



**CONFERENCE TECHNICAL PROGRAM**

\*Subject to change. Updated as of 4/27/2026

**Conference: May 11-14, 2026**

**Pre-conference Workshops: May 11, 2026**

**Kansas City Convention Center**

**Kansas City, MO**

<https://www.wef.org/events--education/conferences/RBITT/>

**#RBTT2026**

**TABLE OF CONTENTS**

**CONFERENCE SCHEDULE-AT-A-GLANCE ..... 3**

**REGISTRATION ..... 4**

**CONTINUING EDUCATION..... 6**

**CONFERENCE SAFETY AND SECURITY ..... 8**

**RBTT CONFERENCE COMMITTEES: ..... 10**

**CONFERENCE TECHNICAL SESSIONS ..... 23**

**EXHIBITION SCHEDULE ..... 72**

## CONFERENCE SCHEDULE-AT-A-GLANCE

### Monday, May 11<sup>th</sup>

8:30 AM – 12:00 PM

W03

8:30 AM – 5:00 PM

W01, W02, W04, W05, W06, W07

### Tuesday, May 12

8:30 – 10:00 AM

Opening General Session

10:00 – 10:30 AM

Networking Break

10:30 AM – 12:00 PM

Technical Sessions 01 – 04

12:00 – 1:30 PM

Lunch Break

1:30 – 3:00 PM

Technical Sessions 04 – 11

3:00 – 3:30 PM

Networking Break

3:10 – 3:30 PM

Technology Spotlight 01

3:30 – 5:00 PM

Technical Sessions 12 – 18

### Wednesday, May 13

8:30 – 10:00 AM

Technical Sessions 19 – 23

10:00 – 10:30 AM

Networking Break

10:10 – 10:30 AM

Technology Spotlight 02

10:30 AM – 12:00 PM

Technical Sessions 24 – 30

12:00 – 1:30 PM

Lunch Break

1:30 – 3:00 PM

Technical Sessions 31 – 37

3:00 – 3:30 PM

Networking Break

3:10 – 3:30 PM

Technology Spotlight 03

3:30 – 5:00 PM

Technical Sessions 38 – 43

### Thursday, May 14

8:30 – 10:00 AM

Technical Sessions 44 – 47

10:00 – 10:30 AM

Networking Break

10:30 AM – 12:00 PM

Technical Sessions 48 – 51

12:00 PM

Conference Adjourns

## REGISTRATION

Badges are not mailed in advance. Register onsite or bring your online registration confirmation email to the onsite Registration Desk to pick up your badge. Badge Pickup and Registration will be located in Exhibit Hall A at the Kansas City Convention Center.

### Registration Hours

Monday, May 11	7:30 AM – 5:00 PM
Tuesday, May 12	7:30 AM – 5:00 PM
Wednesday, May 13	7:30 AM – 5:00 PM
Thursday, May 14	8:00 AM – 11:30 AM

### MEALS AND RECEPTIONS

#### Refreshments, Lunch and Reception

WEF provides refreshments and lunch during the conference. Click [here](#) to see the conference menus. As allergens may be present in any food and beverage, Event Participants are responsible for managing their food allergies and notifying event staff of necessary accommodations.

#### Networking Breaks

Take a short break from sessions and enjoy a cup of coffee or tea with your colleagues.

Monday, May 11

2100 Lobby

10:00 AM – 10:30 AM and 3:00 PM – 3:30 PM

Tuesday, May 12, and Wednesday, May 13

Exhibit Hall A-B

10:00 AM – 10:30 AM and 3:00 PM – 3:30 PM

Thursday, May 14

2100 Lobby

10:00 AM – 10:30 AM

### Luncheons

Lunch will be provided for all registered attendees on Tuesday, May 12<sup>th</sup> and Wednesday, May 13<sup>th</sup>. Use this opportunity to meet fellow participants from across the country and abroad while enjoying lunch.

Tuesday, May 12<sup>th</sup> & Wednesday, May 13<sup>th</sup>

Exhibit Hall A-B

12:00 PM – 1:30 PM

### **WEF Networking Reception**

Join fellow attendees, speakers, and exhibitors to network and relax while enjoying a complimentary beverage and light hors d'oeuvres.

Tuesday, May 12<sup>th</sup>

Exhibit Hall A-B

5:00 PM – 6:30 PM

### **Friends of Biosolids and Innovation Welcome Event**

Join conference attendees, the Kansas Water Environment Association, and the Missouri Water Environment Association for an evening of networking on Monday, May 11 beginning at 6:00 PM – details below.

***\*Registration for this event is required. Register [here](#).***

PBR Big Sky – KC Power & Light District

111 E 13<sup>th</sup> Street, Kansas City, MO 64106

Monday, May 11 6:00 – 9:00 PM

# CONTINUING EDUCATION

## **Continuing Education credits**

Participating attendees will receive an email within 2 weeks after this event informing them when CE Credit files are available. Attendees will be able to download a certificate and transcript detailing their participation using the link provided. These details are also posted under events on [www.WEF.org](http://www.WEF.org).

## **How Do I Receive Credit For this Conference?**

To receive credit for participation in educational sessions, attendees will be required to scan their badge when entering and exiting each session room. Credits obtained during this event will be available using the link provided in the post event email and WEF site listed above.

## **Pre-Conference Workshops:**

WEF offers Continuing Education Units (CEUs) for participation in workshops. One CEU is the equivalent to 10 hours of training or formal instruction. These are distributed for structured, relevant professional training above and beyond that of initial certification or employment in a particular field.

## **Technical Sessions:**

WEF offers Professional Development Hours (PDHs) for participation in technical sessions. A PDH is defined as one hour spent engaged in an activity that contributes to the advancement or enhancement of professional skills or scientific knowledge of a professional engineer or operator.

## **General Contact Hours:**

These credits are issued for participation in the Opening General Session, Technology Spotlights and in Facility Tours. A contact hour is defined as one hour spent engaged in an activity that contributes to the professional skills of the participant. Licensing boards will vary in approval of these sessions.

## **When Will I Receive Credits For this Conference?**

Certificates and transcripts are available for download as soon as the CE Credit link is made available. WEF will send an email after the conference to inform attendees where they can obtain their credits. Please keep in mind that most state licensing boards require the individual licensees to report their continuing education credits.

## **Are WEF Continuing Education Credits Approved in My State?**

Most state engineering boards will accept WEF event credits as issued by WEF. WEF will be happy to work with individuals and Member Associations for additional state or agency approvals upon request. In addition, WEF has been approved as a Training Provider through the following: The Florida Board of Professional Engineers, the New York State Department of Education, and the Ohio EPA.

### **What Else Do I Need to Know?**

WEF follows the International Association of Continuing Education and Training (IACET) guidelines along with strict state-specific CE Credit regulations. We strive to maintain these policies and procedures regarding our Continuing Education Program to meet with and receive state recognition of our events. WEF calculates education credits following a standardized method that is the most widely accepted by certification and licensing agencies. However, many states differ in the type and/or number of credits they will approve for educational events. Because of this, participants are responsible for exploring their state requirements and for ensuring that WEF conference credits are accepted.

Note: Educational Credits will not be recorded, and documentation will not be distributed unless the attendee is a confirmed registrant of this event and the proper steps are completed as indicated in the directions provided.

### **Service and Support:**

WEF maintains a database of all continuing education files for a minimum of 7 years. You may contact WEF's Customer Service Team between the hours of 8:30 a.m. and 5:00 p.m. EST, Monday through Friday for questions related to WEF Programs - 1-800-666-0206 or [csc@wef.org](mailto:csc@wef.org).

### **State Credit Calculations:**

Each state licensing board has its own set of CE credit requirements. Some states use different acronyms for approved training credits. In most cases the credits issued by WEF can be converted to meet state specific requirements that vary from the system used by WEF. This is usually managed at the state level using the following conversion:

**1.0 CEU = 10 Hours** of session time

**1.0 PDH = 1 Hour** of session time

**1.0 General Contact Hour = 1 Hour** of session time

For example: **1.7 CEU** Credits = **17.0 PDH** depending on individual state regulations.

*\*CEU will be converted to PDH credits for Workshops attended by Professional Engineers licensed in the state of New York (NYSSED).*

Important: Sessions that are not related to professional practice, such as accounting/financial planning, basic Auto CAD, general office management, insurance,

marketing, real estate, risk management, DE&I, etc. are not approved for CE credits by some state licensing boards, including the NYSED.

**For more information regarding WEF’s Continuing Education Program, please visit the Events & Education tab at [www.WEF.org](http://www.WEF.org). WEF and AWWA would like to thank our conference committees for creating the technical program, opening general session, networking activities, and more!**

## CONFERENCE SAFETY AND SECURITY

**Kansas City Convention Center** 301 West 13th Street, Kansas City, MO 64105

- Immediate / Medical Emergency: Call 911 and follow up with a call to inform Convention Center Security at (816)-513-5111.
- Other Emergency / Security: Call (816)-513-5111

**Loews Kansas City** 1515 Wyandotte St, Kansas City, MO 64108

- Immediate / Medical Emergency: Call 911
- Other Emergency / Loss Prevention / Security: Call (816) 897-7070 or Dial “0” from a hotel phone.

### Code of Conduct

WEF is committed to providing a professional, safe, and welcoming environment during its in-person and virtual events for all participants. WEF expects all attendees, moderators, panelists, and speakers to uphold our commitment to diversity and inclusion by helping us provide a positive environment for everyone.

As a participant you agree to the following:

- To treat all individuals with respect and create a collegial, inclusive, and professional environment.
- To value a diversity of views and opinions by communicating openly with respect for others.
- Not to verbally abuse any individual or to discriminate, harass, or intimidate on the basis of gender, race, gender identity and expression, sexual orientation, physical or mental disability, physical appearance, age, religion, national origin, veteran status, citizenship, or professional rank.
- View the full [WEF Events Code of Conduct here](#).

Anyone requested to stop unacceptable behavior is expected to comply immediately. WEF management may take any action deemed necessary and appropriate, including removal

from the event (and any remaining portions thereof) without warning and without refund of registration fee.

Additionally, if you are a WEF member, you agree to uphold the [WEF Member Code of Conduct](#) while attending WEF events.

#### Reporting Concerns

To report a Code of Conduct violation, you may email the WEF Executive Director, at: [executivedirector@wef.org](mailto:executivedirector@wef.org).

## RBTT CONFERENCE COMMITTEES:

WEF would like to thank the following committee members for their contributions to the technical program. We would not be able to produce high quality events year after year without the assistance of dedicated volunteers.

Thank you!

### Steering Committee

Dusting Craig, CDM Smith, Co-chair

Elaine Hung, Trinity River Authority of Texas, Co-chair

Heather Phillips, City of Olathe, Co-chair

Wendell Khunjar, Hazen and Sawyer, Co-chair

### Program Committee

Adrian Romero, Jacobs

Ahmad Bitar, AECOM

Alexander Kraemer, Harvest Technology

Alexandra Doody, CDM Smith

Belinda Sturm, University of Kansas

Brett Wagner, AECOM

Charles Bott, HRSD

Erik Larson, Vaughan Company Inc

George Wells, Northwestern University

Guangbin Li, University of Maryland

Heather Stewart, Jacobs

Isaac Avila, Black & Veatch

Kwok-Wai Richard Tsang, CDM Smith

Kyle Stern, Kiewit

Manuel Moncholi, GHD

Mark Lang, Black & Veatch

Matt Seib, Madison Metropolitan

Sewaerage District

Matthew Hutton, LACSD

Meagan Malloy, CDM Smith

Michael Liu, LACSD

Natalie Sierra, Brown and Caldwell

Patrick McNamara, Marquette University;

Black & Veatch

Patrick O'Donnell, INVENT Environmental

Peter Schauer, Clean Water Services

Rashi Gupta, Carollo

Yewei Sun, Hazen and Sawyer

### Abstract Micro Reviewers

Alexandria Gagnon

Amanda Lake

Arifur Rahman

Ashley Berninghaus

Ashwin Dhanasekar

Aykut Sayin

Bhargavi Subramanian

Bipin Pathak

Bishav Bhattarai

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Caroline Nguyen

Dana Gonzalez

David Grace

David Ponder

David Wankmuller

Dawn Taylor

Demi Ladipo-Obasa

Derya Dusun

Ed Fritz

Edward Becker

Elaine Leonard

Elizabeth Schrandt  
Emma Shen  
Eric Auerbach  
Frederick Tack  
Gholamreza Bahreini  
Gnanaraj Augustine  
Greg Woodward  
Hannah Molitor  
Haydee De Clippeleir  
Henry Croll  
Jascika Maclean  
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Khoa Nam Ngo  
Laurel Schaich  
Lauren Stanford  
Leila Tootchi  
Leon Downing

Manav Baid  
Marija Peric  
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Mohammed Dilshaad  
Uzair  
Mojolaoluwa Lapido-  
Obasa  
Murthy Kasi  
Narasimman  
Lakshminarasimman  
Nerea Uri Carreno  
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Paniteja Madala  
Patrick Dube  
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Paul Wood  
Pedro Puente  
Phil Ackman

Pranava Sai Raju  
Nannapuraju  
Pranoti Kikale  
Rachel Hanson  
Raj Chavan  
Ruth Spierling  
Sam Reifsnyder  
Sarah Guzman  
Shakthi Jayavelu  
Shubha Oza  
Shyam Sivaprasad  
Stephanie Klaus  
Stephanie Spalding  
Stephen Riches  
Taylor Jordan  
Temidayo Sanoyomi  
Tim Abbot  
Yuan Tan  
Zhongtian Li

## PRE-CONFERENCE WORKSHOPS (additional fees apply)

### **W01 Thickening and Dewatering Optimization: Getting Water Out of Sludge Efficiently**

Monday, May 11<sup>th</sup> 8:30AM – 5:00PM

Room 2101

**Workshop Chair:** Ed Fritz, Jacobs

**Workshop ViceChair(s):** Christine Hengel-Prom, Black & Veatch Water

The Thickening and Dewatering Optimization: Getting Water Out of Sludge workshop will focus on practical solutions to improve thickening and dewatering performance. The focus of the workshop will be municipal (primary and waste activated) sludge with discussions on achieving thicker solids, better solids capture, reducing polymer consumption, reducing O&M costs, and providing smaller or more efficient downstream solids handling processes. This workshop will be of primary interest to plant managers, superintendents, operators and maintenance staff from municipalities. Furthermore, this workshop topic is critical and timely to the industry since municipalities are getting more pressure to reduce their budgets or to 'do more for less' in addition to addressing the challenges of increasing polymer, and solids processing cost.

#### Learning Objectives

At the end of this workshop, learners will be able to:

- 1) Recognize the impacts and benefits of optimized thickening and dewatering processes on other plant processes.
- 2) List and be able to implement practical steps for mechanical optimization of thickening and dewatering equipment.
- 3) Compile, evaluate and prioritize practical operational changes implemented by other municipalities to reduce costs by reducing polymer consumption and operation and maintenance labor and producing thicker solids/higher cake solids and high solids capture.

**8:30 AM Introduction: Workshop Agenda and Goals**

E.Fritz, Jacobs

**8:35 AM Interactive Survey**

E.Fritz, Jacobs

**8:45 AM Thickening and Dewatering 101**

R.Gupta, Carollo Engineers

**9:15 AM Thickening and Dewatering Equipment Basics – 'How Does It Work?'**

D.Fronhofer, BDP Industries, Inc

- 9:40 AM**      **Interactive Session: Thickening and Dewatering Challenges**
- 10:00 AM**      **Networking Break**
- 10:30 AM**      **Coagulants and Flocculants**  
R.Waterous, Kemira
- 10:50 AM**      **Polymer Activation**  
P.Gallagher, Cleanwater1
- 11:10 AM**      **Bench and Lab Testing Demonstrations**  
E.Fritz, Jacobs
- 11:20 AM**      **Evaluation Criteria for Selection of Dewatering Technologies**
- 12:00 PM**      **Lunch Break**
- 1:30 PM**      **Rheology of Thickened Sludge**  
E.Leonard, HDR
- 1:50 PM**      **Cake Storage and Truck Loading**  
Z.Ngwenya, Jacobs Solutions Inc.
- 2:10 PM**      **Protecting Equipment and Processes: Sludge Screening**  
T.Marshall, HUBER
- 2:30 PM**      **Interactive Session: Thickening and Dewatering – Upstream and Downstream Considerations**
- 3:00 PM**      **Networking Break**
- 3:30 PM**      **Innovations in Thickening and Dewatering**  
D.Dursun, Caliskaner Water Technologies
- 3:55 PM**      **Suspended Air Flotation**  
J.Knollenberg, Heron Innovators, Inc.
- 4:10 PM**      **Sludge Vision**  
R.Giguere, Cleanwater1, Inc.
- 4:25 PM**      **Interactive Session: Facilitated Discussion and Brainstorming Session – 'What is the Future of Thickening and Dewatering?'**  
R.Gupta, Carollo Engineers

**W02 Thermal Drying: State of the Practice, Advancements, and Future Applications**

Monday, May 11<sup>th</sup> 8:30AM – 5:00PM

Room 2102A

**Workshop Chair:** John Ross, Brown and Caldwell

**Workshop Vice Chair(s):** Jody Barksdale, Carollo Engineers; Chip Pless

Given rising disposal costs and regulations, many utilities are considering biosolids drying to create sustainable solutions. This workshop will unite operators, technologists, and engineers

to explore drying technologies, considerations for dryer implementation, and future areas of collaboration. Focus will be given to how dryers can be successfully integrated into existing utility programs and WRRFs and future considerations for drying technology advancement, including compatibility with PFAS treatment.

### Learning Objectives

At the end of this workshop, learners will be able to:

1. Share real-life experiences from utilities and system suppliers with experience commissioning and overseeing long-term operations of dryer facilities to better understand the full cost and benefits of ownership.
2. Collaboratively identify a comprehensive list of considerations related to integration of dryer facilities with upstream WRRF processes, and the impact of new facility subsystems to WRRF staff, such as dried product handling, dust collection, and emissions control.
3. Explore areas for further advancement including integration with post-drying thermal processes (i.e. combustion, pyrolysis, and gasification) and studying the fate of PFAS within drying systems.

<b>8:30 AM</b>	<b>Introduction and Workshop Objectives</b> J.Ross, Brown and Caldwell
<b>8:35 AM</b>	<b>First Interactive Session: Live Poll</b>
<b>8:40 AM</b>	<b>State of the Drying Industry</b> J.Ross, Brown and Caldwell
<b>8:50 AM</b>	<b>Dryer Facility Environmental Impacts and Permitting</b> R.Porter, Porter Odor Science
<b>9:15 AM</b>	<b>Emissions and Odor Control Technologies</b> A.Parmenter, HDR
<b>9:40 AM</b>	<b>Group Exercise: Identifying Key Considerations for Environmental Impacts</b>
<b>10:00 AM</b>	<b>Networking Break</b>
<b>10:30 AM</b>	<b>New Regional Dryer Facility: Crossroads, ME</b> C.Pless
<b>10:55 AM</b>	<b>Dryer Rehabilitation and Repair: JEA, FL</b> J.Barksdale, Carollo Engineers; P.Blackley, JEA
<b>11:20 AM</b>	<b>Dryer Modernization: MCES/Encina</b> W.Hoener
<b>11:30 AM</b>	<b>Group Exercise: Dryer Lifecycle Milestones</b> J.Ross, Brown and Caldwell
<b>12:00 PM</b>	<b>Lunch Break</b>

- 1:30 PM**      **Biosolids Drying: GHG Overview**  
W.Brower, Brown and Caldwell
- 2:15 PM**      **GHG Opportunities with Pellet Reuse**  
N.Sierra, Brown and Caldwell; K.Pointer, On Point; D.Song, Stantec; P.Burrowes, Jacobs; T.Merrel, Merrel Brothers
- 2:40 PM**      **Group Q&A**
- 3:00 PM**      **Networking Break**
- 3:30 PM**      **Dryer Facility Overview: Subsystems and Design Coordination**  
S.Murnan, NEFCO
- 3:55 PM**      **Dryer Facility Construction: Builder Panel Discussion**  
J.Barksdale, Carollo; S.Greseth, Kiewit; A.Parent, PC Construction; A.Patel, Walsh
- 4:30 PM**      **Group Exercise: Identifying Implementation Lessons Learned**  
J.Barksdale, Carollo
- 4:45 PM**      **Workshop Closing**  
J.Ross, Brown and Caldwell

### **W03 Best Practices for Planning, Designing, and Operating Anaerobic Digestion Systems**

Monday, May 11<sup>th</sup> 8:30 AM – 12:00 PM

Room 2102B

**Workshop Chair:** Drury Whitlock, Stantec Inc.

**Workshop Vice Chair(s):** David Parry, Jacobs

This workshop is centered on the planning, design, and operation of anaerobic digestion systems. Adaptive biosolids planning with a comparison of anaerobic digestion processes to provide key drivers and meet core objectives. Both conventional and high performing digestion processes will be discussed. Best practice digestion design will be covered including digester shape, mixing, heating, and methods to mitigate gas entrainment, foaming, and struvite deposition. Operation of digestion systems and their impact on gas production, dewatering performance, and biosolids quality will be presented and discussed. Learning objectives is that this is the beginning of a recurring anaerobic digestion workshops for continuing learning. This workshop covers adaptive planning, best practices in anaerobic digestion, and operation of digestion systems and their impact on the balance of solids processing.

#### Learning Objectives

At the conclusion of this workshop, participants will be able to do the following:

1. Synthesis – Participants will develop and integrate operating digestion systems with designing digestion systems with planning biosolids programs with digestion systems as the core process.
2. Evaluation – Participants will assess operating conditions and be able to evaluate mitigation measures.
3. Analysis – Participants will analyze and differentiate between anaerobic digestion systems recognizing the key benefits of each digestion process.
4. Comprehension – Participants will recognize and compile strategies and best practices for the objective planning of biosolids systems with anaerobic digestion.
5. Application – Participants will apply best practices in planning, design, and operations of anaerobic digestion systems.

- 8:30AM**      **Opening Remarks & Workshop Overview: Welcome and Introductions**  
D.Whitlock, Stantec Inc.
- 8:30 AM**      **Adaptive PlanningEvWorkshopSpeaker**  
D.Parry, Jacobs; W.Barber, CAMBI, Inc; C.Peot, DC Water & Sewer Authority
- 9:30 AM**      **Best Practice Design**  
M.Higgins, Bucknell University; A. Miot, Silicon Valley Clean Water; D.Whitlock, Stantec Inc.
- 10:00 AM**      **Networking Break**
- 10:30 AM**      **Best Practice Design, Part II**  
M.Higgins, Bucknell University; A. Miot, Silicon Valley Clean Water; D.Whitlock, Stantec Inc.
- 11:00 AM**      **Digestion System Operations**  
A.Miot, Silicon Valley Clean Water; C.Muller, Brown and Caldwell; M.Higgins, Bucknell University
- 11:50 AM**      **Closing Remarks and Discussion**  
D.Parry, Jacobs

**W04 Get the N Out: Fundamentals of Activated Sludge Biological Nitrogen Removal and Operation Troubleshooting using Process Simulators**

Monday, May 11<sup>th</sup> 8:30 AM – 5:00 PM

Room 2104A

**Workshop Chair:** Paul Dombrowski, Woodard & Curran

**Workshop Facilitator:** Zachary Jackson, North Texas Municipal Water District

The workshop will provide an overview of the fundamental concepts associated with biological nitrogen removal as well as advanced topics commonly used at operating facilities. The presentation will cover each main concept followed up by process model simulations led by the instructors but performed by attendees to solidify the understanding of each topic. Several steady state simulations will be used to drive home concepts and demonstrate the benefits of various process control concepts.

### Learning Objectives

At the end of this workshop, learners will be able to:

1. Identify the key operational aspects of activated sludge systems to accomplish BNR.
2. Learn how operational controls can be used together to make BNR systems work efficiently.
3. Use simulation to improve understanding of process optimization both with regard to effluent quality and operating costs.

<b>8:30 AM</b>	<b>Welcome and Introductions</b> P.Dombrowski, Woodard & Curran; Z.Jackson, North Texas Municipal Water District
<b>8:40 AM</b>	<b>Activated Sludge Fundamentals</b> P.Dombrowski, Woodard & Curran
<b>9:30 AM</b>	<b>Secondary Clarifier Operation</b> P.Dombrowski, Woodard & Curran
<b>10:00 AM</b>	<b>Networking Break</b>
<b>10:30 AM</b>	<b>Simulator Demonstration and Activated Sludge Exercises</b> P.Dombrowski, Woodard & Curran
<b>10:30 AM</b>	<b>Simulator Demonstration and Activated Sludge Exercises</b> Z.Jackson, North Texas Municipal Water District
<b>11:00 AM</b>	<b>Nitrification Fundamentals</b> P.Dombrowski, Woodard & Curran
<b>12:00 PM</b>	<b>Lunch Break</b>
<b>1:30 PM</b>	<b>Nitrification Simulator Demonstrations and Exercises</b> P.Dombrowski, Woodard & Curran; Z.Jackson, North Texas Municipal Water District
<b>2:00 PM</b>	<b>Denitrification Fundamentals</b> P.Dombrowski, Woodard & Curran
<b>3:00 PM</b>	<b>Networking Break</b>
<b>3:30 PM</b>	<b>Denitrification Demonstrations and Exercises</b>

P.Dombrowski, Woodard & Curran; Z.Jackson, North Texas Municipal Water District

**4:15PM Process Control Simulator Challenge**

P.Dombrowski, Woodard & Curran; Z.Jackson, North Texas Municipal Water District

**4:45 PM Discussions on Simulator Based Training**

Z.Jackson, North Texas Municipal Water District; P.Dombrowski, Woodard & Curran

**4:55 PM Conclusion**

**W05 From Data to Decisions: Building and Launching Digital Transformation Programs in Utilities**

Monday, May 11 8:30 AM – 5:00 PM

Room 2104B

**Workshop Chair:** Josh Goldman, Metro Water Recovery

**Workshop Vice Chair:** Jeffrey Hlad, Metro Water Recovery

This workshop is designed to bring together practitioners, utility leaders, consultants, and researchers to explore practical frameworks for launching and advancing digital transformation programs in water utilities. The session focuses on how utilities can move beyond fragmented data environments toward integrated data ecosystems that support reliable metrics, operational insights, and more effective organizational decision-making.

**Learning Objectives**

At the end of this workshop, learners will be able to:

1. Describe a practical framework for initiating and sequencing digital transformation efforts that align with treatment and biosolids operational priorities.
2. Identify governance, stakeholder engagement, and data integration strategies that translate digital plans into implementable projects with measurable operational benefits.
3. Recognize common pitfalls and apply proven lessons learned from peer utilities to accelerate adoption and avoid disconnected pilot efforts.

**8:30 AM Introduction and Workshop Overview**

J.Goldman, Metro Water Recovery; J.Hlad, Metro Water Recovery

**8:45 AM Foundational Systems Integration**

K.Fletcher, Brown and Caldwell

**9:05 AM Facilitated Discussion: IT/OT Challenges**

- 9:20 AM**      **Governance & Strategic Planning**  
B.Stanford, Hazen and Sawyer
- 9:40 AM**      **Demonstrating Return on Investment (ROI)**  
M.Zimmerman, SWAN Forum
- 10:00 AM**      **Networking Break**
- 10:30 AM**      **Facilitated Discussion: Priorities & Alignment**
- 10:45 AM**      **Takeaway Capture 1: Morning Synthesis**  
J.Goldman, Metro Water Recovery
- 11:00 AM**      **Case Study: Large Utility Perspective**  
J.Sparks, HRSD
- 11:20 AM**      **Case Study: Cross-Utility Implementation Lessons**  
P.Chandrasekeran, Arcadis U.S., Inc.
- 11:40 AM**      **Case Study: Small Utility Perspective**  
A.Walkins
- 12:00 PM**      **Lunch Break**
- 1:30 PM**      **Facilitated Discussion: Most Transferable Approaches**
- 1:45 PM**      **Incremental Implementation**  
A.Menniti, Clean Water Services
- 2:05 PM**      **Utility Implementation Reflection**  
M.Magruder, Milwaukee Metropolitan Sewerage District
- 2:25 PM**      **The Future Utility**  
G.Karmous-Edwards, Karmous Edwards Consulting
- 2:45 PM**      **Applied AI Platform Example**  
K.Lesnik, ETHOS
- 3:00 PM**      **Networking Break**
- 3:30 PM**      **Panel: Implementation Perspectives on Emerging Tools**  
D.DeLaughter, Rocky Mountain WEA (CO, NM, WY); E.Masters, Trinity River Authority of Texas; B.Johnson, Jacobs; H.Stewart, Jacobs
- 4:00 PM**      **Applied Innovation Lightning Talks**
- 4:20 PM**      **Digital Transformation Road-mapping Exercise**
- 4:40 PM**      **Takeaway Capture 2: Workshop Synthesis**  
J.Goldman, Metro Water Recovery; J.Hlad, Metro Water Recovery
- 4:50 PM**      **Speaker Follow-up and Participant Networking**

**W06 Lessons Learned from Ten Years of Sidestream Treatment**

Monday, May 11<sup>th</sup> 8:30 AM – 5:00 PM

Room 2103C

**Workshop Chair(s):** Jennifer Loconsole, Black & Veatch Corporation; Louis Ortenzio,

This workshop will cover lessons learned and opportunities for improving sidestream treatment at WRRFs. The morning portion of the workshop will focus on phosphorus management and recovery while the afternoon will focus on nitrogen and phosphorus co-management. Case studies of full-scale installations will be presentation. Topics that will be discussed include struvite formation mechanisms, fines recycling as well as impacts of pre-treatment and intensified digestion technologies on sidestreams management. Vendors will also be invited to provide an update of the latest and greatest offerings for managing sidestreams.

- 8:30 AM Introduction**  
P.O'Donnell, INVENT Environmental Technologies Inc
- 8:45 AM P Recovery**  
L.Downing, Black & Veatch
- 8:55 AM Struvite Recovery**  
R.Cusick, University of Illinois
- 9:05 AM Utility Case Studies**  
I.Avila, Black & Veatch; J.Prevatt, Pima County Regional; M.Seib, Madison Metropolitan Sewerage District
- 10:00 AM Networking Break**
- 10:30 AM Operational Scenario and Mitigation Approaches**  
L.Ortenzio; J.Loconsole, Black & Veatch Corporation (HQ)
- 11:30 AM From P to N**  
C.Bott, HRSD
- 12:00 PM Lunch Break**
- 1:30 PM N Treatment**  
L.Ortenzio
- 1:45 PM Lessons from Multiple Years of DMX**  
D.Freeman; C.Bott, HRSD
- 2:15 PM PAD and DMX Experience at TRA**  
E.Redmond, Black & Veatch
- 2:30 PM DMX on THP Reject, Part I**  
E.Bailey, City of Raleigh; S.Fuentes, Washington Sanitary Suburban Commission
- 3:00 PM Networking Break**

- 3:30 PM**      **DMX on THP Reject, Part II**  
E.Bailey, City of Raleigh; S.Fuentes, Washington Sanitary Suburban Commission
- 4:00 PM**      **Design Scenario and Vendor Approaches**  
L.Ortenzio; T.Dunaev; L.Li, Veolia Water; C. Johnson, World Water Works, Inc.
- 4:50 PM**      **Closing Comments**

**W07 Positioning for Reuse: Understanding Drivers, Strategies and Technologies for Enabling Potable and Non-potable Reuse**

Monday, May 11 8:30 AM – 5:00 PM

Room 2105

**Workshop Chair:** Greta Zornes, CDM Smith Inc

**Workshop Vice Chair:** Gayathri Ram Mohan, Hazen and Sawyer

In this Workshop, participants will learn the basics of reuse and what to consider when implementing reuse projects, including the technical aspects of non-potable and potable reuse as well as regulatory considerations. Case studies from Reuse Master planning projects in the mid-west will be shared, with an emphasis on providing recycled water for data center cooling and other industrial applications. Potable reuse project examples will also be presented from across the U.S., including both Indirect potable reuse (IPR) and direct potable reuse (DPR), including recent learnings from DPR piloting in CA.

- 8:30 AM**      **Introduction to the Topic and Team**  
G.R.Mohan, Hazen and Sawyer; G.Zornes, CDM Smith Inc
- 9:15 AM**      **Topic 2: Regulatory Overview**  
J.Mattingly, WEF
- 9:40 AM**      **Topic 3: Lessons Learned from Reuse Case Studies**  
G.R.Mohan, Hazen and Sawyer
- 10:00 AM**      **Networking Break**
- 10:30 AM**      **Topic 4: Reuse Program Overview**  
G.Janzen; G.Salazar-Benites, HRSD; J.Kaberline, Loudoun Water
- 11:30 AM**      **Facilitated Discussion: Application Potential of Potable and Non-Potable Reuse**
- 12:00 PM**      **Lunch Break**
- 1:30 PM**      **Topic 5: The Latest on AWT Piloting**  
E.Wood, CDM Smith; G.Salazar-Benites, HRSD; K.Bell
- 3:00 PM**      **Networking Break**
- 3:30 PM**      **Topic 6: Operator Training and Full-scale Experience Panel Discussion**

G.Salazar-Benites, HRSD; J.Kaberline, Loudoun Water; R.Angelotti

**4:30 PM Facilitated Discussion: Future of CBAT in the One Water**

**4:55 PM Workshop Wrap-up**

## **FACILITY TOURS (additional fees apply)**

### **Facility Tour I: Blue River Wastewater Plant**

**Tuesday, May 12<sup>th</sup> 8:00 AM - 12:00 PM**

On this tour of the Blue River Wastewater Treatment Plant attendees will experience a behind-the-scenes look at how Kansas City cleans and treats millions of gallons of wastewater each day. Attendees will move through key treatment areas - from initial screening to aeration, clarification, and disinfection - while learning how the plant protects the Blue River and supports the region's infrastructure. The tour also highlights the facility's major modernization efforts, including advanced biosolids processing, giving guests a clear sense of the innovation and coordination required to keep this essential system running.

### **Facility Tour II: Tomahawk Wastewater Treatment Plant**

**Thursday, May 14<sup>th</sup> 8:00 AM - 12:00 PM**

On this tour of the Tomahawk Wastewater Treatment Facility attendees will experience a close look at one of the region's most advanced and sustainable treatment plants. Attendees will move through the major treatment stages - screening, biological nutrient removal, clarification, and UV disinfection - while learning how the facility was transformed from a lagoon-based system into a state-of-the-art plant capable of treating up to 19 million gallons per day. The tour highlights the plant's energy-efficient processes, its role in improving water quality in the Indian Creek and Blue River watersheds, and the innovative technologies that make it one of the most environmentally forward facilities in the area.

## CONFERENCE TECHNICAL SESSIONS

### Opening General Session

Tuesday, May 12<sup>th</sup> 8:30am – 10:00am

Room 2103AB

- 8:30 AM**      **Welcome and Introductions** (Conference Steering Committee)  
Dustin Craig; Elaine Masters; Heather Phillips; Wendell Kunjar
- 8:40 AM**      **WEF Welcome**  
Rasha Maal-Bared, WEF Board of Trustees
- 8:45 AM**      **MWEA & KWEA Welcome**  
Mike Castner, MWEA; Ed McGrath, KWEA
- 8:55 AM**      **Innovation as Core Business: How Water Utilities Are Rising to the Century's  
Defining Challenges**  
Per Henrik Nielsen, Senior Project Director, VCS Denmark
- 9:25 AM**      **Celebration of James Bernard Legacy**  
Charles Bott, Heather Phillips & Peter Schauer
- 9:55 AM**      **Conference Kick-off!**
- 10:00 AM**     **End of Session**

### Session 01 Advanced Thermal Processes Fundamentals and Practices

Tuesday, May 12<sup>th</sup> 10:30 AM – 12:00 PM

Room 2103C

**Lead Facilitator**      Kwok-Wai Tsang, CDM Smith

Advanced thermal processes fundamentals will be introduced including the differences among the processes. Energy and mass balance modeling will be presented, along with examples of actual process. Interactive Session | Facilitated Discussion

#### Learning Objectives

At the end of this session, participants will be able to:

- 1) Understand the basic concepts of advance thermal processes such as gasification and pyrolysis.
- 2) Learn innovative thermal processes including hydrothermal oxidation, gasification, pyrolysis and incineration.
- 3) Learn about the application of modeling for conducting mass and energy balance of thermal processes.

**10:30 AM**      **Thermal Decomposition: Fundamentals of Gasification, Pyrolysis, and  
Incineration**

Peter Burrowes, CH2M

CoAuthor(s): C.Holcomb, Jacobs

- 10:45 AM Facilitated Discussion: Thermal Decomposition**
- 11:00 AM Hydrothermal Oxidation: Showcasing Innovation in Advanced Thermal Conversion and Resource Recovery**  
 Stephen Riches, Atkinsrealis  
 CoAuthor(s): B.Luqmani, Atkinsrealis; D.Gapes, Cetogenix; D.Inman, Anglian Water Services; B.Jefferson, Cranfield University
- 11:15 AM Facilitated Discussion: Hydrothermal Oxidation**
- 11:30 AM An Energy and Mass Balance Model for Assessment of Either Pyrolysis or Gasification for the Processing of Sewage Sludge, Results and Discussion**  
 Philip Pedros, Mott Macdonald  
 CoAuthor(s): T.Daugaard, Iowa State University
- 11:45 AM Facilitated Discussion: An Energy and Mass Balance Model**

**Session 02 Biogas Operations Optimization for Revenue and End Use**

Tuesday, May 12<sup>th</sup> 10:30 AM – 12:00 PM

Room 2104A

**Lead Facilitator** Manuel Moncholi

**Assistant Facilitator** Meagan Malloy, CDM Smith

This session explores strategies to maximize revenue from resource recovery in anaerobic digestion processes. Presentations will cover long-term operation and financial performance from a renewable natural gas facility, business case evaluation for co-digestion, and tailoring process control to meet specific end-use requirements. The session will also highlight lessons learned and practical strategies for sustainable and profitable biogas operations.

Interactive Session | Panel Discussion

Learning Objectives

At the end of this session, learners will be able to:

- 1) Identify process control approaches tailored to specific biogas end uses.
- 2) Evaluate business cases for co-digestion, RNG, and other resource recovery opportunities.
- 3) Assess regulatory, environmental, and safety considerations affecting project implementation and cost effectiveness.

**10:30 AM Tailoring Biogas Process Control for Its End Use**

John Maley, HDR Engineering Inc.

**10:50 AM Implementing CHP Systems at Smaller WRRFs: Making CHP Economically Viable Using Unconventional Design Thinking**

Benjamin Burroughs, Arcadis

**11:10 AM      Operating in the Black: Five Years of Operation and Revenue Generation at the RNG Facility at Des Moines Iowa WRF**

Dustin Craig, CDM Smith

CoAuthor(s): L.Schaich, CDM Smith; T.Runde, Des Moines Metropolitan Wastewater Reclamation Authority

**11:30 AM      Panel Discussion**

**Session 03 Keeping the Good Bugs and Losing the Fluff: Advances in Selective Wasting**

Tuesday, May 12<sup>th</sup> 10:30 AM – 12:00 PM

Room 2102A

**Moderator**                      Adrian Romero, Black & Veatch

**Assistant Moderator** Zhongtian Li, Carollo

This technical session presents pilot- and full-scale evaluations of hydrocyclone-based selective wasting applied to high-rate and nutrient removal activated sludge systems to improve settleability, increase hydraulic capacity, and enhance biological performance. The session begins with a controlled pilot-scale study demonstrating how selective wasting interacts with food-to-microorganism ratio and famine conditions to influence flocculation, sludge compression, and solids flux. Full-scale case studies from municipal WRRFs illustrate how hydrocyclones have been deployed to stabilize settling, increase peak wet-weather capacity, and improve nutrient performance without new tankage. Additional insights include mixed liquor feeding strategies, protozoan community profiling as a biological KPI, and operational lessons learned during retrofit and long-term operation. This session provides actionable guidance for process engineers, operators, and researchers seeking scalable solutions for secondary treatment intensification.

Learning Objectives

At the end of the session, learners will be able to:

- 1) Evaluate how selective wasting interacts with biological controls and performance metrics to influence sludge characteristics.
- 2) Interpret pilot and full-scale results to assess effectiveness of selective wasting.
- 3) Apply practical implementation best practices and lessons learned from full scale case studies.

**10:30 AM      Lessons Learned from a Pilot-Scale High-Rate Contact Stabilization System with inDENSE Application: Coupling Biological and Physical Selection to Improve Performance and Capacity**

Yuang Li, Cornell University

CoAuthor(s): S.Ahmad, George Washington University; K.Nam Ngo, DC Water; A.Diop; M.Mendoza, University of the District of Columbia; G.Okechukwu, University of the District of Columbia; A.Massoudieh, Catholic University of America; H.Azam, University of the District of Columbia; R.Riffat, George Washington University; A.Gu; H.DeClippeleir, DC Water & Sewer Authority; E.Goldberg, Catholic University of America

**11:00 AM      Optimizing Sludge Densification with Hydrocyclones: A Mixed Liquor Selection Approach**

Pranta Roy, Brown and Caldwell; Runze Sun, Virginia Tech

CoAuthor(s): R.Carlson, Prince William Water; D.Dair, World Water Works, Inc.; Z.Wang, Virginia Tech

**11:30 AM      Navigating the Challenges of Aging Infrastructure While Improving Peak Flow Capacity with Process Densification**

Anjana Kadava, Johnson County Wastewater

CoAuthor(s): D.Nolkemper, Johnson County Wastewater; A.Doody, CDM Smith; D.Nolkemper, Johnson County Wastewater

**Session 04 Young Professional Session**

Tuesday, May 12<sup>th</sup> 10:30AM – 12:00PM

Room 2104B

**Lead Facilitator**      Madeleine Fairley-Wax, Jacobs

This session is designed to engage students and young professionals at the conference and provide them an opportunity to increase their network and engagement in the wastewater engineering field and WEF activities. The session include an introduction to WEF SYPC and YP engagement across WEF committees as well as a panel of 'senior' young professionals who will share their experiences, insights, and advice on navigating the early stages of a career in water.

Learning Objectives

- 1) Identify and explore opportunities for increased involvement in WEF.
- 2) Provide knowledge to foster both career and technical growth for YPs in the industry.
- 3) Create opportunities for YPs to build their peer-network within WEF, increasing likelihood of continued engagement in the community.

**3:30 PM      Conference 101 and WEF Involvement Presentation**

**4:00 PM      YP Panel and Open Networking**

**Session 05 Advocacy and Outreach in Biosolids Management: Real-World Case Studies**

Tuesday, May 12<sup>th</sup> 1:30 – 3:00 PM

Room 2105

**Lead Facilitator** Pranoti Kikale, Arcadis

**Assistant Facilitator** Ed Fritz, Jacobs

Concerns related to PFAS and nutrients are increasingly shaping legislation, regulation, and public discourse around biosolids management across the United States. At the state and regional level, these concerns have driven a wide range of policy proposals, some grounded in evolving science and risk frameworks, others influenced by public perception, precautionary approaches, or broader pollution control agendas. Understanding these policy drivers and how they vary regionally is critical for biosolids professionals navigating a rapidly changing regulatory landscape. Interactive Session | Panel Discussion

Learning Objectives

At the end of the session, learners will be able to:

- 1) Understand how regional associations are engaging in advocacy and outreach to inform policymakers and stakeholders on technical issues, and how communication strategies are counteracting scrutiny of biosolids programs.
- 2) Understand common themes, regional differences, and emerging trends, as well as anticipated future challenges as PFAS regulations and contaminant policies continue to develop.
- 3) Gain a broader national perspective on the policy environment influencing biosolids management and practical insight into how regional organizations are responding to current and emerging regulatory drivers.

**1:30 PM      Advocacy and Outreach in Biosolids Management: Real-World Case Studies in Action**

Megan Ross, Kiewit; Steven Daniels, Trinity River Authority of Texas

CoAuthor(s): S.Daniels, Trinity River Authority of Texas; A.Cox, MWRDGC; J.Burke-Wells, NEBRA; M.Lono-Batura, California Association Of Sanitation Agencies; J.Dunbar, Lystek International Limited

**2:15 PM      Panel Discussion**

**Session 06 Approaches for Quantifying and Mitigating Fugitive GHG Emissions**

Tuesday, May 12<sup>th</sup> 1:30 – 3:00 PM

Room 2104A

**Lead Facilitator** Jim Groman, Ovivo Water

**Assistant Facilitator** Bhargavi Subramanian, Kennedy Jenks

This session explores strategies for measuring fugitive greenhouse gas emissions from full-scale wastewater treatment plants. Presentations will cover multi-method monitoring approaches, plant-wide emission modeling, and insights from odor control unit monitoring. The session will highlight practical approaches for implementing fugitive GHG monitoring and mitigation to improve emission quantification and reporting accuracy.

Interactive Session | Panel Discussion

#### Learning Objectives

At the end of this session, learners will be able to:

- 1) Identify multiple methods for measuring fugitive methane and VOC emissions.
- 2) Evaluate strategies to reduce uncertainty in estimating greenhouse gas emissions.
- 3) Analyze how modeling can be used to estimate facility-wide emissions.

**1:30 PM      A Multi-Method Approach for Quantifying Fugitive GHG Emissions at Metro Vancouver's Lulu Island WWTP**

Emma Shen, Jacobs

CoAuthor(s): A.Lake, Jacobs Engineering Headquarters Office; T.Davis, Jacobs; R.Das, Associated Engineering (B.C.) Ltd.; J.Carmichael, Metro Vancouver; S.Mostafa Mehrdad; K.Du

**1:45 PM      A Plant-wide Model for Estimating Fugitive Methane Emissions from Full-scale Wastewater Treatment Plants**

Amr Ismail, Toronto Metropolitan University

CoAuthor(s): A.Abdelrahman, University of Western Ontario; A.Elsayed, Toronto Metropolitan University; M.Zaghloul, F.Laqa Kakar, Brown and Caldwell; J.Willis, Brown and Caldwell; A.da Silva, Brown and Caldwell; S.Daneshgarq; A.Alsayed, Western University; E.Elbesbshy, Toronto Metropolitan University

**2:00 PM      Beyond Odour: What OCU Monitoring Reveals About Methane and VOC Emissions**

Sofia Georgaki, Jacobs

CoAuthor(s): S.Chersono, Jacobs; A.Lake, Jacobs Engineering Headquarters Office; N.Telcik, Arcadis

**2:15 PM      Adopting Multi-level Sensing Techniques for Accurate Quantification of Fugitive Methane Emissions in Full-scale Canadian Water Resource Recovery Facilities**

Ahmed Elsayed, Toronto Metropolitan University

CoAuthor(s): O.Abdelrahman; A.Ismail, Toronto Metropolitan University; F.Laqa Kakar, Brown and Caldwell; T.Le, Brown and Caldwell; S.Cavanaugh, Brown and

Caldwell; A.da Silva, Brown and Caldwell; D.Santoro, USP Technologies;  
A.Alsayed, Western University; E.Elbeshbishy, Toronto Metropolitan University

**2:30 PM Panel Discussion**

**Session 07 Biological and Chemical Strategies for Phosphorus Removal Optimization**

Tuesday, May 12<sup>th</sup> 1:30 – 3:00 PM

Room 2103C

**Lead Facilitator** Patrick Dunlap, Black & Veatch

**Assistant Facilitator** Karthik Manchala, GHD

This session explores integrated biological and chemical strategies for achieving reliable phosphorus removal in municipal and industrial wastewater. Presentations will examine how operational conditions such as carbon availability and anaerobic retention time influence enhanced biological phosphorus removal (EBPR) performance and sludge settleability. The session will also highlight advanced modeling approaches for optimizing phosphorus removal and will evaluate chemical coagulation strategies for non-reactive phosphate removal.

Interactive Session | Panel Discussion

Learning Objectives

At the end of the session, learners will be able to:

- 1) Evaluate how carbon availability and anaerobic hydraulic retention time influence sludge settleability and phosphorus removal performance at low DO.
- 2) Identify how Monte Carlo analysis can increase confidence that strict phosphorus limits can be met with EBPR even under uncertain and varying BOD availability.
- 3) Explain the differences in treatability among phosphorus species and determine the dominant non-reactive phosphorus removal mechanisms.

**1:30 PM Evaluating the Effect of Carbon Availability and Anaerobic HRT on Sludge Settleability and Phosphorus Removal at Low DO**

Megan Wittman, University of Kansas; Alexandra Doody, CDM Smith  
CoAuthor(s): B.Sturm, University of Kansas; T.Binty, University of Kansas;  
Y.Hiripitiyage, University of Kansas; J.Jimenez, Brown and Caldwell

**1:50 PM Optimizing MBR with S2EBPR using Quantitative Probabilistic Modeling: Lessons for Utilities Needing to Meet Strict TP Limits**

Theresa Kopper, CDM Smith  
CoAuthor(s): A.Doody, CDM Smith; E.Heronemus, CDM Smith

**2:10 PM Non-Reactive Phosphate Removal from Industrial Wastewater using Alum Coagulation**

Sayed Maaz Sadat, University of Kansas

CoAuthor(s): Belinda Sturm, University of Kansas; E.Peltier

**2:30 PM Panel Discussion**

### **Session 08 Discussions on Thermophilic Digestion for High Quality Biosolids**

Tuesday, May 12<sup>th</sup> 1:30 – 3:00PM

Room 2104B

**Lead Facilitator** Ahmad Bitar, AECOM

This session explores decades of progress in thermophilic digestion and the growing role of heat-driven technologies, including thermal hydrolysis, in producing high-quality biosolids. Presenters will share full-scale case studies, operational insights, and technical comparisons across thermophilic anaerobic digestion, thermophilic aerobic digestion, and THP-enhanced systems. The session will conclude with a facilitated discussion designed to engage participants in exploring implementation challenges, performance considerations, and future opportunities in thermophilic and THP processes.

Interactive Session | Facilitated Discussion

#### Learning Objectives

At the end of this session, learners will be able to:

- 1) Analyze thermophilic digestion advancements and their impacts on biosolids quality and system performance.
- 2) Compare thermophilic aerobic and anaerobic processes to assess operational benefits and challenges.
- 3) Evaluate differences between thermophilic digestion and thermal hydrolysis systems for achieving Class A biosolids.

**1:30 PM The Same; But Completely Different: Thermophilic Aerobic Digestion Overhaul(s) in the Pacific Northwest**

Matthew Williams, Thermal Process Systems

CoAuthor(s): E.Grimstad, City of McMinnville Water Reclamation Facility

**1:45 PM Facilitated Discussion**

**2:00 PM Hot Stuff: 30 Years of Thermophilic Digestion**

Emma Guertin, Brown and Caldwell; Roya Eatebarian, Brown and Caldwell

CoAuthor(s): R. Eatebarian, Brown and Caldwell; D.Hull, Brown and Caldwell

**2:15 PM Facilitated Discussion**

**2:30 PM Direct Technical Comparison Between Thermophilic Digestion and Thermal Hydrolysis with Digestion for Production of Class A Biosolids**

William Barber, CAMBI, Inc

**2:45 PM Facilitated Discussion**

**Session 09 Holistic Assessment of Impacts of Liquid-Stream Intensification Processes**

Tuesday, May 12<sup>th</sup> 1:30 – 3:00 PM

Room 2102B

**Moderator** Patrick O'Donnell, INVENT

**Assistant Moderator** Heather Stewart, Jacobs

This session will highlight studies that investigated the impacts on downstream systems, aeration, effluent quality, N<sub>2</sub>O emissions, and sludge characteristics from various liquid-stream intensification processes.

Learning Objectives

At the end of this session, learners will be able to:

- 1) Identify the different potential impacts that must be considered for different intensification processes.
- 2) Forecast potential issues that may impact their particular facilities if they incorporate an intensification process.
- 3) Identify additional research needs or studies that they may need to conduct as part of process evaluations.

**1:30 PM Balancing Nutrients, Energy, and Emissions: Two Years of Pilot Testing for Water Research Foundation Project 5271**

McKenna Farmer, Black & Veatch; Levi Straka, Metropolitan Water Reclamation District of Greater Chicago

CoAuthor(s): L.Straka, Metropolitan Water Reclamation District of Greater Chicago; C.Coffey, Black & Veatch; F.Cecconi, Black & Veatch Corporation (HQ); L.Downing, Black & Veatch

**2:00 PM A Practitioners Guide to Densified Activated Sludge: From Settling Benefits to Gaseous Emissions**

Anna Scopp, Hazen and Sawyer; Wendell Khunjar, Hazen and Sawyer  
CoAuthor(s): W.Khunjar, Hazen and Sawyer; R.Maltos, Metro Water Recovery; B.Marron, Metro Water Recovery; M.Mabry, Hazen and Sawyer; B.Wallen, Hazen and Sawyer; D.Rosso, University Of California Irvine; B.Atieh, Hazen and Sawyer; R.Priest, Hazen and Sawyer; S.Rivera, Manhattan College - Department of Civil and Environmental Engineering; A.Griaborio, Hazen and Sawyer; M.Alkire, Hazen and Sawyer; Y.Sun, Hazen and Sawyer

**2:30 PM Energy, Emissions, and Effluent Quality Trade-offs in Emerging BNR Intensification Technologies**

Narasimman Lakshminarasimman, University of Michigan

CoAuthor(s): Niclas Astrand, Stantec Inc.; S.Arab, Stantec Inc.; P.Regmi, Stantec Inc.; T.Wadhawan, Dynamita North America Inc.

### **Session 10 Soft Sensors and Digital Twins with Low-Cost Inputs**

Tuesday, May 12<sup>th</sup> 1:30 – 3:00 PM

Room 2101

This session will highlight proofs-of-concept and a real-world implementation of treatment facility digital twins for process control using primarily inputs from laboratory and real-time data inputs that are regularly collected at municipal facilities. The application of machine learning tools for autocalibration of model parameters will also be presented.

#### Learning Objectives

At the end of the session, learners will be able to:

- 1) Understand a new data-driven approach to monitor settling model parameters and forecast clarifier performance using routinely measured data.
- 2) See how utilities can build digital twins for critical tools like SRT control & peak flow management on existing enterprise data platforms and dashboards, thereby cutting the need for custom code/softwares.
- 3) Understand how soft sensors can be developed without historical plant data using probabilistic, training on mechanistic synthetic data and adaptively correcting with Bayesian updating.

**1:30 PM      Predicting Clarifier Performance Using Routine Process Data: R-Floc Autocalibration**

Chinmay Gaidhani, Georgia Tech

CoAuthor(s): I.Avila, Black & Veatch; P.Dunlap, Black & Veatch; P.Ali, Rice University; K.Leung, Black & Veatch; L.Downing, Black & Veatch

**2:00 PM      Evaluation of Sludge Characteristics from Advanced Primary Treatment Technologies**

Onder Caliskaner, Caliskaner Water Technologies

CoAuthor(s): Y.Wu, Caliskaner Water Technologies; D.Dursun, Caliskaner Water Technologies; G.Tchobanoglous; B.Davis, Linda County Water District

**2:30 PM      Soft Sensors for Data-Scarce Utilities: A Probabilistic Machine Learning Based Emulator**

Mostafa Khalil, Stantec Consulting

CoAuthor(s): G.Gilles, Stantec Consulting Puerto Rico, LLC; B.Kim, Stantec Consulting Inc; K.Gordon, Stantec; S.Satyhatmoorthy, Stantec

## **Session 11 Thermal Treatment of PFAS in Biosolids**

Tuesday, May 12<sup>th</sup> 1:30 – 3:00 PM

Room 2102A

**Moderator** Patrick Mcnamara, Black & Veatch; Marquette University

This session will provide data on how various thermal treatments impact the fate of PFAS in biosolids. The impact of thermal hydrolysis on PFAS fate will first be addressed. Then data will be presented on how thermal conversion processes (pyrolysis, pyrocarbonization) affect PFAS. Come for the content. Stay for the dialogue.

### Learning Objectives

At the end of this session, learners will be able to:

- 1) Understand how precursors can affect specific PFAS fate during thermal hydrolysis as a pretreatment to anaerobic digestion.
- 2) Recognize fate of PFAS across solids and gas through pyrolysis.
- 3) Know the possibility for PFAS destruction at full scale in a pyrocarbonization process.

### **1:30 PM      Interpreting PFAS Fate Through Thermal Hydrolysis To Support Biosolids Management Decision-Making**

Dana Gonzalez, Carollo Engineers; Barbara Ward, HRSD

CoAuthor(s): Barbara Ward, HRSD; H.A.Matel, HRSD; C.Alukkal, Purdue University; L.Lee, Purdue University; C.Wilson, HRSD; C.Bott, HRSD

### **2:00 PM      Can Pyrolysis Meet Your PFAS Treatment Goals? Probably, But Here's The Data To Help You Decide**

Lloyd Winchell, Brown and Caldwell

CoAuthor(s): A.Seidel, Brown and Caldwell; M.L.Romero, Brown and Caldwell; F.Laqa Kakar, Brown and Caldwell; A.Arhami, Brown and Caldwell; M.Wells, EnviroChem Services

### **2:30 PM      Assessment of PFAS Destruction Efficiency in a Full Scale Sewage Sludge Pyrocarbonization Process**

Sid Ahmed Kessas, Suez International

CoAuthor(s): H.Coarita Fernandez, Suez International; H.Gerber, PYREG GmbH; H.Vanden Bossche, Suez International

## **Session 12 Conventional Anaerobic Digestion Is Still Relevant!**

Tuesday, May 12<sup>th</sup> 3:30 – 5:00 PM

Room 2105

**Moderator** Erik Larson, Vaughan Company Inc.

While Advanced AD (AAD), High-Performance AD (HPAD), Temperature-Phased AD (TPAD), Thermally Hydrolyzed Pretreatment (THP), and other acronyms have dominated the landscape - conventional anaerobic digestion is still relevant. This session will cover topics related to the operation, monitoring, and rehabilitation of conventional mesophilic anaerobic digesters with some handy insights and lessons learned to take back home.

#### Learning Objectives

At the end of this session, learners will be able to:

- 1) Understand multiple methods for determining, and verifying, anaerobic digester performance.
- 2) Implement methods to monitor anaerobic digester stability through bench-scale testing methods.
- 3) Recognize the key factors in upgrading conventional anaerobic digestion to achieve modern treatment goals.

#### **3:30 PM      Keeping it Simple: Principles for Application of Traditional Mesophilic Digestion**

Jeffrey Zahller, HDR Inc

CoAuthor(s): A.Parmenter, HDR Engineering Inc.; L.Nolan, HDR Inc; N.Martin, Kitsap County Wasterwater Division

#### **4:00 PM      Navigating a Digester Upset Event Using a Bench-scale Digestion Stability Test**

Ornella Sosa-Hernandez, Clean Water Services; Kevin Wegener, Clean Water Services

CoAuthor(s): K.Wegener, Clean Water Services; P.Schauer, Clean Water Services

#### **4:30 PM      Overhauling Dinosaurs: Upgrading 20th Century Digesters for Next Generation Performance**

Tom Nangle

CoAuthor(s): G.Schweinfurth, City of Columbus Department of Public Utilities; W.Lawson, Orange Water & Sewer Authority

### **Session 13 Digester and Sidestream Scaling Mitigation and Planning**

Tuesday, May 12<sup>th</sup> 3:30 – 5:00 PM

Room 2102A

**Moderator**    Mark Lang

Addresses the impacts of struvite generation in solids handling process. the session will review how to plan for it implement improvement and optimize operations.

### Learning Objectives

At the end of this session, learners will be able to:

- 1) Understand the impacts that struvite formation has on solids processing.
- 2) Discuss how process modeling can help to plan and implement struvite removal processes.
- 3) Explain steps to consider in the optimization of struvite removal processes.

**3:30 PM      Struvite or Wrong: An Alternatives Analysis for Sidestream Phosphorus Management**

Danelle Bishoff, Stantec

CoAuthor(s): S.Arab, Stantec Inc.; N.Brown, Stantec Inc.

**4:00 PM      A Process Modeling Approach for Assessing Sidestream Phosphorus Control Alternatives in High-Salinity Wastewater**

Sara Arabi, Stantec Inc.

CoAuthor(s): N.Brown, Stantec Inc.; D.Bishoff, Stantec

**4:30 PM      Struvite on a Shoestring: Optimization of a Simple Mg(OH)<sub>2</sub> Dosing System for Controlled Struvite Formation at the Bozeman WRF**

Derek Lycke, Jacobs Solutions Inc.

CoAuthor(s): C.Fitzgerald, Jacobs; M.Li, Jacobs Engineering Group; J.Binger, Jacobs Engineering Group; M.Gibbon, City of Bozeman WRF; J.Kercher, City of Bozeman WRF

### **Session 14 Digital Tools for Predictive Insights**

Tuesday, May 12<sup>th</sup> 3:30 – 5:00 PM

Room 2101

**Moderator**                      Alexandra Doody, CDM Smith

**Assistant Moderator** Heather Stewart, Jacobs

This session will present case studies of digital tools including visualization dashboards and hybrid digital twins (i.e. hybrid of mechanistic models with machine learning) to provide predictive insights for operators in a wide array of use cases, including biosolids management, SRT control and nitrification safety factor, and enhanced biological phosphorus removal.

### Learning Objectives

At the end of this session, learners will be able to:

- 1) Explain lessons learned from real-world deployment of digital twins at WRRFs and understand the factors that drive success versus failure in digital twin adoption.

- 2) Learn best practices for developing dashboards that can boost productivity, help optimize operations, and serve as a springboard for creation of other digital tools.
- 3) See the first-of-its-kind implementation of a live digital twin that combines mechanistic and machine-learning calibration of hydrolysis rates to match BioP performance.

**3:30 PM      Eleven Full-Scale Implementations in Five Years: Lessons from Hybrid Digital Twin Applications for Operations and Design**

Cheng Yang, Jacobs; Bruce Johnson, Jacobs

CoAuthor(s): B.Johnson, Jacobs; H.Stewart, Jacobs; L.Rieger, Jacobs Solutions Inc.; O.Schraa; J.Registe, Jacobs Solutions Inc.; K.Printz, Jacobs; I.Miletic, Jacobs

**4:00 PM      Residuals in Real Time: Lessons Learned in Developing Biosolids Management Digital Solutions**

Adam Behr, Hazen and Sawyer; Barbara Ward, HRSD

CoAuthor(s): B.Lisk, Hazen and Sawyer; B.Ward, HRSD

**4:30 PM      Looking Under the Hood: Live Digital Twin Supports Operational Decisions for Stable BioP and Nitrification**

Heather Stewart, Jacobs

CoAuthor(s): K.Printz, Jacobs; N.Jaworski; K.Sanders, City of Ann Arbor WWTP; B.Johnson, Jacobs; C.Yang, Jacobs Engineering; J.Zaveri, Jacobs; D.Pienta, Jacobs; A.Emaminejad, Jacobs Engineering; A.Gelderloos, Jacobs

**Session 15 Improving Biosolids Processing: Conditioning, Dewatering, and Hydraulics**

Tuesday, May 12<sup>th</sup> 3:30 – 5:00 PM

Room 2102B

**Moderator**                      Manny Moncholi

**Assistant Moderator** Reza Bahreini

This technical session showcases field proven and research backed strategies to improve solids handling performance in water resource recovery facilities. Presenters will share data driven approaches to dewatering optimization in bench testing setups and targeted full-scale evaluations including: a multi-facility comparison of sludge pumping headloss estimation methods to improve pumping designs; and a full case study of replacing aging WAS thickening centrifuges with rotary drum thickeners. Attendees will leave with practical guidance for improving cake solids, reducing polymer demand, selecting appropriate mixing and dosing strategies, and designing and operating reliable pumping and thickening systems.

Learning Objectives

At the end of this session, learners will be able to:

- 1) Apply a stepwise optimization framework to improve dewatering consistency, increase cake solids, and reduce polymer consumption.
- 2) Evaluate when operational changes versus capital improvements are most likely to improve solids handling outcomes.
- 3) Identify start-up and tuning practices that improve thickening and support long-term operability.

**3:30 PM      A Stepwise Approach to Dewatering Optimization from Labscale to Fullscale**

Trung Le, Brown and Caldwell

CoAuthor(s): T.Chouinard, Brown and Caldwell; J.Barnett, York Sewer District; D.Lauletta, York Sewer District; P.Tucker, York Sewer District

**4:00 PM      Breaking it Down: Methodology for Accurately Estimating Pumping Headloss of Modern Sludges**

Hemanth Haft, CDM Smith; Vincent Apa, CDM Smith

CoAuthor(s): V.Apa, CDM Smith

**4:30 PM      The Plot Thickens: Optimization of WAS Thickening at Johnson County Wastewater (JCW) KS Middle Basin Treatment Facility**

Dustin Craig, CDM Smith

CoAuthor(s): D.Nolkemper, Johnson County Wastewater; A.Kadava, Johnson County Wastewater

**Session 16 Improving Biosolids Quality and Solids Processing Resilience**

Tuesday, May 12<sup>th</sup> 3:30 – 5:00 PM

Room 2104B

**Moderator**    Manuel Moncholi

If you're seeking ideas for how to enhance your solids processing and biosolids quality through optimization and incorporation of technological advancements, this is the session for you. Understand how two different sludge screens can impact solids characteristics that affect downstream processes and ultimately, the final biosolids product. See how intensified, phased digestion and the flexibility of separate or co-thickening can maximize digestion capacity and reduce associated capital and O&M costs. Learn how AI could complement operator training for more cost effective and reliable dewatering. Leave the session with practical ideas for solids processing improvements.

Learning Objectives

At the end of this session, learners will be able to:

- 1) Discuss the potential impacts of sludge screening on downstream systems and biosolids quality.

- 2) Visualize ways to improve the flexibility of digestion and thickening.
- 3) Conceptualize ways that AI could help utility staff with day-to-day functions.

**3:30 PM      Maximizing Biosolids Upgrades Through Operational Flexibility and Intensified Processes**

Katherine Bezek, Carollo Engineers; Brian Wilson

CoAuthor(s): R.Doppalapudi, Carollo Engineers; R.Gupta, Carollo Engineers; G.Juby, Carollo Engineers; E.Yarbrough, Carollo Engineers; M.Zhang, LA County Sanitation District; S.Huang, Carollo Engineers; C.Gomez, IEUA; S.Lening, IEUA; R.Love, Inland Empire Utility Agency; J.Marseilles, Inland Empire Utility Agency; B.Wilson,

**4:00 PM      Piloting Sludge Screening Technologies to Enhance Regional Biosolids Management Resilience**

Eric Spargimino, CDM Smith

CoAuthor(s): V.Apa, CDM Smith; M.Malloy, CDM Smith

**4:30 PM      Transforming Final Dewatering Operations Through Image-Based AI Toolbox and Operator-in-the-Loop Learning**

Khoa Nam Ngo, DC Water

CoAuthor(s): K.Newhart, Oregon State University; K.Lesnik, Maia Analytica; T.Duong, The Catholic University of America; A.Massoudieh, Catholic University of America; J.Proctor, DC Water & Sewer Authority; J.Mckinley, DC Water; P.Parret, DC Water; S.Martinelli, DC Water & Sewer Authority; N.Passarelli, DC Water; H.De Clippeleir, DC Water & Sewer Authority

**Session 17 Shortcut Nitrogen Removal Advancements, Operation, and Implementation**

Tuesday, May 12<sup>th</sup> 3:30 – 5:00 PM

Room 2104A

**Lead Facilitator**      Wendell Khunjar, Hazen and Sawyer

This session explores innovations in shortcut nitrogen removal processes such as partial nitrification anammox (PNA) and partial denitrification anammox (PdNA) for advanced nutrient removal in wastewater treatment. Presentations will cover novel biofilm carriers that integrate zeolite, full-scale PdNA design considerations, and the development of sensor control strategies. The session will also highlight lessons learned and practical considerations for utilities looking to implement shortcut nitrogen processes.

Interactive Session | Panel Discussion

Learning Objectives

At the end of this session, learners will be able to:

- 1) Identify advancements in the integration of zeolite for partial nitrification anammox (PNA).
- 2) Gain an understanding of partial denitrification anammox (PdNA) design considerations.
- 3) Understand the differences of operational strategies such as Ammonia Based Aeration Control (ABAC) vs. Ammonia vs Nitrate (AvN) Control for the operation of reactors upstream of PdNA.

**3:30 PM Polyvinyl Alcohol–Sodium Alginate–Zeolite Biofilm Carriers to Enhance Wastewater Deammonification**

Sarina Ergas, University of South Florida

CoAuthor(s): S.Chero Osorio, University of South Florida; C.James; M.Rivas Maldonado, University of South Florida; A.Bhattacharjee; J.Kuhn, University of South Florida

**3:50 PM Implementation of Primary Effluent–Driven PdNA at Full–Scale with Tight TN Compliance**

Brett Wagner, AECOM; Maureen O’Shaughnessy, Prince William Water

CoAuthor(s) J.McQuarrie, AECOM; G.Ganesh, AECOM; M.O’Shaughnessy, Prince William Water; R.Carlson, Prince William Water; G.Pearson, Prince William Water; C.Egharevba, Prince William Water; Z.Wang, Virginia Tech; R.Sun, Virginia Tech; C.Johnson, World Water Works, Inc.

**4:10 PM Advancing PdNA: Development of Sensors and Control Operation Strategy for Next–Gen Nutrient Removal**

Pranta Roy, Brown and Caldwell; Michael Clementson, Washington Suburban Sanitation Commission

CoAuthor C.Nguyen, Washington Suburban Sanitation Commission; M.Clementson, Washington Suburban Sanitation Commission; S.Jayavelu, World Water Works, Inc.; A.Al–Omari, Brown and Caldwell; J.Jimenez, Brown and Caldwell

**4:30 PM Panel Discussion**

**Session 18 Understanding PFAS Management in Recycle Streams from Biosolids Thickening and Dewatering through WRF Research**

Tuesday, May 12<sup>th</sup> 3:30 – 5:00 PM

Room 2103C

**Lead Facilitator** Lynne Moss,

**Assistant Facilitator** Chichedo Duru

Per- and Polyfluoroalkyl Substances (PFAS) have dramatically shifted the biosolids management landscape. While emerging technologies have predominantly focused on

treatment of biosolids specifically, treatment of recycle streams from biosolids thickening and dewatering processes could have a major impact on end use options of biosolids. This session will highlight results from Water Research Foundation project #5337 on how treatment of filtrate can help biosolids management. This session will first dive into the limitations of PFAS methods on recycle streams with a particular focus on samples with solids content between 1 and 5 %TS. The session will then reveal the importance of PFAS, including precursors and Di-PAPs, in recycle streams. Finally, the session will end with a data-driven overview of an innovative PFAS treatment technology to reduce PFAS from filtrate.

Interactive Session | Panel Discussion

#### Learning Objectives

- 1) Understand practical ramifications of PFAS analysis in recycle stream samples and how to overcome limitations.
- 2) Understand the fraction of PFAS (including precursors) being recycled back to head of plant with thickening and dewatering streams relative to PFAS in the influent.
- 3) Determine electrical energy required for removal of PFAS in filtrates using a novel destructive technology.

**3:30 PM      Opening Remarks on National Landscape for PFAS**

Lynne Moss

**3:35 PM      Practical Constraints of PFAS Methods in Biosolids Recycle Streams**

Patrick Mcnamara, Black & Veatch; Marquette University

**3:55 PM      PFAS in Recycle Streams are a Substantial (and treatable) PFAS Load**

Malcolm Taylor, Washington Suburban Sanitary Commission

**4:15 PM      Novel Treatment Technology for PFAS Destruction in Recycle Streams**

Megan Hart, University of Missouri - Kansas City

**4:45 PM      Panel Discussion**

Chichedo Duru; Lynne Moss

**Session 19 Cyclones, Carbon, and Clarifiers: Intensifying Activated Sludge with CaCO<sub>3</sub>**

Wednesday, May 13<sup>th</sup> 8:30 -10:00 AM

Room 2101

**Moderator**      Adrian Romero, Black & Veatch

This technical session explores wastewater alkalinity enhancement as a practical, plant-integrated pathway to reduce biogenic CO<sub>2</sub> emissions while improving activated sludge performance. Presenters will describe how dosing calcium carbonate, a slower-dissolving alternative to conventional alkalinity sources, can increase effluent alkalinity and pH, convert dissolved CO<sub>2</sub> to bicarbonate, and simultaneously ballast and densify biomass to improve

settling. The session highlights how pairing calcium carbonate addition with hydrocyclone-based densification can retain the carbonate solids in the biological system, increasing dissolution efficiency and corresponding carbon dioxide removal potential while reducing chemical losses to waste sludge.

#### Learning Objectives

At the end of this session, learners will be able to:

- 1) Explain how wastewater alkalinity enhancement using calcium carbonate can reduce biogenic CO<sub>2</sub> emissions.
- 2) Evaluate the role of hydrocyclones on CaCO<sub>3</sub> retention and dissolution efficiency, and its resulting impacts on sludge volume index and clarifier performance.
- 3) Apply full-scale implementation lessons including dosing strategies, retention time considerations, monitoring metrics, and operational tradeoffs to assess where CaCO<sub>3</sub> addition and solids densification technologies may be viable options for intensification.

**8:30 AM      Activated Sludge Densification with CaCO<sub>3</sub>: Evidence for Increased Secondary Treatment Capacity, Wet Weather Resilience, and Reduced Recycle Flows at Scale**

Julia Kossakowski, CREW; Benjamin Geyman, CREW Carbon

CoAuthor(s): B.Geyman, CREW Carbon; K.Vu, CREW Carbon; J.Katchinoff, CREW Carbon; N.Popolizio, CREW Carbon; E.Sosa, CREW; O.Kotagama, CREW Carbon; N.Planavsky, Yale University

**9:00 AM      A Densified Approach to Carbon Dioxide Removal: Integrating Alkalinity Addition with CaCO<sub>3</sub> and Hydrocyclone Separation**

Riley Doyle, HRSD

CoAuthor(s): A.Gagnon, HRSD; M.Poe, HRSD; J.Nicholson, HRSD; K.Vu, CREW Carbon; J.Katchinoff, CREW Carbon; N.Planavsky, Yale University; P.Vanrolleghem, Université Laval; C.Bott, HRSD

**9:30 AM      State Point in Action: Evaluating Assumptions to Address New Technologies and Intensification**

Adrienne Menniti, Clean Water Services

CoAuthor(s): O.Sosa-Hernandez, Clean Water Services; E.Lorntson, Clean Water Services; P.Schauer, Clean Water Services

### **Session 20 Emerging Biosolids Research: Microplastics and PFAS**

Wednesday, May 13<sup>th</sup> 8:30 – 10:00 AM

Room 2102B

**Moderator**                      Jim Fitzpatrick, Black & Veatch

**Assistant Moderator** Stephen Riches, Atkins Realis

This session will highlight research conducted through university settings and through the Water Research Foundation. Come hear about the latest research on microplastics through anaerobic digestion and sidestream treatment. Stay for the most up to date information on PFAS leaching from land applied biosolids.

Learning Objectives

At the end of this session, learners will be able to:

- 1) Define microplastics and know how various sidestream treatments affect microplastics.
- 2) Establish the role of pretreatment processes to anaerobic digestion on microplastics.
- 3) Articulate which groups of PFAS leach from biosolids and the impact of biosolids on PFAS soil concentrations.

**8:30 AM      WRF 5221: the Impact of Solid Stream Treatment on Microplastics in Biosolids**

Cayla Cook, Hazen and Sawyer

CoAuthor(s): M.Abu-Orf, Hazen and Sawyer

**9:00 AM      Enhancing Mesophilic Anaerobic Digestion Performance in the Presence of Polypropylene Microplastics through Alkaline Thermal and Thermal Enzymatic Disintegration**

Oguzhan Altuntas, Middle East Technical University; F. Dilek Sanin, Middle East Technical University

CoAuthor(s): F. Dilek Sanin, Middle East Technical University

**9:30 AM      Field Measurement of PFAS Leaching at a Long-Term Land-Applied Biosolids Site**

Maxwell Hire, CDM Smith

CoAuthor(s): C.Schaefer; L.Lee, Purdue University; J.Klamerus, Nutrien; K.Khan, Hazen and Sawyer

**Session 21 Food Waste & Co-digestion**

Wednesday, May 13<sup>th</sup> 8:30 – 10:00 AM

Room 2103C

**Lead Facilitator**      Kyle Stern, Kiewit

This session will cover lessons learned, business planning, and technical analysis for food waste in mono- and co-digestion applications. Attendees will learn beyond theory and focus on decision making, trade offs, and real world performance.

Interactive Session | Facilitated Discussion

Learning Objectives

At the end of this session, learners will be able to:

- 1) Evaluate financial tradeoffs among multiple co-digestion alternatives using life cycle cost and payback analysis.
- 2) Tailor preprocessing and digestion systems to local feedstock, regulatory context, and physical constraints.
- 3) Describe how advanced anaerobic digestion technologies are being implemented at full scale biosolids and food waste processing.

**8:30 AM      Analysis of Reconfigurable Organic Feedstock Preprocessing for Mono and Co-Digestion**

Zhongtian Li, Carollo Engineers

CoAuthor(s): C.Tasser, Carollo Engineers; J.Blischke

**8:45 AM      Facilitated Discussion: Analysis of Reconfigurable Organic Feedstock Preprocessing for Mono and Co-digestion**

**9:00 AM      Business Case Evaluation for Co-digestion at the Sand Island Wastewater Treatment Plant, Honolulu HI**

Sarang Agarwal, Stantec Consulting Inc; Yuan Fang, Stantec Inc.

CoAuthor(s): Y.Fang, Stantec Inc.

**9:15 AM      Facilitated Discussion: Business Case Evaluation**

**9:30 AM      Codigestion and Food Waste: Lessons Learned from Three Anaerobic Digestion Facility Startups**

Jason Wert, RETTEW Associates, Inc.; Michele Aukerman

CoAuthor(s): M.Aukerman; L.Randles,

**9:45 AM      Facilitated Discussion: Codigestion and Food Waste**

**Session 22 Pushing the Boundaries of Wastewater Treatment: Multi Technology, Limit of Performance Pilot Program for Olathe's Cedar Creek WWTP**

Wednesday, May 13<sup>th</sup> 8:30 – 10:00 AM

Room 2104A

**Lead Facilitator**      Kerrie Greenfelder, Burns & McDonnell Engineering Company, Inc.

**Assistant Facilitator** Sabrina Parker, City of Olathe

The City of Olathe, Kansas, is pioneering a multi-technology pilot program to push its Cedar Creek WWTP to the limits of performance. This session provides a roadmap for evaluating and integrating four innovative technologies simultaneously: Supercritical Water Oxidation (SCWO) for biosolids destruction, and advanced solutions for biological nutrient removal, aeration control, and process intensification. Learn how Olathe, in partnership with its design and construction team under a CMAR model, is de-risking innovation to build a resilient,

sustainable, and future-proofed treatment facility. This case study offers practical lessons for any utility planning its next generation of wastewater infrastructure.

Interactive Session | Panel Discussion

### Learning Objectives

This session will provide a roadmap for other utilities on:

- 1) Selecting and integrating a portfolio of innovative technologies to solve multiple complex treatment challenges simultaneously.
- 2) Designing and executing a phased, multi-technology piloting program to generate crucial performance data and ensure regulatory buy-in.
- 3) Leveraging the CMAR project delivery model to foster the collaboration necessary for successful innovation.
- 4) Developing a comprehensive, future-proofed solution that redefines the limits of wastewater treatment.

**8:30 AM Welcome, Context, and Session Overview**

Kerrie Greenfelder, Burns & McDonnell Engineering Company, Inc.

**8:35 AM Evolution of the Project and the Decision to Innovate**

Sabrina Parker, City of Olathe

**8:45 AM Digital Integration and Data Strategy**

David Newman, Burns & McDonnell

**8:55 AM Solids Treatment Pilot: Supercritical Water Oxidation (SCWO)**

Heather Phillips, City of Olathe; Bill Morehead; David Newman, Burns & McDonnell

**9:20 AM Liquids Treatment Pilot: BNR, Aeration Control, and Intensification**

Heather Phillips, City of Olathe; David Newman, Burns & McDonnell

**9:25 AM Operator Perspective: What We Are Learning**

Heather Phillips, City of Olathe

**9:30 AM Key Takeaways, Lessons Learned, and Q&A**

Kerrie Greenfelder, Burns & McDonnell Engineering Company, Inc.; Sabrina Parker, City of Olathe; Heather Phillips, City of Olathe; David Newman, Burns & McDonnell; Bill Morehead

### **Session 23 Strategies for Accurate N<sub>2</sub>O Measurement and Mitigation**

Wednesday, May 13<sup>th</sup> 8:30 – 10:00 AM

Room 2104B

**Lead Facilitator** Narasimman Lakshminarasimman, Stantec

**Assistant Facilitator** Shakthi Jayavelu, World Water Works

This session examines strategies for monitoring and mitigating nitrous oxide (N<sub>2</sub>O) emissions in biological nutrient removal (BNR). Presentations will cover long-term dissolved-phase monitoring, gas-phase validation, process modeling, and comparisons of liquid versus off-gas measurements across multiple WRRFs. The session will also explore the influence of carbon sources on denitrification and N<sub>2</sub>O dynamics to minimize greenhouse gas emissions from nitrogen removal processes.

Interactive Session | Panel Discussion

#### Learning Objectives

At the end of this session, learners will be able to:

- 1) Identify methods for accurately measuring N<sub>2</sub>O in liquid and gas phases.
- 2) Evaluate strategies for modeling and controlling N<sub>2</sub>O emissions to improve process sustainability.
- 3) Analyze how carbon sources affect N<sub>2</sub>O production in low-DO BNR processes.

**8:30 AM      Towards Best Practice N<sub>2</sub>O Measurement: Liquid and Off Gas Comparison Across Multiple WRRFs**

Mikkel Andersen, Unisense Environment AS; Amanda Lake, Jacobs Engineering  
CoAuthor(s): M.Moller, Unisense Environment AS; L.Debel, Veolia; W. Gruber, UpWater AG; A.Lake, Jacobs Engineering; N.Thagersen, Aalborg Forsyning; C.Bayley

**8:50 AM      Long-Term Dissolved-Phase N<sub>2</sub>O Monitoring With Gas-Phase Validation and Process Modeling Under Low-DO Operation**

Adam Horn, LA County Sanitation District; Samuel Reifsnyder, Carollo Engineers  
CoAuthor(s): S.Reifsnyder, Carollo Engineers; R.Appleton; A.Conklin, Carollo Engineers; P.Ackman, LA County Sanitation District; R.Tsai, LA County Sanitation District; R.Spierling, LA County Sanitation District; B.Mansell, LA County Sanitation District

**9:10AM      Impact of Carbon Sources and Dosing Ratios in Denitrification and N<sub>2</sub>O Dynamics in a Low DO BNR Process**

Bishav Bhattarai, Black & Veatch  
CoAuthor(s): L.Pifer, Black & Veatch; F.Sabba; M.Farmer, Black & Veatch; L.Downing, Black & Veatch

**9:30 AM      Panel Discussion**

### **Session 24 Advancing Predictive Tools for Modern Digestion Systems**

Wednesday, May 13<sup>th</sup> 10:30 AM – 12:00 PM

Room 2104A

**Lead Facilitator** Manav Baid, AECOM

**Assistant Facilitator** Shubha Oza, Brown and Caldwell; Ruth Spierling, LACSD

This session highlights emerging advances in modeling tools that enhance the design, operation, and optimization of anaerobic digestion systems. Presenters will explore reinterpretations of classical digestion models, development and calibration of microbial hydrolysis process models, and the application of machine-learning regression techniques for predicting methane yield and biogas production. Together, these approaches demonstrate how data-driven insights and refined process representation can drive more reliable and efficient co-digestion performance.

Interactive Session | Panel Discussion

Learning Objectives

At the end of this session, learners will be able to:

- 1) Analyze updated digestion modeling approaches that improve design accuracy and operational decision-making.
- 2) Evaluate microbial hydrolysis model calibration methods to enhance prediction of process kinetics.
- 3) Assess machine-learning regression tools for forecasting methane yield and biogas production.

**10:30 AM Reinterpretation of the Anaerobic Digestion Model for Design and Operation**

Katherine Gardner, Arcadis U.S., Inc.

CoAuthor(s): M.Andalib, Stantec Inc.

**10:50 AM Microbial Hydrolysis Process Model Development and Calibration**

Thomas Johnson, Jacobs; Claire Funk, Jacobs

CoAuthor(s): C.Funk, Jacobs; J.Ohemeng-Ntiamoah, Jacobs Solutions Inc.;

M.Fairley-Wax, Jacobs; D.Parry, Jacobs

**11:10 AM Leveraging Regression-based Machine learning Techniques for Accurate Prediction of Methane Yield and Biogas Production in Anaerobic Co-digestion**

Ahmed Elsayed, Toronto Metropolitan University

CoAuthor(s): N.Ahmed, Toronto Metropolitan University; M.Dassouki Dit Tahan, Department of Civil Engineering, Toronto Metropolitan University, Toronto, Canada; A.Rabii; M.Sherif Zaghloul, United Arab Emirates University;

E.Elbesbshy, Toronto Metropolitan University

**11:30 AM Panel Discussion**

**Session 25 Advancing Tertiary PdNA for Water Reuse**

Wednesday, May 13<sup>th</sup> 10:30 AM – 12:00 PM

Room 2103C

**Lead Facilitator** Brett Wagner, AECOM

This session highlights emerging tertiary treatment approaches that integrate partial denitrification anammox (PdNA) to achieve low effluent nitrogen concentrations with reduced carbon demands. Presentations will showcase pilot-scale results from membrane bioreactors, membrane aerated biofilm reactors, and biological aerated filters. The session will focus on process design, operational performance, and lessons learned for implementing PdNA in advanced treatment and potable reuse.

Interactive Session | Panel Discussion

#### Learning Objectives

At the end of this session, learners will be able to:

- 1) Recognize how tertiary PdNA processes reduce carbon demand while achieving low effluent nitrogen concentrations.
- 2) Identify several tertiary technologies that can be integrated with PdNA.
- 3) Evaluate pilot results to inform the adoption of PdNA for advanced treatment prior to potable reuse.

#### **10:30 AM Carbon Efficient Tertiary Membrane Bioreactor with Partial Denitrification Anammox for Potable Reuse**

Ariana Coracero, LA County Sanitation District

CoAuthor(s): M.Farrokh Shad, P.Hsia, LA County Sanitation District; B.Mansell, LA County Sanitation District; Y.Sun, Hazen and Sawyer; B.Danker, Hazen and Sawyer; P.Pitt, Hazen and Sawyer; W.Khunjar, Hazen and Sawyer; R.Latimer, Hazen and Sawyer; C.Fitzgerald, JacobsConstantine, Jacobs; J.Delgado, LA County Sanitation District

#### **10:50 AM Tertiary Membrane Aerated Biofilm Reactor/Partial Denitrification-Anammox Process**

Raymond Tsai, LA County Sanitation District

CoAuthor(s): B.Mansell, LA County Sanitation District; P.Hsia, LA County Sanitation District; A.Coracero, LA County Sanitation District; T.Le, Jacobs; C.Fitzgerald, Jacobs; T.Constantine, Jacobs

#### **11:10 AM Pilot-Scale Demonstration of PdNA in a Tertiary BAF for Low Effluent TIN**

Sarah Schoepflin, AECOM; Yuanbin Wu, Caliskaner Water Technologies

CoAuthor(s): Brett Wagner, AECOM; G.Ganesh, AECOM; Y.Wu, Caliskaner Water Technologies; D.Dursun, Caliskaner Water Technologies; U.Ghimire, Tomorrow Water; D.Rhu, Tomorrow Water; J.Cho, Tomorrow Water

## **Session 26 Biosolids Recycling Defense 2.0**

Wednesday, May 13<sup>th</sup> 10:30 AM – 12:00 PM

Room 2102A

**Lead Facilitator** Hilary Jacobs, Beveridge & Diamond PC

This session will survey and analyze the current policy, legislative, and litigation landscape affecting the beneficial use of biosolids and compost, including PFAS developments. The talk will provide wastewater and residuals professionals the latest information that will help their decisions on management, planning, risk, liability, and defense of litigation.

Interactive Session | Panel Discussion

affecting the beneficial use of biosolids and compost, including PFAS developments. The talk will provide wastewater and residuals professionals the latest information that will help their decisions on management, planning, risk, liability, and defense of litigation.

### Learning Objectives

At the end of this session, learners will be able to:

- 1) Understand current federal legislative, regulatory, and policy updates regarding biosolids, with a particular focus on PFAS-related updates, including EPA's Draft Risk Assessment for PFOA and PFOS in Biosolids.
- 2) Identify state legislative and regulatory trends and updates regarding PFAS in biosolids and other residuals, including the ongoing campaign to regulate and test for PFAS in biosolids and groundwater.
- 3) Speak to the current state of play of ongoing and recent cases focusing on biosolids defense.
- 4) Evaluate strategies to manage land application and defend against attacks on beneficial use in the face of a changing legal environment and widespread misunderstanding, sensationalism, and animosity toward land application.

**10:30 AM Federal Regulatory and Policymaking: What Could Go Wrong?**

Eric Sapirstein, ENS Resources, Inc.

**10:50 AM State Legislation and Advocacy Efforts**

Layne Baroldi, Synagro

**11:10 AM Biosolids Litigation Trends, Updates, and Defense Strategies**

Hilary Jacobs, Beveridge & Diamond P.C.

**11:30AM Panel Discussion**

## **Session 27 High and Dry: Thermal Drying Fundamentals and Practices**

Wednesday, May 13<sup>th</sup> 10:30 AM – 12:00 PM

Room 2105

**Lead Facilitator** Kwok-Wai Tsang, CDM Smith

This session introduces the fundamentals of thermal drying technologies and presents pilot testing results for different sludge from large wastewater treatment plants.

Interactive Session | Facilitated Discussion

Learning Objectives

At the end of this session, learners will be able to:

- 1) Have a better understanding of the thermal drying technology and the key parameters involved.
- 2) Learn about how different sludges from major municipalities behave in a belt dryer.
- 3) Learn the importance of sludge characteristics on drying, the type of dryers, and product characteristics.

**10:30 AM Thermal Processes: What Have We learned?**

John Ross, Brown and Caldwell

CoAuthor(s): L.Winchell, Brown and Caldwell; M.Mastin,

**10:45 AM Facilitated Discussion**

**11:00 AM Belt Dryer Pilot Study with Three Different Cakes from Some of the Largest Municipalities in the US**

Vincent Apa, CDM Smith; Aykut Sayin, CDM Smith Inc

CoAuthor(s): A.Sayin, CDM Smith Inc; S.Verrengia, Passaic Valley Sewerage Commissioners

**11:15 AM Facilitated Discussion**

**11:30 AM You Have a Thermal Dryer. Now What?**

Amy Hanna, Hazen and Sawyer; Rich Tomko, Hazen and Sawyer

CoAuthor(s): M.Van Horne, Hazen and Sawyer; M.Abu-Orf, Hazen and Sawyer; R.Tomko, Hazen and Sawyer

**11:45 AM Facilitated Discussion**

**Session 28 Innovations in Biosolids Odor Control**

Wednesday, May 13<sup>th</sup> 10:30 AM – 12:00 PM

Room 2101

**Moderator** Greg Woodward

This session explores practical, data-driven approaches to managing odors across biosolids facilities, from process design through product handling. Presentations will cover innovative odor control solutions such as rooftop biofilters, comparative odor characterization of dewatering technologies, and the impacts of curing and biochar amendment on Class A

biosolids. Attendees will gain insight into how operational choices, storage time, and treatment strategies influence odor generation, air handling requirements, and community impacts.

#### Learning Objectives

At the end of this session, learners will be able to:

- 1) Evaluate how biosolids processes affect odor generation, air handling requirements, and product quality over time.
- 2) Compare applied odor control and mitigation strategies, such as rooftop biofilters and process enclosure, using real-world performance data, design considerations, and operational lessons learned.
- 3) Apply field data and case study insights to inform odor management decisions that balance community impacts, sustainability goals, operational constraints, and lifecycle costs at biosolids facilities.

**10:30 AM      Evaluating Biochar Blending During Curing of THP Class A Biosolids: Impacts on Product Quality, Odor, Handleability, and PFAS Concentrations**

Nickolas Hines, Material Matters

CoAuthor(s): BJ Ward, HRSD; K.Whedbee, HRSD; R.Fogle, Material Matters

**11:00 AM      How An Innovative Green Biosolids Facility Rooftop Biofilter Saved Money, Space, and Noses**

Scott Cowden, PPS; James Cutz, Jacobs Engineering

CoAuthor(s): J.Cutz, Jacobs Engineering; V.Han, City of Portland Bureau of Environmental Service

**11:30 AM      Which THP Digested Dewatered Material Has the Most Odor Generation?**

David Oerke, Jacobs; Elaine Masters, Trinity River Authority of Texas

CoAuthor(s): E.Masters, Trinity River Authority of Texas; K.Galardi

### **Session 29 The Biosolids Life Cycle: Case Studies and Round Tables**

Wednesday, May 13<sup>th</sup> 10:30 AM – 12:00 PM

Room 2104B

**Lead Facilitator**      Meagan Malloy, CDM Smith

**Assistant Facilitator** Engin Guven, Black & Veatch

Session participants will experience several case studies focusing on the biosolids life cycle.

The case studies will be followed by interactive round table discussions.

Interactive | Case Study Analysis

**10:30 AM      Resilient Biosolids Management Planning in Southern California**

Erica AghaGholizadeh, Brown and Caldwell; Thomas Chapman, Brown and Caldwell

CoAuthor(s): A.Picazo, Eastern Municipal Water District; T.Chapman, Brown and Caldwell; R.Gupta, Carollo Engineers; E.Charbonnet, Carollo Engineers; A.Berninghaus; N.Sierra, Brown and Caldwell; P.Ma, Brown and Caldwell; S.Noone, Brown and Caldwell; A.Valenti

**10:45 AM Future-Ready Biosolids Management in Western Australia: An Adaptive Strategy Framework**

Hari Santha, Black & Veatch

CoAuthor(s): B.Li; A.McNeil, Black & Veatch; H.Ho, Black & Veatch; S.McPhee, Water Corporation; N.Locke, Water Corporation

**11:00 AM Round Table #1**

**11:15 AM Using Long-Term Biosolids and Biogas Planning to Improve Short-Term Decisions**

Caitlin McHugh, HDR; Jacob Metch, HDR

CoAuthor(s): Jacob Metch, HDR; S.Spalding, HDR Engineering Inc.; S.Smoot, HDR Inc; G.Kansas, HDR Inc; D.Lockwood III,

**11:30 AM Data-Driven Biosolids Design - Life Cycle Costing and Sludge Yield Modeling**

Karthik Manchala, GHD

**11:45 AM Round Table #2**

**Session 30 Utilities Tackling Biosolids Management Issues**

Wednesday, May 13<sup>th</sup> 10:30 AM – 12:00 PM

Room 2102B

**Lead Facilitator** Natalie Sierra, Brown and Caldwell

This session provides utility perspectives on assessing and addressing relevant biosolids management issues. Whether it's PFAS or Part 503 compliance, these utilities have engaged in practical research to help shape and proactively manage their biosolids land application programs. A facilitated discussion following the talks will allow utilities to collaboratively share lessons learned more broadly among attendees. Session participants will be able to share any practical research initiatives they have undertaken and receive feedback and input from the speakers.

Interactive Session | Facilitated Discussion

Learning Objectives

At the end of this session, learners will be able to:

- 1) Think constructively about which aspects of their land application program might be addressed via in-house applied research.

- 2) Understand the level of effort to undertake applied research, including staffing, data gathering and lab analysis.
- 3) See the benefits of taking a 'deep dive' on aspects of a land application program to address potential nuisance or compliance issues head-on.

**10:30 AM      Field-Scale Fate, Vertical Attenuation, and Crop Uptake of PFAS Following Long-Term Biosolids Land Application**

Jeffrey Hlad, Metro Water Recovery

CoAuthor(s): T.Rauch-Williams, Metro Water Recovery; E.Jackson, Metro Water Recovery; N.Fitzgerald

**10:45 AM      Facilitated Discussion**

**11:00 AM      From Landfill to Land Application: Low-Cost Wins in Biosolids Management**

Giovanna Portioli, Charlotte Water

CoAuthor(s): M.Steele, Charlotte Water

**11:15 AM      Facilitated Discussion**

**11:30 AM      Transforming Challenges Into Awards: Manhattan's Biosolids Management Program Success Story**

Garrett Sheehan, Carollo Engineer; Abdu Durar, City of Manhattan Public Works

CoAuthor(s): A.Durar, City of Manhattan Public Works

**11:45 AM      Facilitated Discussion**

**Session 31 Control What You Can At Full Scale**

Wednesday, May 13<sup>th</sup> 1:30 – 3:00 PM

Room 2102A

**Moderator**      Heather Stewart, Jacobs

This session will focus on aeration control at full-scale implementations of advanced process technologies, from ABAC to Densified Activated Sludge.

**1:30 PM      Full-Scale Optimization of Mechanistic Feedforward Feedback Ammonium-Based Aeration Control at Blue Plains**

Chengpeng Lee, DC Water and Sewer Authority; Nishedh Phokarel, University of District of Columbia, DC Water And Sewer Authority

CoAuthor(s): Khoa Nam Ngo, DC Water; N.Phokarel, University of District of Columbia, DC Water And Sewer Authority; R.Fofana, DC Water; G.Wells, Northwestern University; H.De Clippeleir, DC Water & Sewer Authority

**2:00 PM      Implementation and Control of Low-DO Operation Using ABAC**

Sara Arabi, Stantec Inc.; Shelley Trujillo; Cole Sigmon, City of Boulder

CoAuthor(s): P.Regmi, Stantec Inc.; C.Sigmon, City of Boulder; C.Marks, City of Boulder; B.Janoka, City of Boulder; S.Trujillo; N.Lakshminarasimman, University of Michigan; N.Brown, Stantec Inc.

**2:30 PM Full-scale Side-by-Side Evaluation of Aeration Efficiency in Densified versus Conventional Activated Sludge Process**

Samuel Reifsnnyder, Carollo Engineers; Rudy Maltos, Metro Water Recovery  
CoAuthor(s): J.Zambrano; A.Berninghaus; B.Marron, Metro Water Recovery;  
B.Wisdom, Metro Water Recovery; T.Rauch-Williams, Metro Water Recovery

**Session 32 Emerging Insights into EBPR Stability and Kinetics**

Wednesday, May 13<sup>th</sup> 1:30 – 3:00 PM

Room 2102B

**Lead Facilitator** Patrick Dunlap, Black & Veatch

**Assitant Facilitator** McKenna Farmer, Black & Veatch

This session explores emerging insights into the performance and stability of enhanced biological phosphorus removal (EBPR) systems. Presentations will examine how intracellular carbon storage can be used to assess EBPR health and process performance. The session will also evaluate how electron acceptors and metal salt dosing influence EBPR kinetics and the ability to achieve very low effluent total phosphorus concentrations.

Interactive Session | Panel Discussion

Learning Objectives

At the end of this session, learners will be able to:

- 1) Recognize the limitations of using internal carbon to measure EBPR stability.
- 2) Identify how dPAO kinetics differ from traditional PAOs kinetics in EBPR.
- 3) Understand how metal salts and chemical phosphorus removal impact EBPR performance.

**1:30 PM Can Measuring Intracellular Carbon Storage Levels Predict BPR Stability?**

Adrienne Menniti, Clean Water Services; Theresa Passe, Clean Water Services  
CoAuthor(s): T.Passe, Clean Water Services; E.Coats; P.Schauer, Clean Water Services

**1:50 PM Impacts of Nitrate and Nitrite as Electron Acceptors on EBPR Performance and Enrichment of Denitrifying Polyphosphate-accumulating Organisms (dPAOs) in Post-anoxic and Pre-anoxic EBPR Systems**

Andy Kumi, University of Idaho; Isabel Huggins, University of Idaho  
CoAuthor(s): Isabel Huggins, University of Idaho; E.Coats,

**2:10 PM Impact of Metal Salt Dosing on EBPR Kinetics and Stoichiometry in MBR Targeting  $\leq 0.1$  mg/L TP in Effluent**

Soubhagya Pattanayak, Carollo Engineers

**2:30 PM Panel Discussion**

**Session 33 Extremizing Process Intensification: Biokinetics, Biofilms, and GAC**

Wednesday, May 13<sup>th</sup> 1:30 – 3:00 PM

Room 2105

**Lead Facilitator** Elaine Masters, Trinity River Authority of Texas

How efficient can nutrient removal become? This session explores comparing nutrient removal rates of various process intensification systems, combining mobile media with low DO conditions, and GAC addition in low DO systems. Case studies provide insight into nutrient removal rates, additional research on mobile media in low DO conditions, and further process intensification with biofilms. Attendees are invited to learn and discuss combining multiple treatment methods to further maximize process intensification.

Interactive Session | Facilitated Discussion

Learning Objectives

At the end of this session, learners will be able to:

- 1) Compare nutrient removal of aerobic granular sludge, organic biofilm carrier, and densified activated sludge treatment processes.
- 2) Combining process intensification systems under low DO conditions with mobile media.
- 3) Gain insight into how GAC can remove micropollutants while enhancing biofilm formation.

**1:30 PM Biokinetic Comparison of Process Intensification Technologies**

Jose Jimenez, Brown and Caldwell

CoAuthor(s): M.Miller, Brown and Caldwell; A.Al-Omari, Brown and Caldwell; K.Bauhs, Brown and Caldwell; E.Giraldo,

**1:45 PM Facilitated Discussion**

**2:00 PM Low DO, High Impact: Integrating Low DO and Mobile Biofilms for Sustainable Nutrient Removal**

Kelly Gordon, Stantec

CoAuthor(s): B.Kim, Stantec Consulting Inc; M.A.Sadikul Islam, DC Water and Sewer Authority; P.Regmi, Stantec Inc.; S.Arab, Stantec Inc.; S.Sathyamoorthy,

**2:15 PM Facilitated Discussion**

**2:30 PM Process Intensification for Simultaneous Nutrient and PFAS Management Using Reactive Migrating Carriers**

Ramesh Goel, University of Utah

CoAuthor(s): T.Quereshi, University of Utah; S.Murthy, NEWhub Corp; E.Giraldo; B.Wett

**2:45 PM      Facilitated Discussion**

**Session 34 Innovations in Digestion Pretreatment, Hydrolysis, and Resource Recovery**

Wednesday, May 13<sup>th</sup> 1:30 – 3:00 PM

Room 2103C

**Lead Facilitator**      Adrian Romero, Jacobs Solutions Inc.

This session explores emerging strategies that enhance sludge treatment efficiency through advanced digestion, pretreatment, and hydrolysis processes. Presenters will highlight innovations such as high-solids digestion, thermal-alkaline conditioning with vacuum-assisted fermentation, and full-scale microbial hydrolysis design. Together, these approaches demonstrate new opportunities for improved energy generation and recovery of valuable carbon and nitrogen resources.

Interactive Session | Facilitated Discussion

Learning Objectives

At the end of this session, learners will be able to:

- 1) Analyze operational requirements and design factors influencing advanced digestion and hydrolysis systems.
- 2) Compare pretreatment technologies to determine impacts on carbon and nitrogen recovery efficiency.
- 3) Evaluate integrated process strategies that enhance overall energy generation and resource recovery potential.

**1:30 PM      Application of Thermal-Alkaline Pretreatment and Vacuum-Assisted Fermentation of Sewage Sludge and Opportunities for Carbon and Nitrogen Recovery**

David Cham, City College of New York

CoAuthor(s): D.Halim, The City College of New York; M.Soleimanifar, The City College of New York; K.Ramalingam, The City College of New York; E.Giraldo; N.Perez, NYCDEP; J.Fillos, City College

**1:45 PM      Facilitated Discussion**

**2:00 PM      Full-Scale Design and Energy Recovery for the Microbial Hydrolysis Process**

Madeleine Fairley-Wax, Jacobs; Stephanie Cope, Jacobs

CoAuthor(s): S.Cope, Jacobs; P.Nielsen, VCS Denmark; S.Eriksen, VCS Denmark; D.Parry, Jacobs

**2:15 PM      Facilitated Discussion**

**2:30 PM      Why So Much Water? Implementing High TS Digestion**

Thomas Paulmann, HDR; Mario Benisch, HDR Engineering Inc.  
CoAuthor(s): M.Benisch, HDR Engineering Inc.

**2:45 PM Facilitated Discussion**

**Session 35 Optimizing Sludge Fermentation: Managing P Release and Recovery**

Wednesday, May 13<sup>th</sup> 1:30 – 3:00 PM

Room 2101

**Moderator** Kyle Stern, Kiewit

This session explores how utilities can optimize internal carbon generation and sidestream phosphorus control to support enhanced biological nutrient removal while reducing chemical dependency. Through full-scale and pilot-scale case studies, presenters examine strategies to decouple COD and phosphorus release during primary sludge fermentation, intentionally sequester phosphorus as stable calcium phosphate precipitates, and evaluate fermenter performance using improved, net-benefit metrics.

Learning Objectives

At the end of this session, learners will be able to:

- 1) Evaluate strategies such as alkalinity addition, ferric dosing, and sludge dilution to reduce phosphorus release while maintaining sCOD yields in primary sludge fermenters.
- 2) Apply lessons learned from full-scale operation to evaluate sidestream phosphorus control strategies at enhanced biological phosphorus recovery (EBPR) facilities.
- 3) Recognize tradeoffs between carbon production and nutrient release when selecting fermenter design and operating conditions.

**1:30 PM Primary Sludge Fermentation in Chem-P Plants: Decoupling P-Release from C-Release**

Kathryn Hanson, DC Water

CoAuthor(s): S.Davis, DC Water, GW; J.Poli, KU; M.Boulware; I.Avila, Black & Veatch; S.Islam, George Washington University; A.Massoudieh, Catholic University of America; L.Downing, Black & Veatch; M.Ladipo-Obasa, DC Water & Sewer Authority; M.Miranda, DC Water & Sewer Authority; C.Passarelli, DC Water & Sewer Authority; K.Nam Ngo, DC Water; H.De Clippeleir, DC Water & Sewer Authority

**2:00 PM Witchy Brew: New Empirical Insights into the Dark Art of Primary Sludge Fermentation**

Jon Liberzon, Black & Veatch

CoAuthor(s): M.Farmer, Black & Veatch; A.Menniti, Clean Water Services; T.Passe, Clean Water Services; L.Pinkerton, Metropolitan Council; D.Freedman, Metro Water Recovery; A.Carnes, City of Boise Public Works Department

**2:30 PM Influence of Hydraulic Retention Time on Volatile Fatty Acid Production and Sludge Dewaterability in Anaerobic Sludge Fermentation**

Monisha Alam, University of Alberta

CoAuthor(s): R.Saila, University of Albert; S.Ismail, University of Alberta; A.Mou, University of Alberta; B.Dhar

**Session 36 PFAS Lightning Talks: Roundtable Discussion**

Wednesday, May 13<sup>th</sup> 1:30 – 3:00 PM

Room 2104B

**Lead Facilitator** Meagan Malloy, CDM Smith

**Assistant Facilitator** Raj Chavan, Ardurra; Stephen Riches, Atkins Realis

This session features a series of short presentations that trace the PFAS management pathway, from industrial source control to assessment tools and treatment technologies. Following the talks, facilitated roundtable discussions will allow participants to engage directly with presenters, compare approaches, and discuss practical implications. The session concludes with insights into global experience and U.S. trends in advanced thermal treatment for PFAS destruction.

Interactive Session | Facilitated Discussion

**1:30 PM Impacts of Industrial Discharge Control on PFAS and Precursor Concentrations in Wastewater**

Rasha Maal-Bared, CDM Smith

CoAuthor(s): E.Tavasoli, HDR Inc; E.Spargimino, CDM Smith; S.Mathur, CDM Smith

**1:40 PM Extension of BEAM Tool for Assessing PFAS Emissions and Sustainability Metrics in Biosolids Thermal Processes**

Leah Pifer, Black & Veatch

CoAuthor(s): F.Cecconi, Black & Veatch; S.Shankar; P.Mcnamara, Black & Veatch; Marquette University; W.Hoener; L.Moss; J.Burke-Wells, NEBRA; A.Shaw, Black & Veatch

**1:50 PM Roundtable Discussion #1**

**2:10 PM Emerging PFAS Treatment Train for Removal and Destruction of Landfill Leachate Using Foam Fractionation and Electrooxidation**

Lee Kimbell, Black & Veatch; Gary Hunter, Black & Veatch

CoAuthor(s): G.Hunter, Black & Veatch; F.Sabba; C.Kassar, Black & Veatch

**2:20 PM Evaluation of Hydrothermal Liquefaction for the Great Lakes Water Authority:  
A pilot scale study**

Xavier Fonoll Almansa, University of Texas At Austin

CoAuthor(s): W.Weohner, University of Texas At Austin; J.Norton, Great Lakes Water Authority (GLWA); A.Marcus, Great Lakes Water Authority (GLWA); D.Santosa; J.Oyler, Genifuel Corporation; M.Wooldridge, University of Michigan; Z.Ismail, University of Michigan; A.Mansfield, Eastern Michigan University; J.Willis, Brown and Caldwell; L.Winchell, Brown and Caldwell

**2:30 PM Roundtable Discussion #2**

**2:50 PM Advanced Thermal Biosolids Treatment for PFAS Destruction: Global Experience and U.S. Implementation Trends**

Mohammad Abu-Orf, Hazen and Sawyer

CoAuthor(s): K.Khan, Hazen and Sawyer

**Session 37 Targeting Net-Zero With THP: Innovative Energy Plays**

Wednesday, May 13<sup>th</sup> 1:30 – 3:00 PM

Room 2104A

**Lead Facilitator** Erik Larson, Vaughan Company Inc.

As the target of net-zero is being adopted more broadly, there is a focus on finding innovative ways to incrementally improve energy balance. Thermal Hydrolysis Pretreatment (THP) provides several interesting applications for this line of thinking. This session will explore a few creative ways energy is being recovered or offset in THP facilities.

Interactive Session | Facilitated Discussion

Learning Objectives

At the end of this session, learners will be able to:

- 1) Perform a net energy analysis to consider treatment process alternatives.
- 2) Identify opportunities to transfer waste heat to offset heating demands.
- 3) Evaluate case studies to inform process selection based on energy neutrality.

**1:30 PM From Waste to Watts: Global Case Studies in Advanced Biosolids & Energy Recovery through Thermal Hydrolysis**

Shyam Sivaprasad, Stantec Inc.; Pusker Regmi, Stantec Inc.

CoAuthor(s): A.Le Roux; D.Starrenburg; V.Borkowski, Stantec Inc.; P.Regmi, Stantec Inc.; S.Arabj, Stantec Inc.

**1:45 PM Facilitated Discussion**

**2:00 PM Is A Second Thermal Hydrolysis Energy-positive? A Net Energy Analysis of Dual-THP Configuration**

Yitao Li, Virginia Tech

CoAuthor(s): H.Luo, Virginia Tech; F.Haile, Arlington County Water Pollution Control Bureau; M.Strawn, Arlington County Water Pollution Control Bureau; J.Novak, VA Poly Institute & State University; Z.Wang, Virginia Tech

**2:15 PM Facilitated Discussion**

**2:30 PM Recovering Blower Waste Heat to Offset Thermal Hydrolysis Energy Demands**

Ty Morton, HDR

CoAuthor(s): J.Prevatt, Pima County Regional

**2:45 PM Facilitated Discussion**

### **Session 38 A Diamond Is Forever, But Managing Carbon Is Too**

Wednesday, May 13<sup>th</sup> 3:30 – 5:00 PM

Room 2102B

**Facilitator** Raj Chavan, Ardurra

**Assistant Facilitator** Derya Dursun

The amount of carbon influences treatment outcomes in the secondary system and can be a critical component in operating scenarios and design impacts. The session explores carbon measurement with a bio-electrochemical sensors, high mixed liquors levels in low C:N, and optimizing chem-P with sludge fermentation.

Interactive Session | Case Study Analysis

#### Learning Objectives

At the end of this session, learners will be able to:

- 1) Gain insight into measuring carbon via bio-electrochemical sensors while understanding potential limitations.
- 2) Understand how increasing mixed liquors in a step feed process can be implemented successfully in low C:N conditions resulting in improving settling, operating at low DO, and granulation.
- 3) Learn how primary sludge fermentation and pH control can affect phosphorous release in an iron-dosed chemical phosphorus plant.

**3:30 PM Starving the Competition: Carbon Control Strategies for Enhanced MABR Performance**

Komal Rathore, Carollo Engineers

CoAuthor(s): A.Gharagozian, Carollo Engineers; B.Coday, Carollo Engineers; M.Reeve, Veolia Water

**3:50 PM Group Analysis**

**4:00 PM A New Lens to See Carbon: Full-Scale Bio-Electrochemical Sensor Trial**

Nathaniel Stein, Ovivo USA LLC; Sergio Pino-Jelcic, Ovivo USA LLC  
CoAuthor(s): S.Pino-Jelcic, Ovivo USA LLC; J.Mejia Franco, Sentry; P.Kiely, Island  
Water Technologies Inc; T.Truax; D.Lords, City of Idaho Falls; C.Utter, City of  
Idaho Falls; C.Anderson, Consor

**4:20 PM Group Analysis**

**4:30 PM Full Scale Intensified Step Feed BNR Process for Achieving Stringent Nitrogen  
Limits at Low C:N Ratios**

John Kabouris, Stantec

CoAuthor(s): T.Nogaj, University of Central Florida College of Engineering

**4:50 PM Group Analysis**

### **Session 39 AI and the Future of the Workforce: Three Types of Learning**

Wednesday, May 13<sup>th</sup> 3:30 – 5:00 PM

Room 2103C

**Lead Facilitator** Keaton Lesnik, Eaos

Utilities are continually looking for ways to preserve institutional knowledge, accelerate operator development, and get more value from the systems they build. This session explores how agentic digital twins address these challenges by enabling new kinds of learning between operators and AI. Three utilities share their current work, each approaching the problem from a different angle. DC Water encodes operator expertise for knowledge-driven decision support, creating a cognitive apprenticeship at scale. Metro Water Recovery integrates heterogeneous models across treatment process and economics, revealing cross-domain insights no single expert could find alone. Prince William Water embeds co-learning into the commissioning process itself, building the twin while training operators and capturing knowledge as it's created. Discussion focuses on workforce implications, what changes for operator roles, how these systems fit into existing operations, and what it takes to get started.

#### Learning Objectives

At the end of this session, participants will be able to:

- 1) Describe three types of learning that become possible when operators work alongside AI agents: learning from, learning with, and co-discovery
- 2) Articulate how agentic digital twins can preserve institutional knowledge and accelerate operator development
- 3) Identify opportunities at their own facilities where human-agent collaboration could address knowledge transfer challenges
- 4) Discuss workforce implications, including how agent-operator partnerships change training, career development, and daily operations

- 3:30 PM**      **Three Types of Learning for the Future Workforce**  
Keaton Lesnik, Eaos
- 3:35 PM**      **Learning from the Agent: Cognitive Apprenticeship**  
Haydee De Clippeleir, DC Water & Sewer Authority; Todd Wingers, Metro Water Recovery
- 4:15 PM**      **Learning Together: Co-Discovery During Commissioning**  
Rachel Carlson, Prince William Water
- 4:35 PM**      **Panel Discussion: The Future Workforce and Human-Agent Collaboration**
- 4:55 PM**      **Closing Remarks**  
Keaton Lesnik, Eaos

### **Session 40 Keys to Successful Renewable Natural Gas Project Delivery**

Wednesday, May 13<sup>th</sup> 3:30 – 5:00 PM

Room 2105

**Lead Facilitator**      Engin Guven, Black & Veatch

**Assistant Facilitator** Terry Goss, AECOM

This session highlights methods to accelerate renewable natural gas (RNG) project implementation while managing financial, technical, and market risks. Presentations will include lessons from biogas sales contracts, alternative project delivery models, and case studies of RNG production for pipeline injection. The session will also provide insights into avoiding common mistakes that can delay RNG projects.

Interactive Session | Panel Discussion

#### Learning Objectives

At the end of this session, learners will be able to:

- 1) Describe delivery strategies for renewable natural gas (RNG) project acceleration.
- 2) Identify approaches to reduce risk in project development and implementation.
- 3) Evaluate best practices for biogas contracting, sales agreements, and market integration.

- 3:30 PM**      **De-Risking and Accelerating RNG Projects via Alternative Delivery**  
Eider Alvarez-Puras, Johnson Controls  
CoAuthor(s): A.Kontorousis, Johnson Controls; A.Sheposh; J.VanVoorhis, Mead & Hunt
- 3:50 PM**      **Lessons Learned from Biogas Sales Contracting: Success Stories and Pitfalls from Selling Biogas into the RNG Market**  
Pranoti Kikale, Arcadis, U.S., Inc.; Patrick Ludwig, City of Dayton WWTP

CoAuthor(s): E.Auerbach, Arcadis; P.Kube, Arcadis, US Inc; P.Ludwig, City of Dayton WWTP; J.Rosentel, Capital Region Water

**4:10 PM San Francisco Converting Biogas to RNG for PG&E Pipeline Injection**

Yueyun Tse, Black & Veatch; Dorothy Ching, Veolia

CoAuthor(s): D.Ching, Veolia; B.Wong, Stantec Inc.; J.Pendergrass; D.Wright, PCL Construction, Inc; D.Brandao, San Francisco Public Utilities Commission

**4:30 PM Panel Discussion**

**Session 41 Lessons Learned in Deammonification/ANAMOX Sidestream Treatment**

Wednesday, May 13<sup>th</sup> 3:30 – 5:00 PM

Room 2104A

**Lead Facilitator** Kyle Stern, Kiewit

This session examines how sidestream nitrogen removal enables facilities with thermal hydrolysis and anaerobic digestion to manage increased and variable nitrogen recycle loads. Through full-scale and pilot-scale case studies, presenters share lessons learned from design, startup, and long-term operation of ANAMOX and two-stage PN-ANAMOX systems. The session highlights how filtrate quality, solids management, process control, and operational flexibility affect system stability and recovery from upsets.

Interactive Session | Facilitated Discussion

Learning Objectives

At the end of this session, learners will be able to:

- 1) Identify common start up challenges, including inhibition events, biomass loss, and nitrite accumulation.
- 2) Evaluate impacts of low ammonia loading, high centrate TSS, polymer carryover, and dissolved oxygen on deammonification performance.
- 3) Apply lessons learned from pilot operation to inform full-scale design and risk management for challenging sidestream applications.

**3:30 PM Lessons Learned from Deammonification Startup treating THP Filtrate at two WRFs**

David Wankmuller, Hazen and Sawyer

CoAuthor(s): E.Bailey, City of Raleigh; S.Fuentes, Washington Sanitary Suburban Commission; L.Li, Veolia Water

**3:45 PM Facilitated Discussion**

**4:00 PM Experience and Lessons Learned in Design, Construction and Operation of the First Deammonification System in Central USA**

Larry Li, Veolia Water; Anjana Kadava, Johnson County Wastewater; James Fitzpatrick, Black & Veatch

CoAuthor(s): A.Kadava, Johnson County Wastewater; J.Fitzpatrick, Black & Veatch; C.Ruff,

**4:15 PM Facilitated Discussion**

**4:30 PM Pilot-scale Demonstration of a Two-stage Anammox Process Under High C:N ratio (2-5) Influent Condition**

Umesh Ghimire, Tomorrow Water; David Rhu, Tomorrow Water

CoAuthor(s): D.Rhu, Tomorrow Water; S.J.Kang; A.Kaldate, Tomorrow Water; T.Oh; J.Lipe,

**4:45 PM Facilitated Discussion**

### **Session 42 Low DO Operations Flip the Script on Traditional BNR**

Wednesday, May 13<sup>th</sup> 3:30 – 5:00 PM

Room 2101

**Moderator** Patrick O'Donnell, INVENT

**Assistant Moderator** Bishav Bhattarai, Black & Veatch

This session will demonstrate how some facilities are bucking conventional wisdom by operating at low DO in aerobic zones to promote denitrification with less pumping energy and less carbon inputs, and to promote more stable EBPR. Two case studies also highlight the intensification benefits of pairing Low DO operation with densification via kinetic selection and physical selection.

#### Learning Objectives

At the end of this session, learners will be able to:

- 1) Understand how facilities are attempting operations at low DO to achieve denitrification without internal recycle pumping, thus achieving energy savings.
- 2) Explain cutting-edge research that bucks conventional wisdom that higher DO improves biological phosphorus removal, showing instead that PAOs perform best at very low DO and are inhibited at high DO.
- 3) Understand how some utilities are attempting operations at low DO to achieve denitrification via shortcut nitrogen removal, thus achieving carbon savings.

**3:30 PM Intensifying BNR with Low DO and DAS: Lessons from Startup**

Sara Arabi, Stantec Inc.; Pusker Regmi, Stantec Inc.; Cole Sigmon, City of Boulder

CoAuthor(s): C.Sigmon, City of Boulder; C.Marks, City of Boulder; B.Janoka, City of Boulder; P.Regmi, Stantec Inc.; S.Trujillo; N.Brown, Stantec Inc; N.Lakshminarasimman, University of Michigan

**4:00 PM Why Does Low Dissolved Oxygen Favor Biological Phosphorus Removal? Oxygen Inhibition of PAOs Is An Important Part of the Story**

Lilian McIntosh, HRSD

CoAuthor(s): K.McCullough, HRSD; A.Gagnon, HRSD; S.Klaus, HRSD; C.Bott, HRSD

**4:30 PM Synergistic Process Intensification Via Densification, Mainstream Anammox, and Low DO Operation Under Mainstream Conditions**

Cyrus Li, Virginia Tech

CoAuthor(s): Y.Sun, Hazen and Sawyer; W.Khunjar, Hazen and Sawyer; S.Rivera, Hazen and Sawyer; K.Platt, Upper Occoquan Service Authority; E.Schlosser, Upper Occoquan Service Authority; D.Hague, Upper Occoquan Service Authority; B.Steglitz, Upper Occoquan Service Authority; Y.Duan, Virginia Tech; Z.Liao, Virginia Polytechnic Institute and State University; Z.Wang, Virginia Tech

**Session 43 Thermal Drying in Biosolids Planning and Management**

Wednesday, May 13<sup>th</sup> 3:30 – 5:00 PM

Room 2102A

**Lead Facilitator** Kwok-Wai Tsang, CDM Smith

This session explores the roles of thermal drying as part of biosolids management planning. The types of thermal drying technologies available, and selection criteria.

Interactive Session | Facilitated Discussion

Learning Objectives

At the end of this session, learners will be able to:

- 1) See examples of how utilities employing thermal drying for planning and biosolids management.
- 2) Learn about different types of thermal dryers and vendors, the key in comparisons.
- 3) See examples of how thermal drying is applied to address future growth and increased plant loadings.

**3:30 PM Burn It or Dry It? MSD's Path Forward for Solids Management**

Ruth Borgmann, Hazen and Sawyer

CoAuthor(s): J.Yeh, Hazen and Sawyer; C Bullard, Hazen and Sawyer

**3:45 PM Facilitated Discussion**

**4:00 PM Drying for the Future: Selecting the Right Technology for Rogers Water Utilities**

Suzie Carpenter, Black & Veatch; Todd Beaver, Rogers Water Utilities – Pollution Control

CoAuthor(s): J.Keller, Black & Veatch; J.Durham, Hawkins–Weir Engineers, Inc.; T.Beaver, Rogers Water Utilities – Pollution Control

**4:15 PM Facilitated Discussion**

**4:30 PM Meeting the Moment: A Comprehensive Thermal Drying Program for Growth, Industrial Loadings, and Class A Biosolids**

Travis Calhoun, Columbus City Utilities; Maritza Villalobos Tempest, Strand Associates, Inc.

CoAuthor(s): M.Villalobos Tempest, Strand Associates, Inc.

**4:45 PM Facilitated Discussion**

### **Session 44 Farming for RNG: Topics on AD for Agriculture**

Thursday, May 14<sup>th</sup> 8:30 – 10:00 AM

Room 2101

**Moderator** Erik Larson, Vaughan Company Inc.

The American Biogas Council will start this session off with an update on the state of anaerobic digestion in the agriculture industry. This will be followed by a few presentations related to research and technology focused on agricultural applications.

#### Learning Objectives

At the end of the session, learners will be able to:

- 1) Understand the current state and trajectory of the agricultural AD industry.
- 2) Evaluate the feasibility of per-treatment technologies for manure feed stock.
- 3) Recognize the potential for side-stream products like VFAs from agricultural wastewater.

**8:30 AM Invited Speaker: American Biogas Council**

**9:00 AM Success of Arrested Anaerobic Digestion to Treat Variable Swine Wastewater at Different pH for Volatile Fatty Acids (VFAs) Production**

Caitlin Swope, Kansas State University; Huu Tuan Tran,

CoAuthor(s): P.Parameswaran, Kansas State University; H.Tuan Tran,

**9:30 AM Expanding the Feasibility of On-Farm Anaerobic Digestion Operations: An Innovative Application of Thermal-Alkaline Hydrolysis and Combined Digestion and Storage of Livestock Manures**

Kelly Ward, Lystek International

CoAuthor(s): A.Singh, Lystek; M.Beswick, Lystek; S.Mason–Renton, Lystek; K.Bell

### **Session 45 Small Particles, Big Gains: Engineering the Ingredients for Intensification**

Thursday, May 14<sup>th</sup> 8:30 – 10:00 AM

Room 2102A

**Moderator** Shakthi Jayavelu, World Water Works

**Assistant Moderator** Phil Ackman, LACSD

This technical session highlights how WRRFs can do more with the same tanks by leveraging key biological and physical selective pressures. Presentations span full-scale modeling of densified activated sludge systems, bench-scale evaluation of pathogen removal in aerobic granular sludge, and field and laboratory investigations of low-DO simultaneous nitrification-denitrification. Together, the studies demonstrate how diffusion-driven microenvironments enable stacked biological functions, decouple performance from conventional SRT and DO constraints, and improve resilience, energy efficiency, and treatment capacity. The session provides mechanistic insight and practical guidance for engineers, operators, and researchers seeking scalable, granulation-based strategies for modern WRRF intensification.

Learning Objectives

At the end of this session, learners will be able to:

- 1) Understand how key selective pressures enable process intensification by decoupling bulk SRT, DO, and hydraulic constraints from biological performance through diffusion-driven microenvironments.
- 2) Evaluate how floc size, diffusion resistance, and selection mechanisms influence nitrification, simultaneous nitrification-denitrification, and pathogen removal under low-DO and high-rate operating conditions.
- 3) Apply modeling, bench-scale, and full-scale insights to assess when process intensification strategies can improve treatment capacity, energy efficiency, and resilience in existing WRRF infrastructure without major expansion.

**8:30 AM      SND: Why You Should Believe**

Gretchen Gutenberger, Black & Veatch

CoAuthor(s): L.Downing, Black & Veatch; S.Sadreddini, Black & Veatch; T.Biese, New Water, Green Bay Metro Sewerage District; J.Watson, New Water, Green Bay Metro Sewerage District; S.Elger, EnviroMix; J.Koch, EnviroMix; T.Jordan, EnviroMix

**9:00 AM      Modeling Granule and Floc Dynamics in Full-scale Densified Activated Sludge System**

Yewei Sun, Hazen and Sawyer; Rudy Maltos, Metro Water Recovery

CoAuthor(s): R.Maltos, Metro Water Recovery; N.Love, Metro Water Recovery; T.Rauch-Williams, Metro Water Recovery; D.Freedman, Metro Water Recovery;

K.Florence, Hazen and Sawyer; A.Mayer, Hazen and Sawyer; R.Latimer, Hazen and Sawyer; W.Khunjar, Hazen and Sawyer

**9:30 AM Investigating the Impact of Ciliate Protozoal Grazing of Escherichia Coli in Aerobic Granular Sludge Under Variable DO and Substrate Conditions**

Snigdha Bardhan, University of Kansas; Belinda Sturm, University of Kansas; Snigdha Bardhan, University of Kansas

CoAuthor(s): Y.Hiripitiyage, University of Kansas; I.Mutema, University of Kansas; B.Sturm, University of Kansas

**Session 46 The Machines are Learning! Establishing Frameworks for Data-driven Machine Learning Applications in Wastewater Treatment**

Thursday, May 14<sup>th</sup> 8:30 – 10:00 AM

Room 2104B

**Lead Facilitator** Chinmay Gaidhani, Black & Veatch

**Assistant Facilitator** Dana Gonzalez, Carollo

This session explores how machine learning is being applied to optimize nitrogen removal, energy recovery, and emissions management in advanced wastewater treatment systems. Presentations are paired with facilitated discussions, giving attendees the chance to reflect, ask questions, and connect cutting-edge research with real-world practice.

Interactive Session | Facilitated Discussion

**8:30 AM Interpretable Machine Learning for Nitrogen Removal, Energy Recovery, and Biosensing in Advanced Wastewater Systems**

Soyoung Park, Washington University in St. Louis

CoAuthor(s): Z.He, Washington University in St. Louis

**9:00 AM Facilitated Discussion #1**

**9:15 AM Machine Learning Based Prediction of Nitrous Oxide Emissions in Biological Wastewater Treatment using Multi-Decadal Datasets**

Gnanaraj Augustine, Columbia University; Kartik Chandran,

CoAuthor(s): K.Chandran

**9:45 AM Facilitated Discussion #2**

**Session 47 Understanding a Variety of Biofilm Applications**

Thursday, May 14<sup>th</sup> 8:30 – 10:00 AM

Room 2104A

**Lead Facilitator** Rachel Hanson, AECOM

This session dives into biofilm-based treatment processes, highlighting both innovative design approaches and operational insights. Presentations are paired with facilitated discussions to explore how fixed-film biofiltration and biological indicators can help diagnose performance challenges and improve system efficiency. Attendees will leave with practical perspectives on integrating ecology and process optimization in biofilm systems.

Interactive Session | Facilitated Discussion

**8:30 AM Integrating Fixed-Film Biofiltration into Primary Treatment Processes**

Victory Fiifi Dsane, Tomorrow Water; Yuanbin Wu, Caliskaner Water Technologies

CoAuthor(s): D.Rhu, Tomorrow Water; S.J.Kang; D.Dursun, Caliskaner Water Technologies; O.Caliskaner, Caliskaner Water Technologies; G.Daigger, University of Michigan; Y.Wu, Caliskaner Water Technologies

**9:00 AM Facilitated Discussion #1**

**9:15 AM Oligochaete Proliferation as an Ecological Indicator of Chronic Underloading in a Biofilm Rotating Biological Contactors Process**

Jake Hunt, Arcadis, U.S., Inc.

**9:45 AM Facilitated Discussion #2**

**Session 48 Biofilms and Membranes Had the Ultimate Baby: MABR**

Thursday, May 14<sup>th</sup> 10:30 AM – 12:00 PM

Room 2104A

**Lead Facilitator** Raj Chava, Ardurra

**Assistant Facilitator** Narasimman Lakshminarasimman, Stantec

With the multitude of process intensification technologies, membrane aerated bioreactors (MABR) have become at the forefront of innovation. The session provides insight on addressing an existing plant's capacity by electing to utilize MABR, performance results from a MABR pilot, and controlling biofilm thickness using a soft sensor analysis. The session provides MABR piloting performance results while understanding operational lessons. Attendees are invited to learn about approaches for their own facilities and to understand operational considerations.

Interactive Session | Facilitated Discussion

Learning Objectives

At the end of this session, learners will be able to:

- 1) Learn about drivers and considerations of implementing MABR at an existing plant with increasing organic loading.
- 2) Evaluate nitrification performance and operational lessons from an MABR pilot.

3) Understand how to best control biofilm thickness in MABR via soft sensor controls.

**10:30 AM Impossible is Nothing: MABR Making it Possible**

Eric Redmond, Black & Veatch

CoAuthor(s): T.Ho; P.Salekar, Black & Veatch; T.Davies, Trinity River Authority of Texas; J.Nash, Black & Veatch; D.Coutts; M.Reeve, Veolia Water; M.Suarez;

L.Downing, Black & Veatch

**10:45 AM Facilitated Discussion**

**11:00 AM Using Fingerprint Soft Sensor to Control Biofilm Thickness in MABRs**

Yi Cao, Carollo Engineers

CoAuthor(s): G.Daigger, University of Michigan

**11:15 AM Facilitated Discussion**

**11:30 AM Piloting MABR Under Real-World Operating Constraints: Operational Lessons for Nitrogen Removal**

Dana Gonzalez, Carollo Engineers

CoAuthor(s): K.Rathore, Carollo Engineers; N.Kowal, Carollo Engineers; A.Conklin, Carollo Engineers; A.Toth, Veolia; M.Reeve, Veolia Water

**11:45 AM Facilitated Discussion**

**Session 49 Next-Generation Biosolids Conditioning Approaches**

Thursday, May 14<sup>th</sup> 10:30 AM – 12:00 PM

Room 2102A

**Moderator** Zhongtian Li, Carollo

**Assistant Moderator** Caitlyn Harris, Brown and Caldwell

This session highlights emerging conditioning approaches that improve dewatering performance while supporting nutrient management and lifecycle cost control. Speakers will present on bench-scale anaerobic digestion results demonstrating phosphate and sulfide sequestration using micronized steel slag as a lower-hazard alternative to soluble iron salts, including polymer compatibility and dewatering kinetics; full-scale centrifuge trials showing how nanobubble-conditioned polymer makedown water can enhance polymer activation and shift the dose/response curve to reduce active polymer requirements while maintaining dewatering performance; and a full-scale case study applying nanobubble enhanced polymer hydration to improve thickening and dewatering outcomes under variable influent conditions. Together, these presentations provide a glimpse into work being done for utilities seeking low-footprint innovations that increase dewatering performance.

Learning Objectives

At the end of this session, learners will be able to:

- 1) Describe the mechanisms and operational implications of phosphate and sulfide control in anaerobic digestion using micronized steel slag versus conventional ferric addition, including effects on alkalinity and scaling risk.
- 2) Explain how nanobubbles can influence polymer hydration and activation and how this translates to improved floc bridging, capture efficiency, and polymer usage.
- 3) Assess where these innovations fit within biosolids treatment goals, including chemical cost reduction, hauling and disposal cost impacts, resilience to influent variability, and potential pathways for nutrient recovery.

**10:30 AM      Isolating Dewatering Potential and Rheological Factors of Next Generation Iron Salt Replacements for Sustainable Nutrient Recovery from Anaerobic Digester Biosolids**

Mark Hernandez, Green Steel Environmental; Jonathan Teaford, Green Steel Environmental

CoAuthor(s): J.Teaford, Green Steel Environmental; J.Jonis, Green Steel Environmental; A.Lingaraj, Green Steel Environmental

**11:00 AM      Reducing Polymer Use and Sludge Handling Costs with Nanobubble-Conditioned Makedown Water**

Chris Maher, Clean Water Services; John Crisman, Moleaer

CoAuthor(s): J.Crisman, Moleaer; R.Murnane, Moleaer

**11:30 AM      Reducing Polymer Demand and Increasing Cake Solids Using Nanobubble-Enhanced Polymer Activation**

Gary Hunter, Black & Veatch; Daniel Fahr, Greer CPW

CoAuthor(s): D.Fahr, Greer CPW; J.Crisman, Moleaer; B.Gobburi, Moleaer; K.Schoenheit, Xylem; C.Beazley, Xylem; L.Herrera Estrada, Black & Veatch

**Session 50 Operation Optimizations: Predictions, CFD Modeling, and Training**

Thursday, May 14<sup>th</sup> 10:30 AM – 12:00 PM

Room 2104B

**Lead Facilitator**      Rachel Hanson, AECOM

**Assistant Facilitator** Shubha Oza, Brown and Caldwell

This session showcases how advanced modeling tools are shaping smarter wastewater treatment operations. From AI-driven influent flow forecasting to CFD-based optimization of BNR processes, presentations are paired with facilitated discussions to spark conversation and connect technology with practical application.

Interactive Session | Facilitated Discussion

- 10:30 AM**      **AI on Tap: Revolutionizing Influent Flow Forecasting with Ensemble Learning**  
Erin Amoueyan, Stantec
- 11:00 AM**      **Facilitated Discussion #1**
- 11:15 AM**      **Using CFD to Optimize the BNR Treatment Process**  
Carrie Knatz, CDM Smith  
CoAuthor(s): S.Reddy, CDM Smith; A.Doody, CDM Smith; R.Maal-Bared, CDM Smith
- 11:45 AM**      **Facilitated Discussion #2**

**Session 51 THP Process Optimization, GHG Reduction and Other Benefits**

Thursday, May 14<sup>th</sup> 10:30 AM – 12:00 PM

Room 2101

**Moderator**      Mark Lang

The session will describe the THP process and its benefits associated with anaerobic digestion. The presentations will describe ways to optimize the process and the effect it can have on the production of biogas the reduction of GHG along with while producing a more stable material.

Learning Objectives

At the end of this session, learners will be able to:

- 1) Describe the Thermal Hydrolysis Process (THP)benefits anaerobic digestion and improves performance.
- 2) Explain the Thermal Hydrolysis Process (THP)prior to anaerobic digestion impacts GHG Emissions.

- 10:30 AM**      **Enhancing Digester Performance: Pretreatment Approaches for Improved Volatile Solids Reduction and Biogas Enhancement**  
Jared Alder, SUEZ
- 11:00 AM**      **Full-Scale Thermal Hydrolysis Optimization: Impact on Refractory Organics and Anaerobic Digestion Robustness**  
Mathieu Haddad, SUEZ  
CoAuthor(s): C.Africano Avenda, SUEZ; P.Duque Diaz, CRITT-GPTE / TBI; X.Lefebvre, CRITT-GPTE / TBI; J.Garrigues, CNRS
- 11:30 AM**      **Biodrying of THP Cake: The Energy and GHG Reduction Story**  
Adrian Romero, Jacobs Solutions Inc.  
CoAuthor(s): Z.Alexander; J.A.Funk; E.Shen, Jacobs

## EXHIBITION SCHEDULE

### Located in Exhibit Hall A-B

Tuesday, May 12 – 10:00 AM – 6:30 PM

10:00 AM – 10: AM – Networking Break

12:00 PM – 1:30 PM – Networking Luncheon

3:00 PM – 3:30 PM – Networking Break

3:10 PM – 3:30 PM – Technology Spotlight I

5:00 PM – 6:30 PM – Networking Reception

Wednesday, May 13 – 10:00 AM – 3:30 PM

10:00 AM – 10:30 AM – Networking Break

10:10 AM – 10:30 AM – Technology Spotlight II

12:00 PM – 1:30 PM – Networking Luncheon

3:00 AM – 3:30 PM – Networking Break

3:10 PM – 3:30 PM – Technology Spotlight III

### TECHNOLOGY SPOTLIGHTS

The three exhibitors listed below will hold a 20-minute presentation at their exhibitor booths during the scheduled conference networking breaks. Participants are invited to attend at each of the times listed below.

#### **Technology Spotlight: LIFEGUARD Monitor Technology – Revolutionizing Odor Control Maintenance**

Tuesday, May 12<sup>th</sup> 3:10 – 3:30 PM | Booth 805

Dry scrubbing filtration media is the critical barrier for removing odor-causing compounds in municipal wastewater treatment, yet accurately determining its remaining life has long been a challenge. The LIFEGARD Media Bed Monitor introduces a groundbreaking approach, delivering predictive insight into adsorbent media performance through accurate, continuous monitoring. Traditional methods—scheduled changeouts, waiting for odor breakthrough, or sending samples for laboratory analysis—can be inefficient, time-consuming, and result in unnecessary operational costs. The LIFEGARD monitor combines MEMS sensor technology with a proprietary algorithm to forecast remaining media life in real time.

#### **Technology Spotlight: True-Life Efficiencies of Indirect Thermal Drying**

Wednesday, May 13<sup>th</sup> 10:10 AM – 10:30 AM | Booth 504

The speaker will present 6 months of data from operation of the first installed and operating Bio-Scru indirect thermal sludge dryer - incorporating third generation improvements to maximize drying efficiency and productivity.

**Technology Spotlight: SludgeVision - Real-time Polymer Optimization Using Computer Vision**

Wednesday, May 13<sup>th</sup> 3:10 - 3:30 PM | Booth 805

SludgeVision is an innovative, camera-based control platform developed by Cleanwater1 to optimize polymer dosing during sludge dewatering on belt presses. The system combines high-definition imaging, real-time computer vision algorithms, and industrial control integration to automate the feedback loop between sludge characteristics and polymer delivery—transforming what has traditionally been a visual, operator-driven process into a data-informed and automated control task.