Ohio Water Environment Association
Volume 92:2 | Issue 2 2019

Buckeye Bulletin

READ ABOUT OWEA'S FLY-IN TO DC
pg. 52-53

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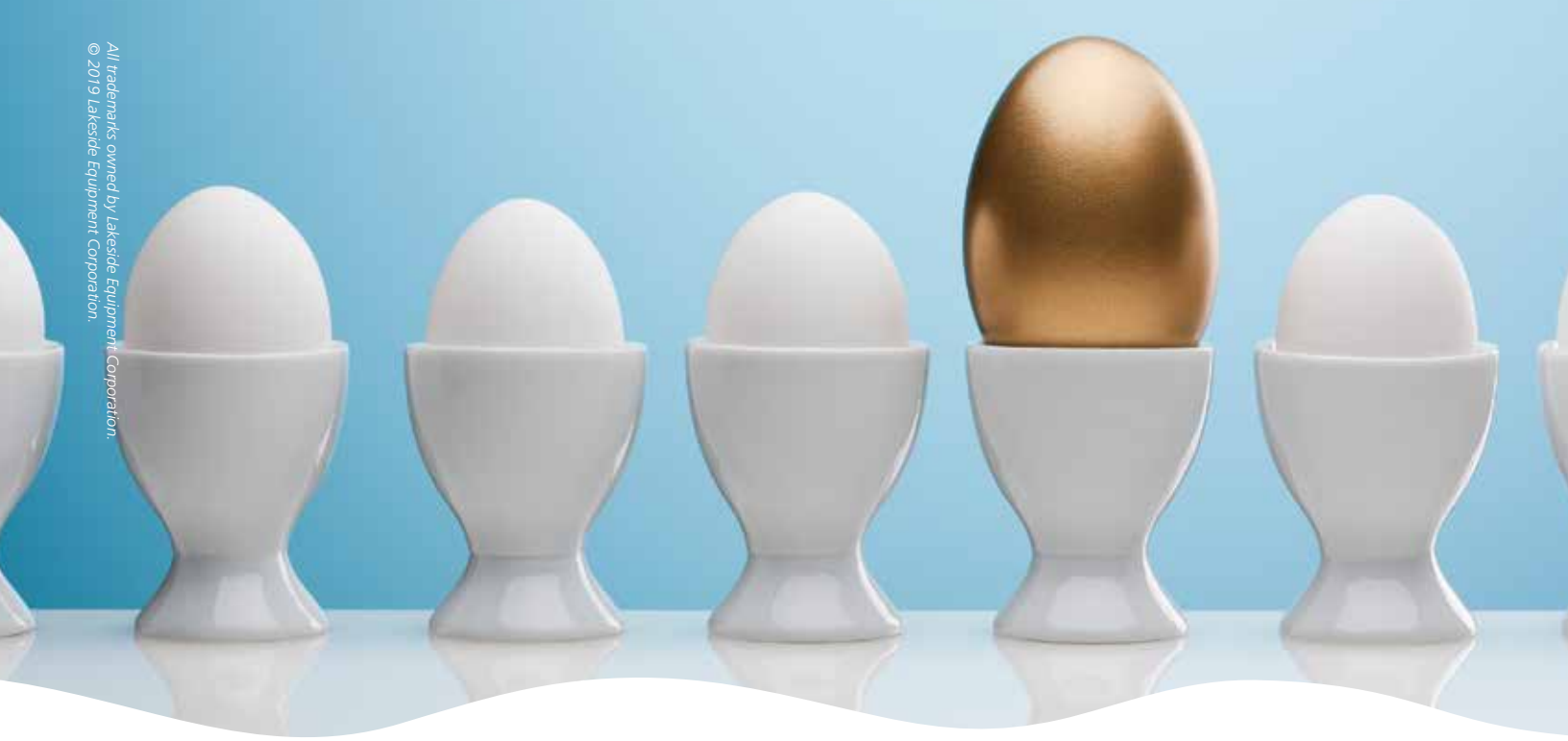

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Cover Photo - Senator Sherrod Brown's Photographer. Other photos OWEA Section and Committee photographers, article contributors, advertisers, Mike Welke, and Megan Borror (list not all inclusive).

Contact Hour Information:

OWEA training is submitted for contact hour approval.

Article Deadlines:

1st day of January, April, July, and October

Publication Dates:

Spring, Summer, Fall, and Winter

Photo Requirements:

Please contact the OWEA office regarding photo requirements for covers and articles.

OWEA is a Member Association of the

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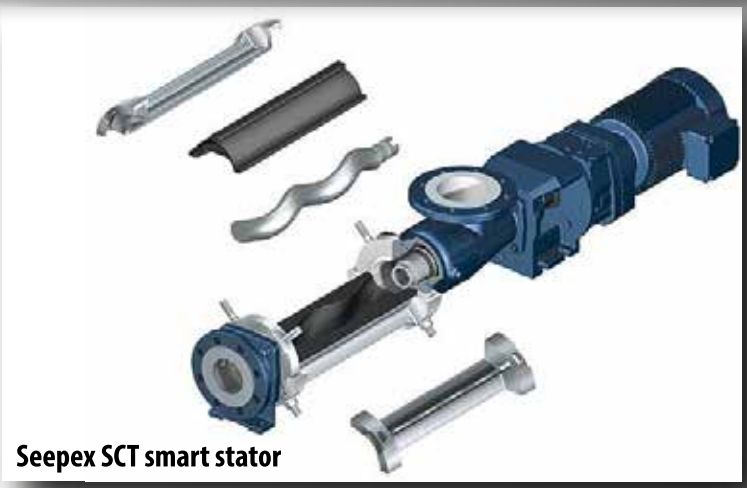
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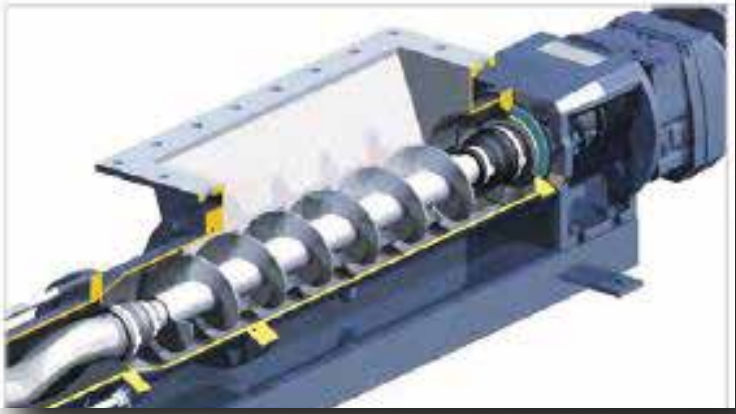

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Fred Smith
OWEA President

Hard to believe this is my final President's Message. That said, I am sure the OWEA staff is thankful it is my last one. I am typically the final article added to the Buckeye Bulletin, squeezing just under the deadline yet again. What a pleasure it has been to serve as the OWEA President this year. As I look back on my year as President, I hope that my leadership has helped to improve OWEA slightly. I look forward to working with Kim Furry (Riddell) #WOW (Woman of Water) next year as she becomes President in June. I know she will be a great leader for the organization. I must also thank those that have served with me this year. The entire Executive Committee, our Section leadership, our Committee Chairs, our volunteers, and the OWEA staff. I am grateful for your service.

I joined OWEA in 1990 as a young engineer who could not wait to get started in our industry. I wanted to be a civil engineer going back to when I was in kindergarten and looked forward with great anticipation to designing my first wastewater treatment plant. That plant is in Danville, Ohio. #MyWaterHistory comes from my Dad, Francis Smith, and my Uncle George Smith. Both were civil engineering graduates from The Ohio State University, and their careers focused on the clean water industry. Both became leaders at their respective companies and retired as the man in charge. I can simply not quantify their impact on clean water, our business, jobs created, families provided for, and communities served. Ralph Waldo Emerson said you can pay back only seldom, but you can always pay forward, and you must pay line for line, deed for deed, and cent for cent. I certainly can never pay back my Dad, or my Mom, or my Uncle for all that they provided for me and others, but I work to pay forward.

The #MyWaterLegacy campaign was launched by WEF in 2016. The campaign is to bring attention to the value of mentorship and membership, the tradition of working in the water sector, and the important contributions that water professionals make every day to build a legacy of clean water for future generations. #MyWaterLegacy is about paying forward, because we can pay back only seldom. Woody Hayes was a great proponent of paying forward, and he, my Dad, Mom, my Uncle, and many others in this clean water industry pay it forward every day. #MyWaterLegacy starts first with my two daughters, Emily and Lucy. They did not end up with a career in the clean water industry, but they are provided with clean water every day. Clean water that keeps them healthy. Nearly 1,000 children under age 5 die every day from diarrhea caused by contaminated water, poor sanitation, and improper hygiene. We are all working to solve the global water and sanitation crisis. That's why we are focused on providing clean water and sanitation to every man, woman, and child in every community we work in. You should take great pride in the work you do. This is a #WonderfulWorldofWater that we serve, and you are all saving lives! Never be ashamed of working at a wastewater treatment plant or working in the clean water industry.

I take great pride in leading our Strategic Planning session on April 23 and 24. The initial Strategic Planning workgroup met for 2 days and developed 4 goals for

Fred is a Senior Project Manager with CDM Smith in Columbus. He has a Bachelor of Science Degree in Civil Engineering from The Ohio State University and is a third-generation engineering graduate from Ohio State. Fred resides in Dublin Ohio with wife Susie. Fred and Susie have two daughters Emily (23) and Lucy (21). Emily graduated from Ohio State in May, and Lucy is attending Ohio State. Fred enjoys running marathons and drags Susie around the country to watch him race. Fred started taking ballet lessons three years ago and performed as Mr. Banks in last year's Artisan Ballet Company's production of Mary Poppins.

2018-2019
Executive Committee Meeting Dates

June 23, 2019 Sawmill Creek

moving OWEA forward into the future. The goals include volunteerism, training, public education and perception, and communication. We will be further developing these goals further with four more workgroups helping the Executive Committee create the final 2020-2024 OWEA Strategic Plan. Please let me know if you are interested in serving on one of these workgroups. This is your chance to have a voice in OWEA.

I had the opportunity to attend the Student Design Competition, hosted by our Northeast Section in late April. Seven total teams from Cleveland State University, Case Western Reserve University, and Youngstown State University competed this year. OWEAs sponsoring the winning team's trip to compete at WEFTEC later this year. We also provided student memberships to all participants. This was and is a fantastic opportunity to connect with the future leaders of the water profession. Based on what I saw at this competition, our future looks very promising! A special thanks to Krishna Chelupati and Paul Solanics for their leadership in organizing this competition.

Jane Winkler, what can I say! A wonderful person, and a #WOW (Woman of Water). Jane has served on the OWEA Executive Committee for 18 years, and she is retiring as our Secretary/Treasurer in June. Jane received a Bachelor of Art's Degree in Microbiology from Miami University, she is a Class III Wastewater Treatment Operator, and a Class IV Laboratory Analyst. Jane has received many awards through the years from OWEA and WEF. She received the OWEA Laboratory Analyst Award in 1998, and the Larry Moon Award in 2000. Jane received the WEF Laboratory Analyst Award in 2004 and became a WEF Quarter Century Operator in 2001. Jane is also a member of 5S and the Crystal Crucible Society. Jane has served our industry for 45 years. Simply amazing. Not only has Jane been a great leader for clean water, but she also serves her local community as a member of the Greater Hamilton Civic Theatre. She is currently the Chairperson of their Board of Directors. Jane models the principles of being a servant leader. I aspire one day to look back on my career and have half the impact Jane has had on clean water, our industry, and my community. Well done Jane! Two thousand years ago, the poet Sophocles wrote, "One must wait until the evening to see how splendid the day has been." Jane, rest assured that in the evening, you can look back and see that the day has indeed been splendid. Thank You!

In closing, this is not my goodbye to OWEA and the clean water industry. I hope to continue to serve as a leader making just a small impact on my corner of the Earth. Hope to see you at the Technical Conference & Expo at Sawmill Creek Resort from June 24-27. God Bless!

Welcome New Members

January 2019 - March 2019

Cody Bower
Mitch Bowling
Mike Brewster
Jeremy Cawley
Darion Chisholm
Diana Christy
Regina Collins
Joshua Dress
Marie Fechik-Kirk
Tiffany Fridley
Mike Green
Justin Gress
Keith Grewell
Byron Harbour
Jennifer Heard
Otis Hooper
Trent Howell
Abeer Huffman
Trophy Iler
Joshua Jeffi
Darren Johnson
Nathaniel Ledbetter
Sally Locher
Galen Mahoney
Drew McAvoy
John McGinnis
Haley Miller
Namrath Nallappan
Maegan Nunley
Jacob Ogonek
Steve Ostanek
Kip Pahl
Alicia Pater
Edwin Reyes
Robert Rick
Andrea Salimbene
Vilas Sarsani
Rick Schultz
Lorna Shea
Scott Smith
Henry Stephenson
David Tahmassebi
Chelsea Thomas
Sherr Vue
Jay Willen
Dan Wood
Louis Zigmund

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Members of CT's water/ wastewater group lent a hand at the Greater Cleveland Food Bank. CT's volunteer days offer employees the opportunity to pay it forward & give back to others.

Members of CT's water/ wastewater group at the site of the $120M Euclid WWTP Upgrade where CT is providing CMAR services.

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Welcome!

The 2019 conference is going to be value packed and fun! We're headed to Sawmill Creek for the first time in 16 years, and if you weren't there last time, you're in for a surprise! In two and a half days a wastewater professional can earn 12 contact hours and engineers can get continuing education, including their ethics hours. Everyone will be able to see the latest products and services in the exhibit hall and enjoy networking throughout the entire conference.

Sawmill Creek provides the perks of a resort in a casual setting. For the first time golfers will be on property for our outing (the only driving will be from tee boxes!). Everyone will be able to enjoy the shores of Lake Erie during our Meet & Greet on the beach.

As we all know, just as much learning happens outside the technical sessions as in them. This venue provides plenty of opportunity for the best networking and personal connections.

If you aren't already registered, do so TODAY! You don't want to miss this one, plan to Bounce North for Learning and Fun!

2019 Conference Co-chairs
Dave Sprague
Elizabeth Wick
Doug Borkosky

Bounce North
for Learning & Fun

June 24-27, 2019

OWEA 2019

Sawmill Creek Resort, Huron

Tuesday

Ethics Workshop
Exhibitor Presentations

Wednesday

Nutrients
Modeling and Data Analytics
Collection Systems
Pretreatment & Laboratory
Construction
Planning & Design

Thursday 1/2 Day

Utility Innovation & Regulation
Wet Weather & Green Infrastructure
Solids Handling
Odors, Air and Piping

Visit www.ohiowea.org/2019 to Register

Registration Options

	Early 3/1/19-5/17/19	Late 5/18/19-6/17/19	Onsite
Preconference			
Preconference Workshop Member	$50		$60
Preconference Workshop Nonmember	$125		$135
Full Conference			
Full Conference Member	$325	$375	$385
Full Conference Nonmember	$445	$495	$505
Retired	$175	$225	$235
Student	$50	$75	$85
Partial Conference			
One Day Member	$195	$225	$235
One Day Nonmember	$275	$305	$315
Budget Option One Day Member w/lunch only	$100	**Not available after 5/17/19**	
Budget Option One Day Nonmember w/lunch only	$175		
Golf			
Golf - Team	$360		**Not available onsite**
Golf - individual	$90		
Hole Sponsor	$250		
Exhibitor			
Exhibitor Member	$800		**Not available onsite**
Exhibitor Nonmember	$975		
Exhibitor Passport	$200		
Booth Attendant (max 2)	$165		$175
Extras			
Tuesday Awards Lunch	$40		
Tuesday Meet & Greet	$100		
Wednesday Banquet	$65		
Guest Package	$185		
Ops Challenge Guest	$100		

Please be aware online registration is not available after June 17th. Any registrations after this date will need to occur onsite and could involve a significant wait time.

Register early and save!

What's included?

Package	Mon-day		Tuesday						Wednesday				Thurs.	
	Golf	Welcome	Breakfast	Expo	Tech Sessions	Awards Luncheon	Expo Reception	Meet & Greet	Breakfast	Tech	Lunch	Banquet	Breakfast	Tech Sessions
Full Conference														
Full Conference		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Partial Conference														
Tuesday One Day		✓	✓	✓	✓	✓	✓	✓						
Tuesday Budget				✓	✓	✓								
Wednesday One Day									✓	✓	✓	✓		
Wednesday Budget										✓	✓			
Thursday One Day													✓	✓
Thursday Budget														✓
Golf														
Golf	✓	✓												
Exhibitor														
Main Exhibitor		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Booth Attendant (max 2)		✓	✓	✓	✓	✓	✓	✓						
Extras														
Tuesday Awards Lunch						✓								
Tuesday Meet & Greet								✓						
Wednesday Banquet												✓		
Guest Package		✓	✓			✓	✓	✓	✓			✓	✓	
Ops Challenge														
Team (5 people)		✓	✓	✓	✓	✓	✓	✓						
Guest		✓	✓	✓		✓	✓	✓						

Golf

Enjoy a round of golf at the Sawmill Creek Golf Club. The 6700 yard, Par 71 course was designed by Fazio and is bordered by nature on three sides with Sheldon Marsh on the West, Lake Erie on the North and Sawmill Creek on the East. The course is located right on the grounds of Sawmill Creek Resort so there is no need to travel to and from the course. A shotgun start will occur at 10:30 AM. Cost is $90 per golfer and includes breakfast, lunch and prizes/awards. It's sure to be a great time you don't want to miss.

Schedule of Events

Monday

8:00 AM	6:00 PM	Registration Open
8:00 AM	4:30 PM	Ops Challenge
8:30 AM	10:30 AM	Golf Outing Registration at Range
9:00 AM	4:30 PM	Preconference Workshop (6 contact hours)
10:30 AM	4:30 PM	Golf Outing
12:00 PM	1:00 PM	Preconference Lunch
6:00 PM	9:00 PM	Exhibitor Setup
6:00 PM	9:00 PM	Welcome Social & Ops Challenge Collections Event

Tuesday

7:00 AM	9:00 AM	Exhibitor Setup
7:30 AM	5:00 PM	Registration Open
9:00 AM	5:00 PM	Exhibit Hall Open
9:30 AM	11:30 AM	Ethics Seminar (2 contact hours)
10:00 AM	11:00 AM	Exhibit Booth Tours (1 contact hour)
11:30 AM	12:30 PM	Exhibitor Lunch
11:30 AM	1:00 PM	Awards Luncheon
1:00 PM	2:00 PM	Women's Networking Event
1:30 PM	4:00 PM	Exhibitor Presentations (2 contact hours)
2:00 PM	3:00 PM	Exhibit Booth Tours (1 contact hour)
3:00 PM	4:00 PM	Ohio WEA Annual Meeting
5:00 PM	6:00 PM	Exhibitor Reception
6:00 PM	10:00 PM	Meet & Greet

Wednesday

7:00 AM	8:00 AM	Crystal Crucible Breakfast (Invitation Only)
7:00 AM	9:00 AM	Breakfast
7:30 AM	5:00 PM	Registration Open
8:00 AM	11:45 AM	Tech Sessions (3 contact hours)
12:00 PM	1:30 PM	Lunch
12:00 PM	1:30 PM	President's Luncheon (Invitation Only)
1:30 PM	4:15 PM	Tech Sessions (2.25 contact hours)
4:15 PM	5:00 PM	Student Design Team Presentation
5:00 PM	6:00 PM	Young Professional Mixer
6:00 PM	7:00 PM	Reception and 5S Induction
7:00 PM	9:30 PM	Annual Banquet

Thursday

7:00 AM	8:00 AM	5S Breakfast (Invitation Only)
7:00 AM	9:00 AM	Breakfast
7:30 AM	12:00 PM	Registration Open
8:00 AM	12:00 PM	Tech Sessions (3 contact hours)

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Exhibit Booths Sold Out as of 4/22

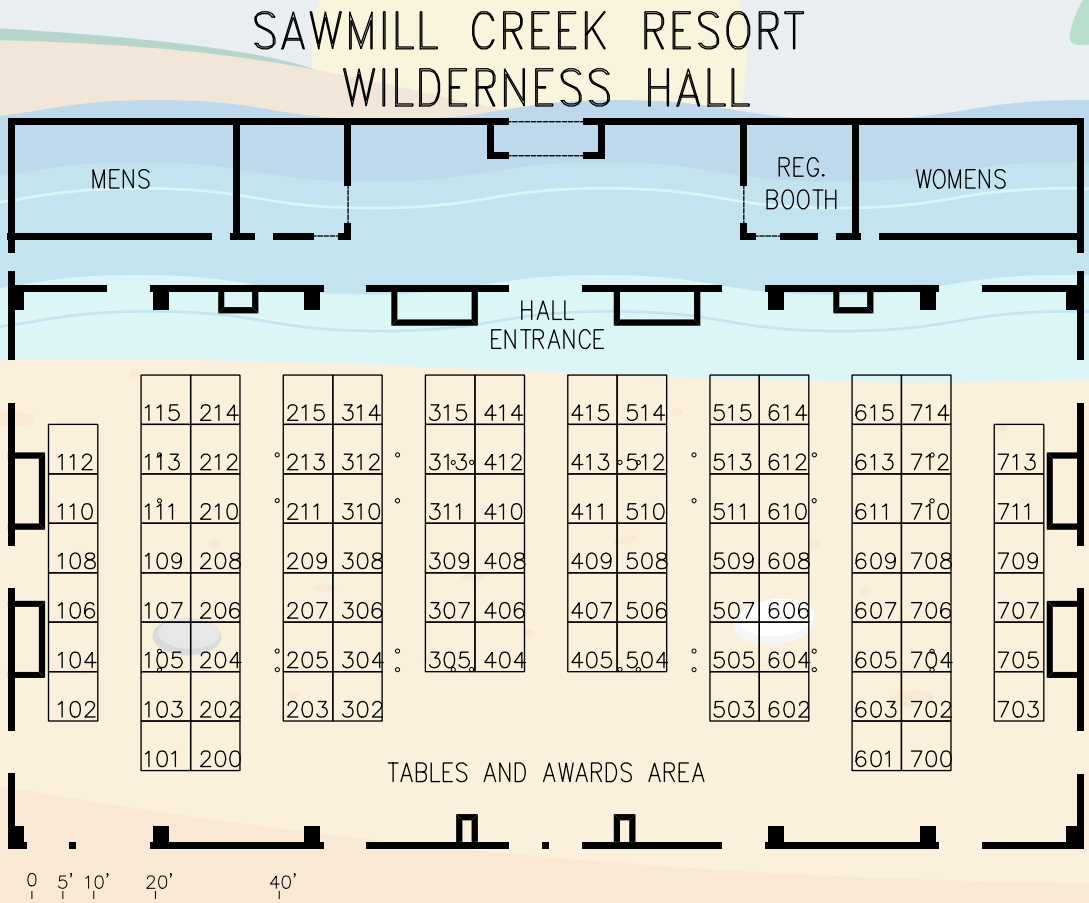
Tuesday Exhibitor Technical Presentations

1:30pm-2:00pm	WW OM	**Sludge dewaterability improvement coupled with phosphate removal by AirPrex® - experiences from practice and modeling** **Sanjeev Verma, Centrisys**
2:00pm-2:30pm	WW OM	**Case study of blending blowers for optimum efficiency** **Paul Petersen, Atlas Copco.**
2:30pm-3:00pm		**Break to Tour Exhibit Hall**
3:00pm-3:30pm	WW OM	**Centralized Versus Satellite Stormwater Treatment** **Darin St. Germain, WesTech Inc**
3:30pm-4:00pm	WW OM	**Protecting Severe Wastewater Infrastructure Using High-Performance Epoxy Linings: Lessons Learned to Achieve Sustainable Protection** **Buddy Stanford, Tnemec**

WW = Wastewater B = Both OM = Operations & Maintenance X = Other

Approval Received from OEPA

Exhibit Hall Map



Booth Number	Organization
200	360water, Inc.
102	ADS Environmental Services
202	ADS Pipe
506	Advance Instruments
104	Advanced Rehabilitation Technology
211	AGRU America, Inc.
108	Akron Electric Inc.
406	AllMax Software, Inc.
404	Alloway
113	Asahi/America, Inc.
700	Baker & Associates / Atlas Copco
702	Baker & Associates / KSB
704	Baker & Associates / Enaqua
110	Baker Tilly Municipal Advisors, LLC
106	Bayer Becker
307	Bergren Associates Inc
302, 304	BissNuss Inc
509, 511, 513	BL Anderson Company
512, 514	Buckeye Pumps
305	Chaltron Systems Inc.
709	Commerce Controls, Inc.
607	Covalen
712	Crane Pumps & Systems
203	CTI ENGINEERS, INC.
315	CWM Environmental
505	DN Tanks, Inc.
612	DRV
510	Duke's Root Control Inc
207	Ekoton USA Corporation
608	Energy Systems Group (ESG)
602	Environmental Express
308	EnviroScience, Inc.
707	EOSi
714	EXCEL FLUID GROUP
508	FeeCorp Inc
311	Granite Inliner, LLC
310	Great Lakes Water & Waste Systems, LLC
314	H.R. Gray
204	Hach Company
213	Hobas Pipe USA
614	Hydro Dynamics Company
604	HydromaxUSA
101	IDEXX Laboratories,Inc.

Booth Number	Organization
215	JGM Valve Corporation
405, 504	Jones & Henry Engineers
615	K E McCartney & Associates Inc
105	Kennedy Valve
610	Kraft Power Corporation
107	Marcum Pump Equipment, Inc.
713	MASI Environmental Laboratories Inc.
706	Mersino Dewatering, Inc.
507	Milliken Infrastructure Solutions
208	MSD Environmental Services Inc
313	Neo Chemicals & Oxides
306	NETZSCH PUMPS NORTH AMERICA LLC
309	Nexom
103	North Shore Pump & Equipment Co.
711	Ohio Stormwater Association
Hallway	Ohio Water Environment Association YP Group
Hallway	Ohio RCAP
111	OTP Industrial
109	Pace Analytical Services, LLC
609	Paxxo Inc.
611, 613	Pelton Environmental Products, Inc
112	Pump Systems LLC
703	Quasar Energy Group
209	RootX
312	RoviSys
205	Schultz Fluid Handling Equipment
503	Smith Environmental Inc
605	Technique Roofing Systems LLC
708, 710	The Craun-Liebing Company
407, 408, 409, 410, 411, 412, 413, 414, 415	The Henry P. Thompson Co.
214	Tnemec Company
210	UIS SCADA
515	Ulliman Schutte Construction
206	USABlueBook
212	USALCO
601	Waterworks Systems and Equipment
606	YSI, a Xylem brand
115	Zesco Inc
603	Zimmerman Steel & Supply Co. LLC

Go to the OWEA website to be added to the exhibitor waitlist.

Monday Preconference Workshop

Conference Add On

Are you looking to maximize your learning opportunities at the 2019 technical conference? The Northwest Section of OWEA will be hosting a pre-conference workshop for those early arrival conference attendees on Monday, June 24th. Earn up to an additional 6 contact hours on top of those offered through the conference technical sessions.

This year's theme is Nutrient Solutions for the Lake Erie Basin and will follow the lightening round format used at OWEA's Nutrient Workshop. As our keynote presenter, we are honored to have Harry Campbell from the Chesapeake Bay Foundation come and share with us lessons learned when implementing nutrient solutions in Chesapeake Bay. We will also have local experts from professors, to agriculture, to municipal representatives on the agenda. Come and learn what's being done to address nutrients in the Lake Erie basin right on the shores of Lake Erie. The cost of the pre-conference workshop is $50 per member and will include lunch.

Stick around after the workshop for the poolside conference Welcome Social open to all conference registrants, golfers, and preconference workshop attendees.

Nutrients Preconference	
9:00am-10:00am	**Session 1: The Science of Nutrients/Watershed Concepts** **1. Dr. Kristen Fussell, OSU, Assistant Director of Administration and Research** **2. Dr. Tim Davis, BGSU, Department of Biological Sciences** **3. Dr. Libby Dayton, OSU, School of Environment and Natural Resources** Facilitator: Beth Toot-Levy
10:00am-11:00am	**Session 2: The Science of Nutrients/Watershed Concepts** **1. Nicole Zacharda, Program Manager, Great Lakes Commission** **2. Bruce Cleland, Tetra Tech** **3. Dr. Daryl Dwyer, UT, Dept. of Environmental Sciences** Facilitator: Jason Tincu
11:00am-11:15am	Break
11:15am-12:15pm	**Session 3: Agricultural Practices** **1.Theresa Dirksen, P.E., Mercer County Agriculture Solutions Coordinator** **2. Aaron Heilers, Blanchard River Demonstration Project** **3. Kip Studer, WLEB Nutrient Management Specialist, Ohio Dept of Agriculture** Facilitator: Beth Toot-Levy
12:15pm-1:00pm	Lunch
1:00pm-2:00pm	**Session 4: POTW Solutions** **1. Don Rector, P.E., Fairfield County Utilities** **2. Adrienne Nemura, Geosyntec** **3. Alice Godsey, P.E., City of Perrysburg** Facilitator: Jason Tincu
2:00pm-2:15pm	Break
2:15pm-3:15pm	**Session 5: Chesapeake Bay Lessons Learned** **Harry Campbell – Chesapeake Bay** Facilitator: Jason Tincu
3:15pm-4:15pm	**Session 6 Chesapeake Bay Lessons Learned/Roundtable discussion of day** **Harry Campbell – Chesapeake Bay** Facilitators: Jason Tincu and Beth Toot-Levy
4:15pm-4:30pm	Wrap-up

Pending Approval from OEPA

Monday Welcome Social

Enjoy the classic rock and other musical musings of NW Section's very own Josh Wehring. Josh will be providing music for the Welcome Social and again at the post-banquet informal gathering at the Black Bear Saloon. Thanks Josh!

Tuesday Awards Luncheon

Every day, we all do our part to keep Ohio's water clean. Each of us plays a different role and although there are times we like to believe differently, every role is just as important as the other. By working together as a team, we get the job done. Join us for lunch on Tuesday, June 25 at 11:30 am to honor the best in our industry. Enjoy lunch, catch up with colleagues, and congratulate those in our industry that have gone above and beyond. The OWEA awards, Crystal Crucible, and Golden Manhole awards will be presented. The 5S inductees will be announced and handed their red buckets. Plan on joining us for this special event.

Tuesday Meet & Greet

The 2019 Meet & Greet will be a Beach Party along the shores of Lake Erie at the Sawmill Creek Resort beach. Great food, fantastic live music, and a chance to visit with old friends and make new ones, all while relaxing in front of a bonfire or dancing under the sky or our tent. It doesn't get any better than this. Nashville Crush will provide tunes across multiple genres -- you just need to don your casual attire and join us on the beach for networking and fun. The Beach Party Meet & Greet begins Tuesday evening at 6:00.

Wednesday Annual Banquet

Excellence deserves recognition and at Wednesday evening's Annual Banquet, we will honor excellence. The highest honors will be given to OWEA members, and we'll celebrate the ongoing vision and mission of the Ohio WEA. More details will come, but we'll save you a seat...

Wednesday Women's Networking Event

Are you a woman in water? Join fellow women in water for OWEA's second Women's Networking Event. We will have interactive group activities that promote communication, experience sharing, and provide meaningful growth and collaborative opportunities. Come enjoy the activities on Wednesday, June 26, at 1:00 where you can connect, collaborate, and grow!

Wednesday Technical Program

	Collections	Construction	Modeling & Data Analytics	Nutrients	Planning & Design	Pretreatment & Lab
8:00am-8:45am	**Prioritizing Sewer Cleaning in Cincinnati with Acoustic Inspection** Todd Trabert and Randy Schneider, Metropolitan Sewer District of Greater Cincinnati	**Toledo Waterways Initiative Downtown Storage Basin Project - Case Study** Derek Dalton, P.E., Stantec; David Selhorst, P.E., City of Toledo	**Modeling saves City of Youngstown $$$ by rethinking LTCP Strategy** Said AbouAbdallah, Arcadis US, Inc.	**Achieving Chesapeake Bay Nutrient Limits at a Large WWTP** Bob Andryszak, RK&K	**Fond du Lac's Sidestream Deammonification Project - Design, Startup, and Lessons Learned** Randy Wirtz, Ph.D., P.E., Strand Associates, Inc.; Jamie Mills, Strand Associates, Inc.	**Can a POTW Receiving Industrial Loads Comply with Future TP Limits? The City of Newark Story** Dr. Samuel Jeyanayagam, Jacobs
9:00am-9:45am	**How advances in computer vision, robotics and artificial intelligence are helping municipals to inspect underground assets** Robert Lee, Subterra AI INC	**Dayton Parallel Intercetor-Innovative Construction Methods** Larry Kremer, City of Dayton Water Engineering Dept.; Dane Brown, Arcadis	**Often Overlooked - Lessons from WWTP Non-Potable Water Model** Dante Fiorino, Brown and Caldwell; Darin Wise, City of Columbus Southerly WWTP	**Using Metabolic and Physical Selectors to Densify Activated** Mark Strahota, Hazen and Sawyer	**Master Planning New Phosphorus Limits & Asset Management Needs** Peter Kube, Arcadis US, Inc.; Nick Dailey, City of Dayton; Sharon Vaughn, City of Dayton	**A Cost Effective Solution to Total Dissolved Solids** Rick Johnson, Applied Environmental Solutions
10:00am-10:45am	**Retrofitting a Pump Station for Intermediate and Future Use** Adam Athmer, Strand Associates, Inc. ★ YP Paper Winner	**Progressive Design-Build Upgrade to MBR Helps University Optimize Water Reuse** Mark Strahota, Hazen and Sawyer	**A Comprehensive Sanitary Sewer Study of the City of Warren** Louis Burnoski, AECOM; Ed Haller, City of Warren; Tanner Adair, AECOM	**Time-Tested Bio-P Removal Options for Cold and Wet Weather** Jim Fitzpatrick, Black & Veatch	**BioCEPT Treatment for wet weather flows at Akron's WRF** Dan Johnson, P.E., Burgess & Niple; Brian Gresser, P.E., City of Akron	**Wapakoneta, Ohio - Wastewater Treatment Challenges after Attracting a New Industry** Christy McCarthy, Jacobs
11:00am-11:45am	**A Focused Sanitary Sewer Survey provides actionable results for a successful sewer rehabilitation project** Gary Silcott, P.E., Stantec	**Preparing for the Unexpected During Design, Construction, and Commissioning** Sierra McCreary, Black & Veatch; Tim Weaver, City of Springfield	**Reducing Odor Complaints through Air Dispersion Modeling and Odor Control Master Planning** Amy West, Brown and Caldwell; Sara Cramer, MSDGC	**Enhanced Nutrient Removal Upgrades using Ballasted Activated Sludge Technology** Kevin Nash, RK&K	**Determining WWTP Screen Capacity During Wet Weather Flows** Dante Fiorino, Brown and Caldwell; Troy Branson, City of Columbus	**The Cuyahoga River, 1969 to Present** Ed Kelly, Storm Water Control Services, LLC
1:30pm-2:15pm	**Let's Get This Program Started - Hidden Challenges of Large Diameter Sewer Rehab Projects** Joe Siwek, Tetra Tech; Matt Choma, Lucas County Sanitary Engineer	**SBR to BNR in 10 Years - Phased, Grant Funded Improvements** Mark Upite, P.E., Burgess & Niple, Inc.; Sam Swanson, PE, Burgess & Niple, Inc.; Kyle Cribbet, Village of Williamsburg	**Application of Real-Time Weather Forecast in Collection System Operation** Tiantian Xiang, Arcadis US, Inc.; Hazem Gheith, Arcadis US, Inc.	**A Look into Phosphorus Removal Design** Jamie Mills. Strand Associates, Inc.	**How Old Are Your Lamps: Cost Effectively Upgrading Your UV System** Lindsey Hassenauer, Hazen and Sawyer	**Oxidation Reduction Potential, a Versatile but Misunderstood Wastewater Treatment Monitoring Parameter** Laura St. Pierre, YSI, a Xylem brand
2:30pm-3:15pm	**Successful I&I Reduction using Design-Build - Developing and Implementing the River Valley Highlands Design-Build Sewer Rehabilitation Project** James W Shelton, Arcadis US, Inc.	**Lessons Learned on Installing Spiral Wound Pipe Renewal (SPR PE) in a Combined Sewer in the City of Lima, OH** Bill Weaver, Black & Veatch	**Integrating Plant and Enterprise Systems to Streamline Operations** Vicki McCorkle, T&M Associates	**Improvements for Nutrient Removal at a Package Plant** Elizabeth Buening, Delaware County ★ YP Paper Winner	**Improving WWTP Safety by complying with NFPA 820 & NFPA 70E** Arvin Kasyouhanan, Arcadis US, Inc.; Jason Watts, Delaware County	**Determination of Readily Biodegradable COD (rbCOD)** Radek Bolek, Alloway
3:30pm-4:15pm	**A Tale of a Corroded Pipe: Failures, Analysis and Mitigation** Marissa Lauer, Brown and Caldwell; Mike Erkkila, Lake County Department of Utilities	**A Public-Private Collaboration for Replacement of a Collapsed Sewer** Brian Egan, AECOM; Louis Burnoski, AECOM; Amanda Foote, AECOM; Doug Lopata, NEORSD	**CFD methods for evaluating air entrainment in drop structures** John Wendelbo, Flow Science; Brian Fox, Flow Science	**Struvite Recovery Lessons Learned** David Wrightsman, ESG	**Navigating Regulatory Mandates with Limited Funds and Resources** Kris Ruggles, Strand Associates, Inc.	**Evaluation of high precision in-situ analysis against benchtop lab analyzers for process insight** Dave Rutowski, Hach Process Management

WW = Wastewater B = Both OM = Operations & Maintenance X = Other

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Thursday Technical Program

	Innovation & Regulation	Odors, Air, & Piping	Solids Handling	Wet Weather
8:00am-8:45am	B X **Leading Water and Wastewater Utility Innovation** Joanna Brunner, Arcadis US, Inc.	WW OM **Sinking Feeling- Finding and fixing leaking plant conduits and air piping** Robert Hrusovsky, Stantec; Harry Shaposka, NEORSD; Robert Bonnett-NEORSD	WW OM **Hamilton, Ohio - WWTP Biosolids and Energy Master Planning** Randy Wirtz, Ph.D., P.E.; Strand Associates, Inc.; Dwight Culberson, City of Hamilton, Ohio; Dave Jenkins, City of Hamilton, Ohio; Jenn Delebreau, P.E., Strand Associates, Inc.	WW X **Keys to an Effective GI Operations and Maintenance Program** William Landshof, Arcadis US, Inc.; Kurt Kinney, Arcadis US, Inc.
9:00am-9:45am	WW OM **Water Quality Standards Variances: Not Just for Mercury** Adrienne Nemura, Geosyntec Consultants	WW OM **Airflow Ventilation of Sewers and Tunnels** Adam Dellinger, HDR; Jennie Celik, HDR ★ YP Paper Winner	WW OM **Pelletization of Thermal Dried Sludge to Improve Usability and Marketability of Biofertilizer** Sudhakar Viswanathan, Veolia; Meg Hollowed, Veolia; Wes Yellen, ITAC; Damon Forney, Town of Cary	WW OM **Startup and Commissioning Enhanced High-Rate Treatment in Cincinnati** Jim Fitzpatrick, Black & Veatch; Tony Yee, Metropolitan Sewer District of Greater Cincinnati
10:00am-10:45am	WW OM **Ohio EPA Update** Tiffani Kavalec, Ohio EPA	WW OM **BWARI Biofilter Rehabilitation - Converting a Liability into an Asset** Lee Weber, P.E., Black & Veatch	WW OM **Gravity Settling: Harnessing the Law of Nature** Dale E. Kocarek, P.E., BCEE, Stantec; Joseph D. Cook, P.E., Stantec; Michael J. Brewster, P.E., Stantec; Troy Pranson, P.E., City of Columbus	WW OM **Toledo's Ottawa River Storage Facility Design, Construction and Operation** Tim Harmsen, Arcadis US, Inc.
11:00am-11:45am	B **Ohio EPA Update** OM Laurie Stevenson, Ohio EPA	WW OM **Using Hydroxyl Radicals to Treat FOG & Odors and Prevent Corrosioin** Suzanne Dill, Vapex Environmental Technologies, LLC.	WW OM **The Sludge Thickens! Gravity Belt Thickening to Increase Efficiency** Timothy McCann, P.E., AECOM; Terry Korzan, City of Elyria	WW X **Planning Large GI Programs Using Automated ArcGIS tool** Khaled Abdo, Arcadis US, Inc.

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Volunteers Needed

Sign up at OhioWEA.org/2019

Golf Volunteers:
Monday, 2 hours
Golf registration, greeting, etc.

Exhibit Tour Monitors:
Tuesday, 75 min
Guide/monitor small group through four 15 minute booth presentations, be present early to gather/sign-in group.

Sign Wranglers:
Tuesday –Thursday, 30 min
Place and remove signs as conference progresses, early morning and evening options.

Ticket Takers:
Tuesday & Wednesday, 45 min
Be present at the beginning of meals to collect event tickets

Moderators:
Tuesday –Thursday, 3 hours
Announce technical session speakers and manage flow of presentations for one morning or afternoon track.

Monitors:
Tuesday –Thursday, 3 hours
Assist with contact hour check-in/out at entry to room for one morning or afternoon track.

Young Professional Award Winners

Every year the Young Professionals Award is given to one young professional from each section with an outstanding abstract to be presented at the annual conference. To be eligible, the person must be 35 years of age or less or have less than 5 years of experience in the wastewater industry.

The winners receive full conference registration from OWEA, an award (usually covering their hotel stay) from their section, and get to present their topic at the annual conference. We had nearly 20 YP abstracts submitted for consideration this year. Each was intriguing and interesting, and I would like to thank all the YPs who submitted abstracts. Keep up the good work!

This year's winners are presented below. Be sure to sit in on their presentations at the 2019 Technical Conference and Expo!

Northeast Section – Adam Dellinger, HDR
Presentation Title: Airflow Ventilation of Sewers and Tunnels

Adam is a Water/Wastewater Engineer at HDR in Cleveland. He graduated from the University of Toledo with a Master's degree in Industrial Engineering and previously worked for quasar energy group as a Process Engineer responsible for designing, constructing, commissioning and operating sludge dewatering facilities. During his time at HDR he has been involved with a variety of projects and tasks including ventilation and odor control studies, process control narrative documentation and development, program management, mechanical design and construction administration. He has enjoyed working with a firm that provides him with the support and encouragement to be successful and deliver high-quality work for its clients. Adam and his wife Sarah live on the east side of Cleveland with their 2-year-old son Miles and are expecting a daughter in June.

Presentation Abstract:
The conveyance of airflow through a sewer or sewage tunnel can be driven by one or more of several factors including (1) Friction Drag Airflow, (2) Drop Structure Education, (3) Flushing Airflow Effect, (4) Buoyancy Airflow Effect, and (5) Displacement Air. This presentation will describe these five (5) factors and discuss how these effects are considerations for an overall ventilation air management strategy and are considerations for the design of wastewater structures. In addition, this presentation will give two case studies of airflow ventilation analyses that were performed for the Northeast Ohio Regional Sewer District (NEORSD) and City of Akron, Ohio. A ventilation review was performed for tunnels for both agencies to assess airflow dynamics in the proposed tunnel system to determine potential locations that would emit air from the tunnel for the purposes of evaluating risk, as well as potential capital costs and required land areas for potential odor control facilities.

Southeast Section – Elizabeth Buening, Delaware County Regional Sewer District
Presentation Title: Improvements for Nutrient Removal at a Package Plant

Elizabeth is certified as an Ohio Class II wastewater treatment operator and an Ohio Class A water supply operator. She decided to work as a drinking water and wastewater operator after college at small treatment plants near road side rests. After a few years of operations, she took an opportunity with the Ohio EPA as a permit writer for wastewater plants that discharge flow over 1 million gallons per day. Looking for something different, she changed her role in the agency from office staff to field staff. She traveled across the state assisting wastewater operators on complying with their discharge permit in the Compliance Assistance

Unit. Leaving the regulatory side, she started with Delaware County Regional Sewer District two years ago as a staff engineer. She is currently pursuing a Master's degree in Civil Engineering.

Presentation Abstract:
Tartan Fields water reuse facility (WRF) has a design capacity of 0.25 million gallons per day. Unlike most wastewater treatment plants that discharge to a nearby waterbody, this facility discharges into a storage pond. The water from the pond is used to irrigate the golf course. Because of this usage, the state permitting authority requires compliance under a land application management plan. Tartan Fields WRF is permitted with a limit on total inorganic nitrogen but not total phosphorus. A year's worth of nutrient data has revealed that the improvements made to this package plant resulted in the biological removal of ammonia-nitrogen, nitrate, and ortho-phosphates from the treatment system. At the annual conference in 2018, this facility was presented on the hydraulic improvements; this year the focus will be on the operations of the plant to achieve biological nutrient removal.

Southwest section – Adam Athmer, Strand Associates
Presentation Title: Retrofitting a Pump Station for Intermediate and Future Use

Adam was the lead design engineer and Project Manager for the construction phase of the Richwood Pump Station Intermediate Improvements Project. Adam holds a degree in Civil Engineering from the University of Dayton and is a registered professional engineer in Ohio and Kentucky. He has been working in the municipal field for over 6 years. His work history includes a blend of system and facility planning, detailed design, and construction services related to underground utility design, primarily focused on gravity storm and sanitary design, force main design, sanitary and stormwater pumping facilities, and water distribution systems design.

Presentation Abstract:
SD1 initiated this project to develop detailed evaluations of retrofit alternatives to maximize the available site and facilities to reach the intermediate capacity goal of 7.8 MGD of firm capacity at the Richwood Pumping Station. The alternatives considered were focused on the reuse of the existing dry well and/or the reconfiguration of the existing structure into a submersible station. The alternatives included options to install the electrical components in a new separate building, expansion of the existing building, and the installation of exterior cabinetry. A common component of all alternatives was the replacement of the existing pumps and controls to better adjust flow regimes due to wet weather events and consistently increasing dry weather demands. The ultimate recommendation was to utilize the existing superstructure and customized controls to maintain the upgraded electrical equipment within the existing building superstructure.

OWEA 2019

YOUNG PROFESSIONALS MIXER

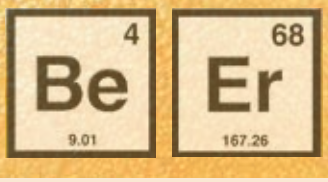
Wednesday, June 26
5:00 - 6:00 PM
Tall Pines Room

Attending the OWEA 2019 Technical Conference and Expo? Come network with fellow Young Professionals in the Tall Pines room, located on the second floor above Great Sky Lobby.

Drink tickets and appetizers will be provided by OWEA. When registering for the conference, remember to select the Young Professionals checkbox. Conference registration and additional information here:

https://www.ohiowea.org/2019_technical_conference_ex.php

If you're not able to join us, at least be sure to stop by the Young Professionals booth at the conference. Happy networking!



OWEA 2019

JUNE 24TH, 2019

Operations Challenge Invitational

OWEA is proud to announce they will be hosting an Operations Challenge Competition and National Invitational as part of our 2019 Technical Conference and Exhibition

- 12 teams total
- 6 spots held for invitational teams

$100 Team Registration (up to 5 people) includes:

- Breakfast on Monday
- Lunch on Monday
- Welcome Event Monday evening
- Tuesday Awards Luncheon
- Entrance to Exhibit Hall on Tuesday
- Tuesday Reception where Ops Challenge awards will be presented
- Tuesday Meet & Greet

Registration and details at ***www.ohiowea.org***

Process Control
2019 Operations Challenge Invitational
Laboratory
Test Your Skills! Meet and compete with fellow Operations Challenge teams
Collections
Great way to prepare for 2019 National Competition in Chicago
Maintenance
Visit *www.ohiowea.org* for details
Safety
Don't Miss It!

Ohio Water Environment Association
1890 Northwest Blvd, Suite 210
Columbus, OH 43212
614.488.5800
www.ohiowea.org
info@ohiowea.org

Maintenance Event

Wipes, Ragging, FATBERGS… Oh My! A lift station trouble alarm was received via the SCADA system at the Operations Control Center. A crew has been dispatched to troubleshoot the alarm. The teams will need to troubleshoot the electrical control panel, perform routine maintenance on the submersible pump and wet well, and then ultimately restore the pump station back to normal operating condition. While troubleshooting the alarm, it has been decided to replace the impeller of the pump to prevent continued calls due to clogging – all because of wipes. In a first for this event, we will be using a "live" pump and wet well. In the last step of the event the teams will be testing the pump to be sure their work was successful.

Process Control Event

This event consists of a written test and computerized process simulator meant to evaluate an operator's knowledge of WRRF process control. The written test is made up of four main sections: short math, multiple choice, extended multiple choice and longer process scenario questions. Point values range from 10 for multiple choice to 200 for the process control scenarios in the written portion. The process simulator will be run by each team on a laptop that will be provided. The process simulation software is provided by Hydromantis and will be the same for each team. Each scenario lists a set of goals and points are awarded for the number of goals achieved.

Collection Systems Event

How long do you think it would take you to cut through an 8" SDR-35 pipe with a hand saw? No battery powered Sawzall® here. 30 seconds . . . how about 45 seconds? Unless you can be around 20, don't even try. The object of the Collections Event is to cut out a 1' – 2' section of broken sewer line from a six foot long pipe, replace it with another unbroken section using two Ferncos®, and install a new saddle connection on the fresh pipe. You have four team members: who cuts what, and when? Choreographed chaos is the best way to describe the event. Complete the whole thing in less than two minutes and you might just be fast enough to be the winners.

Safety Event

While your WRRF facility crew is working, one of the workers collapses in the bottom of a confined space lift station. It is suspected that he/she has been overcome with an unknown gas or lack of oxygen due to a worn 4" check valve gasket in the station. The in-plant rescue/ repair team is immediately called to the scene. Two members of the team will enter the confined space, rescue the downed worker and repair the check valve. Two gate valves will be closed and locked out/ tagged out by the entrants, the check valve flapper and gasket will be replaced and the line put back into service. Tools and equipment will be lowered to them by the attendants and all proper confined space entry protocols will be followed during the rescue and repair completing just another day in the life of a WRRF operator!

Single Day Competition!

AWARDS WILL BE PRESENTED ON TUESDAY AT THE EXHIBITOR RECEPTION.

Laboratory Event

One of the primary functions of your treatment plant is removing solids from the waste stream. In order to do this effectively and efficiently you must first know where the solids are throughout the plant. The lab event requires you to complete analysis for total suspended solids from samples collected throughout a WWTP. This event will require the preparation of filter paper for drying for each of the samples. You will also complete a total dissolved solids analysis of each sample using a calibrated YSI MultiLAb instrument. Team members will then weigh pre-dried filter paper samples and complete calculations for total suspended solids on each sample. Bench sheets will need to be completed properly in addition to proper performance of such techniques as measuring with graduated cylinders, pipetting, use of a balance, and basic math skills.

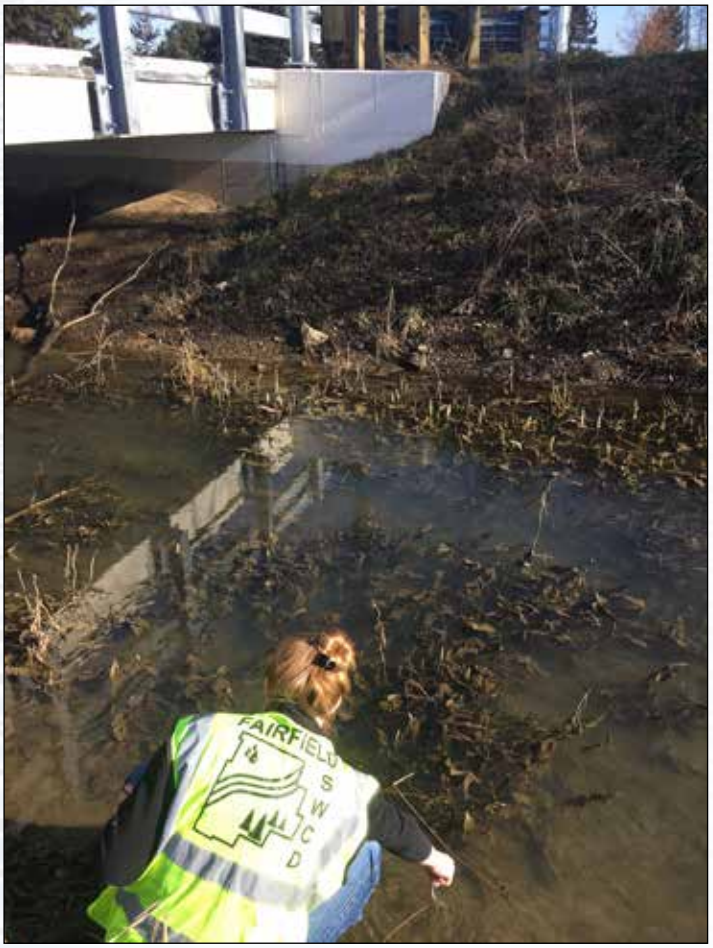
Buckeye Lake: A Legacy for Tomorrow

by Sebastian Teas, AmeriCorps member, Perry County Soil and Water Conservation District

Buckeye Lake was once Ohio's premiere tourist destination – a 3,200 acre haven for boaters, anglers, and families looking for a summertime getaway. The lake was created in the 1820s as a reservoir for the Ohio and Erie Canal Project, with miles of drainage diverted from the South Fork Licking River into an impounded area once called 'The Big Swamp'. When the canal system closed at the turn of the century, however, Buckeye Lake became a public park. Residential developments shot up around its perimeter. Just 30 miles east of Columbus, it was an opportunity for many Ohioans to experience beachfront living. Throughout the early twentieth century, the lake's popularity grew, with an amusement park drawing in tens of thousands of visitors a day at its peak. Even throughout the Great Depression, the park continued to expand, adding a roller coaster, a roller skating rink, and a ballroom where famous musicians, including Louis Armstrong, Duke Ellington, and Glenn Miller, performed for adoring crowds. Unfortunately, the following decades saw a steady decline in tourism, and by the end of the 1960s, buildings were being torn down and park attractions dismantled. Residents remained, but the glamour was gone.

Though short-lived, Buckeye Lake's golden days inspired many in the subsequent years. The Buckeye Lake Region Corporation is one organization made of such inspired individuals. Their mission? To enhance the economic prosperity of the lake and its residents. In their vision, a return to form for Buckeye Lake, in which tourists are once more drawn to its shores by the thousands, is achievable with enough dedication. Yet, the obstacles are large and plenty – and many arise from none other than the lake itself. In recent years, Buckeye Lake has seen increases in harmful algal blooms and other symptoms of hyper-eutrophic conditions. Such a development has residents concerned, so mitigating the condition is one of the region's top priorities. In conjunction with the Buckeye Lake Region Corporation, Buckeye Lake for Tomorrow, Inc., a non-profit focused on the lake's water quality, made it its mission to improve the environmental quality of Buckeye Lake and enhance its economic potential. For as long as there are extensive algal blooms, a second golden era for Buckeye Lake must wait.

Of course, there have been monumental efforts to heal Buckeye Lake's waters already. Buckeye Lake for Tomorrow performs regular testing of pH, dissolved oxygen, conductivity, and nutrient levels, to name a few parameters. They have spent countless hours drafting proposals to bring the algae under control, and they have conducted studies on potential solutions to over-sedimentation and lower, overall water level. The Buckeye Lake Region Corporation supports these efforts, and recently, both organizations have been instrumental in pushing for greater awareness about both the lake's issues and its potential.



What makes such a task challenging, though, are the crisscrossing boundaries that overlay the lake. Not only are there several municipalities around the shoreline (Millersport, the Village of Buckeye Lake and Thornport to name a few), the lake lies at the intersection of three counties (Perry, Fairfield and Licking) and two watershed conservancy districts (Muskingum and South Fork Licking). Two HUC-12 subwatersheds drain the area, one holding the lake itself and the other (aptly named the Reservoir Feeder) draining a high number of western tributaries into the lake. Each organization, town or county brings a unique perspective to the table, with a different set of goals and different methods for achieving those goals. To piece everything together, the Soil and Water Conservation Districts for Perry, Fairfield and Licking Counties collaborated to secure funding for a new watershed coordinator position for Buckeye Lake, starting in 2018. With so many perspectives to account for, it was necessary to find one person to unify them all and to develop a clear plan for the future of the area.

Among the goals of the new watershed coordinator, nutrient reduction plays the biggest role. The algal blooms are due to excessive nitrogen and phosphorous entering the lake, but how and in what form are the questions to answer. Land use around Buckeye Lake is heavily agricultural. Farm fields extend all across the watershed. Many producers are already aware of nutrient impacts on the lake, however, and they are doing what they can to protect Buckeye Lake's water quality. So, the solution is not as simple as convincing farmers to mitigate nutrient runoff from their fields, since they've made strides already. Pollution is instead coming from a wide variety of factors, not just one, quickly identifiable source. Therefore, if Buckeye Lake is to succeed, then it will require comprehensive changes, some small, some big. As a starting point, five key goals have been selected: 1) precision nutrient application on farm fields for farmers who are not already doing so, 2) streambank restoration and stabilization in critical areas, especially along the lake's tributaries, to prevent further sedimentation, 3) wetland creation or enhancement to filter runoff, 4) introducing cover crops to producers who

are not already using them, and 5) identifying and fixing leaking household septic tanks in the watershed.

The watershed coordinator's task is to bring people on board for these developments and to guide their efforts. Such a job necessitates some political savvy, plenty of interpersonal skills, and a whole lot of patience. A lot of people care deeply about Buckeye Lake. Such a concern garners vast support for improving water quality. But at the same time, one must be careful not to overpromise about the future. The lake's waters will never be crystal clear. As the reservoir is a manmade structure, natural order pushes for the area to return to its original marshy state, and because this is the case, there will always be a need to maintain the lake. Algal blooms may decrease significantly, but they are not guaranteed to go away completely. It is part of the coordinator's job to temper these expectations and support a greater understanding of water quality and the science behind what is possible and what is not.

Regardless, improvements in water quality are beneficial to Buckeye Lake's prosperity. The lake water can be made cleaner and it can be made safer. Once Ohioans start to see these positive changes to the water, the region will start to draw in more families looking for good recreation opportunities. The economy of the region will flourish again, and Buckeye Lake will once more become not only an escape, but a lifestyle like no other.

Buckeye Lake Dam Part 2:

by Joseph Rikk, Jr., PE, Project Principal for Buckeye Lake Dam
and Gannett Fleming Vice President and Midwest DOTs & Tolls Business Line Leader

Buckeye Lake Dam: Innovative Designs and Accelerated Delivery

The Buckeye Lake Dam Improvements Project holds the title of the largest capital improvements project for the Ohio Department of Natural Resources (ODNR) in the agency's 70-year history. Gannett Fleming provided design and construction management services for the dam that spans across Fairfield, Licking, and Perry counties in Ohio. The team completed the $107-million construction project in three years, revitalizing the economy and restoring life for the residents of the three counties.

A Danger to a Thriving Community

In 2015, the Army Corps of Engineers deemed the 4.1-mile-long, 180-year-old dam a Class I, high-hazard-potential earthen embankment at risk of imminent catastrophic failure. The warning came after the dam did not meet safety requirements, posing a threat to as many as 3,000 people and 2,100 homes and businesses downstream if the dam failed.

ODNR immediately held the lake's water to winter-pool level, which is approximately 3 feet below summer pool, to reduce the risk of failure. In an attempt to improve the

The Buckeye Lake Dam Improvements Project reduced risks for residents and businesses within close proximity to the Class I, high-hazard potential dam.

dam's conditions as quickly as possible, the agency took action and selected Gannett Fleming through a quality-based selection process to design and provide construction observation for the Phase 1 interim risk-reduction measure, which included constructing an earthen stability berm and seepage barrier. The construction manager at risk delivery method was used to fast track this work and allow the lake's level to be raised to an interim pool, which permitted recreational use of the lake while the new dam was being constructed in Phase 2.

Innovative Solutions for Improvement

Gannett Fleming implemented an innovative first-of-its-kind solution to improve the dam and allow Phase 1 of the project to be constructed within six months. A key feature of this phase was the 30-foot-wide earthen stability berm, which served to protect the existing dam embankment and allowed the lake to be restored to normal pool level for the remainder of the construction phases. The stability berm runs the length of the dam and required the placement of 400,000 cubic-yards of bank run material that was imported from a local quarry. The 24-inch wide seepage barrier extends 42 feet below the ground and was constructed using deep-soil mixing to create the cutoff wall to stop seepage through and under the existing dam. This served as protection for adjacent homes during construction and lowered the risk of damage.

After addressing the short-term fixes, the team moved to Phase 2, which involved the design of a new buttress wall between the new seepage barrier and the existing dam face, a long-term solution to protect against dam failure. The finished design also consists of a concrete-paved, 4.1-mile-long path on top of the new dam that offers additional protection, vehicle access for dam safety inspections, and a lakeside promenade for residents and tourists to enjoy recreational walking and biking in the state park setting.

Prior to Gannett Fleming's suggested approach, ODNR faced the threat of needing to keep the lake at winter-pool level for nearly five years until the dam was fully reconstructed. Thanks to Gannett Fleming's two-phase approach, the lake level was reduced for only one recreational season, offering a different approach and schedule than any other competing firm. The project was completed nearly two years ahead of schedule and more than $40 million under budget. ODNR was able to restore water levels ahead of schedule, which boosted the area business activity that thrives on boating, fishing, and tourism, improving the quality of life for residents and the experience for tourists.

The Buckeye Lake Dam Improvements Project reduced risks for residents and businesses within close proximity to the Class I, high-hazard potential dam.

Improving Ohio Water Quality Through the Farm Bill

by U.S. Senator Sherrod Brown

When most people hear the phrase "farm bill," the images that come to mind are cornfields stretching to the horizon, rolling green pastures, or herds of cattle.

But the bipartisan Farm Bill that was signed into law isn't just an agriculture bill – it's also an economic development bill, it's a research bill, it's a conservation bill, and it's a Great Lakes bill.

As the first Ohio Senator to serve on the Senate Agriculture, Nutrition, and Forestry Committee in more than 50 years, making sure Ohio priorities were included in this critical legislation was a top priority of mine, and I'm proud that the final bill includes important protections for Lake Erie and water quality across Ohio and the nation.

Ohio has some of the most productive farmland in the country, yet there are real challenges to watersheds, utilities, and public health throughout our state. The Farm Bill is one of the most important pieces of legislation we have to protect that farmland, promote water quality, and protect Lake Erie and other streams and rivers across the state.

For 18 months, I held roundtables across Ohio where I heard from farmers, conservation advocates, elected officials, and businesses about the challenges facing farms, small towns, and our waters. I held a roundtable at Bill Myers' family farm, less than half a mile from the lake, across the road from Maumee Bay State Park. There I heard from producers and conservation experts who talked about how they all wanted to work together to protect our lake – but Mr. Myers urged us to "think differently" about how we do that. The same old programs just aren't enough.

So that's what we did in the Farm Bill. worked with Republican Senators Chuck Grassley and Joni Ernst to reform the Conservation Stewardship Program, making it easier to use, and prioritizing cover crops and crop rotations to improve soil health and reduce erosion.

I also worked with those same Republican colleagues from Iowa to improve the Conservation Reserve Program (CRP). We came up with a new idea, the Clean Lakes, Estuaries, and Rivers – or CLEAR – Program, which will strategically enroll two million acres of at-risk land into CRP to best prevent runoff and protect water quality,

without taking prime acres out of production. When we do a better job of targeting the acres in conservation programs, water quality improves, farmers benefit, and taxpayer dollars are better spent.

In the last Farm Bill, we worked with stakeholders across the Western Lake Erie basin to create the Regional Conservation Partnership Program (RCPP), to reduce nutrient runoff and protect our natural resources. That success led to a historic investment in the Western Lake Erie Basin to ensure that we are developing and implementing the practices that will keep soil on the fields and phosphorous out of the rivers and streams that feed Lake Erie.

This year, we built on that success, and made improvements to the RCPP. We increased funding, encourage innovative conservation practices, and will increase private sector participation to protect our water and lands. This is a program that water utilities have been able to take advantage of in the past, and combined with other provisions in the bill that encourage innovative partnerships between utilities and farmers, will have a real impact on reducing nutrients in our waters.

Together, these efforts will improve federal conservation programs and better support Ohio farmers by reforming the three largest conservation funding programs to protect waterways, all while increasing better farming practices. We know we have more to do to clean up our lake, but the new tools included in the 2018 Farm Bill will protect our drinking water, support farmers, and help ensure that all Ohioans have access to safe, clean water no matter where they live.

10 Tips That Will Help You on Your Path to DMR-QA Enlightenment

by Tony Hintze, City of Fremont

Spring is here and the Lab is as busy as ever. When most people think of spring, they think of flowers popping up- but for us in the lab it means DMR-QAs popping up. Unfortunately, many look at DMR-QAs as more of a weed than a flower. No matter how inconvenient these tests, they are a necessity and cannot be plucked from the bench to be discarded. Hopefully, with the tips found in this article, you will look at DMR-QAs in a whole new light.

What is DMR-QA? DMR-QA is an acronym for Discharge Monitoring Report - Quality Assurance. It is a study that ensures the integrity of data submitted by the permittee for their Discharge Monitoring Report (DMR) requirements and evaluates performance of the laboratories to analyze wastewater samples. This is done by running a series of Proficiency Testing (PT) samples which contain pollutants that are listed in your NPDES permit. The value of the contaminants are unknown to the lab and must be tested by the lab who performs the test for DMR reporting, using the same methods and procedures. The lab then reports their results which are evaluated against a predetermined set of criteria. Ultimately these tests prove to the EPA that we know what we are doing and that our equipment is working properly. Instead of frowning when we hear DMR-QA, we need to step up and look at this as an opportunity to prove ourselves as the capable lab analysts we are. If you don't feel capable then you need to change that. The data that we supply is not only reported to the EPA, but also allows operations to make crucial changes to the plant. People count on our data and we as lab analysts need to be confident with our results. So without further ado, let's review the tips!

1. You as an analyst need to be confident with your results and the methods you are using.

Whether it be on a shelf or a digital copy, every lab should have access to a copy of Standard Methods. Now I don't mean an old copy from the 90's. Methods change and you need to stay on top of those changes. Currently, Standard Methods is on the 23rd edition, so it may be time to update your copy and your methods.

2. If you follow your Quality Assurance/ Quality Control (QA/QC) program you should be in good shape.

Just make sure that Standard Operating Procedures (SOP) are followed. If you haven't implemented a QA/QC program, you better get started on one. Not only is a good QA/QC program essential to create confidence in your performance and improve compliance, it is a crucial part in producing defensible data. Ask anyone who has had their data questioned, defensible data is a must!

3. Sometimes it is the simplest of things that cause issues.

There are expiration dates on things for a reason. Yeah, I know some of you are saying to yourself, "I've used (insert item here) past the expiration date and I've never had problems. They just do that to make money." Well that's great, until the one time it does make a difference. If it's expired, it's time to reorder. Why take the chance?

4. Don't wait too long to conduct tests.

Murphy's Law is always waiting for the right moment to pay some unsuspecting lab analyst a visit. Give yourself plenty of time to take on any issues that may arise.

5. When you receive your PT samples you should immediately open the package.

Make sure all PT samples ordered are there and not broken. Some PT samples must be refrigerated, so be sure to store all PT samples according to PT provider recommendations until analysis is performed. Review the instructions for each test and make sure you have all the supplies needed for each test.

6. When the time comes to analyze the PT sample, review the instructions again.

If the sample was refrigerated, allow the sample to reach room temperature. Be sure to analyze the sample the same day that it is unsealed. Be prepared to make pH adjustments for the PT samples that are preserved. Ensure that you get a result; you cannot report an AE or non-detect. It is important that your results are reported to three significant numbers. Note the concentration range specified by the PT provider. The results should fall within that range, if not, you have a problem.

7. So, let's look at our pH.

First, make sure the sample is stored as recommended and is at room temperature when analyzing. Small changes in temperature can cause huge differences in pH. Make sure to do a 3 point calibration on your meter using fresh buffers and that your slope falls within manufacturer's recommendations. Typically, 95-102%. The electrode should stabilize within 30 seconds. Any longer than that is a sign that your electrode needs maintenance. One common issue is that film can build up on the outside of the electrode not allowing the electrode to have proper contact with the sample. Follow the manufacturer's specifications to clean the electrode. Another common issue is the electrode's filling solution. Constantly refilling the solution can cause saturation of the solution within the electrode. Empty the old filling solution, rinse twice with DI water, rinse once with filling solution and then fill with fresh filling solution. Yes, I know it's a pain to do all this through that little hole but it's worth it and could bring new life to your electrode.

8. When analyzing TSS, be sure the sample is at room temperature.

Follow the PT Provider's instructions. Run a method blank along with your PT sample. Method blanks are used to determine if the preparation and analysis procedures contaminate the sample. The TSS powder used for TSS PT samples can have a tendency to stick and is heavier than water, so it will settle. For these reasons mixing the sample vigorously is very important. I like to shake the sample for at least a minute. Then immediately pour your aliquot followed by rinsing the graduated cylinder and funnel at least 3 times with DI water. After drying in an oven, place the filter in a desiccator to cool. When the filter has reached room temperature weigh the filter, then place back in the oven for at least another 30 minutes. Allow it to cool in a desiccator then reweigh to ensure a constant weight is achieved.

9. Ammonia (NH3) using ISE.

When analyzing NH3 be sure the sample is at room temperature. Follow the PT Provider's instructions. If the PT sample is a concentrate, dilution is required. Analyze immediately after diluting. The electrode uses a membrane that measures partial pressures on both sides of the membrane. The membrane will begin to foul over time reducing its ability to measure the pressures. For this reason the membrane should be replaced as recommended by the manufacturer's specification. Calibrate the meter. The slope must fall between -54 to -60 mV. Analyze a 2nd source standard to verify calibration. Perform a Matrix Spike and a Duplicate Matrix Spike on a sample from your plant. Both the Matrix Spike and Duplicate Matrix Spike must fall within your laboratory acceptance limits. Generally 90-110%R. Analyze a method blank along with your PT sample.

10. Biochemical Oxygen Demand (BOD)/ Carbonaceous Biochemical Oxygen Demand (CBOD).

Be sure the sample is at room temperature. Follow the PT Provider's instructions. If the PT sample is a concentrate, dilution is required. Analyze immediately after diluting. BOD/CBOD PT Samples are typically preserved and need to be pH adjusted to 6.5-7.5. Analyze PT sample with a set of plant samples. Use multiple dilutions that have overlapping ranges. I typically use at least 4 dilutions. Seed your dilutions. Set up blanks and a GGA. GGA (Glucose Glutamic Acid) is used for establishing accuracy and precision of the BOD test and is the principal measure of seed quality and set-up procedure. The ideal GGA range for a BOD sample is 198✶30.5 mg/L. Ensure that the DO probe cap/membrane have been replaced as recommended by the manufacture's specification. Calibrate meter when measuring initial DO and when measuring residual DO. Initial DO should be between 7-9 mg/L, incubation should be exactly 5 days at a temperature of 20✶1°C, DO difference should be at least 2 mg/L and at

least 1.0 mg/L residual DO, and do not allow any air to enter the sample during incubation.

I chose just a few specific tests for this article. If you are having problems getting within any of your DMR-QA sample's concentration ranges, or even worse, if you get a "Not Acceptable" and are at a loss, don't hesitate to contact your section's LAC Chair or the State LAC Chairs. We are always willing to help with any questions you may have! Another option is to call your PT manufacturer. They are usually willing to help you figure out what might be going on.

Now I leave you with one more piece of advice. Working in the lab is just like cooking in your kitchen, just don't lick the spoon!

Leadership Training as Part of Succession Planning

by Tom Merritt, President, H.R. Gray, a Haskell Company

This article is the first in a series that examines company management and leadership, focusing on long-term as well as short-term success.

The act of "managing" is often considered in a very limited sense. Managing staff often means working within a hierarchical structure where bosses supervise and shape the behavior of their direct reports. Similarly, managing finances is often performed within a limited scope; with quarter-to-quarter and annual metrics passing for long-term planning. But this mode of thinking leaves out important pieces of the puzzle. True management is not just handling a list of tasks in a way that leads to immediate rewards. It involves investing in deeper leadership skills and the consideration of long-range outcomes. Even public sector organization with collective bargaining agreements and the reliance on an uncertain and sometimes politicized funding program can benefit from investing in the "next level" employees. Leadership skills on the part of all employees are key to establishing a more effective flow within an organization. These skills are also foundational to connecting with clients and with a broader community of stakeholders. They help an organization achieve typical short-term goals, such as harmonious working relationships (community or client support) and good quarterly returns, but they will also set the organization up for long-term success.

Succession Planning: The Ultimate Long-Term Consideration

All managers understand the importance of project planning. Succession planning, however, in which an organization actively prepares to replace senior staff over a comparatively long future period, is often ignored. Yet succession planning is crucial for the health of the organization. Even a planned retirement, not to mention unplanned events such as illness or death, can create upheaval in day-to-day operations. Having a solid plan in place—a plan which employees clearly understand and can approach using concrete action steps—smooths daily workflow.

The failure to plan for succession may be partly attributable to basic human psychology (the fear of losing control or highlighting areas of personal/professional weakness) or organizational constraints (collective bargaining agreements, civil service requirements or family attachments). But there is another important factor in play: junior employees who are viable candidates for taking the reins may be encouraged—by both existing

The People Place

This Buckeye Bulletin series focuses on the people side of our industry, hence the title: The People Place. Traditionally, the Buckeye Bulletin comes loaded with mountains of technical pieces: plant profiles, industry trends, regulatory insight, project overviews, etc., which, without proper 'people-care' would not be possible! After all, your organization can only be as successful as the health, wellness, and productivity of your people and culture. Focus areas of this series are topics such as leadership, management, health and wellness, succession planning, work/life balance, recruiting/retaining, change management, knowledge transfer, career laddering/branding, etc. We hope you enjoy this series as much as we are excited to bring it to you! If you are interested in submitting an article or specific focus area, please contact Jason Tincu. (jtincu20@gmail.com) Thank you!

management techniques and larger societal messages—to focus on their own self-development in somewhat of a vacuum. Many leadership programs assume an inward focus for the employee and they set goals that are not necessarily aligned with those of the organization.

Some leadership programs are expanding with a shift in management philosophies. The traditional top-down approach to management is now more popularly termed, "managing downward." This terminology brings a new awareness that there exists other directions of management: upward and outward. These terms refer to managing interactions and expectations with upper level management (managing upward) and working effectively with colleagues and customers (managing outward). New training approaches consider relationships within an organization and help connect the needs of an individual employee to the needs of his or her organization; supervisors, subordinates, customers, elected and appointed authorities.

To accomplish this more expansive view, employee training programs cannot be used as simply a means to educate new hires on tasks associated with their job. A fundamental shift must occur, with a goal of teaching employees the reasons behind doing a task in a particular way. The shift entails consideration of the organization as a whole. It is crucial in today's marketplace to help all employees, especially the younger generations, understand their role in the organization both now and in the future. The legacy of current ownership/leadership can go beyond, say, teaching a project manager how to prepare a schedule to also include some of the softer skills, such as communication, mentoring and strategy.

While the balance of this series will focus on a private sector business approach to succession, many of the principals and ideas can be adopted to public sector and non-profit organizations.

H.R. Gray: A Succession Planning Case Study

Employees of H.R. Gray – a construction management company and consulting firm – benefit from a leadership training program that helps exemplify the company's core values of Team, Excellence, Service and Trust (TEST). Taught by coach and author Chip Scholz of Scholz and Associates, the series has been used by H.R. Gray's parent company, Haskell, since 2010. The program teaches participants how to put themselves in the client's shoes and better understand the bigger picture. It also teaches them how to ask questions – the right questions.

H.R. Gray's program is a three-year, tiered series. The first year focuses on an introspective analysis of individual employees, since having an outward- or company-focused mentality does not negate the need for a focus on individuals. Rather, understanding the strengths and weaknesses of individuals, and positioning them for growth, is a critical first step. It lays the groundwork on which organizational level thinking can take place.

During the program's first year, assessment tools are used to identify a person's goals, strengths, and weaknesses. Over the course of this year, participants must identify qualities that will help chart an appropriate future path. In year two, the focus shifts toward the individual's role within the company. During the third year, leadership qualities are fine-tuned.

A key issue that is addressed at the program's outset is whether or not an employee's goals fit with the goals of the company. This can be a difficult point to discuss, but without this information, it is impossible to put together a meaningful career development path for the employee. Without a good fit, individuals have little or no emotional connection to their work, and their results show it. Quality, customer service and productivity suffer. If a mismatch is identified, it creates the opportunity to realign objectives as applicable.

The training program involves specific exercises that build upon one another to help employees grow. For example, one of H.R. Gray's employees, Aaron "A.J." Smith, Senior Construction Manager, has completed the first year of the program and reports that the first year is fundamentally about learning how to lead yourself. An exercise he found helpful was one in which program participants examine their own use of time by keeping track of all activities over the course of a few days. Once it becomes clear where time is being spent, it is possible to assess efficiency.

Bryan Celik, Senior Construction Manager at H.R. Gray, completed all three years of training and reported that it helps employees see themselves in a different light. It encourages self-evaluation and the insights gained can be used to make oneself a better leader.

For example, Celik points to the 360 Degree Feedback Review that is conducted early in the program. This type of review involves having multiple sources for feedback and analysis. The person being coached is interviewed and gives a self-assessment of their strengths and weaknesses. Then 10-15 of their peers, bosses and direct reports assess those same areas. Thoughts are given on where improvement could be made. Having accounts from different areas within a company's hierarchy gives individuals a clearer picture of their overall abilities and performance.

Celik also found value in the program's elevation project, in which students chose an area of the company where they wanted to see change. They presented on that topic, first to their classmates, then to senior leadership. Celik's group looked at the company's maternity and paternity benefits. H.R. Gray did implement the policy change proposed by the group. Celik's feedback was that seeing fast, meaningful results— the new policy was adopted by the company within a matter of months—was very impactful.

Future Focus for a Company's Youngest Workers

Millennial and Gen X populations are bringing different considerations to the negotiating table. Earlier generations seemed content to receive wage increases as a metric of their value to the organization. Younger employees have different criteria for success. While compensation is important, similar value is placed on moving up in the hierarchy, job titles and clearly defined career path objectives. Training for this group can focus on defining expectations and showing a clear path for moving up within the organization.

Younger workers tend to express an interest in making contributions that matter to the organization and to the world beyond. Organizations can help these employees build on the skills they learn and apply them in a way that is meaningful to the business. When all associates are aligned with the corporate direction, doing work that uses their strengths and talents, productivity and customer service are at peak levels.

In the five years since H.R. Gray's first graduating class, the company has seen changes in how employees approach their job duties. Participants use the techniques they were taught to help them work through and resolve problems for themselves. Managers come back from training able to coach their direct reports by presenting them with a series of questions and encouraging them to find their own solution. Upper level managers should keep in mind that when implementing a training program, it's important for them to 'practice what they preach.' Doing so is critical for credibility.

The success of the leadership training program lays the groundwork for the future success of the organization. By helping employees see increased opportunities and pathways, management has ensured growth and competence not only for those employees but for the company as a whole. It is always easier for owners and managers to do something themselves rather than take the time to explain it to others. But real success—both short and long term-- is in passing on one's knowledge.

Key takeaways:

- Succession planning is important for all organizations.
- Employees must understand the value of meeting the need of the organization and their "customers" which include supervisors and subordinates, as well as elected and appointed officials and those internal clients, fiscal, personnel and human resource operations.
- Communicate organizational goals and expectations.
- Embrace training opportunities.
- Plan for the future.

Read more on how leadership training can promote communication and efficient project execution in Parts 2 and 3 of this article series.

WEF Utility Partnership Program Member Utilities

The WEF Utility Partnership Program (UPP) is designed to allow Ohio utilities to join WEF and **OWEA** while creating a comprehensive membership package for designated employees. Utilities can consolidate all members within their organization on to one account and have the flexibility to tailor the appropriate value packages based on the designated employees' needs. Key benefits include:

- UPP is fully customizable, based on the needs of each utility, and a WEF team member will be on-hand to walk each utility through the enrollment process.
- ALL members at the utility will be enrolled, with synchronized begin and end dates, on ONE invoice, for an easy one-time per year payment.
- All members, who were already WEF members, retain original membership number, credit for all years of membership, and remain a full-voting WEF member.
- ALL employees at the UPP utility will be eligible for membership registration rates at WEFTEC, as well as the early-bird rate for Premium and Standard WEFTEC registration at anytime throughout the registration period.
- ALL employees at the UPP utility will also be eligible for member rates for the OWEA Technical Conference and Exposition, OWEA Workshops, and events.
- All employees at the utility will be eligible to register for a WEFTEC Exhibition-only pass at NO-Charge.
- WEFTEC registrations can be included in the UPP Membership transaction at the time of enrollment or can be grouped and submitted closer to WEFTEC.
- UPP also includes a special, NO-Charge membership for Public Officials designated by the Utility, at their discretion.
- Up to five new WEF/OWEA members can be added by the utility each year, at no charge for the first year of membership.
- UPP utility will be eligible for distributor pricing on all WEF products and services – that's 40% off list pricing. In addition to traditional items this discount also extends to online learning in the new WEF Knowledge Center.
- UPP members will be eligible for special discounted registration for other WEF Conferences and events.

OWEA currently has 29 municipalities signed up for the Utility Partnership Program.

To learn about the benefits for your utility visit ***http://www.wef.org/UtilityPartnership/***

Or contact OWEA, *info@ohiowea.org*, 614.488.5800

Avon Lake Regional Water
City of Bellevue
City of Canton WRF
City of Celina
City of Columbus
City of Dayton WWTP
City of Fairborn
City of Harrison
City of London Ohio
City of Mansfield
City of Marietta WWTP
City of Mason
City of Newark WWTP
City of Oberlin
City of Painesville
City of Solon
City of Steubenville
City of Toledo Div of Water Reclamation
City of Troy
City of Twinsburg
City of Warren WWTP
Clermont County Sewer District
Delaware County Regional Sewer District
Fairfield County
Lake County Dept. of Utilities
Metropolitan Sewer District of Greater Cincinnati
Northeast Ohio Regional Sewer District
Sanitation District No 1

The Science of Phosphorus

by Dr. Rob Smith, formerly with YSI a xylem brand, now with Black & Veatch

The History of Phosphorus

A German alchemist named Hennig Brand discovered phosphorus, albeit accidentally. His experimental subject was human urine. It is estimated that he processed 1,500 gallons of pee in his career. This would have required many sources, of course, and it is likely that he had to coerce dozens if not hundreds of people into donations. In our time, Brand might be behind bars, but in his time he was just another alchemist seeking the Philosopher's Stone, a substance with magical powers believed to be able to turn base metals into gold or silver.

He was convinced that it could be produced from concentrated urine. What he discovered instead was pure Phosphorus. Shortly thereafter he also discovered that pure phosphorus burns spontaneously in air, inadvertently burning down his laboratory. It is so reactive, in fact, that it is always combined in nature, usually as phosphate, a phosphorus atom bonded with 4 oxygen atoms with the chemical formula PO_4^{3-}.

The Science of Phosphorus

Phosphate compounds are present in all living organisms. In humans, the largest portion occurs in bones where, together with calcium, it forms the mineral apatite. It is also part of genetic material (DNA and RNA) and the compound adenosine tri-phosphate (ATP), the molecular unit of currency for energy transfer in cells (metabolism). The recommended daily allowance for phosphorus is about 4 g/day but varies depending on your age and condition. Excess phosphorus is processed in the kidneys and discharged in urine and feces at a rate of about 1.3 g per person per day which equates to 29 lbs. P/day, mostly in particulate form, for every 10,000 population equivalent.

Phosphates are also very important for hygiene. Phosphates sequester hardness, solubilize soil, and enhance clean rinsing making them an excellent cleaning agent, except for the undesirable effects once returned to the environment. As a result, phosphates have been removed from many consumer cleaning agents. Proctor & Gamble stopped using phosphates in laundry detergent sold in the US in the early 1990s. Even so, approximately 0.5 g P/day is estimated to enter the collection system from laundry and dishwashing detergent per person per day which equates to another 11 lbs. soluble P/day for every 10,000 population equivalent.

So that's 40 lbs. of phosphate as P per day not counting industrial sources of which about two-thirds is particulate and about one-third is dissolved, mostly ortho-phosphate. This equates to a concentration of about 4.8 mg P/L from daily human activity using 100 gpcd. Industrial wastewater may contain a much higher proportion of P, for example, from meat-packing facilities and metal processing. However, point sources of treated municipal wastewater are not the largest source of phosphorus that is discharged to the environment.

Phosphorus Clean Point Source

Why Does this Matter?

Nationwide, runoff from non-point sources is the largest source of nutrients, including N (nitrogen) and P (phosphorus) discharged to surface water. Although phosphorus is the 11th most abundant element in the earth's crust, most natural phosphate compounds are very insoluble, and therefore, not quickly replenished.

Therefore, plant available phosphorus is only a fraction of phosphorus in the soil. To make up for the difference between what is available and what is needed, more soluble forms are created for use in commercial fertilizers. Unfortunately, this same property makes them susceptible to runoff to surface waters through field tiles, storm sewers, and non-point sources.

So, why are the treatment regulations so stringent when the main problem is in the fields? Indeed, scrutiny over HABs (harmful algae blooms - HAB blog posts) in Lake Erie and other locations has, rightly so, been directed towards the agricultural sector. However, unlike the examples above, quantifying the amount of P in agricultural runoff is complicated (Wisconsin's guidance on calculating P index to estimate runoff potential is 33 pages long!).

Still, there are options to offset point source loads with non-point source reductions. For example, in Wisconsin adaptive management is a compliance option whereby point sources partner with land owners to restore the watershed and reduce in-stream phosphorus concentrations to water quality standards. However, for many reasons, adaptive management is not a practical alternative for many WRRFs (water resource recovery facilities). Some additional treatment will be required.

The Status of P Regulations

When a watershed does not meet attainment status for designated uses, there are three main mechanisms for regulation of phosphorus in treated effluent from a WRRF discharged to surface water: technology-based standards, total maximum daily loads (TMDL), and water quality based effluent limits (WQBEL). Technology-based standards are probably the most common form of regulation. However, it is the WQBEL which are currently the driving force for more widespread regulation.

Technology-Based Limits

Technology-based limits (TBL) are an end-of-pipe approach that relies on available technologies to derive discharge limits. A TBL may be imposed in combination with other forms of regulation and are often imposed as interim limits to provide time for a utility to implement treatment solutions or explore alternatives to treatment for achieving more stringent requirements. The advantage of a TBL is that it is simple to define. It depends only on the present state of technology and therefore has widespread applicability.

One example of a TBL is the Bay View Water Reclamation facility which discharges treated effluent from Toledo's lone WRRF into Maumee Bay, a tributary to Lake Erie. Like all major facilities in the Great Lakes watershed, the Bay View discharge permit includes a limit not to exceed a monthly average of 1.0 mg P/L or a weekly average of 1.5 mg P/L in treated effluent.

The disadvantage of a TBL is not based on the specific properties of a particular watershed and therefore, may not be sufficient to bring a watershed into attainment status.

Wastewater Plant Settling Tanks Aerial View

Total Maximum Daily Load

A TMDL is a water-quality based standard applied to impaired watersheds. Nutrient enrichment is one of the most common causes of impairment (WEF Nutrient Removal). A TMDL is hence a nutrient diet for watersheds. An important distinction of a TMDL is that it is based on load and not concentration. (Read Blog Post: Oregon's Tualatin River: America's Early TMDL Case Study). Each point source is assigned a portion of the total allowable load. The load restriction does not change as the facility expands such that the concentration of phosphorus in treated effluent must be reduced as flow increases. Thus, a facility must achieve greater levels of removal as flows increase. Another important distinction is that

limits may be applied over a term longer than typical weekly or monthly limits, providing greater flexibility to offset periods of low performance with periods of high performance.

Water Quality-Based Effluent Limits

WQBELs have traditionally been applied to limit discharge of toxic substances. Phosphorus and nitrogen are not toxic in the traditional sense – a specific concentration will not lead to a predictable response, e.g. mortality. Therefore, in order to facilitate standards development USEPA released the report National Strategy for the Development of Regional Nutrient Criteria in 1998. Progress has been slow but nutrient water quality standards now exist in 23 states (view an interactive map, State Development of Numeric Criteria for Nitrogen and Phosphorus Pollution). Implementation of new standards varies by state but some very stringent limits for phosphorus are appearing in NPDES discharge permits. In Wisconsin, for example, treated effluent from WRRFs discharging to streams is limited to a maximum concentration of 0.075 mg TP/L. A compliance schedule of up to 9 years is provided to meet the new limit.

Phosphorus Monitoring

The two most common measurements of phosphorus in wastewater are Total Phosphorus (TP) and orthophosphate (OP). TP is typically the compliance parameter required by National Pollutant Discharge Elimination System (NPDES) discharge permits; while OP is a useful process control parameter. TP is measured following digestion of the sample with acid and heat but OP is not well defined, analytically speaking. OP is generally assumed to consist of dissolved reactive phosphorus (DRP) which may consist of compounds besides orthophosphate.

DRP is measured as that portion of the sample that passes a 0.45 um membrane filter and can be measured using direct colorimetry. Lastly, there is non-reactive phosphorus (NRP). NRP occurs at a very low concentration. However, the proportion of NRP increases as the TP in treated effluent becomes lower because it is difficult to remove from wastewater.

Measurement Methods of P

Colorimetry is the most convenient analytical method for measuring phosphorus in wastewater. Multiple colorimetric methods exist but all are the same in principle: phosphate ion combines with ammonium molybdate under acidic conditions to form ammonium phosphomolybdate. In the “yellow” method vanadium in the reagent generates a yellow color in solution, the intensity of which is proportional to the phosphate concentration in the sample. The “yellow” method is the principle of measurement for the YSI IQ SensorNet P700 and most other online phosphate analyzers.

YSI P700 Ortho Next to WWTP

A different method, the “blue” method, is required for compliance-level measurements. In the “blue” method, tin and antimony in the reagent generates a blue color proportional to the phosphate concentration. The “blue” method has a lower method detection limit (MDL) and is generally considered more accurate than the yellow method. However, the chemistry requires the use of more complicated and expensive optics which increases the cost of the analyzer but is not warranted for process monitoring.

The aforementioned colorimetric methods are applicable only to dissolved phosphate. Sample preparation using chemicals and or heat is required to dissolve particulate phosphate. The digestion step is not a common feature of online phosphate analyzers because of the added complexity and cost. Therefore, compliance monitoring is almost exclusively done in the lab on grab

or composited samples. The digestion step also increases the measurement time which increases analyzer response time limiting its application for process control.

What is the P700 and How Does it Measure?

The IQ SensorNet version of a phosphate analyzer is the P700 IQ orthophosphate monitoring system. The base model (item 8P-000Y) consists of a photometer, peristaltic pump, and reagent tray in a powder-coated IP54 aluminum enclosure which can be mounted on a handrail, on a wall, or be free-standing and runs off 115V power. Most customers purchase the version that includes an integrated electric diaphragm sample pump (item 8P-010Y). A lightweight 0.45 micron filter (item 821 987Y) on a sliderail (item 821 986Y) is available separately. The maximum total suspended solids (TSS) for the filtration system is 6,000 mg/L. Competitive systems without filtration are limited to a maximum of 75 mg/L TSS which limits application to treated effluent. A version with a sample pump and climate package (item 8P-011Y) allows operation at ambient temperatures between -4°F and 104°F.

The P700 IQ features a wide measuring range, low reagent consumption, automatic calibration to a standard, and automatic cleaning. Two measuring ranges, 0.05 to 15 mg P/L, and 1 to 50 mg P/L are available for monitoring untreated wastewater, treated wastewater, or sidestreams. Competitive systems are limited to 15 mg P/L or less or only offer 1 measuring range with a resolution of 1 mg P/L. Automatic calibration to a standard and cleaning at user-programmed intervals provides assurance of analyzer performance and trouble-free operation. A manual 1 or 2-point calibration is also possible. Competitive systems only perform a zero adjustment and manual calibration is not possible. Reagent (vanadomolybdate solution in sulfuric acid) consumption is 1 x 2.5L bottle every 4 months at a 5 minute measurement frequency.

Chemical Removal of Phosphorus

Chemical removal of phosphorus has been utilized for decades. It is easily integrated into any configuration with the addition of facilities for chemical storage and feed. It starts working quickly and is easy to turn down or turn off. Chemical treatment is generally a good choice for WRRFs with one or more of the following characteristics: small flows (<0.5 mgd), extended periods of unattended operation, or discharge limits of 1.0 mg P/L or higher. For other WRRFs, the cost of chemical, chemical handling requirements, increased sludge generation, and fouling of quartz sleeves on UV disinfection lamps may offset the benefits forcing a hard look at biological P removal.

Both chemical and biological P removal methods are effective converting soluble P into particulate P. The concentration of total phosphorus (TP) in treated effluent ultimately depends on the presence and function of settling and filtration steps. A well-functioning clarifier can remove down to 0.5 mg P/L; a conventional sand filter down to 0.1 mg P/L; and a membrane filter down to 0.01 mg P/L.

Chemistry and Mechanism of P Removal

Three classes of chemicals are used for chemical P removal: iron salts, aluminum salts, and lime (calcium). Precipitation of P with lime was one of the earliest chemical treatments. Lime is inexpensive and widely available. However, handling requirements and the high pH required have limited its present usage. Iron and aluminum salts are the most common chemicals used today.

Ferrous or ferric iron may be used. Ferric salts are more effective but ferrous is easily oxidized to ferric in aerated tanks. Waste pickle liquor, a by-product of steel processing, has been used extensively as an inexpensive source of the chemical. In the 1990's the City of Toledo Bay View Water Reclamation Facility dosed waste pickle liquor, a by-product of steel processing, to the aerated grit tanks where it would be oxidized to ferric for greater effect. Variability in quality and heavy metal content has curtailed usage of pickle liquor in recent years.

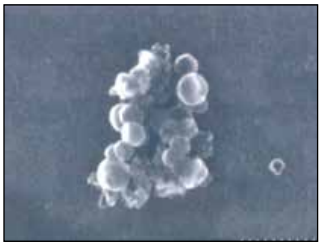
Alum is the most common aluminum salt. Sodium aluminate and polyaluminum chloride (PAC) are more expensive but do not depress pH, an advantage for low alkalinity waters.

Understanding Chemical Removal

The understanding of chemical P removal with iron and aluminum salts is undergoing a makeover. The traditional understanding is an equilibrium precipitation model based on formation of metal phosphates which are insoluble and can be captured by settling or filtration. The equilibrium model is convenient from a design standpoint because chemical dosage, sludge generation, and alkalinity consumption are all calculated from balanced chemical formulas. Full-scale plant data showing lower effluent P than predicted and experimental observations revealing that metal phosphate does not precipitate at the pH and P concentrations typically encountered in municipal wastewater treatment demonstrated flaws with the equilibrium model. An alternative model based on formation of a hydrous metal oxide (HMO) precipitate is now coming into acceptance.

Co-precipitation is the main P removal mechanism in the surface complexation model (SCM). Iron or aluminum salts react with alkalinity in water to form HMO precipitate with variable capacity to adsorb soluble P. Mixing intensity at the point of chemical dosing is a critical factor limiting adsorption. The TP removal for a given dosage is limited by the amount of high-HMO generated at the dosing point.

A high mixing intensity generates a high proportion of HMO with high adsorptive capacity. High-HMO sorbs P instantaneously. Within moments of chemical addition, high-HMO precipitates grow and consolidate into flocs, changing to a form with low adsorptive capacity. A low mixing intensity, on the other hand, generates a higher proportion of HMO with low adsorptive capacity (low-HMO) increasing the chemical dosage required to achieve target P levels. Adsorption of soluble P to low-HMO continues until no adsorption sites remain. This may account for residual removal with return activated sludge, even when chemical feed is stopped. Chemical sludge recirculation has been engineered into the tertiary phosphorus removal system at Coeur d'Alene, Idaho to take advantage of the continued adsorption and reduce total chemical costs.

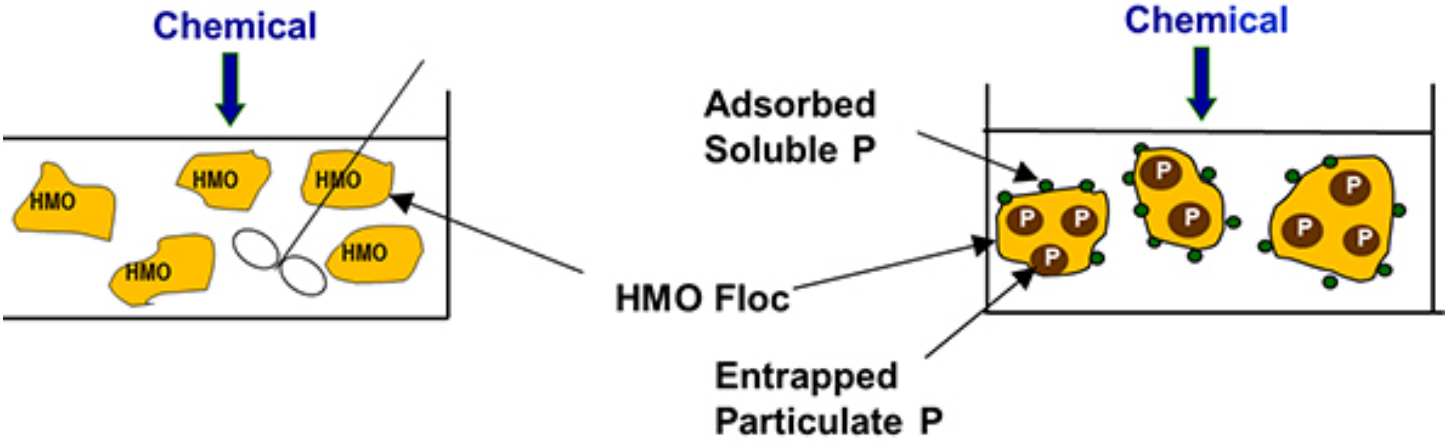


Phosphorus Baby FeOH Floc Dr. Vladimir Kitaev, Wilfrid Laurier University

The growing flocs act like a fishnet to entrap non-settleable colloidal P and drag it down, a minor removal mechanism. Therefore, another benefit of high mixing is that it increases the contact between soluble P and HMO in the initial moments after dosing and thereafter increasing adsorption and entrapment of colloidal P in the growing HMO floc. (Baby Floc Shown in Image. Image Credit: Dr. Vladimir Kitaev, Wilfrid Laurier University)

Chemical Dosage Strategy

Early in my career I came to believe that the most optimal chemical addition strategy was adding chemical upstream from primary settling. My first experience with chemical P removal was as a college intern at Bay View. Pickle liquor was added to aerated grit tanks and P was removed with



HMO Formation. Credit: Dr. Sam Jeyanayagam, Jacobs

primary sludge in the primary settling tanks downstream, a strategy known as pre-precipitation. Ferrous was stored in three large, insulated and heat-traced tanks inside a concrete containment. Pumps and a maze of piping and valves were located in an adjacent building.

One of my projects was to map the distribution system and create valve tags (documentation of its construction was lost or never existed). The wisdom, as it was explained to me, was that pre-precipitation resulted in fewer side-reactions and more efficient chemical use. Besides that, addition of chemical to secondary treatment increased the inert content of mixed liquor making it necessary to keep a higher solids inventory and increasing final settling tank loading rates.

Simultaneous precipitation is the most common strategy for WRRFs that do not have primary treatment. Chemical is added to the mixed liquor upstream from final settling tanks and P is removed with waste activated sludge (WAS). The final settling distribution chamber is a common dosing point. One YSI customer doses chemical just upstream of their oxidation ditch rotors.

Some facilities that do have primary treatment may also choose simultaneous precipitation for a more predictable and stable process. Some wastewater P may yet be converted to soluble form, a requirement for chemical P removal, in primary treatment. On the other hand, removing too much P in primary treatment can cause a P deficiency in downstream biological treatment. Using the same ratio as below, for a primary effluent BOD concentration of 100 mg/L, a minimum concentration of 1.0 mg P/L is required to support biological growth.

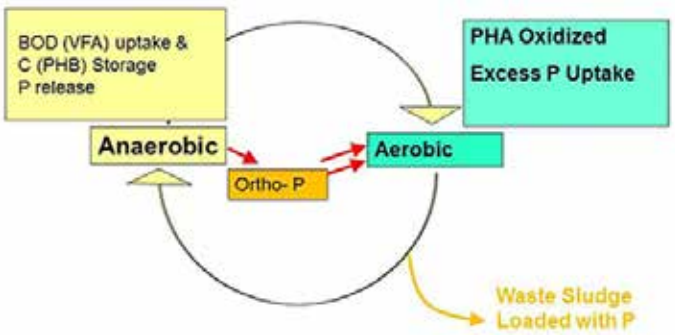
The Hampton Roads Sanitation District (HRSD) York River Treatment Plant utilized both pre-precipitation and simultaneous precipitation strategies in the mid-2000's. A baseline amount of ferric chloride was added to primary treatment with additional ferric added to secondary treatment to achieve target effluent concentrations leaving a small amount of soluble P to support biological growth in downstream biological denitrification filters.

A multi-point chemical addition strategy, as in the HRSD example, is required to achieve the lowest effluent TP. The strategy may also include chemical addition to tertiary treatment, known as post-precipitation. Solids would be captured on sand filters or in tertiary clarifiers. Many facilities do not already have tertiary facilities so new construction would be required to implement post-precipitation.

Enhanced Biological Phosphorus Removal

Supplemental biological P removal occurs by a process known as enhanced biological phosphorus removal (EBPR). EBPR is a more recent innovation than chemical P removal but is also now common. EBPR is implemented into the activated sludge process and P is removed with waste activated sludge (WAS). The potential for EBPR depends on successful cultivation of phosphate accumulating organisms (PAO) which require three conditions for growth: excess phosphate in the wastewater, alternating oxic and anaerobic conditions, and the availability of a particular type of organic carbon called volatile fatty acids (VFA).

In anaerobic conditions, PAOs can store their food (VFA) before eating it. In a similar way, I might stuff cookies that I cannot eat immediately into my pockets to eat later. People without pockets could be left out. The PAOs are people with pockets in this analogy. The VFA are packed into a storage product called poly-hydroxy alkanoates (PHA) and phosphate is ejected from the PAO into the mixed liquor.



Phosphorus EBPR

PAOs consume the VFA using oxygen. Under oxic conditions (ORP > 100 mV), or possibly even anoxic conditions, the bacteria oxidize the stored carbon (VFA), replenish the depleted phosphate, and accumulate extra phosphate. The accumulated phosphate can be thought of as an investment. The more phosphate that is accumulated the greater the potential to thrive if the conditions are right. The PAOs become rich driving orthophosphate (OP) to nearly 0 and the particulate P (PP) content of mixed liquor is increased up to 8% or higher. If anaerobic conditions are not encountered or the amount of VFA is not sufficient, the investment in accumulated phosphate does not completely pay off and competing organisms which do not accumulate OP prosper limiting the PP content of the mixed liquor and possibly resulting in OP escaping in treated effluent. PP is removed with WAS.

Design and Operation of EBPR

Treatment configurations for EBPR include an upstream anaerobic zone in which DO and nitrate are very low. The recommended hydraulic retention time (HRT) of the anaerobic zone varies from 30 minutes to 2 hours depending on the characteristics of the wastewater and the design and operation of the treatment system. OP may be increased in the anaerobic zone by 3 times or more as PAOs release it to sequester VFA. Primary release of OP in the presence of VFA is desirable. Secondary release downstream, described below, is not desirable. The anaerobic zone may also need to accommodate fermentation of mixed liquor to generate VFA. It has been demonstrated that ORP needs to be -300 mV or less for fermentation to occur in wastewater.

OP uptake occurs in downstream oxic zones. The prevailing wisdom is that DO must be maintained at 2.0 mg/L or higher at the front end of the oxic zone following an anaerobic zone to achieve the greatest uptake. OP uptake occurs rapidly in the front end and tapers off moving downstream. Recently, this wisdom has been challenged as substantial P removal has been observed in simultaneous nitrification-denitrification facilities operated at relatively low DO concentrations.

EBPR is More Complicated than Chemical P Removal

Practitioners have identified several prerequisites for achieving reliable performance. A consistent and adequate supply of VFA is very critical. Variable and insufficient VFA stress PAOs and allow other organisms (or other metabolisms) which do not result in accumulation of P to flourish. WRRF that are required to also transform or remove nitrogen may need to add an external source of carbon. Simple and inexpensive methods for continuous monitoring of VFA do not presently exist. However, online monitoring of soluble COD and dissolved organic carbon (DOC) is possible with an optical spectral sensor and can be beneficial to optimize the use of wastewater carbon and minimize the use of external carbon.

Integrity of the anaerobic zone is also important. DO or nitrates will interfere with P release. For this reason, the DO in downstream oxic zones should be minimized to prevent carryover of DO with return activated sludge (RAS). Nitrification will increase the concentration of nitrate in the RAS. The purpose of a pre-anoxic zone upstream from the anaerobic zone in some configurations is to denitrify return activated sludge (RAS). In other configurations, denitrified mixed liquor is recirculated upstream to mix with raw wastewater.

Efficient operation of solids separation systems is essential to prevent captured particulate P from escaping in the effluent. The P content of EBPR sludges can be 10% by mass or higher. The effluent PP in 10 mg TSS/L is 1.0 mg/L for a P content of 10%. Continuous monitoring of downstream effluent TSS can provide an early indication of upsets and provide a signal to start polymer addition, for example. Monitoring of upstream MLSS can allow fast calculation of solids loading and a signal to switch to step feed operation.

OP previously sequestered by PAO can be released downstream, increasing effluent TP. Secondary release occurs when mixed liquor becomes anaerobic in deep final settling tank blankets or during sludge treatment. Minimizing sludge blanket depths can prevent secondary release in final settling tanks. P can be removed from sludge handling recycle streams by chemical treatment or by installing a struvite recovery system.

To See the Unseen

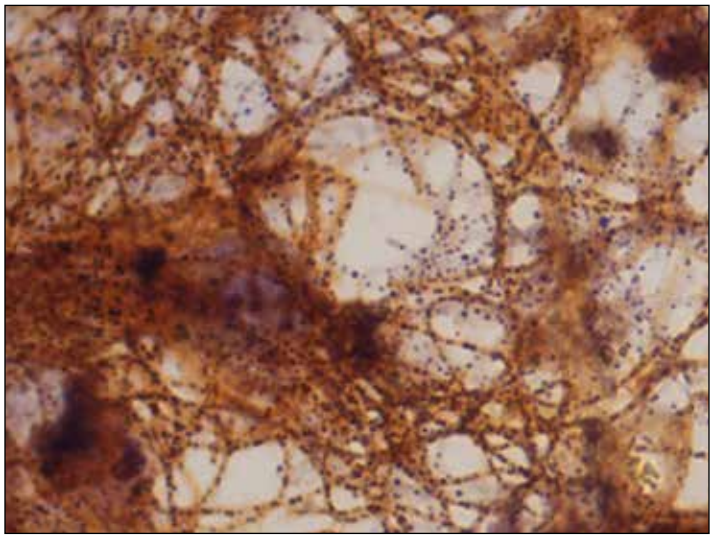
by Jon van Dommelen, Compliance Assistance Unit, Ohio EPA

When I first became a member of Ohio EPA's Compliance Assistance Unit, I was a bit overwhelmed by the vast quantities of meters, probes, equipment and reagents. But one thing that really grabbed my interest was an oversized Pelican case. The case contained a phase contrast microscope, specially made to allow you to see, in incredible detail, what was once invisible.

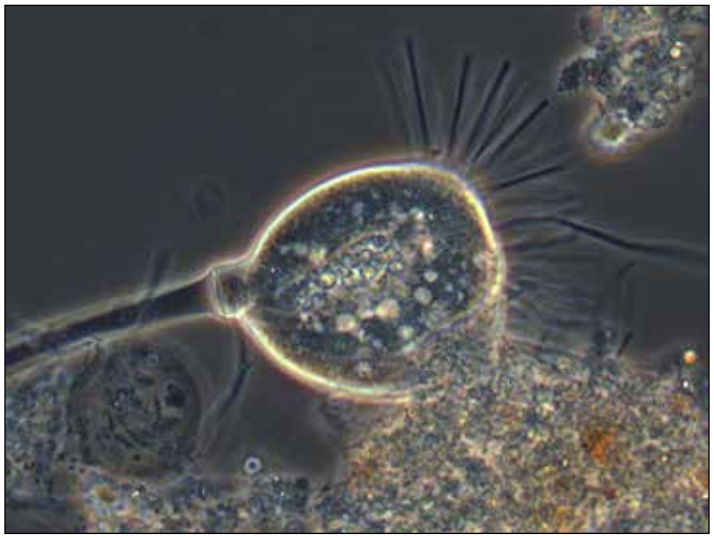
I began to bring back samples from every wastewater treatment plant I visited to analyze the mixed liquor suspended solids. Soon, I was taking it, and the accompanying copy of the Manual on the Causes and Control of Activated Sludge Bulking, Foaming, and other Solids Separation Problems (Jenkins, 2nd edition, Lewis Publishing, 1993) with me on my visits. The manual was invaluable as I explored, and learned, what I was seeing through the microscope. Thanks to that microscope and manual, I embraced my new role as an amateur microbiologist.

After 19 years of analyzing samples, I have come to trust the bacteria to tell me what is happening in the aeration tanks. If I can identify the dominant bacteria, I can determine the aeration tank's environment that allows the filament to dominate. Then, using process control methods, the aeration tank environment can be changed to select against that dominant bacteria. Simple, right? Ah, not so fast.

The thing about bacteria -- filamentous bacteria to be precise -- is that they tend to grow when nutrients are scarce. The conditions that encourage filamentous bacteria are low F/M, low dissolved oxygen (DO) and septicity. For example, when a WWTP has a weak influent loading, and there is more biomass than needed to completely oxidize the load, the aeration tank is in a low food-to-microorganism ratio environment. Since the operator cannot control what comes into the WWTP, the proper process control is to waste sludge. If sludge is not wasted, then the low F/M filament will continue to dominate the mixed liquor, the biomass will not settle in the clarifier, and the result will be suspended solids loss to the sand filter, the chlorine contact tank and (or) to the effluent. And it can also result in a violation.



Microthrix parvicella (1000x, Neisser stain, photomicrograph by Jon van Dommelen)



Suctorian (400x, wet mount, photomicrograph by Jon van Dommelen)

In the low DO environment, the low DO filaments will out compete the floc formers for oxygen. Because filaments grow end-to-end and floc formers grow in clumps (they flocculate - stick together), the filaments have more surface area to take up the low concentration of available oxygen. Thus, they can dominate the system, causing poor settling sludge, and potentially result in violations. If there are low DO filaments present, there is probably also high ammonia in the aeration tank because the nitrifying bacteria use around four times more oxygen than the carbon oxidizers. The proper process control response: turn up the air (if possible).

But again, it's not always simple. There is a possibility that there may be textbook levels of DO measured in the aeration tank and yet low DO filaments still exist. This can occur when there is a readily metabolized substrate in the influent. In this case, the nutrients can be absorbed so fast that oxygen cannot penetrate the floc, and low DO filaments may develop inside. It is not as common as having a low bulk DO, but it does occur.

Similarly, septicity filaments will take hold and dominate the biomass when septicity products are present in an aerobic environment. These are the low molecular weight organic acids, the same septicity products that are formed in the first stage of anaerobic digestion. To identify them, an operator could run organic acid tests. A much simpler method is to identify the filaments. If the septicity filaments are present, then rest assured that there is septicity coming into the aeration tank.

Septicity filaments are often generated within the treatment system of package plants. If the clarifiers become full of solids, they can begin to go septic by the time the sludge reaches the bottom of the clarifier and is returned to the aeration tank via RAS pump. When the septic sludge is returned to the aeration tank, the septicity filaments feast on the low molecular weight organic acids and begin to dominate the system. These filaments cause poor settling and a clarifier full of solids, which leads to more septic sludge and septicity.

As you can see, it is a seemingly self-perpetuating, vicious cycle. Unfortunately, the remedy is not as easy as wasting or turning up the air. For septicity filaments, the source of the septicity must be found and eliminated. Often, the source is something inside the WWTP fence that is unintentionally contributing to the problem — clarifiers full of solids, "aerobic" digesters with the air turned off for days to decant supernatant, or most any solids process from a "nonaerobic" aerobic digester (sand beds, sludge bags, dewatering presses, or even unaerated areas in aeration tanks where solids may be settling and breaking down). External sources can include low-flow pump stations, very long force main (long in-pipe detention time), as well as septic haulers if the volume is excessive and uncontrollable.

A high-quality phase contrast microscope is essential if you want to identify filaments and other organisms in the mixed liquor. Unlike a typical light microscope, the light source passes through the phase condenser, glass slide, specimen, cover slip, air gap and objective lens, then on to the ocular lenses (eye pieces). The excellent contrast resulting from the phase condenser and objective lens combination allows the otherwise featureless bacteria and protozoa to be visible in great detail. With this detail, even an amateur microbiologist can determine physical properties of the filaments leading to proper identification. But high-quality also means high cost as less-expensive phase contrast microscopes have cheaper optics that may not be able to provide the detail needed for filament identification. The least expensive high-quality microscope I have found that provides adequate detail was just under $4,000.

In addition to phase contrast capability, I recommend having four objective lenses: 10X, 20X, 40X and 100X oil immersion lenses. If your budget is tight, I would likely drop the 20X objective, but I do find it useful. The 100X oil immersion lens allows you to eliminate the air gap

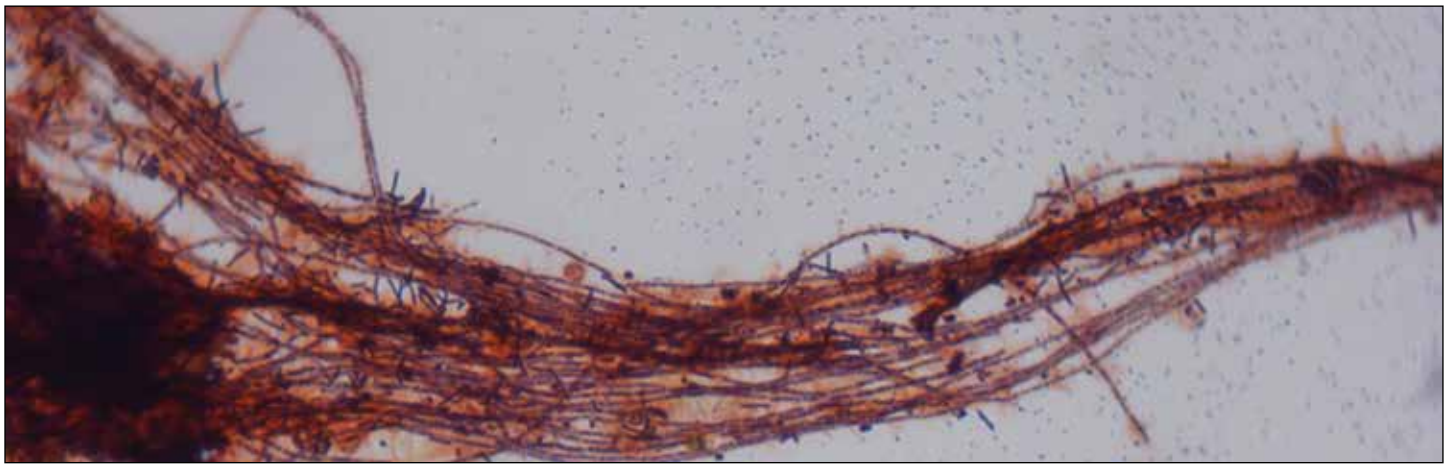
between the cover slip and the objective lens. Immersion oil has the same refractive index as the glass (cover slip and objective lens) so there is no distortion of the specimen image. At 100X the focal plane is so narrow that any distortion would cause a very blurry image. This distortion is like the distortion that is visible when a spoon is in a half-filled glass of water — the spoon appears to be displaced horizontally at the water-air interface. The 100X oil immersion lens is essential for seeing the structures of the filaments necessary for identification.

The newer 3rd edition Jenkins Manual (Jenkins, et al, 2004) is a great resource. It is full of microphotographs of the common filaments and has guides for a logical process for identifying filaments. In addition to many other subjects, it has photos of protozoa and metazoa and a section on the control of nocardia foam. Wastewater Microbiology: A Handbook for Operators (AWWA, 2005 and A Wastewater Microbiology Laboratory Manual for Operators (OTCO, 2011) by Toni Glymph have awesome photographs and identification guides.

One final step to consider to ease your identification is staining — it is very easy and can go a long way to positively identifying filaments. Since many bacteria resemble each other, a misidentification could lead to a mistake and selection of the wrong process control response which could make the situation worse.

Two common stains used in wastewater microbiology are the Gram stain and the Nessier stain. Using these two stains will reveal stain reactions that can absolutely determine which filament is dominant. It can also uncover filaments that grow within the floc which may not be visible otherwise. Frequently, the stain reaction reveals large numbers of filaments obscured by the floc leading to an easier, and accurate, filament identification.

Although the equipment is expensive, it seems a small price to pay to protect the effluent of a treatment plant that cost hundreds of thousand, or even millions to build and operate. The right equipment, and the identification tools to interpret the samples, are key to making sure that the operator can learn to observe and correctly react to filamentous bacteria growing in the aeration tank, heading off potential upsets before they become violations.



Top: Rotifer (200x, wet mount, photomicrograph by Jon van Dommelen). Bottom: Type 1851 (1000x, gram stain, photomicrograph by Jon van Dommelen)

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2019 Fly-In for Water Week

by Jason Tincu

On April 3, 2019, an OWEA contingent that included Brian Gresser (Akron), Dale Kocerek (Stantec), Dawn Kennedy (OWEA), Doug Clark (Bowling Green), Fred Smith (CDM Smith), and Jason Tincu (Greene County), seized the opportunity to crash Capitol Hill and meet with various Ohio representatives to discuss water policy, build relationships, and ensure that over 10 million Ohioans are fairly represented.

The meetings started on April 3 with the legislative plenum and break-out sessions. Here, attendees were briefed on what to expect when on the Hill, what is in the works in DC related to water, and what the regulatory landscape looks like. From here, break-out sessions formed. These sessions centered around some of the hottest water topics: wet weather, nutrients, PFAS, innovation/technology, financing, and many more. The day ended with a congressional reception overlooking the Capitol where attendees, representatives, and others chatted, mingled, and networked.

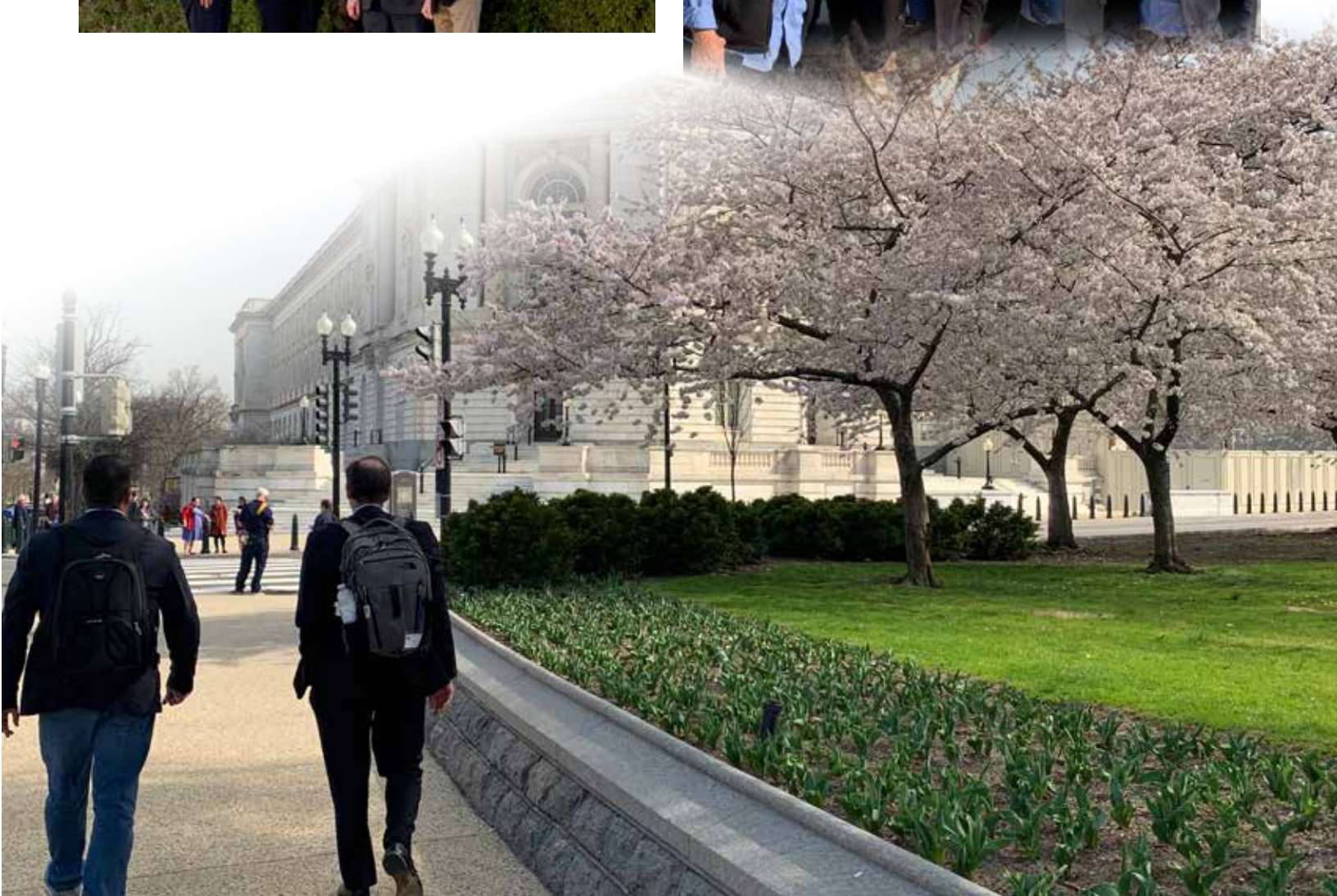
Thursday the 4th started with a kick-off breakfast and joint session designed to energize participants and provide guidance on how to facilitate meetings on the Hill.

Also on Thursday morning, OWEA met directly with Senator Sherrod Brown and gave him his 2018 OWEA Public Service award to recognize his tireless efforts in protecting Ohio's water resources.

Throughout Thursday, the OWEA contingent participated in eleven meetings with Ohio policy makers. Our messaging focused on funding availability, common sense regulations, the common benefits of infrastructure investment, workforce development and training, nutrients, biosolids, and climate change. The meetings and discussion were well-received and very productive.

OWEA is committed to maintaining these relationships and collaborating with Ohio's representatives throughout the coming years. Thursday's exhausting activities ended with a closing reception where stories from the day were shared.

OWEA was pleased with the outcome of this year's Water Week and we look forward to continuing the tradition in 2020!



A Chat with President Elect, Kim Riddell-Furry

interview by Megan Borror

Staff: How did you get your start in this industry?

Kim: I started with the City of Van Wert as a Laboratory Technician. I obviously, like many other people, didn't anticipate getting into wastewater when I went to college and got my undergraduate in biology. However, I was working at a pharmaceutical laboratory and I didn't particularly like the position and a friend of the family indicated that there was an opening at the City of Van Wert. I interviewed for the position and that's how I got into wastewater.

Staff: Where did you work leading up to Alloway?

Kim: During the 2 years I was at Van Wert, I had gotten my Lab I and my Class III in wastewater. Actually the gentleman that had told me about the job at Van Wert, Rick Boerger, had left Van Wert and gone to Allen County. Their Laboratory Manager position came open at Allen County and he let me know about that. I applied and left the City of Van Wert and went to Allen County.

After I was there for about a year a Chief Plant Operator's position became open and I knew that I didn't want to stay in the lab forever. I knew I wanted to move into Operations since I had my Class III and knew I wanted to work on my Class IV, also I knew I really loved operations and I wanted to eventually be a superintendent. I knew I needed to get some operations experience in order to make that transition. So I left the lab and went into operations as Chief Operator for Allen County at their American Bath Plant. I worked at both American Bath and the American II facilities. They have three medium sized wastewater treatment plants and at the time they had six package plants. They don't have that many package plants now. So, I left the lab, went into operations at Allen County and then while I was on maternity leave for Emma, the City of Delphos Superintendent position became open.

The day that I would have gone back to work at Allen County after having Emma, I started at the City of Delphos as Superintendent. That was in 2002, and I was Superintendent at the City of Delphos until May of 2010. I left Delphos to go to work for Smith Environmental as a manufacturer's rep, where I stayed until August of 2014, when John offered me the job of Director of Business Development for Alloway.

Staff: Why did you decide to make the leap from working in a plant to becoming a manufacturers rep?

Kim: I knew I had about 15 years in operations and if I didn't go then, I never would and I was looking for a new challenge. We had built the new wastewater treatment plant and at the time I left, things were running smoothly and I was looking for a new challenge. An opportunity to make more money and to look at different aspects of wastewater.

Once you get in and you work so many years in operations, you're not going to be inclined to get out. So I chose to leave when I did, and check out new opportunities.

Staff: What exactly do you do now for Alloway?

Fireside Chats - Looking for Recommendations!

The Fireside Chats is a series for the Buckeye Bulletin focusing on leaders in the industry. The Question and Answer Feature will dig into their leadership role and how it has had an impact on the industry. We will be focusing on leaders from OWEA to Plant Superintendents and every leader in between. Please nominate your boss, coworker, or someone you admire for a future article by emailing Megan Borror at:

meganborror@ohiowea.org.

Kim: I'm the Director of Business Development for Alloway, which means I do everything from generate quotes for analytical and sampling services to training to customer relations / customer service. I do a lot of training because of my background in wastewater. I do a lot of package plant training for clients, microscopic evaluations and other various types of training. My job is to work with existing customers to maintain relationships that we have with them. And then to go out and look for new avenues for business, new customers, and build new relationships, as well.

Staff: What is your favorite thing about this industry? You have a very unique perspective since you've seen it from both sides.

Kim: That we all have the opportunity to work together in a variety of different ways towards the same end goal, which is protecting the water quality for the state of Ohio. Whether that's from the laboratory perspective, operations, from city government, and everything in-between, like manufacturers reps and engineering services. It takes everybody all working together.

Staff: What advice do you have for aspiring leaders in the industry, like those that want to develop their career?

Kim: I think the best advice I can give is to get involved, whether it's involved with your community in some aspect of protecting the environment or involved in education or involved in the association. I definitely think that without my involvement in OWEA and the different positions that I've held, be it at the section or at the state level, without the relationships that I've built within the organization, I wouldn't have had all the opportunities for advancing my career that I've had. So I've met a lot of people, I've learned a lot and really credit my involvement with the association for that.

Staff: What qualities do you think make a good leader?

Kim: Honesty. The willingness to listen. **I think you have to be a good listener to be a good leader.**

Staff: Do those leadership characteristics help you both in your professional career and your volunteer position for OWEA?

Kim: I think it does. I think that you have to be willing to sit back and listen to other folks, even in our relationships that we have on the board, we have to be willing to sit back and listen to other people's perspective. They may not look at the association or the goals of the association the same way, say, that I do or as somebody else does, and I struggle with this. I'm not saying by any means [LAUGH] that I am this excellent listener. I struggle with it just as much as anybody else does.

We have to take the opportunity to sit back and listen to what others have to say that provides different perspectives on how we might approach a problem, or where we might steer the ship in the future, and what's really important to not just me, or what I think the association should be doing, or what I think Alloway should be doing, but what common goals we have together.

Staff: Who is somebody, or a couple of people, that you look up to in this industry? And why do you look up to them?

Kim: Doug Clark, because, he was my supervisor at the city of Van Wert and he encouraged me to grow and to move on when the time was right. He's a great operator and a great friend, and encouraged me to do that way back when. I'm not sure I ever would have taken the leap to leave Van Wert, I mean I was so new to the industry that it was kind of nerve-wracking.

Mike Agin was my supervisor at Allen County, who encouraged me to take the leap and leave the lab and go into operations. He afforded me the opportunity to do all kinds of things, work on state reports, go out and do maintenance activities and things and operations in the plant, work on nutrient removal options. He encouraged me do different things and really make that leap to leave the lab and get into operations. And I appreciate that because when I thought about it, I knew that's what I needed to do to get the experience I would need to be a supervisor or a superintendent at some point. **He was always there to encourage me and let me fall on my face if I needed to, but pick me up and help me solve the problem too.** He was great. Then the folks that I've worked with on the board have been mentors all along the way, Fred Smith, Jamie Gellner, Dale Kocarek, Elizabeth Wick all for just helping guide me.

If you look at the trajectory that I had, it was rather expedited. I didn't start in the industry until July of 1997, and was Superintendent of Wastewater for the City of Delphos by August of 2002. During that time I had gotten my Class III in Operations and my Class II in the lab. I jumped in feet first. It just happened that way. I would consider myself very lucky

that those opportunities were around and that they were close enough that I didn't have to move my family, that I could stay in Delphos. Even though I've worked for Allen County and Van Wert, I've always lived in Delphos. I just consider myself really lucky that I was able to advance that quickly. It was also a little scary [LAUGH]!

When I became superintendent at Delphos, all of the guys that worked for me, with the exception of one, were basically old enough to be my father. In every community I've ever worked in, I was the first female in operations that had ever been hired. Things have changed through the years. I can remember when I first started, I might be one of two or three women at section meeting or a state meeting. While it's not 50-50 yet, which is something I think a lot of women in the industry strive for, it's getting a lot closer than it used to be 20 years ago.

Staff: How has being in this industry made an impact on your life as a whole?

Kim: You can't be involved without developing relationships and friendships with people that you wouldn't have otherwise had the opportunity to meet throughout OWEA and WEF, people from Ohio and across the country that I'm now able to call my friends.

Staff: What is something that you would like to see in this industry in the next five years?

Kim: I'd like to see OWEA offer operator training for certification, and help work towards better training avenues and opportunities for operators to gain the knowledge that they need to pass their certification exams.

I'd like OWEA to be in the forefront of helping guide operators and better prepare folks to take on the leadership positions that are going to be vacated over the next five to ten years. I know we keep saying the baby boomers are leaving, the baby boomers are leaving [LAUGH]. Eventually they really are. We are going to be faced with an operator shortage and I think we have to work together to provide better training and skill development for operations staff to be able to step into some of those positions, and not just current operators, but folks thinking about entering the field that are looking for a solid stable career path.

This isn't just a job. This can very much be a career. Whether you choose to work in the lab or in operations or in engineering, this can be a very solid career path particularly on the operations side for folks who don't want to go to the standard four-year college. Folks that are looking for a career that will provide good benefits for their family and an honest wage, this is definitely an avenue that they should consider and can explore. I think it's important for us all to do our part and try and to get the word out about that opportunity, and then for OWEA to provide the training that would be necessary for them to be able to advance in those career paths.

Staff: Why did you decide to join into OWEA leadership?

Kim: Well, I think it's all in the ask, and I did things kind of backwards. [LAUGH] Keith Raddick asked me, well, actually, he just made an open kind of announcement at one of the Northwest Section meetings that he was involved in the Plant Ops committee at WEF and they were always looking for new members. I was working at Allen County at the time and was sitting at the meeting with my boss, Mike Agin, that I mentioned before.

Mike's like, 'That's right up your alley, you ought to go talk to Keith.'

I talked to Keith, and he said, 'Yeah, you should get involved,' and so I joined.

I was already a member of OWEA but I wasn't active other than attending section meetings and stuff. I joined the WEF Plant Operations and Maintenance Committee and got very active at the WEF level. I got to know a lot of people and eventually became chair of the Plant Operations and Maintenance Committee at WEF.

Around that same time, somebody said, 'Well, if you're so active at WEF, why aren't you involved at the section?' Doug Borkosky was getting ready to move from the Contact Hour Coordinator into the officers track at the section and so they needed a new Contact Hour Coordinator. They reached out to me and that's kind of how I got started in OWEA leadership positions. It just kind of grew from there [LAUGH] because I can't say no.

I was contact hour coordinator, moved up through the section chairs, was Plant Ops Chair in the Northwest section, competed with Allen County in Ops Challenge in 2002, actually, when Emma was just two weeks old. It was right after that I left the county and went to work as Superintendent at the City of Delphos. I got involved with the Ohio Ops Challenge Program from a planning standpoint since I wasn't competing any more,

and then eventually was Plant Ops Chair. All the while kind of still doing stuff at WEF with the Plant Ops Committee.

Then I was approached to consider being Ohio's WEF Delegate. I was a delegate before going through the state chairs, so yeah, I've been doing this for a long time. [LAUGH]. I did things backwards, I was the first person besides Kathy Richards now, from Ohio to not go through the chairs before becoming a delegate. I did three years as a delegate then immediately became section delegate. Actually they kind of overlapped for three months because I wouldn't have been done until October 2013 as a delegate. But I technically was Northwest section delegate starting in June of 2013. For a little while I held two hats, I guess. [LAUGH] Yeah, I've been around forever.

Staff: What is something that you want the membership to know about you as their incoming president?

Kim: That I'm very honored to be in the position and I look forward to working with the board to advance OWEA and our relevancy. Not just with the state legislature or the national legislature, but also here at home with our operations folks and laboratory professionals. To provide them new and better education opportunities and training opportunities.

I look forward to working with the board over the next year to kind of advance those ideas and bring some new and innovative training.

Staff: What is one goal that you have in your presidency?

Kim: By the time I'm done being president, we will have a beginners and an advanced operator training courses.

Staff: What is your favorite thing about OWEA as an organization?

Kim: The networking opportunities, the friends, and the opportunity to work with folks that have the same common goal of protecting the environment who just have become what I believe will be lifelong friends.

Staff: What advice do you have for someone that's looking to get more involved with OWEA?

Kim: Hopefully, we're doing the asking. I always tell people that I think that as committee chairs and section leaders, that we need to be encouraging folks at every level to get involved. Find something that interests you, be it collection systems or operations or laboratory, and get on a committee. If you don't have that much time, volunteer for a committee activity first. You don't have to be on the board to be involved. It takes people at all levels of willingness to get involved, to be able to maintain the different activities and things that are so vital to our organization.

I just encourage folks to ask, to reach out to staff or to reach out to somebody at the section level and say, 'hey, here's where my interests are' or 'maybe I could attend a committee meeting. Who could you put me in touch with who could provide me with a variety of different opportunities so I could see?'

They may want to explore collections and operations until they decide which one has the activities that they would most like to be involved with. It just kind of depends on where you're coming from and what your interests are. This is a volunteer driven organization so we're always looking for folks who want to get involved. If nothing else, reach out to me. **We will find a place that you feel at home.**

Staff: Is there anything else you would like to share with the membership?

Kim: I dearly love the opportunities that I've had working with so many different people at OWEA and WEF. It's all about the relationships that you build within the organization, not just in terms of advancing your career, but in terms of working together, toward all different aspects of at the end of the day improving water quality and the environment for the State of Ohio. We all are working towards that common thread no matter whether it's the laboratory committee or stormwater or watershed or operations that we all have that same goal in mind. There's nothing better than working with like-minded people towards that goal. Like I said, it isn't where I thought I would be going when I went to college and got my undergrad in biology, but I can't imagine working in any other field.

There isn't anything else I would rather do, there's just not. I love wastewater and water, but mostly wastewater. [LAUGH] We do both here at Alloway so that's been a transition for me to learn the other side of it. We do hazardous waste and solid waste here as well. So, that has been challenging but **wastewater is where my heart's at. I can't imagine doing anything else.**

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Safety History at City of Wooster

by Nathan Coey, City of Wooster

Greetings fellow Water Warriors, I hope this article serves as a warm spring greeting. Spring is upon us in the awaited majestic display. Baseball fields and parks are buzzing with activity with a scent of fresh cut grass. I took this picture this week from the well-manicured flower bed by the Wooster Utilities Water Warriors. I am blessed with a group of talented individuals that treat water right and take pride in the facility appearance. Doing a great job or leaving a mark runs deeper than a pay check. It is a gut check of the commitment of making every moment count, even in the routine. Safety is that same instinctive gut check, a thought of consequences and motivation of protection.

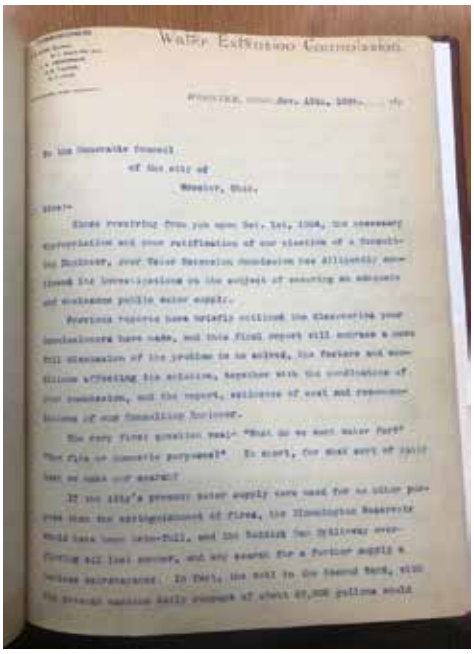
If surveyed, most folks will accept and embrace safety as it relates to their wellbeing. While some may have a penchant for risk, or the thrill of activities like skydiving; I have yet to meet someone that jumped without a parachute. The idea of a safety program or intentional efforts to engage our co-workers about safety extends past what our "pay check" may require of us. It is a deep rooted care for the human beings around us. We instinctively value life and make a conscious decision to encourage activities that protect the wellbeing of ourselves and those around us. I would share some of the history of Wooster and one man's desire for safety began with a vision of public health and safety.

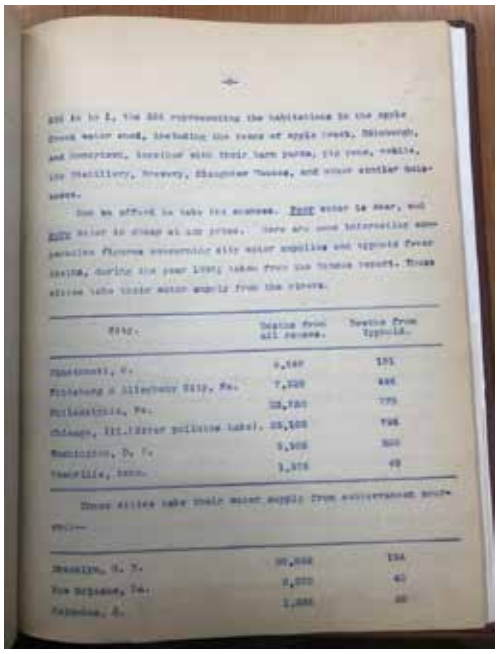
Historical records indicate the City of Wooster, Ohio operated a public water supply as early as 1875. Ulysses S. Grant was nearing the completion of his second term as the 18th President of the United States. Records indicate a customer base of 300 accounts, including a local Saloon. Surface water reservoirs were the source of drinking water for the community. Records indicate sporadic supply of water to the community. A steam driven engine was used to pump water into the reservoir from a local stream.

In October of 1894, Consulting Engineer Minor Scovel was hired by the "Water Extension Commission" to address water supply concerns. By November 19th, 1894 a completed report was provided to the commission. Minor Scovel asked the question "What do we want water for?" in the search for sustainable water supply. The commission cited the need for fire suppression as the past indicated hardships for growing cities due to catastrophic structure fires. In 1870 the City of Medina was nearly destroyed, two major fires in Chicago in 1871 and 1874, and Boston fire in 1872. However, Scovel suggested that search for water solely for fire suppression would have been a "useless extravagance". The goal was to find sustainable, safe drinking water for the growing community. At the time, a dam was used to supply water to the community and was not reliable. Scovel felt the dam was highly susceptible with noted contamination sources. Based on previous studies, Wooster was "blessed" with an abundance of safe ground water sources. His goal was to encourage the commission to use the water in what is now known as the Killbuck Buried Valley Aquifer.

Scovel also shared the official findings of an 1885 Plymouth, Pennsylvania typhoid fever outbreak. The illnesses of 1,100 people with 114 deaths were directly linked to a single individual. The individual fell ill to typhoid from a holiday trip to Philadelphia. The report stated

"dejecta of a single typhoid fever patent whose case occurred on the banks of the stream supplying the reservoirs, several miles distant from the town". Scovel shared the cost of this case including medical bills and loss of life in the range of $138,000. In his report, Scovel asked the commission "Can we afford to take the chances. Poor water is dear and pure water is cheap at any price." The report included a price estimate no less than $40,000 to build a water treatment facility on the Killbuck Valley Aquifer due to the protected ground water source and not subject to surface contamination.





It is important to note at this time chlorine disinfection was not utilized for virus and bacterial control. It would be 1908 when chlorine was first used in the United States at a treatment facility in New Jersey. Scovel's findings concluded that ground water poses a less risk for typhoid fever, supported by an 1890 census report regarding cause of death. A total of six cities that used surface water for their communities indicated a typhoid death toll of 2,460. Six communities (including Columbus Ohio) that used ground water indicated a typhoid death toll of 715. The solution was clear not only for public health, but Wooster's future to utilize subterranean water sources.

In his report to the commission, Scovel shared that "deep driven wells of more recent times may afford a pure and wholesome supply" of water to the community. He urged the officials to take action especially in light of Plymouth and what was found at the supply and pumping portions of the Wooster dam. Urging action, "so that the citizens of Wooster, who in the future visit the water works, will not be likely to have so revolting a sight thrust upon them, when they found about foot of human excrement depositing within 25 or 30 feet of the stream of water flowing to the pumped wells into the dam." It would not be until the 1920's that ground water was used for the citizens of Wooster.

By 1924, ground water wells were dug near the first water treatment facility site on Old Lincoln Way between Lattasburg Road and Old Mansfield Road. Water from the first well (Well #1-no longer in service) was delivered to customers via at 16 inch cast iron main. At that time the water was delivered to nearly 9,000 people with no treatment prior to delivery. Due to insistence from the community to address hard water, quality concerns, and need for reliable fire suppression systems, a treatment facility was commissioned in 1936. By this time, the vision first outlined by Minor Scovel in 1894 became a reality to support the past, present, and future citizens of Wooster. In 1998, Wooster's current Water Production Facility was commissioned with the continued focus of great sustainable drinking water to the community.

Minor Scovel felt that people had inherent value; he stood up and took action. He was motivated by concern for his community and driven to make an impact. The spirit of Scovel's impact remains at the core of Wooster Water Utilities. As Water Warriors we have accepted the solemn oath and commitment to servant leadership and vigilance protecting the public.

"Can we afford to take the chances? Poor water is dear and pure water is cheap at any price." Minor Scovel 1894

Make it count, Godspeed Water Warriors,

Nate Coey, OWEA Safety

Finding and Training the Operator of the Future

Obstacles and paths to water operator careers

by Katherine Saltzman

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From wef hq Leading-edge updates from the Water Environment Federation

Amid retirement surges across the water workforce, there are ongoing discussions about the urgency to recruit, train, and retain new professionals. Part of this effort involves establishing the water sector as an attractive career path that supports essential infrastructure and protects public health and the natural environment.

However, the water sector faces additional challenges that most sectors do not. Training requirements and certification expectations vary among states and naturally among utilities that differ in size, revenue, and process capacity. But the challenges go deeper. They include limited access to updated, peer-reviewed training materials; inadequate time and money for operators to study or maintain continuing education requirements; and the challenges to keep pace with rapid technological changes. These challenges are in addition to equipping employees with the complex science, technology, engineering, and mathematics (STEM) components necessary to be a water operator.

However, solutions are emerging to overcome these challenges and secure the workforce of the future. Organizations, states, and utilities are finding ways to attract and train the essential employees who will protect our infrastructure, environment, and public health.

Water Sector Uniqueness

As highlighted in the 2018 Brookings Institution report, Renewing the Water Workforce:

Improving Water Infrastructure and Creating a Pipeline to Opportunity, many of the water sector's concerns about its workforce reflect similar social, labor, and economic concerns across all U.S. sectors. These concerns include high retirement rates, limited pools of qualified replacements, and fear of technical knowledge loss. The report calls these concerns "emblematic of bigger economic trends and broader policy issues facing the country, including the continued need to support a new generation of workers amid mounting retirements, changing technologies, and other labor market shifts."

But where the water sector stands apart is the need for greater upfront preparation in terms of extensive training, skills, and knowledge competency. The Brookings report states a U.S. Bureau of Labor Statistics finding that water sector jobs have a higher threshold for entry.

More than 78% of water workers need at least 1 year of related experience and 16% of water workers need 4 or more years prior to joining the water workforce. Moreover, about 44.7% of water workers need at least 1 year of on-the job training to qualify for their positions.

Compare this to the national average of 5.6% of jobs across all occupations that need more than 1 year of on-the-job training, according to the data.

In addition to on-the-job-training, water workers are required to operate various technologies and tools as part of their daily responsibilities. These requirements add additional complexity to operator jobs and training. According to the Brookings report, "Water workers embody the definition of skilled trades. On average, water workers use 63 different tools and technologies each, compared to the 6 tools and technologies typically used by workers in all occupations nationally."

Entering the Water Workforce

Even though most sector newcomers lack operational experience, each still is required to passing a level 1 certification exam and possess hands-on experience as prerequisites for employment. With these considerations, utilities typically hire entry-level employees without a license and provide a certain amount of time for the employee to study for and pass a certification examination. Those who pass are then promoted to a full-time, certified operator position. This pre-certification periods ranges from 30 days in some states up to year in others.

"We have a chicken and egg system here: you can't get hands on experience unless you have a license, but you can't get a license without hands on experience," said Sidney Innerebner, principal and owner of Indigo Water Group LLC, a wastewater consulting and operator training company. Innerebner also is authoring WEF's new Wastewater Treatment Fundamentals series.

Supporting Continual Operator Training

Once hired, operators are expected to continue studying for higher certifications and collect continuing education units (CEUs). Larger utilities may have an in-house trainer who develops CEU curriculum related to facility processes or equipment. This trainer works with the entire operations staff to help prepare them for certification exams. However, midsize and small facilities, which make up most treatment systems in the U.S., typically don't have the resources to support in-house training; therefore, operators self-study and use external trainers one online courses to prepare for examinations.

Despite the options available, there is concern among operators and trainers that the Need-to-Know (NTK) Criteria, which is tested for in certification exams and incorporated into curriculums for CEUs, may not always apply to the processes at an operator's facility or be relevant to their daily responsibilities, Innerebner said. NTK criteria is extensive but lacks detail on which topics are necessary for exam preparation or responsibilities in the field, making it difficult for operators to study, she explained.

"One of the big issues with training is that it's often geared toward more complicated systems. If you look online, you could probably find 100 classes on activated sludge but more than 85% of the treatment plants in the U.S. are lagoon systems," Innerebner said. "It's hard to find training on lagoon systems or classes on wastewater treatment ponds."

Additionally, acquiring CEUs and preparing for certification exam require time. In some cases, operators are given working time to prepare and test; this requires them to get shifts covered. In other cases, operators must use time-off to maintain their licenses and training.

In Colorado, for example, there are week long operator training classes which would meet the entire training requirements for 3 years, Innerebner said. But this requires coverage at the facility as well as travel expenses.

Other options include online training, which provides more scheduling flexibility. Indigo Water Group has about 650 operators enrolled in online training class.

"Operators like it better so you can do it over time, it's a little easier to incorporate in the day," Innerebner said.

Updating Materials

A significant portion of operator training materials, including U.S. Environmental Protection Agency (EPA) manuals, have not been updated since the late 1970s or the 1980s, Innerebner said. She added that training materials typically have been based on work practices at facilities instead of scientific research.

"We have learned a lot about wastewater treatment in the last 40 years, a lot of stuff has changed how we teach, has changed our understanding of the process" she said.

"We've been in a cycle of asking people in the field what they do every day at work and then basing training materials on that instead of setting standard practices based on scientific research. The result is a cycle that always looks backwards instead of forward," she explained.

To provide new training materials, WEF developed the

Wastewater Treatment Fundamentals series. In addition to being double peer-reviewed by water sector experts, the series aims to assist in translating the world of wastewater treatment to individuals who have held technical jobs outside of the water sector.

"I try to take new concepts and relate back to what people already know. It's easier to hang things on your framework, then to build a new framework all together," Innerebner said. Because many operators come from mechanical backgrounds, it helps to relate new topics to familiar ones, she explained. For example, biology and bacteria can be compared, albeit imperfectly, to engines.

"Live with the imperfect analogy until you can get a better understanding of what's actually happening," Innerebner said. "That goes a long way with helping people learn."

Keeping Pace with Technology

Utilities and trainers work to keep pace with rapid technological changes to ensure their staff and operators are prepared to handle new equipment. This has led to training that focuses primarily on technology at a facility. While this training is valuable, it needs to be coupled with education on the general curriculum.

"I am seeing more clients asking for very specific training on the technology they have at their location, onsite training for specific technology," said Scott Jameson, a water and wastewater operator trainer and consultant in British Columbia, Canada offers classroom courses and on-site training for utilities in the region.

Sometimes the tech training is to reduce a knowledge gap after losing a senior operator, other times, however, utilities are trying to multitask and prepare operators for certification exams and train them on new technology at the same time, Jameson said.

"I find them more and more willing to pay to have an instructor to come to their sites," Jameson said, "This is tied into the idea that they want training focused on the technology they are using."

He cautioned, however, that this doubling up doesn't work well, if the goal is to pass a certification exam. Jameson said he takes the time to sort out this different with his clients. He works with them to clarify their objectives to provide the training truly needed.

The Operations Challenge competition held annually at WEFTEC, and similar state and regional events are examples of programing that combines operations training and skill development with practice on new technologies. To keep the competition fresh and challenging, the events are redesigned periodically. These events introduce competitors to new processes and technologies and provide hands-on experience with new and different equipment.

Apprentice Programs and Technical Schools

One highly visible path for newcomers to enter a water sector career is through apprenticeship programs or technical schools. Some utilities have created these programs or built partnerships with local colleges to help facilitate the education and hands-on training necessary for an operator position.

South Platte Water Renewal Partners (formerly known as the Littleton Englewood Wastewater Treatment Plant) has done both. Cindy Goodburn, a WEF member who now works as an independent consultant to help organizations improve workforce development and organizational skills, started the apprentice program in the 1990s when the utility struggled to fill Operator A positions.

"At the time, we were focused on the A certification. Most A operators are really secure where they are working. They have the 'golden chain,' fully vested in all of their retirement stuff, maxed out on vacation — all those benefits that make it difficult to leave and start with a new organization," she explained. "Our answer to golden chain was that we would build our own."

Though there have been some changes, the goals of the apprentice program remain the same. Operators are given a designated time frame in which to obtain higher certification levels; they are incentivized with pay increases.

"Each time the person passed a new certification, they got promoted to a new operator certification and payline raise. We paid for all of their schooling, their books, certification exam." Goodburn said. "But their end of the deal was that they had a certain timeframe in which to complete these [tasks]. The goal was to get all our operators A certified and there was a maximum amount of time. If at any of those points, they couldn't pass the exam, we would have to terminate employment. But we've only had to do that a couple of times over all these years [that we have had this program] It's just been a huge success."

This facility also maintains a partnership with a local community college with a water quality management program. Many of the college students interned at the facility as part of their curriculum. These same students later joined the apprentice program to become operators.

Goodburn noted that utilities can help direct curricula at technical colleges to ensure colleges are preparing students for workforce needs. For example, when supervisory control and data acquisition (SCADA) systems were introduced to the facility, few staff possessed the needed skills to use them. As Goodburn searched for employees or students to fill the role, she discovered that the community college was providing outdated curriculum.

"The instrumentation and controls [curriculum] were in the electrical degree programs and it was so antiquated it wouldn't do us any good," she said. "That's kind of my soap box on partnering with local educational institutions and helping them understand what is needed in the industry for their students to graduate and get into a job."

Taking this collaboration one step farther, the Water Engineering Technology (WET) Program at Okanagan College in Kelowna, British Columbia, in Canada has a curriculum recognized by the Environmental Operators Certification Program (EOCP), which is the main certifying entity for the region. The WET program also is a nationally accredited engineering technology program. All certified engineering technology programs are mandated to meet regularly with an advisory committee to determine curriculum and skills needed for the workforce.

"We have to keep in contact with the industry. All of the Engineering Technology programs are mandated to have Program Advisory Committee that is comprised of individuals from different industries that our students would go and work in" said Allison O'Neill, chair of the Water Engineering Technology Department. These committees "advise us on changes in the industry. We also ask them about our curriculum [and] when we propose

curriculum changes, they review those changes to ensure it fits with the need of the industry."

The committees include members from public and private sectors organizations, including the local municipalities, the water resource recovery facility, consultants, urban planners as well as representatives from the Province of British Columbia's Ministries of Environment & Climate Change Strategies, and Forest, and Lands and Natural Resources.

"We make sure that we have broad representation, we also try to make sure that our advisory committee includes WET graduates who are working in the industry because they understand both the curriculum and the industry," O'Neill said.

Interactive Development

The Brookings report also includes recommendations to involve stakeholders in training development. The report suggests that since water workers are required to maintain continuing education units, utilities and other water employers should provide additional frameworks and "develop competency models —or customize existing models — to promote continued learning and skills development among staff."

Tasks associated with this development include defining and measuring types of knowledge, skills, and abilities needed among water workers within the organization. The report also recommends creating more robust programs to introduce younger, nontraditional workers to the water sector to acquire hands-on experience.

Goodburn noted that the success of the apprentice program is based on supporting staff and operators at each level of their career and providing training and opportunities to move upward.

"One of things we were successful at was developing people in their careers," Goodburn said. "I used to tell my staff — and it would freak them out— 'I want you to work yourself out of your job every 5 years, but I want your new job to be here, with us, at Littleton/ Englewood.'"

"I think that's philosophically what the management was looking for: those people that really wanted to reach, grow, and really make a career out of it, not just a job. I think that has really been the success in the apprentice program and throughout the rest of the organization because people do have the opportunity to grow."

Katherine Saltzman is a publications assistant at the Water Environment Federation (Alexandria, Va.) where she works on WEF's Operator Initiative programs.

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2019 APPLICATION

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Home Phone | Cell Phone | Business Phone

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☐ **Young Professional (YP)**	$49	WEF members or former WEF Student members with 5 or less years of experience in the industry and less than 35 years of age. This package is available for 3 years.
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Dependent upon your membership level, $55, $47 or $20 of your membership dues is allocated towards a subscription of Water Environment & Technology (WE&T) magazine that is non-deductible from the membership dues.

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Self Esteem. Sort of an odd topic for an association's magazine, huh? So why am I writing about it? Recently the Executive Committee of OWEA and some other core members met to work towards developing a strategic plan for the organization for the next five years. We spent two days dreaming, brainstorming and then formulating a detailed plan to put these ideas into action. One topic that became increasingly clear was we have a self-esteem issue.

What do I mean by self-esteem? I mean how we view ourselves and our industry. I mean the negative connotation of the term wastewater. I also mean that it's really tough to change the public perception of our industry when we don't even value ourselves and our work.

You often see the term "water warriors" in our social media accounts. That is truly what we are, but is that really how we see ourselves? When we think of warriors, we normally think of the service members of our armed forces or perhaps, police or fire department personnel. But what about our wastewater operators? Aren't they warriors fighting for our most precious resource of water? Aren't they heroes?

The modern treatment of human waste has had a larger impact on the health of our society than penicillin. Stop and think about how different our society would be without wastewater treatment. Days like "A Day Without Water" and "National Toilet Day" force us to imagine what our life would be like without the conveniences we take for granted, but we should be singing our own praises every day.

We know that the public doesn't really think of us unless there is an issue or a rate increase and that also needs to change. The issue is we can't change public perception unless we change the way we view ourselves. "You can't love someone until you love yourself!" holds very true.

So what's next? Do we need to seek therapy as a group? Read some self help books? No, of course not! What we need to do is start small. When someone asks you what you do, think about replying "I save lives." You might be asked if you are a doctor. You can then explain that you aren't but you are responsible for protecting more lives daily than some doctors are their entire career. You might think this is a dramatic statement, but it isn't. YOU ARE A HERO! YOU SAVE LIVES! YOU PROTECT THE PUBLIC and yes, I am shouting. It's that important!

OWEA works very hard to recognize the importance of our industry and excellence in it. We do this through social media, public outreach, awards, publications and various other ways. Our industry is critical to public health yet, often the public doesn't know what we do. As part of our long-term strategic plan we will be working to change that, but before we can change "them" we have to change "us." This isn't going to happen overnight, but the effort is worth it. A better public perception will lead to a greater ability to pass rate increases because your audience actually understands what you to. It will lead to a better and more diverse workforce because young people will see water as viable career. Imagine a world where Joe Q. Public understands that "flushable" wipes aren't really flushable. This is a BIG task, but it's possible and it starts with YOU.

So here's the challenge...I am asking everyone reading to consider how you speak about what you do. Whether you are an operator, engineer, or lab analyst...it doesn't matter. You are a part of this industry and you are a WATER WARRIOR. Now go act like it! If you don't tell your story who will?

Dawn Sink Kennedy, CAE, Executive Administrator

Our Visit to the Halls of Government

by Dale E. Kocarek, P.E., BCEE, Past President 2010-2011

April 3-5, 2019 marks the ninth consecutive year that OWEA participated in the Fly In to Washington D.C. for Water Week. In 2011 as OWEA President I was invited by my co-worker Cliff Shrive to participate in Water Week with the Ohio AWWA. It was during my period as President, I wanted Ohio to take this one step of many to become more relevant. I felt that we had an important message to share, and I felt that without continual evolution, all organizations become stagnant and eventually die.

The Fly In is when various water organizations including WEF, NACWA, and Water Reuse converge on Washington D.C. to meet with our elected representatives in Congress to build relationships and carry forth a targeted message consistent with our mission statement of clean water. I was very disappointed that we were not joined this year by AWWA, as I feel that our message together can be best described as a force multiplier. This is also why I have insisted that our annual Government and Regulatory Affairs Workshop be both OWEA and OAWWA. I understand from Fly In organizers that AWWA will be with us next year.

In addition to enjoying the company of our OWEA Fly In team, a visit to the City of Washington D.C. is a lesson in American history, architecture, and governance. Most buildings were designed according to a neo-classical revival style modeled after buildings of ancient Greece. All are constructed of limestone, and I believe from the same quarries to match colors. The Washington monument at slightly over 555 feet is the tallest building in the District. In summary, the city is magnificent and creates a sense of awe. One time I heard that that was the intended purpose for foreign dignitaries.

Our visits to the "Hill" are generally concentrated in the three buildings for the House of Representatives: the Rayburn Building, the Cannon Building, and the Longworth Building. All were named for noteworthy leaders in the House of Representatives. Alas, another history lesson!

Many of my visits were in the Longworth Building, named after Nicholas Longworth III (1869-1931). A prominent lawyer, born in Cincinnati, Ohio in 1869, he became well known in 1906 after his marriage to Alice Lee Roosevelt (1884-1980), the daughter of President Theodore Roosevelt (1858-1919). A conservative Republican, Longworth was the Speaker of the House from 1925 until his death at 61 in 1931. He was described as debonair, aristocratic, perpetually cheerful and witty. The Longworth Building was completed in 1933 and covers an area of 599,675 square feet with 251 congressional offices and suites. The Building like others is of the neo-classical revival style. It is simple in layout, but elegant with marble floors, ornate stairways, large windows, eleven-foot ceilings, and chandeliers in offices.

All members of the Fly In contingent in meeting with the 116th Congress adhere to a simple message. Through the years we have found that 'simple works best.' With

the dozens of visitors to offices every week, we want our message to be clear, memorable and not lost in the cacophony from other visitors and lobbyists. We have learned that our members of congress have to voice opinions and vote on a variety of matters. While many are experts at certain things such as defense or infrastructure, it is literally impossible to know everything about everything.

While our talking points vary year to year, our core messages center around continued and increasing financing support of the State Revolving Loan (SRF) fund and the importance of the Great Lakes Restoration Initiative, which continues to enjoy bipartisan support in Congress despite several close calls from the Administration.

In listening to a NACWA speaker in 2014 in our plenary session upon arrival, I learned that members of Congress enjoy hearing from grass roots groups like OWEA and WEF. We are technical people in the field of operations, engineering, education and utilities management who see things first hand. We don't put a spin on our message. We may not be polished, but we are true and sincere, and this puts lawmakers at ease when we present our message. There are several critical aspects that I wish to share based on our experiences:

- The men and women serving as our elected representatives are hardworking, talented, high energy, and sincerely interested in what we say. Yes, they are politicians who have to get elected, but my experience is that they roll up their sleeves and do the hard work of lawmaking.
- They like to hear feedback on things working well such as the success of SRF in Ohio. Like normal people, they wish to hear good news on what is working well, particularly if it is from the Great State of Ohio.
- Aides are of critical importance in the communication of messages to our representatives. They are typically young (at least compared to me), energetic, good listeners, and eager to learn. We have formed friends with some of them.
- The process of walking around in suits and street shoes on hard marble floors is punishing. One must be physically fit to literally be on the run from morning to evening in meetings, one after the other. One can't go to the Fly In and walk less than three miles.

I close by thanking my Fly In partners Fred Smith, Jason Tincu, Doug Clark, Brian Gresser, and Dawn Sink-Kennedy. We all have differences in temperament, background, and approach, but form a good team and deliver a powerful grass roots message.

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SWOWEA

Dave Wilson, President

Operations Challenge!

Are you an excellent #WaterWarrior? Are you out there every day getting done to protect the environment and help provide clean water for everyone? Are you competitive? Have you heard about Operations Challenge, but do not know what it is all about? Operations Challenge challenges a team in areas that are the basics of wastewater conveyance and treatment. An Operations Challenge Team participates in the following events:

- Collections system
- Laboratory
- Maintenance
- Process Control
- Safety

Obviously, an Operations Challenge Team has team members with specific and multiple skills.

Currently, the Southwest District of OWEA does not have a team organized to participate in Operations Challenge. Keep an eye out for upcoming information on the organization of "district" Operations Challenge team(s). The members of the team(s) would not all have to work for the same employer. Contact me if interested.

Off and Running in 2019!

2019 is already an exciting year for SWOWEA! We have been tweeting on Twitter! Twitter handle @SWOWEA.

SWOWEA nearly set a section meeting attendance record for the March meeting hosted by Cincinnati MSD with tours at two wet weather facilities! The March Section meeting was co-organized by the Collections Committee and featured a social networking event/happy hour at Westside brewing! Look for more social events after section meetings this year!

The Lab Analyst Committee has already had two events. Plant Operations Committee hosted an Operator Education Day, helping to prepare people for state licensing exams.

Lastly, back in January the Industrial Waste Committee hosted the Industrial Waste Seminar at Manor House in Mason. The event featured a high quality, educational slate of topics and speakers, hosted by the Industrial Waste Committee!

More to Come!

In 2019, SWOWEA will continue its commitment to high quality educational events that include valuable opportunities for networking and socializing. See below for a sampling of upcoming events:

- 6/6/19 Plant Ops "Nearly Free" Seminar – Greene County Fairgrounds
- 7/11/19 Lab Analyst Committee – Greene County

Remember, we are a mostly volunteer organization, so many people doing small things add up to a great thing! So if you or someone you know would be interested in a small commitment to help make all we do better for all of us, let SWOWEA know!

Work Hard and Have Fun!!

Dave Wilson, dwilson@blanderson.com

SEOWEA

Brenda VanCleave, President

Welcome to Spring! With thoughts of warmer days, time outside, and gardens growing, now is also the time to prepare for wet weather events. When it comes to Mother Nature and flooding, wastewater treatment plants are particularly vulnerable to flooding and therefore should be a top priority when storms come knocking on our doors. Recommended preventative measures to protect against flooding include:

- Make sure your Wet Weather plan is functional, up to date and all staff have been trained on it. If it is not current (i.e. you are under major construction) be sure to have a temporary plan in place for each storm.
- Creating an emergency response plan – PLAN FOR OPERATOR SAFETY
- Exercise valves and gates prior to needing them in an emergency when the headworks becomes hydraulically overloaded.
- Prepare backup procedures for collecting samples, monitoring influent and discharge flow, and for maintaining treatment.
- Elevating electrical equipment and essential systems and equipment – including data systems such as servers, switches, and network devices.
- Having emergency generators and backup pumps ready to go.

Safety first! Come May, disinfection season returns. Consider coordinating a safety drill with EMA and local First Responders. For chlorine gas and sulfur dioxide users, please update safety protocols, ensure working ventilation, check gas monitors, and have an emergency plan. For UV users, please wear proper eye protection and use appropriate electrical connections. For sodium hypochlorite and bisulfide users, please update safety protocols, test safety shower, ensure working ventilation and wear appropriate gloves.

Sofidel Facility Tour in Circleville. I want to thank everyone who attended our tour of the Sofidel facility in Circleville. Everyone in attendance was treated to seeing how tissue paper products were manufactured from virgin pulp through processing to packaging and shipping. We also toured their industrial pretreatment system and learned about the NPDES compliance challenges associated with bringing a new facility with varying organic and nutrient loading online. A special thank you to our presenters and to Brian Tornes and Chris Tarr for coordinating the event.

SEOWEA Section Awards. We are now accepting nominations for the SEOWEA Section Awards that will be presented at our May 30th Section Meeting. Watch your email for a description of each award that we offer. If you know of a person or project that is deserving of an award, please send your nominees to Melodi Clark at mlclark@columbus.gov.

April's Section Meeting is fast approaching and will consist of a tour of four wastewater facilities – Buckeye Lake WWTP, the Southwest Licking Community Water and Sewer District ECF, the City of Pataskala WRF and the Fairfield County – Sycamore Creek WRF. The event is on April 11th and offer 4.0 contact hours. Tours will begin at Buckeye Lake at 8:30 a.m. and lunch will be held at the Cumberland Trail Golf Course in Pataskala.

The May Section meeting will be our annual Regulatory, Biosolids, and Awards event in Delaware. We will be touring Delaware County's Lower Scioto WRF and the City of Delaware's Upper Olentangy WRC. Presenters include Betsy VanWormer from the Ohio EPA, Jeremy Cook from PRIME AE Group, and Jim Fitzpatrick from Black and Veatch. This will also be the meeting where we thank our Science Fair judges and Past Presidents.

I look forward to seeing you at our upcoming events!

NWOWEA

Gary Bauer, President

Hello fellow OWEA members!

As we emerge from another winter that seemed way too long, I wanted to fill you all in on what has been happening in the Northwest Section. Spring is our busy time, as we hold two section meetings; one in March and one in May. On March 20, we were in the City of Bellevue Ohio. We had an opportunity to tour the Bellevue Water Pollution Control Facility and see the unique processes that provide excellent water treatment for the City. I want to thank Mayor Kevin Strecker, Superintendent Eric MacMichael and his staff, who had the facility looking great and provided informative tours for over 80 people that attended. The entire City staff that participated were wonderful hosts for the day. Following the plant tours, we convened at the Meilenstein Banquet Hall for a great lunch and technical presentations.

On May 15, we held our second spring section meeting in Findlay, Ohio. This meeting included technical presentations and a tour of the Findlay Water Pollution Control Center. A big thank you to Mayor Christina Muryn, Superintendent Dave Beach, and his staff for allowing us to visit the plant and see their operations. This meeting also included our annual NW section golf outing at the Sycamore Springs Golf Course. Everyone that participated had a great time.

Also during the month of March, NW section members assisted in judging at three State of Ohio, High School District Science Fairs. These Fairs were held at the University of Toledo, Ohio Northern University, and The Ohio State University at Marion. Judges reviewed various interesting projects that focused on both water and wastewater themes. One student at each fair received an award certificate and a $100 check from the NWOWEA for their selected winning project. Congratulations to all these young scientists on their work and interest in the water and wastewater fields.

Looking forward, the NW section will be sponsoring our annual Friends and Family Day celebration. This year we will be hosting an outing at the Toledo Mud Hens game on Saturday, August 10th. We will have our own area for food and drinks and seats in the stadium for the baseball game. Mark your calendars! More details will be available in the near future.

We also want to remind you to come visit us up north for the 2019 Annual Conference, which will be held at the Sawmill Creek Conference Center. All the details are listed in this issue of the Buckeye Bulletin. We value the opportunity to host this year's conference and to welcome the other Sections to our backyard. Hope to see you there!

Gary Bauer gbauer@jheng.com

NESOWEA

Jim Cooper, President

Water professionals in the Northeast Section are welcoming the signs of spring and summer and collaborating with other water professionals in new ways! Several events recently occurred and are happening soon.

On April 18 we held our first Innovation Seminar at Furnace Run Metropark in Richfield. The event consisted of topics including utility innovation, innovation design, a culture of innovation and a special presentation by the 2018 Student Design Competition winners! Thanks to Bill Zawiski for coordinating this Seminar!

On April 26 the Northeast Section Student Design Competition concluded with final presentations and selection by a panel of water professional judges. Stay tuned to social media and future newsletters for the results of this competition! I'm encouraged by the interest in water coupled with the new talent entering our workforce. Thanks to Krishna for continuing to lead and grow this successful competition!

Our Annual business meeting is May 23 at Avon Lake Regional Water. Tours of both the Water Filtration Plant and the Water Reclamation Facility are followed by technical presentations highlighting the recent improvements throughout the utility. Thanks to Doug Harris and Steve Baytos for coordinating this event.

This is Your Time

The old saying goes "Time flies when you are having fun!" I have first-hand evidence to support this. It seems like yesterday I began my involvement in NESOWEA as a Young Professional that evolved into a multi-year commitment with the volunteer leaders of this Section. I wholeheartedly believe water professionals are the greatest group of folks on this planet and each of you have made my time fly as an executive committee member for NESOWEA. Many of you have worked in the trenches and in offices for decades generally unbeknownst to the hundreds of millions of people who are your customers. In a season when many utilities are transforming for a sustainable future, the public is more than ever interested in clean and affordable water. Public events such as the Cuyahoga River Homecoming (June 21, Akron Waterways Renewed!) and the Clean Water Fest (Sept. 21, Northeast Ohio Regional Sewer District) highlight your profession, and are trending events! If you haven't heard of the update to the Water's Worth It campaign by WEF, it is worth your time to check it out and share a few images or links with your network. https://watersworthit.org/ My daughter is fond of the children's book that was published as well.

To the water professionals who work tirelessly for a clean environment and safe drinking water, to the humble engineer, to the night-shift operator, and to the focused scientist: This is your time! Be proud of what you do and the impact you have on society and – most importantly – share your story. Our future depends on it. Our lives depend on it.

Mark Your Calendar

Save the date for our 13th Annual BioMass-ter's Open golf outing scheduled for July 19 at Grantwood Golf Club. This is a highly attended event and a great time to be social for a good cause! Sponsorship opportunities exist and proceeds support Water for People. Please contact Michael Cook at Michael.Cook@ads-pipe.com for questions and to sponsor.

James P. Cooper

NESOWEA President

jim.cooper@arcadis.com

NESOWEA volunteered at the Goodyear STEM Career Day on Saturday April 9, 2019 and demonstrated the urban water cycle with the above model. Thanks to Steve Baytos for leading this.

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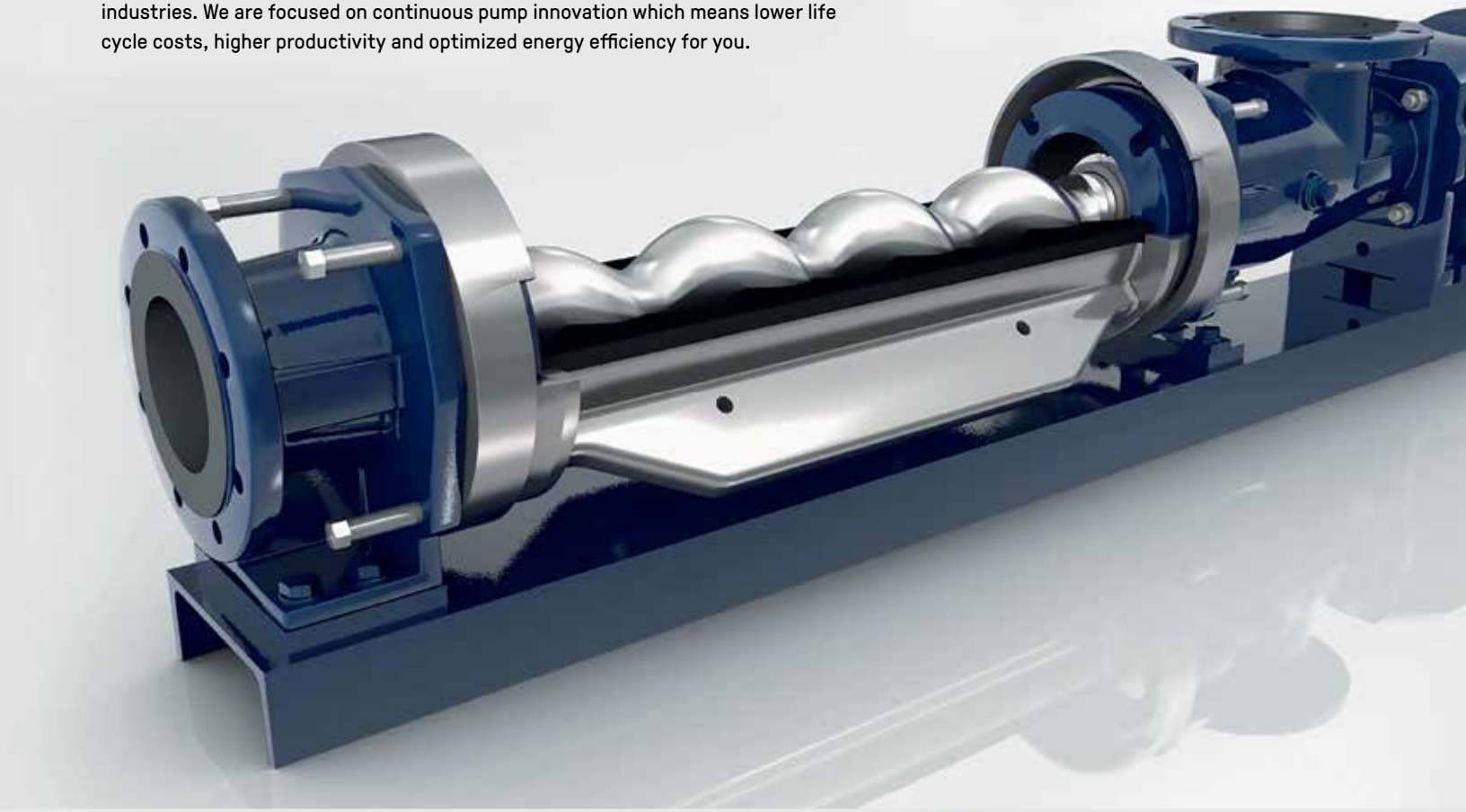

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Northeast Section Science Fairs

by Krishna Chelupati

The Northeast section of the Ohio Water Environment Association sponsored special awards for the 2019 Science Fair events conducted in Northeast Ohio. OWEA members graciously volunteered their time to judge water and environment related projects presented by students at various locations. Our judges reviewed the projects and selected seven (7) students for first place and eleven (11) students for the honorable mention awards. The first place winners were awarded a certificate, a letter of appreciation and a $100 check. Students who received an honorable mention were awarded a $50 check along with a letter of appreciation. Below is the list of students who won the awards at the 2019 Science Fairs. In addition, we would like to thank the following OWEA members for volunteering their time as special award judges at these Science Fairs.

District	OWEA Special Award Judges
Akron Public Schools STEM Expo	• Todd Taylor, ms Consultants • Dave Celik, Civil Engineer (Retired)
Northeastern Ohio Science and Engineering Fair	• Chuck Allen, OEPA • Steve Baytos, City of Avon Lake • Cynthia Collyard, Stantec
Ohio District 13 Science Day	• Rodney Dray, Stark County Sanitary Engineering (Retired) • Doug Harris, City of Canton
Western Reserve District 5 Science Day	• Keith Riley, OEPA (Retired) • Krishna Chelupati, Stantec • Meredith Cariglio, Stantec
Lake-to-River Science Day	• Todd Taylor, ms Consultants • Angelina Joseph, EnviroScience
Mohican District Science Day	• Marc Morgan, City of Canton • Debbie Houdeshell, City of Canton • Mike Cook, ADS

2019 Ohio Water Environment Science Award - Winners				
Event Date	District	Location	Student Name	School
1/26/2019	Akron Public Schools STEM Expo	North High School	Hannah Adams-Gemmell	Firestone High School
1/26/2019	Akron Public Schools STEM Expo	North High School	Darelle Lee	Litchfield Middle School
3/12/2019	Northeastern Ohio Science and Engineering Fair	Cleveland State University	John Shin	Birchwood Elementary School
3/16/2019	Ohio District 13	University of Mount Union	Olivia Ryan and Emma Goettel	Marlington Middle School
3/16/2019	Western Reserve District 5	University of Akron	Graden Snyder	The University School
3/23/2019	District 15 Lake-to-River	Youngstown State University	Allison Frank	Geneva High School
3/23/2019	District 15 Lake-to-River	Youngstown State University	Michael Ge	Valley Christian School

2019 Ohio Water Environment Science Award - Honorable Mentions				
Event Date	District	Location	Student Name	School
1/26/2019	Akron Public Schools STEM Expo	North High School	John Benson	STEM School
1/26/2019	Akron Public Schools STEM Expo	North High School	Dmitri Dahal	Innes Middle School
3/12/2019	Northeastern Ohio Science and Engineering Fair	Cleveland State University	Lucy Chmura	St. Vincent St Mary High School
3/12/2019	Northeastern Ohio Science and Engineering Fair	Cleveland State University	David Anand	Home School
3/16/2019	Ohio District 13	University of Mt. Union	Haley Hamilton and Erica Headley	Marlington Middle School
3/16/2019	Ohio District 13	University of Mt. Union	Emma Stewart	Indian Valley Middle School
3/16/2019	Ohio District 13	University of Mt. Union	Sam Fonner	St. Paul School
3/16/2019	Western Reserve District 5	University of Akron	Bryan Rego	The University School
3/16/2019	Western Reserve District 5	University of Akron	Eleanor Flemming	St. Paschal Baylon School
3/23/2019	District 15 Lake-to-River	Youngstown State University	Ireland Connor	Beaver Local School
3/23/2019	District 15 Lake-to-River	Youngstown State University	Sarah Moser	Valley Christian School

Plant Operations Update

by Joe Tillison and Walter Ariss, Co-Chairs

We hope that everyone is planning on joining us at the 2019 Operations Challenge competition which will be held at the 2019 Technical Conference and Expo at the Sawmill Creek Resort. A major change this year from past events is we will be holding the competition on one day, Monday, June 24th. This should make for an action packed day with the day culminating with the collection events which will take place during the Monday evening welcome social. Team registration is open and contest rules are available on the website so check it out or contact Joe or Walter to be put on a mailing list for all pertinent information. Go to the 2019 technical conference webpage where you will find the sign up for Ops Challenge. Each registered team (up to 5 people) will get breakfast and lunch on Monday, tickets to the welcome reception on Monday evening, Tuesday morning awards brunch and the Meet and Great Tuesday night. Awards will be presented at a reception in the exhibit hall on Tuesday evening prior to the Meet and Greet event. The cost for each team to register is $100! We look forward to seeing you there!

The Plant Ops Committee will again host an advanced activated sludge workshop this year. The dates of the workshop are July 16, 17, and 18. A big thank you to the folks with Greene County for agreeing to host us for our three day event. We have heard nothing but great reviews from the attendees the last two years at this event and are looking forward to providing a great opportunity for a new round of operators to really take a deep dive on activated sludge. Please see the OWEA website for registration details. Sign up today as there are a limited number of seats for this workshop. We keep this workshop under 30 people in order to be sure you are getting hands on instruction.

Planning has also begun for the Plant Operations and Lab Analyst Workshop which will again be held at Nationwide Conference Center on October 10th and 11th. Stay tuned to future Buckeye Bulletins for an agenda and registration details. Please contact Joe Tillison or Walter Ariss if you would like to help out with any of our events or become a member of our committee either at the state or section level.

Test Your Knowledge: Take the Operations Quiz

1. Ecoli or fecal coliform monitoring in NPDES permits represent the only bacteria that are of concern for public health?

a. True

b. False

2. Ultraviolet light disinfects wastewater by which process?

a. destroying bacteria cell walls, effectively killing them

b. sterilizing bacteria by destroying their DNA

c. eats bacteria for food

d. blinds them so they can't find partners to reproduce

3. Chlorine gas reacts with water to form which products that provide the primary constituents for disinfection?

a. monochloramine

b. bleach

c. Hypochlorous acid and hypochlorite ions

d. Hydroxide ions

4. It is acceptable to keep chlorination and dechlorination chemicals in the same room together.

a. True

b. False

5. The appropriate contact time to achieve proper disinfection with chlorine is

a. 14 minutes

b. 11 minutes

c. 30 minutes

d. 15 minutes

Answers noted below.
Have questions, comments, or want to submit a suggested question? Email OWEA at *info@ohiowea.org*.

Answers: 1–B; 2-B; 3-C; 4-B; 5-D

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Lab Analysis Committee Update

by Melodi Clark and Tony Hintze, Committee Co-Chairs

Happy Spring!! Greeting's from you state lab co-chairs. I would like to welcome aboard my co-chair Mr. Tony Hintze from the City of Fremont. I am super excited to be working with Tony to provide everyone excellent service in the Laboratory Committee. We held the 1st Lab Analyst review workshop on March 21st at the City of Columbus Surveillance Lab. It was a huge success. We got some great feedback that we are taking and working on improving the workshop to be offered multiple times a year. If anyone needs help with questions on the exam or general question in your lab feel free to reach out to Tony or I. That is what we are here for. If you are interested in being a judge for the Ops Challenge lab event, let us know.

Northeast LAC

Greetings my compatriots! We have arranged a meeting with three contact hours pending for May 10th in Cleveland at NEORSD's laboratory. Leslie Van Kuren will present a session on holding times and sample handling; Nivia Torres will present a session on hazardous waste management in wastewater labs; Erm Gomes will present a session to address frequently asked questions regarding DMRQA; There will be a full tour of their laboratory to round out the day.

Please keep an eye on nesowea.org for the final details of the meeting. Interference free determinations to you now and always!

Northwest LAC

Hello again from the Northwest Section. Terri and I had the opportunity to help organize the State LAC's Lab Analyst Exam Review Workshop in March. The Workshop was a huge success! I highly recommend this workshop not only for those of you taking the Lab Analyst Exam but for anyone involved in the lab.

Currently we are still in the planning stage for our next meeting. We'll be sending out the details when everything is finalized. Hope to see you there!

Our Email List continues to grow. Don't miss out, come join us. If you are interested please send us an email. Tony Hintze (thintze@fremontohio.org) or Terri Brenner (tbrenner@ci.perrysburg.oh.us).

If anyone has a topic they would like to see presented or if you know of someone who would like to present a topic at one of our meetings, please let us know!

We look forward to seeing you at the next meeting, and of course always remember working in the lab is just like cooking in your kitchen, just don't lick the spoon!

Southeast LAC

Hello from the SE LAC. We are looking to hold our next LAC meeting sometime in June at YSI which is always a great meeting. I am looking for other venues to host our remaining LAC meetings so if you would like to host please reach out to me at mlclark@columbus.gov so we can get it scheduled. My hope is to have three total this year so I need two more venues. Hope to see you all at the LAC in June!

Southwest LAC

The Southwest LAC wishes to thank the City of Dayton Water Reclamation Facility for hosting our Winter Laboratory Analysis Committee on February 14, 2019. We had excellent attendance with 35 people attending. Attendees could earn up to 2.0 contact hours for the meeting. We had speakers who presented on the following topics:

- Quality Control, Process Control, and Local Limits - Jian Cao, City of Dayton
- City of Dayton's Pretreatment Program - Inez Preyor and Jerome Wright, City of Dayton
- Talking to Students about Water & Wastewater -

Kevin Stilwell, PE, Structure Point

- City of Dayton WRF Lab Tour

Presentations at our April 11th meeting included NPDES WWTP Permits, Industrial Waste Permits, and Microbiological PTs and CRMs: Behind the scenes.

Upcoming Southwest LAC Meetings include:

- Thursday, July 11,2019 - Hosted by City of Greene County
- Thursday, October 10,2019 - Hosted by YSI, Inc.

To inquire about being added to our e-mail list or to get information about attending, hosting, sponsoring or presenting at a future LAC meeting, please contact one of the co-chairs listed below or a committee member.

LAC Contact Info

Co-State Chair & SE Chair
Melodi Clark
(614) 645-1239
MLClark@columbus.gov

Co-State Chair & NW Co-Chair
Anthony Hintze
(419) 334-3876
tjhintze@gmail.com

SW Co-Chair
Jim Davis
(937) 496-7051
DavisJi@mcohio.org

SW Co-Chair
Lori Kyle
lkyle@co.greene.oh.us

NW Co-Chair
Terri Brenner
(419) 872-8041
tbrenner@ci.perrysburg.oh.us

NE Co-Chair
Bev Hoffman
wwlab@genevaohio.gov

NE Co-Chair
Tom Zocolo
tzocolo@akronohio.gov

Committee mission statement:

The OWEA Laboratory Analysis Committee (LAC) strives to provide relevant and timely information on laboratory regulation and policy for the collection and analysis of wastewater and surface water samples. We strive to provide training in a relaxed, stress-free manner, to ensure the ability for participants to gain knowledge and skills to benefit them in their professional environment.

Join Your Section's Lab Analysis Committee

Certified wastewater analysts are a valuable resource to the industry. Network with and learn from other certified wastewater analysts in your area. Learn how to become certified by contacting the LAC Chair in your section.

Young Professionals Committee Update

by Lindsey Hassenauer, OWEA YP Committee Chair

Are you a YP attending the OWEA conference in June? Here are some YP related items and tips to consider:

- Be sure to check the "Young Professional" box when registering on the OWEA website.
- At the conference, stop by our booth near registration to sign up to receive email YP updates from your section and to receive your YP ribbon.
- Come to the YP Mixer on Wednesday, June 26 from 5 PM to 6 PM in the Tall Pines room
- Sit in on the presentations by the YP Award Winners.
- Sit with a stranger. One of the great things about the state conference is the opportunity to network.
- Join a committee! Whether at the section level or state level, committees are eager to gain fresh perspective from YPs. Involvement on committees is another great way to network as well. Talk to a committee member at the conference, or email your Section President or info@ohiowea.org to get the contact info for the committee you're interested in.

Northwest Update

by Kevin Connor, NW YP Chair

The Northwest section YP group is planning an outing with the NW OAWWA YP group this year. Details will be sent out closer to the event. If you are looking to attend northwest YP events or have any ideas for future events feel free to email me at kconnor@cityofdefiance.com to get on the mailing list.

Northeast Update

Ashley Williston, NE YP Co-Chair

Kelsie Senuta, Incoming NE YP Co-Chair

We would like to welcome Kelsie Senuta as the new co-chair to the Northeast YPs. Kelsie will join the current chair, Ashley Williston, and help to plan future Young Professional Events in Northeast Ohio.

The Northeast Young Professional Section is looking for ideas for upcoming YP Events now that the weather is warming up and the days are getting longer. Please feel free to reach out to Kelsie at kelsie.senuta@burgessniple.com or Ashley at ashley.williston@burgessniple.com with any questions or ideas for future events!

Southeast Update

Jamie Mills, Outgoing SE YP Chair

Cody Allison and Tucker Randles, Incoming SE YP Co-Chairs

Happy Spring everyone! It seems like warm weather is upon us and I hope everyone is as excited as I am to finally step outside without a jacket on. As an update for the Southeast Section YP's, we are planning to have two events again this year that will consist of a WWTP tour and social hour afterwards. Furthermore, I have been given the opportunity to serve as First Year Director for the Southeast Section EC. Thus, I'm glad to welcome Cody Allison with Arcadis and Tucker Randles with the City of Columbus as the new YP Committee Co-Chairs for the Southeast Section. Both Cody and Tucker have been active with our Section and with their energy and diverse backgrounds, I'm sure they'll encourage more young professional involvement. It's been my pleasure to serve as your Sections YP Chair and I still plan on staying actively involved in the YP committee so expect to see me at the upcoming YP events. Feel free to reach out to Cody at Cody.Allison@arcadis.com and Tucker at tuckerrandles@yahoo.com with any questions or comments. – Jamie

Southwest Update

Lindsey Hassenauer, SW YP Chair

The SW YP group is hosting a lunch and learn on April 17 with odor control, nutrient removal, and disinfection overview presentations from three Southwest YPs: Amy West, Alyssa Mayer, and Lindsey Hassenauer. Each presentation will offer 0.5 contact hours, with lunch provided by Brown and Caldwell and Hazen and Sawyer.

We are also planning a tour of the MSDGC Sycamore Creek WWTP in Cincinnati on May 9. Details will be emailed out soon!

We are looking for more event ideas for later in the year! Contact me at lhassenauer@hazenandsawyer.com if you have an idea, would like to join the SW YP committee, or to receive SW YP updates.

Young Professionals Committee

YP State Chair and Southwest Chair
Lindsey Hassenauer
Hazen and Sawyer
lhassenauer@hazenandsawyer.com

Southeast Co-Chair
Tucker Randles
City of Columbus
wtrandles@columbus.gov

Southeast Co-Chair
Cody Allison
Arcadis
cody.allison@arcadis.com

Northwest Chair
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Northeast Co Chair
Ashley Williston
Burgess and Niple
Ashley.Williston@burgessniple.com

Northeast Co Chair
Kelsie Senuta
Burgess and Niple
kelsie.senuta@burgessniple.com

Certification Clarifications

by Kathy Richards, Certification Chair

Hello all! I think it is time once again for a refresher about the minimum requirements to sit for the Voluntary Wastewater Laboratory Analyst Certification examination. Please understand that these minimum qualifications are set nationally by the Association of Boards of Certification, in part to ensure consistency and also to help enable reciprocity should your career take you to another state (or even country). Please note that all examinations must be taken sequentially.

Experience must be actual hands on experience in a water pollution control/water reclamation laboratory!

Class	Education	Experience
I	High School or GED	1 Year - 2080 Hours
II	High School or GED	3 Years - 6240 Hours
III	High School + 900 Hrs. Training/Education	4 Years - 8320 Hours
IV	High School + 1800 Hrs. Training/Education	4 Years - 8320 Hours

CLASS I

- High school diploma, general equivalency diploma (GED), or equivalent and
- 1 year acceptable wastewater laboratory experience.

Note that no substitution for education or experience shall be permitted.

Class II

- High school diploma, GED, or equivalent and
- 3 years of acceptable wastewater laboratory experience.

Note that a maximum of 675 contact hours or 68 continuing education units (CEUs) or 68 quarter credits or 45 semester credits of post-high school education in the environmental control field, engineering, or related science may be substituted for 1.5 years of wastewater

laboratory experience.

Class III

- High school diploma, GED, or equivalent and
- 4 years of acceptable wastewater laboratory experience and
- 900 contact hours or 90 CEUs or 90 quarter credit hours or 60 semester credits of post-high school education in the environmental control field, engineering, or related science.

Note that a maximum of 900 contact hours or 90 continuing education units (CEUs) or 90 quarter credits or 60 semester credits of post-high school education in the environmental control field, engineering, or related science may be substituted for 2 years of wastewater laboratory experience. A maximum of 1 year experience in a Class II or higher position may be substituted for 450 contact hours or 45 CEUs or 45 quarter credit hours or 30 semester hours of post-high school education in the environmental control field, engineering or related science.

Class IV

- High school diploma, GED, or equivalent and
- 4 years of acceptable wastewater laboratory experience and
- 1800 contact hours or 180 CEUs or 180 quarter credit hours or 120 semester credits of post-high school education in the environmental control field, engineering, or related science.

Note that a maximum of 900 contact hours or 90 continuing education units (CEUs) or 90 quarter credits or 60 semester credits of post-high school education in the environmental control field, engineering, or related science may be substituted for 2 years of wastewater laboratory experience. A maximum of 2 year experience in a Class III or higher position may be substituted for 900 contact hours or 90 CEUs or 90 quarter credit hours or 60 semester hours of post-high school education in the environmental control field, engineering or related science.

Additional information regarding education & experience

- Education applied to the experience requirements shall not also be applied to the education requirements.
- Experience applied to the education requirements shall not also be applied to the experience requirements.
- Where applicable, related experience in operations, maintenance, other environmental control utility positions, and allied trades such as a hospital laboratory technician or other certification categories may be substituted for one- half of the experience requirement.

If you have any questions as to whether or not you qualify, please contact me before you apply and I will assess your eligibility.

Kathy Richards, Director, OhioWEA Certification Board

certification@ohiowea.org

2019 Student Design Competition

by Krishna Chelupati

The Northeast Section of the Ohio Water Environment Association (NESOWEA) launched the 2019 Student Design Competition (SDC). This competition is modeled after the WEF Student Design Competition held annually at WEFTEC. The purpose of the competition is to promote "real world" design experience for students interested in pursuing an education and/or career in water and environment science and engineering. The competition is typically geared towards upper class students and/or graduate students, however all students are encouraged to participate.

Case Western Reserve University (CWRU) initiated a new course in Spring 2019 to encourage more students to participate in the Student Design Competition. The nine (9) students from CWRU enrolled in Dr. Kurt Rhoads's class and the eight (8) students from Cleveland State University enrolled in Dr. Sanda Kaufman's class are participating in the 2019 Student Design Competition to meet the class requirements. The Youngstown State University (YSU) team is a new addition to the SDC this year. Paul Solanics and Muralikrishna Chelupati developed the competition guidelines and advised CSU faculty in developing the class syllabus. Students formed teams and selected a problem statement provided by NESWOEA. A kickoff meeting was held with students and faculty from CSU, CWRU and YSU on February 1, 2019 at CWRU campus. We would like to thank Dr. Kurt Rhoads from CWRU, Dr. Sanda Kaufman from CSU and Dr. Tony Vercellino from YSU for their support and encouraging their students to participate in the SDC.

Thanks to Heather Ullinger from the City of Akron for providing a stormwater problem statement and Doug Dietzel from the City of Loran for providing a wastewater problem statement and hosting a plant tour for the students. In addition, we would like to thank Meredith Cariglio, David Gleason, Shakthi Varman Jayavelu and Thomas Zocolo, for graciously volunteering their time to advise the students. Many thanks to Jim Cooper, Mike Welke and NESOWEA Executive Committee for their support and funding for the competition.

Seven teams competed against each other by presenting their innovative ideas at the final competition to a panel of NESOWEA judges on Friday, April 26, 2019 at Cleveland State University.

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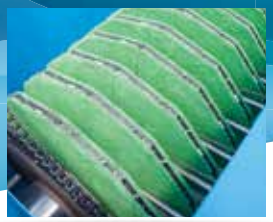

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- The Ohio Water Environment Association is offering a year-long OWEA/WEF membership to students with an interest in the water quality/wastewater field. This is a dual membership with OWEA (as the state member association) and WEF.
- Students must be enrolled in a minimum of 6 credit hours in an accredited college or university.
- Encourage students to apply for a free year-long OWEA/WEF membership at: https://www.ohiowea.org/membership.php

CONTACT

OHIO WATER ENVIRONMENT ASSOCIATION

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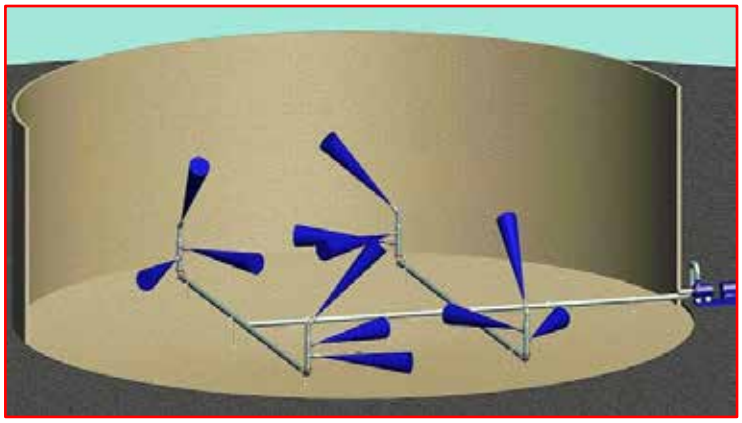
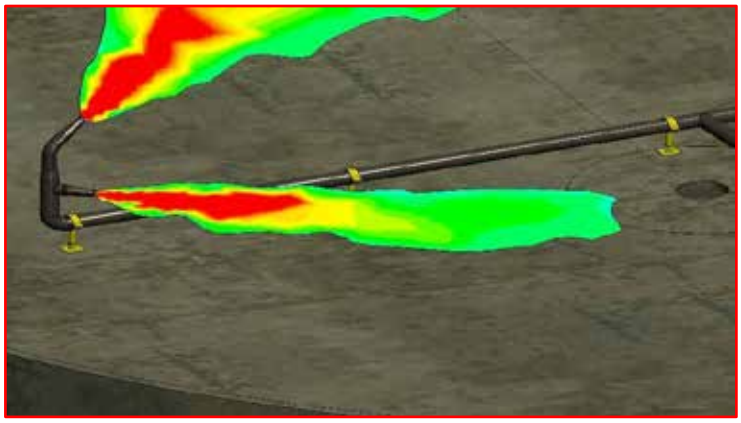
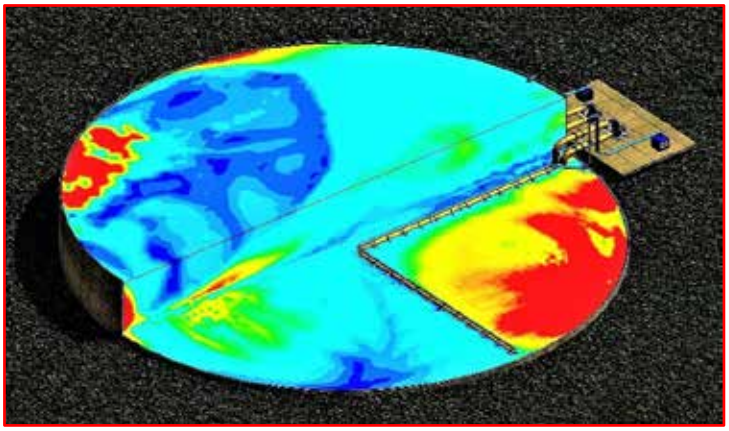


MULTIPLE ZONE SLUDGE MIXING



CFD ANALYSIS



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