Ohio Water Environment Association
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Buckeye Bulletin

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kim.riddell@alloway.com - 419.234.4507

President-Elect Mike Welke
City of Warren
mwelke@warren.org - 330.841.2595

Vice President Jason Tincu
Greene County
jtincu@co.greene.oh.us - 937-562-7414

Past President Fred Smith
CDM Smith, Inc.
smithfj@cdmsmith.com - 614.572.6123

Secretary-Treasurer / WEF Delegate Dale Kocarek
Stantec
dale.kocarek@stantec.com - 614.486.4383

WEF Delegate Ted Baker
Baker and Associates
kingsnu@aol.com - 440.461.4577

WEF Delegate Kathy Richards
City of Akron
KRichards@akronohio.gov - 330.375.2963x7184

SE Delegate Brandon Fox
City of Columbus
bdfox@columbus.gov - 614.645.3153

NW Delegate Jeff Lamson
City of Fremont
jslamson@fremontohio.org - 419.334.3876

NE Delegate Mary Ann Driscoll
Burgess & Niple, Inc.
MaryAnn.Driscoll@burgessniple.com - 330.376.5778x3417

SW Delegate Dave Wilson
BL Anderson
dwilson@blanderson.com - 513.889.4746

2019-2020 Committee Chairs

Annual Conference Jennie Celik and Angelina Joseph
Jennie.Celik@hdrinc.com, ajoseph@enviroscienceinc.com

Auditing Doug Clark and Tom Fishbaugh
douglas.clark@bgohio.org, tfish@fishbaugh.com

Awards Jamie Gellner
jgellner@hazenandsawyer.com

Certification Kathy Richards
krichards@akronohio.gov

Charitable Outreach Afaf Musa and Stephanie Johnson
musaab@cdmsmith.com, sjohnson@msconsultants.com

Collection Systems Bill Horst and Afaf Musa
horstb@mcohio.org, musaab@cdmsmith.com

Contact Hours Marc Morgan
marc.morgan@cantonohio.gov

Governance Kim Riddell-Furry
kim.riddell@alloway.com

Government and Regulatory Affairs Elizabeth Toot-Levy
etootlevy@Geosyntec.com

Vice Chairs: Dale Kocarek and Jason Tincu
dale.kocarek@stantec.com, jtincu@co.greene.oh.us

Laboratory Analysts Melodi Clark and Tony Hintze
mlclark@columbus.gov, thintze@fremontohio.org

Membership Ted Baker
kingsnu@aol.com

Nominating Ted Baker
kingsnu@aol.com

Past Presidents Mike Frommer
MFrommer@co.delaware.oh.us

Plant Operations Joe Tillison and Walter Ariss
jtillison@cityofdelphos.com,walter.ariss@epa.ohio.gov

Pretreatment and Industrial Waste Sharon Vaughn
sharon.vaughn@cityofdayton.org

Public Education Kevin Stilwell
KStilwell@structurepoint.com

Publications Elizabeth Wick
elizabeth.wick@epa.ohio.gov

Residuals Jamie Gellner
jgellner@hazenandsawyer.com

Safety Mike Welke and Nathan Coey
mwelke@warren.org, ncoey@woosteroh.com

Sponsorship Fred Smith
smithfj@cdmsmith.com

Sustainability Paul Fletcher
Pfletcher@jheng.com

Utility Enhancement VACANT

Watershed Anil Tangirala and Bryon Ringley
atangirala@msconsultants.com, bringley@blueheronengineering.com

Young Professionals Lindsey Hassenauer
lhassenauer@hazenandsawyer.com

2019-2020 Section Presidents

NW President Mark Lehnert
mlehnert@cityofdefiance.com

NE President Doug Harris
doug.harris@cantonohio.gov

SW President Erik Torgersen
erik@jagsenv.com

SE President Chris Tarr
ctarr@glec.com

STAFF

Executive Administrator Dawn Sink Kennedy

dawn@ohiowea.org

Association Coordinator Megan Borror

megan@ohiowea.org

Administrative Assistant Chelsea Cameron

chelsea@ohiowea.org

Ohio Water Environment Association

1890 Northwest Blvd, Suite 210

Columbus, OH 43212

T: 614.488.5800

F: 614.488.5801

E: info@ohiowea.org

www.ohiowea.org

Elizabeth Wick, Publications Chair

Dawn Kennedy, Executive Administrator

Megan Borror, Association Coordinator

Chelsea Cameron, Administrative Assistant

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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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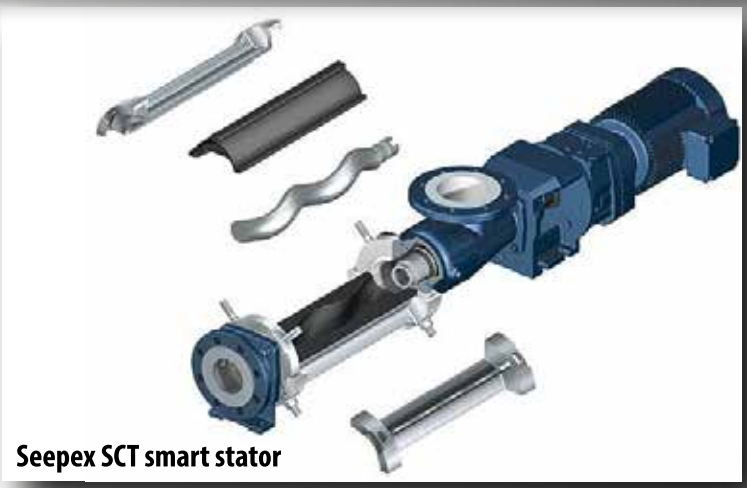
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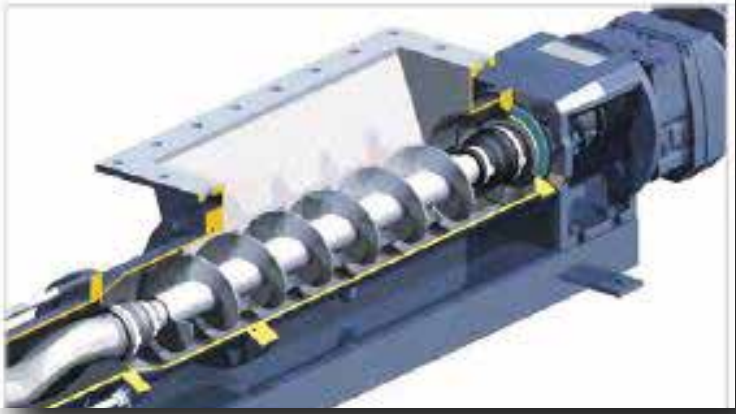

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Kim Riddell-Furry
OWEA President

I am truly honored to be the next President of Ohio Water Environment Association. Thank you to the membership for giving me the opportunity to continue to serve an organization and vocation that I've been very passionate about for over 20 years. It has been my privilege to have worked with many dedicated professionals on the executive committee since 2010. Without the volunteerism of the executive committee, section and committee leaders and our membership as a whole, OWEA would not be the strong and vibrant organization that we are today. It has been my sincere pleasure to have worked with Fred Smith and Jamie Gellner over the past two years that I have been an officer with them. They have both been amazing mentors as I prepared to become President and I only aspire to be the leaders and listeners that they both are... as many of you know and as my father and husband would be glad to tell you – I'm a talker who still has to work on those listening skills some days.

I also want to thank everyone who joined the Northwest Section at the end of June as they hosted the 2019 Technical Conference and Exhibition at Sawmill Creek Resort in Huron, OH. Doug Borkosky, Elizabeth Wick and Dave Sprague certainly outdid themselves again and I know everyone joins me in saying thank you for the spectacular conference on the North Coast! I would also like to say a special thank you to my family for joining me at conference to experience the activities they've been supporting my participation in for the past 17 plus years. Many of you know my daughter Emmalee as she's been a customary fixture during Operations Challenge along with my husband Eric who was at the conference on Monday to assist with the challenge. My parents were also able to join me and I'm so grateful they had the opportunity to come and meet so many folks that are near and dear to me. I also appreciate the support of my employer, Alloway, for providing me the time that is inevitably associated with the leadership roles I've had in OWEA and WEF.

As many have heard me discuss, my primary goal as President is to work with the board and prepare for and roll-out wastewater operator classroom training courses based on the new Wastewater Treatment Fundamentals manuals being produced by WEF. We anticipate these courses becoming available to our membership in 2020 and being offered in various locations throughout the state. If you are interested in assisting in the development of this curriculum or in teaching these courses, please contact me to discuss this effort in greater detail.

In addition, the Board plans to move forward with the initiatives that were identified at our Strategic Planning meeting organized by Fred Smith on April 23rd and 24th of this year. There were four initiatives that came out of that meeting:

- Create an engaging volunteer experience that allows members to have a voice in the organization fostered by personal relationships to achieve personal and professional growth.
- Increase training opportunities for all audiences by providing diverse relevant content with engaging instructors.

Kim is the Director of Business Development for Alloway. She has a Bachelor of Science in Biology from the University of Toledo and a Master's Degree in Organizational Management from Bluffton University. Kim resides in Delphos, Ohio with her husband Eric and her two children. Alex is working on his degree in Wildlife Management at Hocking College and Emmalee is a junior in high school. The family resides in their renovated Queen Anne Victorian home that served the Delphos community as a funeral home for over 80 years. In her spare time, Kim enjoys cooking and hosting family and friends in their home for weekend get-togethers, family holidays and their annual Halloween party.

2019-2020 Executive Committee Meeting Dates

August 14th, 2019	February 12th, 2020
October 15th, 2019	April 8th, 2020
December 10th, 2019	June 21st, 2020

- Elevate the internal and external perception through outreach and public education to enhance the image of the water resource and recovery industry.
- Develop more effective communication tools and techniques to communicate with our membership and others.

These initiatives will be further developed throughout the next year as workgroups and organization leadership turn these concepts into a strategic plan for the organization and set goals and methods to measure our implementation success.

And finally, I am excited to announce that the board voted to move forward in conjunction with AWWA to hold the One Water Joint Conference and Exhibition annually for six years starting in 2021 and rotate this conference around the State of Ohio. The memorandum of understanding between OWEA and AWWA is under development between the two organizations and the conferences are slated to be held towards the end of July or early August based on venue availability. As we work to solidify the details of this MOU, we will be sure to keep the membership aware of all of the exciting details.

I want to close my first President' Message with some additional thoughts of gratitude. I want to thank Jane Winkler and Dale Kocarek for their years of continued service to OWEA. Jane has served as Secretary / Treasurer for OWEA for the past 18 years. Dale was OWEA President from 2010 to 2011 and since then has served as a WEF Delegate for two terms. Dale will be continuing his service to OWEA as the newly elected Secretary / Treasurer. Thank you to both of you for your many years of dedication to OWEA. I want to thank the Executive Committee and welcome our newest member, Dave Wilson (SWOWEA Delegate) to the fold. I also want to thank the OWEA staff. Dawn, Megan and Chelsea – you ladies always take care of business and do a wonderful job of supporting our members. And finally, I want to thank everyone who generously donated to the fundraising efforts at the annual conference for the victims of the tragic event on May 31st in Virginia Beach that affected some very dear friends and colleagues of ours in the Operations Challenge community. Thank you to Ted Baker who MC'd for the evening and to all of the members and companies who participated. I know your kindness and generosity is greatly appreciated.

Again, thank you for this opportunity to continue to serve OWEA. Don't hesitate to contact me if you have any concerns, ideas or questions at kim.riddell@alloway.com. I look forward to the next year!

Welcome New Members

April 2019 - June 2019

Todd Abbott	Nicole Erkkila	Norman Jackson	Julie Montero	Jacob Sinn
John Aravai	Derrick Fairbanks	Michael Keating	Sapna Mulki	Ronald Sockman
Asnika Bajracharya	Joseph Fornaro	Steve Lambert	Josh Mullins	Buddy Stanford
Alex Berki	Mike Funk	Kenneth Langenderfer	Dennis Murphy	Cory Stewart
Stephen Beros	Matt Gabler	Christopher Lavery	Scott Myers	Heather Ullinger
Owen Bledsoe	David Gardner	Brandon Long	Robert Nye	Emma Van Dommelen
Matt Brackman	Josh Goodridge	James Lorence	Christine Okonak	Siena Van Horne
Robert Budzilek	Seth Grimes	Mark Loria	Chelsey Paquette	Lanny Wallace
Mark Chandler	Juan Guzman	Mackenzie Love	Robert Pesarchick	Zachary Wengerd
Gary Christie	Randie Hall	Eric Mack	Nathan Pietras	Sven Wiberg
Tim Cox	Isabelle Hammer	John Miller	Adam Rothermel	Emma Williams
Christopher Cypcar	Sarah Helbig	Craig Miller	Jeffrey Rowe	Brandon Worden
Aaron Deaton	Eric Honaker	Brian Mishey	Mark Shelf	Austin Wurm
Patrick Dodds	Otis Hooper	Dave Modd	Steve Simmons	Hanbae Yang

Thank you for joining the Ohio Water Environment Association and the Water Environment Federation.
We welcome your contribution to preserving and enhancing Ohio's water quality environment.

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Kelli Jamison
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Dave Wilson
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2019 Award Winners

F.D. DEAN STEWART AWARD

The F.D. Dean Stewart Award is presented to an individual for his/her efforts in plant operations, maintenance, and especially for his/her keeping of records and reports of operations.

Tracy Mills
City of Canton/ Retired

Tracy is a true professional and excelled at managing Canton's Water Reclamation Facility (from which he just retired). His leadership resulted in Canton's WRF receiving multiple National Association of Clean Water Agencies peak performance awards. His detailed and complete documentation procedures have aided in everything from annual budgeting to providing crucial data for design projects to zeroing in on operational problems.

He spearheaded the current WRF improvement project, that will result in the Canton WRF being the largest Kubota membrane facility in North America, at a flow rate of 39 MGD.

Tracy was a leader in our industry (and 5S member). He was on the executive committee in both the NW and NE sections, was a past president of OTCO Board of Trustees, served on many committees and was recognized by winning many awards including the F.H. Waring, J.W. Ellms, and WEF Hatfield awards. His organizational skills lead to Canton awarding him the Mayor's Cabinet's Choice Award.

J.W. ELLMS AWARD

The J.W. Ellms Award is presented to an individual who is in an administrative or supervisory position, stressing participation in conference activities, civic affairs, and leadership.

Paul Solanics
City of Solon

Paul is a Class IV Operator and Director of Water Reclamation for the City of Solon. He has supported and helped develop the NE Ohio Young Professionals Group into a very successful group. Paul attends most YP events and has a contagious personality that encourages YPs and college students to become involved in OWEA and the wastewater industry.

Paul was instrumental in establishing Cleveland State University's Environmental Professionals Internship Program and hiring the CSU interns at Solon's WRF. Paul has developed a partnership with CSU's Student Environmental Movement Group. Members have attended NESOWEA YP events, hosted beach cleanups, and held resume review events. He launched a Student Design Competition, modeled after the WEF competition, to promote "real world" design experience for environmental engineering students.

Paul is a past president and active member of NESOWEA and is always willing to share his time and ideas to improve the perception of our industry. He is a 5S member, winner of OWEA PWO Award, WEF Hatfield Award, and Larry Moon Award.

F.H. WARING AWARD

The F.H. Waring Award is presented to an individual who has demonstrated a significant contribution to the field of industrial waste treatment through administration, operation, research, development, or treatment.

Kristi Babcock
City of Wadsworth

Kristi is a Class IV certified operator and is the superintendent at the City of Wadsworth Regional WWTP. She also has her Pesticides License and is certified in confined space entry. Previously, she was the Assistant Superintendent at the city of Defiance Water Pollution Control Center. While at both Defiance and Wadsworth, Kristi has been responsible for the Industrial Pretreatment Program. In addition to the routine, Kristi takes additional effort to identify any health and safety concerns with pollutants discharged to the collection system that may impact the crews that maintain the system. She meets with new industries to communicate pretreatment requirements and to assess potential impacts on the water pollution control center from the proposed discharge. Kristi's skill set, knowledge, and attitude allow the city to work with their industries beyond the point of a violation letter. Her professional style and effort are an integral part of the pretreatment program.

W.D. SHEETS AWARD

The W.D. Sheets Award is presented to an individual who is active in the field of education and demonstrates outstanding accomplishment and service in the field of training and education of students for the positions in the areas of operation and design of wastewater facilities.

William Beyer
MSDGC

William (Bill) Beyer is the Treatment Supervisor for the West Section of the Metropolitan Sewer District of Greater Cincinnati, MSDGC. Bill is responsible for overseeing the operations and maintenance of all five of the districts West Section Treatment facilities. Bill has over 40 years of experience in the industry with MSDGC and the Clermont County Wastewater District. Bill has worked as everything from an entry level operator to his current position as Treatment Supervisor. Bill holds a class IV wastewater certification from the OEPA. Bill has been instrumental in supporting numerous SWOWEA section meetings and plant tours held at West Section treatment facilities. Bill is responsible for training of all staff at the five plants he oversees. Bill has been an instructor at the SW section Plant Operations Education days for over ten years and has trained or prepared over 500 students for taking their state certification exams. Bill is always will to go out of his way to share his extensive knowledge with new operators.

L.T. "TOM" HAGGERTY AWARD

The L.T. "Tom" Hagerty Award is presented to a public agency employee who unselfishly provides guidance and assistance to wastewater plant operators and superintendents as a part of his/her duties within an agency.

Joseph Hadley, Jr.
Northeast Ohio Four County Regional Planning and Development Organization (NEFCO)

Joe has been with Northeast Ohio Four County Regional Planning and Development Organization (NEFCO) for 43 years, now as Executive Director. Through Joe's leadership, for the past 20+ years NEFCO has hosted monthly meetings to provide a forum for leadership (including licensed operators, sanitarians, and engineers). 181 presentations have been planned by NEFCO Staff and approved by Ohio EPA for contact hours.
His commitment to Ohio's water environment is obvious. Under Joe, NEFCO, OEPA and municipalities have collaborated in regional watershed restoration, including removal of four of six dams on the Cuyahoga River, to restore the river to its natural condition.

Joe planned dozens of formal educational presentations across the region promoting the importance of providing an improved strong updated 208 Plan to support watershed goals made by active participating community leaders. These updated plans now serve as a road map to ensure protection of Lake Erie, Ohio River, and Mahoning Rivers watersheds.

ENGINEERING EXCELLENCE AWARD

The focus of this award is on a project and not a person. The selected project must have been in operation for a period of one (1) year and not more than five (5) years.

City of Fremont Water Reclamation Center

The City of Fremont Water Reclamation Center's $65million expansion project was completed in 2016. The new facility has an average daily design flow of 7.6MGD with a peak flow of 24MGD. The improvements include new influent headworks facilities, grit management facility, an Anaerobic, Anoxic, Oxic (A2O) biological nutrient removal activated sludge system, secondary clarifiers, cloth disc filter system, UV disinfection, a final effluent pump station, an Autothermal Thermophilic Aerobic Digestion (ATAD) biosolids system, RAS/thickening facility, diesel powered backup generator, a new administration building that includes an updated lab and maintenance garage. The city used an alternative project delivery method, known as construction manager at-risk (CMAR). With this method, the CMAR firm serves as a consultant during the design phase, then acts as the general contractor during the construction phase. By using CMAR, the city saved $5.5million during the design phase and more than $500,000 in the construction phase. Compared to the effluent of the previous facility, ammonia has been reduced by 60%, nitrate/nitrite by 74% and total phosphorus by 38%. The average daily influent flows have increased 52% (4.78-7.3 MGD) over the last 3 years. The combined sewer overflow volumes have decreased by 90 percent, a result of expanding plant capacity. The project was designed by MWH, now Stantec.

PROFESSIONAL WASTEWATER OPERATIONS AWARD

The Professional Wastewater Operations, P.W.O. Award, honors individuals doing front-line work who have contributed practical application, professionalism and dedication to their particular wastewater treatment system.

Albert B. Stroop
City of Fairborn

Albert (Barry) Stroop is a Plant & Pump Operator for the City of Fairborn Water Reclamation Center. As part of the WRC team, Barry is responsible for daily operations of the WRC and sewage system lift stations. Barry has over 35 years of wastewater experience with the Greene County Sanitary Engineering Department and the Fairborn WRC. Barry holds a class III wastewater certification from the OEPA. Barry's positive, can do attitude keeps morale high. Additionally he continues to draw upon his 30+ years of wastewater experience to help assist with problem solving when out of the ordinary issues come up. He takes great pride in the performance and appearance of the Fairborn WRC and makes an extra effort to ensure high standards are the norm.

PUBLIC SERVICE AWARD

The Public Service Award is presented to an elected Ohio official or officials demonstrating a significant commitment to the protection and improvement of the water environment. Awardees need not be a member of the Ohio Water Environment Association.

Joshua P. Gillespie
Mayor of City of Delphos

Mayor Gillespie has held the office of Mayor for the City of Delphos since December 2017. Mayor Gillespie is a Relationship Manager for the U.S. Bank. He is also a USMC Veteran and served as an EMT for Delphos for almost 12 years. Mayor Gillespie has demonstrated his commitment to the protection and improvement of the water environment through his tenure in city government. In the first decade of operation of the new WWTP, there were many equipment failures, design issues and technology advances that led to the community choosing to upgrade the WWTP. Mayor Gillespie has been very supportive of these upgrades and worked to ensure that the community understood the reasons behind these upgrades. Mayor Gillespie has implemented other educational pieces in the community that work to support water quality and environmental education. He has scheduled and held community tours of the water and wastewater plants. He has the city council meetings televised on Facebook Live to help ensure all citizens have access to information. He has brought city council together and encouraged everyone to work together towards the common goal of protecting the water quality for the citizens of Delphos.

LABORATORY ANALYST AWARD

This award recognizes a laboratory analyst who has demonstrated excellence and professionalism in his/her daily laboratory work.

Karen L. Tenore
Retired from City of Dayton

Karen Tenore was the Laboratory Manager at the City of Dayton WRF. Karen retired in 2019 with 29 years of service with the City of Dayton WRF. Karen holds an OWEA Laboratory Analyst IV certificate and an OEPA Wastewater Operator III certificate. Karen has been the SWOWEA Laboratory Analyst Committee chair or co-chair for over 17 years, attending all SWOWEA LAC meetings, most SWOWEA meetings, and numerous State OWEA conferences. Karen was active with the SWOWEA Education Committee, organizing the SW District Science Fair judges and helping judge the District 10 and District 1 Science Fairs. She also helped judge the Laboratory part of the Ops Challenge. Karen was instrumental in instructing operators and interns on laboratory processes to assist in furthering their abilities to attain certificates and enhance their resumes. Karen was always part of plant tours for grade school, high school, and college students.

Michael R. Heniken
City of Columbus

Mike Heniken was the Laboratory Supervisor at the City of Columbus Surveillance Lab and he retired in 2018 with 40 years of service. Mike holds an OWEA Laboratory Analyst IV certificate and an OEPA Wastewater Operator III certificate. He is a member of the Crystal Crucible and the 5S. He has been a professor at Columbus State and worked with Ohio State University at Stone Lab for over 30 years. Mike was one of the first state Lab chairs for OWEA. HHe has been a judge for the Operations Challenge Lab event for many years and has attended all of the SEOWEA Lab meetings along with countless SEOWEA section meetings. Mike has presented at State and local OWEA workshops as well as always being a part of the Lab tours for section meetings and college students. Mike was the head of safety for the lab for over 40 years and helped build the Surveillance Lab when it was moved to its current location.

LIFETIME ENGINEERING AWARD

The Lifetime Engineering Achievement Award was established to honor a member who, as an Ohio design engineer, has consistently delivered good basic engineering design of wastewater facilities over a period of 20 or more years. The awardee must be an Active, Lifetime, or Retired member of OWEA, recognized by his/her peers as having demonstrated a high level of competence in the design profession.

Vui Chung
Burgess & Niple

Vui Chung has 32 years of experience with B&N and has a Bachelor of Science Degree in Civil Engineering from The Ohio State University and is a licensed professional engineer in the State of Ohio. Ms. Chung has managed numerous capital improvement projects for water and wastewater treatment plants. Project sizes range from 1.5 million gallons per day (MGD) to 125 MGD. She has been project manager for various capital improvement projects including the Southerly WWTP Chemically Enhanced Primary Treatment (CEPT) Disinfection and the Jackson Pike WWTP New Headworks projects for the City of Columbus, DOSD as well as Southeastern Correction Institution WWTP Upgrade located in Lancaster, Ohio for the Ohio Department of Rehabilitation and Correction.

Richard Reed, PE
CTI Engineers, Inc.

Rick's 30 years in the industry have given him the opportunity to manage a multitude of wastewater treatment plant and collection system design projects in NE Ohio. His first projects were accomplished while he was with Summit County Department of Environmental Services. For the past 23 years, he has worked with CTI Engineers for which he is now President and CEO.

In addition to his PE, Rick is an Ohio EPA Class III Wastewater Operator. As a result, Rick specializes in and prides himself in designing plants that are technically sound, robust, and operator friendly. He is not afraid of using new technology – where it makes sense. He served as a member of Ohio EPA's Operator Certification Advisory Council for 10 years as one of two registered engineers on the council.

Rick served at Treasurer for the NESOWEA for two terms.

COLLECTION SYSTEM AWARD

The Collection System Award is presented to an individual for contributions to the advancement of state-of-the-art wastewater collection.

John Barton, PhD, PE
MSDGC

John is the Principal Engineer in the Watershed Operation Division of the Metropolitan Sewer District of Greater Cincinnati. John earned his Ph.D. in Environmental Engineering from the University of Cincinnati and has a Master's Degree in Civil Engineering from the University of Illinois, he also holds two patents in micro monitoring. John's primary responsibility lies in the area of system monitoring and modeling. John has made great advances in MSDGCs monitoring system, integrating it with SCADA and generating a continuously updated system wide model to support operations and engineering decisions. John has presented at many WEF and OWEA conferences over the years in the areas of I&I, monitoring and modeling. John's abstract was accepted for presentation at the OWEA Technical Conference where he will speak along with his team on the work they have done for MSDGC. The accurate sewer system data he provides is invaluable to the Collections Division and Treatment Facility operations.

FACILITY IMAGE AWARD

This Award is intended to recognize OWEA members who have enhanced the image of our profession by improving the physical image of their workplace or through outreach programs to schools and the general public.

The Northwestern Water and Sewer District

The Northwestern Water and Sewer District, "The District," provides water and sewer services in Northwest Ohio. A primary focus for The District's communication plan is to showcase their workforce. One example has been to feature their Operations Challenge Team, "Dirty Deeds" on social media through photographs and live video on their journey to compete at WEFTEC. The District also features its employees on social media through professional photographs that capture their team on the job doing various functions that support the mission. Each year, The District hosts an Open House, showcasing the employees and where they work. District employees take pride in where they work and like to show it to others at this annual event. Another public outreach effort included launching a new, mobile and user-friendly website in 2018 www.nwwsd.org. They also send a newsletter to all customers updating them about the District's work each month.

WEF WILLIAM D. HATFIELD AWARD

Presented to operators of wastewater treatment plants for outstanding performance and professionalism.

Michael Nixon
City of Lancaster

Michael Nixon has served the City of Lancaster for over 36 years. In addition to his responsibilities as Superintendent of Lancaster's two water pollution control facilities, and all of the collection system, he is also the Superintendent of Lancaster's two water plants and all of the distribution system. Mike has been a WEF member for 35 years. He has been instrumental in many state events and conferences through the years and has facilitated over ten Southeast Section meetings in Lancaster. Mike has always supported his staff in becoming WEF members and being active in the organization. In addition, Mike is very supportive of his employees as they seek higher licenses and ongoing education in the field. Mike is involved in many committees outside of his wastewater responsibilities in Lancaster including Fairfield County Emergency Management Committee, the Economic Development Team, and the Stream Corridor Advisory Committee. Mike also worked with Hocking College in development of their Water and Wastewater Management major.

WEF ARTHUR SIDNEY BEDELL AWARD

Established to acknowledge extraordinary personal service to a Member Association.

Douglas Borkosky
Baker and Associates

Doug wears many hats. He is very active in the Northwest Section, he is an active member of his church, he is a Boy Scout leader, he is involved in his boys' school, and he works for Baker and Associates. No matter what Doug is involved in, he gives it his all. He is invaluable to the Northwest Section and OWEA. Doug was co-chair of the 2007, 2011, 2015, and 2019 annual conference committees. He was also a member of the 2003 annual conference committee. Every year since 2006, he has organized and participated in the NW Section Water for People (WFP) pancake breakfast. He has served as the co-chair of the state WFP committee. He is a Past President of the NW Section, an At-Large member of the NW EC committee, and a 5S member. He has been the NW contact hour coordinator, a golf outing coordinator, and the NW AV guy. Doug has a bachelor's degree in Civil Engineering, a master's degree in Environmental and Water Resources Engineering and is a registered Professional Engineer. Doug was awarded the JW Ellms award in 2012.

WEF LABORATORY ANALYST EXCELLENCE AWARD

Recognizes individuals for outstanding performance, professionalism, and contributions to the water quality analysis profession.

Ange Layton
City of Lima

Ange Layton is the Industrial Monitoring Chief at the City of Lima. Ange holds two Bachelor of Science Degrees from Ohio Northern and a Class III Wastewater Certification. She has been a vital part of the Wastewater Treatment lab work for the City of Lima for 11 ½ years. Ange was instrumental in the acquisition of the Ion Chromatography unit and has spent endless hours gaining the skills needed to make the unit perform accurately and efficiently. Ange has also taken on entering the data for the e-DMR and making sure all of the data is entered correctly. She has been instrumental in making sure the lab is operated in a professional and efficient manner. Ange goes above and beyond the duties of her position in the lab and has taken on the responsibilities of Industrial Monitor Chief since the vacancy of that position, along with her normal lab duties.

WEF GEORGE W. BURKE AWARD

Presented to a municipality or industrial wastewater facility for an active and effective safety program.

City of Columbus Jackson Pike Wastewater Treatment Plant

Life Member

The Water Environment Federation's WEF Life Membership is bestowed upon members who have been active for at least 35 years and have reached age 65.

Michael Benza
G. Thomas Graber
Michael Heniken
Guy M. Jamesson
Gary Johnson
Sam Jeyanayagam
Jane Siegwarth

Quarter Century Operator

David A. Davis

2019 Section Sponsored OWEA Awesome Operator Award

NW Section

Carl Stevens, City of Willard
Scott Pifher, City of Willard

Collection System of the year

Northeast Ohio Regional Sewer District

Safety Awards - Collections

1 -9 employees
City of Newark Sewer Maintenance Department

10 -20 employees
City of Fairfield

>20 employees
City of Columbus Surveillance Lab

Safety Awards - Treatment

1 -9 employees
Lake County Department of Utilities - Madison Wastewater District

10 -20 employees
City of Newark

>20 employees
Metropolitan Sewer District- Little Miami WWTP

Minutes of the 2019 OWEA Annual Business meeting

The 93rd Annual Meeting | Sawmill Creek Lodge, Huron, Ohio | June 26, 2019

President Fred Smith called the meeting to order at 3:08 pm. A quorum was established.

President Smith welcomed the group.

Items for approval were the 2018 annual business meeting minutes. Fred stated that Jane Winkler, Secretary-Treasurer, reported that the minutes were published in the Fall 2018 issue of the Buckeye Bulletin. The minutes and Treasurer's report were distributed. Mike Welke made a motion to approve the minutes, with a second by Kim Riddell-Furry. Motion passed. President Smith read the Treasurer's report. A motion to approve the report was made by Mike Welke and seconded by Kim Riddell-Furry. The motion passed.

Section reports were given. Walter Ariss gave the Northwest section report, Melodi Clark reported for the Southeast section, Dave Wilson represented the Southwest section and Doug Harris presented the Northeast section report. Each outgoing section President was presented a certificate of appreciation for their service by President Smith.

The WEF Delegate report was given by Dale Kocarek. This was Dale's last year as Delegate. The new WEF delegate will be appointed by September.

Standing/Ad hoc committee reports- Committee chairs were permitted to give brief updates on their committee's activities.

Items for Voting-

Nominations and elections- Elizabeth Wick presented the 2019-2020 slate of nominations as President–Kim Riddell-Furry, President Elect – Mike Welke, Vice President- Jason Tincu and Secretary-Treasurer- Dale Kocarek. The motion was made by Elizabeth Wick to accept the slate as presented. Second by Leon Smith. Motion passed. Fred Smith will serve as Past President. Dave Wilson the will serve as the new SW delegate.

There were no other announcements from those present. A motion to adjourn was made by Mike Welke, second by Kim Riddell-Furry. Motion carried.

President Smith adjourned the meeting at 4:15 pm.

Submitted by Jane Winkler, Secretary-Treasurer

For publishing in the Fall 2019 Buckeye Bulletin

There was something for everyone at the

Change

Networking

Golf

Knowledge Transfer

OWEA 2019 Technical Conference

Competition

Matching Frames of Mind

Fun

Honor

There was something for everyone at the OWEA 2019 Technical Conference

Looking to the Future

Pizza

Recognizing Excellence

Family

SIDNEY INNEREBNER

Sidney is the Principal and Owner of Indigo Water Group, based in Littleton, Colorado. Indigo specializes in water and wastewater treatment projects and has been involved in numerous projects from planning through permitting and construction.

She is also the author of the new WEF Operator Manual.

OWEA

2019 PLANT OPERATIONS & LAB WORKSHOP

Eric is the Co-Owner, Principal Instructor and Wastewater Treatment Plant Operations Consultant at Wastewater Technology Trainers in Orange County, California.

ERIC WAHLBERG

OCTOBER 3RD & 4TH

THURSDAY & FRIDAY

NATIONWIDE HOTEL & CONFERENCE CENTER

LEWIS CENTER

THIS TWO DAY WORKSHOP WILL BE AN INTERACTIVE EXPERIENCE THAT WILL ALLOW YOU TO LEARN FROM NATIONAL EXPERTS AND EACH OTHERS' EXPERIENCES.

13 CONTACT HOURS

REGISTER ONLINE AT OHIOWEA.ORG

Western Lake Erie Tributary Water Monitoring Summary

March 1, 2018 - July 31, 2018

lakeerie.ohio.gov

Why is water monitoring done, and by whom?

Federal, state, and educational institutions conduct water monitoring for a variety of reasons.

The U. S. Geological Survey (USGS), along with its federal, state, and local partners, investigates the occurrence, quantity, quality, distribution, and movement of surface and ground waters and shares data with the public and other agencies involved with managing our water resources.

Ohio EPA conducts water monitoring for Total Maximum Daily Load development and to assess trends in impairment.

ODNR is interested in protecting recreation, fish, and wildlife water uses.

Educational institutions such as Heidelberg University's National Center for Water Quality Research do water testing to answer research questions.

What do we measure?

A large number of components are measured. This summary focuses on total phosphorus, dissolved reactive phosphorus, and nitrogen in the form of nitrate (NO_2) + nitrite (NO_3).

The amount of water in the rivers is measured by USGS at their streamflow gaging stations.

Why this summary?

This summary provides a simplified overview of nutrient loads and concentrations that have been shown to be highly correlated with harmful algal blooms in Lake Erie.

Summarizing the results of these water monitoring efforts provides critical information to agencies and the public. This summary is a tool for tracking annual changes and comparisons to water quality goals established by Annex 4 of the Great Lakes Water Quality Agreement and the Western Basin of Lake Erie Collaborative Agreement.

Where is the water monitored?

Ohio EPA, ODNR, USGS, and Heidelberg University have established many sampling stations in the Lake Erie watershed. Some of these stations are in the same locations to take advantage of USGS streamflow gage locations.

The stations in Figure 1 were chosen from a larger set to indicate the nutrient contributions upstream of the lake influenced sections of the rivers. Due to its large size, several tributaries to the Maumee River were also included.

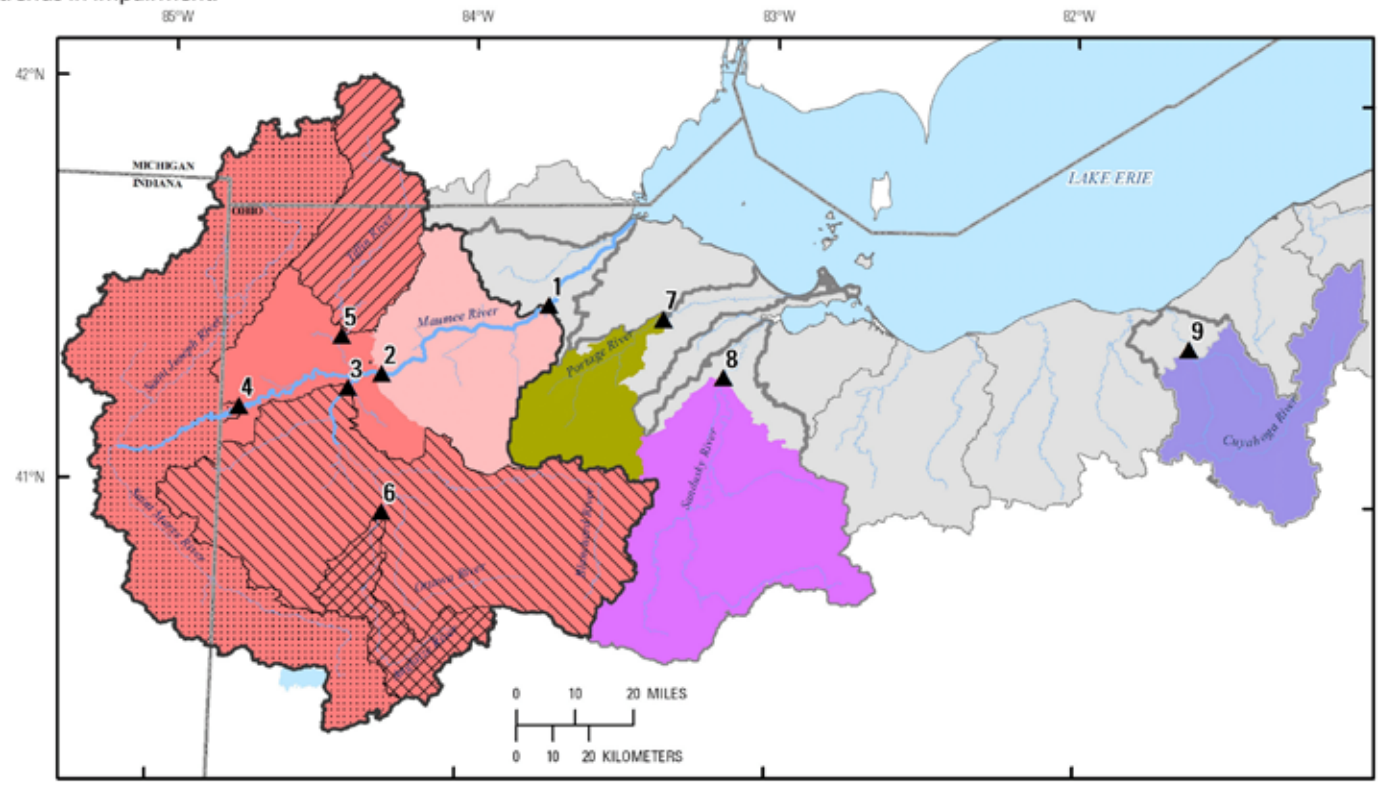


Figure 1: Sampling stations discussed in this report.

Station 1: Gage 04193500 - Maumee River at Waterville
Station 2: Gage 04192500 - Maumee River near Defiance
Station 3: Gage 04191500a - Auglaize River near Defiance d/s Dam
Station 4: Gage 04183500 - Maumee River at Antwerp
Station 5: Gage 04185318 - Tiffin River near Evansport
Station 6: Gage 04186500 - Auglaize River near Fort Jennings
Station 7: Gage 04195500 - Portage River at Woodville
Station 8: Gage 04198000 - Sandusky River near Fremont
Station 9: Gage 04208000 - Cuyahoga River at Independence

Water Monitoring Summary *March 1, 2018 - July 31, 2018*

What were the nutrient levels for Spring 2018?

This set of charts compares nutrient levels at these stations for the spring months of March through July. This period is used because the Annex 4 subcommittee determined that phosphorus contributions in the spring correlate well with the occurrence of harmful algae blooms. Nitrogen is included because of its potential role in augmenting the blooms or their toxicity. The six Maumee River stations are grouped together to the left of the vertical line for ease of comparison, going roughly upstream to downstream from the left to right.

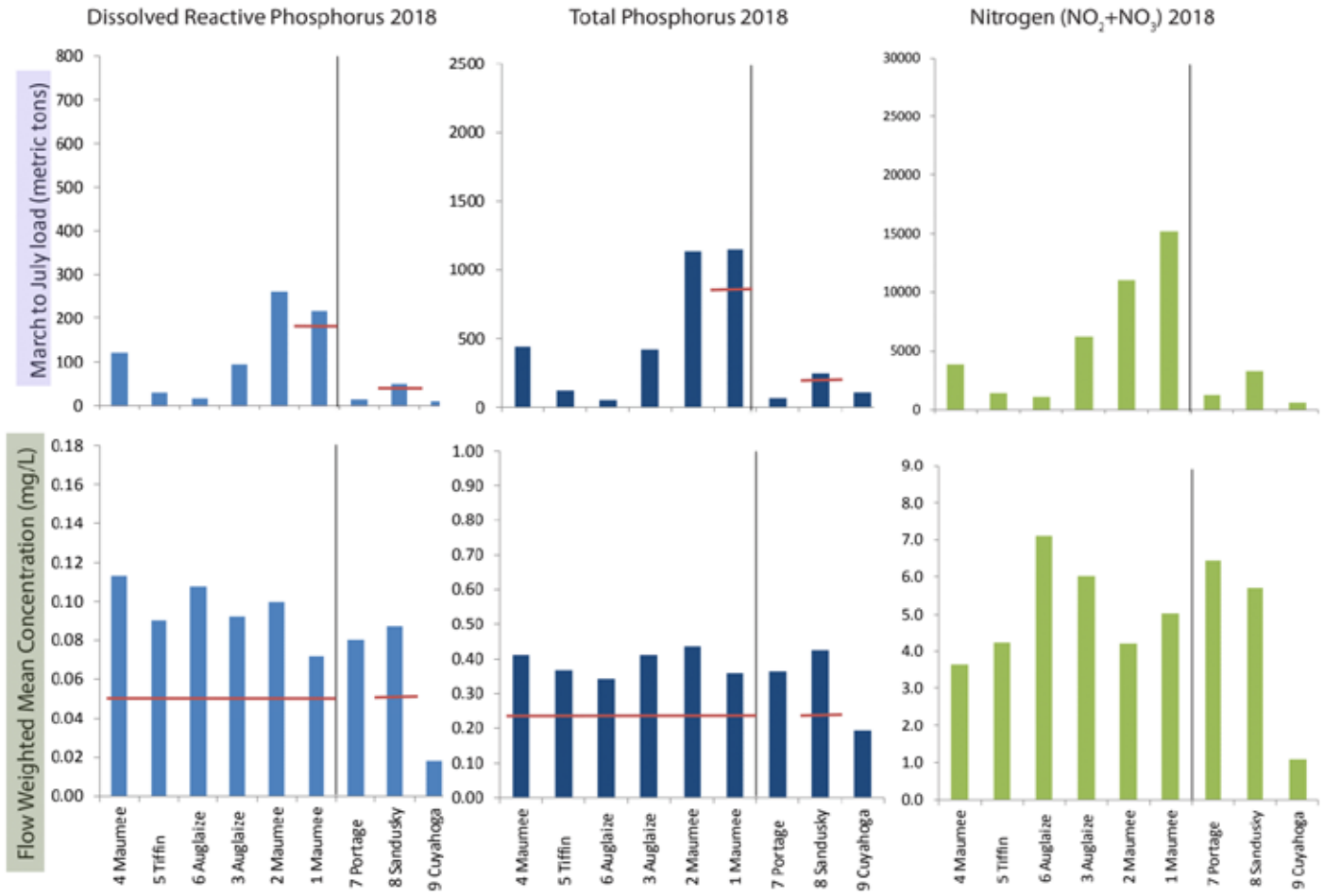


Figure 2: Side by side comparison of loads and flow weighted mean concentrations. Axis titles at bottom and left. Red lines indicate target levels at the points where they apply (not all targets are the same at all locations). Station numbers as in Figure 1.

March-July Load (MT)

The loading graphs across the top show that the two farthest downstream sites on the main stem of the Maumee River have the largest nutrient loads. The Portage, Sandusky, and Cuyahoga Rivers have a much lower contribution to the overall nutrient loading.

Within the Maumee River, the smaller watersheds of the Tiffin and upper Auglaize River also have relatively low loads.

In 2018, the Annex 4 target loads were exceeded for both dissolved reactive phosphorus and total phosphorus as indicated by the red lines at the Maumee River near Waterville station where the target is applied. The Sandusky River load targets were also exceeded.

There are no targets for nitrogen, but the pattern of loading is similar because it is also influenced by the amount of flow.

Flow Weighted Mean Concentration (mg/L)

The corresponding concentration graphs are shown across the bottom. Dissolved reactive phosphorus concentrations ranged from 0.072 to 0.113 milligrams/liter (mg/L) in the Maumee, Portage, and Sandusky Rivers.

Total phosphorus flow weighted mean concentrations for all stations ranged from 0.193 mg/L in the Cuyahoga River to 0.436 mg/L in the Maumee River at Defiance.

In 2018, the Annex 4 target flow weighted mean concentrations were exceeded at all stations for both total phosphorus and dissolved reactive phosphorus. This target applies throughout the Maumee River watershed and for the Sandusky River.

What is Flow Weighted Mean Concentration (FWMC)?

The FWMC represents the total load for the time period divided by the total discharge for the time period. FWMC standardizes the measure of phosphorus delivery from a tributary so that year-to-year and trib-to-trib performance can be compared despite different flows.

Water Monitoring Summary — *March 1, 2018- July 31, 2018*

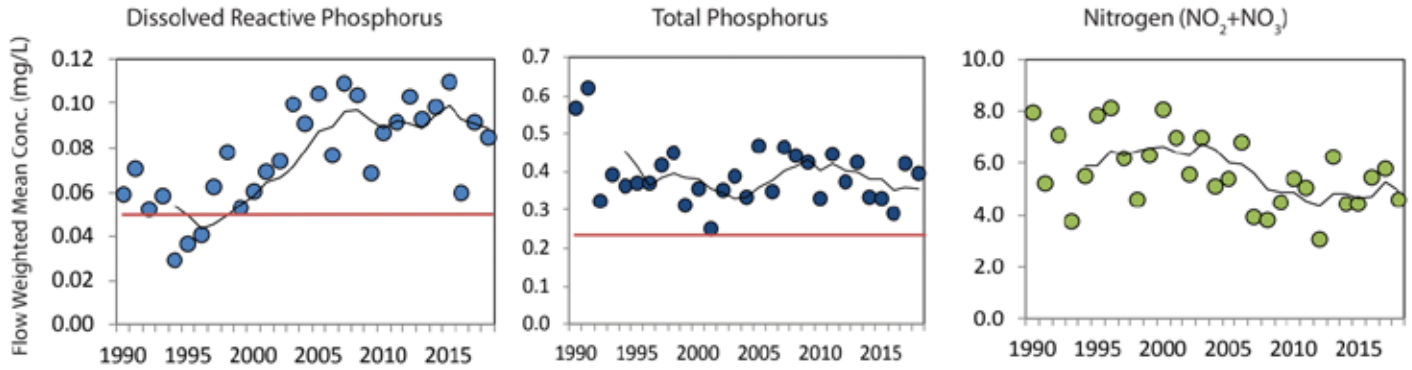


Figure 3: Annual nutrient flow weighted mean concentrations for the Maumee River at Waterville by water year. The five-year running average (black line) smooths out annual variation and shows trends. The red line is the Annex 4 target flow weighted mean concentrations.

How does 2018 compare to previous years?

Figure 3 shows that dissolved reactive phosphorus has been at about 0.09 mg/L since 2003, after increasing from its recent lows in the mid-1990s. Note that in the mid-1990s, the dissolved reactive phosphorus flow weighted mean concentrations were below the 0.05 mg/L Annex 4 target level, but more recently are nearly twice as high. Total phosphorus decreased from its high levels in the early 1990s, but have been about the same at around 0.4 mg/L since. Nitrogen levels seem to have increased slightly the last two years but are still lower than the averages in the 1990s.

Where are the nutrients coming from?

This map shows the spatial distribution of dissolved reactive phosphorus flow weighted mean concentrations (triangles) superimposed on total phosphorus load (circles) across nine stations. Dissolved reactive phosphorus concentration was highest in the Maumee River River at Antwerp: 0.11 mg/L (6), but total phosphorus load was highest on the Maumee River main stem at Defiance (2): 1139 MT and at Waterville (1): 1151 MT. Sandusky River at Fremont (8) and the Portage River at Woodville (7) had slightly higher dissolved reactive phosphorus concentrations: 0.087 mg/L and 0.08 mg/L, respectively, than the Maumee at Waterville (1): 0.07 mg/L, but much lower total phosphorus loads at 244 MT and 69 MT, respectively. Within the Maumee River watershed, the Tiffin River near Evansport (5) had the lowest dissolved reactive phosphorus levels at 0.09 mg/L and the Auglaize River at Ft. Jennings (2) had the lowest total phosphorus load at 52 MT. The Cuyahoga River (9) had the lowest dissolved reactive phosphorus concentrations (0.018 mg/L) and a low total phosphorus load (109 MT).

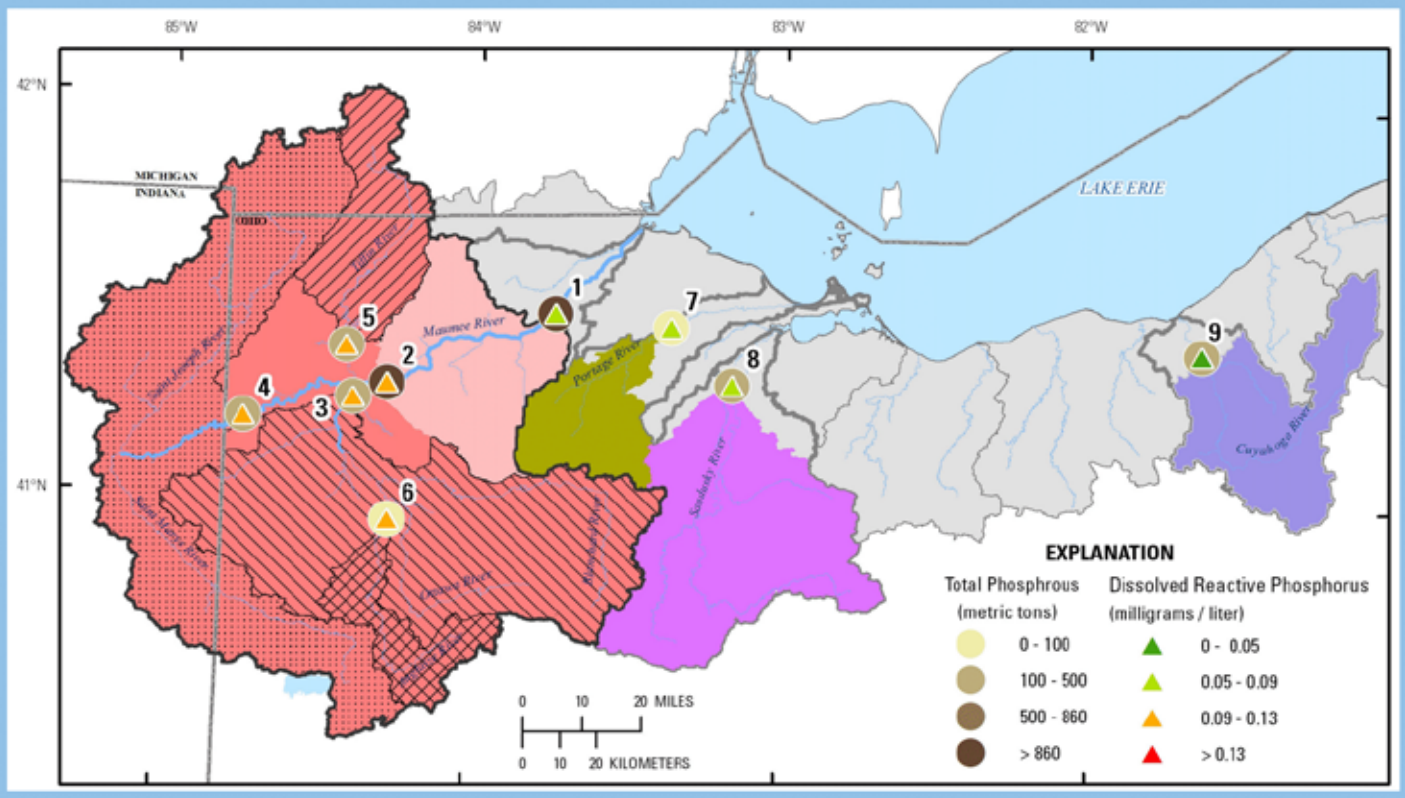


Figure 4: Phosphorus monitoring in the Lake Erie watershed. Data from March 1, 2018 - July 31, 2018.

Water Monitoring Summary *March 1, 2018 - July 31, 2018*

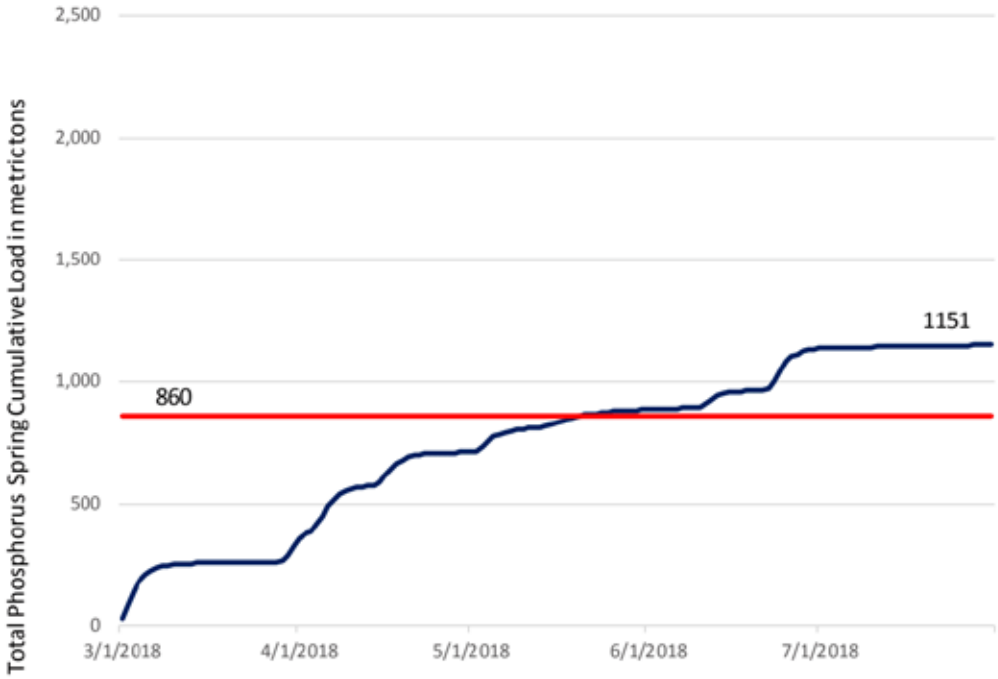


Figure 5: Cumulative total phosphorus loads at the Maumee River at Waterville station (1).

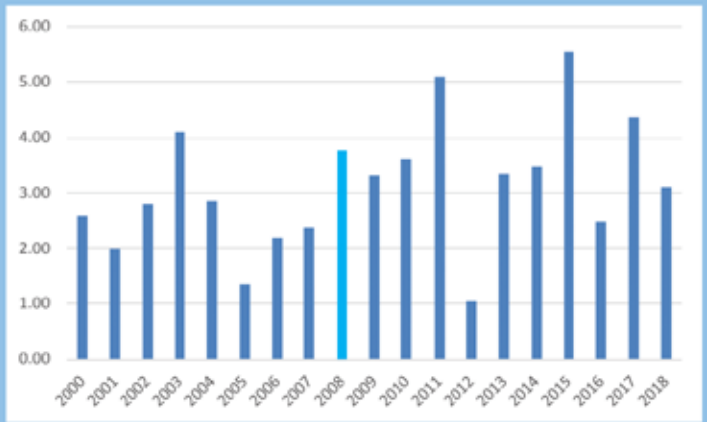
When does total phosphorus enter the rivers?

This graph shows the cumulative load of total phosphorus at the Maumee River at Waterville (1) station for March 1 to July 31, 2018. Each day, the water carries more load past the monitoring station which is summed to create the running cumulative total. When the amount of water moving through the river increases due to rainfall, the load increases.

Total phosphorus movement through the system is closely coupled to the timing of rainfall, as shown by the jumps in loads in March and April. In 2018, rains in March and April increased the total phosphorus load at this station above the 860 MT Annex 4 target load by the end of May. More rainfall in June led to a final total of 1151 MT, 34% higher than the target.

How wet was spring 2018 in comparison to spring in the target year of 2008?

The amount of flow for the period is a major factor influencing how much phosphorus and nitrogen moves down the river into the lake as runoff. For the period March 1-July 31, 2018, flow in the Maumee River at Waterville (1) was **3.02** km³. By comparison, flow for March 1-July 31, 2008 (base year for the target loads and concentrations, and selected because it represented a wet year) was **3.76** km³. Flows at this station for these months for the period 2000-2017 averaged 3.13 km³. So, flow in 2018 was not as wet as the target year - about 20% less than the amount of flow recorded in 2008 - and it was also slightly less than the recent past average.



Concentration and Loading information can be accessed at http://arcg.is/21i9CUF (USGS) and https://ncwqr.org/ (Heidelberg).

A publication of the Ohio Lake Erie Commission with the assistance of the following partners:

Ohio | Lake Erie Commission
Environmental Protection Agency
Department of Natural Resources

USGS science for a changing world

National Center for Water Quality Research
Heidelberg University

Beavercreek Water Resource Recovery Facility – Greene County, Ohio

by James H Boyd II, Operations Supervisor

The Greene County Board of County Commissioners, committed to protecting the environment and public health, completed construction of the original Beavercreek Wastewater Treatment Plant in 1965, as a way to provide enhanced treatment of the area's wastewater, while also fostering economic growth within the region. The original activated sludge treatment plant was constructed for an average daily flow capacity of 4.6 MGD and a peak daily hydraulic capacity of 12.7 MGD. The plant consisted of screw type influent pumps, coarse screen, grit removal, primary settling, grease removal, aeration basins, secondary clarification, chlorine disinfection, and aerobic sludge digestion. The site also had an administration/ maintenance building and a laboratory.

In 1994, a major expansion of the treatment plant was undertaken to address concerns over plant limitations and the growth rate of the area. The plan for expansion was to utilize existing facilities while constructing a second treatment system on land to the north of the existing facility. This expansion would allow the expanded combined treatment plants to handle an average daily flow capacity of 10.2 MGD and a peak daily hydraulic capacity of 20.4 MGD when completed in 1996. The expansion included a new influent pump station to replace the existing screw pumps, 12 MG of equalization storage capacity, 2 basins at 6 MG each, 2 aeration basins, 2 additional final clarifiers and support buildings to accommodate blowers, pumping systems and standby power capabilities. This project also included a new administration building for plant operations, constructed a modern regional laboratory facility, and repurposed the existing administration building into a facility for the central maintenance group. In 2005, work was started to again increase the treatment of the area's wastewater due to concerns over the amount of nutrients being discharged into the Little Miami River via Beaver Creek. This treatment expansion allowed for

Original Plant Overview

TOP: Equalization Basins
BOTTOM: North Plant Expansion (1996)

the addition of biological nutrient removal, ultraviolet disinfection of plant effluent, and dewatering of biosolids on site. The completion of the 2006 expansion included the addition of anaerobic zones in each aeration basin which resulted in biological nutrient removal; however, the loss of part of the aeration zones resulted in a reduction of the peak flow capacity to the current average flow capacity of 8.5 MGD.

The current layout of the Beavercreek WRRF incorporates many of the standard treatment systems used in treatment plants to provide exceptional wastewater treatment, meet NPDES permit requirements, and support customer needs. These systems include screening, primary clarification, an activated sludge process with biological nutrient removal, secondary clarification, and disinfection. Many parts of the facility have exceeded expected lifespans and created some unique operational challenges for plant staff.

The following section describes the current treatment processes and the challenges which were verified during the completion of the collection system master plan and wet weather stress test.

Head Works and Primary Treatment

The treatment plant uses segmented processes in preliminary treatment combining parts of the original plant and the 1996 expansion. The incoming plant flow reaches a central point where it passes through a mechanical bar rack before reaching the influent pumping wet well. This portion of the plant was installed during the 1996 expansion and allows for screening of the influent upstream of the influent pumps. The current bar rack has some limitations as it does not operate during high flow events during which time the influent wet well becomes surcharged and reaches a level where the drive motor becomes compromised. The removed screenings are not washed after removal limiting the carbon source from entering the treatment plant. After the flow travels through the bar rack, it enters the Influent Pump Building. The Influent Pump Building has 4 -12MGD pumps and 2 -8MGD pumps which were installed as part of the 1996 expansion. Influent pumping is divided between the 4 -12MGD pumps, with 2 pumps dedicated to plant flow and 2 dedicated to filling the facility's 2 -12MG Equalization Tanks.

When flow leaves the Influent Pump Building, it is piped back over to the original pretreatment building where it is processed for grit removal using 2 grit separation units. The flow then proceeds to the Primary Clarifiers which is also the location where oil and grease removal takes place with grease pumps that send the flow through a static screen in the original pretreatment building. During high flow events, the Primary Clarifiers become surcharged and surpass their weirs allowing for oil and grease to enter the rest of the treatment process. This surcharging restricts the amount of flow through the plant to prevent an overflow of the Primary Clarifiers. Surcharging is also an issue due to a restriction at the primary effluent diversion box that splits plant flow between the old and new sections of the facility. The distribution box restriction limits the amount of flow which can enter the

Preliminary screening/ INF Pump station

North Plant Anaerobic Zone/ Aeration

plant to an average 18MGD flow rate, which is below the pumping capacity of the facility.

Secondary Treatment

Secondary treatment is accomplished using an activated sludge process in both sections of the plant. The South (Original) Plant has five basins for aeration, each holding 250,000 gallons. The North Plant (expansion) has two basins for aeration, each holding 845,000 gallons. The total amount of aeration space was reduced during the 2006 plant project which added biological phosphorus removal capabilities.

The biological nutrient removal is achieved through the use of anaerobic zones in what was originally the first pass of the aeration tanks. These zones are subdivided into three zones each with a floating mixer. The south plant shares a common anaerobic zone while each north plant aeration tank has its own anaerobic zone. During the 1996 project, the facility was constructed to eventually increase the North Plant capacity by doubling the amount of tankage in this area. Engineers provided the means to accomplish this as part of the original design. The construction included the ability to use installed piping in order to provide flow to a combined biological nutrient treatment zone and two additional aeration basins and final clarifiers.

South Aeration Anaerobic Zone

The aerobic zones contain disk diffusers which receive air from centrifugal blowers located in a dedicated building for each plant. These blowers are not controlled via SCADA and are only adjustable through manual valves.

Final clarification for both plants is accomplished with two clarifiers with Schreiber top drive collectors. While effective, all four clarifiers are subject to issues requiring attention during the winter season. When there is accumulating ice and snow, the clarifiers have the potential to stall out which needs to be addressed by plant staff. This issue is more often a problem on the primary clarifiers, and the south clarifiers as the newer install in the north plant contain a built- in heat trace system to prevent the snow and ice buildup; however, occasionally the system will trip out causing accumulation. Scum removed from the secondary clarifiers is sent through the same process that the primary clarifier scum goes through, allowing removal of any oil and grease from the secondary effluent.

Return Activated Sludge is removed via a multi valve

North Secondary Clarifiers

common header configuration which supplies centrifugal pumps in each return pump building. One pump is dedicated to pull from each clarifier in order to maintain even sludge blanket levels. The Waste Activated Sludge pumps are also fed from the same common header and sent to one of three anaerobic digesters for further processing.

Secondary Effluent Flow

Flow leaving the secondary clarifiers is handled differently between the North and South Plants. The South Plant is able to use the original flow path in order to reach the disinfection channels and the plant outfall. The North Plant Secondary Effluent must be pumped from the South Secondary Pump Building and into the disinfection channels. The North Plant Effluent Pumping consists of three pumps which are controlled via the SCADA System and are in use based on the level of the Secondary Effluent Wet Well.

Effluent Disinfection

During the disinfection season all plant effluent is conveyed through the facility's Ultraviolet Disinfection System. The system consists of two channels each containing two banks of ultraviolet modules. Each bank consists of twenty-two modules each containing eight bulbs. The system is designed to treat 21.8 MGD. After leaving disinfection, the flow exits the plant and enters Beaver Creek, a tributary of the Little Miami River.

Biosolids Processing and Handling

Like many wastewater utilities, Biosolids treatment and disposal is one of the most concerning aspects of the treatment of wastewater. With the increased demands to reduce nutrient loadings to the receiving waters resulting in greater solids production and handling, the Biosolids produced has become a challenge. The liquid sludge from digesters is fed into two Westfalia Separator Dewatering Centrifuge Systems. Once the dewatered sludge exits the centrifuge, the processed Biosolids are pumped up and out into one of two truck bays for removal to a landfill. Currently, the county is exploring alternatives for Biosolids handling in order to reduce the costs associated with removal.

TOP: Aerobic Digesters
BOTTOM: Westfalia Dewatering Centrifuges

Final Plant Outfall

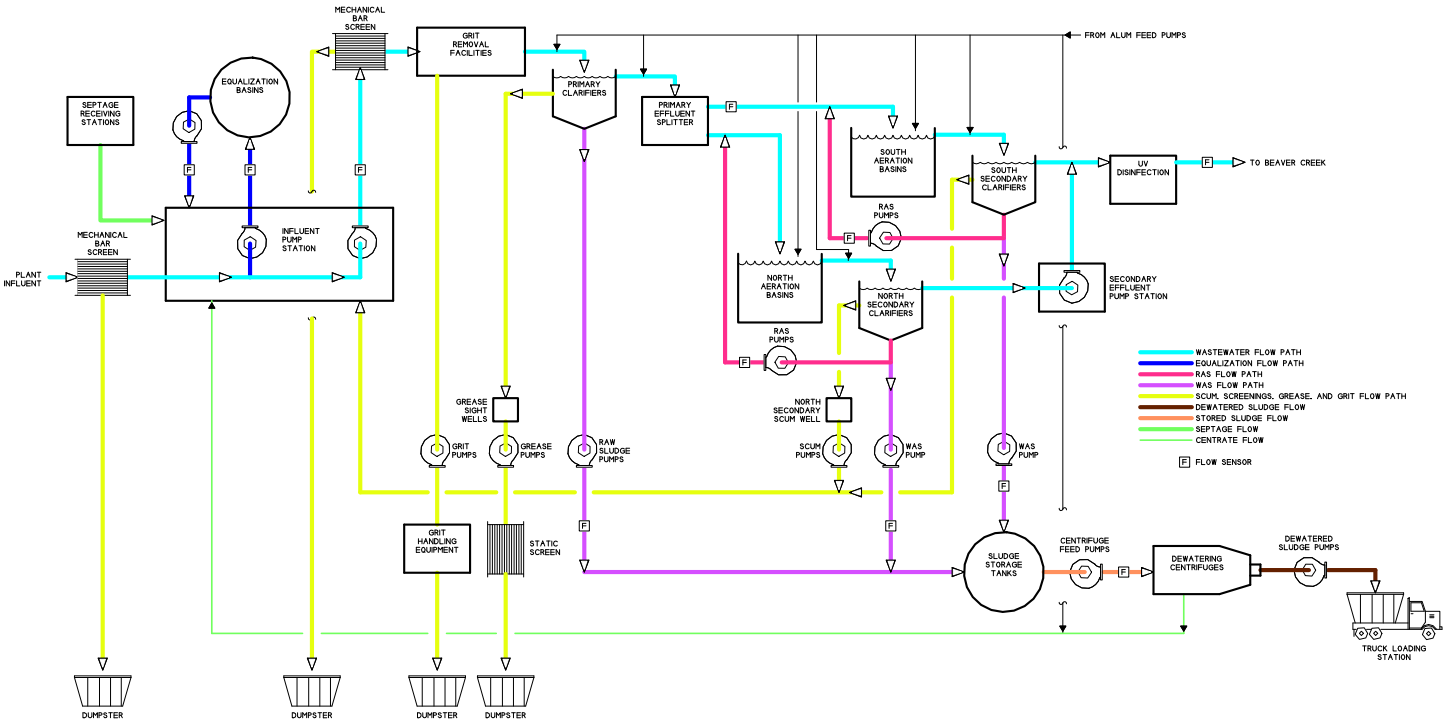
Performance Overview

Plant performance overall is very good with minimal exceedances of the NPDES Permit over the last several years, most of which were related to excessive wet weather flows. With the plant operating at an annual average flow above current design the county is working on the commissioning of a wastewater facility master plan to address needs at all of the County's water reclamation facilities. While the plant at times operates at higher flows, the treatment results show good treatment throughout the system.

While the Beavercreek WRRF staff maintains high operations and performance results the Greene County Sanitary Engineering Department Administration is working hard to address the current challenges faced at the facility and move the entire utility forward. The department is proceeding with enhancing the operational capabilities through an upcoming facilities master planning initiative, a utility wide asset management system implementation, and hydraulic capability upgrades throughout the service areas.

Beavercreek WRRF Data 2018

Average Daily Flow (MGD)	8.764
Peak Daily Flow (MGD)	22.942
AVG EFF NH3	0.14
AVG TP	0.52
AVG NO2 & NO3	7.14
AVG TSS (% Removal)	3.7 (97 %)
AVG CBOD (% Removal)	2.7 (97 %)



Leadership Training Helps Employees "Think Like a Client"

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

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

Many organizations do a good job of teaching employees how to perform the "hard skills" of their job, where they often fall short is in teaching their employees "soft skills." For organizations that participate in publicly funded projects, a fundamental soft skill is understanding what their client views as important. It is key that senior staff develops a sense of their client's perspective. In other words, they get the hot buttons: why certain pieces of information don't seem important, but others do. Qualifying and articulating these intuitions to your team become critical to improving the function of an organization overall.

Getting Started

One basic fact that has implications for every member of a project team is that it is hard for a public project to get funded. The project must be approved at many levels, ranging from administrative layers to public or oversight bodies, such as trustees or city councils or county commissioners. Identifying the need or mandated requirement, determining costs, addressing the impacts of funding, securing funding, achieving legislative approval as well as delivering to meet the expectations of the organization, is time consuming yet critical. Agency staff and consultants engaged to provide planning, design and construction services need to be aware of this critical truth.

Changes to schedule or budget are two of the most common—and most obvious—concerns for the public and for their elected officials. Quality is another major factor. No one likes to be surprised by negative or bad news and you certainly don't want to learn of delays, cost increases and other "negative" issues by hearing about it in the media or by your supervisor or elected officials. Should cost or schedule variances occur, or before issues with quality undermine a project's performance, it is vital that "your client" be informed so they can manage communications with their staff, legislative bodies and constituents. At H.R. Gray – a construction management company and consulting firm – our in-house training focuses on communication to make sure that key information makes its way to the right people. To do this, they must build upon the skills imparted by leadership training and focus on an outward mindset of understanding the needs of their clients.

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!

What the Process Should Look Like

Managers that interact directly with clients will recognize that each client is unique. Outward management [link to Article 1 here: https://www.ohiowea.org/docs/May_2019_BB_Web.pdf] comes into play as those managers use their knowledge to establish good workflows with each client, understanding the nuances or, at times, the challenges. To make sure those nuances are not lost as project work progresses, an organization should develop a training course for newer employees. This should include project communications and crisis communication. Most agencies have a crisis communication plan developed to respond accurately, promptly and confidently. You never want your boss nor your client to be surprised by a local news story leading on the 6 p.m. news. Knowing the proper communication protocol will be beneficial to the public perception of the client.

The three-year, tiered training program at H.R. Gray helps employees step outside of their own perspective, and at times, even out of their comfort zone. Participants do a lot of role playing to help them get beyond their usual approach. They work on assignments outside of class then meet every four to six weeks, so their progress is tracked.

Group activities help hone a team approach to problem solving skills. H.R. Gray Project Manager Denny Murphy, CCM, completed the program and noted that exercises were assigned with minimal instruction and no assigned leadership. This helped teach group members to develop their own leadership structure using group dynamics. The exercise showed individuals where they naturally tend to fit within a group.

An organization's managers—and eventually, the majority of its workers—can develop the habit of focusing not just on immediate tasks, but on the intent of those tasks. Work should be guided by more than just the goal of checking off items on a list to show a supervisor. This kind of short-term thinking is a matter of conditioning: workers respond and react in the way their immediate supervisor requires. But it benefits individuals as well as the organization to think through what their decisions mean to the project owner or to the end-user.

Managers can facilitate this mindset by pushing down knowledge, not just assignments. When discussing workflows and work products, managers should keep in mind that they are coaching their employees. They should take the time to sit down with staff and articulate why something is important and how it can affect outcomes in the long run. Employees need to understand the nuances of the client and the feedback loop that affects any project. Managers should also take the opportunity to ask questions and involve the employee in a dialogue.

Building Success

Once a team has been trained to broaden their perspectives, exploring problems analytically and thinking like a client or customer, more decisions can be made at the lowest level or the level closest to the problem. This can keep tasks moving, eliminating unnecessary meetings and delays. Delays always come at a cost - the value of people's time and the escalation of the price of the solution. As the decision is pushed higher in the organization, the final cost of any solution increases.

Ultimately, younger workers and field workers should make decisions with their "client hat" on. Empowering them through leadership training or knowledge transfer can make this happen. Big-picture thinking, confidence in one's own role and understanding the viewpoints of others are foundational not only for employee and company growth, but for client interactions at every level.

Key takeaways:

- Know your clients'/customers' issues/hot buttons.
- Proactive communication eliminates surprises.
- Understand how your decisions impact the project or end-user.
- Empower decision-making ability to the client/customer-facing employees.

Read more on how leadership training can promote communication and efficient project execution in Parts 1 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

Benefits of SRT Control and a Wasting Clarifier

by Harry Shaposka, Brian Flanagan (NEORSD), Jeff Ifft, Don Esping (Brown and Caldwell), Eric J. Wahlberg (WasteWater Technology Trainers, LLC)

Introduction

This article summarizes the concept and recommended approach to simplified solids retention time (SRT) control using a dedicated wasting clarifier at the Northeast Ohio Regional Sewer District (NEORSD) Southerly Wastewater Treatment Center (SWWTC). The SWWTC is located south of Cleveland in Cuyahoga Heights, Ohio, and has a capacity of 400 million gallons per day (mgd). In 2012, NEORSD hired Brown and Caldwell to design performance and capacity improvements associated with the First Stage Aeration System (FSAS) final settling tanks (FSTs). While the FSAS FSTs are commonly referred to as "final," they are actually intermediate settling tanks. During design, SRT control and the wasting clarifier concept were introduced. Both were approved for full-scale construction and implementation. The benefits of SRT control using the wasting clarifier are: 1) simplified waste sludge control, 2) improved sludge quality, control nitrification in the FSAS which had been a recurring problem leading to operational issues, and (3) reduced operation and maintenance costs.

Background and Concept

The SWWTC liquid treatment facilities include a two-stage activated sludge process as shown in Figure 1. The purpose of the FSAS is to remove carbonaceous biochemical oxygen demand ($CBOD_5$) and total suspended solids (TSS) from the primary effluent so that nitrification of ammonia may be accomplished in the Second Stage Aeration System (SSAS). Sludge is thickened, dewatered and incinerated. Historically, the FSAS was controlled using a target mixed liquor suspended solids (MLSS) concentration. Since the MLSS concentration in any activated sludge system is a response variable, the MLSS

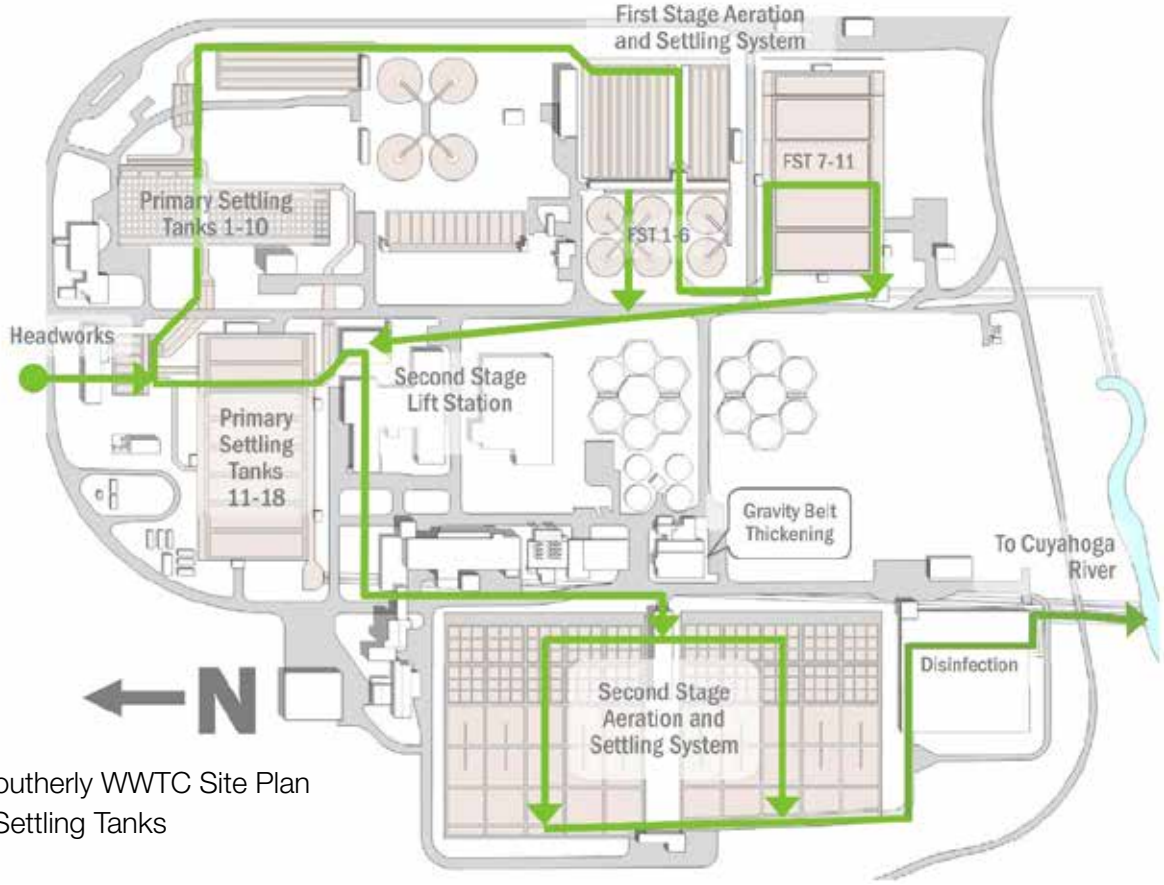


Figure 1. Southerly WWTC Site Plan and FSAS Settling Tanks

concentrations were variable and FSAS nitrification was a recurring problem. Operation was complicated by the configuration of the existing FSAS infrastructure and need to balance waste activated sludge flows from multiple locations.

The major process components of the FSAS prior to construction included:

- Three fine-bubble aeration tanks operated in plug flow or step-feed mode
- Six circular FSTs and four rectangular FSTs arranged in two batteries
- 21 return activated sludge (RAS) pumps connected to three RAS headers
- Four waste or "excess" activated sludge (EAS) pumps in a common station which draw suction from each of three RAS headers

FSTs 1-6 used hydraulic suction tubes attached to rotating collector arms for sludge removal while FSTs 7-10 used two traveling bridges with siphon tubes for sludge removal. During normal operation ten FSTs are in service. RAS is pumped to Pass 1 of each Aeration Tank with wasting of solids occurring from all three RAS headers. Improvements included a new rectangular FST (FST 11), rehabilitation and/or replacement of all collector mechanisms and RAS pumps for a total FSAS capacity of 215 mgd during wet weather. The new FST and each of the circular FSTs were considered for use as a wasting clarifier. The concept of a wasting clarifer is essentially the same as wasting mixed liquor to a dissolved air flotation system, but in this case the MLSS flow to be wasted is directed to a dedicated clarifier in which all captured solids are wasted from the system (which simplifies wasting operations) with flexibility to adjust the sludge pumping rate based on a desired underflow TSS concentration. It was determined that a circular FST was more ideally suited based on tank volume and the ability to control influent flow over the probably operating range. FST 6 was selected based on available space and configuration of necessary underflow modifications to sludge pumps and piping.

SRT is the most important parameter to be controlled in any activated sludge process. The reason for this is because the SRT controls: (1) whether or not an activated sludge will nitrify, and (2) sludge quality— how the activated sludge flocculates, settles, and compacts—and, therefore, effluent quality. First, it is critical that the FSAS not nitrify anytime during the year. It was a reoccurring problem for the operations staff to prevent nitrification in the FSAS during the summer months. The SWWTC is designed to nitrify in the SSAS, not the FSAS. Good quality FSAS effluent that is predictable and stable is key for maintaining stable operation.

The equation used to design activated sludge systems, using BOD to measure organic concentration, is given in Equation 1.

$$MLSS := \frac{SRT \cdot Q}{V_a} \cdot \left(ISS_{inf} + Yg \cdot \frac{BOD_{inf} - BOD_{eff}}{1 + b \cdot SRT} \right)$$

Equation 1

where:

MLSS = mixed liquor suspended solids concentration, mg/L,

SRT = solids residence time, days

Q = influent flow, MGD

V_a = on-line aeration basin volume, million gallons (MG)

ISS_{inf} = influent (i.e., primary effluent) inorganic TSS concentration, mg/L

Y_g = growth yield, mg MLVSS/mg BOD removed

BOD_{inf} = total influent (i.e., primary effluent) BOD concentration, mg/L

BOD_{eff} = effluent (i.e., FST effluent) soluble BOD concentration, mg/L, and

b = decay rate, day^{-1}

From an operational standpoint, the following are noted:

1. The MLSS concentration is a response variable, not a control variable; the MLSS concentration, on the left-hand side of the equation, responds to all the variables on the right-hand side of the equation.
2. Neither RAS flow nor the RAS TSS concentration

affects the MLSS concentration (i.e., neither appear in the equation).

3. Only the SRT and the on-line aeration tank volume (V_a) can be controlled by operators
4. This equation can be used to show that the SRT also controls all of the following: (a) MLSS concentration (as already stated), (b) MLSS mass (i.e., MLSS x V_a), (c) MLVSS concentration, (d) MLVSS mass, and (e) the F:M ratio.
5. For a given SRT and organic load (i.e., Q x BOD_{inf}), the equation says that the mass of solids in the system (again, MLSS x V_a) is very predictable; moreover, it does not matter if there are one, two, or three FSAS aeration tanks online, this mass will be the same for a given BOD load, ISS load, and wastewater temperature (what will change with how many aeration basins are on line is the MLSS concentration).
6. While it is not evident from looking at this equation, because Y_g and b are temperature dependent, the MLSS concentration will decrease with increasing wastewater temperatures and increase with decreasing wastewater temperatures all other factors in the equation being equal. What this means is that operation at a constant SRT will result in a varying MLSS concentration throughout the year. The previous practice at the FSAS was to target a constant MLSS concentration, which resulted in a varying SRT throughout the year and, often, nitrification during the warmest months.

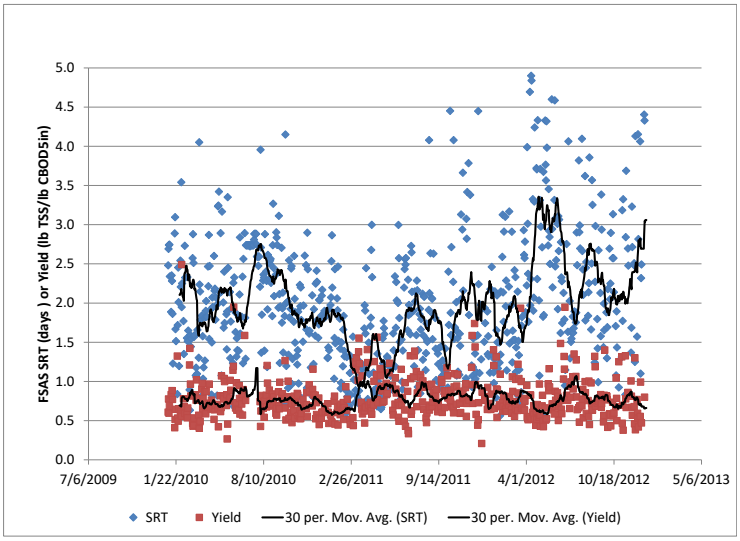


Figure 2. Variability of Solids Resident Time and Yield prior to Improvements

The equation for calculating SRT is given in Equation 2. As can be seen, there are many inputs required to calculate the SRT. The purpose of this calculation would be to see what the SRT is to determine what changes, if any, are needed to the EAS flow rate (Q_{eas}) to maintain the target SRT. Maintaining low sludge blankets (i.e., less than approximately 1 ft) in the final settling tanks and ignoring the solids in the FSAS effluent, simplifies this equation as shown in Equation 3.

$$SRT := \frac{V_a \cdot MLSS}{Q_{eas} \cdot TSS_{eas} + Q_{eff} \cdot TSS_{eff}}$$

Equation 2

Where:

SRT = solids residence time, days

V_a = on-line aeration tank volume, MG

MLSS = mixed liquor suspended solids concentration, mg/L

Q_{eas} = excess activated sludge flow, MGD

TSS_{eas} = TSS concentration of the EAS, mg/L

Q_{eff} = effluent flow, MGD, and

TSS_{eff} = TSS concentration in effluent, mg/L.

$$SRT := \frac{V_a \cdot MLSS}{Q_{eas} \cdot TSS_{eas}}$$

Equation 3

Equation 3 becomes that much simpler if mixed liquor is wasted from the system rather than RAS as shown in Equation 4. (Note: if wasting mixed liquor, TSSeas in Equation 3 becomes MLSS which cancels with the MLSS in the numerator simplifying to Equation 4.) Finally, solving Equation 4 for the mixed liquor wasting flowrate necessary to maintain a target SRT results in Equation 5.

$$SRT := \frac{V_a}{Q_{mlwas}}$$

Equation 4

$$Q_{mlwas} = \frac{V_a}{SRT_{target}}$$

Equation 5

Where:

SRT = solids residence time, days

V_a = on-line aeration tank volume, MG, and

Q_{mlwas} = mixed liquor flow wasted, MGD.

The simplicity of Equation 5 cannot be overemphasized: in order to maintain the target SRT, the mixed liquor wasting rate (Q_{mlwas}) is set at a flow equal to $1/SRT_{target}$ times the on-line aeration tank volume; TSS or other flow data are not required and the SRT_{target} will be maintained regardless of the BOD load to the FSAS, wastewater temperature, MLSS concentration, sludge settleability, or RAS TSS concentration. Despite the simplicity of the Equation 5, most activated sludge plants waste RAS, not mixed liquor. The reason for this is that wasting RAS decreases the waste sludge flow rate by a factor of between 2 to 5, which reduces the size and number of waste sludge thickening devices such as gravity belt thickeners (GBTs). The wasting clarifier effluent however can be combined with the effluent flow from other on-line final clarifiers. All the settled solids in the other on-line final clarifiers can be returned to the on-line aeration tanks.

Wasting Clarifier Construction and Operation

Construction of the wasting clarifier began in 2014 as part of a much larger rehabilitation project which included improvements to the entire FSAS settling and sludge processes. Five of six circular FSTs as shown in Figures 3 and 4 were upgraded with new drives and collector mechanisms that use two-arm hydraulic suction headers and one influent sluice gate from the mixed liquor channels to each FST. Conversely, FST 6 was designed with a two-arm spiral scraper type sludge collector mechanism to provide provision to thicken waste solids up to 2.5% TS in the wasting clarifier.

Figure 3. View of FST 6 Looking West along MLSS Channel

FST 6 is flexibly used as a normal clarifier (Non-Wasting Mode) or as a wasting clarifier (Wasting Mode). When in Wasting Mode, the normal clarifier influent gate is closed, and a secondary MLSS flow path is used which consists of an additional isolation sluice gate in the MLSS Channel, a magnetic flowmeter, a short run of piping and a control valve. The MLSS flow control is achieved by modulating the control valve in response to a flow setpoint. During wasting mode, all the solids captured in FST 6 are pumped to gravity belt thickeners (GBTs) for thickening, whereas all solids settled in the other on-line FSTs are returned to the on-line aeration tanks. This provides a single point of process waste sludge flow control compared to the old system which used three points of control. When in non-wasting mode, the FST 6 settled solids are returned with the solids from all other FSTs and a portion of the settled solids from all tanks conveyed to the EAS pumps and are wasted to the GBTs.

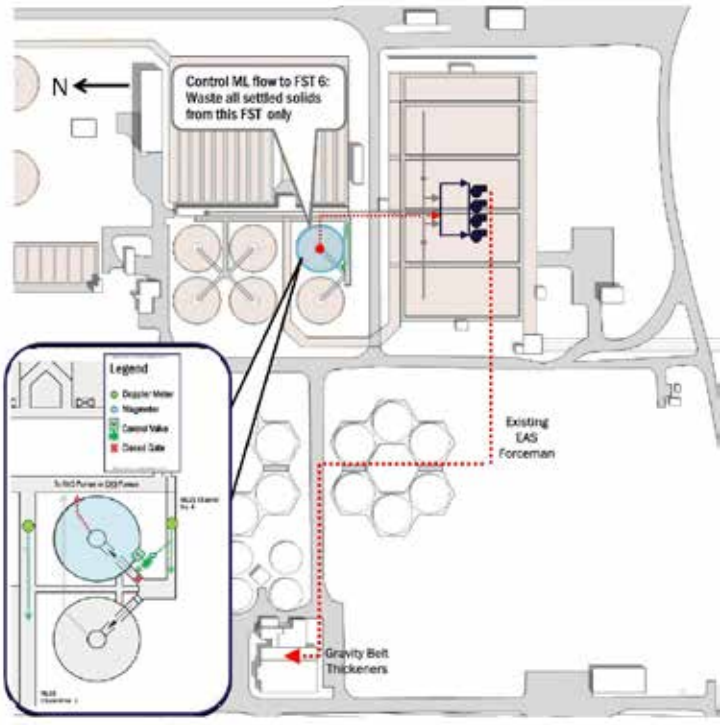


Figure 4. Wasting Clarifier Flow Path Allows a Single Point of Sludge Wasting Control for Stability and Efficiency

SRT. The PLC automatically closes the FST 6 influent gate, opens the FST 6 influent control valve, stops the associated RAS pump and opens the dedicated EAS pump suction valve (provided that these gates, valves and pumps are in auto mode). The MLSS influent flow rate to FST 6 is then measured by the magnetic flowmeter and adjusted using the automated influent control valve to maintain the MLSS flow to maintain the target SRT within the FSAS system. FST 6 settled solids only are directed to the EAS pumps and the GBTs. All other settled solids in all other FSTs are returned to Pass 1 of the aeration tanks.

Two additional monitoring and alarm points are displayed through SCADA: 1) suspended solids concentration of the wasted solids are measured by a TSS probe inserted into the pipeline to the EAS pumps and 2) the FST 6 sludge blanket level. These instruments provide the operator with real time feedback and trending to notify and alarm the operator if the sludge blanket is getting too high and identify if the EAS pump flow rate should be adjusted because of too high, too low, or variable solids concentrations are being pumped. Programming was provided to automatically adjust the pump speed with a sufficient bias and dead band if desired but generally operations staff prefer to make manual adjustments to minimize variation at the GBTs and resulting need to adjust polymer.

Performance and Conclusions

Performance changes were monitored before, during and post-construction from 2011 through 2019 as shown in Figure 6. Construction outages of all ten existing settling tanks, PLC programming modifications and concurrent construction projects created some gaps and variation in plant data collection. However, trends were noticed starting in 2015. First, with the simplified SRT control and FST improvements, the MLSS concentration in the aeration tanks was more stable and nitrification was mitigated by easily and consistently maintaining a non-nitrifying SRT, which is temperature dependent.

As additional tanks were rehabilitated and the equipment reliability and control of each FST improved, the EAS flow and solids control programming were concurrently tuned. Stability in the FSAS process and improved operational

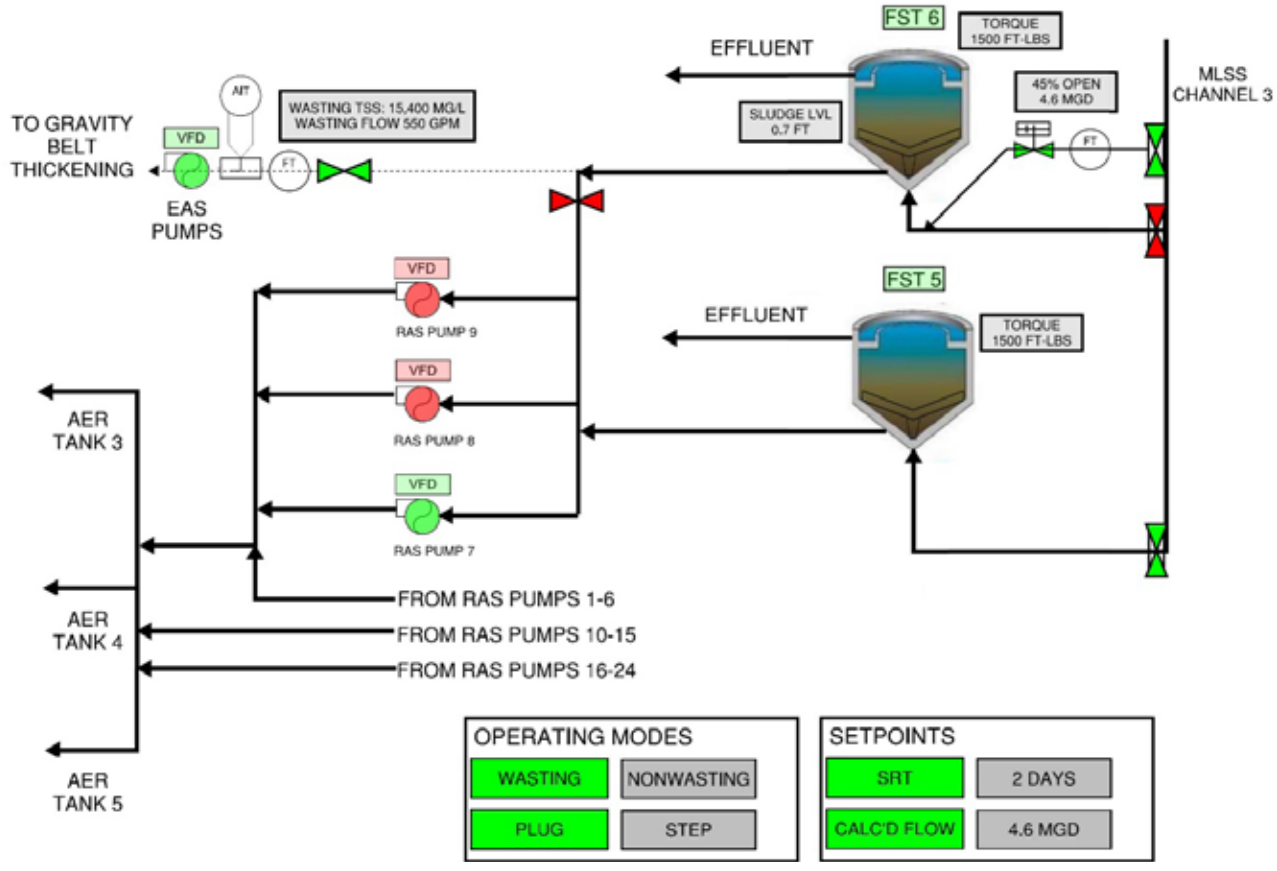


Figure 5. Schematic Representation of SCADA Screen

control has allowed the Southerly WWTC Staff to refine their operating strategy with the wasting clarifier, solids pumping and thickening. Staff have been able to increase EAS solids from 3,000 mg/L to 12,000 mg/L, lower the wasting flowrate and still maintain a consistent thickened solids to the downstream GBTs. As a result, there has been reduced pumping costs, fewer GBTs online, and thus less dewatering polymer used. The estimated annual operating and maintenance cost reduction (not including polymer) is $32,000 per year from 2012 when three pumps and five GBTs were online compared to 2018 with one pump and two GBTs online. Long term reduction in polymer use has approached 40% and while cost are variable, and market driven, at $2/gallon for emulsion polymer the change equates to $45,000/year savings. Finally, it is anticipated that the reduced number of EAS pumps and GBTs online may lead to a long-term reduction in replacement costs as each pump and appurtenances would cost in the order $80,000 and similarly, each 2-meter GBT may be in the order of $100,000 to rebuild. In conclusion, SRT control by wasting MLSS using a dedicated wasting clarifier can simplify operations, reduce operation and maintenance costs, and improve sludge quality.

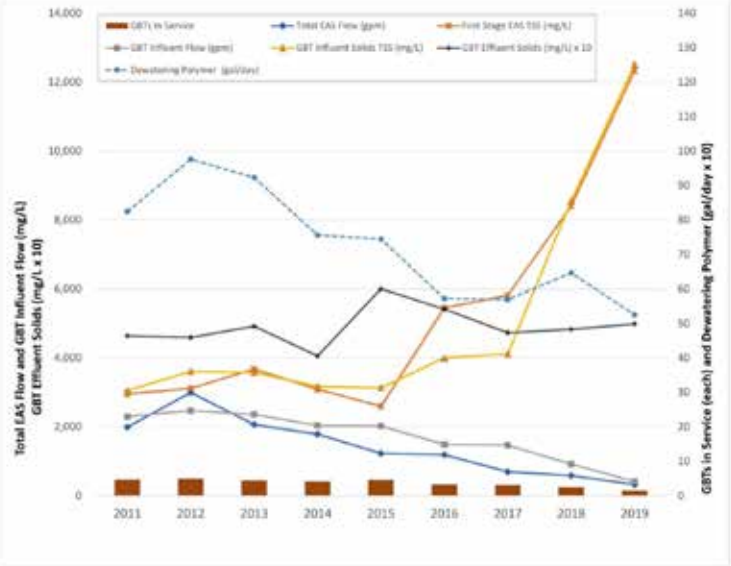


Figure 6. Southerly WWTC Performance Change 2011 - 2019

Tales from the Files of the Compliance Assistance Unit

Better Effluent, Less Cost: Alternative Operation for Biological Phosphorus Removal

by Jon van Dommelen, Compliance Assistance Unit, Ohio EPA

Nutrient reduction in wastewater treatment systems is becoming increasingly important as National Pollutant Discharge Elimination System (NPDES) permits become more strict and energy becomes more expensive. Many small communities are facing permit limits that their existing treatment systems were not designed to meet. New, expensive facilities are constructed and often the costs for energy and chemicals are much higher than expected, yet compliance with permit limits are not guaranteed.

The Village of Bradford constructed a new wastewater treatment plant in late 2013 to comply with a new total phosphorus (TP) limit and to eliminate combined sewer overflows in their collection system. The village constructed a biological nutrient removal wastewater treatment plant (WWTP) which came online in early 2014. Almost immediately, the treatment plant had difficulty attaining the 1 mg/L TP limitation in its NPDES permit. This was despite feeding alum prior to clarification. From 2014 through April 2018, the village met their permit only seven times in 48 months, approximately 14.5 percent of samples.

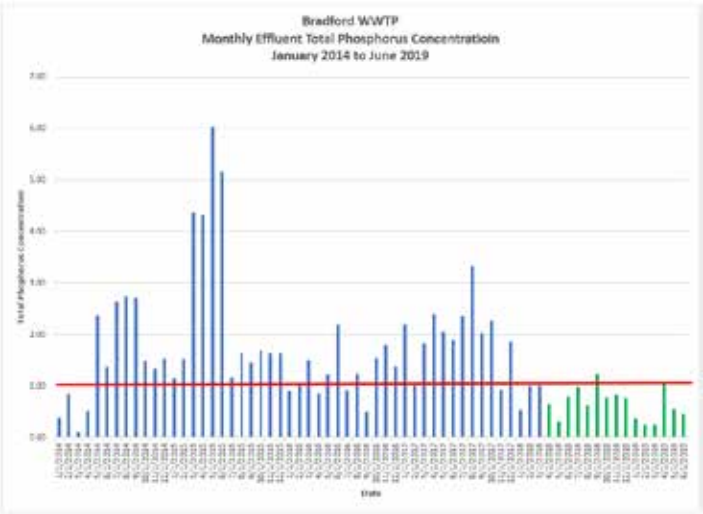


Figure 1: Total Effluent Phosphorus (Monthly Average 2014-2019)

Although Jay Roberts, superintendent of the Bradford WWTP, was skeptical, the village contacted Ohio EPA's Compliance Assistance Unit (CAU) for help in March 2018. The CAU provides hands-on assistance to communities that are experiencing noncompliance with their NPDES permits. The CAU prides itself on returning communities to compliance using process control methods to optimize the treatment processes rather than proposing construction remedies. Through cheap, easy and effective analysis techniques, the CAU can often determine the process-limiting factors and then devise a plan to overcome such factors and achieve compliance.

When the CAU arrives at a WWTP, we typically conduct a nutrient profile to see if the bacteria are performing as they should in each treatment tank. In Bradford, the profile showed that anaerobic tanks tested chemically identical to the anoxic tank which tested identically to the oxic tank. Each was full of nitrate at concentrations of 11-

Figure 2: Anaerobic Tanks (Mixers ON)

14 mg/L. The only tank that this amount of nitrate would be expected would be the oxic tank. The results indicated that the environment of the anaerobic and anoxic tanks would need to change.

In this instance, correcting the chemical environment in each of the treatment zones required nitrate management. The first step was to reduce the nitrate recycle into the anoxic tank from the oxic tank. The anoxic zone appeared to have more nitrate coming into it than could be denitrified with the available carbon in the influent waste stream. Jay and CAU decided to reduce the nitrate recycle in the anoxic tank significantly by nearly shutting off the gate from the oxic tank. We also slowed down the main rotor in the oxic tank by turning down the variable frequency drive, reducing the highly oxidized mixed liquor flow into the anoxic zone and the amount of nitrate in the return activated sludge (RAS) that would enter the anaerobic tank. These simple process modifications dropped the nitrate in the anaerobic and anoxic tank to approximately 6 mg/L NO3-N.

Since the desired result was not yet attained (near zero nitrate in the anaerobic tank, and not much more in the anoxic tank), the next step was to completely shut off the nitrate recycle from the oxic tank into the anoxic tank. This ensured that only the nitrate in the RAS would enter the anaerobic and anoxic tanks.

A second issue affecting the desired biological environments was that the soluble carbon loading in the raw wastewater was insufficient to drive the anaerobic zone truly anaerobic and to denitrify the nitrate in the anoxic zone. This issue called for more drastic measures: turn off the mixers in the anaerobic and anoxic zones. By cycling the mixers ON for 30 minutes and OFF for 210 minutes continuously, the CAU theorized that the biological solids would settle, and the aerobic bacteria would begin to lyse in the settled sludge blanket. The lysed bacteria would provide the soluble carbon to drive the fermentation reactions in the anaerobic zone and drive the denitrification in the anoxic zone. The CAU installed ammonium and nitrate probes (IQ SensorNet VARiON by YSI/Xylem) in the anaerobic and anoxic zone to monitor these nutrients. A week later, the effluent orthophosphate concentrations were within permit. But the village was still feeding alum to combine with the orthophosphate.

The CAU believed that the WWTP was performing well enough to stop the alum feed. But the plant was running within its concentration permit and Roberts was concerned that any change might jeopardize the new-found compliance. To give him some confidence, the CAU installed a composite sampler on the clarifier effluent so that the total phosphorus concentrations could be sampled, but not be reportable because the sample was not taken at the final effluent. Repeated samples from this internal location indicated that the treatment plant was meeting its total phosphorus limit even after the alum feed was shut off. Although it was not being run as designed, the treatment plant was meeting it NPDES permit limits.

The next step was to set up a process control scheme to monitor the ammonia, nitrate and orthophosphate in each of the zones. Using field analysis techniques on grab samples, Roberts performed ammonia, nitrate and orthophosphate analysis on each of the zones (anaerobic, anoxic and oxic) approximately three days per week to monitor the chemical environment.

To take advantage of simultaneous nitrification/denitrification in the oxic tank, the rotor, which was controlled by a variable frequency drive, was slowed down incrementally as long as the effluent ammonia remained very low, typically less than 0.2 mg/L NH3-N. This allowed denitrification to occur on the back side of the oxidation ditch, further reducing the nitrate loading on the anaerobic and anoxic zones. The process control goal was to keep dissolved oxygen concentrations to a minimum in the oxic tank, thus reducing the nitrates contained in the RAS that could poison the anaerobic zone. Ultimately the first cell of the anaerobic zone was mixed continuously with influent wastewater to denitrify the RAS nitrate, and the second anaerobic zone begins to release orthophosphate in the settled sludge during the OFF part of the mixing cycle. The orthophosphate release continues during the mixer OFF cycle in the large anoxic tank in the settled sludge blanket. The orthophosphate is then taken up by the phosphorus accumulating bacteria in the oxic tank.

Total phosphorus noncompliance at Bradford's WWTP very likely resulted from an insufficient and inconsistent soluble carbon loading from influent waste stream. The lack of this carbon loading caused the anaerobic, anoxic and oxic zones to become overwhelmed with nitrate. Running the anaerobic and anoxic mixers ON/OFF to deep cycle the mixed liquor created an environment in the settled sludge blanket to get the desired bacterial response. Turning down the VFD on the main oxic rotor allowed additional denitrification in the back side of the oxidation ditch, further reducing the nitrate being returned to the anaerobic zone.

Compliance with the Bradford WWTP NPDES permit for TP began during the second week of April. The monthly average concentration has been attained for 12 of 14 months since the operational change was initiated with just two monthly concentration violations in that interval. Note though that the compliance also included three additional loading violations for TP, due to the high influent flows that pushed the loading over the limit despite having a compliant concentration. The alum feed system was recently repaired to attempt to improve compliance with TP during particularly wet weather conditions.

Bradford has also saved up to $750-$1,000 per month on alum as well as on their energy consumption through efficient operation of the main oxic rotor at low Hertz and cycling the anaerobic and anoxic mixers only three hours every 24 hours. The wastewater treatment plant is putting out better effluent at a significant operational cost savings.

If you have questions about operation at your facility, or would like more information about the CAU, visit our website (https://epa.ohio.gov/defa/CAU) or contact me at (614-580-5069).

Figure 3: Nitrate Recycle Gate Closed

No Space? No Problem!

Membrane Bioreactor and Silo Digester Expand Capacity

by Jamie Mills and Scott Stearns

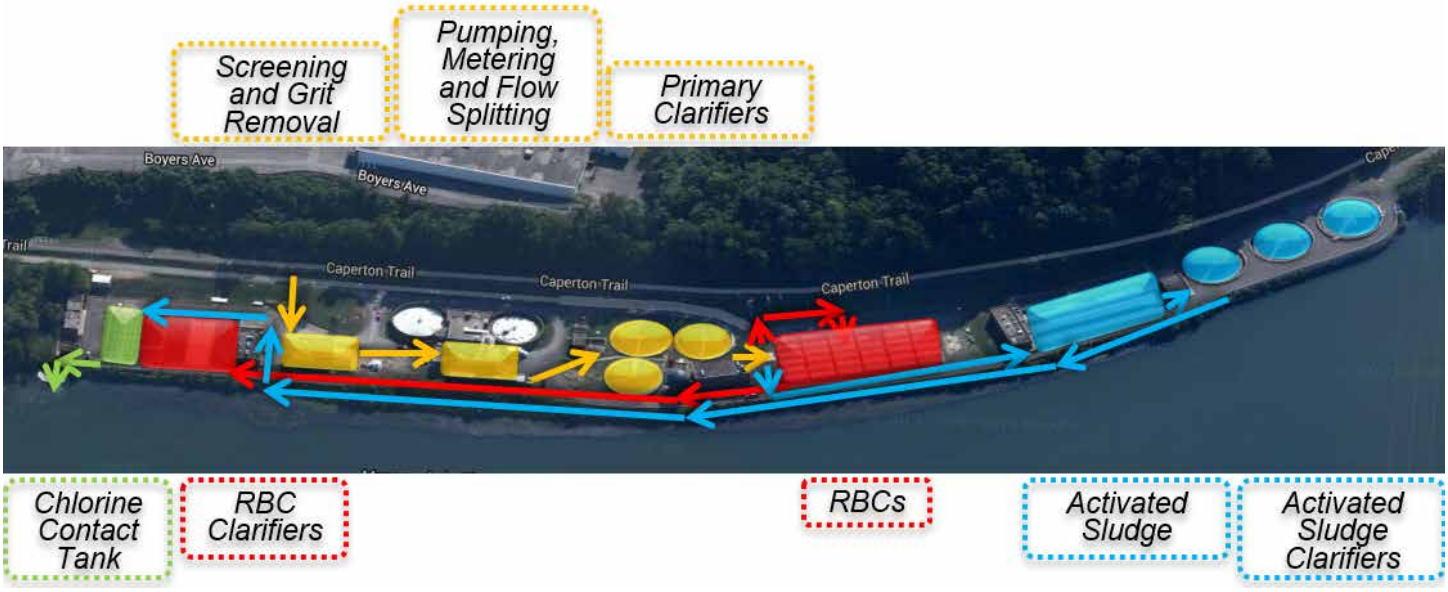
History of the Star City Wastewater Treatment Plant

The Star City Wastewater Treatment Plant (WWTP) located in Morgantown, West Virginia, is owned and operated by Morgantown Utility Board (MUB). MUB provides water, sewer, and stormwater infrastructure for approximately 100,000 residents. MUB also owns and operates a microfiltration membrane water treatment plant (WTP) as well as the smaller Cheat Lake WWTP.

The Star City WWTP receives flow from a combined sewer system and has an average design flow (ADF) of 12 million gallons per day (mgd), though it can treat up to 16 mgd during wet-weather periods. Star City WWTP was constructed in three major phases. Phase 1 occurred in 1965 and consisted of preliminary and primary treatment, along with disinfection and anaerobic digestion. Phase 2, occurring in 1980, added preliminary treatment, primary treatment, rotating biological contactors (RBCs), and improved disinfection and effluent pumping. Phase 3 occurred in 1990 and incorporated the addition of activated sludge with final clarifiers, waste activated sludge (WAS) thickening, and electrical improvements.

Aerial of Existing Star City WWTP Prior to Construction

Map Data: Google



Star City WWTP Existing Liquid Train

Map Data: Google

The pre-construction Star City WWTP liquid train consists of fine screening and aerated grit removal, followed by pumping, metering, and flow splitting to three circular primary clarifiers. Following primary treatment, flow is split between an RBC train and an activated sludge train for biological treatment. Both the RBC and activated sludge trains have their own dedicated secondary clarifiers. Following final clarification, flow is disinfected by chlorine gas and dechlorinated with sodium bisulfite prior to final discharge to the Monongahela river.

Needs for Additional WWTP Improvements

With the increase in population in the Morgantown area, the Star City WWTP was nearing hydraulic and organic treatment capacity. Even though through sound operational practices the WWTP has consistently satisfied permit limits since its startup, MUB desired to improve the facility's ability to treat future projected flows and loadings. However, because the existing WWTP already spans the entire available property and is landlocked by the Caperton Trail and Monongahela River, improving capacity presented spatial challenges. Thus, to improve capacity while still maintaining the existing site footprint, more efficient processes were evaluated and ultimately selected and, where possible, oriented upward rather than outward.

The key drivers of the project were: develop a plan for expanding the WWTP to accommodate loads and flows to 2035 and beyond; identify and plan for future nutrient limits; repair or replace aging structures and processes and equipment; reduce operations and maintenance efforts; provide additional administration and training spaces; and address odors to be a good neighbor. The proposed new liquid train consists of new screening and grit removal, pumping, metering, and flow splitting. Mechanical refinements include improvements to the existing primary clarifiers as well as removal and replacement of the existing RBC units with membrane bioreactors and replacement of chlorine disinfection with ultraviolet (UV) disinfection and effluent pumping.

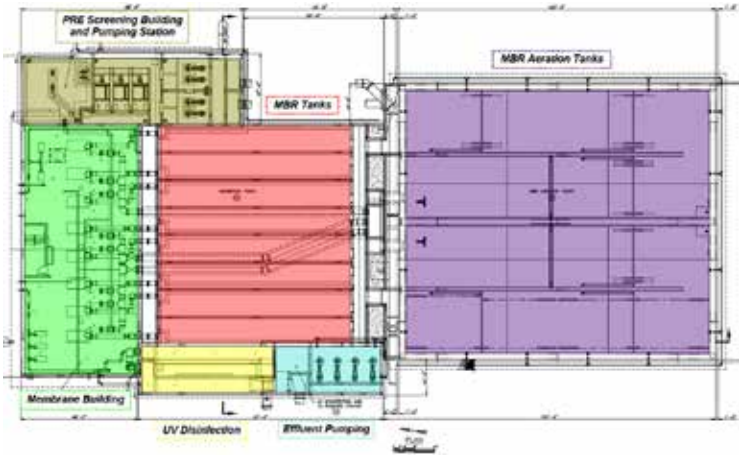
Raw wastewater from the Deckers Creek Pump Station, West Run Pump Station as well as raw wastewater from a 48-inch gravity sewer flow into the raw water splitter structure. Flow is then routed to a wet-weather diversion structure where influent wastewater can either be directed to the headworks building or to wet-weather screening and metering before discharge to the Monongahela River at combined sewer overflow (CSO) outfall No.39.

Preliminary Treatment Improvements

The existing headworks building contains one mechanical step-type screen with a manual bypass screen and aerated grit removal and grit classification. Though nuisance odors generated at the headworks building are treated with a biofilter, there is still hydrogen sulfide corrosion. As part of the improvement project, the design team decided that the existing headworks building had

New Screening Equipment
Courtesy of: Strand Associates, Inc.®

New Grit Removal Equipment
Courtesy of: Strand Associates, Inc.®



Plan View of Membrane Complex
Courtesy of: Strand Associates, Inc.®

exceeded its useful life and a new headworks building was constructed to replace antiquated processes and improve process reliability.

Upon entering the new headworks building, influent wastewater is split between two step-type screens via a manual bypass screen; this bypass can also be used to either increase screening capacity during wet-weather events or if one of the mechanical screens requires maintenance. Both mechanical fine screens have a 0.25-inch screen width and dedicated screenings washer and compacter units that wash, dewater, and compress the captured screenings. Screenings are then directed to a common dumpster for landfill disposal. Flow leaving the screening process is merged in a common channel that leads to a vortex grit chamber. Captured grit is pumped to a grit washer for washing and dewatering before being routed to a dumpster for disposal. The cleaning and dewatering action of the grit washer ensures that the captured grit is dried, and that organics and excess water are returned to the forward flow process for use in primary and secondary treatment.

Primary Treatment Improvements

From the headworks building, wastewater flows to the influent pump wetwell located in the control building. Four influent pumps route wastewater to the primary influent splitter structure, which splits flows between three existing 70-foot diameter circular primary clarifiers. The clarifiers are relatively shallow and have approximately a 9-foot side water depth (SWD) and the effluent launders, weirs, and troughs are covered to capture nuisance odors. The clarifiers are structurally sound; thus, efforts were directed toward replacing clarifier mechanical elements. Mechanisms, drives, access bridges, center columns, as

Construction of MBR Complex shows MBR Aeration Tanks, MBR Tanks, Membrane Building, UV Disinfection and Effluent Pumping

With Permission of: Ulliman Schutte

well as scum troughs and beaches were removed and replaced for all three clarifiers. Furthermore, new gates and valves were installed for the four influent pumps and the three existing piston pumps used to convey primary sludge to the digestion process were replaced with three new air operated diaphragm pumps.

Secondary Treatment Improvements

To increase hydraulic and treatment capacity while still maintaining the existing site footprint, three biological process alternatives were reviewed to replace the existing RBCs. Considered alternatives included moving bed bioreactors (MBBR), biologically aerated filters (BAF), and membrane bioreactors (MBR). Because of treatment efficiency, compactness, and operator familiarity, MBRs were chosen to replace the RBCs and work in tandem with the existing activated sludge process for biological treatment.

The existing primary effluent (PRE) splitter structure required modification before the RBCs could be properly demolished and removed. The purpose of the existing splitter structure was to split primary clarifier effluent between the RBC treatment train and the activated sludge process as well as manipulate flow distribution between the two processes for operations and maintenance purposes. Improvements to the PRE-splitter structure include a new downward opening weir, sluice gates, odor control, and a phosphorus removal chemical and sodium hydroxide feed point.

The membrane complex includes PRE-screening and pumping, MBR aeration tanks, MBR tanks, and associated pumps and blowers. From the PRE-splitter structure, flow enters the PRE-screening building and pumping station through a 42-inch pipe. Flow is routed through three 2-mm rotary drum screens that provide positive protection for the membranes. Captured screenings are cleaned and dewatered through two screenings wash presses. After screening, flow is then directed to four primary effluent pumps that lift it to the MBR aeration tanks. The serpentine-style aeration tanks are approximately 30 feet deep and aeration efforts are powered by high-efficiency blowers. The aeration tanks are also compartmentalized to incorporate a nitrate return to provide an oxygen credit

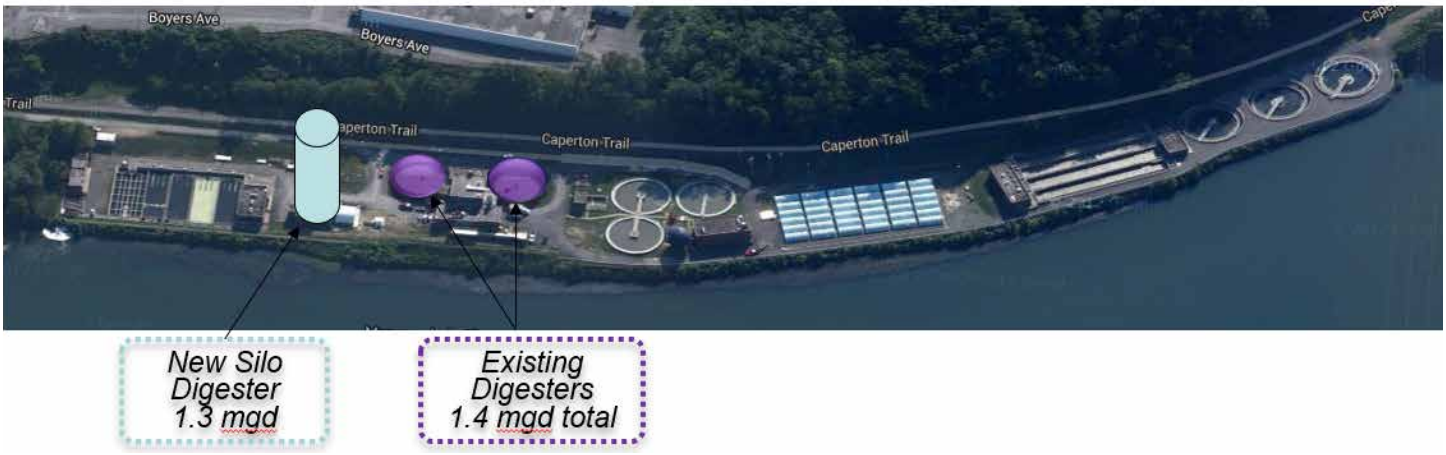
MBR Aeration Tanks
Courtesy of: Strand Associates, Inc.®

and reduce oxygen demands within the tanks, reducing energy costs. Mixed liquor from the MBR aeration tanks then flows to the MBR tanks for further treatment. The MBR tanks are arranged strategic to accommodate future growth, providing five membrane tanks for treatment and three redundant tanks for future expansion from 20.8 mgd to 27.8 mgd. From the MBR tanks, flow is routed to UV disinfection and then a Parshall flume and sampler for wastewater flow metering and sampling prior to four high river level effluent pumps that discharge the final effluent to the Monongahela River.

Pilot Testing Results

The MBR system was piloted to validate performance and enable MUB operators to become familiar and develop confidence with the new system. Mixed liquor suspended solids (MLSS) averaged 11,500 mg/L and the system demonstrated exceptional performance and effluent quality.

Average Effluent Quality	
Biochemical Oxygen Demand	0.4 mg/L
Total Suspended Solids	0.3 mg/L
Total Nitrogen	15 mg/L
Total Phosphorus	0.7 mg/L
Total Kjeldahl Nitrogen	0.75 mg/L
Fecal Coliform	Below Limit



New Silo Digester Addition

Map Source: Google

Solids Handling Improvements

The existing Star City WWTP solids train consists of primary sludge and thickened WAS loading to two anaerobic digesters. As part of the improvements project, one of the RBC final clarifiers will be repurposed as WAS storage tanks for use prior to WAS thickening. Once WAS is thickened by a gravity belt thickener, it is mixed with primary sludge in the blended sludge tank prior to be being pumped to anaerobic digestion. In efforts to increase the facility's digestion capacity while preserving valuable site space, a silo-shaped and egg-shaped digester were evaluated to serve as a third digester for the facility. To maintain a minimal footprint, a 58-foot diameter, 100-foot tall concrete silo digester was designed to work in tandem with the two existing anaerobic digesters. This improvement will increase the digestion capacity by 1.3 million gallons (MG) in addition to the existing 1.4 MG. Further improvements to the solids handling train include pipe, valve, and pumping replacement in addition to replacing digester mixing systems, gas handling equipment, waste gas burner, and replacing the digester covers with membrane-type gas holder covers. Following digestion, sludge is dewatered by a belt filter press, which discharges solids directly into hauling trucks for sludge removal from the facility.

Odor Control Improvements

Existing odor control consisted of biological and chemical odor control for the headworks building and solids handling elements. To be an even better neighbor to the city, two additional biological odor control units were added, and the two existing units were refurbished. The four units provide odor treatment for influent wastewater, primary treatment, primary effluent screening, and the solids handling train.

New Biological Odor Control Unit
Courtesy of: Strand Associates, Inc.®

New Control Building
Courtesy of: Strand Associates, Inc.®

Control Building

Following a space needs study, the design team concluded that the existing control building presented several deficiencies for operations and administration space. Improvements to the existing control building include construction of a new laboratory, new digester heating equipment, new training room, new administrative offices, a new conference room, and an IT/mechanical room and electrical room, as well as new rest rooms.

Project Costs and Funding

The total construction costs were $84 million and the project is anticipated to be completed by February 2021. The project was funded by a State Revolving Fund (SRF) Loan and a SRF Green Reserve Grant, as well as bonds. MUB was awarded a $500,000 SRF Green Reserve Grant due to incorporating energy efficient upgrades to the MBR aeration tanks, conventional activated sludge, and facility lighting.

Upgrades to the MBR aeration tanks include the use of more energy efficient rotary lobe compressors instead of conventional positive displacement blowers to aerate the MBR aeration tanks. Additionally, less air will be required to meet effluent limits because the anoxic zones provide oxygen credits as these zones are mixed, but not aerated, which reduces blower use and consequently reduces power used to meet wastewater treatment goals. Furthermore, the speed of the blowers will be controlled using variable frequency drives (VFDs), which can adjust their output to maintain a target dissolved oxygen (DO) level in the MBR aeration tanks.

New high-efficiency blowers will replace the existing positive displacement blowers to aerate the conventional activated sludge aeration tanks. The new blowers will be also be equipped with VFDs and a DO control system to adjust blower output. Additionally, high-efficiency LED lighting will be installed in place of fluorescent lighting for interior and exterior applications throughout the facility.

Construction Status

Ulliman Schutte is the General Contractor for the Star City WWTP Improvements Project. They are approximately 24 months into its 4-year construction schedule. While still maintaining the same footprint, the hydraulic capacity of the WWTP will be improved from 12 mgd to 20.8 mgd with future expandability to 27.8 mgd. The improvements projects will provide MUB with sufficient treatment capacity to beyond 2035, as well as provide the ability to continue meeting permit limits, protect the environment, and better serve the City for current and future generations.

WWTP Aerial of Construction Progress

With Permission of: Ulliman Schutte

A Chat with Government Affairs Chair, Elizabeth (Beth) Toot-Levy

Interview by Megan Borror

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

Beth: Heidelberg University, I have a bachelor's degree in water resources biology and environmental science. I got my master's degree from Cleveland State University, College of Urban Affairs. (It's a master of the arts in environmental studies). When I was an undergrad, I focused on the science and very technical stuff and I avoided all of the classes that were related to the law, policy, and financial aspects of environmental science. Then after working at the Northeast Ohio Regional Sewer District for a few years, I realized that avoiding all of those topics in my undergrad probably wasn't the best approach, so I went back to school. In doing my masters research, I actually ended up doing a lot of work with risk communication.

Staff: So did you start out at NEORSD?

Beth: Yes, I went there straight from college. I was one of the very fortunate people that graduated from college and had a job.

Staff: What did you do at NEORSD?

Beth: When I started at NEORSD, I was an investigator in the pretreatment program. I started working on mercury issues as part of the pretreatment program and was involved in environmental monitoring. NEORSD has a department called Water Quality and Industrial Surveillance, so it all fits together. I spent a long time in that department working on either pretreatment, mercury, and other water quality issues. That work got me more involved in general regulatory issues and eventually I was promoted to Environmental Specialist where it was my job to focus on the regulatory aspect of water quality issues. I worked on mercury, pharmaceuticals, nutrients, bacteria, credible data and a wide range of other issues. Later, NEORSD

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: megan@ohiowea.org.

created a Regulatory Compliance department, and I moved to that department where I continued to work on those oddball—if you will—water quality issues.

Staff: When you left NEORSD, did you go straight to Geosyntec?

Beth: I did go straight to Geosyntec. I was with NEORSD for 14 years and I joined Geosyntec in 2015. At Geosyntec I do a lot of the same type of water quality work that I did at NEORSD, but for a wider range of clients. I do more pretreatment work than I anticipated doing as a consultant, but I've found that I really enjoy pretreatment. My focus is still on Clean Water Act compliance and I work with a diversity of clients, not just in Ohio but throughout the country. I'm supporting municipalities, agriculture groups, industries, and even watershed groups with water quality and regulatory issues. It's a ton of variety of projects and people.

Staff: How did you get involved with OWEA?

Beth: I honestly can't remember. I've been involved with the Government Affairs Committee for a really long time. Initially, I probably got involved first in the Northeast Section going to section meetings to get contact hours. I always went to the Government Affairs Workshop because it was directly relevant to the work that I was doing at NEORSD, especially when the nutrient issues started heating up.

Staff: Why are you passionate about Government Affairs?

Beth: I'm a scientist at heart, but over time the regulatory side of things has also become more interesting. Through the years, I have learned that you can know and understand the science, but if the science is not well communicated, then it really doesn't matter. If we don't communicate the science in a way that is understandable, we end up with regulations that don't work very well. When I left NEORSD, it's not like I didn't realize it before, but it seemed more obvious that there were a lot of utilities that didn't have the resources that NEORSD had or the ability to have that expertise in house. So that is what is driving my interest in OWEA Government Affairs – it is getting these resources to all the utilities. I want to spread OWEA's knowledge base across the state.

Staff: What are your goals as the new Government Affairs Chair?

Beth: My first goal is to get more people involved across the state. I would like better representation of the utilities and the consultants that make up OWEA. OWEA has some very large utility members, but OWEA also has a lot of very small utility members. I want to make sure that when it comes to regulatory affairs, that everybody's voice is heard. Things that are a big concern to smaller wastewater treatment plants may not be a big concern to the larger wastewater treatment plants or vice versa so I want to make sure that we get more of that diversity represented. I also think that the committee needs broader representation from across the state; there are different issues and concerns in different parts of the state. So that's my first priority, to grow the committee. Then I want to work on making the committee more of a resource to the membership, as well as the regulators and legislators. In the last couple of years, Government Affairs has really been working on building a strong relationship with Ohio EPA. We are well on that path, and need to continue that, but I would also like to see the committee become more of a resource to support the members dealing with regulatory issues. Because of the diversity in utility membership, not everyone is dealing with the same issues and maybe, more importantly, not every utility wants the same regulatory outcome. I'm hoping that as regulatory issues arise, we will be able to have conference calls or meetings to discuss the issues so that the members can share knowledge, opinions, and concerns with each other. This will help everyone to make well informed decisions and develop positions that best address the needs of their utility. I think we have some big issues coming, of course there are nutrients, but we

"I want to make sure that when it comes to regulatory affairs, that everybody's voice is heard."

also have ammonia, PFAS other similar compounds, and issues with biosolids disposal. The pharmaceutical issues haven't gone away either.

Staff: What is something that you want the OWEA membership to know about you as their Government Affairs chair?

Beth: I'm really looking forward to it, I'm excited to be the chair, and I want to hear from people.

Staff: What are you looking for in Government Affairs Committee members?

Beth: Enthusiasm. I want people who have an interest in these issues to be a part of the discussion and I don't want to exclude anybody. I know that finding the time to volunteer can be a struggle for everyone, so I want to be sure that folks know that I think every little bit helps. The more people we can get involved with the committee, the more we can divide and conquer individual issues. Also, if people have one particular interest, like nutrients as an example, I want people to volunteer to help with just that issue if that works better for them.

"I know that finding the time to volunteer can be a struggle for everyone, so I want to be sure that folks know that I think every little bit helps. The more people we can get involved with the committee, the more we can divide and conquer individual issues."

Staff: As our newest leader in OWEA, what would you say are some qualities that make a good leader?

Beth: In a state association that's made up of very diverse membership, I think we need someone who can listen to all aspects of an issue. I think that the Government Affairs Committee has always struggled with how to represent the interests of Ohio's wastewater treatment community as a whole. We have different types and sizes of wastewater treatment plants, all with different concerns. I think it can be hard to have one position that represents the entire group. Because of that, a leader needs to guide members to find the common ground if it exists and to also facilitate development of individual positions on regulatory issues.

Staff: You work in a very male-dominated field, so how do you handle that? And what advice do you have for other women facing similar obstacles?

Beth: Oh, that's a rough question. I have to say quite honestly, I've been very fortunate to only seldom run into that as an issue. Yes, there are definitely less females in this industry as a whole. However, we have some very admirable women in our association. If somebody is struggling with that, I would say find one of them, partner up with them, and talk to them more about it and the struggles that you have.

I started at NEORSD right out of college, so when I first started working on regulatory issues in the wastewater industry, I was much younger than a lot of people. I had a hard time getting people to not discount my opinion because they seemed to view me as just a kid. What I have learned from that is that you can't be afraid to change things, but before you do that, you have to take the time to understand why things are the way they are. Decisions were made for a reason, and understanding those, the background, and the institutional knowledge are key to leading effective change.

Staff: Looking to the future, what would you like to see happen in this industry?

Beth: I really think that in this industry we're going to be dealing with climate change. There doesn't seem to be a silver bullet or a magic wand, but it really seems like in Ohio we're just dealing with more and more water, and more weather extremes. I don't know what I want to see, but I feel like we're going to have to find a way to address that, plan for it, and find ways to cope with it.

Staff: Anything else you would like to share with the membership?

Beth: First, I want to remind folks to volunteer to be a part of the Government Affairs committee. Second, I want to know what government or regulatory issues are keeping utility representatives awake at night. I want to make sure that we are addressing those things at the workshops. You can email me at **etootlevy@geosyntec.com** with your ideas or your interest.

Beth working in the field

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Heat Safety

by Julie Fritchley, City of Akron

Rising temperatures can cause a danger to employees if extra precautions are not taken. It is important that we are able to recognize when we or someone else is experiencing a heat related illness and how we should react. This is something to keep in mind whether we are at work or at home. A list of heat related illnesses which includes: heat rash, heat cramps, heat syncope, heat exhaustion, and heat stroke.

Heat rash is an irritation to the skin from excessive sweating. This illness can be avoided by practicing good hygiene and staying dry.

Heat cramps are painful muscle spasms. Getting rest, fluid intake, and having a snack can help treat this illness.

Heat syncope occurs when the body doesn't produce proper blood flow. People can experience fainting due to poor circulation and should lie down and elevate their legs. Sitting in a cool area and drinking water may help recover.

Heat exhaustion can be dangerous if not treated and occurs from a loss of water and salt from the body. Symptoms of heat exhaustion can include fainting, excessive sweating, cool and clammy skin, nausea, vomiting, and rapid or weak pulse. Victims should seek a cooler or air conditioned area, drink water if fully conscious, and use a cold compress.

Heat stroke is one of the most dangerous illnesses and occurs when the body fails to control its temperature. Symptoms of heat stroke can include headache, no sweating, hot and red skin, nausea, vomiting, and unconsciousness. 911 should be contacted along with taking action to keep the victim cool.

Individuals who are in poor health, taking certain medications, pregnant, or elderly may be at higher risk of developing these heat related illnesses.

The OSHA NIOSH Heat Safety Tool app is available for download on your smartphone (IPhone and Android compatible). This app will help you calculate the heat index and risk levels for your location. You can access information on signs of heat illness and first aid measures. This is a free tool you can use to help plan your workday and stay safe.

There is plenty we can do to keep cool in these hot spring and summer seasons. Try to get work done earlier in the day. Take scheduled breaks, preferably in an air conditioned area, to stay cool. If you work on the road, take breaks in your vehicle if you don't have a building to utilize. Use a buddy system so that individuals can monitor each other's symptoms and take turns on a job.

It's recommended to drink small amounts of water throughout the day when working in the heat. Eating fruits or adding them to your water can help replace lost electrolytes. Avoid consuming caffeine or alcohol in order to prevent heat related illness.

There are a variety of products you can purchase for your employees to keep them safe in the heat. You can purchase drinks and popsicles available specifically to replace electrolytes lost from sweating. There are clothes designed to keep the wearer cool such as shirts, vests, and hats. Hard hats can be equipped with accessories from sweatbands to sun blocking attachments.

It's also important to remember to take precautions against skin cancer. Long sleeve shirt and pants, sunglasses, and hats offer protection from UV rays. Use a sunscreen of at least 15 spf before going outside. Sunscreen may wear off after sweating so be sure to reapply when needed.

It is that time of year again. Remember to take measures to get acclimated to the heat and humidity. Stay hydrated, keep cool, and take breaks. You can get more information on workplace safety and training on the OSHA and CDC websites.

No P in My Sludge?

Nutrient Recovery Benefits for Biosolids

by Rob Smith and Bob O'Bryan, Black & Veatch

"We may be able to substitute nuclear power for coal power, and plastics for wood, and yeast for meat, and friendliness for isolation, but for phosphorus there is neither substitute nor replacement." – Isaac Asimov

The requirement to protect surface water resources from the negative effects of habitat degradation due to phosphorus (P) is creating new opportunities for resource recovery. As a result, the options have increased substantially in recent years. New and advancing technologies for sequestering and recovering P from wastewater sludge are providing water resource recovery facilities (WRRF) greater flexibility for custom solutions that solve existing problems without creating new ones. This article will explain the importance of P, identify the unintended negative consequences of advanced wastewater treatment including nutrient removal, and summarize the available technologies and how they prevent those negative consequences.

Phosphorus is a Special Element

Phosphorus is one of six essential elements for living organisms along with carbon, hydrogen, oxygen, nitrogen, and sulfur. Among those elements P is considered life's bottleneck. Therefore, P that leaves the WRRF in effluent takes the foot off nature's brake and may contribute to excessive growth of algae which can severely degrade receiving waters. Furthermore, removal of P from wastewater is a special problem because P cannot be transformed to a gas like carbon and nitrogen. It must be converted to a particulate form and removed from the wastewater with hauled sludge. WRRFs can convert P to particulate form by chemical addition to form P-containing precipitates or through biological means by cultivating phosphate accumulating organisms (PAO) in the activated sludge system.

Enhanced Biological Phosphorus Removal Innovation

Many facilities are opting for enhanced biological phosphorus removal (EBPR) for its benefits which include lower operating costs and reduced carbon footprint. EBPR was first described in 1975 and has been practiced extensively in municipal wastewater treatment. The traditional configuration incorporates upstream anaerobic (AN) and sometimes anoxic (AX) zones into the activated sludge reactors.

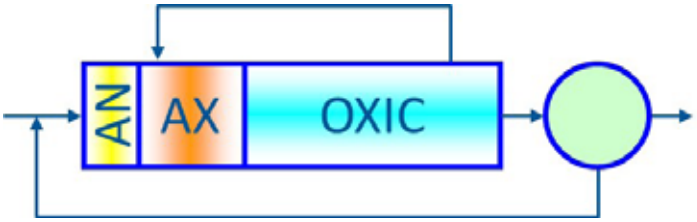


Figure 1 Traditional EBPR

However, reliability of EBPR has sometimes been a knock against the technology. The bottleneck is the amount of readily biodegradable carbon, specifically volatile fatty acids (VFAs), in the wastewater which the PAOs require. As a result, the performance of EBPR may suffer during cold, wet conditions. The recent innovation of side-stream EBPR (S2EBPR) facilitates VFA production in the side-stream, allowing reliable EBPR even for cold, weak wastewater. Moreover, S2EBPR allows more efficient use of wastewater carbon for P and N removal, thereby reducing the need for chemicals (ferric, alum, methanol, glycerol, etc.). S2EBPR improves reliability of biological P removal which will increase adoption in the industry but will also force a reckoning with the unintended consequences of EBPR.

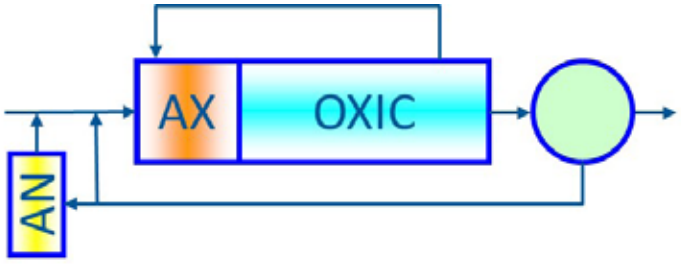


Figure 2 Side-Stream EBPR (S2EBPR)

Unintended Consequences

Potential disadvantages to EBPR manifest themselves in solids management. PAO bacteria give up their accumulated P in sludge digestion. For example, the orthophosphate (PO4) concentration measured in the aerobic digester of a WRRF performing EBPR was 220 mg P/L (Jon vanDommelen, Ohio EPA, personal correspondence). Even higher concentrations are possible downstream from anaerobic digestion. As a result, recycled solids handling reject waters constitute a significant loading to the main-stream liquid process reducing overall treatment efficiency.

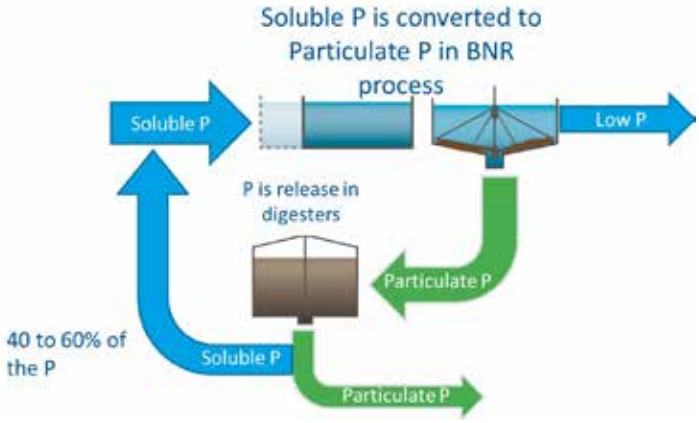


Figure 3

Furthermore, higher soluble P concentrations increase the potential for struvite formation downstream from digestion leading to fouling of pipelines and damage to equipment.

Figure 4

The higher P content in biosolids also may increase the total acreage required for biosolids land application. If P is the limiting agronomic factor lower biosolids application rates are allowed or else risk water pollution from agricultural runoff due to excess application of P. As a result, more acreage is needed from more distant sites increasing transportation cost.

Lastly, decreased dewaterability of digested biosolids has been observed resulting in higher operating costs for transportation and polymer.

When Life Gives you Lemons....

It is not all bad news, though. Concentrating P in sludge also creates opportunities for P recovery from digested sludge, from dewatering liquor post digestion, or pre-digestion.

The most common form of P recovery is through intentional precipitation of struvite, magnesium ammonium phosphate (MAP). In general, the configuration of struvite technologies consists of a vertical fluidized bed reactor (FBR) tank with addition of magnesium and pH adjustment. Digested sludge and dewatering liquors that contain high concentrations of ammonium and phosphate have high struvite formation potential but are limited by magnesium. Also, the rate of struvite formation increases with pH. pH adjustment is achieved with chemical addition or by aerating sludge with ambient air to strip CO2.

Figure 5 Struvite Recovery from Dewatering Liquors

The most common configuration for struvite recovery is from the liquid that is decanted from sludge dewatering. The Ostara™ process is the most common technology for struvite recovery with 14 operational municipal installations in the US. Centrate is fed into an FBR with addition of magnesium chloride (MgCl2) and sodium hydroxide for pH adjustment. The product is a highly pure crystalline and uniformly-sized struvite pellet or prill. Up to 90% of P is recovered from the centrate improving overall treatment efficiency and providing the minimum biosolids P content. Various financing options are available which allow cost recovery from sale of the product which is marketed as Crystal Green®, a slow-release commercial-grade fertilizer, for $300 to $400 per dry ton. On the downside, Ostara has the highest cost and the largest footprint of the commercial P recovery technologies.

Multiform Harvest (MH) is a similar technology to Ostara but on a smaller scale. It is also marketed to the agricultural sector. The product is less uniform and more suitable for fertilizer blends. A price of $200 to $375 per dry ton is expected for municipal projects. MH was recently acquired by Ostara which is expected to increase marketability of the technology to smaller facilities.

Both Ostara (WASSTRIP) and MH (MultiWAS) have optional pre-digestion add-on processes to maximize P recovery. Waste activated sludge (WAS) is fed to an anerobic pre-release tank with VFA addition to cause biological P release. Filtrate from thickening of the pre-release tank sludge bypasses the digester and is fed directly into the FBR.

P Sequestration / Recovery from Digested Sludge

Low-tech and high-tech alternatives are available for treating digested sludge. One low-tech solution is to add ferric chloride to digested sludge prior to dewatering allowing phosphorus to be captured in dewatering and removed with hauled sludge. This simple alternative achieves many objectives including preventing struvite formation, reducing recycle of PO4, and odor control. The drawbacks include the need for ferric chloride storage and dosing systems, an increase in the amount of sludge generated, an increase in the iron content of the sludge, and the potential for formation of vivianite, another troublesome mineral deposit that causes similar effects as struvite.

Another low-tech solution is degasification. As mentioned previously, aeration strips CO2 from the sludge and raises the pH. The effectiveness is limited by the amount of magnesium in the sludge. Therefore, supplemental ferric chloride addition may be necessary to meet struvite control objectives. Furthermore, uncontrolled struvite formation in the degassing tank results in significant maintenance effort to remove scale.

The main advantage of ferric chloride addition and degasification is low capital cost and simple operation. However, neither option allows recovery of P and has other very significant drawbacks.

High-tech solutions to precipitate struvite from digested sludge (digestate) include Airprex® and NuReSys. Similar to Ostara, Airprex and NuReSys technologies utilize an FBR with Mg addition and pH adjustment. However, pH adjustment is achieved with aeration only (CO2 stripping). Mg addition and pH adjustment are both done in the MAP reactor in the Airprex process. NuReSys consists of a CO2 release tank followed by a struvite reactor where Mg is added.

There are two options for the precipitated struvite. In the sequestration option, struvite crystals remain in the sludge. The facility gets the advantages of reduced struvite formation on equipment and recycle loading but a marketable product is not recovered. Alternatively, in the recovery option, a grit classifier (Airprex) or cyclone (NuReSys) recover 45 to 50% of the precipitated struvite. The product is not uniform, like the Ostara prills which limits the available markets. The harvested struvite is marketed by the technology vendors to soil blenders for up to $150 per ton. Besides the struvite recovery equipment, a larger reactor is required so the equipment price for the recovery option is higher than for sequestration.

Airprex is gaining traction in the US. There are 2 operational systems in the US, including Medina County with another heading to construction, another in design,

and many other utilities doing studies. NuReSys has 3 operational systems in Europe but should be competitive in upcoming bids for US installations.

P Recovery Pre-Digestion

P recovery as brushite (CaHPO4 x 2H2O) is still in the piloting stage. Sludge is fed to an acid-phase digester which solubilizes P. The sludge is dewatered on a centrifuge and the P-rich centrate is sent to a precipitation reactor where calcium hydroxide Ca(OH)2and calcium chloride CaCl2 are added. The process advantage is a relatively high P recovery rate. Pilot-scale systems have demonstrated that up to 50% of the total P in sludge is recovered. From a cost recovery perspective, brushite has a higher market value than struvite. Complexity and capital cost are potential disadvantages.

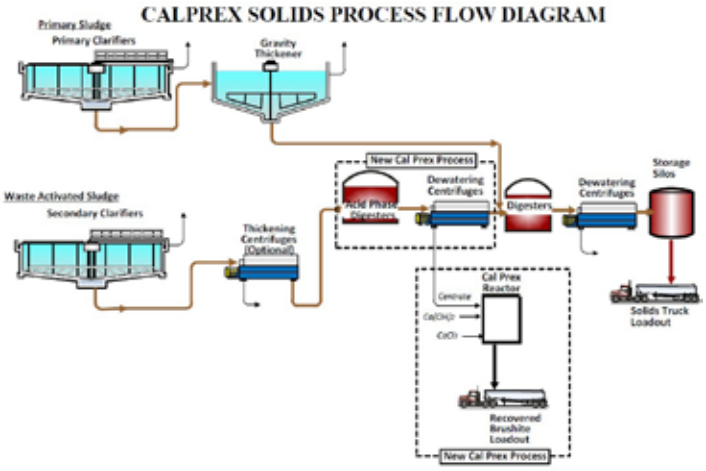
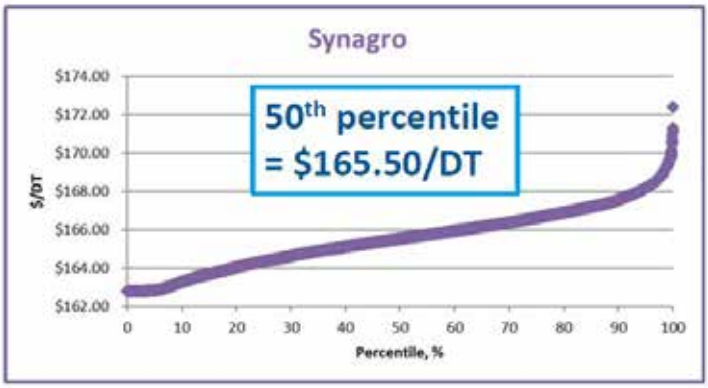
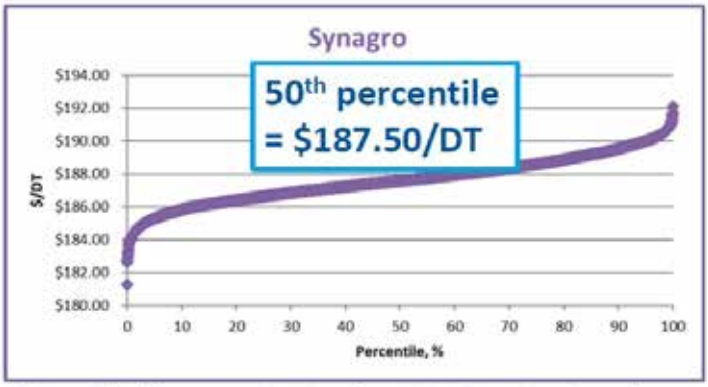


Figure 6

The Big Picture

Phosphorus recovery from sludge has multiple benefits including reduced potential for struvite scaling, increased dewatered cake solids concentration, reduced recycle loading, and production of a fertilizer product with enhanced value. Recovering P also may reduce the cost for biosolids land application. Biosolids are an unbalanced fertilizer with a lower nitrogen to phosphorus ratio than is required for crops. This may force facilities to use more fields a greater distance from the source in order to not exceed agronomic requirements for P. increasing transportation costs which are the largest expense for biosolids land application. A desktop evaluation for the City of Columbus showed a potential cost increase of over 13% for a 50% reduction in availability of land application fields.





*Normalized future projections from 5000 iterations based on historical data from Columbus, OH WWTPs

Figure 7

This article was based on a presentation given at the 2018 OWEA Biosolids Workshop by Bob O'Bryan

Rob Smith, P.E., BCEE, Ph.D. is a Process Engineer and Bob O'Bryan, P.E., ENV SP is a Project Manager based in the Columbus office of Black & Veatch

Phosphorus recovery is also part of the solution to global depletion, the other phosphorus predicament. Phosphorus in commercial fertilizers is obtained from mined phosphate rock, also known as phosphorite. Phosphorite reserves are finite, as they take millions of years to form. Current global reserves, mostly located in Morocco and Western Sahara, are projected to last 300 years at current extraction rates (USGS Mineral Commodity Survey, 2016). The economic effects, however, will be felt long before phosphorite is depleted according to the Hubbert peak theory, which predicts the point of maximum production of a non-renewable resource, like phosphorus. Post peak periods are characterized by higher prices and greater price volatility. The year of peak phosphorus production is predicted to be from 2035 to 2075 (White and Cordell, Peak Phosphorus: the sequel to Peak Oil, http://phosphorusfutures.net/the-phosphorus-challenge/peak-phosphorus-the-sequel-to-peak-oil/, accessed June 30, 2019).

Cybersecurity Fundamentals Guide for Water and Wastewater Utilities Now Available

by Michael Arceneaux and Jennifer Lyn Walker

This article solely reflects the personal opinions of the authors, not necessarily WEF and its members. It is provided for educational purposes only, and is not intended to substitute for the retainer and advice of an appropriate professional. No warranties or endorsement of any kind are granted or implied.

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

Water and wastewater utilities provide critical lifeline services to their communities and their regions. Supporting these vitally important functions requires secure information technology (IT) and operational technology (OT), yet the sector's IT and OT networks continue to face an onslaught of threats from cyber criminals, nation states, and others.

To support the sector in its cybersecurity goals, and in response to the continually evolving threats, WaterISAC, the Water Information Sharing and Analysis Center, has just published a newly updated resource: 15 Cybersecurity Fundamentals for Water and Wastewater Utilities.

The updated guide contains dozens of best practices, grouped into 15 main categories, that water and wastewater systems can implement to reduce security risks to their IT and OT systems. Each recommendation is accompanied by links to corresponding technical resources. In sum, the guide connects users to the information and tools needed to take a dive deep into this important issue.

Here is a summary of the 15 fundamentals.

- **Perform asset inventories.** You can only protect what you know about. Knowing your environment is a basic requirement of a sound cybersecurity program.

- **Assess risks.** Once assets inventories are completed, OT and IT risk should be assessed, considering the likelihood a threat will occur and the degree of impact the threat will cause to the organization.

- **Minimize control system exposure.** Protect the control system environment from outside, untrusted networks. This involves network segmentation, traffic restrictions, and encrypted communications.

- **Enforce user access controls.** Users on a network should have no more access than they need to do their jobs. Apply role-based access controls and the principle of least privilege, including limited use of administrator rights to prevent users from accessing systems and files they are not authorized to access.

- **Safeguard from unauthorized physical access.** If an adversary can gain physical access to your equipment, they can compromise it. Non-technical, physical security controls can restrict physical access to IT and OT environments.

- **Install independent cyber and physical safety systems.** Cyber-attacks can result in physical effects. To protect critical assets from such "blended" threats, utilities should consider non-digital engineering solutions such as independent cyber and physical safety systems.

- **Embrace vulnerability management.** Largely informed by asset inventory and risk assessments, vulnerability management involves the need to identify and remediate cybersecurity gaps and vulnerabilities before the bad guys exploit them.

- **Create a cybersecurity culture.** Cybersecurity

is everyone's responsibility, the break room to the boardroom. Effective cybersecurity starts at the top; to affect positive behavioral changes, involve every executive, board member, and employee in cybersecurity awareness and training.

- **Develop and enforce cybersecurity policies and procedures (Governance).** Create, disseminate, and operationalize clear and actionable organizational policies and procedures regarding cybersecurity expectations. The fundamentals in this guide can be used to begin developing policies that are most relevant to each organization.

- **Implement threat detection and monitoring.** You will not find it if you are not looking. The importance of configuring detailed logging and reviewing system logs to detect active threats in your environment cannot be overstated.

- **Plan for incidents, emergencies, and disasters.** Plan ahead for maintaining business continuity and resilience. Emergency response plans (ERPs) will be required by America's Water Infrastructure Act (AWIA) beginning in 2020.

- **Tackle insider threats.** The insider threat is a people problem, not a technology problem; however, not all insider threats are malicious. Mitigate this organizational-level threat by understanding behavioral indicators that predicate an insider threat and apply appropriate training and technology controls to deter an incident.

- **Secure the supply chain.** The supply chain/vendor relationship is a common threat vector for cyber-attacks and must be intentionally managed through security and vulnerability testing and risk assessments.

- **Address all smart devices.** When unsecured internet of things (IoT) and mobile devices are connected to networks, they create holes (often to the Internet) that may not have previously existed. Cisco's 2018 Annual Cybersecurity Report states that few organizations view IoT as an imminent threat, yet adversaries are exploiting weaknesses in connected devices to gain access to industrial control systems that support critical infrastructure.

- **Participate in information sharing and collaboration communities.** Share information with others. Utilities can learn from each another by getting involved in WaterISAC, InfraGard, and similar communities. Cyber-mature utilities can significantly help the community and sector by sharing their experiences.

About WaterISAC

WaterISAC is a nonprofit water and wastewater sector organization dedicated to protecting sector utilities from all hazards. WaterISAC disseminates threat advisories, reports, and mitigation resources to help utilities prevent cyber and physical security incidents and to recover from disasters.

WaterISAC draws information from federal and state law enforcement and many private sector sources to produce products that are relevant to the water and wastewater sector.

Membership, including a free 60-day trial, is open to utilities, consulting firms, sector associations and state agencies. More information is available at www.waterisac.org.

Michael Arceneaux is WaterISAC's managing director and Jennifer Lyn Walker is WaterISAC's cybersecurity risk analyst.

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2019 APPLICATION

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Business Name *(if applicable)*

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Home Phone | Cell Phone | Business Phone

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☐ I do NOT wish to receive information on special offers, discounts, training and educational events, and new product information to enhance my career.

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By joining WEF, you also become a member of a local Member Association (MA). Please enter your membership category (Box 1) and the Local MA you wish to join from the list on the next page. ***Note:*** *District of Columbia, Illinois, Maryland, and Virginia residents have two MA choices. Please indicate your primary choice in box 2 below. If you join both, please add your secondary selection as a Dual MA with the corresponding Dual MA dues in box 3 below.*

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☐ **Academic**	$140	Instructors/Professors interested in subjects related to water quality.
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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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The following is requested for informational purposes only.

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We see the hashtags and often hear those in the water sector refer to each other as family... but what does that really mean? It means we support each other in tough times. It means we think about how we can help each other. It means we stand together.

Saying we are a family is an easy thing to do, but how do we put these feelings and words into action? We do it in a variety of ways. We reach out to members whose communities are hit with severe weather. We check in on each other. We say, "what do you need and how can I help?"

Recently, how close of a family the water community is was tested through an awful act of violence. We all too often hear the words mass shooting on the news. Unfortunately, this time it was very close to home, in the form of the mass shooting that took place in Virginia Beach on May 31.

The shooter was a long-time municipal employee and all but one of the twelve killed and four injured victims were employees of the city working in the public works department. Details aren't necessary, but many in our own Ohio water family knew and had worked with the victims, and some even the shooter. This event hit our Ops Challenge participants especially hard, as several of the victims were heavily involved in Operations Challenge at the WEF level.

This shook us to our core. These people were just doing their job and didn't come home that night. We all thought "what if it had been me?"

Instead of dwelling on the ugliness of this event, OWEA members chose to unite together and help our Virginia Beach water family members. In the course of just a few short emails and a couple of phone calls, we had a plan. We would use our 2019 Conference as an opportunity to help in the form of fundraising. This was a joint effort of our incoming President, committee chairs, our executive committee and volunteers.

Everyone worked together and through the generosity of all those involved, we raised more than $11,000 in the course of just a few hours during our Welcome Event. Donations ranged from $1 – over $1,000. From individuals to companies. Out of horror and sorrow, came unity and sharing.

While the events on May 31 are horrific, the actions following it were none short of amazing. The shooting will be remembered as one of the worst times in water, but the unity and love following as one of the best.

OWEA, you put your words into action and "your money where your mouth is." You triumphed over tragedy. I am very proud to be part of water's #OneFamily and you should be too.

Dawn Sink Kennedy, CAE, Executive Administrator

At the Heart of it All

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

The 1985 Slogan

Inspiration for the title is from the Ohio slogan from the 1980s: Ohio: The Heart of it All. Intended as a promotional statement for Ohio by then Governor Richard F. Celeste during his two terms in office from 1983 to 1991, the statement captures much of what our state has to offer very well. With easy access to transportation and located in a strategic part of the United States which one has to pass through when traveling from east to west, Ohio is diverse in its people and landscape. Ohio has no truly large cities that resemble Chicago or New York, it can be well described as a blend of farms, villages, small cities, and suburban developments between larger urban areas of Cleveland, Columbus, Cincinnati, Akron, Canton, Dayton, and Toledo.

The Ohio Water Environment Association (OWEA) is also fortunate to have four active and vibrant sections. Each is similar but slightly different as each reflects it's people, traditions, and geography. The Northeast and Southwest Sections are the most developed and reflect larger municipalities and feature a significant industrial base. Conversely, Southeast takes on a more rural flavor as it includes much of Ohio's Appalachian region.

Our Northwest Section can be described as a blend of the other three. Attendance at meetings is typically larger than what is seen in the Southeast Section but a bit smaller than Northeast and Southwest. While more urban than Southeast, Northwest Ohio includes large expanses of agricultural lands that form the heritage of the region. Lagoon treatment technology remains a commonly applied treatment technology in small towns due to thick clay deposits from the last Ohio glacier over 10,000 years ago.

The Heart of OWEA

Everyone who has served in a leadership capacity in OWEA understands our passion for education of our members and our youth who will be our leaders of tomorrow. Our core focus is providing training to operators and continuing to evolve and reinvent ourselves to stay relevant. Many of our members have found a love for serving as judges at district level science fairs and look forward to serving as a judge for a few hours every year.

Serving as a public education chair at the section level is an excellent way to become part of the organization and where I got my start in OWEA in 1996 as the SEOWEA Public Education Chair. So much did I enjoy this role, that I have continued to serve as a judge for the last 22 years at the Ohio University Lancaster (OUL) Campus, which is held on a Saturday morning in mid-March each year. During the first week of January of each year, I receive a phone call from Diane Gabriel who leads the effort for organizing the OUL event. Each year our phone calls get longer and longer as we have become friends through the years. Having this personal connection has also helped OWEA understand the culture of public education and the many challenges teachers face in their profession. Through this understanding, we are better positioned to understand how to work with teachers and promote education in the water environment. Through the years it has been increasingly clear that education in the water environment starting in grade school is necessary to create awareness of the need for us as a society to serve as good stewards for the future of our water environment.

The Stockholm Junior Water Prize

OWEA started promoting the Stockholm Junior Water Prize in 2003 and has chosen a winner every year since that time. Sponsored annually in the United States by the Water Environment Federation and Xylem, OWEA and others (see WEF press release below) sponsor when it is in close proximity. According to former WEF President and SJWP Lead Judge Jeanette Brown, the event is considered to be the Nobel Peace Prize of science fairs for water environment projects. Students compete from most of the 50 states. Those in the competition are considered to be the best of the best in their Member Associations. The winner receives a cash prize of $10,000 and the opportunity to compete for the prize in Sweden each year during World Water Week. For this year and the next two

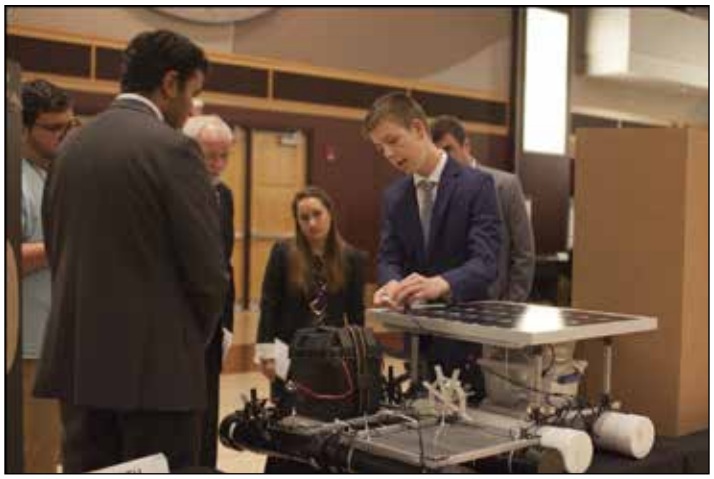
years, the Ohio State University was selected to be the host university.

Our primary Ohio liaison and organizer was Deborah Houdeshell of the City of Canton. As most know, Deb was a Past OWEA President (2004-5) and served on the WEF House of Delegates and Board of Trustees. I served as a coordinator to the OWEA Board in addition to serving as a national judge. I was one of 18 national judges who reviewed papers, and met on June 14-15 for more than 18 hours to interview students, deliberate and select the winner, two runner ups and two other award winners. Our key tasks are to interview the projects in teams to determine knowledge and content, relevancy, and significance to addressing important water challenges. Judge teams also determine if the students do most of the work themselves and if the work is exploring an original question with the understanding that all research is built on a body of previous work.

The awards ceremony itself was so well done; it took my breath away. The entire event was immensely well done, and serving as a national judge was the capstone of my WEF career. Deb has written a separate article on the Stockholm Junior Water Prize.

I feel that it is important to let everyone know the role of volunteers and what opportunities exist for the next two years. One thing that we want to do next year is advertise this event so that the public can come and see the students' projects. The challenge we faced was that the competition includes evenings and weekends when people do not wish to volunteer. We had a number of people contribute to the success of the event, but the search for volunteers went down to the wire.

SWJP Judges



One of the Ohio winners, Ryan Ziegler, presenting his project to the judges.

The Stockholm Junior Water Prize Winner

Below is the press release from WEF after the competition was completed:

The Water Environment Federation (WEF) proudly announced that Sonja Michaluk has won the 2019 U.S. Stockholm Junior Water Prize (SJWP), the nation's most prestigious youth competition for water-related research.

Michaluk, a student at Hopewell Valley Central High School in Pennington, N.J., explored the use of DNA barcoding to measure the health of waterways with larval Chironomidae (order Diptera), the most widespread macroinvertebrate family. She won $10,000 and an all-expenses paid trip to Stockholm to represent the United States at the international competition in late August.

Students from 45 states and Puerto Rico competed in the national finals June 13-16 at the Ohio State University in Columbus, Ohio. The Stockholm Junior Water Prize aims to increase students' interest in water issues, research, and careers, as well as to raise awareness about global water challenges. The competition is open to projects focused on improving water quality, water resource management, water protection, and drinking water and wastewater treatment.

The two U.S. runners-up were Noel Lange of Alabama and Ankush Dhawan of Indiana, who each received $1,000. Haley Jostes of Minnesota received the Bjorn von Euler Innovation in Water Scholarship Award from Xylem Inc. Mehaa Amirthalingam of Texas received the James L. Condon Recognition for Environmental Stewardship.

"The health and future of our global water environment depends on the kind of ingenuity and innovation the Stockholm Junior Water Prize competition showcases," said WEF Executive Director Eileen O'Neill. "WEF takes pride in supporting these young scientists as they work to solve some of the most complex challenges facing the water sector."

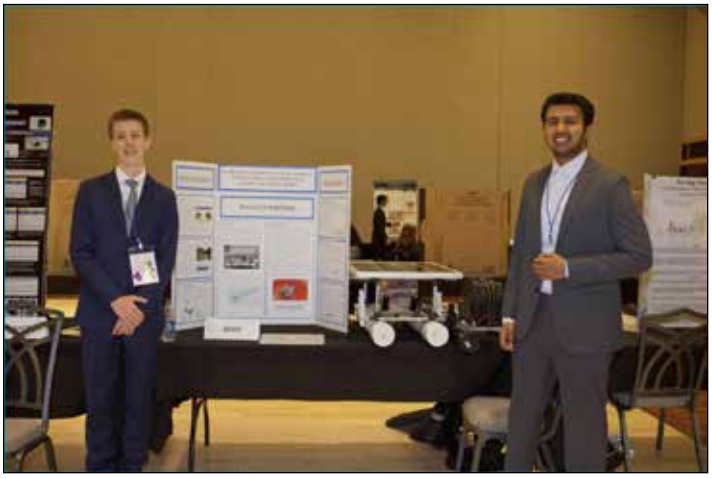
Michaluk's winning project, "A Novel Method of Monitoring the Health of our Global Fresh Water Supply using DNA Barcoding of Chironomidae (Diptera)," emphasized a forecast that 66 percent of the U.S. population will experience water scarcity within a decade, leaving residents more dependent on surface water for drinking. Current surface water monitoring methods rely on expensive and technically challenging manual identification of biological samples. DNA barcoding, Michaluk noted, "results in more accurate and precise waterway health data, adding significant value for monitoring scarce water resources."

The judges commented: "Beyond the very impressive research Sonja performed in her study of Chironomidae DNA barcoding to determine water quality health, she also applied her knowledge to a local non-profit water institute to improve her own community watershed. These students are creating solutions to improve communities across the world, and the Stockholm Junior Water Prize is a testament to the importance of investing in the future of our industry. The diversity of students and ideas this year demonstrated solutions for our world's water challenges will come from young people of all backgrounds."

In the U.S., WEF and its Member Associations organize the regional, state, and national competitions with support from Xylem Inc., who also sponsors the international competition.

In Closing

I think that we have continued to do a better job in promoting the Stockholm Junior Water Prize competition in Ohio and have had some good candidates in recent years. I have found the ideal candidates evolve their project over a period of years to the point where it is almost a year-round activity. In listening to Doug Borkosky the 2019 Conference Co-Chair and emcee of the Banquet, the students at the competition are part of Generation Z (2001-Present). Born in the current century, they have lived through a tough economy, rely on social media, are are entrepreneurial and multi-taskers. As a baby boomer from the middle of the era, I learn much from the different generations has each as much to offer. In this way, we learn from each other.



Ohio SJWP Winners Ryan Ziegler, Raghav Samavedam, and Jayanth Gunda (not pictured) with their project.

Stockholm Junior Water Prize hits The Ohio State University

by Deborah Houdeshell, City of Canton

On Thursday, June 13th students from all over the United State and Puerto Rico traveled to Columbus, Ohio to participate in the U.S. Stockholm Junior Water Prize Competition. This competition is held annually with the winner representing the United States in Stockholm, Sweden at the international competition held during World Water Week late August or early September. Each state has the ability to send one project as their winner to the competition. The winning project may be done as a solo project or team of two students. No more than two students may represent the state.

The students ranged in age from freshmen to graduating seniors, with some being the first year and some having been at the competition three years with projects they have been working on for years.

Ohio SJWP Winners Raghav Samavedam and Ryan Ziegler. Ohio Winner not pictured: Jayanth Gunda.

The competition was held on the campus of Ohio State University and most activities took place there. Students arrived on Thursday and got to know their roommates. Friday was comprised of hearing about the Water Resources Program at OSU, an ice breaker, setting up their projects, a wonderful tour of Dublin Road Water Treatment Plant, meeting the judges, meals and more social time. On Saturday the competition started at 8:30 am with judging lasting until 12:00 noon. The projects were then dismantled and the kids could relax while the judges were hard at work deliberating all afternoon. Individual and group pictures were taken prior to the awards ceremony Saturday night. In "Kocarek's Korner" on pages 71-72 the award winners are mentioned.

Coordinating the volunteers with WEF, working with WEF staff, the coaches and getting to know the students was a privilege. These students are the future in our industry and to see their passion and enthusiasm is a real treat. A special thank you to those who volunteered for this event and especially for Burgess & Niple, locally, and Xylem ,nationally, who stepped up in a huge way to make this event successful. Ohio WEA contributed to the t-shirts for the event. The judges were from all over including one OWEA member. Volunteer coaches included one OWEA member, two OSU students, and an interested teacher. The rest of the coaches were from out of state. Those that volunteered include:

- Transportation Coordinator: Luke Baker from Burgess & Niple
- Airport Greeters: Michael Merz and Randles Tucker from City of Columbus; Josh Holton from Southwest Licking Community Water & Sewer; Vui Chung from Burgess & Niple
- Coaches: Anisha Patel and Tyler Elkins from Xylem; Elizabeth Schwab and Haley Kujawa from OSU; Malcolm Bernard former SJWP participant; Stephanie Lange parent of a student; Hannah Houdeshell; Nicholas Merchant-Wells from NEORSD.
- Judge: Dale Kocarek from Stantec
- Judges Scribe: Brian Yates from Burgess & Niple

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SWOWEA

Erik Torgersen, President

In the immortal words of Alexander Haig, "I am in control here." Alexander Haig was the Secretary of State when President Reagan was shot. But his statement was not really correct, just as it is not really correct for me to say I am in control. It is quite an honor to serve as the Southwest Section OWEA President, but the fact of the matter is, our committee is made up of great individuals that fulfill many responsibilities. The outgoing President, Dave Wilson, did a fantastic job leading our group. His passion for our organization is second to none. Participating with me on the Southwest Executive Committee is Keith Heffner, Kelly Kuhbander, Dave Reinker, Brandon Leeth, Justin Bahar, and Kevin Stilwell.

I believe that participating on an OWEA committee is one of the best ways to meet people and learn more about our profession. It is also a way to give a little something back to the water environment that is truly crucial to all aspects of life as we know it.

If you or someone you know has interest in becoming involved in OWEA please feel free to email me at erik@jagsenv.com. A good way to get started is to join one of our Southwest Subcommittees. All are welcome! Getting involved requires no particular expertise or experience level.

- Collection Systems
- Government Affairs
- Industrial Waste
- Laboratory Analysts
- Membership
- Plant Operations
- Public Education
- Safety
- Watersheds
- Young Professionals

The Southwest Section has several upcoming events that will surely generate interest. Check out the OWEA website at www.ohiowea.org or the latest Southwest WAVE newsletter for updates on events.

- September Section Meeting – Date and location TBD
- Collection Systems Hands-On Seminar – Nov. 21, 2019 at MSDGC at Galbraith Road
- Lab Analyst Workshop – Oct. 10, 2019 at YSI
- Lick Run Tour hosted by YP and Watershed Committee – Oct. 24, 2019 in Cincinnati
- Fall Operator Education Day – Date and location TBD
- Plant Operations Seminar – Nov. 14, 2019 at Manor House in Mason

SEOWEA

Chris Tarr, President

Greetings from the Southeast section as we begin the long hot dog days of summer. My name is Chris Tarr and I am very excited to begin my tenure as the Southeast Section President for the 2019-2020 term. I want to thank Past President Brenda VanCleave for all her hard work and dedication as the Southeast President over the past year. Also, I would thank outgoing Past President Kris Ruggles for his nine years of service to the Southeast section. Lastly, I would like to thank the current and past Southeast Executive Committee members for all of their dedicated time and efforts to the Southeast section during my time with the Southeast section. I feel very blessed to have worked with such a talented and hardworking group of people.

With the advent of the 2019-2020 term, the Executive Committee will be chaired by Brenda VanCleave – Past President; Melodi Clark – lst Vice President; Tiffany Maag – 2nd Vice President; Amy Eberhardt – Secretary; Josh Holton – Treasurer; Aaron Pennington – 3rd Year Director; and Jamie Mills – 2nd Year Director. Our newly joined committe member for 2019-2020 will be lst Year Director - Kelli Jameson. Welcome aboard, Kelli, and thank you for volunteering to be on the Southeast Section committee.

The Southeast Section held our annual Regulatory, Biosolids and Awards Seminar and Past Presidents luncheon on Thursday, May 30th which was hosted by Delaware County. This event started off with two WWTP tours at the Lower Scioto Water Reclamation Facility and the City of Delaware Upper Olentangy Water Reclamation Center. I would like to thank both staffs at those two facilities for letting us tour their respective plants. The tours were well received by those who attended and the SEOWEA Executive Committee can't thank you enough for your time and effort. Also, I would like to thank Delaware County for letting us hold our event at their meeting facility located in the Willis Building.

Following the tours, we met for our annual Awards and Past President's luncheon. During the awards ceremony we recognized professionals for their outstanding service to their field of work. A list of the award winners is as follows:

- Dean Stuart Award – Tom Bouts, City of Columbus
- J.W. Ellms Award – John Newsome, City of Columbus
- F.H. Waring Award – Daniel Stofan, City of Heath
- W.D. Sheets Award – Jim Shepard, Zane State College
- L.T. "Tom" Hagerty Award – Rick Smith, OEPA (retired)
- Engineering Excellence Award – City of Columbus OARS
- Lifetime Engineering Award – Kerry Hogan, Prime AE Group, Inc.
- Laboratory Analyst Award – Todd Jones, City of Circleville WWTP
- Professional Wastewater Operations Award – William Randles, City of Columbus
- Public Service Award – Delaware County Commissioners
- Collection Systems Award – Kelly Theil, Delaware County Regional Sewer District (DCRSD)
- Facility Image Award – Eastern Ohio Regional Wastewater Authority (EORWA)

Thanks to all those who attended this event and congratulations to all the award winners! We had approximately 105 people attend this event and I am told this may have been the largest number of people at a SEOWEA section meeting, which is outstanding!

Finally, we will be having our annual SEOWEA Friends and Family event at a Columbus Crew match on Saturday, August 3lst. Tickets for this event will include food and beverages (alcohol is not included, but there will be a cash bar available). Please be sure to visit the OWEA website calendar for more details on this event and to register if you are interested in attending.

NW OWEA

Mark Lehnert, President

Greetings to all the water professionals, from the Northwest Section. Another year is upon us which means changes to the executive committee here in Northwest Ohio. As I move from lst Vice President to President, I want to thank Gary Bauer, past president, and all the NW executive committee for allowing me this opportunity to lead our section. Over the last few years I have seen the NW section continue to grow stronger in our water quality commitment and the goal to bring quality programs to all our Northwest members. The accomplishments can only be achieved by the dedicated professionals that make up our executive committee. I believe it is the diversity of our committee that makes it strong, with members coming from different sectors of the water profession. Not only is the Northwest section diversified in our jobs, but we have all age groups from the Baby Boomers through the Millennial's serving our committee. I know personally that I learn more from the committee meetings and section meetings than I contribute and I attribute this to the quality professionals that we continue to get as speakers and trainers at our section meetings.

The Northwest Section meetings will be held in October, March, and May. The dates and locations for these meetings will be announced as soon as they are confirmed. Whether you want to host a meeting, present on a topic or have a topic suggestion, we want to hear from you.

For those of you who don't know me I entered the wastewater field purely by fate. I graduated high school at the age of 17 and did not have the desire to attend college. I was too young to work in the factories and with no motivation to go to college, I worked in the service industry as a banquet chef at the French Quarter, Perrysburg Ohio. At the age of 21 I was tired of the food industry and enlisted in the United States Air Force where I was given the job of "Environmental Support Specialist". Yeah, sounds impressive, but I had no idea what I was getting into. After my basic training in San Antonio, Texas, I was assigned to Sheppard Air Force Base in Wichita Falls, Texas for my "Environmental Support Specialist" training. I remember the first day, we got up about 6:00 am, ate, then marched to class. Once at the classroom site we boarded a bus and where taken on a field trip. The field trip consisted of us going to a couple of wastewater plants. I remember the last treatment plant we went to that day; it was about 95 degrees in the shade and we were looking at something called an Imhoff tank. The instructor leads us over to a manhole and they removed the lid and we were told to look into the manhole. It was just a dry empty manhole, nothing special! After about a minute, the operator of the treatment plant opened a valve that drained the sludge off the bottom of the Imhoff Tank – OH BOY! Welcome to wastewater treatment. To this day I don't think I'll forget that smell and the thoughts going through my head of "What did I get myself into." I served four years as a wastewater treatment plant operator at Ellsworth AFB outside Rapid City South Dakota. After my enlistment was up, I returned to Ohio where I was hired by the City of Defiance. I was hired as a plant operator, eventually moved up to Pretreatment Coordinator. After eight years I left the City of Defiance to work with a couple of guys who just started up a small company selling products to the wastewater field. This small company grew into Industrial Fluid Management and would eventually be acquired by Poggemeyer Design Group. I would work at Arcadis for a short time before being hired by Jeff Stone, who at the time was the superintendent at the City of Defiance wastewater plant. Jeff would retire one and half years later, elevating me to the superintendent position that I have held for the past eleven years. Over the last eleven years the thing I find most valuable is my employees. As a superintendent, I believe it is my responsibility to give the employees the tools to grow and advance in the wastewater profession. I find it important that all employees be given the opportunity to attend classes, training and section meetings.

It's never too late to get involved. When I was the Pretreatment Coordinator, I sat on the Northwest Ohio Pretreatment Ad-hoc committee for about two years. This committee helped me better understand the pretreatment needs and what others were facing in dealing with their industries. After serving on the pretreatment committee I lost touch with the Northwest Section. About four years ago I was asked to be secretary of the Northwest OWEA committee and I thought, it's time to get back in the game. It has been one of the best decisions I have made for my career. Not only has the Northwest OWEA committee been very welcoming to my participation but they have been extremely helpful. There is no one person that makes things happen; it takes a committee of dedicated individuals who are committed to water quality. I would urge anyone who wants to participate in the committee to get involved. The networking alone is worth the time and you will make new friends in the water sector, as well as connect with old friends. If you have an interest, please speak to any of our committee members.

Feel free to email me with any questions, comments or concerns.

Mark Lehnert, mlehnert@cityofdefiance.com

NESOWEA

Doug Harris, President

I am honored and humbled to serve as the Northeast Section President of OWEA in the 2019-2020 year. Over the last several years, our organization has faced several challenges; but we also have been part of some highly acclaimed new initiatives. I've had many positive experiences and opportunities while serving on the Executive Committee, developed personal and professional relationships, and can confidently state that the Executive Committee is committed to bringing innovative and exciting initiatives that are relevant to the current market. I am excited for the future of our organization!

Who Am I?

My career in the water sector began 22 years ago as a college intern at Finkbeiner, Pettis & Strout. I continued in that role for four semesters while pursuing a BS in Civil Engineering at The University of Akron. Upon graduation, I continued working at Finkbeiner, which later became Arcadis. I obtained my Professional Engineer licensure while working at Arcadis, and most recently earned my Class III Wastewater Operators license while serving as Engineer and Assistant Superintendent for the City of Canton in the Collection Systems Department and Water Reclamation Facility. I've been involved in several large projects, including sewer rehabilitation/replacements and full-scale treatment plant renovations. Currently, we are developing and implementing Asset Management and Capacity, Management, Operations and Maintenance plans.

On the personal side, I have been married for 17 years and have two daughters (12 and 15). We enjoy hiking, long distance running, and travelling together as much as possible.

Recent Events

We held our annual business meeting at Avon Lake Regional Water on May 23rd. Tours included the Water Filtration Plant and the Water Reclamation Facility, followed by the annual business meeting, awards and technical sessions. A special thanks to Steve Baytos and all of the folks at Avon Lake for hosting the event. Also, special congratulations are due to our scholarship and award winners who were announced at this event!

It was great catching up with friends and colleagues from each of the sections at the recent OWEA Annual Conference at Sawmill Creek! The 2019 Conference was a great success and we look forward to hosting next year's conference in the Northeast Section! Thank you to the 2020 Conference Co-chairs - Jennie Celik and Angelina Joseph - and the OWEA staff - Dawn, Megan and Chelsea - for the dedication and hard work you've already put into planning this huge event!

Upcoming Schedule

The Northeast Section always has a busy schedule in the fall and early spring. We are in the process of scheduling our fall section meeting – slated for September 19th in Medina. We are also exploring a new venue for our annual clambake and we think you'll like the new ideas! Our Young Professionals Committee has an event planned on September 22nd; Biosolids, Laboratory Analysts, Industrial Pretreatment and Collections workshops are being planned before the end of the year- watch for details online in the coming weeks. In addition, we have our January Operations Seminar and February Industrial Wastes Seminar, which are some of our most popular events. You can always find the latest updates at www.NESOWEA.org.

Our Executive Committee

I am pleased to announce the latest addition to the Northeast Section Executive Committee; Krishna Chelupati from Stantec has joined the EC as a lst year member. For several years, Krishna has mentored college students and continues to be instrumental in the expansion of our very successful Student Design Competition. Krishna is also active in the YP committee and has been the NESOWEA's point person for science fairs for many years.

Appreciation is extended to all our volunteers; however, I must specifically mention those employers who support our leaders on the Executive Committee while they attend many behind-the-scenes engagements throughout the year. These individuals and organizations include Jim Cooper - ARCADIS, Todd Taylor - ms Consultants, Mike Cook - Advanced Drainage Systems, Bill Zawiski – Ohio EPA, Jennie Celik - HDR, Mary Ann Driscoll – Burgess and Niple, Steve Baytos - Avon Lake Regional Water, and Krishna Chelupati - Stantec. Finally, I want to thank the administration at the City of Canton who continue to support my volunteer efforts.

We are proud to be part of the best section in the state, filled with willing and energetic volunteers who are passionate for our organization and the advancement of clean and affordable water for everyone. Thank you for everything that each and every one of you do!

Douglas J. Harris, NESOWEA President

doug.harris@cantonohio.gov

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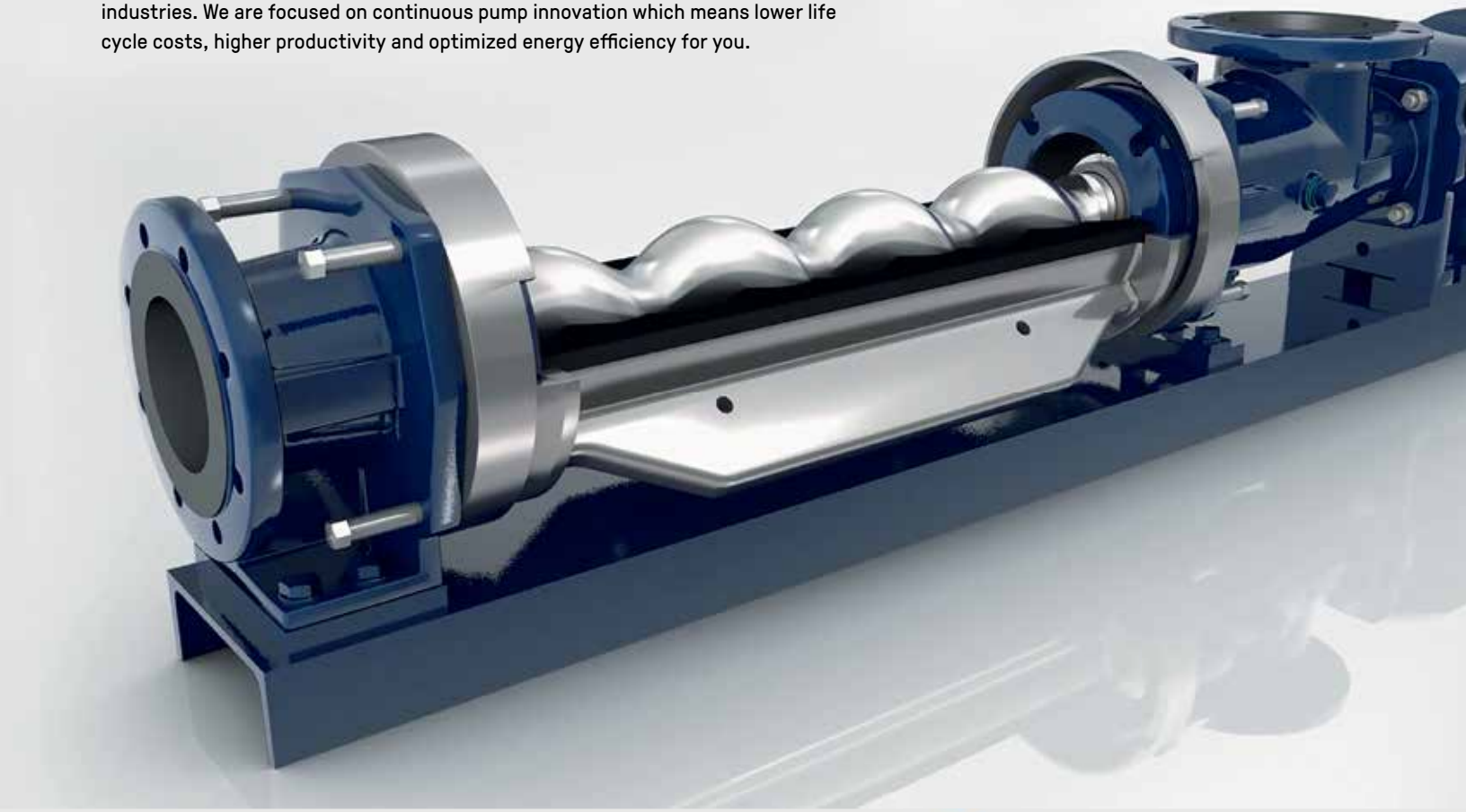

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Certification Board

by Kathy Richards

Firstly and most importantly I want to congratulate those who recently sat for and passed the Laboratory Analyst Certification examination. You should all be very proud of your accomplishment!

CLASS I

Cody Bower	James Brunello
Morgan Koelliker	Olivia Macek
Donovan Reichert	Ana Slocum
Miyah Dunford	Alicia Pater

CLASS II

Kristin Senek	Jessica Wilson

CLASS III

Michelle Harrison	Kevin Connor
Wanda Harney	Walter Schroder

The next examination date is October 18; applications must be postmarked by September 20 and can be found at this link. http://www.ohiowea.org/laboratory_certification.php

Also, 2019 is a renewal year. If you are not absolutely certain we have good contact information, especially email addresses, please provide those ASAP. Renewals will be available online in late October or early November and notifications will be sent out then. If you passed a higher level during this past renewal cycle (2018-2019) you will not need to renew.

Please feel free to reach out to me with any questions you may have.

Kathy Richards
Director, Board of Certification
certification@ohiowea.org

Plant Operations Update

by Joe Tillison and Walter Ariss, Co-Chairs

The Plant Ops Committee would like to extend congratulations to all the participants in this year's 2019 Operations Challenge Invitational that took place during the OWEA Annual Conference at Sawmill Resort. This year's event featured two teams competing from Ohio along with a team from Columbia, South Carolina and one from Chicago, IL. Due to the hard work of all our volunteers the competition went off without a hitch, which is a tremendous achievement considering we completed all the events in one day. A huge thank you to all of the event head judges and volunteers that make this event a huge success. The two teams from Ohio will be representing OWEA during the national Ops Challenge competition which is held as part of WEFTEC in Chicago on September 23rd and 24th. If you are in Chicago be sure to stop by and cheer the teams from the Northwestern Water and Sewer District and the City of Columbus on to victory! This event would not be possible without the support of the OWEA Executive Committee and our sponsors (quasar, Smith Environmental, and Alloway).

During the competition we held a fund raising effort to support the relief fund dedicated to the victims of the recent workplace violence tragedy in Virginia Beach, VA. This tragedy directly effected several members of the national Ops Challenge community. We were able to raise over $11,000, all to be contributed at 100% to the relief fund. This is truly an amazing accomplishment! Thank you to everyone who donated.

The committee is wrapping up another successful advanced activated sludge workshop that was held at Greene County's Beavercreek WWTP. A special thank you to all the staff at Greene County who assisted in pulling off another successful event. Our instructors Jon VanDommelen, Keith Kroeger, and Bob Brown thoroughly enjoyed sharing their knowledge with all of our attendees.

Don't forget to attend the Plant Operations and Laboratory Workshop which will be held in Columbus at the Nationwide Conference Center on October 3rd and 4th. These dates have been updated, and are different than previous committee reports, so be sure to mark your calendars. It's going to be a very nice workshop with lots of great speakers lined up! Eric Wahlberg and Sidney Innerebner will be our keynote speakers. Be sure to attend and hear from these two nationally recognized experts. We will also feature plant profiles from around the state, as well as a packed laboratory agenda, all capped off with the ever popular round table discussion featuring our keynote speakers and homegrown experts. We look forward to seeing you there. Look for registration on the OWEA website.

2019 Ops Challenge teams

Test Your Knowledge: Take the Operations Quiz

1. BOD sample analysis requires incubation at what temperature?
   a. 10°C
   b. 12.5°C
   c. 20°C
   d. 30°C

2. Oxygen deficiency becomes a concern for working in a confined space when the oxygen percentage drops below
   a. 35.0%
   b. 31.5%
   c. 24.3%
   d. 19.5%

3. Large debris, large floating solids, and fibrous materials are categorized as:
   a. Manufactured inerts
   b. Floc
   c. Screenings
   d. Scum

4. Aerobic digestors need free oxygen in order to function properly?
   a. True
   b. False

5. The amount of time it takes for a unit of water to flow through a tank is called
   a. Detention time
   b. Overflow time
   c. Hydraulic loading rate
   d. Weir loading rate

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

Answers: 1–C; 2-D; 3-C; 4-A; 5-A

Lab Analysis Committee Update

by Melodi Clark and Tony Hintze, Committee Co-Chairs

Happy Summer! Greeting's from your state lab co-chairs. We had a great line up of presentations at this year's annual conference. We are looking forward to having another Lab Analyst review workshop in September at the City of Columbus Surveillance Lab to get everyone ready for the exam in October. We are also preparing for the Plant Operations and Lab Workshop on October 3rd and 4th. If you would like to present at either one of these workshops coming up please contact myself or Tony Hintze.

Southeast LAC

Hello from the SE LAC. Hope everyone is enjoying their summer. We had our first LAC meeting of 2019 at YSI on July 23rd which was a great meeting. I am looking to hopefully have two more meetings this year. My plan is to have at least one at a wastewater plant so we can get a tour in and have some presentations again at no cost!

Southwest LAC

The Southwest LAC wishes to thank Greene County Sanitary Engineering Laboratory for hosting the Summer Laboratory Analysis Committee meeting on July 11,2019. Attendees earned 2.5 contact hours. Jason Tincu, Greene County Sanitary Engineering Director gave opening and welcoming remarks. Speakers who presented and their topics are as follows:

- Injury Prevention How Tos by Gary Timmer, Suez
- Specific Oxygen Uptake Rate (Sour) What can it do for you- Dan Leavitt, city of London
- Auditing the Enviromental Laboratory- Marcy Bolek, Alloway

Upcoming Southwest LAC Meeting:

Thursday, October 10, 2019- Hosted by YSI, Inc.

Northeast LAC

Greetings and salutations!

I'd like to take this opportunity to thank those of you who attended our last training session and laboratory tour at NEORSD; to our speakers Nivia Torres, Leslie VanKuren, and Erm Gomes for their volunteerism and engaging presentations; to Cheryl Soltis-Muth for allowing us to take the grand tour about the laboratory (I don't think we broke any of the fancy toys!). An extra thanks goes out to Leslie VanKuren for being instrumental in securing the venue and for being our most gracious tour guide.

On the horizon, we'll be putting together another training session either for the late summer or early fall. Keep your eyes peeled and watch the NES LAC mailing list as well as the section website (nesowea.org) for upcoming announcements.

Walk boldly into the future – Erlenmeyer in hand,

Tom Zocolo – Lab Analyst II, City of Akron WRF – Northeast LAC Co-chair

Northwest LAC

Hello again from the Northwest Section. As I'm writing this, Terri and I have just returned from the OWEA Conference at Sawmill Creek Resort, Huron. While there, we had the opportunity to judge some amazing teams at this year's Operations Challenge event. Congratulations to all the teams. You did a great job!

We are currently working on our next meeting so watch your email and keep an eye out for notices on the OWEA website.

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!

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

Young Professionals had a great showing at this year's conference, with over 70 YPs in attendance! We had a great turnout at the YP Mixer, and we hope to continue this event at future conferences! One final congratulations to Adam Athmer (SW), Elizabeth Buening (SE), and Adam Dellinger (NE), the recipients of this year's YP abstract awards. Lots of YPs signed up to receive email updates from their Section YP chairs, but if you didn't get a chance to, please email your YP chair to be added to their distribution list.

Northeast Update

Solon Water Reclamation Facility will be hosting a tour of their facility on August 22nd at 4:30 pm for our YP Group. Our YP Group last toured the Solon WRF in 2014, and we wanted to give our newer members the opportunity to tour their facility and see some of their new improvements. After the tour, the group will gather at a local restaurant to network. (attached a photo of an aerial of the plant)

Our NESOWEA YP Organization is working with Alliance for the Great Lakes Adopt a Beach to support their beach cleanup at Sims Park in Euclid. The cleanup will be on September 22nd from 10am-1pm. All OWEA members, co-workers, family, and friends are welcome. Gloves, garbage bags, and buckets will be provided. Your own supplies are always welcome! Everyone interested should register for the Event at *http://greatlakesadopt.org/Secure/Event/15302.* (attached a photo of a previous beach cleanup)

Southeast Update

The Southeast section held a tour of the Anheuser Busch, Columbus Brewery on July 26th, 2019. The tour was led by a plant operator and a staff environmental engineer. The tour included their brewing process, packaging facility, and also their BioEnergy Recovery system. The BioEngergy recovery system is an anaerobic pre-treatment process that creates biofuel that the brewery uses to help fuel their brewing boilers.

Southwest Update

Please welcome Pooja Chari as the new YP chair for the southwest section! Pooja has a BS in Chemical Engineering from the Institute of Chemical Technology and a MS in Environmental Engineering from University of Cincinnati. She has worked at FTCH in the Cincinnati office for 2 years. Pooja is active in both SWOWEA and AWWA YP activities, and we are looking forward to having her as the new chair!

The SWOWEA YP group recently toured the Sycamore Creek WWTP in Cincinnati. The 20 attendees learned about the plant's nutrient removal and high rate treatment processes, and afterward enjoyed networking at a local pub, sponsored by Hazen and B&N.

In June, the SWOWEA YP committee organized a group to participate in the Ohio River Sweep in Cincinnati. The annual event has over 100 clean up locations along the Ohio River and tributaries.

Young Professionals Committee

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

Southwest Chair
Pooja Chari
FTCH
pschari@ftch.com

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

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

Northwest Chair
Kevin Connor
City of Defiance
kconnor@cityofdefiance.com

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

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

2019 Student Design Competition

by Krishna Chelupati

Congratulations to Christopher Metzinger, Spencer Desalvo, Tyler Stratton and Walter Wasilewski from Youngstown State University for winning the Ohio Water Environment Association 2019 Student Design Competition. William Worsham, Madeleine Hart and Sharon Kang from Case Western Reserve University, Ashley Kirk, Corey Czinger, Joseph Gyorky and Tena Petrovic from Cleveland State University received an honorable mention. A list of students who participated in the 2019 Student Design Competition is shown below.

Student Name	School
Christopher Metzinger	Youngstown State University
Spencer Desalvo	Youngstown State University
Tyler Stratton	Youngstown State University
Walter Wasilewski	Youngstown State University
Ashwini Tambe	Cleveland State University
Chaitanya Vegesna	Cleveland State University
Johnathan Jankowski	Cleveland State University
Oleksandra Riumkina	Cleveland State University
Daniel Poslet	Cleveland State University
Henry Ho	Cleveland State University
Maria Levanoff	Cleveland State University
Rene Kizys	Cleveland State University
Ashley Kirk	Cleveland State University
Corey Czinger	Cleveland State University
Joe Gyorky	Cleveland State University
Tena Petrovic	Cleveland State University
Jack Worsham	Case Western Reserve University
Maddie Hart	Case Western Reserve University
Sharon Kang	Case Western Reserve University
Adam Joelson	Case Western Reserve University
Christian Griffith	Case Western Reserve University
Minji Kwon	Case Western Reserve University
Alexandra Goldberg	Case Western Reserve University
Andrew Kowalkowski	Case Western Reserve University
Helen Sanderson	Case Western Reserve University

This year's competition was held at Cleveland State University on Friday, April 26th, where seven teams presented their innovative ideas to a panel of judges from OWEA. Thanks to Keith Riley, Jim Cooper, Doug Harris and Christen Wood for volunteering their time as judges for the competition. Special thanks to Fred Smith for providing closing remarks and distributing the awards to winning teams. In addition, we would like to thank Kathy Richards, Mary Ann Driscoll, Paul Solanics, Doug Dietzel, Tom Zocolo, David Gleason, Jen Zajic and Meredith Cariglio for attending the competition and interacting with students and faculty.

The winning team and the honorable mention teams received an all-expense paid trip to attend the OWEA Technical Conference & Expo in Huron. The students had the opportunity to network with water professionals at the Meet & Greet, Young Professionals at the YP Mixer and learn about the current trends in the water industry through various technical sessions. The winning team presented their project to a room full of attendees at the conference. The students deeply appreciated the opportunity and had an amazing time at the conference this year.

The winning team will represent Ohio at the WEF Student Design Competition. The team will present their project on "Outside, Looking In: Determining Toxicity from Trickling Filters" on Sunday, September 22nd at 2019 WEFTEC in Chicago. Many thanks to NESOWEA and OWEA for sponsoring the student's travel and stay. If you're attending WEFTEC this year, please show your support for the Ohio team by attending their presentation.

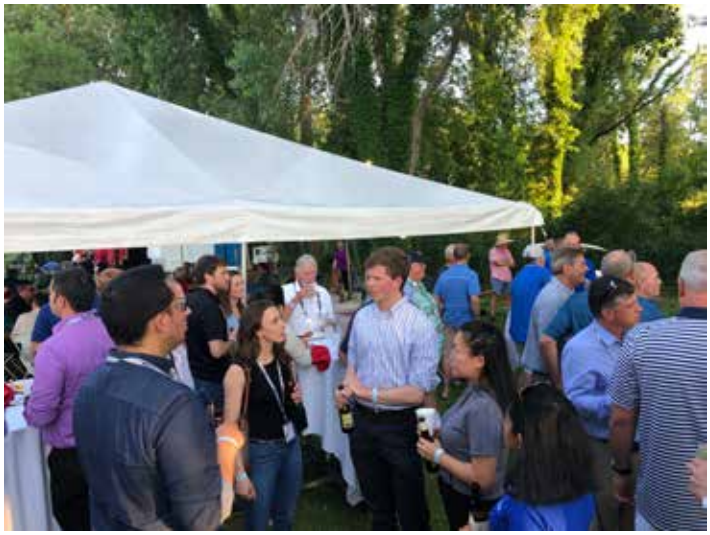
We would like to thank Dr. Sanda Kaufman from Cleveland State University, Dr. Kurt Rhoads from Case Western Reserve University and Dr. Tony Vercellino from Youngstown State University for promoting the Student Design Competition at their Universities. Competitions such as the Student Design Competition offers students opportunities to work on real world projects and apply

the skills learned through the coursework, improve presentation and public speaking skills, experience working in a team environment, network with industry professionals and peers from other universities.

The Student Design Competition committee is looking for volunteers for mentors/adviser roles for the 2020 competition. If you're interested, contact Krishna Chelupati at Muralikrishna.Chelupati@stantec.com

2019 Student Design Competition Winning Team with OWEA organizers

2019 Student Design Competition Honarable Mention Teams with OWEA organizers



Students at OWEA Meet and Greet

Winning team presenting at the 2019 Technical Conference

2019 Student Design Competition Participants with OWEA organizers

Government & Regulatory Affairs Committee Update

by Dale Kocarek, Vice Chair and Jason Tincu, Vice Chair

New Committee Structure

The Government and Regulatory Affairs (GARA) Committee was recently reorganized by President Kim Riddell-Furry for the upcoming year. The Committee Leadership is as follows:

Elizabeth Toot-Levy

Chair

Dale Kocarek

Vice Chair - Internal Communications and Workshop

John Owen

Workshop Leader

Jason Tincu

Vice Chair External Communications

This structure will allow the committee a greater application of talent within OWEA to further goals and objectives for the coming year in a manner consistent with the abilities and interests of these leaders.

Ohio EPA, Division of Surface Water Coordination Meeting

One objective for this year was to have regular coordination meetings with the leadership of the Ohio EPA, Division of Surface Water (DSW)for the purpose of working in a collaborate manner on rule reviews and providing updates for OWEA to pass on to its members.

GARA members including Jason Tincu, Fred Smith, Mike Welke, Dale Kocarek, and Dawn Sink-Kennedy met with leaders of DSW on June 14, 2019. The Ohio EPA DSW Team was led by Tiffani Kavalec, DSW. During our meeting, DSW team members provided discussion on their areas of interest including stormwater program auditing of MS4s, new rules for lagoons, integrated planning bill of 2018, small flows and Ammonia-N limits, TMDL list serve information on sources of impairment, water quality rules, and possible updates to Ten States Standards, and other topics of general interest. DSW has placed an emphasis on ensuring that rules have been reviewed and updated every five years and has done a good job adhering to this timeline. They do plan to update the Antidegradaton Rule this coming year.

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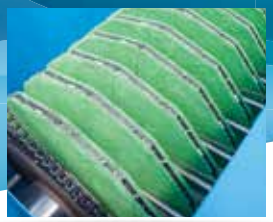

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- The Ohio Water Environment Association is offering a year-long OWEA/WEF membership to students with an interest in the water quality/wastewater field. This is a dual membership with OWEA (as the state member association) and WEF.
- Students must 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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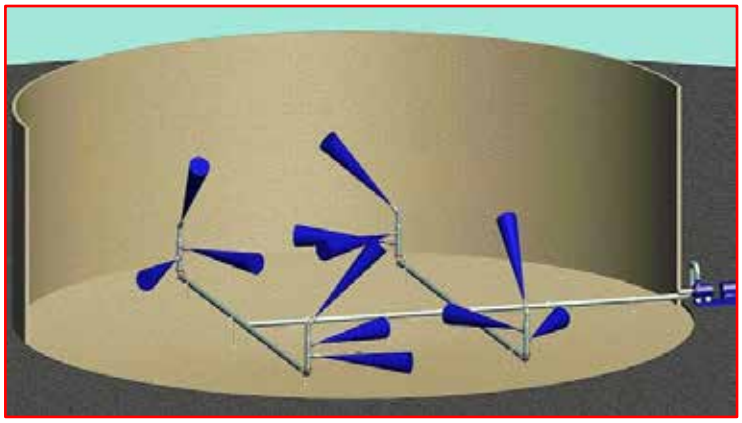
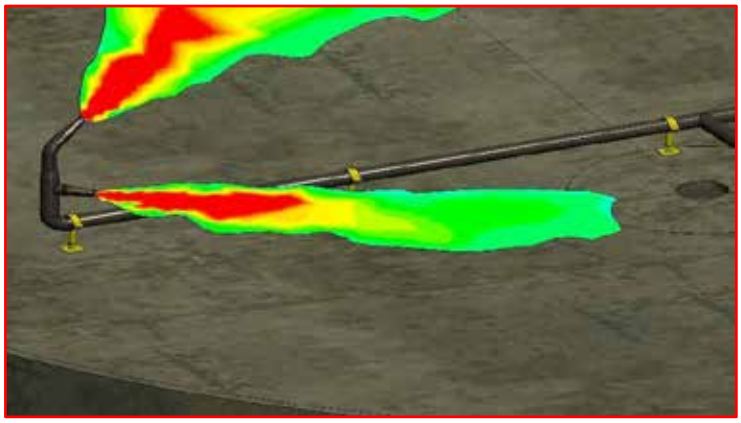
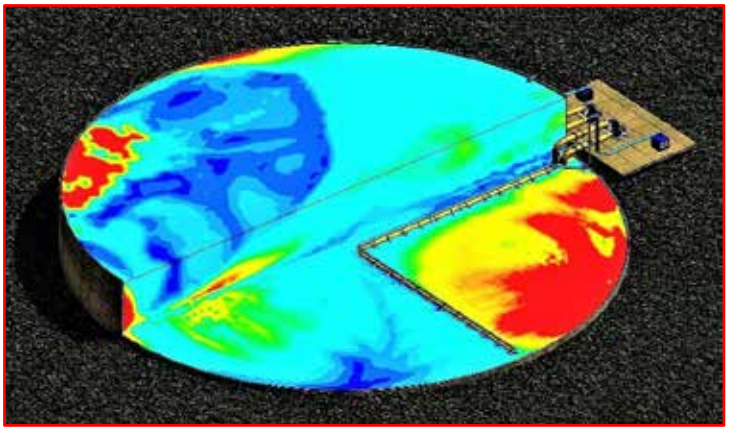


MULTIPLE ZONE SLUDGE MIXING



CFD ANALYSIS



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