climate issues, the wastewater and water treatment operators are on the front line having an incredible impact in what is recognized as arguably the single greatest contribution to the health and safety of the world – the invention of the sewer! – and in line with that, water treatment. It has come to the point that wastewater systems not only remove and disinfect, but they are also now used to track outbreaks and the spread of highly contagious and deadly diseases, such as Ebola, COVID-19 and mpox. Wastewater tracking makes it possible to narrow down the location of outbreaks to a few blocks' radius for targeted treatment and isolation.

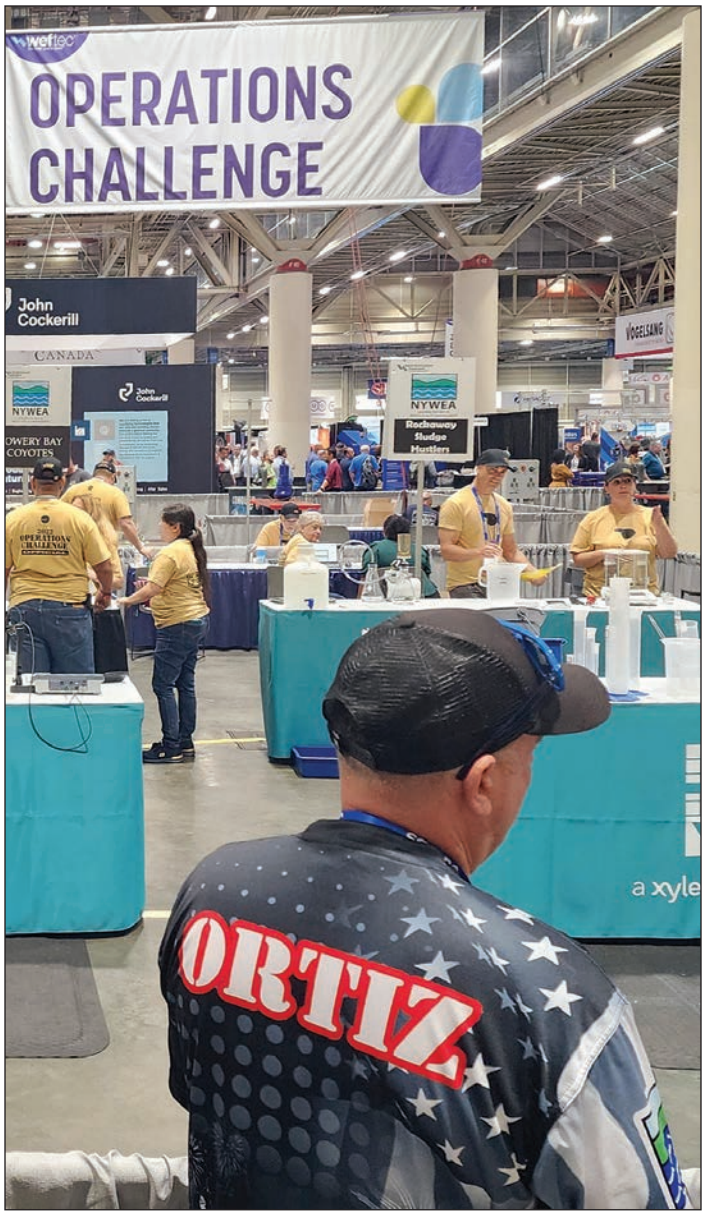
Finding Qualified Operators

I have been in this industry for over 35 years, a second-generation wastewater plant operator. As a retired chief operator, I have seen many challenges in my career. One of the main challenges has been staffing issues. Like other industries, finding qualified plant operators has become increasingly difficult.

Properly trained workers skilled in the process of wastewater treatment are a must, for the health and well-being of the populace and also the legal ramifications of failing to properly meet permit limits set by governmental agencies. Operators of water resource recovery facilities must be adequately trained and certified, since they need to know how to deal with leaking pipes and valves, electrical and instrumentation equipment, process adjustments and laboratory analyses. Influent variability and seasonal changes make this work all the more challenging. The aphorism "A jack of all trades is a master of none, but often times better than a master of one" exemplifies the operator of today.

So how does a municipality or a private concern go about finding qualified personnel? Recruitment is the primary method, in its various forms both conventional and unconventional. Conventional is easy, in some respects. New York City operators are vetted through a

The Bowery Bay Coyotes team working on an Operations Challenge event at WEFTEC New Orleans 2022. Left to right: Michael Prats, Anthony Quadrino, Paraminder Mander. Background: Christopher Reyes. *Howard Robinson*



Robert Ortiz of the Rockaway Sludge Hustlers prepares for the Lab event at the WEFTEC Operations Challenge 2022. *Howard Robinson*

civil service exam with certain qualifiers, resume and an interview. Many outside municipalities are by resume and interview alone. Getting the word out through job boards and websites like LinkedIn and ZipRecruiter is a good way to generically put out the call for applicants. Then there is the more targeted approach, through associations like NYWEA and its various local chapters, along with other water associations throughout the country. National associations like WEF and AWWA all have job boards.

Then we can get to the nitty gritty, the more grassroots approaches. Reaching out to people that would never have thought about a career in this industry. Recruitment through partnerships. Jobs are easy to find but the right job to go along with someone's skills is a little bit more difficult. Partnerships with high schools, colleges and other learning institutions, like Boards of Cooperative Educational Services (BOCES) and vocational trade schools with curriculum leading to operator positions may hold the key. These may be places that can introduce future operators to a career in the world of water treatment, a field that they had little or no knowledge of other than, you turn the faucet and water comes out or you flush the toilet and water goes away.

Another less conventional approach to look for future operators is partnerships with local unions to create, where possible, an apprenticeship program leading to future employment in the field. This is where that saying comes into play "jack of all trades." Trade unions like plumbers, electrical, construction and others may have a large amount of untapped potential for finding qualified workers. (See also, NY Rural Water Association article on their apprenticeship program, page 44.)

Employee Retention

Retention of employees is another key part of this equation. How do we get operators to think of their position as less of a job and more of a career? Salaries and pensions are absolutely one way. However, I think the future lies in the past. For example, mentoring, the old teaching the new, and showing them what they have learned through experience, trial and error, and institutional knowledge. Mentors broadened operators' horizons to new opportunities and a way of thinking that is not so confined to work-eat-sleep-repeat.

Many operators get locked into a niche and only see the operator's world through a very narrow perspective of their own institution. Professional development is something that all facilities should seek to encourage. The chief operator of tomorrow may start off as a sample taker today. Employees benefit from exposure to the wide range of educational opportunities, such as schooling for certification – critical for advancement in the industry – and traveling to WEF or AWWA conferences to learn about new and future processes and equipment in the industry. Engaging in extracurricular activities such as Operations Challenge, one of the premier professional development programs in the world, also benefits both employees and their facilities. Operations Challenge teaches and reinforces skills such as leadership and organization along with pride in one's abilities in their chosen career. Definitely the definition of "all work and no play make for a boring life."

Looking Ahead

The future for operators looks very different from when I began my career. Challenges of climate change, 100-year drought conditions and 100-year flood conditions are already becoming the new normal. As technology and automation become more and more pervasive in the day-to-day operations of water treatment facilities, water quality will improve. These new tools, however, will never replace the hands-on skills and knowledge that professional operators exhibit on a daily basis to protect the environment, the planet, and most importantly their fellow human beings. No small task for people with dirty hands and no capes.

Howard Robinson is a chief operator, Grade 4A certified, who has retired from the New York City Department of Environmental Protection with more than 35 years of experience in the wastewater industry. He was the Operations Challenge representative for NYCDEP for 10 years and is still an active volunteer with the Challenge. Howard is a 5S shovel recipient, and a member of the NYWEA Metro board. He has been – and still is – engaged with professional development and training for the NYCDEP and NYWEA for over 15 years and serves on numerous committees for NYWEA. This year Howard will be the new operator representative to the NYWEA board of directors. Although he is retired, Howard is still engaged with what he considers to be a very worthy cause. He may be reached at hrobinson3@gmail.com.

One Operator's Water Journey

by Steve Giarrusso

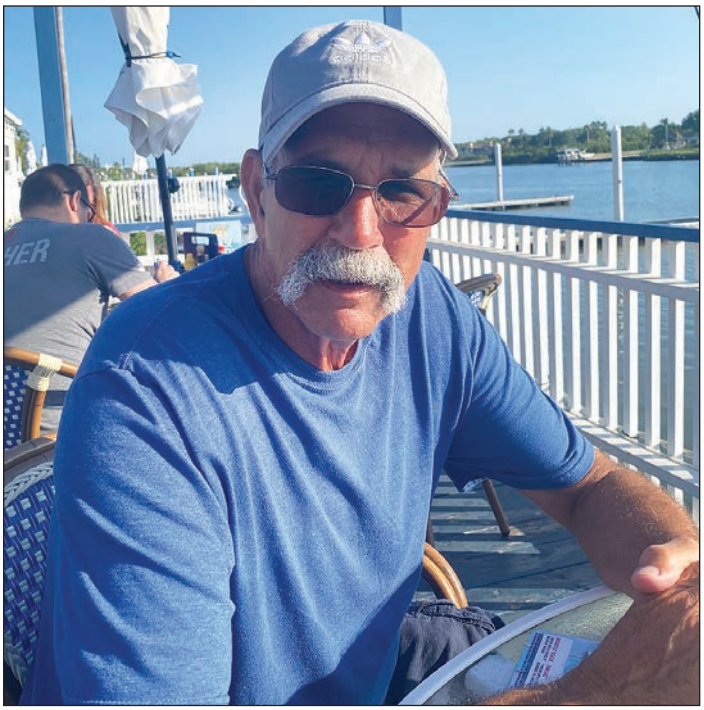
One of the first things we learned as operators is this simple fact: water is life. But after being retired, I also learned that life is like water.

As we continue our journey in life, we, as water, will encounter new and different paths; retirement is one of these new paths. Looking back at my last journey, I realize how important my job was. Keeping the water clean and safe not only enriches the environment but also helps keep people from getting sick – or even possibly dying – from contaminated water. It makes my heart full in knowing that what I did made a difference in people's lives, without them even knowing it.

Being an operator and research biologist, I had the privilege to travel not only around the state, but to other countries and helped them solve issues with their reactors, removing elements that were harming the environment, and repurposing waste material into useful products. Another path I followed was teaching students these new ideas and techniques so they may someday carry this knowledge on their journeys.

My present path has given me more time to think on how to improve things even more. The research I learned proves we can be more energy sustainable, and the new techniques discovered in removing complex compounds that today are found in the water can be implemented to not only reduce greenhouse gases but improve the quality of life.

Being an operator at a small plant was a blessing for me. Looking back, I realized that an operator has to be a person of many skills. An operator has to be a problem solver, pipe fitter, electrician, IT person, and politician. They must constantly keep up to date on new laws, regulations, procedures and new products. My hobby was my work, but after being newly retired I realized that all the skills I learned over the years being an operator have a huge influence on everything I have done since leaving the plant. From the most complex to the simplest projects, I find that the skills I learned being an operator have been priceless.



Steve escaping the cold and snow of New York in Redington, Florida.
Vanessa Giarrusso

So, for me, looking back helps me to look forward. My new path is exciting, meeting new challenges – and I have to admit, just having fun! – but never giving up on making life better for all.

Steve Giarrusso is a retired operator from the Village of Minoa and research biologist. He may be reached at svcjg224@yahoo.com.

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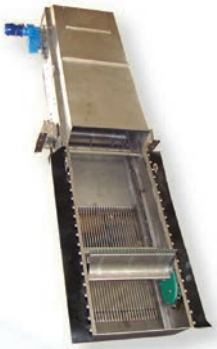

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Perspective from a Former Operator

Following in my father's footsteps, navigating work in a male-dominated field, and changing paths.

by Danielle Hurley

As a member of the NYWEA Publications Committee I was involved in the brainstorming of articles for this issue. As this issue celebrates operators, we wanted to highlight a variety of personal stories and experiences from operators. We discussed having articles focused on an Operations legacy story, a perspective from a female operator, and for an author to share their experience shifting from Operations into Engineering. That is when Patricia Cerro-Reehil chimed in to say, "These all sound like topics Danielle could speak to." Therefore, I will share with you a bit about how each of these topics has played a role in my career.

Following in My Father's Footsteps

Just before my 23rd birthday I began my career in wastewater treatment. It may come as a shock to you, but I did not always dream of working with wastewater! My five-year-old self was certain I would become an animal biologist. As I grew older, I maintained my interest in the natural world. When I started my college search, my dad recommended I consider the SUNY College of Environmental Science and Forestry (ESF). I took a tour of the school and was glad I did. ESF offered exactly the types of programs I was interested in. When I received my acceptance letter, my dad's response was different from what I expect most parents would be. He said "Congratulations, you're going to end up a s--- plant operator." He said most of the new operators being hired at Onondaga County's Department of Water Environment Protection (WEP) had graduated from ESF. He knew something that I would later learn. The wastewater sector is a fascinating interdisciplinary field where you can make a positive impact on the environment and your community. Working in this field allows you to have a career with purpose.

About My Dad

My dad, Patrick Hurley, spent most of his career in Operations at the Metropolitan Syracuse WWTP (Metro). He dropped out of high school in the 1970s. Soon afterward he began working for what was then called Onondaga County's Department of Drainage and Sanitation. He started working in janitorial services, quickly moving up to working in carpentry and maintenance. Some of the guys he worked with recognized his potential and took him under their wings to guide him. They encouraged him to get his GED and pursue other educational opportunities.

My dad's career started in the years after the Clean Water Act when major investments were being made to build and expand treatment facilities to comply with the new regulations. With these expansions came the need for more operators and training. Onondaga County implemented an on-premises operator training and certification program where my dad trained and earned his 3A operator certification. In time he went on to earn his 4A. In his early years he experienced the evolution of Metro from a simple primary treatment plant to one that included secondary and tertiary treatment. Later in his career he operated the facility through another major upgrade.

Metro is a relatively large treatment facility situated on a small lake. Onondaga Lake receives approximately 17% to 20% of its flow from Metro. In 1998 Onondaga County entered the Amended

John, Patrick and Danielle Hurley at the Metro WWTP. *Kevin Stager*

Consent Judgment, which required upgrades to the treatment process for nutrient removal. In 2004 Onondaga County commissioned the Biological Aerated Filter for ammonia removal and in 2005 the High Rate Flocculated Settling process was commissioned for phosphorus removal. This was one of the first installations of these processes in North America.

My dad had the opportunity to learn and operate state-of-the-art nutrient removal systems. In doing so he contributed to the stunning transformation of Onondaga Lake from what was considered one of the most polluted lakes in the United States to the recreational asset it is today. His job as a janitor developed into a rewarding 35-year-long career protecting the environment and public health. He ultimately retired as head operator of the Metro WWTP.

My Childhood Perceptions

For most, wastewater utilities are "out of sight and out of mind." This was true for me even though I grew up with a father that worked in this field. As a kid I heard numerous wild work stories from him. For example, the building that exploded during the 1970s plant expansion construction and the aeration tanks that had enough air entrained that you could not swim in them. If you fell in, you would sink to the bottom and drown!

My dad did not expect any of his three children to work in the wastewater field (until I announced that I would be attending SUNY ESF). I did not tour a treatment plant until I was in college.

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What I remember as a kid was that Dad was an operator who worked on days for two weeks then on nights the next two weeks. When he worked nights, Mom would repeatedly tell us to be quiet so Dad could sleep before work.

I also remember riding by the treatment plant and Mom telling us, "there's the poopy plant; that's where Daddy works!" That was before the odor control system was put online. While driving by on one particularly odorous day, my younger brother John decided he wanted to be a banker like Uncle Charlie instead of working at the "poopy" plant. This became a pretty big joke in our family. Jokes aside, I could tell that my dad was passionate about his work. I remember him telling me that operators are true environmentalists who make a real impact every day.

My Educational Background

My path into the wastewater field was a little different from my dad's. I started researching colleges like a nerd as soon as ninth grade. Ultimately, I decided to attend SUNY ESF and graduated with a degree in environmental biology in December 2011. Although we had moved beyond the 2008 financial crisis, job prospects still were not great. It was difficult to find permanent employment in my field of study without a master's degree.

The summer after graduation found me preparing for the GRE, applying to graduate schools and taking civil service exams. During this time, I enjoyed working as a seasonal field technician with The Nature Conservancy. In the fall of 2012, I began a master's program in fisheries science and management at ESF, studying fish communities' response to the restoration of Onondaga Lake. My research focused on measuring the biological community progress in the lake my dad had helped restore.

OPERATORS ARE TRUE ENVIRONMENTALISTS WHO MAKE A REAL IMPACT EVERY DAY.

How I Became an Operator

I received the results of one of the Civil Service exams I had taken after starting graduate school. I was pleased to have earned the top score. This gave me the opportunity to follow in my dad's footsteps. I chose to accept a position at Onondaga County's WEP while continuing my studies. My career began as a wastewater technician. I collected wastewater samples at Onondaga County's treatment facilities. I was also responsible for collecting samples in support of our Industrial Pretreatment Program and Onondaga Lake Ambient Monitoring Program.

I was interested in learning more about the treatment processes at our facilities and soon transferred to a position as an operator at the Baldwinsville Seneca Knolls WWTP. This is when my passion for wastewater treatment really took off. I was incredibly fortunate to start my Operations career working for a truly dedicated head operator, Sig Pieklik. He was not only incredibly passionate about the work we do but was also an educator who wanted to pass on as much knowledge as he could to his crew.

I worked with a great team of people from Operations, Maintenance and Instrumentation/Electrical. I loved working in Operations. There was something new to learn every day. I enjoyed working in the field and I felt a great sense of pride in the service we provided. Another special thing about working in Operations was the comradery. There is nothing quite like snow blowing and shoveling sludge back into a tank for hours with your crewmates after a winter sludge transfer mishap to really help people bond!

While working in Operations I completed my master's degree. The next year I earned my 4A certification. One thing to know before taking this exam – it is no joke. It is a challenging exam. I was so relieved when they printed out my results and I had passed. I went back to my car and the first person I shared this news with was my dad. He asked me what my score was. When I told him, he said that he beat my score … the fourth time he took the exam.

My dad was resolved that he would earn his 4A. As a kid I remember the hours he put in studying for it. He took the exam decades after earning his 3A. Because of his experience he always recommends people take their exams as soon as they can after the training courses. It is harder later. I tell this story because these exams are truly challenging. There is no shame in needing to take them more than once. I am incredibly proud of my dad's resilience. Never give up, you can do it.

And What Happened to My Brother?

My younger brother John lost interest in becoming a banker. He ultimately enrolled in college at ESF. I think we can all see where this is headed. John accepted a position as an operator at WEP's Brewerton WWTP while he was completing his bachelor's degree. He ultimately transferred to Metro, earned his 4A, and is now a senior operator at the same "poopy" plant where our dad spent his career. Now when our family all gets together my dad, brother and I drive my mom and sister crazy because the conversation always seems to drift to wastewater. I am still holding out hope that we can convert my sister!

Navigating a Male-Dominated Workplace

I had an overwhelmingly positive experience working in Operations and in the wastewater sector as a whole. That said, I cannot ignore the fact that I faced some challenges as a woman in a male-dominated field. Some people were initially skeptical of my ability to perform the job. I am a petite woman standing just 5 feet tall. Their concerns quickly vanished when they saw my capabilities and work ethic in action. There were some things I had to do differently, but this was due to my height rather than my gender. For example, the chains on the many chain valves throughout the facility were at a length readily accessible for a much taller human. I had a step stool that I moved around the facility with me, but there was nothing we did that I could not handle.

I developed strong relationships with my co-workers. As a new and younger employee, I really wanted to fit in and be accepted. I understand that I have more opportunity as a woman in the work-

force today than at any other point in history. However, the unfortunate truth is that women still must navigate bias and harassment in the workplace just as we do in day-to-day life. This is by no means unique to the wastewater sector. I felt pressure to "prove" myself so that people would understand women are just as capable as men in this job. If I failed, it may cement someone's bias that this is a "man's" job. The fact that I succeeded simply made some people view me as the "exception" to the rule rather than eroding any bias. Sadly, proving myself would not necessarily mean that the next female operator would avoid experiencing that same bias.

Every one of us holds some forms of bias. My hope is that through training and open conversation we can move beyond our biases and promote inclusive work environments. I recently attended NYWEA's Justice, Equity, Diversity, and Inclusion Workshop for Water Professionals. I found this workshop to be extremely useful. I am glad to see NYWEA's focus on these topics and pleased that they are offering tools we can take with us to improve our own workplaces.

I have navigated responding to biased opinions, inappropriate comments, and in some instances clear sexual harassment. I do not believe I experienced this solely because I was working in a male-dominated field. I believe women experience this to varying degrees in all fields. As I gained experience, I learned better how to handle these issues. I was most fortunate to have a great deal of support from my mostly male colleagues. I learned that I did not need to accept inappropriate behavior in order for me to be accepted. Though there have been difficult situations I have had tremendous support, mentorship and encouragement along the way. I truly felt at home working in Operations. I felt we were a tight knit team of which I was a valued member. I was accepted.

Although women are underrepresented in Operations we live in a time where it is easier than ever to connect with people outside our immediate surroundings. It has been a joy engaging in NYWEA and seeing what other women operators are accomplishing in New York state. There are also opportunities to build community with female operators on social media, such as the Women of Water and Wastewater Facebook group.

As I move forward in my career, it brings me great pleasure to provide guidance and a helping hand to people entering the field, particularly those from underrepresented groups. While I am very passionate about promoting women in operations and the wastewater sector, it is important to recognize that women are far from the only underrepresented group. It has been an honor to be part of NYWEA's Diversity Equity and Inclusion Committee working on developing NYWEA's InFLOW (Introducing Future Leaders to Opportunities in Water) program. The program's aim is to enhance diversity and inclusion in the water workforce by engaging scholars from underrepresented demographics in NYWEA programs and conferences. The goals of InFLOW are:

- increase their interest in – and awareness of – opportunities for work in the water sector
- increase probabilities for employment
- aid in long term-success in the sector

Many people have helped lift me up to where I am today and continue to do so. I am grateful to be at a point in my career where I can help lift others.

Changing Paths: From Operations to Engineering

I felt a great sense of pride in being an operator. I was working to progress my career in Operations when an opportunity to join WEP's engineering team presented itself. It was not an easy decision to leave Operations, but I also had an interest in digging deep into data to solve problems. While we definitely use data to drive decisions everyday as operators, I felt I could devote more time to this in our engineering group.

I have now been a member of WEP's engineering team for more than five years. I have been able to hone a different skill set and expand my breadth of knowledge in the wastewater sector. I am grateful for the support and encouragement I have received as an engineer, most notably from our now Deputy Commissioner, Dave Snyder, who has and continues to take the time to mentor me and help me grow professionally. After he took on the role of Deputy Commissioner, I was excited to accept his previous role as lead process engineer. I get to work closely with our Operations team to achieve permit compliance, optimize treatment, and provide project management services for capital improvement projects.

While I continue to learn and grow as I take on new projects, it is hard to express just how invaluable my Operations experience has been. It has given me a strong foundation for the work I am doing now and has greatly shaped my perspective. I draw on that experience daily. It helps me better understand our operator's needs as we navigate through capital improvement projects and process changes. I continue to maintain my 4A certification and still feel that Operations is a part of my identity.

Looking Toward the Future

It is interesting how similar some of the challenges we face today are to those the wastewater sector faced when my dad first started in the 1970s. When he started, facilities were being built or greatly expanded and there was a need to ramp up hiring and training. Today we find ourselves in a similar situation. The infrastructure expansions from the Clean Water Act are all of similar age and in need of asset renewal. The workforce hired to keep those facilities running, have – or are now – reaching retirement. We are at a juncture of needing to refresh and re-staff our facilities.

Although I did not always expect to do so, I have been fortunate to follow in my dad's path. As he ended his career protecting our water resources, my brother and I were able to join as part of the next generation carrying that torch. Aging infrastructure and staff turnover due to retirements present challenges, but also opportunity. There are a multitude of ways one can join this sector, from working in municipalities, consulting, regulatory agencies, manufacturing, academia and the list goes on. My hope is that as we continue to onboard wastewater professionals, we all strive to eliminate our biases, celebrate our diversity, and create an inclusive work environment for all. I am proud to be part of this effort. I am proud to be a wastewater professional.

Danielle Hurley is a lead process engineer with the Onondaga County Department of Water Environment Protection. She may be reached at DanielleHurley@ongov.net.

Maintaining the Public Trust is Essential

by Carolyn Steinhauer

Each day a wastewater operator goes into work, great trust is placed in them to protect the health, welfare and safety of the communities they serve and our precious natural water environment. At times, the deck may seem stacked against them, amid aging infrastructure, insufficient staffing and increasingly common storm events. Despite these impediments, wastewater operators and their municipalities and employers in New York state step up to uphold environmental laws and protect water quality. They identify problems, network for potential solutions, and enact the best remedies based on science and experience.

Regulatory agencies – the U.S. Environmental Protection Agency (EPA) on the federal level and the New York State Department of Environmental Conservation on the state level – monitor to provide an essential safety net to ensure water quality is protected. Cases in which water quality has been consciously violated as a matter of convenience are the most egregious and will be vigorously prosecuted. One example comes from the files of the EPA's Environmental Crimes Case Bulletin. As excerpted on this page, the bulletin described a case involving an Iowa wastewater treatment plant superintendent who for several years rigged environmental testing to meet the plant's permit limits rather than address the problems with the treatment process. The consequences in this Iowa case were clearly justified.

In this issue of *Clear Waters,* we were only able to scratch the surface of the many talented, passionate individuals responsible for the safe and successful day-to-day operations of our state's wastewater facilities. We commend how they overcome the challenges they face with professionalism and integrity. We and future generations thank you.

Carolyn Steinhauer is NYWEA's Operator Certification Program administrator and may be reached at carolyn@nywea.org.

Federal Prison for Former Sioux City Iowa Wastewater Treatment Plant Superintendent – Rigged Environmental Testing for Years

The former Superintendent of the Sioux City Wastewater Treatment Plant, who conspired to cheat on environmental testing at the plant, was sentenced April 1, 2021, to three months in federal prison.

Jay Earnest Niday, age 63, from Sergeant Bluff, Iowa, received the prison term after an Oct. 6, 2020, guilty plea to one count of conspiracy and one count of knowingly falsifying, tampering with, and rendering inaccurate a monitoring device or method required to be maintained under the Clean Water Act.

The evidence at Niday's guilty plea and sentencing hearing showed that Niday was employed as the Superintendent of the Sioux City Wastewater Treatment Plant (WWTP). The WWTP is a large, regional sewage treatment plant for wastewater from industrial, commercial and residential sources throughout Siouxland, including Sergeant Bluff, Iowa; South Sioux City, Nebraska; North Sioux City, South Dakota; and Dakota Dunes, South Dakota. The WWTP's more than 20 industrial users produce a large volume of high-strength wastewater. Under a Clean Water Act (CWA) permit, the WWTP was required to treat wastewater before discharging it into the Missouri River, which has heavy local recreational use. Between Mar. 15 and Nov. 15 each year, when public use of the Missouri River was at its highest levels, the WWTP was also required to disinfect its wastewater to remove potentially dangerous human pathogens, including fecal coliform bacteria or *E. coli.*

The WWTP treated its wastewater with liquid chlorine, which kills bacteria but is potentially toxic to aquatic life. The WWTP's permit required the WWTP to periodically test its wastewater not only for the presence of fecal coliform bacteria or *E. coli,* but also total residual chlorine levels, to ensure that the Missouri River was not polluted.

Beginning no later than 2011, and continuing until at least June 2015, Niday and others knowingly withheld from the Iowa Department of Natural Resources (IDNR) serious problems with the WWTP's new treatment process.

Niday and others knew that the WWTP did not work properly and could not consistently disinfect the millions of gallons of wastewater that the WWTP was discharging into the Missouri River each day. In March 2013, an engineering firm prepared a "draft master plan" contemplated under a $1 million contract with the city and provided it to Niday and another person. The draft master plan discussed the disinfection problems at the WWTP at length and concluded the WWTP's treatment process could not provide adequate disinfection of the WWTP's influent given the apparently high toxicity in its significant industrial users' effluent. Instead of following the recommendations in the draft master plan, Niday instructed the engineering firm to not finalize the report.

Niday was sentenced in Sioux City by United States District Court Chief Judge Leonard T. Strand. Niday was sentenced to three months' imprisonment and fined $6,000. He must also repay $2,500 in court-appointed attorney fees and serve a two-year term of supervised release after the prison term. There is no parole in the federal system.

"Jay Niday deliberately worked with others to cheat on environmental tests, knowing he was polluting the Missouri River," said Acting United States Attorney Sean R. Berry. "His actions not only put recreational users of the river at risk, but also endangered the river's aquatic life. Niday's blatant disregard for the law, the safety of the community, and his reprehensible treatment of a vital waterway was outrageous."

"By intentionally tampering with the disinfection processes at the Sioux City Wastewater Treatment Plant, Jay Niday placed the community and its natural resources in jeopardy of sustaining significant environmental damage," said Special Agent in Charge Lance Ehrig of EPA's Criminal Investigation Division for Iowa. "The sentencing demonstrates that such violations will be vigorously prosecuted."

"Jay Niday knowingly manipulated data at a wastewater treatment plant that received millions of dollars in U.S. Environmental Protection Agency state revolving funds," said Daniel Hawthorne, Special Agent in Charge of the EPA Office of Inspector General's Western Region Field Office. "This sentencing fulfills the OIG's commitment with our law enforcement partners to ensure that falsifying data and undermining the integrity of taxpayer dollars will not be tolerated."

The case was investigated by EPA's Criminal Investigation Division, EPA's Office of Inspector General and the FBI. The case was prosecuted by a Department of Justice litigation team.

Source: Excerpt from the Environmental Crimes Case Bulletin, U.S. Environmental Protection Agency Office of Criminal Enforcement, Forensics and Training, April-June 2021. https://www.epa.gov/system/files/documents/2021-09/apr-jun.pdf.

Operator Quiz Winter 2022 – Test Your Math Skills

The following questions are designed for individuals/trainees pursuing certification as they prepare to take the ABC wastewater operator test. It is also designed for existing operators to test their knowledge. Each issue of *Clear Waters* will have more questions from a different process of wastewater treatment. Good luck!

1. If a 120 MGD flow of wastewater is dosed at a rate of 10 mg/l, what should the chlorine-feed setting be to the nearest 100 lb/d?

a. 10,000
b. 12,000
c. 1,200
d. 1,000

2. If chlorine costs $0.23/lb, what is the closest annual cost to chlorinate a 7 MGD flow rate at a chlorine dosage of 3.2 mg/l?

a. $15,700
b. $43
c. $1,570
d. $190

3. The influent suspended solids concentration is 90 mg/l. The effluent suspended solids concentration is 5 mg/l. Calculate the closest treatment efficiency of the plant.

a. 64%
b. 84%
c. 94%
d. 74%

4. Given the following data, determine the percent volatile suspended solids of this sample: weight of dish = 21.01 g, weight of dish and wet sample = 23.71 g, weight of dish and dry sample = 21.48 g, weight of dish and ash = 21.11 g

a. 21%
b. 52%
c. 96%
d. 79%

5. What is the weir overflow rate for a circular clarifier given the following: diameter = 60 feet and flow = 4 MGD.

a. 2,500 gpd/ft
b. 21,231 gpd/ft
c. 66,667 gpd/ft
d. 25,000 gpd/ft

6. Calculate the percentage reduction of BOD through the plant, given the following data: wastewater entering the plant has a BOD of 437 mg/l; plant effluent has a BOD of 42 mg/l.

a. 90%
b. 10%
c. 86%
d. 42%

7. The volume of a primary anaerobic digester is 60,000 cubic feet. The raw sludge feed rate is 8,000 lbs dry sludge per day and the volatile solids content is 78%. What is the organic loading rate in lbs VS/cubic foot/day?

a. 1.04
b. 5.85
c. 0.305
d. 0.104

8. How many pounds per day of polymer must be added to a flow of 15 MGD if it is required to be treated at a dose of 0.6 mg/L?

a. 75.06 lbs
b. 0.5 lbs
c. 125.1 lbs
d. 33.3 lbs

9. Compute the detention time in hours in a final clarifier given the following: diameter = 80 feet and depth = 12 feet and flow rate = 4.0 MGD.

a. 3.1 hrs
b. 2.7 hrs
c. 0.11 hrs
d. 4.6 hrs

10. Wastewater flowing at a velocity of 8.0 ft/sec. in a 96-inch diameter pipe. What is the flow rate in gpm?

a. 401
b. 3,006
c. 180,400
d. 768

Answers below.

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For those who have questions concerning operator certification requirements and scheduling, please contact Carolyn Steinhauer at 315-422-7811 ext. 4, carolyn@nywea.org, or visit www.nywea.org.

Answers: 1. (a) 10,000 **2.** (a) $15,700 **3.** (c) 94%
4. (d) 79% **5.** (b) 21,231 gpd/ft **6.** (a) 40% **7.** (d) 0.104
8. (a) 75.06 lbs **9.** (b) 2.7 hrs **10.** (c) 180,400.

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Clear Waters

New York Water Environment Association, Inc.

NYWEA Scholarship Application Period is Open!

Over $50,000 will be awarded in scholarship monies in 2023 to high school seniors and college students.

NYWEA STUDENT SCHOLARSHIPS include:

- **Child of Member Scholarships** ($4,000) for children of parents or guardians that are current NYWEA members whose child wants to follow in their footsteps and pursue a bachelor's degree in an environmental major.
- **Environmental Career Scholarships** (up to $12,000), Nicholas J. Bartilucci Scholarship (up to $8,000), and General High School Scholarship ($4,000) for high school seniors.
- **College Student Chapter Scholarships** (up to $4,000) for current members of NYWEA student chapters.
- **NG Kaul Memorial Scholarships** (up to $5,000) for graduate students interested in pursuing a career in government service. These named scholarships are in honor of NG Kaul, a former Director of DEC's Division of Water; up to $5,000 in scholarships is available to students pursuing graduate or doctoral degrees in environmental/civil engineering or environmental science concentrating on water quality who show a commitment to government service.
- **Jim Anderson Memorial Scholarship** ($1,250) for students attending school in the NYC metropolitan area.

(Deadlines for the above: February 28, 2023 at 5:00 pm.)

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OPERATOR SCHOLARSHIPS include:

- **Lucy Grassano Operator Scholarship** (Deadline: April 1, 2023)
- **Brian Romeiser Precertification Scholarship** (Deadline: March 1, 2023)
- **Avril D. Woodhead Grit Scholarship** (Deadline: February 28, 2023, 5:00 pm)

Visit nywea.org to learn more and view all scholarship eligibility criteria and application documents.

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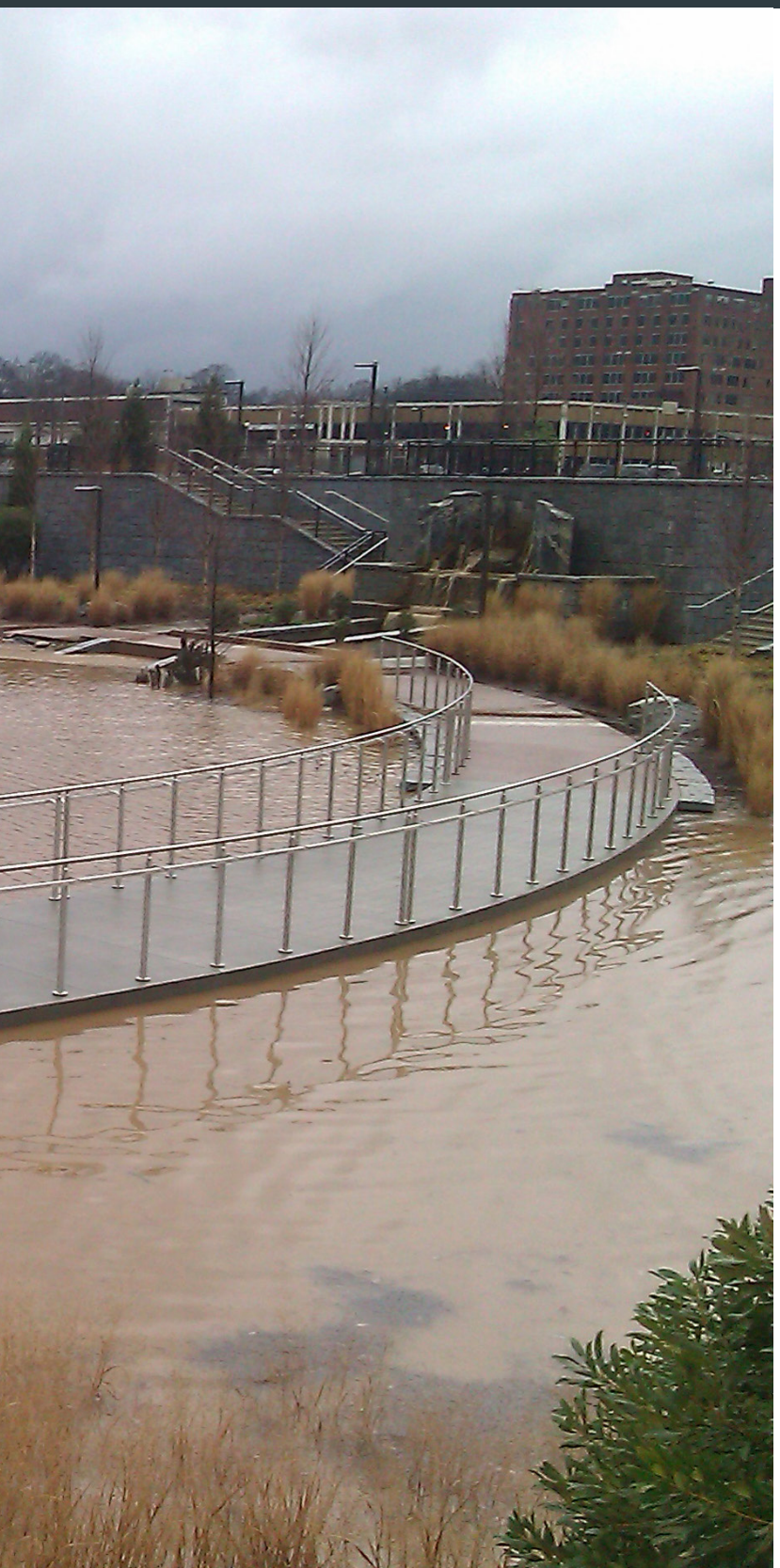

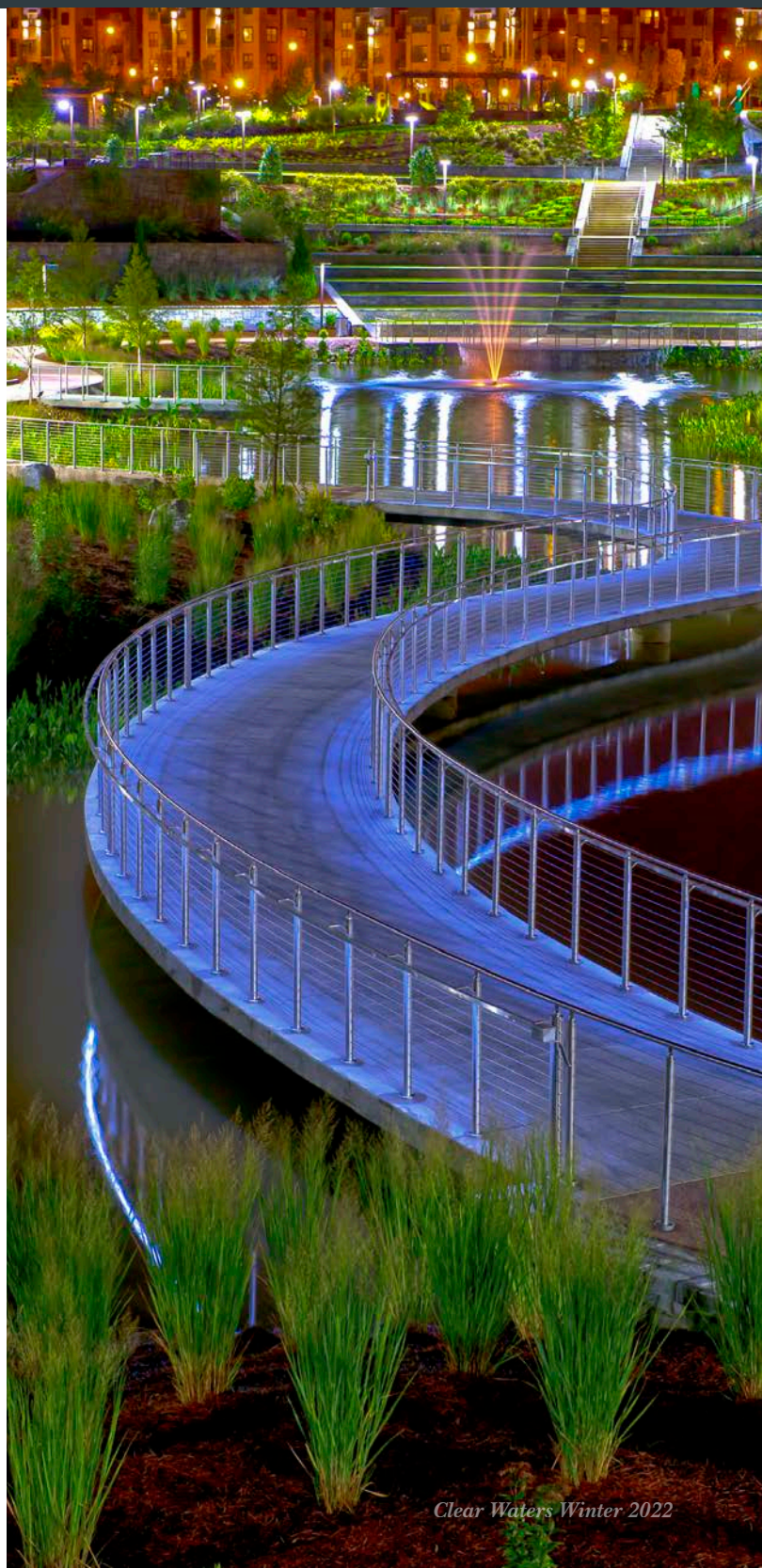

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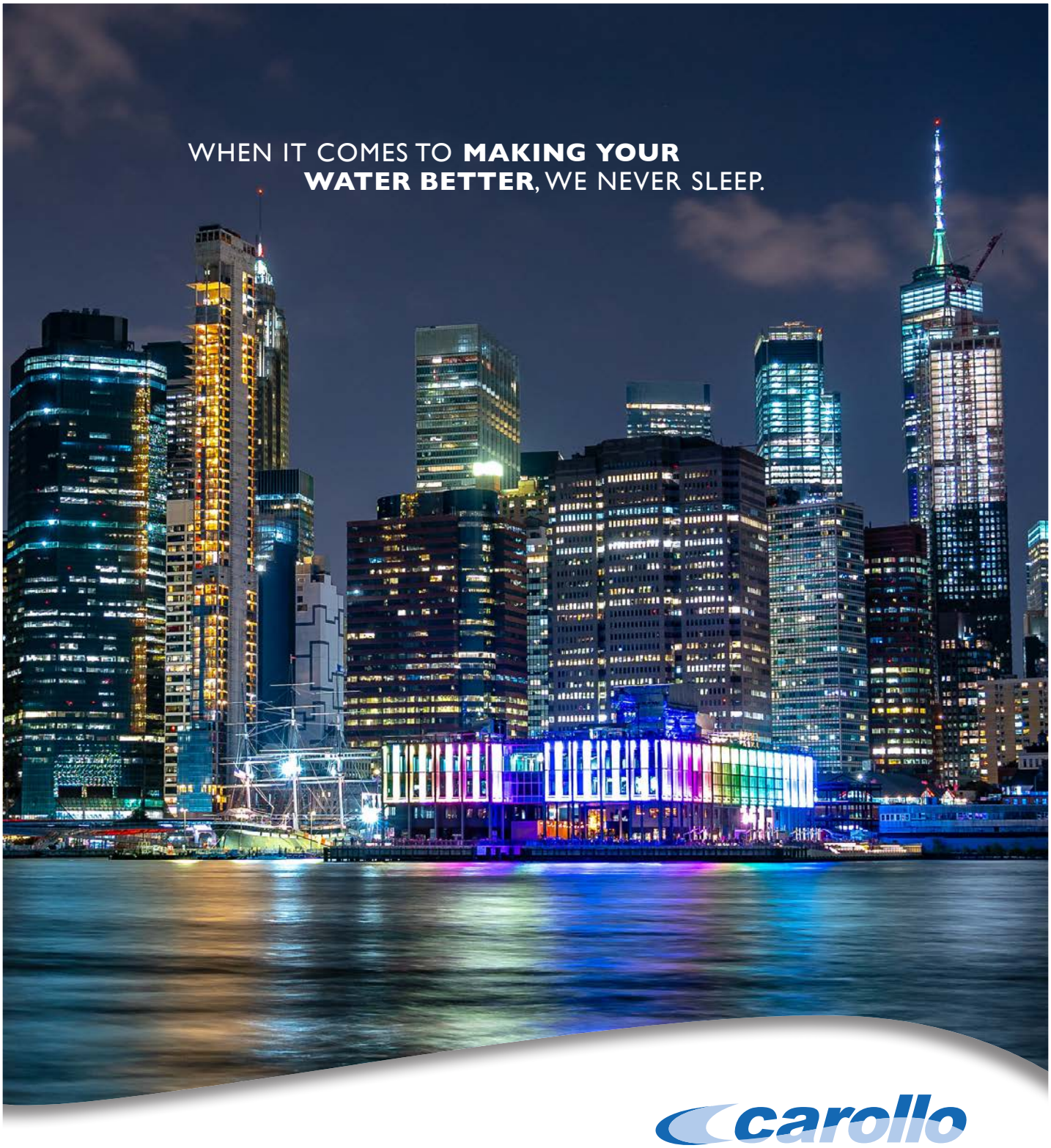

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