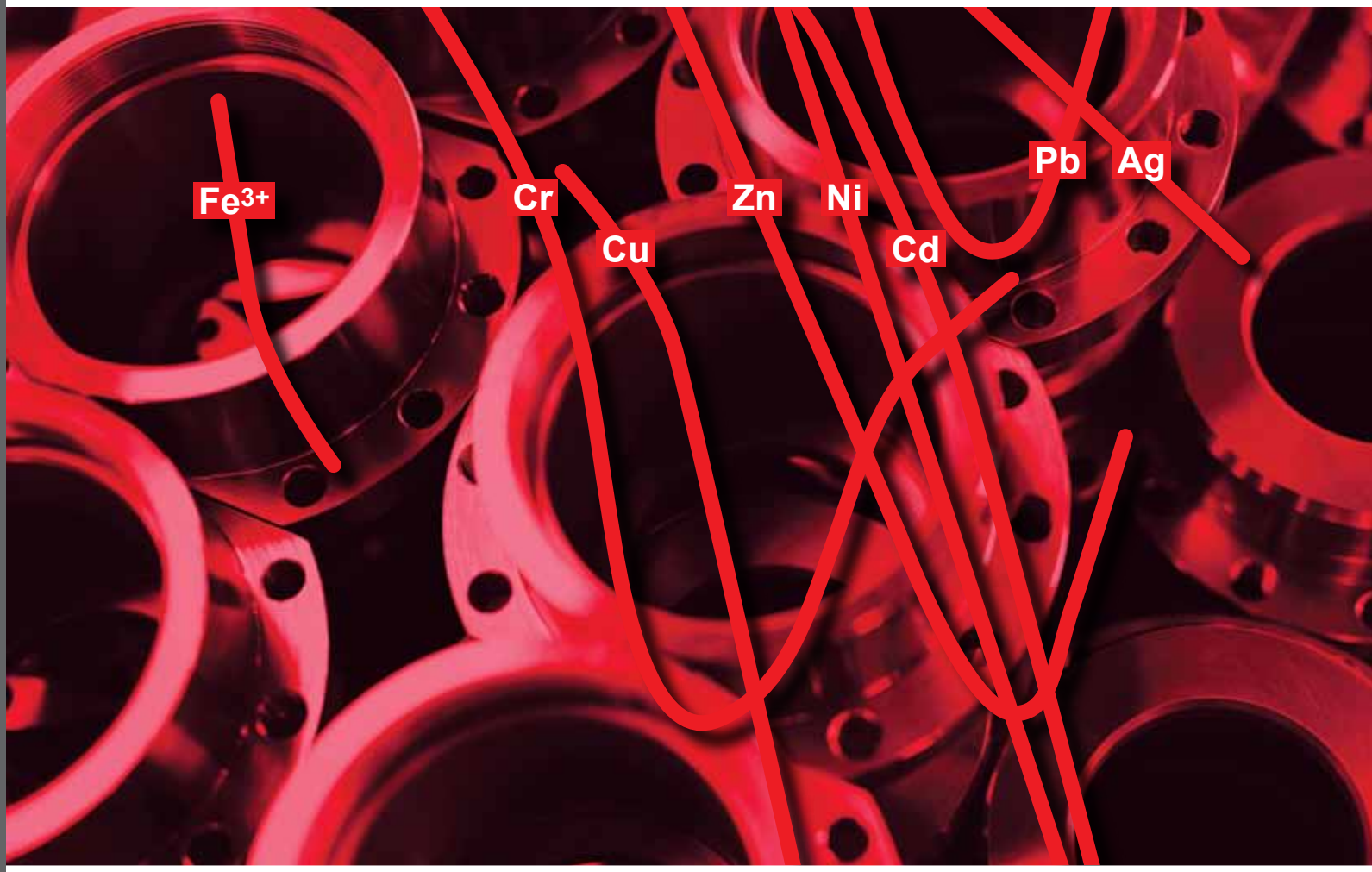
JOURNAL

OF THE NEW ENGLAND WATER ENVIRONMENT ASSOCIATION

VOLUME 58 NUMBER 1 / ISSN 1077-3002 **SPRING 2024**



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On the cover: Plotted pH solubility levels vary wildly for the eight EPA regulated metals, a pretreatment challenge for the metal finishing industry

Page 76: Measurement unit conversions and abbreviations

The concepts, ideas, procedures and opinions contained in the articles in this publication are those expressed by the various authors who submit the material for publication. The New England Water Environment Association, its executive committee, the editors, the executive director, and administrative staff hereby assume no responsibility for any errors or omissions in the articles as presented in this publication, nor are the concepts, ideas, procedures and opinions in these articles necessarily recommended or endorsed as valid by NEWEA, its executive committee, the editors, the executive director or staff. References to specific products or services do not constitute endorsement of those offerings by NEWEA. The Journal's committee reserves the right to make any editorial changes deemed necessary for publication of submitted papers.

NEWEA Journal ISSN #1077-3002
Published four times annually by
New England Water Environment
Association, Inc.
This is Volume 58 Number 1
Periodical postage paid at Woburn, MA
01801, and at additional mailing offices

New England Water Environment Association, Inc.
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Woburn, MA 01801-2155
Telephone: 781-939-0908
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Email: mail@newea.org
Website: newea.org

Postmaster:
Send address changes to:
NEWEA Journal
10 Tower Office Park, Suite 601
Woburn, MA 01801-2155

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Annual Conference
(pages 54–73)
Charles Tyler
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OUR ASSOCIATION WAS ORGANIZED NINETY-FIVE YEARS AGO in Hartford, Connecticut, on April 23, 1929, with the objectives of advancing the knowledge of design, construction, operation and management of waste treatment works and other water pollution control activities, and encouraging a friendly exchange of information and experience. From 40 charter members, the membership has steadily grown to more than 2,000 today. Membership is divided into the following classes:

Professional Member—shall be any individual involved or interested in water quality including any manager or other officer of a private waste treatment works; any person engaged in the design, construction, financing, operation or supervision of pollution control facilities, or in the sale or manufacture of waste treatment equipment.

Executive Member—shall be an upper level manager interested in water quality and who is interested in receiving an expanded suite of WEF products and services.

Corporate Member—shall be a sewerage board, department or commission; sanitary district; or other body, corporation or organization engaged in the design, consultation, operation or management of water quality systems.

Regulatory Member—this membership category is a NEWEA only membership reserved for New England Environmental Regulatory Agencies, including: USEPA Region 1, Connecticut Department of Energy and Environmental Protection, Maine Department of Environmental Protection, Massachusetts Department of Environmental Protection, New Hampshire Department of Environmental Services, Vermont Department of Environmental Conservation, and Rhode Island Department of Environmental Management.

Academic Member—shall be an instructor or professor interested in subjects related to water quality.

Young Professional Member—shall be any individual with five or fewer years of experience in the water quality industry and who is less than 35 years of age.

Professional Wastewater Operations Member (PWO)—shall be any individual who is actively involved on a day-to-day basis with the operation of a wastewater collection, treatment or laboratory facility, or for facilities with a daily flow of <1 million gallons per day. Membership is limited to those actually employed in treatment and collection facilities.

Student Member—shall be a student enrolled for a minimum of six credit hours in an accredited college or university.

WEF Utility Partnership Program (UPP)—NEWEA participates in the WEF Utility Partnership Program (UPP) that supports utilities to join WEF and NEWEA while creating a comprehensive membership package for designated employees. As a UPP a utility can consolidate all members within its organization onto one account and have the flexibility to tailor the appropriate value packages based on the designated employees' needs. Contact WEF for questions & enrollment (703-684-2400 x7213).

BECOME A NEWEA MEMBER

- Complete and mail the membership application form on pages 79–80
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2024 RATES ($)

Professional	215
Executive	385
Corporate	446
Regulatory	50
Academic	215
Young Professional	88
PWO	127
Dual	50
Student	27.50

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New England Water Environment Association | Statement of Ownership, Management and Circulation

Publication Title	The NEWEA Journal
Publication	#24559
Issue Frequency	Quarterly (four per year)
Annual Subscription Price	$24 (included with membership dues)
Complete Mailing Address, Known Office of Publication, General Business Office, Editors and Owner (non profit organization)	NEWEA, 10 Tower Office Park, Suite 601, Woburn, MA 01801
Contact Person/Managing Editor	Mary Barry, NEWEA Executive Director
Tax Status	No change during the preceding 12 months

Issue date for circulation data below: 09/30/2022

Publication title: The NEWEA Journal	Extent and nature of circulation: Technical/ Educational/ Environmental	Average no. copies each issue during preceding 12 months	No. copies of single issue published nearest to filing date
Total number of copies		1,984	1,935
Legitimate paid and/or requested distribution	Outside country paid/requested mail subscriptions	0	0
	In-country paid/ requested mail subscriptions	1,898	1,870
	Sales through dealers & carriers	5	5
	Requested copies distributed by other mail classes	0	0
Total paid and/or requested circulation		1,903	1,875
Total nonrequested distribution		0	0
Total distribution		1,903	1,875
Copies not distributed		81	60
Total		1,984	1,935
Percent paid and/or requested circulation		100	100

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President's Message

It is an honor and a privilege to serve as your 2024 NEWEA president, and I approach the office with a deep sense of responsibility and the energy required to lead and represent all of you, the membership of NEWEA. As a team, we of NEWEA should continue on our journey to address the current challenges and opportunities and those that lie ahead in our field. Together we must strive to foster collaboration, innovation, and sustainable practices to ensure the well-being of our communities and the preservation of our precious water resources.

This effort will require the continued great work of all of our NEWEA committees, leadership of the dynamic Executive Committee, the help and guidance of Executive Director Mary Barry and her team, and the dedication of all NEWEA members. You are all invited to work with us as we continue to promote excellence, knowledge sharing, and continuous improvement. Together, we can make a positive lasting impact concerning water quality.

By way of introduction, here is a short description of how and why I accepted the responsibility of this position, and why my presidential theme, Work for Water, is important to us all.

As a youth, disillusioned with school, unsure of a career direction but naturally attracted to water, I joined the Navy, where I spent a lot of time under the water on submarine duty. After that service, while seeking an occupational pathway, I bounced from job to job, working in restaurants, auto reconditioning, and furniture delivery, and finally landed work servicing porta-johns for a few years. That job required deposits at wastewater treatment plants, and while visiting one of them, I learned of an opening for an operator-in-training. As a young man with a wife and small child and with another one on the way, mounting bills, and no way forward, any opportunity for a stable job with good benefits sounded good. The firm operating the facility took a chance on me, a veteran with a GED, no wastewater license, and no facility experience; they saw something in me that I didn't and they invested in me, in my clean water career. Little did I know at the time that my desire to learn and willingness to progress were the two ingredients of a future clean-water leader. Their excellent management training and advancement opportunities, along with my natural affinity for clean water, helped shape me into the professional who is addressing you today as NEWEA president.

After 20 years at Veolia/Cranston, I accepted a superintendent position at a nearby facility, and now, after working at four plants, three with river discharges and one ocean facility, I have no regrets. Well, just one; I should have moved to an ocean facility sooner, as those discharge permits are easier to handle! While mentioning my facility, I thank my employer, the Town of Narragansett, specifically Town Manager Jim Tierney and Town Engineer Jonathan Gerhard; and special thanks to my facility team—Jenn, Kenny, Phil, and the entire "Gansett Gang"—for filling in for me when I'm away and allowing me the time to dedicate to NEWEA.

My story is just one of the countless testimonies that working in our industry is more than just work, much more. It becomes part of who you are, and you become part of something much bigger than yourself; you become part of a family, a water family, a big, inclusive, all-in, one-water family.

Imagine a workplace where everyone works for one common goal: from the newly hired mechanic to the superintendent, from the office clerk to the lab chemist to the pretreatment inspector to the water operator to the plant manager. The brass ring is 100 percent permit compliance, and getting there is the fun part.

Every day brings its own challenges; my coastal facility was recently gifted with over 4 in. (10 cm) of rain within 24 hours! Other nearby communities got 5 in. (13 cm) or more! Looking for a challenge? There is nothing boring about our jobs. But that's why we are called to this industry; some days it's easy, and others it's hard. It's clean and it's dirty (sometimes very dirty!). It's slow and it's fast. It's fun and it's frustrating. It's a newly built, shiny facility with bells and whistles, and it's a 60-year-old, duct-tape-and-baling-wire, low-budget, waiting-on-the-wrecking-ball plant. The many challenges can be daunting, but we all manage somehow, and we even (though sometimes wryly) smile. Why? Because we all work for water, clean water. We work for clean drinking water and we work for clean wastewater. We work for a cleaner watershed and water cycle. Water is what we do, and we do it right!

NEWEA and our water partners recognize and appreciate the highly skilled and talented water professionals working with us. We consider the human potential to be one of our greatest assets; yet another reason New England stands out as a national water leader. We value our people—all of you and your colleagues, from the CEO of a large engineering company to that newly hired water operator still learning the ropes; this amazing water family that we possess is what matters and what we must improve on, build on, and continue to nurture for the future.

Let's all Work for Water—for our community, for our environment, for our future.

NEWEA and our water partners also understand the significance, value, and need of succession planning; we all know that none of us are getting any younger! Programs and committees like our Workforce Development Committee, our military veterans' Water Warriors effort, and the New England Work for Water program need our collaboration and support. Programs like these will help foster tomorrow's water workforce for years, ensuring our industry continues to thrive.

Now is the time, *our time,* to share our work stories. Let's tell everyone what we do; the fun we have, the good things we do, the challenges we overcome, and the ultimate reward, the brass ring—Clean Water.

From the Editor

Welcome to 2024, NEWEA! This year, we are kicking off the *Journal* with a focus on pretreatment. The United States' National Pretreatment Program is in place to prevent the introduction of pollutants into not only publicly owned treatment works (POTWs) but also subsequent receiving water bodies. If left unchecked, these pollutants would interfere with the POTW's operation and wreak havoc on the receiving environment.

One extreme reminder of the dangers of industrial pollutants in a POTW comes from Louisville, Kentucky. On February 13, 1981, portions of the city's sewer exploded.[1] Ralston Purina Co., a soybean processing plant and industrial discharger to the city's Metropolitan Sewer District (MSD), leaked between 150 and 200 gal (570–760 L) of hexane into the sewers. Ralston-Purina caught and stopped the leak, but it was too late. The hexane that had made it into the sewers ignited and caused an explosion so large it demolished 13 mi (21 km) of sewer lines in a 3 mi^2 (8 km^2) area and created craters as deep at 38 ft (12 m) Surprisingly, only four minor injuries were reported from the event!

Jennifer Lawrence, PhD, PE
Environmental Engineer
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in 1981, a sewer exploded in Louisville, Kentucky—caused by a hexane leak into the sewer from a soybean processing plant

Another unfortunate consequence of the hexane spill was that MSD, in an effort to save its treatment plant, bypassed the plant entirely to avoid possible damage, and more than 60 MG (227 ML) per day of untreated sewage was dumped directly into the Ohio River, a drinking water source for downriver communities.[2] All of this to say—pretreatment programs are invaluable!

In this edition of the *Journal*, I am excited to highlight three examples of pretreatment in New England. The first article, by Thomas Groves, details the design, installation, and operation of a metals removal pretreatment system in Hudson, New Hampshire. This article lays out a comprehensive picture of compliance with pretreatment requirements; one of the most interesting parts of this article is the discussion surrounding industrial waste flow limits, and the company's creative workaround to reuse water and meet its manufacturing needs.

The next article, by Paul Calamita and AJ Johnson, takes a broader look at pretreatment and provides practical and tested advice about how communities and utilities can characterize per- and polyfluoroalkyl substance (PFAS) loadings to their water, sewer, and solid waste facilities, and how POTWs can work with upstream sources to minimize their PFAS loadings. Pretreatment certainly becomes more complicated when pollutants are measured in the parts per trillion!

The final article, by Luke Truman, takes a surprisingly even-broader look at pretreatment, by suggesting a novel strategy to enable breweries in Rhode Island to join forces, combine their pretreatment programs, and streamline the cost- and energy-effectiveness of their programs. I look forward to the progress that Luke makes on this front; perhaps, in a few years, we will have another NEWEA article praising the success of a unified brewery pretreatment program in Rhode Island?

Each of these pretreatment-themed articles ring true with Scott Goodinson's presidential theme, Work for Water. It's not just us, as water professionals, who work toward the ultimate reward of clean water; it's the local business owners who are navigating the pretreatment permitting process, community members investigating PFAS loadings into their private drinking water supplies, brewers looking to turn 7 pints of water into 1 pint of beer, and so, so many more. As we embark upon 2024, let us all Work for Water!

1. "The Big Bang" https://www.mswmag.com/editorial/2008/03/the-big-bang Accessed 3/15/2024.

2. "Series of Blasts in Sewer Lines Rips Louisville." https://www.washingtonpost.com/archive/politics/1981/02/14/series-of-blasts-in-sewer-lines-rips-louisville/2b377826-c1a6-455b-8998-8400c073f42c/ Accessed 3/15/2024.

Contribute to the *Journal*

NEWEA encourages all to submit a paper for publication in the *Journal*

2024 *Journal* themes and submission deadlines:

FALL—Wet Weather
Articles due July 1, 2024

WINTER—Biosolids Management
Articles due September 25, 2024

For more information visit newea.org/resources/journal-2/

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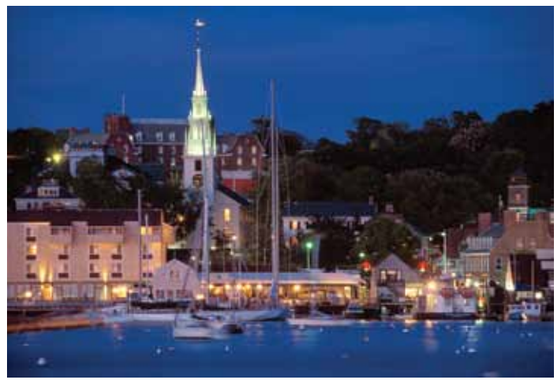

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The program, link to register, and exhibit information will be released soon.

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Industry News

View of Long Island Sound from Southport, Connecticut

Grants awarded to improve Long Island Sound

EPA joined federal and state environmental agencies and officials from New England and New York, including the National Fish and Wildlife Foundation and the U.S. Fish and Wildlife Service, in announcing 39 grants of $12 million to organizations and local governments to improve the health of Long Island Sound. The grants are matched by $8 million from the grantees themselves, resulting in $20 million in total conservation impact for projects in Connecticut, Massachusetts, New Hampshire, New York, and Vermont.

"Everyone that lives, works, and plays on the Sound deserves clean water and equitable access. By Investing in America, these grants, along with the huge investment in the Sound from the Bipartisan Infrastructure Law, put us on the right path," said EPA New England Regional Administrator David W. Cash. "Because of these investments, EPA is making good on its promises to uplift communities, make them more resilient to climate change, and improve the health of the Sound as a whole."

These 2023 Long Island Sound Futures Fund grants will support projects that improve water quality by preventing 2.7 MG (10.2 ML) of stormwater and 101,000 lbs (45,800 kg) of nitrogen pollution from flowing into Long Island Sound. The projects will also remove 120 tons (109 tonnes) of marine debris from the Sound and support restoration of 880 ac (360 ha) of coastal habitat and 102 mi (164 km) of river corridor vital to fish and wildlife. In addition, the projects will reach 30,000 people through environmental education programs that increase awareness of how to improve the health and vitality of the Sound.

A complete list of the 2023 Long Island Sound Futures Fund grant recipients is available at the National Fish and Wildlife Foundation website.

Annual report shows progress to protect communities from PFAS

In December, EPA released its second annual report on perfluoroalkyl and polyfluoroalkyl substances (PFAS) progress, which highlights accomplishments under its PFAS Strategic Roadmap over the past year to restrict, remediate, and research PFAS.

"This PFAS roadmap progress report illustrates EPA's ongoing commitment to protect people from the harmful effects of forever chemicals," said EPA Administrator Michael S. Regan. "By combining science-based solutions, historic funding, and impactful regulations, EPA is following through on the vision set out in our roadmap—to protect people, achieve environmental justice, and improve the lives of hardworking families across America."

The PFAS Strategic Roadmap aims to achieve the following:

- **Make PFAS use safer**: EPA finalized rules for new PFAS reporting, issued a framework for reviewing PFAS to ensure they are used as safely as possible, and proposed to eliminate exemptions for new PFAS and to restrict certain legacy PFAS.
- **Hold polluters accountable**: EPA has proposed to list perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) as hazardous substances under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the nation's Superfund law, and anticipates issuing a final rule in early 2024. This action would enable the agency to improve transparency around PFAS releases, help ensure that polluters pay for treatment and cleanup, and help communities that are facing significant pollution quickly receive effective protection. In the last year, EPA also added PFAS as an EPA enforcement and compliance priority from 2024 to 2027.
- **Protect America's drinking water and identify the scale of exposure**: EPA proposed the first national drinking water standard for six PFAS in March 2023. Once final, this rule will save thousands of lives and prevent tens of thousands of avoidable illnesses. EPA expects to finalize the rule in early 2024. Also, to better understand where PFAS exist and how people are being exposed to them, EPA initiated nationwide monitoring for 29 PFAS at more than 10,000 public water systems under the Fifth Unregulated Contaminant Monitoring Rule. Results are posted publicly each quarter through EPA's website.
- **Deploy infrastructure funding to invest in infrastructure projects to address PFAS in water**: Many communities need to install new infrastructure and treatment technologies to address PFAS in drinking water and wastewater. EPA is providing $10 billion to remove PFAS and other emerging contaminants—more than half to go to disadvantaged and underserved communities. In 2023, EPA distributed nearly $1 billion through the State Revolving Fund Emerging Contaminants programs, and announced the first $2 billion in grant funding to states, Tribes, and territories through the new Small or Disadvantaged Communities Emerging Contaminants grant program.
- **Turn off the tap at industrial polluters**: EPA has taken steps to use permitting and regulatory authority of the Clean Water Act to reduce PFAS pollution in our nation's waters, including regulations to limit PFAS discharges from PFAS manufacturers, metal finishers, and landfills.
- **Incorporate equity and environmental justice across EPA's actions**: EPA has worked to ensure that all communities have equitable access to solutions, to advance the goals of President Biden's Executive Order 14096, Revitalizing Our Nation's Commitment to Environmental Justice for All, and to integrate recommendations from the National Environmental Justice Advisory Council.
- **Advance the science**: EPA continues to build the scientific foundation on PFAS through research and development. The agency is investing in research to fill gaps in our understanding of PFAS, to identify which additional PFAS may pose human health and ecological risks and the corresponding exposure levels, and to develop testing methods.
- **Listen to communities and incorporate environmental justice**: EPA held listening sessions with community members affected by PFAS in each of its 10 regions, as well as a session specifically for Tribal partners. Feedback shared during these sessions will inform agency responses and help communities with environmental justice concerns access information and solutions.

In 2024, EPA anticipates finalizing national drinking water standards for several PFAS; finalizing the list of PFAS as hazardous substances under CERCLA; proposing Effluent Limitation Guidelines for PFAS manufacturers; issuing guidance on destroying and disposing of PFAS; finalizing methods to monitor for PFAS across media; and proposing rules designating certain PFAS as hazardous constituents under the Resource Conservation and Recovery Act. The agency also expects to continue engaging closely with state partners, who are addressing PFAS issues in their communities.

Inaugural Artist-in-Residence Program

EPA announced on February 1 the inaugural Artist-in-Residence Program in collaboration with the National Endowment for the Arts to recognize the impact that arts and culture play in shaping our lives, communities and nation. By launching this program, EPA is investing in arts and culture to boost engagement, awareness, and participation in critical water challenges, from aging infrastructure and climate impacts like flooding and storm surge to investment in safe drinking water. EPA Region 1, through its partnership with the Mystic River Watershed Urban Waters Federal Partnership, and Massachusetts Bays National Estuary Partnership, is one of the six locations chosen to participate in this program.

EPA is investing in arts and culture to boost engagement, awareness, and participation in critical water challenges

"This project will help connect communities to their rivers and estuaries—where the rivers meet the sea—in a whole new way. MassBays is thrilled to partner with the Mystic River Watershed Association (MyRWA) and EPA to make it happen," said Pam DiBona, director of the Massachusetts Bays National Estuary Partnership.

Daria Clark, MyRWA engagement manager, added, "As the most urban watershed in New England, it is so important to connect people with nature in their backyard. The opportunity to work with an Artist-in-Residence on community co-created projects is an exciting way to bring nature to the forefront of our cities."

EPA's inaugural Artist-in-Residence program will focus on opportunities to advance the goals of the National Estuary Program and the Urban Waters Federal Partnership, long-standing programs that have restored and protected treasured water bodies across America. In addition to the New England location, the other partnerships that will participate in the program include the following:

- Passaic River and Bronx and Harlem River Urban Waters Federal Partnerships: New York-New Jersey Harbor and Estuary Program
- San Juan Estuary Partnership
- Greater Philadelphia Area/Delaware River Watershed Urban Waters Federal Partnership: Partnership for the Delaware Estuary
- Green-Duwamish Watershed Urban Waters Federal Partnership: Puget Sound Partnership
- Middle Rio Grande/Albuquerque Urban Waters Federal Partnership
- Mystic River Watershed Urban Waters Federal Partnership: Massachusetts Bays National Estuary Partnership

Public and community engagement, outreach, and education are vital to both the National Energy Partnership and Urban Waters programs. Incorporating arts and cultural strategies into EPA's place-based programs will support innovative approaches and create lasting impact.

Note: All EPA industry news provided by EPA Press Office

Colleen Spero and her team from the Greater Lawrence Sanitary District, based in North Andover, Massachusetts, holding their Industrial Pretreatment Program Excellence Award, flanked by EPA's Mark Spinale and Jay Pimpare

New England wastewater personnel, facilities, and programs recognized

EPA's New England Office recently awarded several 2023 Regional Wastewater Excellence Treatment Awards to personnel in the wastewater field for outstanding commitment to improving water quality throughout the region.

"It's important for us to highlight those individuals and entities who excel in their work to protect our water quality and our health, and we at EPA congratulate them for their dedication to the environment and to our communities." said EPA's Cash.

Wastewater Treatment Plant Operator of the Year Awards

The EPA Regional Wastewater Treatment Plant Operator of the Year Award recognizes the employees of publicly owned wastewater treatment plants for their commitment to improving water quality with outstanding plant operations and maintenance. Only six individuals in New England received this award:

- Kenneth LaCasse, chief operator of the Hardwick, Vermont wastewater treatment facility, was recognized for his work in responding to the severe wreckage at the 0.37 mgd (1.4 ML/d) facility during the devastating floods in Vermont in the summer of 2023.
- Dan Copp, chief operator of the Johnson, Vermont wastewater treatment facility, was recognized for his work in responding to the utter destruction of the 0.1 mgd (0.4 ML/d) facility during the devastating floods in Vermont in the summer of 2023.
- Joseph Gaudiana, chief operator of the Ludlow, Vermont wastewater treatment facility, was recognized for his work in responding to the near-total flooding and influent main destruction at Ludlow's 1.05 mgd (4 ML/d) facility during the devastating floods in Vermont in the summer of 2023.
- Nate Brown, utilities superintendent of the Peterborough, New Hampshire, wastewater treatment facility, was recognized for his work in operating and maintaining his facility.
- Robert Wells, wastewater superintendent of the Middlebury, Vermont, municipal wastewater treatment facility, was recognized for his work over the years operating and maintaining the Middlebury facility.
- Kathy Perez, superintendent of the South Kingstown, Rhode Island wastewater treatment facility, was recognized for her work in operating and maintaining the facility.

Regional Wastewater Treatment Plant Operator of the Year Award: 1. Kenneth LaCasse 2. Dan Copp 3. Nate Brown 4. Robert Wells Joseph Gaudiana (no photo), Kathy Perez (see photo on page 43)

Wastewater Treatment Plant Operation and Maintenance Excellence Awards

The EPA Regional Wastewater Treatment Plant Operation and Maintenance Excellence Award recognizes the employees of publicly owned wastewater treatment plants for their commitment to improving water quality with outstanding plant operations and maintenance. Only three facilities across New England were chosen in 2023:

- Wells, Maine Sanitary District, led by Superintendent Nick Rico and which faced a fire that damaged the facility's electrical system
- Hanover, New Hampshire water reclamation facility, led by Superintendent Kevin MacLean (no photo)
- Burrillville, Rhode Island wastewater treatment facility, led by Superintendent Michael Emond

Wells, Maine Sanitary District, led by Superintendent Nick Rico, holding the Wastewater Treatment Plant Operation and Maintenance Excellence Award

Industrial Pretreatment Program Excellence Awards

The EPA Regional Industrial Pretreatment Program Excellence Award recognizes employees of publicly owned wastewater treatment plants for their commitment to improving water quality through outstanding oversight of industrial users discharging to the municipal sewer system. Two entities received awards for 2023 for excellence in inspecting, permitting, and sampling industrial users that discharge industrial waste into the collection systems leading to their respective facilities:

- Greater Lawrence Sanitary District's Industrial Pretreatment Program staff, led by Colleen Spero, for the 30 mgd (114 ML/d) regional facility
- City of Nashua, New Hampshire Industrial Pretreatment Program staff, led by Douglas Starr, for the 11 mgd (42 ML/d) municipal facility

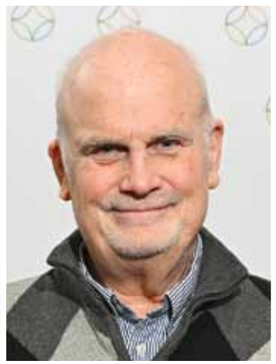
Regional Wastewater Trainer of the Year

The EPA Regional Wastewater Trainer of the Year recognizes the trainers of wastewater system operators. The 2023 winner was Betty Green, owner of B Green L&P Consulting, for her work as an instructor with the Granite State Rural Water Association.

2023 EPA Lifetime Achievement Award

The EPA Lifetime Achievement Award recognizes those in the wastewater treatment profession who have shown exemplary dedication to improving water quality over their entire careers. William L. Patenaude, who retired in 2023 after 34 years as an environmental engineer with the Rhode Island Department of Environmental Management, was recognized for his work over the years in the field. His founding of the Wastewater Leadership Boot Camp, a one-year professional and personal development experience for municipal wastewater staff, increased the professionalism of the sector not just in Rhode Island but in other states that have since adopted this training.

Michael Emond, superintendent Burrillville, Rhode Island wastewater treatment facility



Douglas Starr, Nashua, New Hampshire Industrial Pretreatment Program

Betty Green, B Green L&P Consulting— Regional Wastewater Trainer of the Year

William L. Patenaude, Lifetime Achievement Award

Call for Presentations and Papers

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Installation of an industrial wastewater pretreatment system using precipitation and microfiltration for metals removal

THOMAS GROVES, JMD Industries Inc., Hudson, New Hampshire

ABSTRACT | JMD Industries Inc., a small family-owned metal finishing company in southern New Hampshire, performs metal finishing services including aluminum anodizing, conversion chromate coatings, zinc electroplating, electroless nickel-plating, stainless-steel passivation, painting and powder coating, and other coating and plating services. In 2015, the company decided to reevaluate its business strategy. Growth opportunities were apparent, but the company also had to upgrade its production processing and wastewater pretreatment equipment due to aging infrastructure. This article describes the selection process, installation, and performance of the new pretreatment system, which includes precipitation and microfiltration for metals removal.

KEYWORDS | Pretreatment permit, complex heavy metal waste, ion exchange, hydroxide precipitation, calcium polysulfide, metal waste microfiltration

Since moving from Massachusetts to southern New Hampshire in late 1977, the JMD Industries metal finishing company has seen many changes and additions to the plating services and coatings it offers. Originally a decorative finishing service, the company has steadily grown to serve the commercial and industrial market. As it added new finishes, process waste and wastewater additions were made for each new process, in some cases requiring a stand-alone process to pretreat the influent rinse water from the specific waste stream. Although many rinse water streams could be commingled before treatment, others contained certain complexing agents, or chelators, which required special treatment before being introduced into the main influent stream. This would allow the facility's main wastewater pretreatment system to treat the contaminants present and sustain compliance with discharge into the municipal sewer. After 35 years of production, the facility required several pretreatment areas dedicated to specific plating lines. In 2015, these pretreatment areas included:

- Area dedicated to ion exchange of the conversion chromate process rinses—180 ft² (17 m²)
- Area segregated for cyanide destruction—480 ft² (45 m²)
- Area for hexavalent chromium reduction—180 ft² (17 m²)
- Final treatment area for pH adjustment, metals precipitation, solids settling/separation, and dewatering via filter press—1,100 ft² (102 m²)

This disjointed pretreatment layout was performing as required; however, the demand for better utilization of the space available, as well as better utilization of labor and chemistry, required a reevaluation of the entire wastewater treatment system.

PRETREATMENT PROCESS/WASTEWATER TREATMENT SYSTEM

To build a modern, cost-effective, and easy-to-operate wastewater pretreatment system, we had two technologies to combine: the chemical treatment process regarding metals reduction and solids formation, and the mechanical separation process regarding solids precipitation, segregation, and eventual removal. When researching replacement options for the outdated pretreatment systems, we performed benchtop testing with raw wastewater samples from the shop floor. Benchtop testing was done to evaluate method success or failure, as well as to estimate anticipated dosage rates of treatment reagents on a larger scale, without having to use the pretreatment system for experimentation.

Jar samples of roughly 1 L (0.26 gal) were taken from the concentrated rinse streams and treated with various treatment reagents, including standard hydroxide precipitation chemicals such as lime, sodium hydroxide, ferrous sulfate, sulfuric acid, calcium chloride, etc. Specialty reagents, designed to treat the complex waste streams, were also tried. The metals that were targeted for removal included copper, tin, aluminum, chromium, nickel, and zinc. We also had to factor in the removal of chelating/complexing agents, such as ammonia found in the electroless nickel bath, gluconates present in the aluminum etch baths, and citric acid used for stainless steel passivation. These complexing agents are particularly problematic, as they prevent sodium hydroxide from precipitating metals out of the solution and can affect the entire waste stream. Changing flow rates was another factor.

In addition to the fabrication of a new pretreatment system, a modification to the existing pretreatment permit would also need to be completed, submitted, and approved by the town and state before such a system could be operated. Understanding local sewer "use" requirements and meeting with the local municipal planning committee early in the permitting process was critical to avoid unwanted surprises later in the project. Approval of proposed discharges from industries often depends on the capacity of the local collection systems and the size and age of the local publicly owned treatment works (POTW) receiving the discharge. If the sewage pumping stations downstream from a facility are overtaxed, or the POTW is nearing capacity, sourcing additional volume may require ingenuity. The municipality may restrict increases in flow based on these variables or for other reasons such as allotments based on facility square footage or zoning standards. For these reasons, increased effluent flow requests in our initial application were denied. After recalculating our volumes of sanitary effluent and process effluent, we realized that we could reallot a portion of our sanitary flow to the process side of flow. Once we decreased our sanitary discharge allotment and provided a smaller increase for our process discharge allotment, our application was approved. The approved application allowed for about half of the increase in total water usage expected; the other half of the expected increase would have to come another way.

System installation

UPDATED PRETREATMENT PROCESS DESIGN

The best treatment option identified through jar testing, with relatively low dosage rates, was a calcium polysulfide blend. This provided the best removal over a wider range of pH even in the presence of complexed and mixed waste streams. With the testing data in hand and in collaboration with the equipment manufacturer and chemical supplier, we created a final whole system design. This design included a provision for water reuse, which could be added later if needed, to recycle part of the pretreated effluent flow and send it back to process for use in selected areas. Including a water reuse plan during the initial design of the overall system was the best option, if water reuse may eventually be needed. Tank sizes, plumbing configurations, flow rates, and pollutant information were all relevant to the reuse plan, and estimating available floor space in future was presented for consideration.

A basic two-step, two-component combination was chosen for the chemical treatment part of the updated pretreatment process. This consists of a calcium polysulfide precipitant (CaSx) for metal reduction in combination with a low molecular weight inorganic coagulant to aid in particle formation. Concurrently, sodium hydroxide is used to control pH in both the primary reaction/reduction tank and the Stage 2 precipitation/neutralization tank.

The benefit of using the calcium polysulfide blend rather than standard hydroxide precipitation is that the time-consuming pretreatment of certain complexed waste streams is no longer required. This simplifies plumbing layout, requires less space for pretreatment, reduces operator labor, and increases the consistency of treatment chemistry dosage rates.

For the mechanical part of the treatment system, a single-stream, programmable logic controller (PLC)-controlled, pH-adjust, reduction, and precipitation tank sequence was designed, followed by separation of precipitated solids, sludge thickening, and sludge dewatering.

New shop floor process rinse protocols, including drag-out rinses, were also incorporated into the two step system, to allow for a higher concentration of process rinse contaminants in a smaller, isolated volume of water. Drag-out rinses followed by single or double cascading counter-current rinse tanks are considered a "best practice" for rinsing. These effective rinse methods allow for reduced flow rates while still achieving specified total dissolved solids (TDS) values at the final rinse step.

In the full system layout, the tank sequence starts with a 2,000 gal (7571 L) high density linear polyethylene (HDPE) tank for process equalization, where all incoming wastewater is commingled before the first stage of treatment. The equalization (EQ) tank is larger than the system's other tanks to help reduce variation in the influent simply by diluting any swings in pH,

Microfilter

metal concentration, or other contaminants present in the influent. The larger the tank, the better the equalization, and since space is valuable, this tank is narrow but tall. The EQ tank is operated to keep the pH generally between a pH of 3.0 and 5.0. This is done by monitoring the influent streams and, if needed, spent acids from the aluminum anodizing process (or any non-chelated dilute acid) may be slowly metered in to assist in pH control and aid coagulation further downstream. (It is important to include this activity, if it is used, in the permit particularly if the spent acid is a Resource Conservation and Recovery Act [RCRA] hazardous waste.)

The EQ tank is pumped into the Stage 1 treatment tank to deliver up to 60 gpm (227 L/m) via a 2 hp (1.5 kW) 3,450 rpm pump. This first pump in the system has a screen filter to catch large particles that could damage the pump or get trapped in the flow meters.

The Stage 1 treatment tank is a 1,000 gal (3785 L) HDPE closed-top tank with a 350 rpm 1/3 hp (0.22 kW) mixer. The mixer has a three-blade modest angle prop for gentle mixing. The Stage 1 treatment tank is the primary pH adjustment and primary reduction tank. A reducing agent (CaSx) is added via a 2 gph (7.6 L/h) polyvinylidene fluoride (PVDF) metering pump with the feed rate determined by oxidation-reduction potential (ORP). The pH is raised using sodium hydroxide to keep the pH between 6.0 and 8.0. A sludge return loop from the final third tank in the precipitation sequence is introduced into the Stage 1 treatment tank. It delivers roughly 5 to 10 percent of the overall flow in the form of aged sludge, which helps seed the reaction, increasing overall sludge retention time and assisting with pH adjustment.

The reducing agent, a calcium polysulfide product, combined with the aged sludge, allows a faster (nearly instantaneous) and consistent reaction with less chance of unpleasant odors.

The best results were achieved using a 1,000 gal (3,785 L) tank and operating at a flow rate of up to 40 gpm (150 L/m). Since our influent flow is intermittent with varying flow rates, the EQ tank has a level sensor that initiates flow and pumps into the first treatment stage at a constant rate (set to roughly 30 gpm [114 L/m]) until the EQ tank is pumped down to its minimum desired level. Power to the feed pump stops, and the process repeats over and over as long as influent from the shop floor is accumulating. The Stage 2 treatment and the third "microfilter feed" or sludge accumulation tank flows are fed by gravity and overflow from the Stage 1 tank, so the flow rate of the precipitation tank sequence is determined by the flow rate setpoint of the process equalization to the Stage 1 feed pump.

The Stage 2 neutralization/pH adjustment tank is a 1,000 gal (3,785 L) HDPE closed-top tank also fitted with a 350 rpm 1/3 hp (0.22 kW) mixer. A cationic coagulant is metered into this tank to aid particle formation and structure. The coagulant is a solution of aluminum sulfate with an iron additive specifically for the calcium sulfide metals precipitation system. The coagulant pump is fed via a 1 gph (3.8 L/m) PVDF metering pump. This pump is powered on and off by the system PLC simultaneously with the process EQ pump, so coagulant is added only when the flow is present. In this way, dosage rates can be adjusted manually by adjusting the metering pump speed controller. The Stage 2 tank pH level is raised from an incoming pH of 6.0 to 8.0 to a final pH of 9.0 to 10.0 using sodium hydroxide. The hydroxide pumps in the system all employ 4 gph (15 L/h) PVDF metering pumps.

The Stage 2 tank has an access lid on the top of the tank for obtaining samples. This is the point in the precipitation process where the precipitate structure is evaluated. In general, properly formed particles will settle quickly, accumulate to roughly 10 to 20 percent (by volume) solids in the sample vessel, and leave a clear layer of supernatant liquid on top of the sludge layer. The presence of excessive pin floc could indicate the need for an adjustment of coagulant feed rate, or sludge return rate in Stage 1 may be required. This is also an opportunity to test for metals removal. The presence of dissolved metals above permit limits in a filtered sample of the supernatant liquid would indicate the need for an increase in precipitant in Stage 1.

The third ("microfilter feed") tank in the system is a 900 gal (3400 L) HDPE tank and receives flow from Stage 2 via gravity. No chemical additions are made in this tank; it is solely designed to provide a vehicle for the microfilter flow loop. As the incoming flow from Stage 2 accumulates in the tank, a level sensor initiates the microfilter feed pump and passes the solution out of the tank and through the microfilter assembly at a high speed and relatively low pressure. Solids separation occurs when the treated flow concentrate passes across the filter media, the clear water permeate passes through the membrane media to eventual discharge, and the now thicker, sludge-laden liquor remains in the concentrate loop and returns to the feed tank. During this action, the sludge concentration in the microfilter feed tank increases as more and more concentrate is pumped through the loop. The process is like a reverse osmosis (RO) system except that the concentrated "reject" is returned to the holding tank to be pumped continuously through the loop until the solids and liquids are separated. When the tank becomes too concentrated with solids to afford an efficient permeate flow rate, the remaining sludge in this tank is wasted off to a separate holding tank for thickening and processing through a filter press.

The pump used to feed the concentrate to the microfilters is critical to the system. At the system design phase, pump sizing is based on the viscosity of the solution, rate of flow, pipe diameter, and quantity of microfilter tubes assembled in the loop. This system, sized to achieve up to a 60 gpm (227 L/m) permeate flow rate, employs a 25 hp, 400 gpm @ 60 psi (18.6 kW, 1500 L/m @ 4.1 bar) 3,450 rpm pump. The filter skid contains 12 microfilter tubes, with a pore size of 0.1 µm, configured in a loop via a 4 in. (10 cm) ID sch 80 PVC pipe.

The final filtrate (permeate from the microfilter tubes) is collected in a 1,100 gal (4,160 L) HDPE tank and is accumulated for final discharge. If required, the pH of the filtrate is adjusted using dilute sulfuric acid or sodium hydroxide to meet sewer use/permit requirements. The tank is operated on/off with a level sensor and discharges directly to the sewer outfall using a 1.5 hp (1.1 kW) pump.

The PLC controls system operation, flow, pH, and ORP, and must-have safety interlocks when variable flow rates are unavoidable. As membranes become fouled, and the flow rate is decreased, the headworks must be stopped or slowed accordingly, or tanks will overflow. Interlocks for high/low pressure, pH at various points in the treatment process, ORP value in Stage 1, or membrane back-pulse frequency are only some of the critical attributes that the system PLC must control. Features like programmable sludge return rate and volume are critical to maintaining consistent particle formation. Monitoring of internal permeate and concentrate pressures in the membrane loop determines media health and schedules a cleaning event. Fabrication of a PLC panel proportionate to the system makes the difference between operator monitoring and operator involvement at every level.

Given the pretreatment system's complexity, both an experienced equipment supplier and a skilled treatment chemistry supplier are critical when evaluating a microfilter pretreatment system. Having the two suppliers share technologies during the design phase increases the likelihood of success. System support equipment, waste feed pumps, tanks, pH and ORP controllers, metering pumps, etc., should be sized to deliver treatment chemistry efficiently and the pretreatment system PLC must be set up accordingly. In this system, a talented and experienced local supplier was available for both the system design and installation and the development of the treatment chemistry protocol simultaneously.

PRETREATMENT SYSTEM INSTALLATION AND OPERATION

The permit approval process for installing or modifying an industrial wastewater pretreatment system may take time depending on a few variables. These variables include scheduling and availability of the authority (or authorities) having jurisdiction (AHJ), the complexity of the system being proposed, the volume of supply water being requested, and downstream impacts such as to the local POTW and support infrastructure.

The local planning committee may need to discuss a proposal at their periodic meetings, or a municipality may hire an outside engineering firm to review the permit request before submission to the state for final review and approval. Any of these authorities may make additional information requests which can slow down the process, so it is best to include as much information as possible when preparing the initial application. New systems will require the engineering plans to be signed by a recognized professional engineer before state approval. The AHJ will likely request a system operating procedure including daily and periodic maintenance preplanning.

With the permit application(s) submitted, the wastewater treatment plant system installation began and proceeded smoothly. The facility floor space was prepared, and equipment had been procured and steadily installed per the system schematic, ready to go once the permit was approved. Production was unaffected since the existing pretreatment process could be used until the start-up of the new system. Once flow in the new system was established, pretreated wastewater samples were extracted and analyzed by an independent laboratory within a 30-day time limit, with results submitted to the AHJ. This was anticipated, as periodic independent lab testing is a part of the permit requirements. Initial testing exhibited all effluent concentrations well below the categorical and local limits.

OPERATION AND LOADING CHARACTERISTICS

As days and weeks passed, PLC setpoints were "tweaked" to optimize flow rates and feed pump dosages. The goal is to control the influent flow to provide as much consistency as possible for pH and metal concentrations while operating the pretreatment system to provide effluent metals levels as low as reasonably achievable while still exhibiting some measurable presence.

Having detectable metals present in your effluent while staying well below permit limitations ensures that overdosing is not evident. Riding too close to the upper limit on metals could result in an effluent spike and possible non-compliant discharge if an unexpected

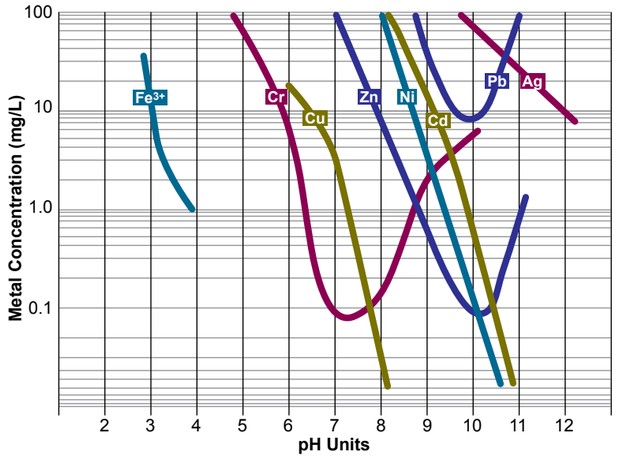


Figure 1. Hydroxide solubility of heavy metals varies by pH—in a complex waste stream, basic hydroxide metals precipitation is difficult

Graph adapted from Hoffland Environmental, Inc.

slug of concentrated influent were to occur. A safe compromise between compliance risk and reasonable precipitant chemistry budgeting is to pretreat the wastewater to achieve about 10 percent of the permit upper limit—if possible—with emphasis on any of the RCRA eight metals (if present) or, if known, which metals in the influent are most difficult to remove due to complexing agents in the waste stream. For example, if the permit allows for a daily maximum of 2.61 mg/L and a 1.48 mg/L monthly average of zinc in the effluent, setting dosage rates to provide about 0.15 mg/L zinc in the effluent would be a safe target. However, if there is a daily and monthly limit of 2.77 and 1.71 mg/L, respectively, of chromium, and the waste stream is complexed, the chromium may be harder to remove at a standard pH of 9.5, so targeting chromium to discharge at 0.1 or 0.2 mg/L

$$Cr^{+6} + 1.5CaS_2O_3 + 1.5H_2O \rightarrow Cr^{+3} + CaSO_4 + 1.5S + 3H^+$$

Where:	Cr^{+3} = Trivalent Chromium
Cr^{+6} = Hexavalent Chromium	$CaSO_4$ = Calcium Sulfate
CaS_2O_3 = Calcium Polysulfide	S = Sulfur
H_2O = Water	H^+ = Hydrogen Ion

Figure 2. Equation showing chromium precipitation as a trivalent hydroxide utilizing calcium polysulfide as a precipitant aid

Table 1. General operating conditions

Pollutant	Influent Loading*	Permit Limit (PPM)	Effluent Avg.
Nickel	20 – 115 PPM	3.98 daily/2.38 Mo. Avg.	0.12 PPM
Zinc	5 – 105 PPM	2.61 daily/1.48 Mo. Avg.	0.16 PPM
Chromium	16 – 90 PPM	2.77 daily/1.71 Mo. Avg.	0.10 PPM
Copper	1 – 25 PPM	3.38 daily/2.07 Mo. Avg.	0.08 PPM

*Daily average, with all production lines operating. This does not include influent spikes or non-typical production levels.

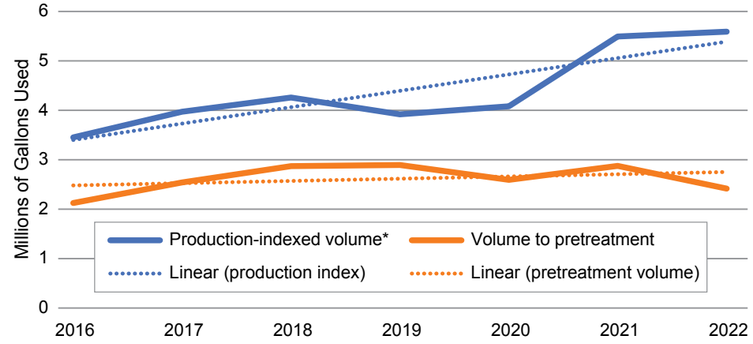
may require raising the precipitant dosage slightly and dropping the pH to about 8.5 or lower. This could be difficult when using basic hydroxide precipitation, as the dissolved zinc may likely begin to rise again (Figure 1).

Using CaSx as the primary precipitant aid means pH adjustment would likely not be needed. Tailoring the precipitant pump rate may be performed to target the most problematic metal without having to constantly adjust pH. This is the primary reason the calcium polysulfide was chosen over simple hydroxide precipitation or the use of other more toxic chemicals such as DTC (sodium dimethyldithiocarbamate) as a precipitant aid. With the CaSx, most heavy metals will precipitate out as insoluble metal sulfides (e.g., FeS, NiS, CuS, ZnS, or CdS). Any excess calcium precipitates as calcium carbonate or calcium sulfate, and hexavalent chromium is reduced to trivalent chromium, as shown in the chemical reaction equation (Figure 2), with the trivalent chromium precipitating as chromium hydroxide ($Cr(OH)_3$).

The reaction happens over a wider pH range, so constant adjustments are not necessary, and spikes in metal concentrations coming into the system are not nearly as worrisome. Nickel rinses complexed with ammonium hydroxide (NH^4+OH) can be combined with copper, zinc, and chromium rinses and still deliver metals removal rates below 1 mg/L at a pH of 8.5 to 9.5.

As weeks of operation turned into months, and the company growth became a reality, using the new drag-out rinse/cascading rinse protocol on the shop floor was clearly not only a benefit in water use reduction but also to the pretreatment scheme If the influent to pretreatment showed a rising pH trend, the pretreatment operator could go onto the shop floor, do a selective drag-out rinse tank dump or partial dump, and correct the trend by using existing acidic wastewater rather than by increasing the dosage of an acid pump. The trend's root cause could then be found and eliminated. In 2019, flow restrictors were added to many of the rinse lines, where feasible, allowing for further control (and restriction) of total flow; this all but eliminated the risk of unexpected slug influent events due to operator error, while allowing for more increases in production without substantial flow increases (Figure 3).

Influent metals loading will vary depending on production levels (Table 1). For example, if the nickel-plating line is running, the influent to the pretreatment system will contain roughly 100 to 400 ppm of dissolved nickel. If the conversion chromate line is also running, it may contribute close to the same concentration of chromium; however, when both lines are running, both metals concentrations will drop, due to dilution. When several lines are operating, influent concentrations change even more. This effect can make dosing of precipitant chemistry based solely on a metering pump anywhere from difficult to impossible when treating wastewater in a mixed job shop. Dosing using ORP allows for precipitant adds based on a mV value which rises and falls in real time with the concentration of dissolved metals in the influent. Introducing proportionate additions of aged sludge to the precipitation reaction scavenges any leftover traces of chelated metals surprisingly well.



*Production indexed volume includes water reused through drag-out rinse/cascading rinse

Figure 3. Increased production water usage through the drag-out rinse/cascading protocol while limiting increased pretreatment volumes

Effluent concentrations are consistent once the ORP upper and lower setpoints (and other factors) are established. If the presence of complexing agents in the influent is increased, typically the precipitant dosage (and sludge return) can be adjusted to offset the condition. Additional measures may be taken if a slug of particularly chelated wastewater enters the system. Knowing the characteristics of each waste stream on the shop floor and keeping tabs on the daily production plan helps minimize surprises for the pretreatment operator. The ability to extract samples at any time and analyze them for target metals also helps. Running an effluent sample on an atomic absorption analyzer with instant results benefits initial evaluations, system setup, and ongoing monitoring.

CONCLUSION

The new system not only simplified the pretreatment process, but it also saved valuable floor space. Subsystems for cyanide destruction, chromium reduction, and ion exchange were all eliminated, freeing 800 ft^2 (74 m^2) of shop floor space previously dedicated to the department. Operator labor and chemistry handling were reduced due to the upgrade, as well as risks to personnel safety in these areas. The successful start-up and the upgraded pretreatment system's continued consistent operation can be attributed to effective preplanning in key areas:

- Sizing the pretreatment system and its associated components properly, according to the volume, pollutants present, and concentration of the influent stream
- Selecting a dependable chemical treatment protocol that is effective in treating the pollutants present, and selecting suppliers with knowledge and experience in the field
- Researching and understanding, early in the process, the local and state permitting requirements to install a new or modified pretreatment system
- Creating a robust operating and maintenance program so that key parts of the system avoid unnecessary damage or premature wear
- Having a dependable operator with experience in the field, a sound analysis lab, and a plan for monitoring influent and effluent consistently

Since 2015 JMD has participated in its pollution prevention program (PPP)—New Hampshire requires a PPP if an organization generates a nonexempt hazardous waste—and has worked steadily toward source reduction and elimination of toxic materials where possible or economically feasible. Such activities have included the following:

- Removal and replacement of all cyanide-bearing processes and wastes at the 1 Park Avenue facility
- Removal and replacement of all hexavalent chromium processes at the 4 Industrial Drive facility
- Reduction of hexavalent chromium by 20 percent at the 1 Park Avenue facility in 2021
- Removal of all dichloromethane-containing processes from the 19 Park Avenue and 4 Industrial Drive facilities in 2023
- Reduction in water use proportionate to production levels at the 1 Park Avenue facility

JMD is also participating in a 2024 EPA survey regarding per- and polyfluoroalkyl substances (PFAS) use, and collaborating with Town of Hudson contract engineers to gather information on PFAS in wastewater effluent. To date, JMD does not use PFAS in its processes, nor is there evidence of prior use; however, testing of incoming supply and treated effluent has been performed to evaluate if the pretreatment process affects the removal of PFAS in the supply. Analysis suggests small amounts of PFAS may be tied up with precipitate, but more testing will be required to see if those results are repeatable.

ABOUT THE AUTHOR

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PFAS trinity: Understanding your community's PFAS chemistry, developing minimization plans, and working with upstream sources

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ABSTRACT | A public health and environmental challenge has never been faced like that presented by per- and polyfluoroalkyl substances (PFAS). PFAS are ubiquitous—in our food, the air, our water, our homes (dust, carpets), and in an incredibly wide range of consumer products. The good news is that, based upon more than 20 years of nationwide monitoring, PFAS levels in the blood of the American population have been decreasing dramatically and should continue to due to the regulatory attention, litigation, and legislation over the continued use of these chemicals (Figure 1). Nevertheless, addressing these chemicals will be a daily challenge for public utilities (water, sewer, and stormwater) for decades to come, especially due to legacy contamination from these chemicals. This article provides practical and tested advice about how communities and utilities should characterize their PFAS loadings for their water, sewer, and solid waste facilities, and outlines strategies for working with upstream sources to minimize their PFAS loadings. Examples of successful minimization approaches are presented from various sources.

KEYWORDS | PFAS, forever chemicals, emerging contaminants, public health, One Water

There is a saying that a well-defined problem is half-solved. While per- and polyfluoroalkyl substances (PFAS) are ubiquitous, they are among the least understood chemicals toxicologically. Uncertainty exists about which of the thousands of chemicals are of concern and at what levels. Deciding if these chemicals are regulated through some type of grouping/subgrouping is complex. Further, uncertainty remains whether individual regulatory levels should be identified for each chemical of concern or if we can regulate a group of these chemicals collectively (such as "not to exceed 20 parts per trillion [ppt] for the following five PFAS…").

With most emerging contaminants, regulation is determined through extrapolation of health impacts from related literature values or lab studies on mice and other human surrogates. EPA and the states are doing that with PFAS. However, unlike other emerging chemicals of concern, because PFAS are ubiquitous, we also have human health data from long-term exposures from PFAS hot spots around the country. Typically, these hot spots are near a facility that makes PFAS or where PFAS were used in industrial concentrations and quantities such as fire-fighting training facilities, military bases, and airports. In some cases, long-term health of these exposed populations is being monitored. Whether PFAS-related health clusters will be identified from these populations remains to be seen.

Adding to our challenges is the disagreement over levels of concern for the handful of PFAS that EPA has sought to regulate. Take perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS), for example. Table 1 shows how dramatically EPA's health advisory levels have changed.

Table 1. EPA's health advisory levels for PFAS have changed dramatically over the years

Parts per trillion	2009	2016	2022	2023*
PFOA	400		0.004	4
PFOS	200		0.02	4
PFOA & PFOS		70		

* Proposed by EPA's Water Health Advisory

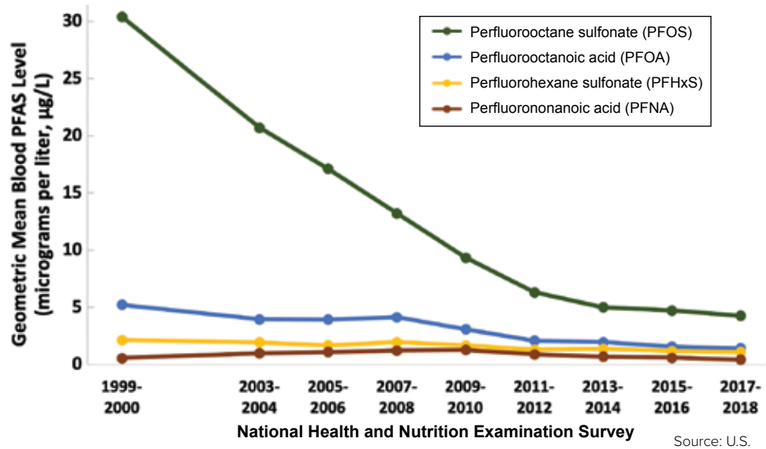

Figure 1. Blood (serum) levels of PFAS in the United States, 2000–2018

Source: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention

There are major gyrations in terms of regulatory approach (setting limits for individual compound levels versus a combined number for several PFAS), as well as in determination of the levels themselves. Even after the EPA's 2022 health advisory levels for PFOA and PFOS were released, the World Health Organization (WHO) and other scientific bodies and countries reiterated much higher regulatory levels (such as WHO's 100 ppt for PFOA and PFOS). Historically these are dramatically different health-related ranges from the world's leading public health organizations. Compounding these challenges further is that there are no EPA-approved methods for testing PFAS. We must use unapproved methods that, at present, likely will not hold up in court, and even then, cover only 40 to 50 of the thousands of individual PFAS. Exacerbating our testing challenge is the lack of lab capacity as well as the analytical costs (approximately $400 per sample, doubled if you add a field blank).

Addressing PFAS through the regulatory process given these challenges has been daunting. The federal process is slow and complex even without these PFAS-specific challenges. These realities have led state legislatures and regulatory agencies to adopt requirements as best they can to characterize and limit PFAS in our drinking water and environment. Lacking any regulatory foundation, public utilities have had to fend for themselves to ensure safe drinking water and to minimize PFAS in their wastewater systems. Some companies have announced a phaseout of the manufacture of PFAS by 2025, but many products still require the use of PFAS, including many military and medical ones. It will take time before alternative formulas with non-PFAS inputs will be allowed for such products.

Normally, it would be concerning that, even with a phaseout of the manufacture of PFAS, there would be successor chemicals (we still want the great products and product attributes that PFAS bring) that would put us in a recurring emerging-contaminant nightmare. What may be different is the litigation against the PFAS manufacturers. That litigation threatens the survival of all the PFAS manufacturers and should send a clear message to corporate executives not to repeat the errors that led to the PFAS crisis we face. The primary error is the alleged knowledge by corporate executives that PFAS were not safe and, again, an alleged failure to share that information with public health and environmental regulators around the world.

PFAS SAMPLING

PFAS sampling is still in its infancy. One positive so far is that most samples do not appear to have significant field contamination despite the ubiquitousness of PFAS in the environment. This is a counterintuitive result, but we see it as positive, nonetheless. This means facilities outside National Pollutant Discharge Elimination System (NPDES) PFAS testing do not need to pay for a field blank. However, if an unexpected result occurs, a retest with a field blank will likely be necessary. We have not seen any field contamination out of several hundred PFAS test results.

Even more promising is that PFAS testing (whether method 1633, 537, etc.) has been consistent, which is shocking given the results are in values of parts per trillion. For example, wastewater influent and effluent results are often close or logically consistent. Drinking water samples often will tell the same story (within normally expected variability) at many facilities. This is helpful as we try to understand and address these chemicals.

Another advantage has been the PFAS sampling holding time, which is usually 28 days (refrigerated). This provides several benefits. First, samples do not have to be rushed to the testing labs or analyzed immediately upon receipt. Second, utilities can take over 24-hour or even longer (three-day, five-day, seven-day) composite samples to receive a better long-term average PFAS result for the medium being tested, all for the same analytical cost as a grab sample. Public utilities are therefore encouraged to collect longer-term, multi-day PFAS samples to better characterize water/wastewater. This is especially so for sampling of non-domestic users of wastewater systems. Longer-term testing is helpful because PFAS are typically addressed over a lifetime exposure period.

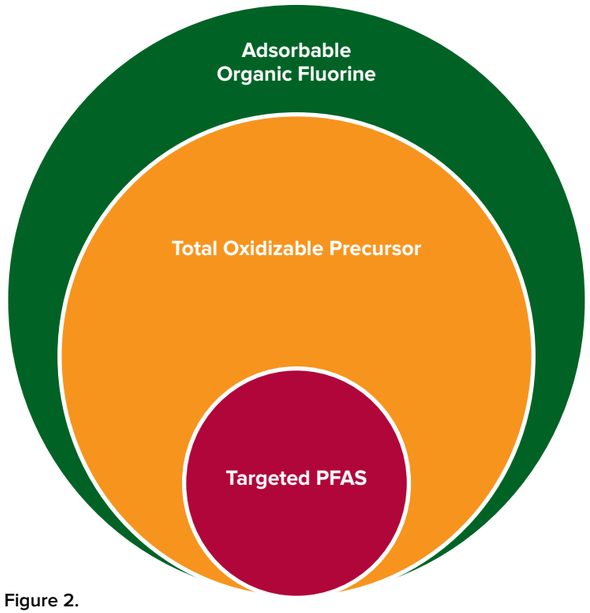

Figure 2.
Targeted PFAS are only a small part of the fluoropolymer spectrum

Two testing approaches are available to characterize PFAS: targeted and non-targeted. Targeted testing will provide results for up to 50 individual PFAS, such as PFOA and PFOS. Non-targeted testing looks at a particular sample (for example, drinking or wastewater) and will tell how much fluorine, both adsorbable organic fluorine and extractable organic fluorine, may be present. This can indicate whether the targeted results are most of the PFAS that may be in the sample or just a small portion. Another sampling approach is total oxidizable precursors, which measures PFAS precursors that may be in the sample.

Targeted testing can be perceived as the tip of an iceberg visible above the water surface and non-targeted testing as the portion of PFAS below the surface. Simply looking at the tip of the iceberg does not reveal the true size of the iceberg (Figure 2). For example, a mid-sized wastewater utility on the East Coast performed targeted sampling of its non-domestic users and landfill leachate. Results showed the landfills represented 80 percent of the targeted PFAS load, and a significant industrial user was a small part. However, subsequent non-targeted sampling revealed that for PFAS and PFAS precursors, the landfills were only 2 percent of the load, and the large industry was a major source (millions of parts per trillion of PFAS precursors). It was determined that the industrial user manufactured military and medical products that required the use of PFAS that were not identified by the targeted testing.

RECOMMENDED PFAS SAMPLING FOR PUBLIC UTILITIES AND COMMUNITIES

Some utilities and communities have been hesitant to sample for PFAS because of a lack of requirements, unapproved methods, and the impact that the uncertainty those results would have on the public. We disagree with that approach. Public utilities should fully characterize their drinking water and wastewater PFAS chemistry and publicly share their data. For the public utilities that did sample, the public familiarity with their already-disclosed numbers served them well when the EPA health advisory level for PFOA and PFOS dropped from a combined 70 ppt to interim levels of 0.004 and 0.02 ppt, respectively.

While there remains uncertainty and disagreement about PFAS of concern and their regulatory levels, the consensus is that lower levels are better. A wide range of simple PFAS reductions at both water and wastewater utilities can be had. Not only does reducing PFAS loadings benefit utilities and customers (lower drinking water levels, lower wastewater solids and effluent levels), but downstream public utilities will expect reasonable minimization steps from upstream sources. We recommend that wastewater and drinking water systems (raw water) conduct non-targeted testing on a 24-hour or multi-day composite basis to ensure they see the entire PFAS picture (to the extent of our current analytical abilities).

Drinking Water Sampling

All public water systems should fully characterize their drinking water using both targeted and non-targeted (raw/unfinished) methods. This is essential to determining whether a utility will need to install PFAS barrier technology and which type. Understanding the PFAS in source water is critical to selecting the most cost-effective PFAS barrier technology. Also, characterizing drinking water PFAS chemistry can help identify upstream sources. While source control is unlikely in most cases to allow a utility to avoid PFAS barrier technology installation at its plant, it can help lessen that technology's operation and maintenance requirements by reducing source water PFAS loadings over time.

In addition to public water supply, communities should consider private wells near usual suspect PFAS hot spots such as landfills, military bases, fire training centers, PFAS manufacturing facilities, and industries testing aqueous film forming foam fire suppression systems. Testing the landfill's downgradient wells or adjacent private wells is prudent to ensure no isolated PFAS hot spots. Private well contamination has been found around these facilities around the country. In one example, wells were tested at a high school. All but one were non-detected for PFAS. That one well was near the school's dumpster, which had been in the same location for decades. The dumpster leachate was the source of the well PFAS contamination.

Wastewater Sampling

Sampling wastewater flows using both targeted and non-targeted sampling is essential, starting with a multi-day composite influent and effluent sample as well as a biosolids composite (targeted sampling). Chemical addition at either water or wastewater plants has not been a source of PFAS loading. In some instances however, the treatment process may convert PFAS precursor chemicals into targeted PFAS. In those instances, targeted levels will be lower for the influent than it would for the effluent.

It is recommended to send non-domestic users information requests about their PFAS (and 1,4-dioxane) usage as well as any data they have about PFAS/1,4-dioxane in their effluent as a treatment process byproduct. Often, these surveys will lead to determining non-domestic sources of emerging contaminants. Many national companies as well as regional ones have already identified and addressed their PFAS chemistry. However, we believe verification testing (both targeted and non-targeted) is warranted for all the usual suspect non-domestic industries.

Most non-industrially impacted wastewater systems will yield no measurable targeted results. For others, one or two non-domestic users may be contributing a significant targeted or non-targeted PFAS load. Identifying those users is easy, either via surveys or limited trunk sewer or pretreatment sampling.

After numerous engagements with non-domestic users that are sources of PFAS (and 1,4-dioxane), the creativity in reducing PFAS loadings and willingness to do so are impressive. Just by engaging with companies, they have substituted products, changed processes (e.g., recapturing/recycling PFAS-laden foam), treated side-stream PFAS laden waste streams, or gone to closed loop for certain processes high in PFAS (medical and military applications). Other sources, such as landfills, have closed older cells (thereby reducing volume and PFAS concentrations in leachate), recycled leachate for irrigation, and are even contemplating underground injection for leachate.

Some waste streams high in PFAS or PFAS precursors may require treatment before discharge to a sewer system or via stormwater outfalls. For example, some significant industrial users discharging to publicly owned treatment works (POTW) may have to pretreat some or all of their wastewater. On the stormwater side, PFAS runoff from airport burn pits or other industrial property contaminated with PFAS may have to be treated with granular activated carbon before discharging.

Minimizing PFAS loadings is positive for public water and wastewater utilities as well as wastewater non-domestic users. Most such companies want to be good environmental stewards; working with them to voluntarily develop a PFAS minimization plan is a major step toward avoiding unreasonable or impractical regulatory demands for those facilities. Every POTW should have a living PFAS minimization plan for each non-domestic user with PFAS loadings that matter. This will lead to minimization of loadings and potentially avoid further regulatory requirements (and litigation against them) while also protecting downstream users and the continued viability of effluent and biosolids reuse programs.

Similar minimization plans should be developed for hauled waste streams to your facilities that contain meaningful levels of PFAS and/or 1,4-dioxane. Some PFAS manufacturers are phasing out the production of PFAS (e.g., 3M by the end of 2025). Minimization plans are a bridge until that phase-out occurs.

PFAS minimization plans should address the following issues:

- **Inventory of all products used**, including a certification that they are PFAS-free. Typically, vendors and manufacturers will certify that their products are PFAS-free.
- **Characterization monitoring followed by maintenance monitoring**. The first stage features intensive monitoring (monthly or quarterly) to characterize the levels of the pollutant(s) of concern, including any seasonal variation. Once PFAS/1,4-dioxane levels are characterized, a shift to less frequent, maintenance monitoring is appropriate. We again recommend 24-hour or multi-day sampling for PFAS testing and do not believe field blanks are necessary.
- **PFAS minimization steps**. After identifying any meaningful PFAS/1,4-dioxane loadings, the heart of a minimization plan is to evaluate any practicable minimization measures. As noted above, product substitution, process changes, taking certain "hot" process wastes to closed loop, recapturing high-PFAS foams that might have previously been wasted, phasing out the use of PFAS inputs, and many other management practices have been proffered by non-domestic users of clients.
- **New and expanding facilities warrant special consideration**. Pretreatment teams will have to evaluate new and expanding businesses discharging to sewer systems within the context of emerging contaminants such as PFAS and 1,4-dioxane. A full evaluation of non-domestic user facilities, their emerging contaminant chemistry, and the implementation of a minimization plan should be determined. POTWs should update their industrial waste surveys to include PFAS, 1,4-dioxane, and any other chemicals of concern. When considering locating new businesses with unavoidable PFAS loadings, coastal discharges make more sense than inland because you avoid impacts to downstream water systems.

APPLYING PFAS LESSONS LEARNED TO FUTURE EMERGING CONTAMINANTS

The PFAS experience has made it clear that our historical approach to regulating environmental discharges is likely adequate to protect aquatic life, but inadequate to protect public health. On the fishery side, the toxicity of wastewater effluent to the most sensitive aquatic species can be measured. A comparison can be made of benthic and stream biology of streams downstream of discharges with unimpacted, reference streams. However, that is not the case with public health, especially when we are concerned about chemicals in the parts-per-trillion level that we cannot always measure.

PFAS-related litigation will, it is hoped, remind industries of the negative consequence if they fail to disclose information about harmful effects of emerging chemicals being used. However, federal and state regulatory programs need to be streamlined. Although they will never likely keep pace with the thousands of emerging chemicals, they must do better. States and EPA permit tens of thousands of direct dischargers around the country. They must ensure that they understand any emerging contaminant chemistry those dischargers know about. This means changes to NDPES permit applications, even if those applications may ask about only the 126 priority pollutants in 40 CFR Part 423, Appendix A.

Additionally, more effective engagement by POTW pretreatment personnel to explore non-domestic dischargers' understanding of their emerging contaminant chemistry is critical. A necessary first step is updating the Industrial Waste Survey and requiring all applicable dischargers to complete it. These efforts may be supported or supplemented by state and/or federal legislation requiring greater disclosure of unregulated contaminants. These goals must, however, be balanced with businesses' need to protect confidential business information.

BENEFITS FROM THE IDENTIFICATION OF PFAS CHEMISTRY

Identifying PFAS chemistry has three benefits. First, it allows PFAS loadings to be minimized. Second, it helps design engineers to identify the most cost-effective PFAS barrier technology if needed. Third, by identifying the PFAS sources, the manufacturers of those sources should be identifiable. For example, if company A produces stain-proof fabrics for the medical industry, using PFAS, the company from which it bought those chemicals can be identified. That could be beneficial should litigation be pursued for those chemical manufacturers. POTW and water systems should make their best efforts to characterize both the PFAS they face as well as the likely sources (and manufacturers).

FINAL THOUGHTS ON EMERGING CONTAMINANT TECHNOLOGY

While PFAS barrier and removal technology is expensive from both a capital and an operation and maintenance perspective, we anticipate that 3,000 to 4,000 water systems in the United States will install it in the next 10 years. Once that happens, it will effectively, if not politically, become the standard treatment expected at leading public water systems.

The reality is that emerging contaminants will always exist—for example, the chemicals that will replace PFAS. Most water systems investing in emerging contaminant control technology do so to show that they have state-of-the-art technology in the hope that it removes or minimizes the emerging contaminants of the future.

ABOUT THE AUTHORS

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An innovative approach to brewery wastewater management, side-streaming, and pretreatment coordination

LUKE TRUMAN, New England Environmental Finance Center of the University of Southern Maine, Portland

ABSTRACT | If you've ever been on a brewery tour, you've been told that beer is made using four ingredients—water, malt, yeast, and hops. If you've ever brewed beer, you know this is an oversimplification given the variety of ingredient types, quality, and ways each ingredient is used. Similar to the work of an accomplished chef, the quality of a brewer's product is in the details. They both can transform simple items into something much more desirable. A brewer's work is also remarkably similar to that of a wastewater treatment plant (WWTP) operator. Operators, too, transform ingredients into something remarkably better, and the details matter. Each brewer or operator understands the impact of pH, temperature, and microbes on the product and that a supply chain snafu can be costly. Although the skills of the two roles align perfectly, often a disconnect exists between the two that can cause irreconcilable harm. This article discusses potential opportunities to better coordinate pretreatment at breweries across Rhode Island and to better align that pretreatment with the needs of the WWTPs.

KEYWORDS | Industrial wastewater, pretreatment, brewery, wastewater management, sustainability

To bridge the gap between the producers of industrial wastewater (in this case, breweries) and wastewater treatment plants (WWTPs), communities often rely on pretreatment programs to establish relevant discharge limits and pretreatment coordinators to ensure that the industries operate within those established limits. If followed, this well-intentioned approach can be the answer to a complicated problem. However, to be successful, transparency, trust, and empathy are critical from both the regulator and the regulated.

Rhode Island offers a unique case study given its pretreatment struggles and latent opportunities for transformation. The state covers only a small geographic area of 1,214 mi^2 (3,144 km^2). Within this space, however, there are many signs of Rhode Island's pride in self-sufficiency. Thirty-six Rhode Island Brewers Guild member craft breweries are spread across the state, most of which are beholden to local pretreatment programs. Given the state's size and proximity to Boston, many visitors make the trip to visit their craft breweries. Rhode Island is also home to 19 conscientiously operated WWTPs that receive flows from these businesses.

CRAFT BREWERY EFFLUENT

As industrial wastewater, brewery wastewater is not a treatment plant's primary concern because it is not going to turn a waterway into a superfund site, but its treatment still presents some challenges. The pH of brewery wastewater commonly spans from 3 to 12, with temperatures that can be well over 100°F (37.8°C). The biochemical oxygen demand (BOD) and total suspended solids (TSS) tend to be much higher than residential wastewater, as does the sheer volume of discharge. The industry average for the amount of water used to produce one pint of beer is 7 pints. With smaller breweries, the ratio is frequently even higher.

The opportunities for Rhode Island's pretreatment programs are clearer when looking at the picture as a whole. Of the 19 treatment plants, 16 have pretreatment programs. Of the 16 pretreatment programs, 15 vary significantly from one another (the only two that are the same are operated by the same entity). The program variations include permit fee rates, surcharge limits and fees, allowable pH ranges, and sampling and inspection practices.

One example to illustrate this variability is the BOD and TSS surcharge (the cost per pound to treat), which ranges among communities from a permit fee as low as a flat $300 per year to as much as $0.66/lb ($1.45/kg) for BOD and $0.70/lb ($1.54/kg) for TSS. If two breweries in different communities were each billed for releasing 1,000 gal (3,785 L) of effluent at 4,000 mg/L of BOD, with one paying a flat permit fee of $300 per year and the other paying $0.66/lb ($1.45/kg), the price would be $0.82 per day for one brewery, but $22 per day for the other. Such differences may have made sense for the individual pretreatment programs as they were initially adapted to include the growing craft beer industry; much work goes into weaving a new industry into an existing pretreatment program, and there are no established templates to follow for craft beer. Similar to any law or regulation, however, once a pretreatment program is established, it can be hard to change.

Spent grain, hops, yeast, and spoiled beer are nutrient rich and can serve as quality fertilizer or compost. As it stands, though, it is more common for craft breweries to simply flush these clean, high-value items down the drain for the local WWTP to manage.

The sometimes broad variances present a challenge to Rhode Island's craft brewers, where brewery-to-brewery alignment is the norm, with breweries dealing similarly with similar challenges, and considering the unusual collaborative culture within the craft beer industry. The misalignment of pretreatment burdens may cause a ripple effect that can negatively affect how brewers deal with pretreatment programs and pretreatment coordinators, and vice versa. In some cases, instead of brewers and pretreatment coordinators understanding each other's priorities and learning each other's needs, they can become locked into a cycle of mutual distrust. Standardizing pretreatment programs, including permit fees, surcharge limits and fees, allowable pH ranges, and sampling and inspection processes, would allow for this cycle to be broken or avoided. The result would help the pretreatment coordinators and the breweries, setting the stage for improved processes statewide.

For breweries, opportunities are also available to streamline practices. Standard practice is for a brewery to work with a farmer to side-stream spent grain—a brewery's largest volume and most valuable high-strength waste material—as animal feed. Such an arrangement is typically cost neutral, as the brewery does not pay for this service, and the farmer does not pay for the feed. It is reasonable to expect every brewery to also side-stream its additional highest-strength materials, such as trub (hops and spices from the brewing process), spent yeast, and spoiled beer. These materials are nutrient-rich and can be excellent feedstock for an anaerobic digester to enhance gas production and result in quality fertilizer or compost. More common, though, is for craft breweries to simply flush these clean, high-value items down the drain for the local WWTP to manage. As a result, these materials mix with other community wastes, some, for instance, rich in PFAS (per- and polyfluoroalkyl substances), thus contributing to much bigger and more expensive problems. Given Rhode Island's limited geographic area, a collaborative approach to side-streaming these materials could collectively establish an economy of quantities unachievable by an individual brewery, with per-unit transportation and service costs reduced accordingly. For instance, if the breweries partnered with an anaerobic digestion enterprise, the industry would be contributing to a green natural gas market. Or a potential outlet could be found though mutually beneficial collaboration with commercial composting service providers.

Beer brew kettle and fermentation tanks

In addition to generating waste high in BOD/TSS, the brewing and processing of beer include regular cleaning and sanitizing of processing vessels with alkaline and acidic chemicals, leading to slugs of high-temperature wastewater with very high or low pH depending on the process. Often these slugs are

routinely sent straight down the drain, which can harm the wastewater infrastructure and operations at the downstream WWTP. The effort and cost necessary for a brewer to collect this chemical-rich wastewater to facilitate cooling and pH neutralization before discharge need not be significant since brewery equipment is not typically hard-piped into a drain. Arranging for an intermediate bulk container tote on the rinse drain could be sufficient for achieving this treatment.

Both side-streaming high-strength waste and neutralizing wastewater are known best management practices for wastewater management in a brewery, and they should become standard management practices for breweries in Rhode Island.

NEXT STEPS FOR PRETREATMENT COORDINATION

Great opportunities exist for Rhode Island's pretreatment program managers and breweries to align their efforts to the benefit of all. Demonstrating the possibilities of positive regulator and regulated collaboration could even lead to a case study shared nationwide, highlighting Rhode Island as a leader in this field. Although convenient, burdening a WWTP with treating high-strength brewery waste while assessing sometimes high pretreatment surcharges and permit fees on the brewery (as is the often the case in Rhode Island) is not the most beneficial treatment practice for the breweries, the WWTPs, the environment and climate, or the shared communities. The ingredients and processes used to make beer affect the pint served in the same way that the WWTP's influent ingredients will affect its processes and the final gallon discharged. However, these minute details are not as relevant as the bigger picture.

The broad variations in Rhode Island's pretreatment programs are not desirable and should not be necessary to achieve the desired outcome, nor should the accompanying frustrations they bring to brewers and pretreatment coordinators. If Rhode Island's breweries can collaboratively commit to profitably side-stream their high-strength waste and to temper and neutralize their wastewater, brewers and all downstream recipients would benefit. If the pretreatment managers could promote BMPs, standardize expectations and processes, and support their breweries in meeting them, Rhode Island's breweries could focus even more on creating jobs, attracting tourists, and serving as comforting ad hoc community centers.

ABOUT THE AUTHOR

Luke Truman has 12 years of brewery experience, realizing years of double-digit brewery growth, major and minor expansions, equipment upgrades, and process improvements. Luke has worked in every facet of the brewing process from farming to manufacturing to distributing to serving, most recently concentrating on facilities management. He now provides technical assistance to craft beverage manufacturers for the New England Environmental Finance Center using EPA pollution prevention grant funds.

NEBRA Highlights

Regional biohub for residuals

Per- and polyfluorinated Substances (PFAS) are affecting biosolids management, especially in Maine. Even before PFAS, the region has seen a steady decline in end uses and outlets for its wastewater sludges. When an incinerator or other regional outlet has to stop accepting wastewater residuals due to planned—or worse yet unplanned—maintenance, it has reverberations. The need for more reliable, cost-effective biosolids management alternatives in the Northeast is widely recognized. Few approved, proven, or established methods treat PFAS in wastewater or in biosolids on a large scale. Pilot studies have identified potential ideas, but these options are not yet fully scaled and may be cost prohibitive.

NEIWPCC, in partnership with NEBRA and the Maine Water Environment Association (MEWEA), is coordinating discussions to address these pressing needs among stakeholders from state health and environment departments, water resource recovery facilities (WRRFs), environmental consulting and law firms, universities, and national environmental organizations.

The Biosolids Technology Hub (BioHub) concept began as an idea for a research facility to test and prove PFAS destruction technologies' effectiveness but has since shifted to an information clearinghouse on research and funding for piloting, planning, and permitting treatment of PFAS in municipal biosolids or sludge. In 2024, this information will be available publicly for other entities to inform proof of concept, demonstration, testing, design, and construction at physical facilities. The intent is still to facilitate and fast-track innovative technical solutions. Already, NEIWPCC has compiled and shared resources on PFAS research, pilot projects, funding, planning efforts, and permitting of PFAS treatment processes for wastewater sludges. NEIWPCC will continue hosting regional BioHub meetings, with another one having taken place in March.

EPA issues second annual progress report on PFAS Strategic Roadmap

In late December, EPA issued the second annual report on its progress in achieving the goals and tactics in its 2021 PFAS Strategic Roadmap. The 14-page report describes EPA's efforts over the last two years to restrict, remediate, and research PFAS in the environment. EPA's accomplishments touted in the report include proposed drinking water standards, wastewater effluent limitations guidelines for additional industries, and risk assessment for PFAS in biosolids. The report states that EPA is "partnering to address the unique challenges of PFAS in biosolids," referring to the Joint Principles for Preventing and Managing PFAS in Biosolids | US EPA. The report forecasts additional significant actions in 2024, including the following:

- Promulgating drinking water standards
- Designating certain PFAS as hazardous under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Resource Conservation and Recovery Act (RCRA)
- Conducting a study of PFAS through publicly owned treatment facilities to "enable strategic decisions"
- Finalizing and codifying Method 1633 for analyzing PFAS in other media
- Looking at effluent limits for additional industries like textiles, pulp and paper, and aviation
- Establishing aquatic life criteria for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS)
- Updating the *Interim Guidance on Destroying and Disposing of Certain PFAS and PFAS-Containing Materials That Are Not Consumer Products* from US EPA

The full report can be found on this page: PFAS Strategic Roadmap: EPA's Commitments to Action 2021-2024 | US EPA.

CERCLA liability still a concern for biosolids management

The U.S. Senate Environment and Public Works (EPW) Committee is still considering draft legislation to require and authorize EPA to carry out certain actions with respect to PFAS. The main concern is for exemptions from CERCLA, more commonly known as the Superfund law, for water utilities. A bill was introduced in the Senate: the Water Systems PFAS Liability Protection Act (S. 1430). Some environmental groups have argued against such an exemption for water systems and other passive receivers of PFAS.

NEBRA urges all its members to contact their senators on this important issue, especially those in the Senate EPW Committee. WEF's Water Advocates Program makes it easy at this site: oneclickpolitics.global.ssl.fastly.net.

CERCLA is based on the "polluter pays" principle but without explicit exemptions for passive receivers of PFAS, like wastewater treatment facilities, communities could be pulled into litigation over PFAS contamination. EPA has proposed to list several PFAS compounds as hazardous under CERCLA. It is important that the agency hears from local utility managers about the impacts of PFAS on their operations and expenses and concerns about future liability for communities.

Maine study shows uncertainties for biosolids management, recommends actions

In mid-December, the Maine Department of Environmental Protection (MEDEP) published the study "An Evaluation of Biosolids Management in Maine and Recommendations for the Future." The report reviews public policy decisions in Maine that have left water resource recovery facilities in the state with only one option for managing their biosolids: disposal in landfill.

The takeaway from the report is that landfilling biosolids is not sustainable. The report warned, "As soon as 5 years from now, there could be a drastic shortfall in capacity..." unless the state acts. It recommended short-term to long-term solutions. Short-term recommendations related to the expansion of landfill disposal capacity, including the following:

- Permit the expansion of the Juniper Ridge landfill
- Seek other landfills in the state with capacity for biosolids
- Fund a study on bulking agents available to facilitate biosolids disposal in landfill
- Fund pilot studies of PFAS removal and destruction technologies

Recommended projects requiring more lead time included reducing sludge volumes, like sludge dryers, with state funding, and looking at regional infrastructure. The report suggested reevaluating the ban on land application of biosolids, perhaps revisiting MEDEP's screening standards. The major long-term recommendation was to fund full-scale PFAS removal and treatment systems for Maine's biosolids.

The collaborative study by the MEDEP is the first step to developing a long-term plan for sustainably managing Maine's wastewater sludges. Now biosolids management is part of the MEDEP's Materials Management Plan. The MEDEP's January 2024 report to the legislature references the December biosolids study in its "2024 State Waste Management and Recycling Plan Update and 2022 Waste Generation and Disposal Capacity Report" submitted to the Joint Standing Committee on Environment and Natural Resources.

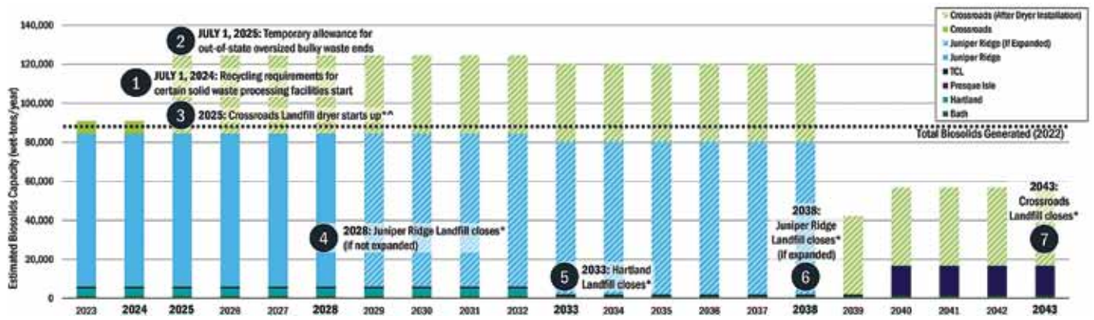
This in-depth biosolids study is what every state should be working on. The Massachusetts Department of Environmental Protection (MassDEP) is undertaking a similar study it hopes to complete soon. In December, MassDEP published a Request for Quotes for "PFAS and Residuals Technology and Management Study, Part 1" and has awarded the work, with targeted completion of Part 1 by June 30.

NEBRA duo presents on PFAS communications

NEBRA's Janine Burke-Wells teamed up with NEBRA Past President (and President-Elect for NEWEA) Deborah Mahoney of Brown & Caldwell for a presentation on "PFAS in Biosolids: How to Be Part of the Conversation!" PFAS Receivers have an important role to play in educating communities about the risks of PFAS and what can be and is being done to reduce PFAS concentrations coming into their facilities. The presentation included resources, examples, and encouragement for clean water utilities to talk about PFAS with customers. NEBRA members can access the slides on the member webpage. Start a conversation with your customers today!

NEBRA comments on MassDEP clean heat standard framework

NEBRA submitted comments in December to MassDEP on the proposed framework for the commonwealth's clean heat standard (CHS). The CHS will determine subsidies and incentives for using cleaner fuels for heating. The draft



Proposed long-term biosolids management plan for Maine

framework did not include renewable natural gas (RNG). The MassDEP's 2030 Solid Waste Master Plan, issued in October 2021, touts anaerobic digestion (AD) for diverting waste and creating new market and business opportunities in the commonwealth. NEBRA has several utility members producing RNG in the commonwealth, including the Massachusetts Water Resources Authority and the Greater Lawrence Sanitary District (GLSD). GLSD also submitted comments on the draft plan.

The commonwealth generates approximately 2,475 wet tons (2,245 wet tonnes) of biosolids every day, the equivalent of 88 tanker truck loads that must be managed. Using AD to manage these materials produces clean energy, reducing greenhouse gas emissions. Seeing a win-win situation for the waste and energy sectors, NEBRA encouraged MassDEP to reconsider the role of RNG in the CHS program design so that the commonwealth's priorities are consistent and support expanding AD and reducing greenhouse gases while generating RNG.

NEBRA committees learn from experts

NEBRA's committees invite experts to their meetings to discuss issues, including research and regulations. The Carbon Trading and Research committees (visit nebiosolids.org)], in particular, learn from the experts. In January, the Reg-Leg Committee discussed PFAS with attorney Bob Bilott of Dark Waters fame. NEBRA member York Sewer District in Maine made this connection and is moving ahead with a lawsuit against PFAS manufacturers for PFAS in its wastewater [Getting Ready: How York is fighting back against PFAS chemicals (seacoastonline.com)].

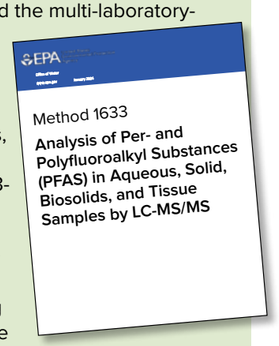
NEBRA members recognized

Several NEBRA Members were recognized recently with awards:

- GLSD's industrial pretreatment staff, led by Colleen Spero, monitoring manager, was recognized by EPA for the Massachusetts Industrial Pretreatment Program for Excellence.
- Robert Wells of the Middlebury, Vermont wastewater treatment facility received EPA's 2023 Wastewater Treatment Plant Operator of the Year Award.
- NEWEA's Biosolids Management Achievement Award was given to Mary Waring, recently retired after a long career with Casella Resource Management. Mary also took home the Quarter Century Operator Award.

Method 1633 for analyzing PFAS gets multi-lab validation

EPA's Office of Water, Engineering and Analysis Division, in collaboration with the Department of Defense, has published the multi-laboratory-validated method for "Analysis of Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous, Solid, Biosolids, and Tissue Samples by LC-MS/MS" [method-1633-final-for-web-posting.pdf (epa.gov)]. The method has gone through quality assessment at multiple laboratories for analyzing 40 PFAS compounds. The method is not yet required for Clean Water Act monitoring compliance, until it is promulgated through formal rulemaking by EPA. However, EPA encourages the use of this method via permits issued under the National Pollutant Discharge Elimination System. For more information about PFAS analytical methods, go to epa.gov/cwa-methods/cwa-analytical-methods-and-polyfluorinated-alkyl-substances-pfas.



- NEBRA board member Phil Tucker of York, Maine received the Alfred E. Peloquin Award as did Tom Tyler of The Metropolitan District in Hartford, Connecticut, and Bernie Fleury, formerly with Essex Junction, Vermont.
- Although not a NEBRA member, Sarah Robertson was nominated by NEBRA and won the Paul Keough Award. Sarah has reported on wastewater-related issues for The Montague Reporter, a local newspaper in Massachusetts. You can see one example here: theshoestring.org/2023/05/25/proposed-law-would-aid-farms-polluted-by-pfas-tainted-sludge-fertilizers/).

Read more on these topics and stay abreast of the latest biosolids/residuals news and events at nebiosolids.org/news. For upcoming events, go to the "event" section of our website.

Janine Burke-Wells, Executive Director
603-323-7654 / info@nebiosolids.org

For additional news or to subscribe to NEBRAMail, NEBRA's email newsletter, visit nebiosolids.org

Committee Focus

Industrial Wastewater

The Industrial Wastewater Committee provides a forum for the exchange of information among NEWEA members about industrial wastewater treatment, permitting, and compliance. We reached out to the committee to learn more about industrial wastewater and what they have been up to.

Wastewater from industrial processes is as complex and varied as the industries themselves. The constituents of concern in industrial wastewater often extend beyond the more familiar biochemical oxygen demand (BOD), total suspended solids (TSS), and nutrients more commonly encountered in municipal wastewater. Depending on the industry, treatment or management is required for constituents ranging from oil and grease, metals, total dissolved solids, scaling minerals, sulfate, boron, fecal coliforms, and even very high concentrations of BOD and nutrients. The toxicity of the wastewater or the carryover of process chemicals can also be a concern. The characteristics of industrial wastewater are often dynamic in terms of flow and chemistry, as driven by upstream processing schedules, changing raw materials characteristics, or changes in upstream processes. Commonly encountered treatment processes employed for industrial wastewater can include pH adjustment, biological treatment (anaerobic and aerobic processes), chemical precipitation, coagulation and flocculation, filtration, disinfection, and advanced treatment processes such as nanofiltration and reverse osmosis.


Current Committee Chair Matt Dickson

Any industry that generates wastewater may have its own National Pollutant Discharge Elimination System (NPDES) permit and discharge directly to a receiving water, or it may only pretreat the wastewater and then discharge it to a collection system for final treatment by the municipal wastewater treatment plant. NPDES-related regulatory trends often affect both industrial wastewater generators and municipal wastewater treatment plants.

Charge of the Industrial Wastewater Committee

The committee aims to achieve the following:

- Improve the understanding within NEWEA of issues unique to industrial wastewater
- Interact with pretreatment coordinators to understand their challenges in an effort to drive that knowledge upstream to industrial dischargers
- Promote the sharing of information on regulatory trends that affect municipal and industrial wastewater
- Promote access to and collaboration among operations, scientific, engineering, and compliance staff who address technical challenges common to both industrial and municipal wastewater

The committee meets four or five times per year, including an in-person meeting during the Annual Conference in January. The committee has 26 members representing consulting engineers, process equipment manufactures and representatives, chemical and industrial representatives, laboratory professionals, private industry, and government and regulatory agencies. Several new members joined this year, and we look forward to their contributions.

Committee Highlights and Planned Activities

The Industrial Waste Committee annually oversees the selection of presentation topics and coordination of presentations for at least one technical session at the Annual Conference. This year's session, Industrial Waste Innovative Technologies and Pretreatment Coordination, focused on innovative technologies and pretreatment. It included four presentations—Industrial Pretreatment, Brewery Wastewater Management, Phosphorus Removal from Fish Hatchery Effluent, and Renewable Energy Production Using High Temperature Pyrolysis in the Treatment of Biosolids.

Looking ahead, we will focus on pretreatment as an avenue to reach industrial companies. Our goal is to broaden NEWEA's presence within the industrial community and provide a technical resource to help with treatment issues as well as general best practices. At our meeting on November 14, 2023, we had guests join from the Massachusetts Office of Technical Assistance, and the Maine Technical Assistance for Municipal and Industrial Wastewater Treatment Facilities program. The meeting included a productive discussion about how to better coordinate the committee efforts with the various state agencies, and the group identified opportunities for the committee and agencies to work together as we move forward with additional outreach and programs. As a first step, we are developing a communication survey for pretreatment coordinators throughout New England to identify major industries, or types of industries, that have the biggest impacts or issues with municipal wastewater treatment plant operations. This is an ongoing effort and our meeting in January focused on refining the communication and outlining next steps.

In addition to developing a resource pool for industry, we will be planning a specialty conference in the next year or so on industrial waste generation and/or pretreatment, ideally with a plant tour associated with the conference.

YP Spotlight

For the past four years, Zach Lamoureux has been organizing the Young Professional (YP) Committee's Poo & Brews across New England—from Connecticut to Maine and Burlington to Providence. For this edition of the Journal, we reached out to Zach to learn more about his experiences in NEWEA and the water industry.

Journal *Can you tell us a bit about your role in the water industry?*

My current role is product manager at Carlsen Systems. This is a healthy role of customer support and engineering. Fixing customer problems by selling them a product while getting to do the calculations behind it gives me a great sense of pride and satisfaction. Getting into this career just happened by following the good advice of others. My friend's father was a sales executive for a large manufacturer. He told me I had a keen sense for engineering, but I'd be better suited in a technical sales role. Then my career counselor at university suggested that I change my desired role to applications/sales. A few months later when I was graduating, Carlsen Systems found me and hired me. When I first started, I had no idea what the water industry was, but over the past four years I've been able to learn more than I ever thought I could absorb.

■ *What has been the most surprising part of the water industry?*

The best and most surprising has had to be the community feel. There are not many places where you can find community now that we have all these social platforms. Being a part of a community used to be in your neighborhood, if you practiced a religion, or joined a social club. Those all still exist, but it's harder to find a community feel when there's always a screen at your fingertips. The water industry and the associations provide that feel for you. The best part is it can make your job not feel like a job at times.

■ *How long have you been involved with NEWEA and the YP Committee?*

I've been involved with NEWEA since late 2019. It started out with just attending events and so on. I decided I wanted to get more involved in early 2020, and that's when I joined the YP Committee. At the same time, I became the organizer for Poo & Brews, and I've been doing that ever since. This past year we developed a subcommittee for events so we can divide and conquer. I've joined a few committees within the Connecticut Water Environment Association as well, but I participate in as many Connecticut, Massachusetts, and Rhode Island events as I can—one of my favorites being the Rhode Island Clean Water Association chowder contest.

■ *Did you attend this year's YP Summit?*

Yes! The summit is always a fantastic time. This year there were so many new faces. There's a new wave in the industry and it was great to see a large turnout on a Sunday. There's networking, seminars, Q&A's, and team building. There's even a meme contest which can provide some comedic relief. I implore anyone who's new to the industry or under that 10-year threshold that hasn't attended to try it out in 2025.


Zach Lamoureux

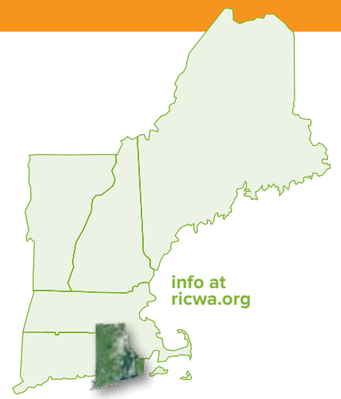
■ *Anything you'd like to share about yourself, with NEWEA readership?*

Fun fact, I'm a huge motorsports fan. Specifically, I follow Formula series, endurance racing, and GT3. When you dive into the sport it's overwhelming because of how many working parts there are. Races aren't won by just a talented driver. The engineers who design the car, the race engineers who derive a strategy, and the mechanics/pit crew who execute the best win races with a talented driver. There's a lot to appreciate within the sport and there's engineering, so that's why I enjoy it so much.

On top of that. I play plenty of sports like soccer, golf, and tennis. Cooking has become one of my favorite hobbies as well. Travel, whether it's local, national, or international with my friends, family, and girlfriend is at the top of my list. There's nothing better than being able to share memories together with the people you love.

Rhode Island State Director Report

by Amy Anderson George
amy.anderson@arcadis.com



It's an exciting year for our little state of Rhode Island! I'm honored to take over as NEWEA state director for Rhode Island and thankful to represent Rhode Island Clean Water Association (RICWA) in this new role. The RICWA Board of Directors congratulates Scott Goodinson, long-time board member and past president, as he steps into his role as 2024 NEWEA president. Congratulations Scott, we are encouraged and excited for all you will accomplish this year. Thank you, Eddie Davies, for representing the Ocean State as NEWEA director for the last three years and for both your guidance during this transition and your leadership in both RICWA and NEWEA. We look forward to seeing your familiar face leading the Rhode Island Operations Challenge Team, RIsing Sludge, in Division 1 competition this year.

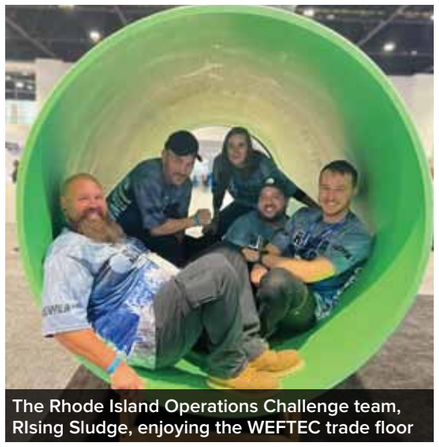
Rhode Island Legislative Event

The 12th Annual Clean Water Legislative Summit was held at the Rhode Island State House on February 8 to discuss water, wastewater, and storm water infrastructure issues and to inform and educate legislators about clean water issues important to Rhode Island. Congratulations to the 2024 Clean Water Legislator of the Year, Senator Alana DiMario, on her contributions to clean water in Rhode Island. The Summit, themed Water Utilities of the Future and sponsored by Representative Thomas Noret and Representative Camille Vella-Wilkinson, highlighted critical infrastructure funding, PFAS, microplastics and other contaminants, biosolids and resource recovery, and resiliency and climate change adaptation. Thank you to Senator DiMario, Representative David Bennet, Terry Gray (Rhode Island Department of Environmental Management [RIDEM]), Bill Fazioli (Rhode Island Infrastructure Bank), and Laurie Horridge (Narragansett Bay Commission) for their participation in our panel discussion, "The Circular Water Economy," and their continued support.

New RICWA Board Members

RICWA welcomes several new faces to our board this year. Our first monthly meeting was on January 9 to develop planning committees, review the proposed 2024 budget, discuss the full calendar of events, and welcome our newest board members. The 2024 board members are as follows:

- President, Peter Connell (Rhode Island Resource Recovery Corporation)



The Rhode Island Operations Challenge team, RIsing Sludge, enjoying the WEFTEC trade floor

- Past President, Scott Goodinson (Town of Narragansett WWTF)
- Vice President, Janine Burke-Wells (Northeast Biosolids & Residuals Association)
- Treasurer, Nora Lough (Narragansett Bay Commission)
- Secretary, Kim Sandbach (Narragansett Bay Commission)
- Executive Board, Jason Trenholm (Narragansett Bay Commission)
- Executive Board, Benjamin Levesque, PE (Tighe & Bond Inc)
- Executive Board, Michael Digiovangiacomo (Veolia Newport)
- Executive Board, Laura Marcolini (Fuss & O'Neill)
- Director of Vendor/Consultant Coordination, Eli Hannon (Fusion Environmental Solutions)
- Director of Vendor/Consultant Coordination, Tracy Santoro (Flygt Division of Xylem)
- Rhode Island Board of Certification of Operators, Jeff Chapdelaine (West Warwick WWTF)
- NEWEA State Director, Amy Anderson George (Arcadis)

Thank you to all our new board members for taking on these positions and chairing several of our planning committees. Special thanks to Eddie Davies, who agreed to stay on as co-chair of our Operations Challenge Committee this year.

WEF and NEWEA Awards

Congratulations to the Rhode Island wastewater professionals who were honored at the 2024 NEWEA Annual Conference awards ceremony luncheon. We appreciate your continued dedication and commitment to our industry. Award winners were as follows:

- EPA Region 1 Wastewater Treatment Plant O&M Excellence Award – Burrillville
- EPA Region 1 Wastewater Treatment Plant Operator of the Year Excellence Award – Kathy Perez (South Kingstown)
- EPA Region 1 Lifetime Achievement Award – William L. Patenaude (RIDEM – retired)
- NEWEA Operator Award – Kathy Perez (South Kingstown)
- Alfred E. Peloquin Award – Nathan Boiros (Providence)
- Elizabeth A. Cutone Executive Leadership Award – Stephen J. King (North Kingstown)
- WEF Operations Challenge, Division II, 3rd Place – RIsing Sludge
- Laboratory Analyst Excellence Award – Walter Palm (Providence)

WEFTEC Operations Challenge

Congratulations to Operations Challenge team RIsing Sludge on its accomplishment at WEFTEC in Chicago where the team represented RICWA and NEWEA nationally. Teams earned an overall score based on their weighted performance in five classic Operations Challenge events, each testing a wastewater task: process control, laboratory, safety, collection systems, and pump maintenance. RIsing Sludge outperformed its Division II competitors by finishing first in process control, third in laboratory, seventh in safety, seventh in collection system, and twenty-first in pump maintenance. The stellar performance enables the team to move to Division I in 2024. The team includes Courtney Iava-Savage (Veolia), Shaun Collum (South Kingstown regional wastewater treatment facility), Dave Bruno (Quonset Development Corporation), Rob Norton (City of Newport), Max Maher (Toray Plastics), and Eddie Davies (Quonset Development Corporation).

Scholarship Winners

Seven $500 scholarships were presented at our annual Trade Show on September 8, 2023. RICWA provides scholarships annually to college students, sponsored by our members and fundraising. Congratulations to our 2023 scholarship recipients: Camryn Sandbach, Emma Johnson, Erica Tedesco, Ian Hassel, Olivia Cimerol, Ryan Snell, and Sophia Pena. Visit ricwa.org for more information on our scholarship program.

Kathy Perez, NEWEA and EPA Region 1 Operator Awards

Walter Palm, WEF Laboratory Analyst Excellence Award

Run for Clean Water 5K

RICWA is partnering with NEWEA for the 1st Annual Run for Clean Water 5K. The 5K will take place at Fort Adams State Park in Newport on Sunday morning (May 19) of the NEWEA Spring Meeting. We encourage all runners, walkers, and supporters to join us to raise money to offset the increasing costs of sending our NEWEA Operations Challenge teams to WEFTEC. Proceeds will support new equipment, travel, and practice. Polish off those running shoes and join us for sun, fun, a little exercise (the most we will all probably get at the Spring Meeting!), and the opportunity to support your local Operations Challenge team.

Upcoming RICWA Events and Happenings

RICWA has a full slate of events throughout 2024. We encourage anyone interested in becoming a RICWA or NEWEA member to join us at these events. We are always looking to welcome new faces to our organization and industry. Upcoming events are as follows:

- April 20 – Earth Day Cleanup
- May 10 – RICWA Awards Banquet
- May 19 – Run for Clean Water 5K
- June 17 – Annual Golf Classic, Potowomut Golf Club
- August 9 – Annual Chowder Cookoff
- September 13 – Annual Trade Show
- December 6 – Annual Holiday Party, Food Drive, and Election of Officers

Connecticut State Director Report

by Vanessa McPherson
vanessa.mcpherson@arcadis.com

Connecticut Water Environment Association (CTWEA) President Jeff LeMay offered a message to our members recently that I would like to reiterate here: Commitment to clean water is more of a lifestyle than simply a profession, and we should all take pride in the work we have done and continue to do. In a world where there seems no shortage of challenges, it is easy to lose sight of this. So let this serve as your reminder! I always come away from the NEWEA Annual Conference with a renewed sense of purpose and appreciation for our clean water community. It is truly special.

Fall Workshop

The Fall Workshop was held on October 16 at the Aqua Turf in Plantsville and featured a packed half-day program. Melissa Biggs provided context for the upcoming legislative session in Connecticut and noted the effectiveness of water pollution control facility (WPCF) tours that have been conducted with legislators. Having the opportunity to see firsthand what we do every day gives essential perspective for stakeholders. The Department of Energy and Environmental Protection (DEEP) provided an overview of the recent PFAS sampling and report as well as information about the Clean Water Fund program. Deb Mahoney provided a NEWEA update for our group. Beth Card also offered remarks about regulatory initiatives and future challenges for utilities.


The Connecticut team competing in the pump event at WEFTEC

Government Affairs and Legislative Outreach

The Government Affairs Committee is gearing up for a busy legislative session. We have been working to maintain awareness and strategize for advocacy on legislation pertaining to our industry. Like most New England states, we anticipate PFAS to be a hot topic in this session and are seeking ways to support legislation that we can stand behind—such as source reduction.

Planning is underway for the April DC Fly-In, and we will be scheduling meetings with the Connecticut delegation to raise awareness about hot topics and express our appreciation for the funding that has been directed toward critical infrastructure and water quality.

Operations Challenge

The 2023 Connecticut Operations Challenge team competed at WEFTEC in Chicago, placing 11th overall in Division 3. Congratulations to the team: John Kaminski (Canton); Kevin Mauricin and John McGarty (Veolia – Norwalk Water Pollution Control Facility); and Nick Stevens, Brad Vasseur, and Coach Jason Nenninger (Greater New Haven Water Pollution Control Authority). Our Connecticut team is looking for participants in 2024. Please visit our website (ctwea.org) to learn more. There are many ways to get involved in Operations Challenge beyond the team itself, including donating equipment and supplies, judging events, and fundraising. The next Operations Challenge events include a training day in April and the NEWEA Spring Meeting competition in May in Newport, Rhode Island. The team also seeks creative suggestions for a new name. Please reach out to any team member with ideas.

NEWEA Award Recipients

This year's NEWEA Annual Conference was well attended and an excellent event, as always.

Connecticut representation in the Regulatory Roundtable session was by Ivonne Hall of the Municipal Wastewater section of DEEP. Many thanks to Ivonne for her time and participation.

We are proud of the other notable recognitions of Connecticut wastewater professionals in 2023, including the following:

- Stockholm Junior Water Prize National and International Winner – Naomi Park (Greenwich)
- Alfred E. Peloquin Award – Thomas Tyler (Hartford)
- Operator Award – David Milano (Cheshire)
- E. Sherman Chase Award – Jane LaMorte (Stafford Springs)

Manager's Forum

The Manager's Forum was held on December 11 at the Aqua Turf in Plantsville. This well-attended event focused on plant operations, laboratory, and maintenance. An overview of Operations Challenge was provided, as well as a summary of the Operator Exchange. Talks included an update from DEEP, training on the process control tool used for Operations Challenge (including a refresher on various WPCF process operations), a discussion on Vernon WPCF upgrades including phosphorus removal, and a sampling presentation by the Bureau of Aquaculture.

WEF Collection Systems and Stormwater Specialty Conference

Connecticut is excited to host the WEF Collection Systems and Stormwater Specialty Conference in Hartford this April. Many of our members are participating in the local planning group to organize the conference. We appreciate their time and look forward to seeing many of you here in the spring.

Events and Happenings

- Spring Workshop – May 2024 at the Aqua Turf in Plantsville
- Sewer Open – Friday June 21, 2024
- Member Outing (Yard Goats game) – September 2024

Other Highlights

- CTWEA is soliciting content for our newsletter! WPCF and operator features are welcomed.
- Graydon Stewart of Farmington participated in the Operator Exchange this year and was hosted in Rhode Island. We are grateful to the Rhode Island Clean Water Association for its hospitality and the wealth of information during the tours.
- Congratulations to Art Simonian (The Mattabassett District) on his election as deputy treasurer for NEWEA.


David Milano, Operator Award


Thomas Tyler, Alfred E. Peloquin Award

Operator Exchange participant, Graydon Stewart of Farmington

Maine State Director Report

by Paula Drouin
pdrouin@lawpca.org

Spring greetings from Maine! Given the severe wet weather events that have devastated parts of the Northeast recently, I am hesitant to celebrate the notion of "April showers bring May flowers." Here's hoping our region experiences the needed showers, but is spared from additional flooding conditions.

Maine Water Environment Association (MEWEA) has always been a strong association, with volunteers who step up time and time again to take on more responsibility, thus expanding the services we offer and the services we provide for our membership, and really for the broader clean water sector. What has been realized is that committees tend to exist in silos, where they aren't always aware of what's happening within other committees, inhibiting collaboration and sometimes leading to duplicate efforts. Because there are so many wonderful ideas and energies, a need became apparent to improve information sharing and develop efficiencies for our volunteers. At the beginning of the year, MEWEA began aligning our association structure with NEWEA's. Phil Tucker, Stacy Thompson, and I are council directors who oversee the 14 MEWEA committees. These support roles are clearly helping to facilitate communication and maximize volunteer efforts. In addition, MEWEA will develop an orientation presentation for new chairpersons, using NEWEA's presentation as a model.

At the beginning of the year, MEWEA began aligning our association structure with NEWEA's.

The Annual Legislative Breakfast, called Waffles and Water, was held on January 16 in Augusta. Along with leaders in our association and speakers from the Maine Department of Environmental Protection, we were delighted to have Ivy Frignoca, Casco Baykeeper, join us. Collaboration with her group, the Friends of Casco Bay, and other environmental groups in the state is imperative to the success of clean water initiatives. Also on the legislative front, MEWEA is preparing for the National Water Policy Fly-In, which is scheduled for April 9 in Washington, D.C. At this event, each state meets with their elected senators and representatives to talk with them about the critical work we do, including the challenges we face. Our story is not new, but there is much value in showing up and providing a clear and concise update on current issues. It is also essential to continuously extend ourselves as a resource should they have clean water questions. MEWEA President Emily Cole-Prescott and Vice President Theresa Tucker plan to attend.

In collaboration with the New Hampshire Water Pollution Control Association, we held our annual Ski Day on March 14 at Saddleback in Rangeley, Maine. This event is always a great opportunity to network, socialize, and have fun. Another social event is the Water & Wastewater Professional Day social gathering at a Portland Sea Dogs baseball game on June 22. Members are encouraged to bring their families and enjoy an all-you-can-eat BBQ while watching the game. This event was a success last year and one that I know many of our members look forward to.

In celebration of Clean Water Week, MEWEA is again sponsoring a poster competition for Maine students grades 1–12, where they create artwork illustrating "Why Water's Worth It to ME." Recent years have been successful, and we routinely receive over 500 posters that are judged for creativity, delivering a strong message, and connecting with MEWEA's mission. The top 12 posters are made into a calendar for the following year and each of the top four student submissions (one from each age group) receives a $100 prize and an invitation to attend a celebratory event.

At the end of April, the MEWEA Executive Committee will hold a strategic planning session. This session allows for thorough review of how our focuses and actions align with the association's short- and long-term goals and whether modifications are needed.

Later this year, on September 19–20, MEWEA will host our annual Fall Convention at Sunday River in Newry. The annual golf tournament will be the Wednesday before, on September 18. This convention is our highest attended event due to the number of technical sessions, the vendor floor, and possibly the after-hours corn hole tournament, a fun and valuable networking event. Annual awards are also presented on Thursday, now in a ceremony separate from lunch, which has proven to be much better. I may be partial having been the past Awards Committee chair, but I cannot express enough the importance of the awards program. Whether you are in Maine or one of the other states, please look at the awards offered, think about all the deserving individuals you know, and submit nominations (state, regional, and national). Also at the Fall Convention, the Executive Committee will staff the MEWEA booth to promote the association and recruit committee members. So many people could help with our work, we need to better define the needs and the benefits of involvement, then be direct and welcoming in ushering in new members.

Last, I share an opportunity for short-term financial support for training through the Harold Alfond Center for the Advancement of Maine's Workforce. The Maine Workforce Development Compact comprises Maine businesses, associations, nonprofits, and municipalities committed to working together to solve Maine's workforce challenges. Financial support of up to $1,200 per worker is available through 2025. This is an opportunity for clean water professionals to attend trainings at a 50 percent discount. More information can be found at mccs.me.edu/workforce-training/maine-workforce-development-compact.

Philip J. Tucker, NEWEA Alfred E. Peloquin Award

Mary Waring, Brunswick, Maine, NEWEA Biosolids Management Award

John Cummons (left) of the Greater Augusta Utility District (GAUD) shows Massachusetts exchange operator Jay Waddington around the GAUD plant

New Hampshire State Director Report

by Michael Trainque
mtraink75@gmail.com

Greetings from the Granite State. Most of us in the water industry accept that climate change is real and is having significant impacts on our environment. These impacts include intense droughts, water scarcity, flooding, more intense and catastrophic storms, severe fires, rising sea levels, melting polar ice, and declining biodiversity. We in New England are not immune to these impacts. In January, coastal New Hampshire had some of the worst flooding in memory, prompting road closures and evacuations in Rye, Hampton Beach, and elsewhere.

This year, New Hampshire will be exchanging operators with Connecticut as part of the annual Operator Exchange event. In New Hampshire, the exchange will take place September 11 to 13 to coincide with the New Hampshire Water Pollution Control Association (NHWPCA) Fall Meeting scheduled for September 13.

The NHWPCA Education Committee has been developing curricula (syllabi) for classes at local technical schools to train future wastewater operators. The committee hopes to start the first training course at Manchester School of Technology in the fall of 2024. It is also focused on outreach to trade schools, high schools, technical schools, community colleges, and veterans' organizations to generate interest in careers in the water and wastewater industry. A brochure to attract target audiences to careers in the industry has been developed to hand out at events and for distribution to targeted audiences. The committee is planning a photo or video contest. It is also developing a New Hampshire Department of Environmental Services (NHDES) "Manager School 2.0," which would provide additional training to individuals who have completed the NHDES Drinking Water/Wastewater Manager School.

New Hampshire's 2024 annual Legislative Breakfast was held on March 6, at the Holiday Inn in Concord. Fred McNeill once again moderated the event. Plaques were given to Legislative Water Champions—members of the New Hampshire Legislature who demonstrate an awareness of and commitment to the water industry.

The NHWPCA and the Maine Water Environment Association hosted the 15th Annual Ski Day for members and sponsors on March 14 at Saddleback Mountain, in Rangeley, Maine.

We are excited to announce that New Hampshire has plans to field an Operations Challenge team for the first time in years.


Rye, New Hampshire on January 13, 2024
Photo courtesy of Melissa Cookson

The always popular Discover Wild New Hampshire Day is scheduled for April 20, 10:00 AM – 3:00 PM, at the New Hampshire Fish & Game Department, 11 Hazen Drive, Concord. I was recently asked at an ASA/state director meeting, "What is Discover Wild New Hampshire Day?" There may have been a misconception that this was a raucous pub crawl, but it's a family-oriented and fun way to learn about New Hampshire's wildlife resources and rich legacy of outdoor traditions. Activities include educational exhibits by environmental and conservation organizations; live animals, fish, and trained falcons; archery, casting, fly-tying, and B-B gun shooting; retriever dogs in action; hands-on crafts for the kids; and the latest hunting and fishing gear and gadgets. The best way to find out about this event is to join us! You may even win a gift from the NHWPCA.

The NHWPCA Winter Meeting was held on December 8, 2023, at the Merrimack River water treatment plant. This was a departure since the focus was on drinking water treatment; however, it kept with the then-current theme of One Water: All for One and One for Water. The morning included tours of the Manchester water treatment facility. This recently completed 7.2 mgd (27.4 ML/d) facility receives water from the Merrimack River via a radial collector well that was constructed in 2016 and supplies drinking water to nearly 180,000 people. The luncheon, technical presentation, and business meeting following the tours were held at the Puritan Backroom Restaurant. The meeting included the president's address, financial report, recommendations and election of 2024 NHWPCA officers, NHDES awards, and the latest management school graduation. The much-anticipated raffle following the business meeting did not disappoint, as "Santa" Ray Vermette was back to officiate. The meeting was well attended and fun for all.

The NHWPCA Government Affairs Committee is tracking a number of bills, especially those that could affect the water and wastewater industry. Comments are being submitted for several proposed bills. As always, PFAS legislation is of concern. House Bill HB 1649 relative to prohibiting certain products with "intentionally added PFAS" would restrict the use of these substances in certain consumer products sold in New Hampshire.

The New Hampshire Four Water Associations, which includes representatives of New Hampshire Water Works Association, Granite State Rural Water Association, New Hampshire Municipal Association, NHWPCA, and NHDES, met in December 2023. Discussion included legislative outreach, proposed bills in the New Hampshire Legislature, PFAS impacts on water and wastewater facilities, and recruiting challenges. On January 9, the New Hampshire Clean Water Associations sent a letter to the New Hampshire House Committee on Commerce and Consumer Affairs in support of House Bill 1649, which would prohibit the sale of certain PFAS-added consumer products, but recommended changes to the bill for clarity.

Congratulations to the following New Hampshire individuals and organizations for their awards and recognition at the 2024 NEWEA Annual Conference in January:

EPA Region 1 Awards

- Hanover Water Reclamation Facility (Kevin MacLean, Superintendent) – Wastewater Treatment Plant O&M Excellence Award
- Nate Brown (Peterborough Wastewater Treatment Facility) – Wastewater Treatment Plant Operator of the Year Excellence Award
- City of Nashua (Douglas Starr, Industrial Pretreatment Coordinator) – Industrial Pretreatment Program of the Year

NEWEA/WEF Awards

- Abhinav Avvaru (Nashua) – Stockholm Junior Water Prize
- Sam Heffron (Newmarket) – NEWEA Operator Award
- Sharon L. Nall (Concord) – Alfred E. Peloquin Award
- Casey Rosenberg (Bedford) – Young Professional Award
- Hall Street Wastewater Treatment Plant (Concord) – Energy Management Achievement Award
- North Conway Water Precinct – Wastewater Utility Management Award
- Frederick J. McNeill (Manchester) – Past President's Plaque and Pin
- Sean Greig (Newmarket) – WEF MA William D. Hatfield Award

Please check out the Winter 2023 edition of *The Collector,* the newsletter of the NHWPCA, at nhwpca.org for more great information on what's happening in the Granite State.

The NHWPCA expresses its sincere appreciation and gratitude to all the members, volunteers, committee members, committee chairs and co-chairs, exhibitors, and sponsors that make the NHWPCA function effectively and the various events possible for our members.


Sharon L. Nall, Alfred E. Peloquin Award


Sam Heffron, Operator Award

Casey Rosenberg, Young Professional Award

Vermont State Director Report

by Jennie E. Auster
jennifer.auster@wright-pierce.com

As I start this director role, I first thank my predecessor, Mike "Smitty" Smith, who completed his term as Vermont state director at the 2024 NEWEA Annual Conference. Smitty is one of the *Vermont engineering all-stars*; sure, that award may not exist, but if it did, Smitty's name would assuredly be on the list. Thank you, Smitty, for setting me up with the foundation to serve as the new director and for your service to NEWEA.

After graduating from the University of Michigan, my engineering consulting career has spanned from Houston to Atlanta to New York City to the past 14 years in Vermont. I have been a director on the Green Mountain Water Environment Association (GMWEA) Board of Directors since 2022 and am the chair of the GMWEA Membership Committee, while also serving on the Government Affairs Committee. I am on the board of advisors for the University of Vermont Civil and Environmental Engineering Department. My focus has been on wastewater treatment, and I have worked with over 40 wastewater treatment facilities in New England.

GMWEA Fall Tradeshow 2023

It was great seeing so many at the 2023 GMWEA Fall Tradeshow held on November 2 at DoubleTree Hotel in South Burlington. We had another amazing event with 438 attendees, 91 vendors, 9 education sessions, and an Operations Challenge demo from the Massachusetts Team. I thank Christine Dougherty and the GMWEA Continuing Education Committee (CEC) for the excellent agenda.

Legislative Breakfast 2024

GMWEA held its annual Legislative Breakfast at the State House on January 9. Our discussions with state legislators focused on the following:

- Vermont's need for a holistic, thoughtful, long-term approach for managing wastewater sludge
- Importance of developing a long-term plan for management of septage produced by 55 percent of Vermont residents
- Importance of developing a long-term plan for the management of landfill leachate generated in Vermont
- Urgency of supporting drinking water, wastewater, and stormwater projects with grant funding

The breakfast was well attended and enabled connections with many state leaders. Legislators are seeing the connection between solving Vermont's housing shortage and ensuring infrastructure integrity as well as the need for resiliency following the 2023 flood events.

EPA Region 1 Awards

In Vermont, EPA Region 1 awards are based on nominations from Vermont Department of Environmental Conservation (VTDEC). This year VTDEC recognized four wastewater systems that were profoundly affected by the summer 2023 flooding. These operators and their teams provided outstanding responses to the devasting floods.

EPA Wastewater Treatment Plant Operator of the Year Excellence Awards

- Dan Copp, Johnson
- Ken LaCasse, Hardwick
- Joe Gaudiana, Ludlow
- Bob Wells, Middlebury

NEWEA and WEF Awards

Vermont was represented among the NEWEA and WEF award winners.

NEWEA Operator Award – Matt Dow, Burlington

Matt Dow has been part of the Burlington wastewater team since starting as an operator in 2012. He was promoted to chief operator in 2015 and then to facilities manager for wastewater in 2017. Matt provides technical support to operations, while also handling all the paperwork and budgets for Burlington's three wastewater treatment plants. Matt is an active leader in the long-term planning for the future

2023 – 2024 GMWEA Board of Directors L–R: Harry Shepard, Joanna Bisceglio, Joe Duncan, Jennie Auster, Christine Dougherty, Jennifer Garrison, Christina Adams, Bob Fischer (2023 NEWEA President), Ashliegh Belrose, Mike Smith (missing from photo: Monika Ingalls, Kaytee Manchester, and Eilen Toomey)

of Burlington's wastewater plants. He constantly analyzes how the wastewater plants can be improved and made safer for the operators. Matt patiently works with staff and consultants to develop effective solutions for wastewater plant upgrades and identify innovative ideas to improve operations, reduce costs, and enhance water quality. Matt is a wastewater leader, a key member of the wastewater operations team, and a leader within Burlington Water Resources.

NEWEA Alfred E. Peloquin Award
Bernie Fleury, Essex Junction

Bernard (Bernie) Fleury, senior operator at the Essex Junction wastewater treatment facility (WWTF), retired December 2022. With 44 years of service, he was the longest continually serving operator at the WWTF. Bernie participated in several process upgrades, including the addition of secondary treatment, tertiary treatment, anaerobic digestion, and solids handling. He has been active in NEWEA and was a signature member of the Vermont Sewer Marines who competed in Operations Challenge competitions in the late 1990s at NEWEA and WEFTEC. He received the GMWEA Operator Excellence Award in 2021 and is a 13-year member of the WEF Quarter Century Operators Club. Thanks, Bernie, for your years of service, and enjoy your retirement!

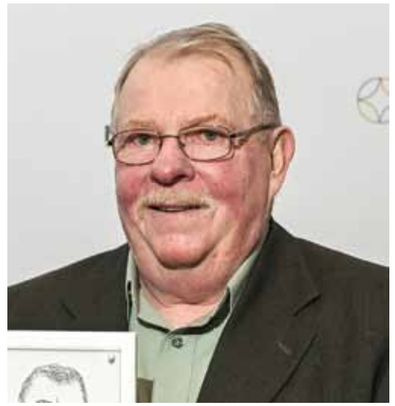
WEF Quarter Century Operator Award

- Chris Robinson, Shelburne
- Erik Bailey, Johnson

Congratulations to all the winners and thank you for your years of service.

Upcoming GMWEA Events

- GMWEA's Spring Meeting—May 23 at the Killington Grand Resort: This meeting includes 9 hours of accredited training, GMWEA's Annual Meeting, and Service Excellence Awards presentation.
- George Dow Golf Tournament: Held in mid-August each year at the Cedar Knoll Country Club in Hinesburg, the event provides an opportunity to meet other professionals in the field, compare notes, share work stories, eat a banquet meal, and have fun with family and friends.



Bernard Fleury, Alfred E. Peloquin Award

Matt Dow, Operator Award

Massachusetts State Director Report

by John Digiacomo
jdigiacomo@natickma.org

It is hard to believe it has been a year since I was selected to be the NEWEA state director for Massachusetts. During this past year, I have had the amazing opportunity to represent both NEWEA and the Massachusetts Water Environment Association (MAWEA) at the Capitol in Washington, D.C., and the State House in Boston to discuss wastewater issues important to Massachusetts as well as our industry. I have also worked with the MAWEA Board of Directors on continuing to promote the exchange of information among water quality professionals and to provide education and training to our members and our industry.

MAWEA Events – Past and Future

Last year was a rebuilding one for MAWEA with life and events continuing to get back to normal from Covid. NEWEA's operational and administrative support for MAWEA has strengthened and reinvigorated the organization, and enabled us to reset our goals and objectives to serve our Massachusetts operators.

This year is already busy and exciting. On February 2, MAWEA members participated in a Ski Day with members from the Connecticut and Vermont state associations at Stratton Mountain in Vermont. From initial reports and pictures, everyone had a great time, and no emergency room visits were reported, which is always a positive! Our quarterly meeting took place on March 13 at the Devens Commerce Center. We are excited to have transitioned back to mostly in-person events. Our annual legislative event "Water's Worth It Day," (held jointly with ACEC/MA) will be held at the State House in Boston on May 11—see the MAWEA website for details. This is an opportunity to partner with our utility works partners in meeting with our state representatives and senators. These meetings are critical in making our governmental representatives aware of the great work we do and the importance of clean water infrastructure funding and other legislation affecting our utilities.

The 2024 National Water Policy Fly-In will take place on April 9–10 in Washington, D.C. This is the largest annual grassroots advocacy event for water policy issues and, like the Massachusetts legislative event, is crucial to engage with and educate our representatives on the valuable work we do and the need for renewed funding for current initiatives as well as additional funding for future legislation. I am honored that the MAWEA Board of Directors has asked me to represent them again at both of these important events. Please reach out to me if you are interested in participating or learning about these two events.

The MAWEA Spring Operators Trade Show and Barbeque will be held at Mt. Wachusett on May 15. Last year's event was successful, and we hope to continue that with this year's event. Let's hope that Mother Nature has decided that Old Man Winter will be gone by then and it will be a warm and sunny day. Our MAWEA Annual Golf Outing is scheduled for June 12 at the Heritage County Club in Charlton. Registration and sponsorship sign-up is under way, and we anticipate another fun event this year. There will be some new incentives and prizes, including the chance to shoot a Golf Cannon on one of the holes! Please check the MAWEA website for info on this event.

MAWEA has reinvigorated our Awards Program and created three Excellence Awards to recognize the outstanding accomplishments of our Massachusetts water quality professionals. While this year's nomination period will be complete when this article is published, please consider nominating a Massachusetts water quality professional for next year's awards. The 2024 awards will be presented at the Annual Trade Show and BBQ on May 15.

MAWEA is always looking for new members. Whether you are an operator, a Young Professional involved in the clean water industry, a consultant, or a municipal employee, we would love to talk to you about the benefits of joining our organization.

NEWEA Annual Conference and Awards Luncheon

NEWEA held its Annual Conference in Boston at the Marriott Copley Place January 21 to 24. Attendance (and the excitement surrounding the event) exceeded pre-Covid numbers, and many Massachusetts operators, municipalities, vendors, and consultants attended and had a great time. At the annual NEWEA Awards Luncheon, Massachusetts was well represented. Award recipients from Massachusetts included the following:

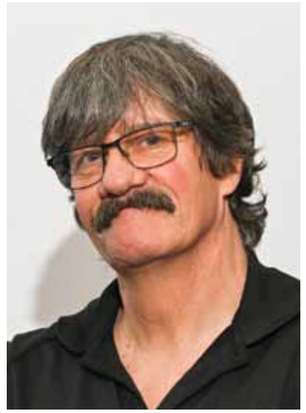
- NEWEA Scholarship Winner – Varsha Niroula, University of Massachusetts
- Stockholm Junior Water Prize – HyeonKi Lee of Gill
- Kate Biedron Memorial Scholarship Recipient – Ella Quinn of University of Massachusetts
- NEWEA Operator Award – Eric Kerr of Chicopee
- Alfred E. Peloquin Award – John Downey of Dedham (MAWEA Past-President)
- Paul Keough Award – Sarah Robertson of Montague
- Youth Educator Award – Jeff Kalmes of Billerica
- James J. Courchaine Collection Systems Award – Kevin Brander of Woburn
- Founders Award – James Barsanti of Framingham
- Clair N. Sawyer Award – Nick Tooker of UMass Amherst
- Committee Service Award – Kevin Garvey of Andover
- Diversity Equity & Inclusion Leadership Award – Jasmine Strout of Westford
- George W. Burke, Jr. Award – Cohasset MA WWTP
- Arthur Sidney Bedell Award – Matt Formica of Chelmsford
- WEF Delegate – Peter Garvey of Boston
- WEF Delegate-at-Large Award – Matt Formica of Chelmsford
- WEF Fellow – Jennifer Kelly Lachmayr of Wakefield
- WEF Operator Scholarship – Mitchell Ryan of Greenfield

Congratulations to all the award recipients on these well-deserved honors.

Operations Challenge Update

The Massachusetts Operations Challenge team, Mass Chaos, is preparing to compete at the NEWEA Spring Meeting in Newport, Rhode Island, in mid-May for the opportunity to represent Massachusetts and New England at the national Operations Challenge competition at WEFTEC in New Orleans in October. Operations Challenge is the "Wastewater Olympics" for professionals in the wastewater treatment industry. Good luck Mass Chaos!

If you are an operator and would like to learn more about Operations Challenge and how to get involved, please let me know and I can put you in touch with the NEWEA Operations Challenge Committee chair.



John Downey
Alfred E. Peloquin Award

Jeff Kalmes
Youth Educator Award

Kevin Garvey
Committee Service Award

Nick Tooker
Clair N. Sawyer Award

Eric Kerr
Operator Award

Ella Quinn
Kate Biedron Memorial Scholarship

2024 Student Poster Board Competition

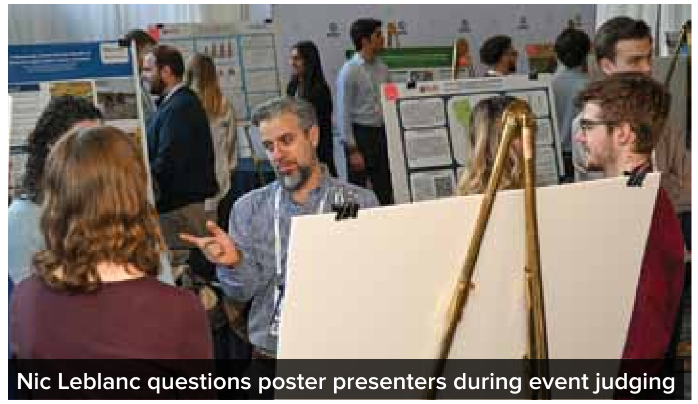
The NEWEA Student Activities Committee hosted the annual Student Poster Competition on Monday. January 22, during the 2024 Annual Conference in Boston. The competition drew a high attendance this year, with 17 posters in the Undergraduate category and 15 posters in the Graduate category.

Students from 11 universities participated:

- Northeastern University
- Quinnipiac University
- Roger Williams University
- University of Hartford
- University of Maine
- University of Massachusetts Amherst
- University of Massachusetts Lowell
- University of New Hampshire
- University of Rhode Island
- University of Vermont
- Worcester Polytechnic Institute

The posters were reviewed and scored by a panel of industry professionals and were displayed all day throughout the third floor Atrium, allowing students to network with and receive feedback from conference attendees.

The winning posters (included here) were presented by the University of Vermont undergraduate student Hudson Smith on "Fungal Derived Biochar as a Viable solution for Copper (ii) Removal from Stormwater" and by University of Maine graduate student Nelson Chime on "Integration of Chlorine Production From Electrolysis into a Wastewater Treatment Plant."

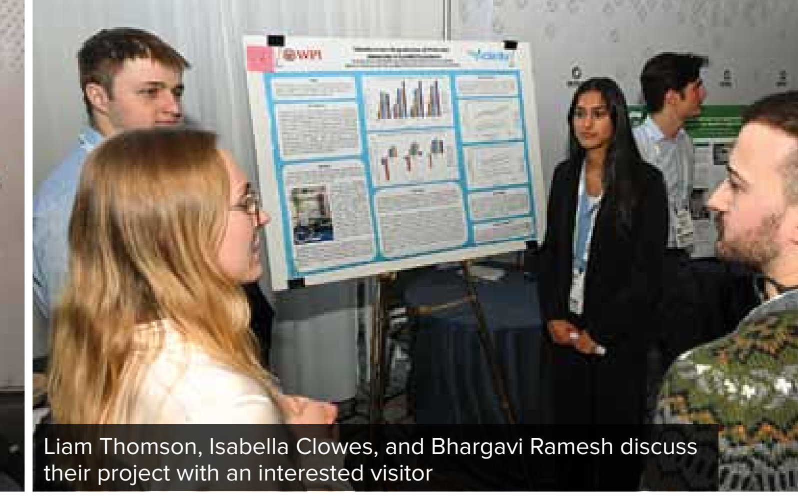


Nic Leblanc questions poster presenters during event judging

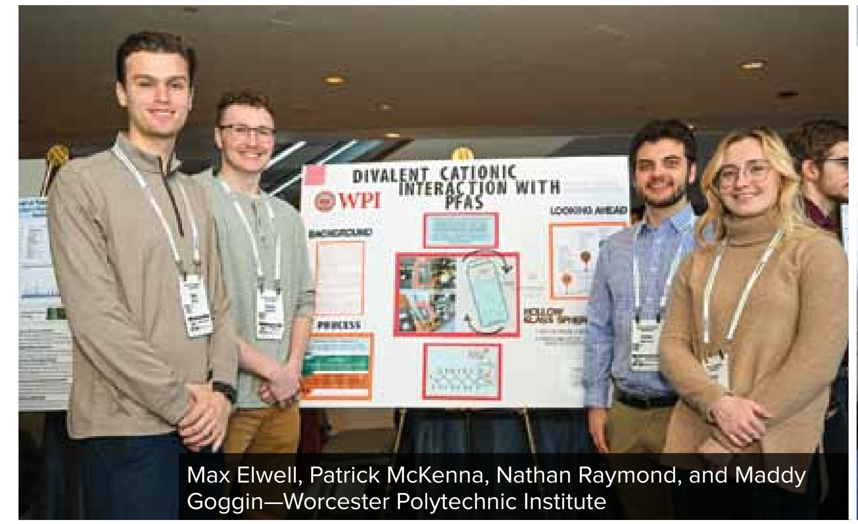
The Student Activities Committee thanks the participating students, whose dedication to and enthusiasm for the field was evident in the incredible display of posters! We also thank the volunteer judges. We are excited to have brought so many students and professionals together in person at this year's event.

If you missed this year's event, stop by next year on Monday during the 2025 Annual Conference. If your organization is interested in supporting future student poster sessions and the student engineers and scientists who present their work, please reach out to the NEWEA Student Activities Committee chair for more information.

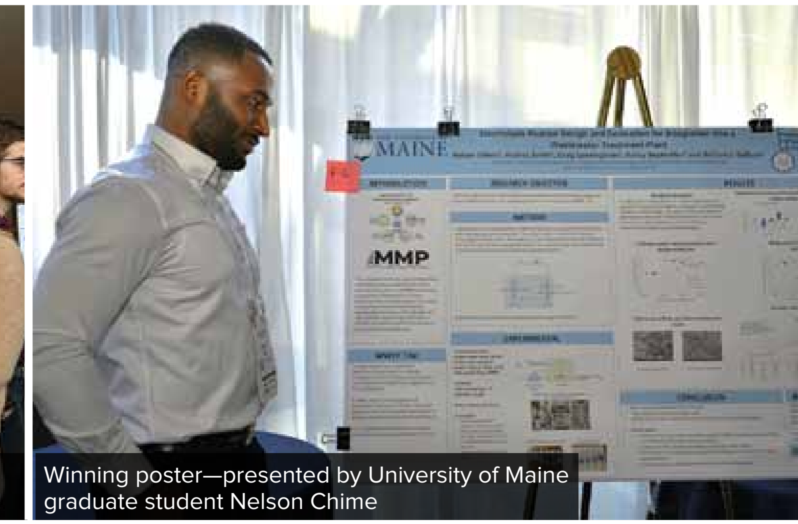
Winning poster—presented by the University of Vermont undergraduate student Hudson Smith



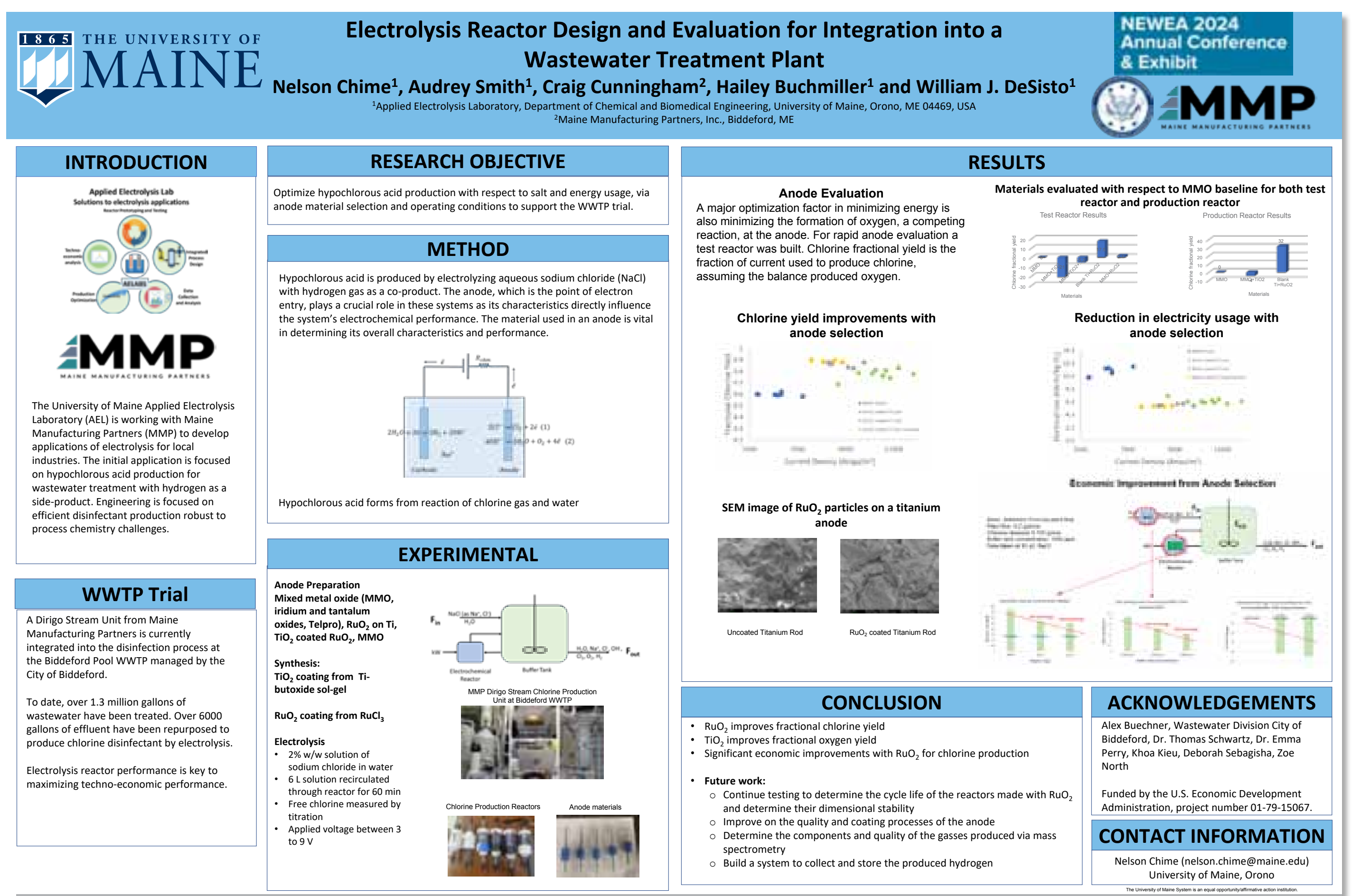
Liam Thomson, Isabella Clowes, and Bhargavi Ramesh discuss their project with an interested visitor



Max Elwell, Patrick McKenna, Nathan Raymond, and Maddy Goggin—Worcester Polytechnic Institute



Winning poster—presented by University of Maine graduate student Nelson Chime



2024 Annual Conference & Exhibit Proceedings

Boston Marriott Copley Place, Boston, MA • January 21–24

NEWEA's 2024 Annual Conference convened with a meeting of the Executive Committee with all chairs on Sunday, January 21, 2024. The three-day event welcomed over 2,300 attendees and featured more than 200 exhibitors and 37 technical sessions.

The Annual Business Meeting was held on Monday, January 22. Nominating Committee Chair Jennifer Kelly Lachmayr presented the slate of officers for 2024 as follows:

- Vice President – Scott Firmin
- Deputy Treasurer – Arthur Simonian
- WEF Delegate – Emily Cole-Prescott
- Council Director – Communications – Philip Tucker
- Council Director – Meeting Management – Scott Neesen
- Council Director – Outreach – Daryl Coppola
- Rhode Island Director – Amy Anderson George
- Vermont Director – Jennie Auster

In accordance with the provisions of Article 9.3.2 of the NEWEA Constitution & Bylaws, these officers will advance to the following positions:

- President – Scott Goodinson
- President-Elect – Deborah Mahoney
- Past President – Robert Fischer

The remaining incumbents are fulfilling unexpired terms:

- Treasurer – David Van Hoven (3rd year)
- WEF Delegate – Raymond Vermette (through WEFTEC 2024)
- WEF Delegate – Janine Burke-Wells (through WEFTEC 2025)
- WEF Delegate – Virgil Lloyd (through WEFTEC 2026)
- Council Director: Collection Systems/Water Resources – Scott Lander (2nd year)
- Council Director: Innovation – Michael Murphy (2nd year)
- Council Director: Treatment, Systems Operations & Management – Marina Fernandes (3rd year)
- Connecticut Director – Vanessa McPherson (2nd year)
- Maine Director – Paula Drouin (3rd year)
- Massachusetts Director – John Digiacomo (2nd year)
- New Hampshire Director – Michael Trainque (3rd Year)

Opposite page: Amy Anderson George, WEF President Aimeé Killeen, NEWEA President Bob Fischer, Maureen Neville, and Mary Barry officiate at the trade floor grand opening **1.** Dr. Jonathan Gruber delivers the opening session keynote address **2.** Registration volunteers Amanda Jett LeBlanc, Chris Hayward, Jaqueline Collins, and Meg Tabacsko **3.** Tim Dupuis and Jane Madden in the registration foyer **4.** Erin Schustek, Angelika Tyhansky, Ben Lanava, and Charlotte Andrews depart with their posters

37 Technical Sessions

SESSION 1
Government Affairs 1: Regulatory Actions
Moderators:
- Jeff McBurnie, Casella Resource Solutions
- Jeff LeMay, Town of South Windsor, CT

Protecting the Unseen Assets: The Addition of Cybersecurity to Rhode Island State Regulations
- Jack Segal, RIDEM

A Proven Regulatory Strategy for Nutrient Removal at WRRFs
- Grant Weaver, Grant Tech

The Impact of PFAS on Water Reclamation Facilities; Current Regulatory Trends and How to Prepare
- Eric Spargimino, CDM Smith

A Tale of Two States: Clean Watershed Needs Survey Lessons Learned and How to Tackle the 2026 Survey
- Tyler Feeney, Woodard & Curran
- Sean McCormick, RIDEM

SESSION 2
Plant Operations 1: Flowing with Creativity – Unique Approaches to Facility Upgrades
Moderators:
- Jim Li, AECOM
- Patty Chesebrough, NHDES

It Takes a Village: Collaborative Low-Flow Start-Up of Orleans's Greenfield WWTF
- Amy Hunter, AECOM
- Edwin McAuliffe, Veolia

MBR Released from Prison: Using Creativity & Fundamentals to Achieve Stringent Nutrient Removal and Improve Process Resiliency at a Prison WWTF
- Joseph Zaleski, Woodard & Curran
- Aaron Brennan, Woodard & Curran
- Krista Forti, Woodard & Curran

Design Bid Build and Design Build in the Same Project
- Brian Messner, Wright-Pierce
- Dan Finan, Veolia
- Jake Fleming, City of Leominster, MA

Grit Removal Design for High Flows, Limited Head Loss and High Efficiency Capture at Springfield, MA Regional Wastewater Treatment Facility
- Jose Infante Corona, Kleinfelder
- Hannah Kominske, Kleinfelder
- Matt Nolan-Parkhouse, Veolia
- Steven Frederick, SWSC

1. Civil engineering students from Blackstone Valley Regional Vocational Technical High School pose at the conference flanked by engineering instructors Jaylene dos Santos and Philip Delacroix 2. The student poster session drew a crowd 3. Patrick McKenna and Nathan Raymond present their poster

Session 3
Collection Systems 1: Pump up the Waste

Moderators:
- Scott Lander, Retain-it
- Allison Shivers, Tata & Howard

The Public and Private Challenges of a Low Pressure Sewer Construction
- Kevin Garvey, Wright-Pierce
- Peter Rice, City of Portsmouth, NH
- Zachary Cronin, City of Portsmouth, NH

What's Not Resiliency? How Diverse and Creative Approaches Improved Pump Station Resiliency in Edgartown, MA
- Samuel Taugher, Tighe & Bond
- Austin Weidner, Tighe & Bond

Abington Pump Station Force Main: Replacing a Critical Asset
- Jill Rossini, Kleinfelder

Tackle the Wipes Apocalypse—Safeguarding Your Sewage System
- Joseph Clark, JWC Environmental

Session 4
Stormwater 1: Application—Advancing Program Funding and Implementation

Moderators:
- Cindy Baumann, CDM Smith
- Maria Rose, Town of Brookline, MA

Strategies and Conceptual Designs for Adaptation and Coastal Stormwater Discharge in Boston
- Ben Agrawal, Hazen and Sawyer
- Charles Wilson, Hazen and Sawyer

Will the First City in New Hampshire Adopt the First Stormwater Fee?
- Kelly Westover, Stantec
- David Hyder, Stantec
- Ken Mavrogeorge, City of Dover

California Dreaming: What New England Can Learn from LA's Safe, Clean Water Program
- Ross Tsantoulis, Woodard & Curran
- Hector Bordas, Woodard & Curran

Stormwater Management Technical Assistance & Project Funding—A Collaborative Approach
- Kimberly Korioth, Rhode Island Infrastructure Bank
- William Guenther, Fuss & O'Neil

Session 5
Contaminants of Emerging Concern 1: Capture, Concentrating, and Destruction Developments

Moderators:
- Laura Marcolini, Fuss & O'Neill
- Shane Hancox, University of Massachusetts

Destruction of PFAS in High Strength Wastes
- Sophie Waterhouse, Aclarity

Multifunctional Zwitterionic Hydrogels as a Platform for the Rapid and Simultaneous Elimination of Organic and Inorganic Micropollutants from Water
- Devashish Gokhale, Massachusetts Institute of Technology
- Andre Hamelberg, Massachusetts Institute of Technology
- Patrick Doyle, Massachusetts Institute of Technology

1. Networking at the Tuesday trade floor reception 2. Art Simonian, Gary Zrelak, Edwin Castilla, Rob Pontau, Karla Sangrey, and Kevin Garvey in line for lunch 3. Brian Shea, Matthew Hernon, and Cameron Jenkins networking 4. Jessica Wagner, Jen Muir, Megan Colemen, Molly Keleher, and Paul Campbell pose for a staff photo in the foyer

Enhancing PFAS Treatment in Water: Insights from Bench-Scale Treatability Studies Using Traditional and Novel Adsorbents
- Francisco Barajas, AECOM

PFAS Treatment of Complex Wastewaters with Foam Fractionation Utilizing Air and Ozone Gasses
- Baxter Miatke, Arcadis

Session 6
Young Professionals 1: The Future of our Industry

Moderators:
- Meghan Otis, Wright-Pierce
- Zach Lamoureux, Carlsen Systems

Your Future Leaders Are Here: How to Engage and Develop Young Professionals
- Hannah Schulz, Woodard & Curran
- Jacob Fortin, Woodard & Curran

Funding the Future of Arcadis
- Andy Elderbrock, Arcadis
- Tyler Miller, Arcadis

Enhancing Mentorship Through Digital Networking
- Amber Foote, AECOM
- Kate Schassler, AECOM

Empowering the Future: Engineering in a Small Water Company
- Ryan Flood, Aquametrix by Water Analytics

Session 7
Government Affairs 2: Regulatory Roundtable

Moderators:
- Jeff McBurnie, Casella Resource Solutions
- Adam Yanulis, Tighe & Bond

The Regulatory Roundtable Session allowed for a discussion of common issues and solutions and facilitated the exchange of information.

Panelists:
- Kathleen Baskin, MassDEP
- Joe Haberek, RIDEM
- Ivonne Hall, CTDEEP
- Amy Polaczyk, VTDEC
- Tracy Wood, NHDES
- Judy Bruenjes, MEDEP
- Zoe LeBlanc, MEDEP

Session 8
DEI: Strengthening Your Company Culture, Mindset, and Project Success Through Effective Equitable Practices and Social Vulnerability Tools

Moderators:
- Jess Locke, Tighe & Bond
- Bill Russo, Automatech

Diversity, Equity, and Inclusion—Establishing the Baseline
- Bill Stierle, Subtext Solutions

Equity in Climate Resilience: A Survey of Progress in Greater Boston Municipalities
- Stefani Harrison, Stantec
- Kalila Barnett, Barr Foundation

Making Sense of Social Vulnerability Indices and Tools
- Nicholas Mitch, Arcadis

Session 9
Collection Systems 2: When the Going Gets Tough, Tough Engineers Get Going

Moderator:
- Peter Garvey, Dewberry
- Kara Keleher, Weston & Sampson












1. WEF's Stephen Sanders moderates the Plenary Session 2. Natalie Sierra raises a point at the Biosolids Management session
3. Vanessa Borkowski moderates the Residuals and Biosolids Risks panel 4. Trevor Johnson presents on utility funding strategies
5. Lucner Charlestra (center) at a Watershed Management session 6. Maeve Carlson moderates the Sustainability session

Targeting Pipes From a Sea of Data: Scheduling Inspections, Cleanings and Rehabilitation in Waterbury, CT
- Courtney Kennedy, Jacobs Engineering
- Karina Massey, Jacobs Engineering

Your Key to Tackling I/I: A Well-Engineered Annual Inspection Program
- Kin Wong, Weston & Sampson

Supply Chain Problems—They're Everywhere: Case Study in Engineering, Procurement, and Construction Management as an Alternative Project Delivery Method
- Douglas Brisee, Fuss & O'Neill

The Hydrogen Sulfide Beast from Below: A Reactive, Responsive, and Proactive Need for Handling H_2S Before it Handles Us; A Sequence of Events That Led the Town of Ayer on a Journey to Discovering and Remedying a High-Risk Issue Within Their Wastewater Collection System
- Cameron Jenkins, Arcadis
- Daniel Van Schalkwyk, Town of Ayer, MA

Session 10
CSO/Wet Weather Issues 1: CSO Mitigation – Implementation and Construction Challenges

Moderators:
- Peter Frick, ADS
- James Drake, CDM Smith

The Portland Back Cove West CSO Storage Conduit, Collaborating to Protect Our Water Resources
- Ryan Wingard, Wright-Pierce
- Steve Guerrette, Wright-Pierce

When Projects Collide: How the City of Haverhill Navigated Utility Coordination During Design of the Locke Street Area Sewer Separation
- Matthew Corbin, Wright-Pierce
- Laurie Perkins, Wright-Pierce

I Think I Can, I Think I Can. The Little Town that Could LTCP – Leverage the Coordination Potential!
- Lindsey Sylvester, Wright-Pierce
- Lisa Muscanell-DePaola, Wright-Pierce

Springfield Water and Sewer Commission: Building System Resiliency—Overcoming the Challenges of the Locust Transfer Construction
- John Rahill, Kleinfelder
- Dave Szymczakiewicz, SWSC
- Jonnas Jacques, Kleinfelder

Session 11
Residuals and Biosolids 1: PFAS Removal and Destruction in Biosolids

Moderators:
- Justin Motta, Stantec
- Scott Firmin, Portland Water District

Technology Demonstration and Cost Analysis for PFAS Destruction in Biosolids
- Micah Blate, Hazen and Sawyer

What Does Pyrolysis Do to PFAS in Biosolids? Distinguishing Removal from Transformation
- Patrick McNamara, Black & Veatch
- Hari Santha, Black & Veatch
- Lynne Moss, Black & Veatch
- Scott Carr, Black & Veatch

Sludge Paralysis Meets Regional Pyrolysis
- Jarod Stuyvesant, Weston & Sampson

1. Todd Brown presents a pump lecture to Young Professionals 2. Hillary Waite asks a question about CSO reporting compliance
3. Sarah Nalven moderates a Watershed Management session 4. Xiaojin (Jim) Li introduces a Plant Operations session
5. Concentrating on a Plant Operations BNR presentation 6. Dru Whitlock speaks on the Residuals and Biosolids Risk panel

Ultra-High Temperature Gasification for Biosolids Treatment, PFAS Destruction, & Hydrogen Production
- Jim Henderson, Heartland Water Technology
- Brandon Davis, Heartland Water Technology

Session 12
Watershed Management 1: Innovative Tools for Quantitative Resilience Planning at Watershed Scale

Moderators:
- Andrea Braga, Jacobs
- Julie Sullivan, MWRA

Building Climate Resilient Integrated Planning: Learning from Alameda County Water District's Cap Approach
- Samantha Cohen, Brown and Caldwell

Innovation in the Field—Using Geospatial Video to Enhance Data Collection
- Elizabeth Karivelil, Brown and Caldwell

Ecosystem-based Integrated Watershed Resource Management in Today's Social Ecological System Context—A "One Water" Connecticut Example
- Paul Stacey, Footprints In The Water

Building Resilience Through Watershed Planning in New London, CT
- Kathryn Edwards, Arcadis
- Nicholas Mitch, Arcadis
- Joseph Lanzafame, City of New London

Session 13
Young Professionals 2: Workshop on Centrifugal Pumping Systems 101 – Fundamentals for Design

Moderators:
- Nick Tooker, University of Massachusetts
- Daryl Coppola, FR Mahony

This 2-hour interactive workshop included an overview of system curves, pump curves, and related calculations for centrifugal pumping systems; a discussion of practical applications of centrifugal pump design; and a guided tour of the Exhibit Hall to view the latest pump models, review literature (including pump curves), and ask questions.

Panelists:
- Todd Brown, University of Hartford
- Ryan Buckley, NEIWPCC
- Daryl Coppola, FR Mahony
- Emily Korot, CDM Smith
- Kitty Lovell, Woodard & Curran
- Colin O'Brien, Brown and Caldwell
- Jaimie Payne, Bartlett & West
- Nick Tooker, University of Massachusetts

Session 14
Plant Operations 2: The BNR Controls & Instrumentation Selection Adventure

Moderators:
- Victoria Helle, NEIWPCC
- Denise Descheneau, Upper Blackstone Clean Water

This interactive session featured a facilitated panel discussion with representatives from participating utilities in a recently-completed Water Research Foundation Project. Project leaders shared the evaluation tools developed for utilities, operators, and engineers, and utility representatives shared their experiences with implementation and operation of sensor-based controls for BNR, including performance, O&M, and costs.

1. Students head down escalator for lunch 2. Brian Tarbuck of Augusta on the Plenary Session panel 3. Josh Schimmel chairs the CSO/Wet Weather Issues committee 4. Zack Henderson introduces the Tuesday Plenary Session panel

Speakers:
- Paul Dombrowski, Woodard & Curran
- Jacob Fortin, Woodard & Curran
- Allie Greenfield, Woodard & Curran
- Sue Guswa, Woodard & Curran
- Maureen Neville, Woodard & Curran
- Nick Tooker, University of Massachusetts

Panelists:
- Michael Andrus, Upper Blackstone Clean Water
- Jesse Freeman, Woodard & Curran
- Jeff Gamelli, City of Westfield
- Matt Nolan-Parkhouse, Veolia

Session 15
Government Affairs 3: Infrastructure Funding

Moderators:
- Jeff McBurnie, Casella Resource Solutions
- Peter Garvey, Dewberry

EPA's State Revolving Fund team presented on the Bipartisan Infrastructure Investment and Jobs Act (IIJA) and its opportunities and implementation for the State Revolving Fund. Topics included financing, eligibility, and the similarities and differences between the domestic preference requirements, specifically the American Iron and Steel requirement (AIS) and the Build America, Buy America Act (BABA).

Panelists:
- Leslie Corcelli, EPA Office of Wastewater Management
- Forrest Petrich, EPA Office of Wastewater Management
- Kelly Tucker, EPA Office of Wastewater Management

Session 16
Collection Systems 3: Be a Smooth Operator

Moderators:
- Ryan Wingard, Wright-Pierce
- Jim Barsanti, Hazen and Sawyer

Clean Smarter, Not Harder: Wastewater Collection System O&M Optimization
- Jacob Mueller, HDR

One Water, One Collection System: Sustainable Design
- Vaughan Harshman, V&A Consulting Engineers
- Chris Hunniford, V&A Consulting Engineers

The Dollars and Sense of Adopting Optimized Cleaning Processes Leveraging Smart Technology
- Jay Boyd, ADS

Step by Step: A Data Collection and Planning Approach for Addressing Sewer Collection System Improvements through the Plymouth CMOM Program
- Andrew Grota, Environmental Partners
- Douglas Pinard, Town of Plymouth, MA
- Ziad Kary, Environmental Partners

Session 17
Stormwater 2: Tools—Expanding your Stormwater Toolbox

Moderators:
- Eric Kelley, Environmental Partners
- Scott Lander, Retain-It

Southern New England Program Retrofit Manual
- James Houle, University of New Hampshire
- Nate Pacheco, VHB

Moving Towards Regional Consistency – EPA BMP Performance Curves
- Theresa McGovern, VHB

1. Shelagh Connelly speaks on the Residuals and Biosolids Risk panel 2. Curt Spalding adds a remark at the opening session 3. Ken Conaty speaks at the Certification Committee meeting 4. John Livsey and Janine Burke-Wells on the panel at the Plenary Session 5. Justin Motta, Jack Segal, Prashanth Emmanuel, and Eric Spargimino at the Residuals Management Committee meeting

Tracking Changes in Land Use in the Charles River Watershed
- Max Rome, Charles River Watershed Association

BWSC: Stormwater Sampling and Water Quality Model Validation Project
- Dave Peterson, Kleinfelder
- Charlie Jewell, BWSC

Session 18
Contaminants of Emerging Concern 2: Mitigating, Managing, and Minimizing PFAS

Moderators:
- Amy Hunter, AECOM
- Jack Segal, RIDEM

Mitigating PFAS Transport Within Water Reclamation Facilities
- Christopher Curran, AECOM

Managing PFAS in Industrial Stormwater to Protect Groundwater Quality
- Russell Parkman, Ramboll

PFAS Trinity: Understanding Your Community's PFAS Chemistry, Developing Minimization Plans, and Working with Upstream Sources
- Paul Calamita, AquaLaw

PFAS in Biosolids: How to Be Part of the Conversation
- Janine Burke-Wells, NEBRA
- Deborah Mahoney, Brown and Caldwell

Session 19
Small Communities: Emerging Water Quality Tools for Small Communities

Moderators:
- Brandon Blanchard, Pare Corporation
- Chris Hayward, Pare Corporation

Challenges Faced by Small and Rural Utilities Participating in Wastewater-Based Disease Surveillance Programs
- Anna Mehrotra, WEF

Towards More Economical Water Treatment: The Development of Robust and Low Cost Electrodes for On-Site Chlorine Generation
- Shane Hancox, University of Massachusetts

Balancing Pilot and Traditional Strategies in Oak Bluffs Integrated Approach to Nitrogen Management
- Anastasia Rudenko, GHD
- Sara Greenberg, GHD

Innovative Wastewater Treatment Technology for Advanced Nutrient Removal with a Focus on Seasonal Operations Optimization
- Mike Sparks, FR Mahony

Session 20
Residuals and Biosolids 2: Biosolids Management Risks and Regionalization Solutions

Moderators:
- Vanessa Borkowski, Stantec
- Eric Spargimino, CDM Smith

This session addressed the drivers and progress with respect to biosolids regionalization within New England via a panel discussion about current programs, regulatory insights, and technical advancements.

Panelists:
- Shelagh Connelly, RMI
- Karla Sangrey, UBCW
- Scott Firmin, PWD
- Dru Whitlock, Stantec
- Peter Loomis, CDM Smith
- Mickey Nowak, Veolia/SWSC (retired)
- Thomas Tyler, MDC Hartford

1. Lin Liang, Liz Garvey, and Erica Lotz at Monday's vendor reception 2. Steve Guerrette, Ryan Wingard, Mike Theriault, David Gaipo, Faye DeMoura, Kevin Olson, Kevin Garvey, and Marc Moccio pose for a staff photo at the billboard 3. Matt Vajdic (r) greets Reza Mirzaiee at the OptiRTC Innovation Pavilion booth 4. Nicole Fernandes demonstrates a product to Laurie Stevens

SESSION 21
Plant Operations 3: Data-Driven Phosphorus Removal
Moderators:
- Varun Srinivasan, Trinnex
- Allie Greenfield, Woodard & Curran

Lessons in Visualizing Data and Utilizing Hybrid Modeling to Improve Operational Stability and Performance with Stringent Phosphorus Limits
- Patrick Dunlap, Black & Veatch
- Brian Shoener, Black & Veatch
- Cody Schoepke, City of Fond du Lac, WI
- Leon Downing, Black & Veatch

Troubleshooting Loss of Efficiency in Chemical Phosphorus Removal and Planning for Future Growth
- Laura Marcolini, Fuss & O'Neill

Optimizing Phosphorus Removal with Minimal Modifications: A Little Data Goes a Long Way
- Amy Decola, Hoyle Tanner
- Matthew Scarborough, Hoyle Tanner

Optimizing Phosphorus Removal to Mitigate New Aluminum Discharge Limits at the Waterbury, CT WPCF
- Thomas Johnson, Jacobs

SESSION 22
CSO/Wet Weather Issues 2: Innovations in CSO Pilot Testing and Modeling
Moderators:
- Keith Gardner, Stantec
- Josh Schimmel, Springfield Water and Sewer Commission

Novel Application of a Biological High-Rate Treatment to Address Wet Weather Needs
- Pat Duggan, AECOM
- Greg Heath, AECOM

Tight Site, No Problem – A Primary Filtration Pilot Study in Bridgeport, CT
- Daniel Thompson, CDM Smith
- Allison Zanette, CDM Smith

Hartford MDC's Clean Water Project: Two Decades of Collection System Improvements Informed by Hydraulic Modeling
- Ajay Prasad, CDM Smith
- Jason Waterbury, The MDC

Weighing The Options: An Overview Of Wet Weather Treatment Technologies
- Mary Penny, Arcadis

SESSION 23
Watershed Management 2: Pivotal Studies and Projects in Integrated Nutrient Management
Moderators:
- Sarah Nalven, VHB
- Janelle Bonn, Woodard & Curran

Boxed In: Wastewater Effluent Discharge Challenges in a Coastal Environment
- Julia Khrakovsky, GHD
- Anastasia Rudenko, GHD

Development of a Robust Inventory and Nitrogen Load Estimation of Onsite Wastewater Treatment Systems to Long Island Sound
- Zachary Eichenwald, CDM Smith

Watershed Planning, Partnerships and Public Education to Address Excessive Nutrients in a Mashpee Wampanoag Tribe Ancestral Pond
- Kimberly Groff, SNEP

1. Laura Stock, Jim Deluca, and Kristina Gerber at the Tuesday reception 2. Daniel Antoine, Caitlin Carbonello, Shannon Matuschak and Patrick Smith pose during a session break 3. Tracy Santoro and Udayarka Karra at Tuesday's vendor reception 4. 2023 President Bob Fischer hands the gavel off to 2024 President Scott Goodinson

Lessons Learned from the Largest Watershed-Based Phosphorus Reduction Facility in the Country
- Scott Shannon, Woodard & Curran

SESSION 24
Public Awareness—Communicating for Collective Impact: Stakeholder Engagement Success Stories from New England
Moderators:
- Emily Cole-Prescott, City of Saco, ME
- Katie Evans, Woodard & Curran
- Sruthi Kakuturu, Dewberry

This panel session presented communications initiatives undertaken by New England utilities, associations, and nonprofits.

Panelists:
- Faye DeMoura, Wright-Pierce
- Kristen Kelleher, City of Cambridge, MA
- Rich Niles, Woodard & Curran
- Don Sands, X-Cel Conservation Corps
- Theresa Tucker, York Sewer District

SESSION 25
Energy: Energy Neutrality from the Local to National Stage
Moderators:
- Tracy Chouinard, Brown and Caldwell
- Tom Schwartz, Woodard & Curran

Optimizing Aeration System Design to Maximize Performance
- Adam Clarke, Aerzen USA
- Clay Evans, Aerzen USA

The Future of Heat and Programs for Decarbonizing Wastewater Operations
- Janine Burke-Wells, NEBRA
- Michael McDonald, National Grid

Roadmap for Achieving Energy Neutrality: Planning and Funding Energy Resiliency Projects Without Compromising Water Quality
- Elizabeth Watson Keddy, Hazen and Sawyer

Energy Concerns for Biosolids Thermal Processing? A Comparison of Pyrolysis, Gasification & Incineration using Real-World Applications is Revealing
- Sara Greenberg, GHD
- Marc Drainville, GHD

SESSION 26
Stormwater 3: Design Solutions—Helping Stormwater Managers Sleep at Night
Moderators:
- Joe Keitner, City of Westfield, MA
- Brutus Cantoreggi, Town of Franklin, MA

MassDCR's Cost Effective Approach to Stormwater Retrofits
- Sarah Nalven, VHB
- Joanna Sullivan, VHB

Providence's Approach to Restoring Water Quality in Roger Williams Park
- Brandon Blanchard, Pare Corporation
- Brian Byrnes, City of Providence, RI
- Ryan Kopp, Audubon Society of Rhode Island

The Climate Change Climb—Preparing for Rising Seas and Extreme Storms in Coastal Communities
- Chris Dapson, Environmental Partners
- Eric Kelley, Environmental Partners

After the Storm: Town of Norwood's Journey From Extreme Rainfall Toward Stormwater Resilience
- Stefani Harrison, Stantec
- Tyler Cosma, Stantec

SESSION 27
Plant Operations 4: Process Intensification & Optimization

Moderators:
- Emily Korot, CDM Smith
- Nick Tooker, University of Massachusetts

Sludge Settleability Improvements Associated with Densification of BNR Activated Sludge
- Eric Staunton, CDM Smith

Using Granular Activated Sludge on a Small Site to Upgrade Saco's WRRF For 50% Growth, Sea Level Rise, CSO Reduction, and Nitrogen Removal
- Frederick Mueller, Tighe & Bond
- Kyle Coolidge, Tighe & Bond

ABAC Unleashed: A Full-Scale Demonstration of Efficient BNR Harnessing Internally Stored Carbon Driven SND and Post-Denitrification
- Pusker Regmi, Brown and Caldwell

Creative Construction Adds Redundancy to Aging Wastewater Treatment Plant
- Julianne Page, Woodard & Curran
- Kayla Marquis, Woodard & Curran

SESSION 28
Collection Systems 4: Looking to Unclog in All the Tight Spaces

Moderators:
- Brad Hayes, Woodard & Curran
- Tom Loto, AECOM

Paradise Avenue Easement Sewer Improvements—Locating, Accessing, and Rehabilitating Major Interceptor Submerged in a Flood Control Water Impoundment
- Sean Mitchell, Arcadis
- Mario Ricozzi, GNHWPCA
- Sarah Wohlfahrt, Arcadis

Rehabilitating a 48-inch Brick Sewer Under a Mass Transit Right-of-Way
- William Ditullio, Woodard & Curran
- Serena Takada, Woodard & Curran

From Vision to Implementation, A Story of Much Needed Sewer Improvements in the Most Dense City in Massachusetts
- Kevin Raftery, Hazen and Sawyer
- Charles Wilson, Hazen and Sawyer

Risk Mitigation in Trenchless Rehabilitation Design & Construction
- Charles Tripp, AECOM

SESSION 29
Residuals and Biosolids 3: Improving Biosolids for a Circular Economy

Moderators:
- Vanessa Borkowski, Stantec
- Phil Tucker, York Sewer District

Working Towards a Sustainable Outlet for Maine Biosolids Through a Regional Solution
- Scott Firmin, Portland Water District
- John Ross, Brown and Caldwell

Consistency is Key: Sludge Thickening for Operational and Treatment Advantages
- Sarah Viola, Wright-Pierce
- Sean Greig, Town of Newmarket, NH

Supercharging Anaerobic Digestion: Exploring a Suite of Intensification Strategies and Technologies
- Baoqiang Li, Black & Veatch

Turning Waste Products into Premium Products
- David Buurma, LaSalle Agri

SESSION 30
Industrial Wastewater: Industrial Waste Innovative Technologies and Pretreatment Coordination

Moderators:
- Michael Smith, Weston & Sampson
- Matthew Dickson, Haley Ward

Troubled Waters: Industrial Pretreatment and Its Effects on Process Control
- Chelsey Little, Town of Montague, MA
- Tim Little, Town of Montague, MA

An Innovative Approach to Brewery Wastewater Management, Side-streaming, and Pretreatment Coordination
- Luke Truman, New England Environmental Finance Center

The Big One That Did Not Get Away: Pilot Testing To Reach 12 µg TP/L in a Hatchery Effluent
- Ellie Tavasoli, HDR
- Rebecca Elwood, HDR

High Temperature Pyrolysis (HTP) Converts Biosolids into Contaminant Free Biochar and Renewable Energy
- Andrew Friedenthal, CHAR Technologies

SESSION 31
Utility Management: Workforce & Funding

Moderators:
- Jay Sheehan, Woodard & Curran
- Donald Gallucci, Weston & Sampson

Engaging the Next Generation of Water Leaders – Stories from an Enterprise-Wide Mentoring Program
- Ben Mosher, CDM Smith

Why Are You Still Working Five Days Per Week?
- Rob Pontau, Brunswick Sewer District

Effective Funding and Finance Technical Assistance Approaches: Perspectives from the New England Environmental Finance Center
- Laura Collins, New England Environmental Finance Center
- Chloe Shields, New England Environmental Finance Center

Comprehensive Funding Strategy Development: Creating a Plan and Executing It
- Trevor Johnson, Arcadis
- Aaron Henderson, Arcadis
- Katherine Duskin, Arcadis

SESSION 32
Plant Operations 5: Biological Nutrient Removal Unconventional Upgrades

Moderators:
- Adam Higgins, Wright-Pierce
- Ben Levin, Hazen and Sawyer

Need to Achieve Low Effluent Total Nitrogen? SBRs are Still a Great Choice
- William McConnell, CDM Smith

Turning all the Dials—Using Multiple Control Parameters To Implement Low DO Operation to Reduce Energy Use and Optimize Nitrogen Removal
- Paul Dombrowski, Woodard & Curran

Wash, Rinse and Repeat? Considerations for a Challenging Aeration Tank Rehabilitation
- Erin Moore, Tighe & Bond
- Mara Kilburn, The Precision Group
- Tom Frankel, SSI Aeration

A Biological Phosphorus Removal Success Story in an Oxidation Ditch at the Town of Sunapee, NH POTW
- John Adie, NHDES
- Kenneth Kessler, NHDES
- Richard Emberely, NHDES

SESSION 33
Stormwater 4: Next Steps in Addressing the Stormwater Nutrient Dilemma

Moderators:
- Zach Henderson, Woodard & Curran
- Natalie Pommersheim, Environmental Partners
- Kate Edwards, Arcadis
- Peter Varga, Kleinfelder

This session built off outcomes from the one-day stormwater specialty conference in May 2023 and focused on source control innovations, regulatory updates, and regional success stories.

Part 1: Street Sweeping & Leaf Litter Collection

Panelists:
- James Houle, University of New Hampshire
- Waneta Trabert, City of Newton, MA
- Marc Valenti, Town of Lexington, MA
- Gretchen Young, City of Rochester, NH
- Dan Walsh, WL French

Part 2: Regulatory Updates & Regional Success Stories

Panelists:
- Liz Clark, MassDEP
- Newton Tedder, EPA
- Max Rome, Charles River Watershed Association
- Cece Gerstenbacher, Merrimack Valley Planning Comm.
- Marja Copeland, Mystic River Watershed Assoc.
- Kerry Reed, Hopkinton DPW

SESSION 34
CSO/Wet Weather Issues 3: CSO Notification and Compliance Hurdles

Moderators:
- Erika Casarano, AECOM
- Lin Liang, Stantec

Lowell's Experience with CSO/SSO Notification Rules
- Cliff Hall, Lowell Regional Wastewater Utility

A Practical Sewer Network Digital Twin: It is not a PIPE dream!
- Varun Srinivasan, Trinnex

Programming Tools to Understand and Communicate Receiving Water Quality Model Results
- Karilyn Heisen, CDM Smith
- Kathryn Swanson, CDM Smith
- Kimberly Hetrick, CDM Smith
- Michael Lichte, Alcosan
- Sam Shamsi, Alcosan

Pitfalls of CSO Public Notification
- Scott Neesen, ADS
- Charlie Jewell, BWSC

SESSION 35
Water Reuse: Recovering Our Resources Through Innovative Water Reuse Applications

Moderators:
- Nicholas Ellis, Hazen and Sawyer
- Meredith Zona, Stantec

Potable Reuse: How Southeastern MA Can Take a Page from the Southwest's Playbook
- Sara Greenberg, GHD
- Chelsea Phan, GHD

Quantification of Greenhouse Gas Emissions in RO and Carbon-Based Potable Reuse Treatment Configurations
- Brett Wagner, AECOM

The Evolution of Membrane Bioreactors in North America
- Anthony Zamarro, CDM Smith

Regulatory Trends in Water Reuse
- Dennis Greene, NHDES
- Marybeth Chubb, MassDEP

SESSION 36
Sustainability: Harnessing the Triple Bottom Line for Water and Wastewater Operations

Moderators:
- Maeve Carlson, Wright-Pierce
- Wayne Bates, Tighe & Bond

Utilizing WRRFs as Community Anchors to Achieve Circular Economy Goals
- Anastasia Rudenko, GHD
- Marc Drainville, GHD

GHG Accounting and Target-Setting for Water Utilities
- Chelsea Conlon, JKMuir
- Jennifer Muir, JKMuir

Sustaining Your Pipes and Your Planet: Calcium Nitrate Dosing for Odor and Corrosion Control Reduces Methane Levels within Collection Systems
- Danielle Arney, Evoqua

With Great Carbon, Comes Great Responsibility: Measuring and Mitigating Climate Impacts from Biosolids and Other Wastewater Operations
- Janine Burke-Wells, NEBRA

SESSION 37
Asset Management

Moderators:
- Peter von Zweck, Jacobs
- Eliza Styczynski, Brown and Caldwell

Modernizing the Municipality: Smart Compliance Reporting with GIS & Asset Management Technology
- Rachel Osborn, Woodard & Curran
- Paul Costello, City of Quincy, MA
- Rich Niles, Woodard & Curran
- Stephen Washburn, City of Quincy, MA

A Decade of Asset Management at the South Essex Sewerage District
- David Michelsen, SESD
- Bob Lawrence, Jacobs
- Erik Nowak, SESD
- Francisco Mago, SESD
- Jonathan Coddington, SESD

Stormwater Tracking and Accounting: A Regional Success Story
- Renee Bourdeau, Geosyntec Consultants

Replace, Renew, Sustain: Asset Management Case Studies in Maximizing LoS
- Daniel Roop, Tighe & Bond
- Trisha Worthington, Tighe & Bond
- Valerie Flaherty, Town of North Attleborough, MA

UNDERGRADUATE STUDENT POSTER BOARD COMPETITION

Analysis and Evaluation of the Shad Factory Reservoir
- Amanda Bucco, Michelle Kryl, Stephen Hansen, Chase Steenburgh, Robert Reino – Roger Williams University

Simultaneous Degradation of PFAS and Ammonia in Landfill Leachate
- Isabella Clowes, Bhargavi Ramesh, Liam Thomson – Worcester Polytechnic Institute

Using Motor Power Sensors to Optimize Activated Sludge Process
- William Fang – University of Massachusetts Amherst

Biologic Erosion Control
- Angie Gabinetti, Hunter Frament, Garrett Molampy, Zach Lang, Matt Viveiros, Tyler Zanini – Roger Williams University

Novel Method for Treating PFAS in Water
- Max Elwell, Maddy Goggin, Patrick McKenna, Nathan Raymond – Worcester Polytechnic Institute

Flowing Together: Bringing Potable Water to Saviefe Deme, Ghana
- Angelina Fung, Jake Chirco, Dan Heron, Kiersten O'Connell, Patrick Walsh – University of Massachusetts Amherst

Phytoremediation of PFAS in Drinking Water
- Ben Lanava, Gray Tynefield, Molly Larson, Erin Schustek, Caleb Hagner – Northeastern University

Analyzing PFAS Concentrations Along the Blackstone River Watershed
- Noelle Noons, Alec Parish – Worcester Polytechnic Institute

Adsorption and Release of Heavy Metals in Compost-Amended Bioswales for Stormwater Treatment
- Mackenzie Guthrie – Quinnipiac University

Integrated Structural and Sanitation Infrastructure Development: A Collaborative Endeavor for Educational Empowerment in Chuixil, Guatemala, in Partnership with Engineers Without Borders
- Jennifer Pena, Olivia Ciaravino – Northeastern University

Sustainable Stormwater Management at Nuestras Raíces: A Rain Garden Design for Resilience
- Rachel Rannikko – University of Massachusetts Amherst

Fungal Derived Biochar as a Viable Solution for Copper (ii) Removal from Stormwater
- Hudson Smith – University of Vermont

Designing a Portable Spectrophotometer for Water Quality Analysis
- Venus Fu, Ethan Howard, Matt DelGrego, Hunter Boutin, Christian Sousa – Roger Williams University

Sustainable Learning: UMass Amherst's Rainwater Catchment System
- Peter Swenson, John Chen, Sadie Lienau – University of Massachusetts Amherst

Infiltration and Inflow Analysis
- Alexander Thornberg, Luis Garcia, Brayden Smith – University of Hartford

Environmental Impact of Remote Partnerships on Long Term Projects
- Andy Giaya, Ryan Roberts – University of Massachusetts Amherst

Borehole Implementation Las Delicias, Panama
- Charlotte Andrews, Angelika Tyhansky – Northeastern University

Graduate Student Poster Board Competition

Evaluating the Resource Recovery Potential of Dairy Processing Waste Through Anaerobic Digestion
- Kennedy Brown – University of Vermont

Integration of Chlorine Production from Electrolysis into a Wastewater Treatment Plant
- Nelson Chime Chidubem – University of Maine

Fermentation of Amino Acids by Anaerobic Microbiomes in the Absence of Methanogenesis
- Leandro Conrado – University of Vermont

The Influence of Thermal Pretreatment on the Fermentation of Cow Manure to Produce Butyrate as a Pre-Cursor for Propane
- Mona Davoudimehr – University of Vermont

Disentangling the Complex Water Reuse Regulatory Situation
- Carrie Ellis – University of Rhode Island

Analysis of SARS-CoV-2 Passive Sampling Uptake Kinetics in a Pilot Scale Simulated Batch Reactor Sewer System
- Andrew Kennefick – University of Massachusetts Amherst

Enhanced Electrochemical Textile Dye Degradation Using Fe-TAML Catalysts
- Faye Kuszewski – University of Massachusetts Amherst

Quantitative Detection of SARSCoV-2 Viral Load in Wastewater Using Acoustic Wave Micropillar Biosensors
- Nerissa Molejon, Alex Ryzi – University of Massachusetts Lowell

Stability and Degradation of Psychoactive Drugs in Riverine Systems
- Varsha Niroula – University of Massachusetts Lowell

Evaluation of the Current and Future Operation of the Mekoryuk Wastewater Lagoon
- Raphael C. Nnachi, Liam Amery, Kevine Odira – University of Massachusetts Amherst

Interaction Between Carboxylated-Polystyrene Nanoparticles in Alginate Matrix: Elucidating the Role Of Crosslinking Density and Particle Size
- Timothy Onuh – University of Massachusetts Amherst

Exposure to Ketamine Affects the Growth and Development of Oyster Larvae
- Gustavo Salcedo – University of Massachusetts Lowell

Determining Ideal OLR for Converting a Mixture of Glucose and Xylose to MCCAs
- Panagiota Stamatopoulou – University of Vermont

Atmospheric Deposition of Per- and Polyfluoroalkyl Substances (PFAS) in the Great Bay Watershed, New Hampshire
- Katherine Wieck – University of New Hampshire

Identifying Transformation Pathways of Five PFAS Classes in Biological Systems Using EPA's Chemical Transformation Simulator (CTS)
- Leila Hassanpourmoghadam – University of New Hampshire

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continued on next page

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Scavin Equipment Company LLC
Schneider Electric
Schwing
Sealing Systems, Inc.
Sherwin-Williams Protective & Marine
SmartCover
SNF Polydyne
Snyder Industries
Sodimate, Precision Systems
Sonetics
SPX FLOW, Inc.
SSI Aeration – WESCOR
Stine Engineering
StormTrap
Sullivan Associates/Ritec Environmental
Synagro Northeast, LLC
Technology Sales Associates
Teledyne ISCO
The MAHER Corporation
Thermal Process
Ti-SALES
Tomorrow Water
Trident Actuator
Troy Valve
Truax Corporation
UET Mixers – WESCOR
United Concrete Products
USABlueBook
Utility Systems Science and Software
Vapex
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VeloDyne
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Verder
Vogelsang USA – WESCOR
Vortex
VTScada
Vulcan Industries
Walker Process Equipment Div. of McNish Corporation
Walker Wellington, A Hayes Pump Affiliate
WasteCorp – WESCOR
Wastewater Treatment Services, Inc.
Waterline Industries
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Watson Marlow
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Xylem Dewatering Solutions
Xylem Inc. – Flygt Pumps
Xylem Water Solutions
Xylem/YSI Inc
Young Industries
Zima Corp (Kusters Water)

YP Summit

The Young Professional Committee poses after another successful YP summit: Sam Downes, Chelsea Phan, Ryan Buckley, Victoria Helle, Zach Lamoureux, Daryl Coppola, James Plummer (seated), Jaimie Payne, Daniel Sullivan-Xenos, and Kelsey George

The eighth annual NEWEA/ NEWWA Young Professional (YP) Summit brought together young professionals in the water and wastewater industry to learn from industry leaders and network with peers from across New England. This year's program focused on One Water, a holistic and collaborative approach to water management.

The YP Committee hosted an engaging program of panels, presentations, and networking sessions to help young professionals strengthen their leadership and technical skills and advance their water industry careers. The program was kicked off by NEWEA's YP Committee chair, Daryl Coppola, followed by a session on "How to Network," which included speed networking. Water experts presented on their respective areas: Kyle Hay from Brown and Caldwell for drinking water; Emily Scerbo from Tighe & Bond for stormwater; and Sara Greenberg and Anastasia Rudenko from GHD for clean water.

Young Professionals engage in speed networking

Following lunch, the cherished Meme Contest, a favorite among attendees, featured water-and- wastewater-related memes submitted by participants. This was followed by a water trivia section,

Kate Schassler proudly wears the meme contest winner's trophy collar

encouraging the audience to collaborate in teams to answer trivia questions about the water industry. Another speed networking session was held, followed by the mentoring program graduation, recognizing successful mentor pairings from the 2023 program.

Concluding the event, a career panel featured professionals with diverse water industry career paths. The session provided advice to young professionals on navigating their career journeys. The panel included Jim Barsanti from Hazen and Sawyer, Udayarka Kara from Arcadis, Dan Sullivan-Xenos from Veolia, Grace Ronca from MassDEP, Ben Patten from Woodard & Curran, and Charlie Tyler, retired from MWRA. At the completion of the program, attendees were invited to enjoy a networking reception attended by experienced water industry professionals and members of the NEWEA and NEWWA executive committees.

YP SUMMIT PROCEEDINGS

Sunday, January 21, 2024
Hosted at NEWEA's Annual Conference, Boston Marriott Copley Place Hotel

Welcome/Opening Remarks
- Daryl Coppola, NEWEA YP Chair, F.R. Mahony & Associates
- Christopher Astephen, NEWWA YP Chair, Tighe & Bond

Intro to Networking/ Skills-Based Group Activity

Stormwater Discussion
Moderator: Sam Downes, Town of Brookline, MA
- Emily Scerbo, Tighe & Bond

Clean Water Discussion
Moderator: Ryan Buckley, NEIWPCC
- Sara Greenberg, GHD
- Anastasia Rudenko, GHD

Drinking Water Discussion
Moderator: Joanna Sullivan, VHB
- Kyle Hay, Brown & Caldwell

Committee Pitches

Meme Contest
Moderators: James Plummer & Victoria Helle, NEIWPCC

Water Trivia
Moderator: Victoria Helle, NEIWPCC

Speed Networking

Mentor Recognition
Moderator: Ryan Buckley, NEIWPCC

Career Panel
Moderator: Ryan Buckley, NEIWPCC
- Jim Barsanti, Hazen and Sawyer
- Udayarka Karra,Arcadis
- Ben Patten, Woodard & Curran
- Grace Ronca, MassDEP
- Dan Sullivan Xenos, Veolia
- Charlie Tyler, MWRA (retired)

Closing Remarks
- Robert Fischer, NEWEA President
- Demetrios Vidalis, NEWWA President-Elect
- Aimeé Killeen, WEF President

Networking Reception

2024 Awards & Recognitions

U.S. EPA REGION I AWARDS

Wastewater Treatment Plant O&M Excellence
- Burrillville, Rhode Island
  Michael Emond, Superintendent
- Hanover, NH Water Reclamation
  Kevin MacLean, Superintendent
- Wells, ME Sanitary District
  Nick Rico, Superintendent

Wastewater Treatment Plant Operator of the Year Excellence
- Nate Brown, Peterborough, NH WWTF
- Dan Copp, Johnson, VT WWTF
- Joseph Gaudiana, Ludlow, VT WWTF
- Kenneth LaCasse, Hardwick, VT WWTF
- Kathy Perez, South Kingstown, RI WWTF
- Robert Wells, Middlebury, VT WWTF

Wastewater Trainer of the Year
- Betty Green, B. Green L&P Consulting

Industrial Pretreatment Program of the Year
- Greater Lawrence Sanitary District, Massachusetts
  Colleen Spero, Monitoring Manager
- City of Nashua, New Hampshire
  Douglas Starr, Industrial Pretreatment Coordinator

Lifetime Achievement
- William L. Patenaude (retired)
  Rhode Island Department of Environmental Mgmt.

A jaunty Jim Barsanti accepts the Founders Award as Awards Committee Chair Marylee Santoro officiates

WEF – MA AWARDS & RECOGNITIONS

George W. Burke, Jr. Award
- Cohasset, MA WWTP

Arthur Sidney Bedell Award
- Matt Formica

William D. Hatfield Award
- Sean Greig

Laboratory Analyst Excellence
- Walter Palm

WEF Fellow
- Jennifer Kelly Lachmayr
- John Trofatter

WEF Service Delegate
- Peter Garvey
- Matt Formica

Operations Challenge Division II 2nd Place
- RI Rising Sludge

Operator Scholarship
- Mitchell Ryan

Quarter Century Operator
- Mary Waring
- Chris Robinson
- Erik Bailey

NEWEA Acknowledged Retiring Directors and Committee Chairs

STATE DIRECTORS
Edward Davies (Rhode Island)
Michael Smith (Vermont)

COUNCIL DIRECTOR
Frederick McNeill (Management Review)
Amy Anderson George (Meeting Management)
Colin O'Brien (Outreach)

COMMITTEE CHAIRS
Walter Palm (Certification*)
John Bobrek (Committee Member Appreciation)
Bruce Walton (I/A OWTS Task Force)
James Galasyn (Lab Practices Certification Sub-Committee)
Garrett Bergey (Membership)
Jennifer Lachmayr (Nominating)
Scott Neesen (Registration)
Ian Catlow (Small Community)
Kathryn Edwards (Stormwater)
Joanna Sullivan (Student Activities)
Wayne Bates (Sustainability)
Anastasia Rudenko (Water Reuse)
Daryl Coppola (Young Professionals)
* Ad hoc

1 2



3 4

NEWEA award recipients: 1. Jasmine Strout, Diversity, Equity, & Inclusion Leadership Award 2. Steven J. King, Elizabeth A. Cutone Executive Leadership Award 3. Jane LaMorte, E. Sherman Chase Award 4. Kevin Brander, James J. Courchaine Collection Systems Award

NEWEA RECOGNITIONS

Scholarship Recipients 2023–24

Environmental Major
- Varsha Niroula
  University of Massachusetts

Non-environmental Major
- Owen Callaghan
  University of Maine

Kate Biedron Scholarship
- Ella Quinn
  University of Massachusetts

Terry Campbell Scholarship
- Dominic Perkins
  University of Maine

Student Design Competition
- *Wastewater Category*: Shannon Butler, Anna LeClair, Katie Moloney, Justin Seo
  Northeastern University, Boston, MA
- *Water Environment Category*: Bella D'Ascoli, Alex Renaud, Grace Pattarini, Chris Perron, Chris Merrikin
  Northeastern University, Boston, MA

Stockholm Junior Water Prize
- Naomi Park, Riverside, CT
- Alexander Busko, Bangor, ME
- HyeonKi Lee, Gill, MA
- Abhinav Avvaru, Nashua, NH

NEWEA AWARDS

Operator Award

Connecticut
- David Milano, Cheshire, CT

Maine
- Keefe Cyr, Bangor, ME

Massachusetts
- Eric Kerr, Chicopee, MA

New Hampshire
- Sam Heffron, Newmarket, NH

Rhode Island
- Kathy Perez, South Kingstown, RI

Vermont
- Matt Dow, Burlington, VT

Alfred E. Peloquin Award

Connecticut
- Thomas Tyler, Hartford, CT

Maine
- Mark Holt, Livermore Falls, ME

Massachusetts
- John Downey, Dedham, MA

New Hampshire
- Sharon L. Nall, Concord, NH

Rhode Island
- Nathan Boiros, Providence, RI

Vermont
- Bernard J. Fleury, Essex Junction, VT


Wastewater Utility Management Award Recipients
North Conway, NH Water Precinct

NEWEA AWARDS

James J. Courchaine Collection Systems
- Kevin Brander, Woburn, MA

Paul Keough Award
- Sarah Robertson, Montague, MA

Young Professional
- Casey Rosenberg, Bedford, NH

Youth Educator
- Jeff Kalmes, Billerica, MA

Biosolids Management
- Mary Waring, Brunswick, ME

Wastewater Utility Management
- North Conway, NH Water Precinct

Energy Management Achievement
- Hall Street Wastewater Treatment Plant
  Concord, NH

Committee Service
- Kevin Garvey, Andover, MA

Diversity, Equity, & Inclusion Leadership
- Jasmine Strout Westford, MA

E. Sherman Chase Award
- Jane LaMorte, Strafford Springs, CT

Clair N. Sawyer Award
- Nick Tooker, Amherst, MA

Elizabeth A. Cutone Executive Leadership
- Steven J. King, North Kingstown, RI

Founders
- James R. Barsanti, Boston, MA

Past President's Plaque and Pin
- Frederick J. McNeill, Manchester, NH

Stormwater Committee Golden Raindrop Award
- Newton Tedder, EPA Region 1
- Angela Blanchette, Town Engineer
  Scarborough, Maine

Collection Systems Committee Golden Manhole Award
- Charlie Tripp, AECOM

New Members December 2023–February 2024

Reed Allen
City of Portland Maine
Portland, ME (YP)

Jose Alvarez Corena
CDM Smith
Boston, MA (PRO)

Renee Angelo
MWRA
Chelsea, MA (UPP)

John Angelone
EHS Support LLC
somerville, MA (PRO)

Katherine Arnold
NEIWPCC
Lowell, MA (YP)

Gabriel Bamforth
Brown and Caldwell
Andover, MA (PRO)

Caleb Bancroft
LAWPCA
Lewiston, ME (YP)

Nathaniel Banks
PolyGone Systems
Princeton, NJ (YP)

Justin Barnett
York Sewer District
Lebanon, ME (PRO)

Dipesh Bava
Veolia
Gloucester, MA (PRO)

Sarah Beckwith
Haley Ward, Inc.
Maynard, MA (YP)

Derek Belanger
Tighe & Bond
Worcester, MA (PRO)

Micah Blate
Hazen and Sawyer
Philadelphia, PA (PRO)

Nikki Borglin
Woodard & Curran Inc. (PRO)

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David Briglio
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Boston, MA (YP)

George Carson
Jacobs
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Maggie Chase
Ferguson Enterprises
Glastonbury, CT
(PRO)

Debbie Cheng
City of Somerville
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Taylor Cilley
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Lawrence, MA (PRO)

John Clark
Hooksett Wastewater
Treatment Facility
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Heather Coburn
Delhi Charter Township
Bedford, NH (YP)

Ross Collins-Wooley
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Thomas Connelly
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Works Department
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Louise Douglas
Portland Water District
Portland, ME (COMP)

Kristin Dowdy
Town of Bedford Water Dept
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Patrick Dunlap
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Carrie Ellis
University of Rhode Island
Hatfield, MA (STU)

Ernst Etheart
BWSC
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Lillian Farah
City of Melrose, MA (YP)

Ross Gambino
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Stamford, CT (PRO)

Matthew Gamelli
City of Westfield
Westfield, MA (PRO)

Mitchell Garon
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Livia Graham
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Corporate (COR)
Dual (DUAL)
Executive (EXEC)
Honorary (HON)
Life (LIFE)
Public Official (POFF)
Professional (PRO)
Wastewater Treatment Plant
Operators (PWO)
Retired (RET)
Student (STU)
Utility Partnership Program (UPP)
Young Professional (YP)

Upcoming Meetings & Events

NATIONAL WATER WEEK
Washington, DC
April 7–13, 2024

NEWEA CONGRESSIONAL BRIEFING & DC FLY-IN
Washington, D.C.
April 8–9, 2024

WEF/NEWEA COLLECTIONS SYSTEMS & STORMWATER CONFERENCE
CT Science Center, Hartford, CT
April 9–12, 2024

NEWEA SPRING MEETING & EXHIBIT
The Hotel Viking, Newport, RI
May 19–22, 2024

NEWEA GOLF CLASSIC
Derryfield Country Club,
Manchester, NH
September 27, 2024

AFFILIATED STATE ASSOCIATIONS AND OTHER EVENTS

NHWPCA TRADE SHOW
Sheraton Nashua, NH
April 12, 2024

RICWA AWARDS BANQUET
Cranston Country Club, Cranston RI
May 10, 2024

CTWEA SPRING EXPO
AquaTurf, Plantsville, CT
May 10, 2024

MAWEA TRADE SHOW
Wachusett Mt, Princeton, MA
May 15, 2024

MAWEA GOLF TOURNAMENT
Heritage Country Club, Charlton, MA
June 12, 2024

NEAPWA SUMMER MEETING
Sea Crest Hotel, Falmouth, MA
June 12–14, 2024

RICWA GOLF TOURNAMENT
Potowomut Country Club
East Greenwich RI
June 17, 2024

NHWPCA SUMMER MEETING
Ellacoya State Park, Gilford, NH
June 21, 2024

CTWEA GOLF TOURNAMENT
Skungamaug River Golf Club,
Coventry, CT
June 21, 2024

NHWPCA GOLF TOURNAMENT
Beaver Meadow Golf Course
Concord, NH
August 1, 2024

RICWA TRADE SHOW & LUNCHEON
Crowne Plaza, Warwick RI
September 13, 2024

NHWPCA FALL MEETING
TBD
September 13, 2024

NEWWA FALL CONFERENCE
Sea Crest Hotel, Falmouth, MA
September 15–18, 2024

MEWEA GOLF TOURNAMENT
Sunday River, Newry, ME
September 18, 2024

MEWEA FALL CONVENTION
Sunday River, Newry, ME
September 19–20, 2024

MAWEA FALL QUARTERLY MEETING
Marconi Club, Springfield, MA
September 25, 2024

Measurement unit conversions and (abbreviations) used in the *Journal*

U.S.	International System of Units (SI)	U.S.	International System of Units (SI)
Liquid volume		**Length**	
gallon (gal)	liter (L)	inches (in.)	centimeters (cm)
cubic feet (ft^3)	cubic meters (m^3)	feet (ft)	meters (m)
cubic yards (yd^3)	cubic meters (m^3)	miles (mi)	kilometers (km)
acre-feet (ac ft)	cubic meters (m^3)	**Area**	
Flow		square feet (ft^2) or yards (yd^2)	square meters (m^2)
million gallons per day (mgd)	million liters per day (ML/d)	acre (ac)	hectare (ha)
for larger flows (over 264 mgd)	cubic meters per day (m^3/d)	square miles (mi^2)	square kilometers (km^2)
gallons per minute (gpm)	liters per minute (L/min)	**Weight**	
Power		pounds (lb)	kilograms (kg)
horsepower (hp)	kilowatts (kW)	pounds per day (lb/d)	kilograms per day (kg/d)
British Thermal Units (BTUs)	kilojoules (kJ) / watt-hours (Wh)	ton – aka short ton (tn)	metric ton or tonne (MT)
Velocity		**Pressure**	
feet per second (fps)	meters per second (m/s)	pounds/square inch (psi)	kiloPascals (kPa)
miles per hour (mph)	kilometers per hour (km/h)	Inches water column (in wc)	kiloPascals (kPa)
Gas		**Head**	
cubic feet per minute (ft^3/min)	cubic meters per minute (m^3/min)	feet of head (ft of head)	meters of head (m of head)

THANK YOU

TO ALL OUR 2024 ANNUAL SPONSOR PROGRAM PARTICIPANTS

- **Platinum**
  - Dewberry
  - EST Associates, Inc.
  - Flow Assessment Services, LLC
- **Gold**
  - AECOM
  - Aqua Solutions, Inc.
  - Brown and Caldwell
  - Carlsen Systems, LLC
  - Environmental Partners
  - F.R. Mahony & Associates
  - GHD, Inc.
  - Hayes Group
  - Hazen and Sawyer
  - HDR
  - Hoyle, Tanner & Associates, Inc.
  - INVENT Environmental Technologies, Inc.
  - Jacobs
  - MWH Constructors
  - The MAHER Corporation
  - Tighe & Bond, Inc.
  - Veolia
  - Weston & Sampson
  - Worcester Polytechnic Institute
  - Woodard & Curran
  - Wright-Pierce
- **Silver**
  - Arcadis
  - CDM Smith
  - Fuss & O'Neill
  - Green Mountain Pipeline Services
  - Kleinfelder
  - NEFCO
  - SDE
  - Stantec
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- **Bronze**
  - ADS Environmental Services
  - BMC Corp
  - CUES, Inc.
  - Multiple Hearth Services
  - Vaughan Company, Inc.

Build relationships with water industry leaders *and* make a positive impact on the water environment

Join NEWEA's 2025 Annual Sponsor Program

NEWEA offers companies the opportunity to promote their products and services throughout the year by participating in multiple sponsorship activities. Annual Sponsorships include:

- NEWEA Annual Conference
- NEWEA Spring Meeting & Golf Tournament
- NEWEA Golf Classic
- A web presence on NEWEA.org's sponsorship program page
- The option to customize sponsorship levels by selecting to participate in up to eight additional unique NEWEA events plus additional activities

Sponsorship Benefits:

- Increased corporate visibility and marketing opportunities before a wide audience of water industry professionals
- Relationship-building access to key influencers involved in advancing water industry services, technology, and policy
- Recognition as an environmental leader among peers and customers

For more information
contact Jordan Gosselin
Email: jgosselin@newea.org
Phone: 781-939-0908

NEWEA
WORKING FOR WATER QUALITY

Advertiser Index

Upcoming *Journal* Themes

Summer 2024—**Emerging Contaminants**

Fall 2024—**Wet Weather**

Winter 2024—**Biosolids Management**

NEWEA/WEF* Membership Application

Personal Information (please print clearly)

First Name | M.I. | Last Name | (jr. sr. etc)

Business Name (if applicable) | Job Title

Street or P.O. Box | (☐ Business Address ☐ Home Address)

City, State, Zip, Country

Home Phone | Cell Phone | Business Phone

Email Address | Date of Birth (mm/dd/yyyy)

☐ Check here if renewing, please provide current member I.D.

☐ Check here if you do NOT wish to receive information on special offers, discounts, training and educational events, and new product information to enhance your career.

***NEWEA is a member association of WEF (Water Environment Federation). By joining NEWEA, you also become a member of WEF.**

ACQ. Code (for WEF use only) | WEF24

Membership Categories (select one only)

		Dues
☐ **Professional**	Individuals involved in or interested in water quality	$215
☐ **Young Professional**	Water quality professionals, under the age of 35, are eligible to join. This program is available for new member applicants and Student Members and is available for 3 years..	$88
☐ **Professional Operator**	Individuals in the day-to-day operation of wastewater collection, treatment or laboratory facility, or for facilities with a daily flow of < 1 mgd or 40 L/sec. License # _____	$127
☐ **Academic**	Instructors/Professors interested in subjects related to water quality.	$215
☐ **Student**	Students enrolled for a minimum of six credit hours in an accredited college or university. Must provide written documentation on school letterhead verifying status, signed by an advisor or faculty member.	$27.50
☐ **Executive**	Upper level managers interested in an expanded suite of WEF products/services.	$385
☐ **Corporate** (member benefits for one person)	Companies engaged in the design, construction, operation or management of water quality systems. Designate one membership contact.	$446
☐ **Dual**	If you are already a member of WEF and wish to join NEWEA	$50
☐ **Associate Membership**	This membership category is a NEWEA only membership reserved for the general public who have an interest in water and the environment but are NOT currently employed in the industry (e.g., attorney or supplier). Examples of Associate Members include: teachers; journalists who cover water quality issues; citizen samplers/members of various watershed/sportsman/conservation organizations, etc.	$45
☐ **New England Regulator**	This membership category is a NEWEA only membership reserved for New England Environmental Regulatory Agencies, including: USEPA Region 1, CT Department of Energy and Environmental Protection, ME Department of Environmental Protection, MA Department of Environmental Protection, NH Department of Environmental Services, VT Department of Environmental Conservation, and RI Department of Environmental Management	$50
All memberships receive these:	■ Water Environment & Technology ■ Water Environment Research Online ■ WEF Conference Proceedings Archive Online ■ WEF SmartBrief ■ Complimentary WEF Webcasts	

WEF Utility Partnership Program (UPP): NEWEA participates in the WEF Utility Partnership Program (UPP) that supports utilities to join WEF and NEWEA while creating a comprehensive membership package for designated employees. As a UPP Utilities can consolidate all members within their organization onto one account and have the flexibility to tailor the appropriate value packages based on the designated employees' needs. Contact upp@wef.org to join.

Payment (Forms without payment will not be processed till payment is received.)

☐ **Check or money order enclosed**
Made payable to NEWEA
10 Tower Office Park, Suite 601
Woburn, MA 01801
For more information: 781.939.0908
Fax 781.939.0907
www.newea.org

Charge
☐ Visa
☐ American Express
☐ Master Card
☐ Discover

Card # | Security/CVC

Signature | Exp. Date

Name on Card (please print)

Depending upon your membership level, $10 of your dues is allocated towards a subscription to the NEWEA Journal. By joining NEWEA/WEF, you acknowledge the WEF Code of Conduct (www.wef.org/membership--community/membership-center/code-of-conduct/) is applicable for all members.

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MEMBERSHIP PROFILE

Please take a few moments to tell us about your background and professional interests.

What is the nature of your ORGANIZATION? (select only one–required) (ORG)

1 Consulting, Contracting, Planning Services

2 Educational Institution

3 Industrial Systems/ Plants

4 Manufacturer or Distributor of Equipment & Supplies (including representatives)

5 Non-profits/NGOs

6 Finance, Investment, and Banking

7 Laboratories

8 State or Federal Government

9 Utility: Wastewater

10 Utility: Drinking Water

11 Utility: Stormwater

12 Utility: Wastewater, Drinking Water, and Stormwater

13 Utility: Wastewater and Drinking Water

14 Utility: Wastewater and Stormwater

15 Other

_____

(please define)

What is your Primary JOB FUNCTION? (select only one) (JOB)

1 Executive Level

2 Management Level

3 Elected or Appointed Official

4 Educator

5 Student

6 Consultant/Contractor

7 Engineering/Design

8 Operator

9 Scientist/Researcher

10 Legislator/Regulator

11 Analyst

12 Sales/Marketing

13 Manufacturer's Representative

14 Communications/ Public Relations

15 IT/OT

16 Other

_____

(please define)

What are your KEY FOCUS AREAS? (circle all that apply) (FOC)

☐ **I would like to join the communities associated with my key focus area(s).**

1 Air Quality and Odor Control

2 Biosolids and Residuals

3 Climate

4 Collection Systems and Conveyance

5 Disinfection and Public Health

6 Drinking Water

7 Energy

8 Finance and Investment

9 Industrial Water Resources

10 Intelligent Water Technology

11 Laboratory Analysis and Practices

12 Nutrients

13 Operations

14 Public Communications and Outreach

15 Regulation, Policy, Legislation

16 Research and Innovation

17 Resource Recovery

18 Safety, Security, Resilience

19 Small Communities

20 Stormwater and Watershed

21 Utility Management and Leadership

22 Watershed Management

23 Wastewater Treatment, Design, and Modeling

24 Water and Wastewater Treatment

25 Workforce

Demographic Information (Check box) The following is requested for informational purposes only.

Gender: ☐ Female ☐ Male ☐ Non-binary

Education: ☐ Doctorate ☐ MA/MBA/MS ☐ BA/BS ☐ AA/AAS ☐ Technical School ☐ High School

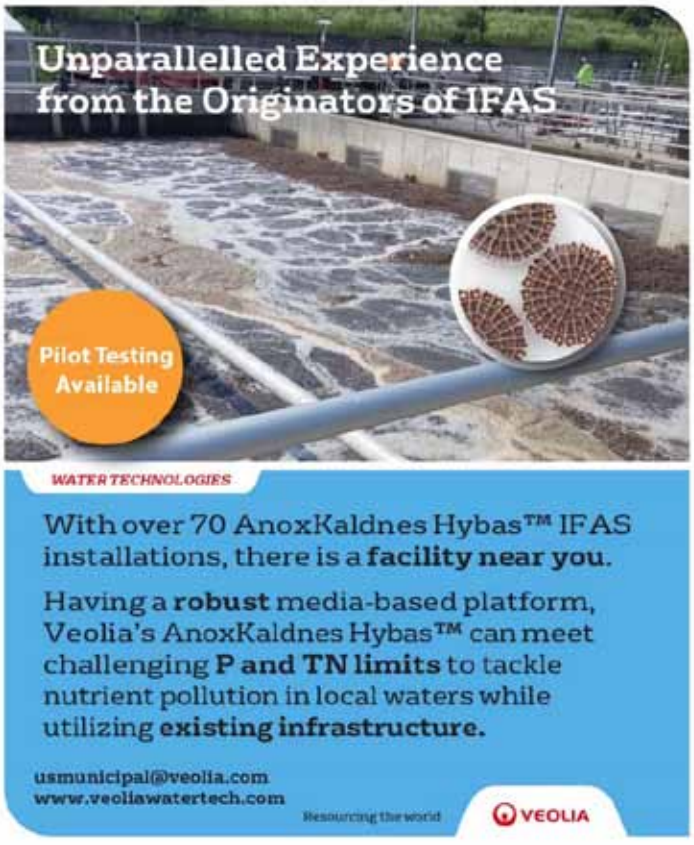
Race/Ethnic Origin (Check box) The following is requested for informational purposes only.

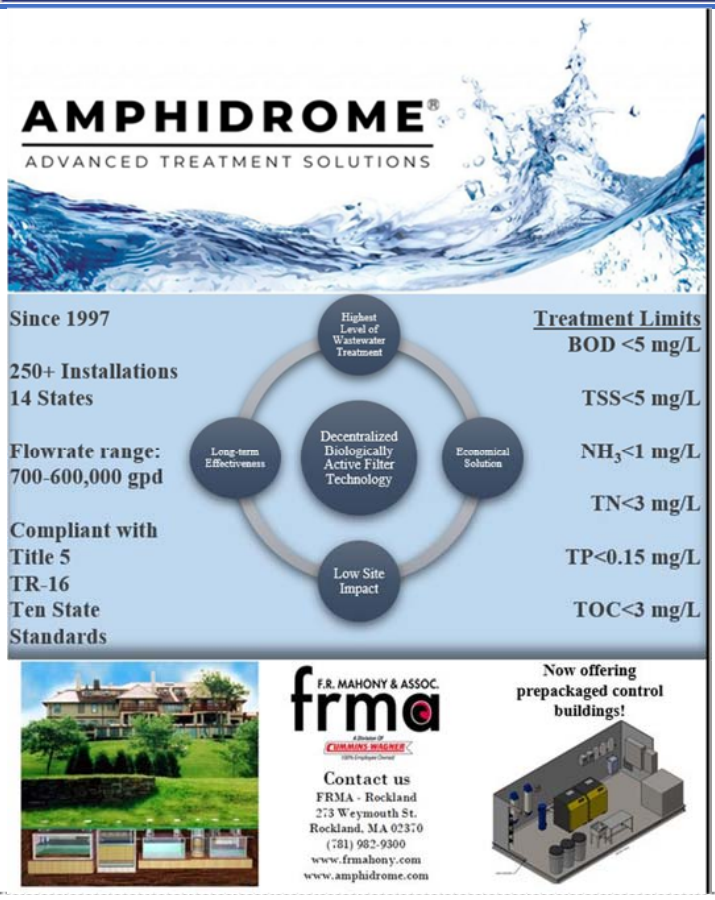
☐ African-American (Not of Hispanic Origin) ☐ American Indian or Alaskan Native ☐ Asian ☐ Caucasian ☐ Hispanic/Latino

☐ Pacific Islander or Native Hawaiian ☐ Other

How Did You Learn About NEWEA/WEF?

Referring member's name: _____ Referring member's email: _____





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100% Employee Owned

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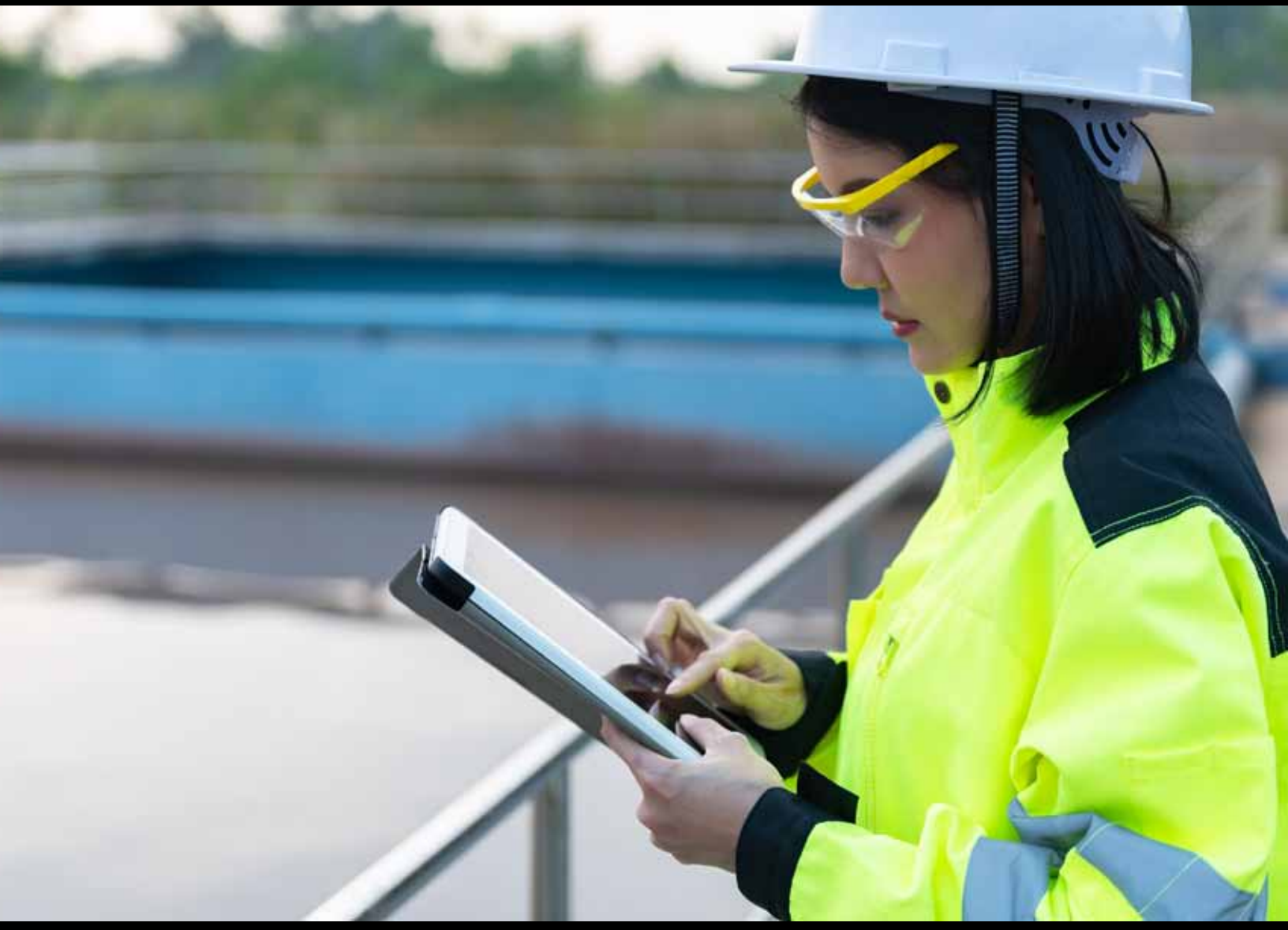
Innovative Solutions Throughout The Water Cycle

- Treatment and Conveyance
- Climate Resilience
- Client Enterprise Solutions
- Municipal and Industrial Sectors



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Stantec

Design with community in mind
stantec.com/water