

wef.org/ProcessEngineering

#WEFProcessEng

INNOVATIONS IN PROCESS ENGINEERING CONFERENCE

CONFERENCE PROGRAM

PRE-CONFERENCE WORKSHOPS

June 20

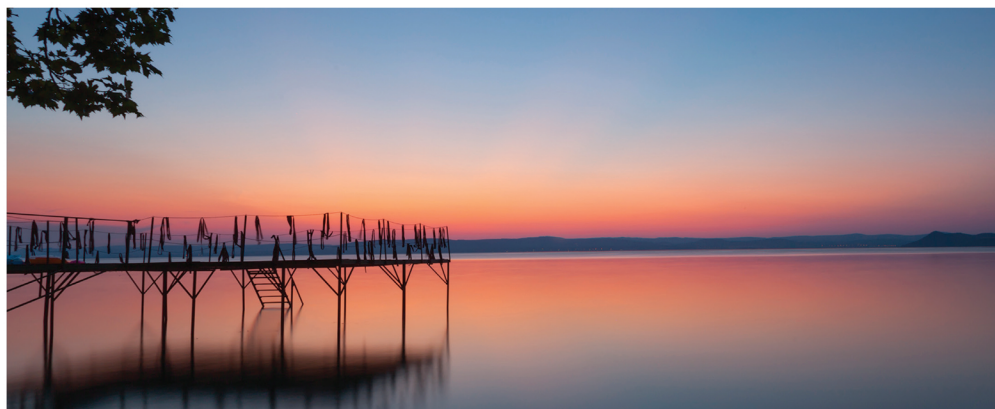
CONFERENCE
June 21–23

EXHIBITION
June 21–22

2022



*This conference is held by the Water Environment Federation and
in cooperation with the Florida Water Environment Association.*



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Innovations in Process Engineering 2022 Conference

June 20-23
Hyatt Regency Miami
Miami, Florida

#WEFProcessEng



*This conference is held by the Water Environment Federation in
cooperation with the Florida Water Environment Association.*

Dear Colleagues,

Welcome to Miami, Florida! The Water Environment Federation and The Florida Water Environment Association are honored to have you join us for the first in-person Innovations in Process Engineering Conference. On their behalf, we invite you to fully participate in this exceptional opportunity for education and collaboration!

WEF is committed to providing continuing learning and information transfer opportunities for our design, operations, and research communities. This conference series focuses on the most innovative emerging technologies in greater detail as a complement to WEFTEC. This conference therefore presents a unique opportunity to share ideas, which is critical for continued advancement, acceptance, and implementation of sustainable process strategies into practice, and identification of knowledge gaps and future needs in this crucial field.

Our Opening General Session will feature a panel bringing their perspectives on the next solutions in process engineering, and a keynote address by Frank Rogalla on innovations in resource recovery. From there, the following 20+ moderated sessions within the technical program features speakers from a wide variety of backgrounds including regulatory, research, design, implementation, and utility operations. These sessions are composed of 15-minute presentations, short technical briefings, and interactive facilitated discussions. Session topics include:

- Biological phosphorus removal;
- Biofilm processes and membrane aerated biofilms;
- Sidestream treatment;
- Process intensification;
- Carbon management;
- Thermal hydrolysis;
- Pyrolysis;
- Solids treatment;
- Sensor-based control and digital twins;
- Process modeling;
- Partial Denitrification/Anammox;
- Emerging contaminants;
- Potable water reuse;
- Hydrothermal liquefaction

We also invite you to join our Technology Spotlight Sessions on *Densification and Granulation*; *MABRs, Membranes and Biofilms*; *Sensors and Instrumentation*; and *Dewater and Thickening* which will prove to be an exchange of ideas between technology providers and end users on cutting-edge technologies.

We also feature several workshops for those who are able to participate on Monday: *Particles and Colloids: The Next Frontier in Intensifying Water Resource*

Recovery; Developing a Framework for Successful Implementations of Digital Twin for Process; Process Intensification -- Getting 10 gallons out of a 5-gallon bucket; and The Next Generation of Nutrient Recovery. The conference workshops are always popular and well attended, offering fantastic opportunities for meeting your peers and hearing current ideas for tackling the issues we as an industry face.

While you network with other attendees and presenters, we encourage the sharing of your experiences in these realms. This collaboration is a great opportunity to hear what others are doing, learn about new areas of research and practice, and maybe get an idea for a different approach that you hadn't thought of before. For these reasons, a facilitated discussion has been curated into each session.

We hope you enjoy this informative event and have many productive interactions.

Sincerely,

2022 IPE Conference Co-Chairs
Charles Bott, HRSD
Jeseth Delgado Vela, Howard University
Jose Jimenez, Brown and Caldwell
Blair Wisdom, Metro Water Recovery

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Section headers are color coded by **General Conference Information** (aqua), **Program** (yellow), and **Exhibition and Sponsors** (red).

CONFERENCE CO-CHAIRS



Charles Bott
Conference Co-chair
HRSD



Jeseth Delgado Vela
Conference Co-chair
Howard University



Jose Jimenez
Conference Co-chair
Brown and Caldwell



Blair Wisdom
Conference Co-chair
Metro Water Recovery

CONFERENCE COMMITTEES

CONFERENCE STEERING COMMITTEE

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City of Raleigh
Public Utilities

Lina Belia
Primodal

Raj Bhattacharai
Clean Water
Strategies

Jeanette Brown
Manhattan College

Gillian Burger
EnviroSim

Martha Dagnew
Western University

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One Water Solutions
LLC

Haydee De
Clippelier
DC Water

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deBarbadillo
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Stephanie Fevig
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Upendrakumar
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VandCenterSyd

Peter Vanrolleghem
Université Laval

Thor Young
GHD

CONFERENCE COMMITTEES

CONFERENCE PROGRAM COMMITTEE

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*Bassett Engineering,
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Somnath Basu
*Headworks
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Lucas Botero
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Metropolitan Council

Chris Bye
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Daniela Conidi
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HRSD

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Purdue University

Han Liping
*ExxonMobil
Engineering and
Research*

Emy Liu
*Iowa Department of
Natural Resources
Wastewater
Engineering Section*

CONFERENCE COMMITTEES

CONFERENCE PROGRAM COMMITTEE, continued

Yanjin Liu <i>American Water</i>	Tak Kai Pang <i>American Structurepoint</i>	Ajay Singh <i>Lystek</i>
Michael Liu <i>Sanitation Districts of Los Angeles county</i>	Erin Partlan <i>WRF</i>	Leslee Storlie <i>Metropolitan Council</i>
Michael Lynch <i>Arcadis</i>	Marija Peric <i>AECOM</i>	Drew Suesse <i>Madison Metropolitan Sewerage District</i>
Chris Maher <i>Clean Water Services</i>	Jeff Peters <i>Suez</i>	Nerea Uri Carreno <i>VandCenterSyd</i>
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Judith Moran <i>MWRDGC</i>	Clint Rogers <i>Stantec</i>	Qingzhong Wu <i>JHT Inc.</i>
Per Henrik Nielsen <i>VCS Denmark</i>	Bikram Sabherwal <i>Black & Veatch</i>	Fenghua Yang <i>MWRD Chicago</i>
Patrick O'Donnell <i>INVENT Environmental Technologies</i>	Valetta Saldanha <i>HDR</i>	Jie Zhang <i>Carollo</i>
Ali Oskouie <i>Illinois Institute of Technology</i>	Sherchan Samendra <i>Tulane University</i>	Renzhun Zhao <i>NC State</i>
	Sandeep Sathyamoorthy <i>Black & Veatch</i>	
	Robert Sharp <i>Manhattan College</i>	
	Rajesh Shenoy <i>previously Xylem</i>	

HEALTH AND WELL-BEING

WEF's priority at all meeting and events is always the health and safety of our community. Refer to this conference's website for the most current protocols posted under "Health and Well-Being": www.wef.org/ProcessEngineering

WEF SOCIAL MEDIA POLICY

WEF strongly encourages the use of social media to share your experiences at our event. This includes sharing interesting quotes or information, taking pictures with colleagues, and using the event hashtag: **#WEFProcessEng**. However, to protect intellectual property, videotaping, filming, or live-streaming of any workshop or technical session presentation, or exhibit booth is prohibited. Any participant violating this policy must relinquish the media and may be removed from the conference. Also, promotional or commercial use of photographs taken at WEFTEC and other WEF conferences is strictly prohibited. If you are interested in content, materials, or products, please consider talking to the speaker or exhibitor, who may provide the information or grant permission.

CODE OF CONDUCT

You agree to treat all individuals with respect and create a collegial, inclusive, and professional environment. You will value a diversity of views and opinions by communicating openly with respect for others. You shall not verbally abuse any individual. You shall not 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. 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.

This **WEF Events Code of Conduct** provides general guidelines and cannot cover every possible type of unacceptable behavior which is listed at <https://bit.ly/300USIA>

Additionally, if you are a WEF Member, you agree to uphold the **WEF Member Code of Conduct** while attending WEF Events and is available at <https://www.wef.org/about/about-wef/wef-policies/>.

Reporting Concerns

To report a Code of Conduct violation, you may email WEF Executive Director, Walter Marlowe at wmarlowe@wef.org or Chief Operating Officer, Kathleen Waugh at kwaugh@wef.org.

CONFERENCE SAFETY AND SECURITY

Hyatt Regency Miami

400 S, SE 2nd Ave

Miami, FL 33131

Main Phone: 305-358-1234 (available 24 hours)

In case of an emergency: dial 55 from any hotel phone and immediately report it.

If the matter is NOT an emergency, dial 0 from any hotel phone, ask to speak to the Security Manager on Duty, and report the matter accordingly.

REGISTRATION

All events are held in the Hyatt Regency Miami.

The Registration Desk is located in the Regency Corridor and will be open at the following times:

Monday, June 20	7:30 a.m. – 5:00 p.m.
Tuesday, June 21	7:30 a.m. – 5:00 p.m.
Wednesday, June 22	8:00 a.m. – 5:00 p.m.
Thursday, June 23	8:00 a.m. – 11:45 a.m.

PRESENTER AND FACILITATOR INFORMATION

All presenters, technical briefs, and facilitators should sign in at the conference Registration Desk and attend their assigned briefing.

Presenters participating Tuesday, Wednesday, and Thursday should attend their assigned briefing. Please attend only once unless speaking on multiple days. The Speaker Briefing and room schedule is as follows:

Tuesday, June 21 — Room Orchid AB	7:45 a.m. – 8:15 a.m.
*Sessions 1 through 9	
Wednesday, June 22 — Room Orchid AB	7:45 a.m. – 8:15 a.m.
*Sessions 10 through 27	

WEF PROCESS ENGINEERING MY SHOW PLANNER

New Online Planner Launching for #WEFProcessEng



WEF is pleased to offer the mobile-friendly online ***WEF Innovations in Process Engineering My Show Planner***.

View full program details, speakers, exhibitors, and sponsors.

Set up your My Show Planner account to begin saving your favorite sessions, speakers, exhibitors, and sponsors to your plan and receiving recommendations.

Scan the QR code to access the site, or visit <https://ipe22.mapyourshow.com>

COMMITTEE MEETINGS

Municipal Resource Recovery Design Committee

Tuesday, June 21, 2022 | 12:30 p.m. - 1:30 p.m.

Room: Orchid AB

Energy Management Task Force

Wednesday, June 22, 2022 | 12:15 p.m. - 1:15 p.m.

Room: Orchid AB

RECEPTIONS AND MEAL FUNCTIONS

Networking Luncheons

Lunch will be provided for all registered attendees on both full days of the Innovations in Process Engineering Conference. Use this opportunity to meet your fellow participants from across the country and abroad while enjoying a luncheon. The menu has been created with a variety of dietary preferences in mind, but please let staff know if you have specific restrictions.

Tuesday, June 21 and Wednesday, June 22

Exhibit Hall – Riverfront Hall

12:00 p.m. – 1:30 p.m.

Networking Reception

Join fellow Innovations in Process Engineering Conference attendees, presenters, exhibitors, and sponsors in the Exhibit Hall to network and relax while enjoying a complimentary beverage and light hors d'oeuvres.

Tuesday, June 21

Exhibit Hall – Riverfront Hall

5:00 p.m. – 6:15 p.m.

Networking Breaks will take place in the Exhibit Hall – Riverfront Hall at the following times:

Tuesday, June 21

10:00 a.m. – 10:45 a.m. and 3:00 p.m. – 3:45 p.m.

Wednesday, June 22

10:00 a.m. – 10:45 a.m. and 3:00 p.m. – 3:45 p.m.

Thursday, June 23 - Foyer outside session rooms

10:00 a.m. – 10:15 a.m.

CONTINUING EDUCATION

Continuing Education files will be available online following the conclusion of the conference.

You will be able to view your participation details and access your Continuing Education Credits for Technical Sessions online. Attendees will have daily access to their certificates and transcripts through an online portal for 1 year from the event date. After that time, CE documentation will be available through WEF's new CE Credit Archive site: <https://www.wef.org/resources/wef-ce-credit-archive>. These details will be posted on the conference homepage on WEF.org and emailed to event participants after the conference.

How Do I Receive Credit For this Conference?

In order to receive credit for participation in any of the technical sessions, you will be required to fill out a paper form indicating the time you entered and exited each session room. Forms should be initialed by either a Room Monitor, WEF Staff, or Facilitator for all technical sessions you attend. Credits obtained during this event will be available at the end of the conference using a link provided via email.

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.

When Will I Receive Credits For this Conference?

Certificates and transcripts will be available for download after the conference. ***WEF will send an email after the conference to inform each attendee where they can obtain these credits.*** Please keep in mind that most state licensing boards require the individual licensees to report continuing education credits.

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.

CONTINUING EDUCATION

Are WEF Continuing Education Credits Approved in My State?

WEF applies for approval in many states and 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. Several states typically accept WEF PDH and CEU credits as issued by WEF. For example: California (CWEA), Florida and New Jersey.

What Else Do I Need to Know?

WEF follows the International Association of Continuing Education and Training (IACET) guidelines along with state-specific regulations to achieve strict policies and procedures regarding its Continuing Education Program. 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.

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.

State Credit Calculations:

Each state has its own set of CE credit requirements. Some state licensing boards will accept CEUs for session under 3 hours in length. Some use different acronyms for training credits. In most instances 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 Contact Hour = 1 Hour of session time

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

**CEU & PDH credits are available for Workshops to Professional Engineers licensed in the state of New York (NYSED).*

For more information regarding WEF's Continuing Education Program, please visit www.wef.org/ProcessEngineering.

GET INVOLVED WITH WEF

The Water Environment Federation offers many ways to get engaged, build a network, and improve your skills as a water professional. See below for just a few examples.

Become a WEF Member

WEF is your access to water knowledge and invaluable networking opportunities with more than 30,000 professionals and thought leaders in water quality. For more information about membership categories, pricing, and member benefits, visit www.wef.org/membership/join-wef.

Join a WEF Committee

More than 2,500 WEF members participate in WEF committee activities, developing conference programs, writing technical manuals and books, developing training materials and program content, and many other WEF program activities. Committees include Research and Innovation, Municipal Resource Recovery Design, and more! To learn more about joining a committee, visit www.wef.org/committees. WEF membership is required to participate.

Submit to Water Environment Research

Published since 1928, Water Environment Research (WER) is an international multidisciplinary water resource management journal for the dissemination of fundamental and applied research in all scientific and technical areas related to water quality and resource recovery. In addition to original research articles, short communications, case studies, reviews, and perspectives are encouraged.

Continue your Education Online

In addition to in-person conferences, WEF also offers a variety of technical and leadership courses online. Through the WEF Learning Center, members and non-members can sign up to join webcasts, online courses, and virtual workshops. Visit <https://learn.wef.org> for more information. In addition, WEF also offers a blending learning program called the Water Leadership Institute which brings together water professionals from around the US, Canada, and world. Learn more at www.wef.org/wli.

Attend WEFTEC

WEFTEC is WEF's largest and most comprehensive conference, featuring dozens of technical sessions, a massive exhibit hall, and plenty of networking opportunities. WEFTEC 2022 will be held October 8-12, 2022 in New Orleans, Louisiana. More information can be found at www.weftec.org.

SPONSORS

We would like to thank the following sponsoring companies for their contributions to the conference and program.

For Company information, view Sponsors in the online planner:
<https://ipe22.mapyourshow.com>.



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LANYARDS

SESSIONS AT A GLANCE

Session Number	Session Title	Start Time	End Time	CE Credits
Monday, June 20				
Workshop A	Particles and Colloids: The Next Frontier in Intensifying Water Resource Recovery	8:30 a.m.	5:00 p.m.	0.6 CEUs
Workshop B	Developing a Framework for Successful Implementations of Digital Twin for Process Improvements	8:30 a.m.	5:00 p.m.	0.6 CEUs
Workshop C	Process Intensification – Getting 10 Gallons out of a 5-gallon Bucket	8:30 a.m.	12:00 p.m.	0.3 CEUs
Workshop D	The Next Generation of Nutrient Recovery	1:30 p.m.	5:00 p.m.	0.3 CEUs
Tuesday, June 21				
OGS	Opening General Session	8:30 a.m.	10:00 a.m.	1.5 PDHs
Session 01	Sidestream Bio-P	10:45 a.m.	12:00 p.m.	1.25 PDHs
Session 02	Do Membrane Aerated Biofilm Reactors have an Edge for Addressing Climate Change?	10:45 a.m.	12:00 p.m.	1.25 PDHs
Session 03	Ballasted Flocculation and Encapsulated Biomass	10:45 a.m.	12:00 p.m.	1.25 PDHs
Session 04	Innovations in Sidestream Treatment	1:30 p.m.	3:00 p.m.	1.5 PDHs
Session 05	Efficiency and Resource Recovery via Membranes and Biofilms	1:30 p.m.	3:00 p.m.	1.5 PDHs
Session 06	Innovations in Densification and Granulation	1:30 p.m.	3:00 p.m.	1.5 PDHs
Session 07	Nitrification: How Low Can DO Go?	3:45 p.m.	5:00 p.m.	1.25 PDHs
Session 08	Innovations in MABR/Membranes/Biofilms	3:45 p.m.	5:00 p.m.	1.25 PDHs
Session 09	There's Something about Densification	3:45 p.m.	5:00 p.m.	1.25 PDHs
Wednesday, June 22, a.m.				
Session 10	Carbon Management for BNR	8:30 a.m.	10:00 a.m.	1.5 PDHs
Session 11	Thermal Hydrolysis	8:30 a.m.	10:00 a.m.	1.5 PDHs
Session 12	Optimization Using Sensors and Control	8:30 a.m.	10:00 a.m.	1.5 PDHs
Session 13	Harnessing Internal Carbon Sources	10:45 a.m.	12:00 p.m.	1.25 PDHs
Session 14	Blazing Solids	10:45 a.m.	12:00 p.m.	1.25 PDHs
Session 15	Advances in Process Modeling	10:45 a.m.	12:00 p.m.	1.25 PDHs

SESSIONS AT A GLANCE

Session Number	Session Title	Start Time	End Time	CE Credits
Wednesday, June 22, p.m.				
Session 16	It's All About Carbon	1:30 p.m.	3:00 p.m.	1.5 PDHs
Session 17	Advances in Solids Treatment	1:30 p.m.	3:00 p.m.	1.5 PDHs
Session 18	Sensors to Data to Knowledge to Action	1:30 p.m.	3:00 p.m.	1.5 PDHs
Session 19	It's Not All About Carbon	3:45 p.m.	5:00 p.m.	1.25 PDHs
Session 20	Today's Alchemy Miracle: Hydrothermal Liquefaction Turns Sludge into Diesel and Jet Fuel	3:45 p.m.	5:00 p.m.	1.25 PDHs
Session 21	Innovations in Sensors and Instrumentation	3:45 p.m.	5:00 p.m.	1.25 PDHs
Thursday, June 23				
Session 22	PdNA: What's in it for me? Part 1	8:30 a.m.	10:00 a.m.	1.5 PDHs
Session 23	Treatment of Emerging Contaminants	8:30 a.m.	10:00 a.m.	1.5 PDHs
Session 24	<i>This session intentionally left blank.</i>			
Session 25	PdNA: What's in it for me? Part 2	10:15 a.m.	11:45 a.m.	1.5 PDHs
Session 26	Advanced Treatment in Potable Reuse	10:15 a.m.	11:45 a.m.	1.5 PDHs
Session 27	Innovations in Thickening and Dewatering	10:15 a.m.	11:45 a.m.	1.5 PDHs

PRE-CONFERENCE WORKSHOPS

(Additional fees required)

Workshop A: Particles and Colloids: The Next Frontier in Intensifying Water Resource Recovery

Monday, June 20, 2022

8:30 a.m. – 5:00 p.m.

0.6 CEUs

9:00 a.m. Welcome and Introduction from the Co-Chairs

Peter Vanrolleghem, Université Laval
Kendra Sveum, Loudoun Water
Jose Jimenez, Brown and Caldwell

9:15 a.m. The Role of Particles in the Design of WRRFs: A Historical Perspective

Art Umble, Stantec Consulting Services, Inc.

9:45 a.m. Facilitated Discussion

10:00 a.m. Networking Break

10:30 a.m. PARTICLE CHARACTERIZATION

Jose Jimenez, Brown and Caldwell

10:30 a.m. Grit Characterization

Queralta Plana, Peter Vanrolleghem, modelEAU –
Université Laval

11:00 a.m. Deciphering Differential Properties of Floccs and Granules

Belinda Sturm, The University of Kansas; Haydee De
Clippeleir, DC Water

11:30 a.m. Facilitated Discussion

Jose Jimenez, Brown and Caldwell

12:00 p.m. Lunch

1:30 p.m. PARTICLE SEPARATION

Charles Bott, HRSD

1:30 p.m. Continuous Flow Activated Sludge - Hydrocyclones

Rudy Maltos, Metro Water Recovery

2:00 p.m. Capture of Particles in Effluent Filtration Systems

Gary Hunter, Black and Veatch

2:30 p.m. Facilitated Discussion

Charles Bott, HRSD

3:00 p.m. Networking Break

Workshop A Agenda continues on next page...

PRE-CONFERENCE WORKSHOPS

(Additional fees required)

Workshop A Agenda continues from previous page...

- 3:30 p.m. PARTICLE MODELING**
Jim McQuarrie, Tetratex; Chris deBarbadillo, Black and Veatch
- 3:30 p.m. Physical Particle Behavior in Systems**
Wim Audenaert, AM-TEAM
- 4:00 p.m. Extending the Practical Benefit of Understanding Particles**
Alonso Griborio, Hazen
- 4:30 p.m. Facilitated Discussion**
Jim McQuarrie, Tetratex; Chris deBarbadillo, Black and Veatch
- 4:55 p.m. Workshop Moderator Wrap-Up and Highlights**
Peter Vanrolleghem, Kendra Sveum, Jose Jimenez
- 5:00 p.m. Workshop Adjourns**

PRE-CONFERENCE WORKSHOPS

(Additional fees required)

Workshop B: Developing a Framework for Successful Implementations of Digital Twin for Process Improvements

Monday, June 20, 2022

8:30 a.m. – 5:00 p.m.

0.6 CEUs

- 8:30 a.m. Welcome and Introduction to DTPIs and Definitions**
Tanush Wadhawan, Dynamita North America
- 9:15 a.m. Utility's Perspective on Importance of Implementing DTPIs**
Charles Bott, HRSD
- 9:30 a.m. Digital Twins Made Possible – A New Tool for the Integration of Data Analysis with Near Real-time Solution**
John Copp, Primodal
- 10:00 a.m. Networking Break**
- 10:30 a.m. Development of a Digital Twin Framework – A Process Control Perspective**
Pusker Regmi, Varun Srinivasan, Ahmed Al-Omari, Brown and Caldwell
- 11:00 a.m. Digital Twin Development, Implementation, and Results for the Changi WRP, Singapore**
Bruce Johnson, Jacobs
- 11:30 a.m. Consensus – Defining and Characterizing DTPIs Panel Discussion**
- 12:00 p.m. Lunch**
- 1:30 p.m. Digital Twins for Predicting Nitrifier Populations and Kinetics**
Jeff Sparks, HRSD
- 2:00 p.m. Maximizing Data Value through Operations Support Tools**
Joe Rohrbacher, Alyssa Mayer, Katya Bilyk, Hazen and Sawyer
- 2:30 p.m. Framework – Decision Tree for Utilities and Engineers Panel Discussion**
- 3:00 p.m. Networking Break**

Workshop B Agenda continues on next page...

PRE-CONFERENCE WORKSHOPS

(Additional fees required)

Workshop B Agenda continues from previous page...

- 3:30 p.m. Performance Twin for Water Utilities – Integrating Equipment and Process Monitoring for Improved Performance**
Simon Baker, Charlie Chen, AECOM
- 3:45 p.m. The Whole is Greater than the Sum of the Digital Parts: Combining Process Simulations with AI to Overcome Model Limitations**
Leon Downing, Brian Shoener, Black and Veatch
- 4:00 p.m. Integrating DTPIs with Urban Watershed Management**
Sudhir Muthy, NEWHub
- 4:15 p.m. Limitations and Gaps to Be Filled Panel Discussion**
- 4:45 p.m. Closing Summary**
- 5:00 p.m. Workshop Adjourns**

PRE-CONFERENCE WORKSHOPS

(Additional fees required)

Workshop C: Process Intensification – Getting 10 Gallons out of a 5-Gallon Bucket

Monday, June 20, 2022

8:30 a.m. – 12:00 p.m.

0.3 CEUs

8:30 a.m. Introduction to RIC/RISE

8:40 a.m. Advanced Primary Treatment

8:40 a.m. Introduction

Tanja Rauch Williams, Carollo

8:50 a.m. Consultant Perspective

Onder Caliskaner, Caliskaner Water Technologies, Inc.

9:10 a.m. Technology Provider Perspective

Sudhir Murthy, NEWhub Corp on behalf of ARA Consult

9:20 a.m. Q&A/Facilitated Discussion

9:40 a.m. Biological Processes

9:40 a.m. Introduction

Sudhir Murthy, NEWhub Corp

9:50 a.m. Utility Perspective

Blair Wisdom, Metro Water Recovery

10:00 a.m. Networking Break

10:20 a.m. Technology Provider Perspective

Jeff Peeters, Suez

10:30 a.m. Technology Provider Perspective

Ajay Nair, Microvi

10:40 a.m. Academic Perspective

Kahao Lim, Kansas State University

10:50 a.m. Q&A /Facilitated Discussion

Workshop C Agenda continues on next page...

PRE-CONFERENCE WORKSHOPS

(Additional fees required)

Workshop C Agenda continues from previous page...

11:10 a.m. Intensifying Anaerobic Digestion

11:10 a.m. Introduction

Belinda Sturm, University of Kansas

11:20 a.m. Utility Perspective

Per Henrik Nielsen, VCS Denmark

11:30 a.m. Technology Provider Perspective

Eugenio Giraldo, NuOrganics LLC

11:40 a.m. Academic Perspective

Berrin Tansel, Florida International University

11:50 a.m. Q&A / Facilitated Discussion

12:00 p.m. Workshop Adjourns

PRE-CONFERENCE WORKSHOPS

(Additional fees required)

Workshop D: The Next Generation of Nutrient Recovery

Monday, June 20, 2022

1:30 p.m. – 5:00 p.m.

0.3 CEUs

- | | |
|------------------|--|
| 1:30 p.m. | Introduction and State of Challenges for Next Generation Nutrient Recovery
Ron Latimer, Hazen and Sawyer |
| 1:50 p.m. | MWR Experience with MagPrex at Full-scale
Blair Wisdom, Metro Water Recovery |
| 2:15 p.m. | GCDWR Experience with Full-Scale WASSTRIP + Pearl
Gayathri Ram Mohan, Gwinnett County Department of Water Resources |
| 2:40 p.m. | Q&A |
| 3:00 p.m. | Networking Break |
| 3:30 p.m. | Pima County Experience with Full-Scale Nuresys
Jeff Prevatt, Pima County Regional |
| 3:55 p.m. | HRSD Experience with Re-Rating Pearl Reactors and Alternative Mg Sources
Sydney Goy, Matthew Allen Poe, HRSD |
| 4:20 p.m. | Insights into Struvite Precipitation Kinetics and Takeaways for Full-Scale Operation
Roland Cusick, University of Illinois |
| 4:45 p.m. | Q&A |
| 5:00 p.m. | Workshop adjourns |

OPENING GENERAL SESSION

Opening General Session

Tuesday, June 21, 2022

8:30 a.m. – 10:00 a.m.

Room: Tuttle/Monroe

1.5 PDHs

- 8:30 a.m. Welcome and Facilitator Introduction**
Beverley Stinson, AECOM
- 8:35 a.m. WEF Welcome**
Ifetayo Venner, Arcadis, WEF Board of Trustees
- 8:40 a.m. Conference Co-Chair Panel: Integrating Perspectives on Challenges and Opportunities – What are the Next Solutions?**
Charles Bott, HRSD
Jeseth Delgado Vela, Howard University
Jose Jimenez, Brown and Caldwell
Blair Wisdom, Metro Water Recovery
- 9:15 a.m. The Black, the White, the Green – The Purple and Yellow... Shifting from Wastewater to Resource Recovery**
Frank Rogalla, Aqualia
- 9:45 a.m. Facilitated Q&A**
- 10:00 a.m. Session Adjourns for Networking Break in Exhibition Hall**

Sponsored by: *INVENT Environmental Technologies*

TECHNICAL SESSIONS

Session 01: Sidestream Bio-P

Tuesday, June 21, 2022

10:45 a.m. - 12:00 p.m.

Room: Tuttle

1.25 PDHs

Facilitators: Matt Seib, Madison Metropolitan Sewerage District; Anndee Huff Chester, Brown and Caldwell

10:45 a.m. Recent Developments in Bio-P
Peter Schauer, Clean Water Services

11:00 a.m. Exploring the Carbon Balance in a Sidestream Enhanced Biological Phosphorus Removal (S2EBPR) Demonstration Facility
Leon Downing, James Barnard, Patrick Dunlap, Eric Redmond, Lucas Botero Black & Veatch

11:15 a.m. Re-calibrating our approach of modeling EBPR and S2EBPR processes
Mark Miller, Varun Srinivasan, Jose Jimenez, Brown & Caldwell; Adam Klein; Jacqueline Jarrell, Charlotte Water; Peter Dold; James Barnard, Black & Veatch

11:30 a.m. Facilitated Discussion

12:00 p.m. Session adjourns for lunch in exhibit hall

TECHNICAL SESSIONS

Session 02: Do Membrane Aerated Biofilm Reactors have an Edge for Addressing Climate Change?

Tuesday, June 21, 2022

Room: Flagler

10:45 a.m. - 12:00 p.m.

1.25 PDHs

Facilitator: Martha Dagnew, Western University

10:45 a.m. Process Intensification & GHG Emissions Reduction — Can they Coexist?

Jeff Peeters, GE Water & Process Technologies; Wayne Bagg, Water Corporation; Sylvain Donnaz, Nadine Oschmann, SUEZ Water Technologies & Solutions; Matt Reeve; Andrew Shaw, Black & Veatch; Isabel Telles Silveira

11:00 a.m. Nitrogen Removal and Nitrous Oxide Emissions from MABR Technology: Experiences from the Ejby Mølle WRRF

Nerea Uri Carreño, Per Nielsen, VCS Denmark; Krist Gernaey, Danish Technical University; Xavier Flores-Alsina

11:15 a.m. Membrane Aerated Biofilm Reactor Enables Low-SRT Nitrification and Improves Sludge Settleability: a long-term experimental study

Amit Kaldate, Giuseppe Guglielmi, Suez Water Technologies & Solutions; Santofabio Corsino, Michele Torregrossa, University of Palermo; Moreno Di Pofi, Matt Reeve, Suez Water Technologies & Solutions

11:30 a.m. Technical Brief: Ten Months of Results from a Full Scale MABR Sidestream Treatment System

Gilad Yogev, Lotan Dagai, Neri Nathan, Ronen Shechter, Yuval Nevo, Fluence

11:35 a.m. Facilitated Discussion

12:00 p.m. Session adjourns for lunch in exhibit hall

TECHNICAL SESSIONS

Session 03: Ballasted Flocculation and Encapsulated Biomass
Tuesday, June 21, 2022
10:45 a.m. - 12:00 p.m.

Room: Brickell
1.25 PDHs

Facilitator: Tom Johnson, Jacobs

10:45 a.m. Biological and Physical Selectors for the Formation and Retention of Mobile Biofilms, Densified-biological Flocs, and Aerobic Granules in Continuous-flow Wastewater Treatment Processes
Joshua Boltz, Bruce Rittmann, Arizona State University; Glen Daigger, One Water Solutions, LLC

11:00 a.m. Comparison of Ballasted Activated Sludge Technologies
Thor Young, Tom Biagioli, Coenraad Pretorius, GHD

11:15 a.m. Advancements in Process Intensification: Utilizing biocatalysts to increase the population of beneficial microorganisms within biological treatment processes
Ajay Nair; Nikolaus Hlavacek; Vedansh Gupta; Fatemeh Shirazi; Ameen Razavi, Microvi Biotech Inc.

11:30 a.m. Facilitated Discussion

12:00 p.m. Session adjourns for lunch in exhibit hall

TECHNICAL SESSIONS

Session 04: Innovations in Sidestream Treatment

Tuesday, June 21, 2022

Room: Tuttle

1:30 p.m. - 3:00 p.m.

1.5 PDHs

Facilitators: Murthy Kasi, Smith and Loveless; Raj Chavan, Atkins; Sirwan Alimoradi; WSP Technologies

1:30 p.m. Full Scale Pilot of a Novel Struvite Precipitation System at the Provo WRP

Eric Auerbach, Mike Broyles, Arcadis; Mudit Gangal, SUEZ - Water Technologies & Solutions; Shellie Turnbow, Matt Kessler, City of Provo Utilities; James Goldhardt, Coombs Hopkins; Matthew Militello,

1:45 p.m. Commissioning the First Full-Scale Digester Filtrate (Sidestream) Ammonia Removal Process in the West Coast Using Microvi MNE Technology

Michael Falk, HDR Inc; Felipe Cartin Munoz; Nikolaus Hlavacek; Allyson Lutz; Ali Dorri; Ajay Nair; Ameen Razavi, Microvi Biotech Inc.

2:00 p.m. Determining Inhibition Coefficients and Studying Gene Expressions for Sulfide, Nitrite, and Recalcitrant Carbon Toxicity for Better Design of Anammox Process

Soklida Hong, University of Utah; Haydee De Clippeleir, DC Water; Ramesh Goel

2:15 p.m. Reducing Overall Plant Loading by using Algae to Treat Centrate, in Sioux City, IA

Martin Gross, Max Gangestad, Jens Dancer, Gross-Wen Technologies

2:30 p.m. Technical Brief: Post Aerobic Digestion (PAD) for Ammonia Removal: Lessons Learned from Full and Bench Scale Studies

Eric Redmond, Black & Veatch; Fabrizio Sabba; Leon Downing, Black & Veatch; Patrick McNamara; Caitlin Ruff

2:35 p.m. Facilitated Discussion

3:00 p.m. Session adjourns for networking break

TECHNICAL SESSIONS

Session 05: Efficiency and Resource Recovery via Membranes and Biofilms

Tuesday, June 21, 2022

Room: Flagler

1:30 p.m. - 3:00 p.m.

1.5 PDHs

Facilitator: Leon Downing, Black & Veatch

1:30 p.m. Why does Proper Simulation Matter in the Acronym Soup of Biofilm Systems? AGS, IFAS, MBBR
Bruce Johnson, Jacobs

1:45 p.m. An Evaluation of the Reported vs Effective Surface Area to Volume Ratios of Plastic Media Carriers
Megan Bachmann, Stephanie Klaus, Justin Macmanus, Michael Parsons, HRSD; Haydee De Clippeleir, DC Water; Charles Bott, HRSD

2:00 p.m. Anaerobic Biofilm Membrane Bioreactor for Wastewater Treatment
Joshua Boltz, Bruce Rittmann, Robert Stirling, Arizona State University; Brian Roman, University of Washington; Yuhang Cai, Harbin University

2:15 p.m. Potential of Using Hydrophobic Deep Eutectic Solvents as a Low Energy Extractant for Anhydrous Volatile Fatty Acid Recovery from Arrested Anaerobic Digesters for Easy Downstream Conversion and Utilization
Xueyao Zhang, Virginia Tech; Yuxuan Zhang, University of Kentucky; Weihua Qing, New Jersey Institute of Technology; Jian Shi, University of Kentucky; Wen Zhang, New Jersey Institute of Technology; Zhiwu Wang

2:30 p.m. Facilitated Discussion

3:00 p.m. Session adjourns for networking break

TECHNICAL SESSIONS

Session 06: Innovations in Densification and Granulation

Tuesday, June 21, 2022

Room: Brickell

1:30 p.m. - 3:00 p.m.

1.5 PDHs

Facilitators: Chris deBarbadillo, Black & Veatch; Thor Young, GHD

This is a Technology Spotlight session. Format of this session will include quick, in-depth reviews on various technologies, presented by technical experts and utility representatives. Facilitated discussion with audience participation will follow in the remaining time at the end of the session, with additional time during breaks to continue those conversations.

1:30 p.m. Technology Reviews

- ❖ **Quantifying the Impacts of Magnetite Ballast on Solids Flux and Secondary Clarifier**
Casey Whittier, Evoqua
- ❖ **Mobile-Organic Biofilm (MOB): A Process for Wastewater Treatment**
Jason Calhoun, Nuvoda; Joshua P. Boltz, Woodard & Curran
- ❖ **Global Developments in Aerobic Granular Sludge Implementation**
Terry Reid, Aqua-Aerobic Systems, Inc.
- ❖ **Densified Biomass without the Fuss**
Chandler Johnson, World Water Works

2:30 p.m. Facilitated Discussion

3:00 p.m. Session adjourns for networking break

TECHNICAL SESSIONS

Session 07: Nitrification: How Low Can DO Go?

Tuesday, June 21, 2022

Room: Tuttle

3:45 p.m. - 5:00 p.m.

1.25 PDHs

Facilitators: Nerea Uri Carreño, VCS Denmark; Jose Jimenez, Brown and Caldwell

3:45 p.m. Facilitator Introduction

3:50 p.m. Low DO Biological Nutrient Removal – Biokinetics and Applicability

Jose Jimenez, Brown and Caldwell

4:00 p.m. When Less is More (GHGs): Comparing the Carbon Impact of Common Nitrogen Treatment Processes using ASM2d Models Demonstrates Surprising Tradeoff for Low-DO Processes

Jon Liberzon, Tomorrow Water; Kwangtae You, UnU Inc.; David Rhu, Tomorrow Water; Jongrack Kim, Gijung Pak, Gahee Rhee, UnU Inc.

4:15 p.m. Kinetic Parameterization of Nitrifiers Adapting to Low DO

Tyler Kisling, Kyle Malin, Kester McCullough, HRSD; Tanja Rauch-Williams, Carollo Engineers; Stephanie Klaus, Christopher Wilson, Charles Bott, HRSD

4:30 p.m. Facilitated Discussion

5:00 p.m. Session adjourns for reception in exhibit hall

TECHNICAL SESSIONS

Session 08: Innovations in MABR/Membranes/Biofilms

Tuesday, June 21, 2022

3:45 p.m. - 5:00 p.m.

Room: Flagler

1.25 PDHs

Facilitators: Stephanie Klaus, HRSD; Isaac Avila, Black & Veatch

This is a Technology Spotlight session. Format of this session will include quick, in-depth reviews on various technologies, presented by technical experts and utility representatives. Facilitated discussion with audience participation will follow in the remaining time at the end of the session, with additional time during breaks to continue those conversations.

3:45 p.m.

Technology Reviews

❖ **Amphibio Technologies**

Francisco Valdes

❖ **Gross-Wen**

Jens Dancer

❖ **Veolia**

Brad Mrdjenovich

❖ **Suez**

Jeff Peeters

❖ **PERC Water**

Nick Griswold

❖ **Innovatreat**

Jeff Danner

4:35 p.m.

Facilitated Discussion

5:00 p.m.

Session adjourns for reception in exhibit hall

TECHNICAL SESSIONS

Session 09: There's Something about Densification

Tuesday, June 21, 2022

3:45 p.m. - 5:00 p.m.

Room: Brickell

1.25 PDHs

Facilitators: Thor Young, GHD; Belinda Sturm, University of Kansas

3:45 p.m. Technical Brief: Continuous Flow Sludge Densification: Biological and Physical Selection Strategies and Carbon Dynamics

Jose Jimenez, Pusker Regmi, Brown and Caldwell; Belinda Sturm, University of Kansas; Joshua Boltz, Arizona State University

3:50 p.m. Coupling a Continuous Upflow Selector with Feast/Famine Selection for a Smooth Startup of Continuous Flow Aerobic Granulation Reactors without Performance Interruption

Zhaohui An, Yewei Sun, Virginia Tech

4:05 p.m. Combining Metabolic, Kinetic and Physical Selection to Achieve Full-Scale Continuous Flow Densification of Activated Sludge at Robert W. Hite Treatment Facility

Blair Wisdom, Isaac Avila, Rudy Maltos, Metro Water Recovery; Ron Latimer, Alonso Griborio, Will Martin, Wendell Khunjar, Hazen & Sawyer

4:20 p.m. Successful Full-Scale Continuous Flow Densification of Activated Sludge at Crooked Creek Water Reclamation Facility Without Physical Selection

Ron Latimer, Hazen and Sawyer

4:35 p.m. Facilitated Discussion

5:00 p.m. Session adjourns for reception in exhibit hall

TECHNICAL SESSIONS

Session 10: Carbon Management for BNR

Wednesday, June 22, 2022

8:30 a.m. - 10:00 a.m.

Room: Monroe

1.5 PDHs

Facilitators: Pusker Regmi, Brown and Caldwell; Rudy Maltos, Metro Water Recovery

8:30 a.m. Metro Water Recovery's Journey of Carbon Management
Rudy Maltos, Metro Water Recovery

8:45 a.m. Integrating Partial Denitrification (PD), Enhanced Biological Phosphorus Removal (EBPR) and Anammox in a Single Stage Process Bioreactor
Soklida Hong, University of Utah; Mari Winkler, University of Washington; Zhiwu Wang, Virginia Tech; Ramesh Goel

9:00 a.m. In-Tank Carbon Generation As a Primary Benefit of RAS and MLSS Fermentation for Stabilizing Biological Phosphorus Removal Performance
David Wankmuller, Damon Forney, Wendell Khunjar, Hazen & Sawyer; Jimmy Pridgen, City of Wilson

9:15 a.m. Compressed Gas Mixing and Inline Fermentation Enhances Biological Phosphorus Removal
John Koch, Enviro Mix, Inc.

9:30 a.m. Facilitated Discussion

10:00 a.m. Session adjourns for networking break

TECHNICAL SESSIONS

Session 11: Thermal Hydrolysis

Wednesday, June 22, 2022

8:30 a.m. - 10:00 a.m.

Room: Flagler

1.5 PDHs

Facilitators: Erika Bailey, Raleigh Water; Chris deBarbadillo, Black & Veatch

8:30 a.m. THP as a Biosolids Solution – Implementation Status and Continued Opportunities to Build on Knowledge Gained
Erika Bailey, Raleigh Water; Chris deBarbadillo, Black & Veatch

8:45 a.m. Reducing Retention Time and Cost of Anaerobic Digestion Using Thermal Hydrolysis & Experiences and Lessons Learnt from Food and Organic Co-Digestion with Thermal Hydrolysis
William Barber, Cambi; Matthew Higgins, Bucknell University

9:00 a.m. Application of Thermal Hydrolysis to Intensify Methane Production in Anaerobic Co-Digestion of Biosolids and Grease Interceptor Waste
Francis De Los Reyes, Seraphim Falterman, NC State University; Erika Bailey, City of Raleigh

9:15 a.m. Evaluating Factors Impacting Hydrothermal Hydrolysis of Sludge Prior to Fermentation and Anaerobic Digestion
Farokh Laqa Kakar, Steven N. Liss, Elsayed Elbeshbishy, Ryerson University

9:30 a.m. Facilitated Discussion

10:00 a.m. Session adjourns for networking break

TECHNICAL SESSIONS

Session 12: Optimization Using Sensors and Control

Wednesday, June 22, 2022

8:30 a.m. - 10:00 a.m.

Room: Brickell

1.5 PDHs

Facilitator: Kate Newhart, West Point

8:30 a.m. Development of Total Solids Prediction Using Passive Acoustic Sensors

Han Nguyen, Haydee De Clippeleir, Ryu Suzuki, Nicholas Passerelli, Aklile Tesfaye, Elkin Hernandez, DC Water; Arash Massoudieh, Catholic University of America

8:45 a.m. Addressing Nutrient Sensor Cost, Reliability, and Performance at HRSD

Arba Williamson, Joshua Walker, HRSD

9:00 a.m. Bringing Aeration Control into the 21st Century

Dale de Kretser, Coenraad Pretorius, GHD

9:15 a.m. How to Right-size Your Blowers to Realize Expected Savings

Coenraad Pretorius, Dale de Kretser, GHD

9:30 a.m. Facilitated Discussion

10:00 a.m. Session adjourns for networking break

TECHNICAL SESSIONS

Session 13: Harnessing Internal Carbon Sources

Wednesday, June 22, 2022

Room: Monroe

10:45 a.m. - 12:00 p.m.

1.25 PDHs

Facilitators: Ali Gagnon, HRSD; Erik Coats, University of Idaho

10:45 a.m. Post-anoxic Denitrification Driven by Biological Phosphorus Removal Carbon Storage Reserves – SBR and Continuous Flow Performance
Erik Coats, University of Idaho

11:00 a.m. Demonstration of SND, Post Denitrification with Internally Stored Carbon and Anammox Potential at a Mainstream Full-Scale BNR Facility
Pusker Regmi, Brown and Caldwell; Marty Johnson, WSSC Water; Caroline Nguyen; Ahmed Al-Omari; George Wells, Northwestern University Library; Brad Yeakle, Washington Suburban Sanitary Commission

11:15 a.m. Kinetics, Biofilm Profile and Microbial Composition of a Fixed Rope Partial Denitrifying Reactor: Case for External vs. Internal Carbon Sources
Lin Sun, Western University; Wudneh Shewa, Bishop Water Tec; Christine Gan; Kevin Bossy; Martha Dagnew, Western University

11:30 a.m. Technical Brief: Investigating the Use of Internally Stored Carbon in Post-Anoxic Denitrification
Kayla Bauhs, Brown and Caldwell; Alexandria Gagnon, Charles Bott, HRSD

11:35 a.m. Facilitated Discussion

12:00 p.m. Session adjourns for lunch in exhibit hall

TECHNICAL SESSIONS

Session 14: Blazing Solids

Wednesday, June 22, 2022

10:45 a.m. - 12:00 p.m.

Room: Flagler

1.25 PDHs

Facilitators: Jeanette Brown, Manhattan College; Raj Bhattarai, Clean Water Strategies

10:45 a.m. Could Thermal Processing be the Answer? Fundamentals of Pyrolysis, Gasification, and Incineration

Stanley Chilson, CET-GHD; Charles Winslow, GHD

11:00 a.m. Decarbonization Using Pyrolysis - A Burning Question

Per Nielsen, Niels Askjær, VCS Denmark

11:15 a.m. Full Scale Pyrolysis for Biosolids: Reducing Contaminants and Closing The Loop

Valentino Villa, Elizabeth Bridges, Garrett Benisch, Bioforcetech; Rob Kershner, Kershner Environmental Technologies, LLC

11:30 a.m. Facilitated Discussion

12:00 p.m. Session adjourns for lunch in exhibit hall

TECHNICAL SESSIONS

Session 15: Advances in Process Modeling

Wednesday, June 22, 2022

10:45 a.m. - 12:00 p.m.

Room: Brickell

1.25 PDHs

Facilitator: Wim Audenaert, AM-Team

10:45 a.m. Application and Field Verification of CFD Modeling for Clarifier Optimization

Alonso Griborio, Hazen & Sawyer

11:00 a.m. Virtual Piloting and Development of a Digital Twin of a Novel Membrane Bioreactor Technology

Miguel Daza, AM-Team; Naoya Tamura, Maezawa Industries Inc.; Katsuki Kimura, Hokkaido University; Wim Audenaert, AM-Team; Usman Rehman

11:15 a.m. One and the Same: Linking Collection System and Resource Recovery Facilities through Sewer Process Models

Adrian Romero, Jacobs; Mark Holstad, Albuquerque Bernalillo County Water Utility Authority; Matthew Ward, The WATS Guys; Jes Vollertsen, Aalborg University; Tom Johnson, Jacobs

11:30 a.m. Technical Brief: Performance Assessment of a Full-Scale Disinfection Unit of a WWTP Using CFD Modelling

Cesare Piacuzzi, Giacomo Bellandi, Alejandro Claro Barreto, Wim Audenaert, AM-Team; Roberta Muoio; Roberto Di Cosmo, Davide Scaglione, Gruppo CAP; Usman Rehman,

11:35 a.m. Facilitated Discussion

12:00 p.m. Session adjourns for lunch in exhibit hall

TECHNICAL SESSIONS

Session 16: It's All About Carbon

Wednesday, June 22, 2022

1:30 p.m. - 3:00 p.m.

Room: Monroe

1.5 PDHs

Facilitator: Mark Miller, Brown and Caldwell

1:30 p.m. Impacts of Advanced Primary Treatment Technologies on Performance of Water Resource Recovery Facilities

Under Caliskaner, Caliskaner Water Technologies; Lilly Imani; George Tchobanoglous; Yihan Zhang, University of California Davis; Brian Davis, Linda County Water District

1:45 p.m. A Swiss-Army Knife Approach: Application of High-Rate Contact Stabilization at Blue Plains

Maryam Sabur, Nam Ngo, DC Water; Margaret Anderson, Northwestern University; Bernhard Wett; Charles Bott, HRSD; Arash Massoudieh, Catholic University of America; Aklile Tesfaye, DC Water

2:00 p.m. Converting Rectangular and Circular Primary Tanks into the AAA Biologically Enhanced Settler

Sudhir Murthy, NEWhub Corp; Bernhard Wett

2:15 p.m. Enhanced Primary Treatment for Carbon Redirection to Meet Utility's Long Term Sustainability Goal

Bikram Sabherwal, Leon Downing, Black & Veatch; Brian Shoener, University of Illinois At Urbana-Champaign

2:30 p.m. Facilitated Discussion

3:00 p.m. Session adjourns for networking break

TECHNICAL SESSIONS

Session 17: Advances in Solids Treatment

Wednesday, June 22, 2022

1:30 p.m. - 3:00 p.m.

Room: Flagler

1.5 PDHs

Facilitators: Blair Wisdom, Metro Water Recovery; Chris Wilson, HRSD

1:30 p.m. Biogas Harvester Recovers Dissolved Biogas for Energy Production, GHG Reduction, and H₂S Collection

John Willis, Brown and Caldwell; Ashwin Dhanasekar, The Water Research Foundation; Robert Fergen, Miami Dade County Florida; Debbie Griner; Melissa Jauregui; Fabian Rangel-Rojas, Brown and Caldwell

1:45 p.m. Biosolids the Hidden Treasure: Current and Future Trends in Biosolids Resource Recovery Technological and Market Maturity

Raj Chavan, Ross Wilson, Richard Lancaster, Esme Piechoczek, Andrew Thompson, Atkins; Garry Strange, Thames Water, UK; Sarah-Jane Westlake, Atkins

2:00 p.m. A Method for Determining When an Anaerobic Digester Needs Mixing

Coenraad Pretorius, David Solley, GHD; Duncan Taylor; Laura Roff

2:15 p.m. Performance and Lessons Learned for Digestion with Recuperative Thickening and High Solids Mixing

Daniel Chien, Rick Chan, Rashi Gupta, Carollo Engineers; Nicholas Talbot; Brian Schumacker; Manuel Santos

2:30 p.m. Facilitated Discussion

3:00 p.m. Session adjourns for networking break

TECHNICAL SESSIONS

Session 18: Sensors to Data to Knowledge to Action

Wednesday, June 22, 2022

1:30 p.m. - 3:00 p.m.

Room: Brickell

1.5 PDHs

Facilitators: Peter Vanrolleghem, Université Laval

- 1:30 p.m. Using Data-Driven Models To Answer Operator's Questions About Their WRFs, And Future Applicability Of Data-Driven Modeling To The Water Industry**
Katya Bilyk, Javad Roostaei, Wendell Khunjar, Hazen & Sawyer; Ankit Pathak
- 1:45 p.m. It's OK to be a Control Freak: Deploying machine learning algorithms and model-based controllers for WRRF optimization**
Jeffrey Sparks, HRSD; Tanush Wadhawan, North Dakota State University; Peter Vanrolleghem, Modeleau Université Laval; Charles Bott, HRSD
- 2:00 p.m. Defining Resilience under Wet Weather Events Using Long-Term Sensor-Based Performance Data**
Isaac Musaaazi, Howard University; Lauren Stadler, Rice University; Jeseth Delgado Vela, Howard University; Moriah Brown; Dylan Christenson, Texas Tech University Health Sciences Center; Priyanka Ali; Lu Liu, Iowa State University
- 2:15 p.m. Mantis.AI - a Digital Twin for Forecasting and Optimizing Future Plant Performance in Real-Time**
Jacob Barclay, Hatch; Nick Piccolo; Rajeev Goel, Spencer Snowling, Hydromantis ESS, Inc.; Houssam Eljerdi, Pima County Regional
- 2:30 p.m. Technical Brief: Third Party Validation of Artificial Intelligence for Water Reclamation and Reuse**
Kyle Thompson; Andrew Salvesson, Carollo Engineers; Yasuhiro Matsui, Mika Kawata, Yokogawa Electric Corporation; Kevin Hardy, Encina Wastewater Authority; Amos Branch; Jason Assouline, Carollo
- 2:35 p.m. Facilitated Discussion**
- 3:00 p.m. Session adjourns for networking break**

TECHNICAL SESSIONS

Session 19: It's Not All About Carbon

Wednesday, June 22, 2022

3:45 p.m. - 5:00 p.m.

Room: Monroe

1.5 PDHs

Facilitators: Jeseth Delgado Vela, Howard University; Monica Oristian, Alexandria Renew

3:45 p.m. Unexpected Journey in Tertiary NDN: Challenges, Solutions, and Opportunities
Michael Liu, LA County Sanitation District; Paul Pitt; Artin Laleian; Rachel Deco, Eric Krikorian, LA County Sanitation District; Joyce Lehman, Metropolitan Water District of Southern California

4:00 p.m. Mitigating Volatile Sulfur Compound Emission from Primary and Secondary Activated Sludge Systems Using New Low-Cost Operational Strategies
Nam Ngo, DC Water; Margaret Anderson, Northwestern University; William Albright, Chris J. Reilly, DC Water; Arash Massoudieh, Catholic University of America; Nicholas Passarelli, Ryu Suzuki, DC Water

4:15 p.m. Zeolite Incorporated Technologies for Enhancing Shortcut Nitrogen Removal Processes in Mainstream Wastewater Treatment
Anndee Chester, University of Minnesota

4:30 p.m. Technical Brief: Impact of Seawater Infiltration on Biological Phosphorus Removal, Chlorine-Based Disinfection, and Settling
Alexandria Gagnon, Charles Bott, HRSD; Tanush Wadhawan, North Dakota State University

4:35 p.m. Facilitated Discussion

5:00 p.m. Session adjourns

TECHNICAL SESSIONS

**Session 20: Today's Alchemy Miracle: Hydrothermal Liquefaction
Turns Sludge into Diesel and Jet Fuel**

Wednesday, June 22, 2022

3:45 p.m. - 5:00 p.m.

Room: Flagler

1.25 PDHs

Facilitator: John Willis, Brown and Caldwell

Presenters: Michael Thorson, Pacific Northwest National Laboratory; David
Blair, Metro Vancouver; Glenn Fuller, Kern Oil

While many Water Resource Recovery Facility residuals are beneficially reused as biosolids, many wastewater solids are still disposed of in landfills or by incineration. The Pacific Northwest National Laboratory (PNNL) has conducted decades of research on hydrothermal liquefaction (HTL) to re-form waste carbon into biological crude oil (Bio-crude) and renewable methane as energy products. Much of this work has been funded by the US Department of Energy (US-DOE) to reduce the country's dependency on foreign oil while lowering the carbon intensity of the transportation sector.

Within the wastewater sector, initial Water Research Foundation (WRF) work at Metro Vancouver was foundational to US-DOE awarding WRF funding to pilot a Genifuel 10-to-15 wet-ton/day HTL demonstration at Central Contra Costa Sanitary District's plant. That HYPOWERS project completed Phase-1 in spring 2019 but has since been on hold while resolving funding and contractual issues. In parallel, metro Vancouver began procuring their own similarly sized unit with their efforts now ahead of the HYPOWERS project. Parallel research has been commissioned with the University of British Columbia including a literature review (Basar, et. al, 2021) and investigations on non-catalytic treatment of HTL aqueous phase.

This session includes presentations from leading technology, utility, and industry experts on the above projects and topics followed by a panel discussion.

TECHNICAL SESSIONS

Session 21: Innovations in Sensors and Instrumentation

Wednesday, June 22, 2022

Room: Brickell

3:45 p.m. - 5:00 p.m.

1.25 PDHs

Facilitators: Tanja Rauch Williams, Carollo; Isaac Musaaazi, Howard University

This is a Technology Spotlight session. Format of this session will include quick, in-depth reviews on various technologies, presented by technical experts and utility representatives. Facilitated discussion with audience participation will follow in the remaining time at the end of the session, with additional time during breaks to continue those conversations.

3:45 p.m. Technology Reviews

- ❖ **Application in Tough Process Conditions**
Masahira Ogura, Horiba Advanced Techno
- ❖ **Innovative Use of Instrumentation for Process Performance Enhancements**
Steve Wortendyke, Xylem, Inc.
- ❖ **Recent Utility Experiences using Claros Advanced Process Control**
Bob Dabkowski, Hach Company
- ❖ **Digital Twins in Wastewater Systems**
Richard Loeffler, Xylem Inc.

4:30 p.m. Facilitated Discussion

5:00 p.m. Session adjourns

TECHNICAL SESSIONS

Session 22: PdNA: What's in it for me? Part 1

Thursday, June 23, 2022

8:30 a.m. - 10:00 a.m.

Room: Monroe

1.5 PDHs

Facilitators: Jim McQuarrie, Tetra Tech; Haydee De Clippeleir, DC Water

8:30 a.m. Facilitator Introduction

8:45 a.m. Partial-denitrification/Anammox as a Path to Infrastructure and Operational Savings for WWRFs Facing Stringent Nitrogen Limits

Kester McCullough, Stephanie Klaus, Michael Parsons, HRSD;
Ahmed Al-Omari; Christopher Wilson, Charles Bott, HRSD

9:00 a.m. Current State of Knowledge on Operation and Implementation of Partial Denitrification — Anammox (PdNA) Filters

Rahil Fofana, DC Water; Megan Bachmann, HRSD; Kimberly Jones; Jeseth Delgado Vela, Howard University; Benay Akyon; Wenjun Liu, Xylem; Stephanie Klaus, HRSD

9:15 a.m. Success at Pilot-Scale leads to the Full-Scale Application of PdNA in MBBR and IFAS and the Inadvertent Development of Mainstream PNA Along the Way

Megan Bachmann, Stephanie Klaus, Justin Macmanus, Michael Parsons, HRSD; Haydee De Clippeleir, DC Water; Charles Bott, HRSD

9:30 a.m. Facilitated Discussion

10:00 a.m. Session adjourns for networking break

TECHNICAL SESSIONS

Session 23: Treatment of Emerging Contaminants

Thursday, June 23, 2022

8:30 a.m. - 10:00 a.m.

Room: Flagler

1.5 PDHs

Facilitators: Shuba Oza, Brown and Caldwell; Kyle Thompson, Carollo

8:30 a.m. Virtual Full-scale Ozonation Plant to Minimize Piloting Efforts and Efficient Micropollutant Removal for Safe Water Discharge

Giacomo Bellandi, Wim Audenaert, AM-Team; Roberta Muoio; Miguel Daza, AM-Team; Usman Rehman; Peter van Dijk, Ruud Schemen, Tom Weijtmans, Waterboard De Dommel

8:45 a.m. Anoxic Granular Activated Sludge Process Bioreactor for the Simultaneous Reduction of Perchlorate and Nitrate
Nathaniel Stein, University of Utah; Ramesh Goel; Aditi Podder

9:00 a.m. Design and Implementation of a Moving Bed Bioreactor for Sulfolane Treatment

Srinivasa Varadhan, Richard Hodges, Geosyntec Consultants; Janet Goodfellow; Scott Forbess, Geosyntec Consultants

9:15 a.m. Development of BioLargo Water's Innovative AOS Technology for Disinfection and Removal of Pharmaceutical Products from Municipal Wastewater

Rimeh Daghrir, Centre des Technologies de l'eau; Jenny Boutros, Richard Smith, Laura Patterson-Fortin, Biolargo Water Inc

9:30 a.m. Facilitated Discussion

10:00 a.m. Session adjourns for networking break

TECHNICAL SESSIONS

Session 25: PdNA: What's in it for me? Part 2

Thursday, June 23, 2022

10:15 a.m. - 11:45 a.m.

Room: Monroe

1.5 PDHs

Facilitators: Haydee De Clippeleir, DC Water; Ahmed Al-Omari, Brown and Caldwell

10:15 a.m. Smart System Automation of Modified 4-Stage Bardenpho Process by Incorporating Partial Nitrification/Denitrification/Anammox (Pdna/PANDA) for Mainstream Municipal Wastewater Treatment with Frequent Storm-Related Fluctuation

Yewei Sun, Hazen and Sawyer; Jiefu Wang; Wendell Khunjar, Hazen & Sawyer; Mari Winkler; Ramesh Goel; Zhiwu Wang

10:30 a.m. Developing Application Guidelines for Mainstream Partial Denitrification-Anammox Application with Raw Fermentate

Mojolaoluwa Ladipo-Obasa, Alexander Seidel, Rumana Riffat, George Washington University; Charles Bott, HRSD; Christine Debarbadillo, Haydee De Clippeleir, DC Water

10:45 a.m. Polishing Tertiary Effluent Nitrogen via the Synergy Between Methanol-Driven Partial Denitrification and Anaerobic Ammonia Oxidation in Moving Bed Biofilm Reactors

Jiefu Wang; Wendell Khunjar, Hazen & Sawyer; Gregory Pace, Manhattan College; Ankit Pathak; Michael McGrath, Fairfax County; Mujahid Ali; Yewei Sun, Hazen and Sawyer

11:00 a.m. R-Strategy Taken by Glycerol-Driven Partial Denitrification in Moving Bed Biofilm Reactors Applied for Anaerobic Ammonia Oxidation of Tertiary Effluent

Jiefu Wang; Wendell Khunjar, Hazen & Sawyer; Gregory Pace, Manhattan College; Ankit Pathak; Michael McGrath, Fairfax County; Mujahid Ali; Yewei Sun, Hazen and Sawyer

11:15 a.m. Facilitated Discussion

11:45 a.m. Conference adjourns

TECHNICAL SESSIONS

Session 26: Advanced Treatment in Potable Reuse

Thursday, June 23, 2022

10:15 a.m. - 11:45 a.m.

Room: Flagler

1.5 PDHs

Facilitators: Charles Bott, HRSD; Hooman Vatankhah, Colorado School of Mines

10:15 a.m. Enhancing 1,4-Dioxane Removal Through Co-Metabolic Biofiltration in Advanced Water Treatment Systems for Potable Reuse

Hannah Stohr, HRSD; Ramola Vaidya, HDR; Germano Salazar-Benites, HRSD; Amy Pruden, Virginia Tech; Christopher Wilson, Charles Bott, HRSD

10:30 a.m. Identification and Removal of Performance- and Health-Based Indicator Chemicals in a Mobile, Carbon-Based Direct Potable Reuse Pilot

Kyle Thompson; James Rosenblum, Colorado School of Mines; John Rehring, Jason Assouline, Carollo; Tzahi Cath, Colorado School of Mines; Christophus Bellona; Kirk Olds, Colorado Springs Utilities

10:45 a.m. Leveraging Process Intensification and Next Generation Nutrient Removal within an Integrated Advanced Water Treatment Facility for Large-Scale Potable Reuse

Bryce Danker, Hazen and Sawyer; Paul Pitt; Wendell Khunjar, Ron Latimer, Yewei Sun, Hazen and Sawyer; Nikos Melitas, Michael Liu, LA County Sanitation District

11:00 a.m. Technical Brief: Blended Reuse Biofiltration Treatment Plant Startup and Process Monitoring, a City's Approach to Continuous Improvement of Drinking Water Treatment Processes

Jonathan Campos, Jackie Solis Armenta, John Meyers, City of Thornton

11:15 a.m. Facilitated Discussion

11:45 a.m. Conference adjourns

TECHNICAL SESSIONS

Session 27: Innovations in Thickening and Dewatering

Thursday, June 23, 2022

Room: Brickell

10:15 a.m. - 11:45 a.m.

1.5 PDHs

Facilitators: Jeanette Brown, Manhattan College; Dru Whitlock, Stantec;
Adam Parmenter, HDR

This is a Technology Spotlight session. Format of this session will include quick, in-depth reviews on various technologies, presented by technical experts and utility representatives. Facilitated discussion with audience participation will follow in the remaining time at the end of the session, with additional time during breaks to continue those conversations.

10:15 a.m. Technology Reviews

- ❖ **GEA - Granulator Technology**
Todd Marshall
- ❖ **Centrisys - Centrifugation Technology**
Josh Benoit
- ❖ **Anaergia - Sludge Screw Thickener**
Sacha Rollings

11:15 a.m. Facilitated Discussion

11:45 a.m. Conference adjourns

EXHIBITION INFORMATION

EXHIBITION SCHEDULE

Tuesday, June 21

10:00 a.m. – 6:15 p.m. **Exhibit Hall Open**
10:00 a.m. – 10:45 a.m. Networking Break
12:00 p.m. – 1:30 p.m. Networking Luncheon
3:00 p.m. – 3:45 p.m. Networking Break
5:00 p.m. – 6:15 p.m. Networking Reception

Wednesday, June 22

10:00 a.m. – 3:45 p.m. **Exhibit Hall Open**
10:00 a.m. – 10:45 a.m. Networking Break
12:00 p.m. – 1:30 p.m. Networking Luncheon
3:00 p.m. – 3:45 p.m. Networking Break

Children under 18 entering the Exhibition must be accompanied by a parent or guardian at all times. The parent or guardian must obtain a child badge at registration, and assumes all risk and responsibility for the child's safety.

Due to the proprietary nature of the displays, photography of displays and materials is forbidden without exhibitors' express permission.

EXHIBITOR DIRECTORY

As of June 7, 2022

For Company Descriptions, view Exhibitors in the online planner:

<https://ipe22.mapyourshow.com>

Egger Pumps & Iris Aeration Control Valves Booth 109

www.eggerpumps.com

Phone: 478-538-1593

140 Willingham Dr E

Juliette, GA 31046

Flygt, A Xylem Brand Booth 106

www.xylem.com/flygt

Phone: 561-933-7174

15132 Park of Commerce Blvd, #102

Jupiter, FL 33478

Innovatreat Booth 116

www.innovatreat.com

Phone: 443-915-2144

11 Easter Ct, Ste L

Owings Mills, MD 21117

Smith & Loveless, Inc Booth 111

www.SmithAndLoveless.com

Phone: 913-888-5201

14040 Santa Fe Trail Dr

Lenexa, KS 66215

SUEZ Water Technologies & Solutions Booth 113

www.suezwatertechnologies.com

Phone: 905-302-1185

3239 Dundas St W

Oakville, ON L6M 4B2

Canada

Vaughan Company, Inc Booth 112

www.chopperpumps.com

Phone: 360-249-4042 x227

364 Monte Elma Rd

Montesano, WA 98563

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EXHIBITOR DIRECTORY

As of June 7, 2022

For Company Descriptions, view Exhibitors in the online planner:
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World Water Works, Inc **Booth 115**
www.worldwaterworks.com
Phone: 800-607-7873
4000 SW 113th St
Oklahoma City, OK 73173

YSI, A Xylem Brand **Booth 110**
www.ysi.com
Phone: 937-260-8565
1725 Brannum Ln
Yellow Springs, OH 45387

EXHIBITION FLOOR PLAN

LUNCHEON

Innovatreat

116

Vaughan
Company,
Inc

112

YSI,
A Xylem
Brand

110

Flygt,
A Xylem
Brand

106

World
Water
Works, Inc.

115

SUEZ Water
Technologies
& Solutions

113

Smith &
Loveless
Inc.

111

Egger Pumps
& Iris Aeration
Control
Valves

109

ENTRANCE

PRESENTER AND FACILITATOR DIRECTORY

Sirwan Alimoradi
WSP Technologies
Facilitator Session
04

Ahmed Al Omari
Brown and Caldwell
Facilitator Session
25

Ahmed Alsayed
York University
Presenter Session
16

Meg Anderson
Northwestern
University
Presenter Session
19

Wim Audenaert
AM-Team
Presenter Workshop
A, Facilitator
Session 15,
Presenter Session
23

Isaac Avila
Black & Veatch
Facilitator Session
08

Megan Bachmann
HRSD
Presenter Session
05, Session 22

Erika Bailey
Raleigh Water
Facilitator Session
11

Simon Baker
AECOM
Presenter Workshop
B

William Barber
Cambi
Presenter Session
11

Jacob Barclay
Hatch
Presenter Session
18

Kayla Bauhs
Brown and Caldwell
Presenter Session
13

Josh Benoit
Centrisys
Presenter Session
27

Raj Bhatte
Clean Water
Services
Facilitator Session
14

David Blair
Metro Vancouver
Coordinator Session
20

Joshua Boltz
Arizona State
University
Presenter Session
03, Session 05

Charles Bott
HRSD
Presenter Workshop
A, Workshop B,
Session 26

Jeanette Brown
Manhattan College
Facilitator Session
14, Session 27

Michael Broyles
Arcadis
Presenter Session
04

Jason Calhoun
Nuvoda
Presenter Session
06

Onder Caliskaner
Caliskaner Water
Technologies
Presenter Session
16

Jonathan Campos
City of Thornton
Presenter Session
26

Raj Chavan
Atkins
Facilitator Session
04, Presenter
Session 17

Stanley Chilson
CET-GHD
Presenter Session
14

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Erik Coats

University of Idaho
Facilitator Session
 13

John Copp

Primodal Inc
Presenter Workshop
 B

Roland Cusick

University of Illinois
Coordinator
Workshop D

Bob Dabkowski

Hach
Presenter Session
 21

Rimeh Daghrir

Centre des
 Technologies de
 l'eau
Presenter Session
 23

Martha Dagnew

Western University
Facilitator Session
 02

Jens Dancer

Gross-Wen
 Technologies
Presenter Session
 04, Session 08

Bryce Danker

Hazen and Sawyer
Presenter Session
 26

Jeff Danner

Innovatret
Presenter Session
 08

Haydee De Clippeleier

DC Water
Presenter Workshop
A, Facilitator
Session 22, Session
 25

Dale de Kretser

GHD
Presenter Session
 12

Chris deBarbadillo

Black & Veatch
Presenter Workshop
A, Facilitator
Session 06, Session
 11

Jeseth Delgado Vela

Howard University
Facilitator Session
 19

Leon Downing

Black & Veatch
 Water
Presenter Session
 01, Facilitator
 Session 05

Michael Falk

HDR Inc
Presenter Session
 04

Seraphim Falterman

North Carolina State
 University
Presenter Session
 11

Rahil Fofana

DC Water
Presenter Session
 22

Glenn Fuller

Kern Oil
Presenter Session
 20

Ali Gagnon

HRSD
Facilitator Session
 13, Presenter
 Session 19

Alonso Griborio

Hazen
Presenter Workshop
 A, Session 15

Nick Griswold

PERC Water
Presenter Session
 08

Rashi Gupta

Carollo Engineers
Presenter Session
 17

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Soklida Hong

The University of
Utah
*Presenter Session
04, Session 10*

Anndee Huff

Chester
Brown and Caldwell
*Facilitator Session
01, Presenter
Session 19*

Gary Hunter

Black & Veatch
*Presenter Workshop
A*

Jose Jimenez

Brown and Caldwell
*Coordinator
Workshop A,
Facilitator Session
07, Presenter
Session 09*

Bruce Johnson

Jacobs
*Presenter Workshop
B, Session 05*

Chandler Johnson

World Water Works
*Presenter Session
06*

Tom Johnson

Jacobs
*Facilitator Session
03*

Farokh Laqa Kakar

Ryerson University
*Presenter Session
11*

Fidan Karimova

Water Environment
Federation
*Coordinator
Workshop C*

Murthy Kasi

Smith and Loveless
*Facilitator Session
04*

Rob Kershner

Kershner
Environmental
Technologies
*Presenter Session
14*

Wendell Khunjar

Hazen & Sawyer PC
*Coordinator
Workshop D*

Tyler Kisling

HRSD
*Presenter Session
07*

Stephanie Klaus

HRSD
*Facilitator Session
08*

John Koch

Enviro Mix, Inc.
*Presenter Session
10*

Mojolaoluwa

Ladipo-Obasa
George Washington
University
*Presenter Session
25*

Ron Latimer

Hazen and Sawyer
*Presenter Session
09*

Michael Liu

LA County
Sanitation District
*Presenter Session
19*

Rudy Maltos

Metro Water
Recovery
*Presenter Workshop
A, Facilitator
Session 10*

Todd Marshall

GEA
*Presenter Session
27*

Alyssa Mayer

Hazen & Sawyer
Presenter Workshop

Kester McCullough

HRSD
*Presenter Session
22*

Jim McQuarrie

Tetra Tech
*Presenter Workshop
A, Facilitator
Session 22, Session
25*

PRESENTER AND FACILITATOR DIRECTORY

Mark Miller

Brown and Caldwell
Presenter Session
 01, *Facilitator*
 Session 16

Brad Mrdjenovich

Veolia
Presenter Session
 08

Sudhir Murthy

NEWHub Corp
Presenter Workshop
 A

Isaac Musaazi

Howard University
Presenter Session
 18, *Facilitator*
 Session 21

Ajay Nair

Microvi
Presenter Session
 03

Neri Nathan

Fluence
Presenter Session
 02

Kate Newhart

West Point
Facilitator Session
 12

Nam Ngo

DC Water
Presenter Session
 16

Han Nguyen

DC Water
Presenter Session
 12

Per Nielsen

VCS Denmark
Presenter Session
 14

Monica Oristian

Alexandria Renew
Facilitator Session
 19

Shuba Oza

Brown and Caldwell
Facilitator Session
 23

Gregory Pace

Manhattan College
Presenter Session
 25

Adam Parmenter

HDR Inc
Facilitator Session
 27

Jeff Peeters

SUEZ Water
 Technologies &
 Solutions
Presenter Session
 02, *Session 08*

Matthew Poe

HRSD
Presenter Workshop
 D

Coenraad Pretorius

GHD
Presenter Session
 17

Jeff Prevatt

Pima County
 Regional
Coordinator
Workshop D

Gayathri Ram Mohan

Gwinnett County -
 Department of Water
 Resources
Coordinator
Workshop D

Tanja Rauch- Williams

Carollo Engineers
Facilitator Session
 21

Eric Redmond

Black & Veatch
Presenter Session
 04

Matt Reeve

SUEZ Water
 Technologies &
 Solutions
Presenter Session
 02

Pusker Regmi

Brown and Caldwell
Facilitator Session
 10, *Presenter*
 Session 13

PRESENTER AND FACILITATOR DIRECTORY

Terry Reid

Aqua Aerobics
Presenter Session
06

Frank Rogalla

Aqualia
Presenter Opening
Session

Sacha Rollings

Anaergia
Presenter Session
27

Adrian Romero

Jacobs
Presenter Session
15

Javad Roostaei

Hazen and Sawyer
Presenter Session
18

Bikram Sabherwal

Black & Veatch\
Presenter Session
16

Peter Schauer

Clean Water
Services
Presenter Session
01

Matt Seib

Madison
Metropolitan
Sewerage District
Facilitator Session
01

Moomen Soliman

York University
Presenter Session
07

Jeffrey Sparks

HRSD
Presenter Workshop
B, Session 18

Varun Srinivasan

Brown & Caldwell
Presenter Workshop

Nathaniel Stein

University of Utah
Presenter Session
23

Beverley Stinson

AECOM
Presenter Opening
Session

Hannah Stohr

HRSD
Presenter Session
26

Belinda Sturm

University of Kansas
Presenter Workshop
A, Facilitator
Session 09

Yewei Sun

Hazen and Sawyer
Presenter Session
09, Session 25

Kendra Sveum

Loudoun Water
Coordinator
Workshop A

Kyle Thompson

Carollo Engineers
Presenter Session
18, Facilitator
Session 23,
Presenter Session
26

Michael Thorson

Northwest National
Laboratory
Speaker Session 20

Howard Truong

DC Water
Presenter Session
10

Art Umble

Stantec
Presenter Workshop
A

Nerea Uri Carreno

VCS Denmark
Presenter Session
02, Facilitator
Session 07

Francisco Valdes

Amphibio
Technologies
Presenter Session
08

Peter

Vanrolleghem
Modeleau Universite
Laval
Coordinator
Workshop A,
Facilitator Session
18

PRESENTER AND FACILITATOR DIRECTORY

Srinivasa Varadhan

Geosyntec
Consultants
Presenter Session
23

Hooman

Vatankhah
Colorado School of
Mines
Presenter Session
26

Tanush Wadhawan

Dynamita North
America
Coordinator
Workshop B

Jiefu Wang

Virginia Tech
Presenter Session
25

David Wankmuller

Hazen and Sawyer
Presenter Session
10

Bernhard Wett

ARAconsult GmbH
Presenter Session
16

Dru Whitlock

Stantec
Facilitator Session
27

Casey Whittier

Evoqua
Presenter Session
06

Arba Williamson

HRSD
Presenter Session
12

John Willis

Brown and Caldwell
Presenter Session
17

John Willis

Brown and Caldwell
Coordinator Session
20

Chris Wilson

HRSD
Facilitator Session
17

Blair Wisdom

Metro Water
Recovery
Coordinator
Workshop D,
Presenter Session
09, Facilitator
Session 17

Kwangtae You

UnU Inc.
Presenter Session
07

Thor Young

GHD Inc
Presenter Session
03, Facilitator
Session 06, Session
09

Xueyao Zhang

Virginia Tech
Presenter Session
05

CONFERENCE SCHEDULE-AT-A-GLANCE

Monday, June 20

7:30 a.m. – 5:00 p.m.	Registration
9:00 a.m. – 5:00 p.m.	Workshop A: Particles and Colloids: The Next Frontier in Intensifying Water Resource Recovery
8:30 a.m. – 5:00 p.m.	Workshop B: Developing a Framework for Successful Implementations of Digital Twin for Process Improvements
8:30 a.m. – 12:00 p.m.	Workshop C: Process Intensification – Getting 10 Gallons out of a 5-gallon Bucket
1:30 p.m. – 5:00 p.m.	Workshop D: The Next Generation of Nutrient Recovery

Tuesday, June 21

7:30 a.m. – 5:00 p.m.	Registration
8:30 a.m. – 10:00 a.m.	Opening General Session
10:00 a.m. – 6:15 p.m.	Exhibit Hall Hours
10:45 a.m. – 12:00 p.m.	Technical Sessions 1, 2, 3
12:00 p.m. – 1:30 p.m.	Networking Luncheon
1:30 p.m. – 3:00 p.m.	Technical Sessions 4, 5, 6
3:45 p.m. – 5:00 p.m.	Technical Sessions 7, 8, 9
5:00 p.m. – 6:15 p.m.	Networking Reception

Wednesday, June 22

8:00 a.m. – 5:00 p.m.	Registration
8:30 a.m. – 10:00 a.m.	Technical Sessions 10, 11, 12
10:00 a.m. – 3:45 p.m.	Exhibit Hall Hours
10:45 a.m. – 12:00 p.m.	Technical Sessions 13, 14, 15
12:00 p.m. – 1:30 p.m.	Networking Luncheon
1:30 p.m. – 3:00 p.m.	Technical Sessions 16, 17, 18
3:45 p.m. – 5:00 p.m.	Technical Sessions 19, 20, 21

Thursday, June 23

8:00 a.m. – 11:45 a.m.	Registration
8:30 a.m. – 10:00 a.m.	Technical Sessions 22, 23
10:15 a.m. – 11:45 a.m.	Technical Sessions 25, 26, 27
11:45 a.m.	Conference Adjourns

UPCOMING WEF EDUCATION & TRAINING EVENTS

Stormwater Summit

June 27-29, 2022
Minneapolis, Minnesota
www.wef.org/stormwatersummit

WEFTEC

October 8-12, 2022
New Orleans, Louisiana
www.weftec.org

AWWA/WEF Utility Management Conference

March 28-31, 2023
Sacramento, California
www.wef.org/utilitymanagement

WEF Forum

March 20-22, 2023
Cary, North Carolina
More information coming shortly

Innovations in Process Engineering Conference

June 5-8, 2023
Portland, Oregon
www.wef.org/ProcessEngineering

Collection Systems Conference

June 27-30, 2023
Kansas City, Missouri
www.wef.org/CollectionSystems

Stormwater Summit

June 27-30, 2023
Kansas City, Missouri
www.wef.org/StormwaterSummit

NOTES

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NOTES

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A portrait of JB Neethling, a middle-aged man with short, graying hair and a slight smile. He is wearing a blue and white plaid button-down shirt. The background is a blurred industrial setting with large pipes and structural elements.

JB Neethling, Ph.D, PE, WEF Fellow
Director, Wastewater Treatment and Effluent Management

