INNOVATIONS IN PROCESS ENGINEERING CONFERENCE

CONFERENE PROGRAM

PRE-CONERENCE 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.
Access Water organizes the information and technical content critical to the water sector into a single, central location.

...ALL WITHIN ONE POWERFUL TOOL

www.accesswater.org
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
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conference Chairs and Committees</td>
<td>2</td>
</tr>
<tr>
<td>Health Policies, Code of Conduct, and WEF Policies</td>
<td>6</td>
</tr>
<tr>
<td>Conference Safety and Security</td>
<td>7</td>
</tr>
<tr>
<td>Registration</td>
<td>7</td>
</tr>
<tr>
<td>Presenter and Facilitator Information</td>
<td>7</td>
</tr>
<tr>
<td>WEF Process Engineering My Show Planner</td>
<td>8</td>
</tr>
<tr>
<td>Committee Meetings</td>
<td>8</td>
</tr>
<tr>
<td>Reception and Meal Functions</td>
<td>9</td>
</tr>
<tr>
<td>Continuing Education</td>
<td>10</td>
</tr>
<tr>
<td>Get Involved with WEF</td>
<td>12</td>
</tr>
<tr>
<td>Sponsorship Information</td>
<td>13</td>
</tr>
<tr>
<td>Sessions-at-a-Glance</td>
<td>14</td>
</tr>
<tr>
<td>Pre-Conference Workshops</td>
<td>16</td>
</tr>
<tr>
<td>Opening General Session</td>
<td>23</td>
</tr>
<tr>
<td>Technical Program</td>
<td>24</td>
</tr>
<tr>
<td>Exhibition Information</td>
<td>50</td>
</tr>
<tr>
<td>Exhibitor Directory</td>
<td>51</td>
</tr>
<tr>
<td>Exhibition Floor Plan</td>
<td>53</td>
</tr>
<tr>
<td>Presenter and Facilitator Directory</td>
<td>54</td>
</tr>
<tr>
<td>Conference Schedule-at-a-Glance</td>
<td>60</td>
</tr>
<tr>
<td>Upcoming WEF Education and Training Events</td>
<td>61</td>
</tr>
</tbody>
</table>

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 STEERING COMMITTEE

Erika Bailey
City of Raleigh
Public Utilities

Lina Belia
Primodal

Raj Bhattarai
Clean Water Strategies

Jeanette Brown
Manhattan College

Gillian Burger
EnviroSim

Martha Dagnew
Western University

Glen Daigger
One Water Solutions LLC

Haydee De
Clippelier
DC Water

Christine deBarbadillo
Black & Veatch

Stephanie Fevig
WRF

Colin Fitzgerald
Jacobs

Ajit Ghorpade
Veolia

Matt Higgins
Bucknell

Paul Kadota
Metro Vancouver

Murthy Kasi
Smith & Loveless Inc.

David Marrs
Valero

Jim McQuarrie
Tetra Tech

Chul Park
UMASS

Tanja Rauch-Williams
Carollo

Matt Seib
Madison Metropolitan Sewerage District

Kumar
Upendrakumar
Veolia

Nerea Uri Carreño
VandCenterSyd

Peter Vanrolleghem
Université Laval

Thor Young
GHD
CONFERENCE PROGRAM COMMITTEE

Phil Ackman  Houssam El Jerdi  Joe Husband
Sanitation Districts  Pima County  Arcadis
of Los Angeles  Regional Water  Adam Jennings
County  Reclamation  Hach Company

Mehran Andalib  Don Esping  Tom Johnson
Stantec  Brown and Caldwell  Jacobs

Britt Bassett  Ian Fife  Amit Kaldate
Bassett Engineering, Inc.  Westech Inc  Suez

Somnath Basu  Mudit Gangal  David Kinnear
Headworks  Ovivo  KPS
International

Lucas Botero  Max Gangestad  Stephanie Klaus
Black & Veatch  Gross-Wen  Virginia Tech
Technologies

Elizabeth Brown  Mark Gockowski  Marc-Andre Labelle
Metropolitan Council  Baxter & Woodman  Centre Des
Metro. Council

Chris Bye  Ramesh Goel  Guangbin Li
Envirosim  University of Utah  University of
Maryland

Daniela Conidi  Dana Gonzalez  Zhongtian Li
Envirosim  HRSD  Purdue University

Tim Constantine  Don Gray  Han Liping
Jacobs  East Bay Municipal  ExxonMobil
Utility District  Engineering and

Tanner Devlin  Mark Greene  Research
Nexom/University of  Ramboll  Engineering Section
Manitoba

Leon Downing  Alan Grooms  Emy Liu
Black & Veatch  Madison  Iowa Department of
Metropolitan  Natural Resources
Sewerage District  Wastewater
Sadra Heidary-  Engineering Section
Monfared  EPCOR
Yanjin Liu  
*American Water*

Michael Liu  
*Sanitation Districts of Los Angeles county*

Michael Lynch  
*Arcadis*

Chris Maher  
*Clean Water Services*

William McConnell  
*CDM Smith*

Kester McCullough  
*HRSD*

Mark Miller  
*Brown and Caldwell*

Judith Moran  
*MWRDGC*

Per Henrik Nielsen  
*VCS Denmark*

Patrick O'Donnell  
*INVENT Environmental Technologies*

Ali Oskouie  
*Illinois Institute of Technology*

Tak Kai Pang  
*American Structurepoint*

Erin Partlan  
*WRF*

Marija Peric  
*AECOM*

Jeff Peters  
*Suez*

Arifur Rahman  
*Jacobs*

Pusker Regmi  
*Brown and Caldwell*

Jenny Reina  
*Jacobs*

Clint Rogers  
*Stantec*

Bikram Sabherwal  
*Black & Veatch*

Valetta Saldanha  
*HDR*

Sherchan Samendra  
*Tulane University*

Sandeep  
*Sathyamoorthy Black & Veatch*

Robert Sharp  
*Manhattan College*

Ajay Singh  
*Lystek*

Leslee Storlie  
*Metropolitan Council*

Drew Suesse  
*Madison Metropolitan Sewerage District*

Nerea Uri Carreno  
*VandCenterSyd*

David Wankmuller  
*Hazen and Sawyer*

David Winters  
*City of Atlanta*

Paul Wood  
*Lockwood, Andrews & Newnam, Inc.*

Qingzhong Wu  
*JHT Inc.*

Fenghua Yang  
*MWRD Chicago*

Jie Zhang  
*Carollo*

Renzhun Zhao  
*NC State*
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/3O0USIA

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

7
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 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.
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](http://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](http://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](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](http://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](http://www.weftec.org).
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.

www.hdrinc.com
BRONZE ELITE

www.invent-uv.de
OPENING GENERAL SESSION

www.worldwaterworks.com
LANYARDS
<table>
<thead>
<tr>
<th>Session Number</th>
<th>Session Title</th>
<th>Start Time</th>
<th>End Time</th>
<th>CE Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Monday, June 20</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workshop A</td>
<td>Particles and Colloids: The Next Frontier in Intensifying Water Resource Recovery</td>
<td>8:30 a.m.</td>
<td>5:00 p.m.</td>
<td>0.6 CEUs</td>
</tr>
<tr>
<td>Workshop B</td>
<td>Developing a Framework for Successful Implementations of Digital Twin for Process Improvements</td>
<td>8:30 a.m.</td>
<td>5:00 p.m.</td>
<td>0.6 CEUs</td>
</tr>
<tr>
<td>Workshop C</td>
<td>Process Intensification – Getting 10 Gallons out of a 5-gallon Bucket</td>
<td>8:30 a.m.</td>
<td>12:00 p.m.</td>
<td>0.3 CEUs</td>
</tr>
<tr>
<td>Workshop D</td>
<td>The Next Generation of Nutrient Recovery</td>
<td>1:30 p.m.</td>
<td>5:00 p.m.</td>
<td>0.3 CEUs</td>
</tr>
<tr>
<td></td>
<td><strong>Tuesday, June 21</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OGS</td>
<td>Opening General Session</td>
<td>8:30 a.m.</td>
<td>10:00 a.m.</td>
<td>1.5 PDHs</td>
</tr>
<tr>
<td>Session 01</td>
<td>Sidestream Bio-P</td>
<td>10:45 a.m.</td>
<td>12:00 p.m.</td>
<td>1.25 PDHs</td>
</tr>
<tr>
<td>Session 02</td>
<td>Do Membrane Aerated Biofilm Reactors have an Edge for Addressing Climate Change?</td>
<td>10:45 a.m.</td>
<td>12:00 p.m.</td>
<td>1.25 PDHs</td>
</tr>
<tr>
<td>Session 03</td>
<td>Ballasted Flocculation and Encapsulated Biomass</td>
<td>10:45 a.m.</td>
<td>12:00 p.m.</td>
<td>1.25 PDHs</td>
</tr>
<tr>
<td>Session 04</td>
<td>Innovations in Sidestream Treatment</td>
<td>1:30 p.m.</td>
<td>3:00 p.m.</td>
<td>1.5 PDHs</td>
</tr>
<tr>
<td>Session 05</td>
<td>Efficiency and Resource Recovery via Membranes and Biofilms</td>
<td>1:30 p.m.</td>
<td>3:00 p.m.</td>
<td>1.5 PDHs</td>
</tr>
<tr>
<td>Session 06</td>
<td>Innovations in Densification and Granulation</td>
<td>1:30 p.m.</td>
<td>3:00 p.m.</td>
<td>1.5 PDHs</td>
</tr>
<tr>
<td>Session 07</td>
<td>Nitrification: How Low Can DO Go?</td>
<td>3:45 p.m.</td>
<td>5:00 p.m.</td>
<td>1.25 PDHs</td>
</tr>
<tr>
<td>Session 08</td>
<td>Innovations in MABR/Membranes/Biofilms</td>
<td>3:45 p.m.</td>
<td>5:00 p.m.</td>
<td>1.25 PDHs</td>
</tr>
<tr>
<td>Session 09</td>
<td>There's Something about Densification</td>
<td>3:45 p.m.</td>
<td>5:00 p.m.</td>
<td>1.25 PDHs</td>
</tr>
<tr>
<td></td>
<td><strong>Wednesday, June 22, a.m.</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Session 10</td>
<td>Carbon Management for BNR</td>
<td>8:30 a.m.</td>
<td>10:00 a.m.</td>
<td>1.5 PDHs</td>
</tr>
<tr>
<td>Session 11</td>
<td>Thermal Hydrolysis</td>
<td>8:30 a.m.</td>
<td>10:00 a.m.</td>
<td>1.5 PDHs</td>
</tr>
<tr>
<td>Session 12</td>
<td>Optimization Using Sensors and Control</td>
<td>8:30 a.m.</td>
<td>10:00 a.m.</td>
<td>1.5 PDHs</td>
</tr>
<tr>
<td>Session 13</td>
<td>Harnessing Internal Carbon Sources</td>
<td>10:45 a.m.</td>
<td>12:00 p.m.</td>
<td>1.25 PDHs</td>
</tr>
<tr>
<td>Session 14</td>
<td>Blazing Solids</td>
<td>10:45 a.m.</td>
<td>12:00 p.m.</td>
<td>1.25 PDHs</td>
</tr>
<tr>
<td>Session 15</td>
<td>Advances in Process Modeling</td>
<td>10:45 a.m.</td>
<td>12:00 p.m.</td>
<td>1.25 PDHs</td>
</tr>
<tr>
<td>Session Number</td>
<td>Session Title</td>
<td>Start Time</td>
<td>End Time</td>
<td>CE Credits</td>
</tr>
<tr>
<td>----------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>------------</td>
<td>----------</td>
<td>------------</td>
</tr>
<tr>
<td>Session 16</td>
<td>It's All About Carbon</td>
<td>1:30 p.m.</td>
<td>3:00 p.m.</td>
<td>1.5 PDHs</td>
</tr>
<tr>
<td>Session 17</td>
<td>Advances in Solids Treatment</td>
<td>1:30 p.m.</td>
<td>3:00 p.m.</td>
<td>1.5 PDHs</td>
</tr>
<tr>
<td>Session 18</td>
<td>Sensors to Data to Knowledge to Action</td>
<td>1:30 p.m.</td>
<td>3:00 p.m.</td>
<td>1.5 PDHs</td>
</tr>
<tr>
<td>Session 19</td>
<td>It's Not All About Carbon</td>
<td>3:45 p.m.</td>
<td>5:00 p.m.</td>
<td>1.25 PDHs</td>
</tr>
<tr>
<td>Session 20</td>
<td>Today’s Alchemy Miracle: Hydrothermal Liquefaction Turns Sludge into Diesel and Jet Fuel</td>
<td>3:45 p.m.</td>
<td>5:00 p.m.</td>
<td>1.25 PDHs</td>
</tr>
<tr>
<td>Session 21</td>
<td>Innovations in Sensors and Instrumentation</td>
<td>3:45 p.m.</td>
<td>5:00 p.m.</td>
<td>1.25 PDHs</td>
</tr>
<tr>
<td>Session 22</td>
<td>PdNA: What’s in it for me? Part 1</td>
<td>8:30 a.m.</td>
<td>10:00 a.m.</td>
<td>1.5 PDHs</td>
</tr>
<tr>
<td>Session 23</td>
<td>Treatment of Emerging Contaminants</td>
<td>8:30 a.m.</td>
<td>10:00 a.m.</td>
<td>1.5 PDHs</td>
</tr>
<tr>
<td>Session 24</td>
<td>This session intentionally left blank.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Session 25</td>
<td>PdNA: What’s in it for me? Part 2</td>
<td>10:15 a.m.</td>
<td>11:45 a.m.</td>
<td>1.5 PDHs</td>
</tr>
<tr>
<td>Session 26</td>
<td>Advanced Treatment in Potable Reuse</td>
<td>10:15 a.m.</td>
<td>11:45 a.m.</td>
<td>1.5 PDHs</td>
</tr>
<tr>
<td>Session 27</td>
<td>Innovations in Thickening and Dewatering</td>
<td>10:15 a.m.</td>
<td>11:45 a.m.</td>
<td>1.5 PDHs</td>
</tr>
</tbody>
</table>
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
Queralt Plana, Peter Vanrolleghem, modelEAU – Université Laval

11:00 a.m. Deciphering Differential Properties of Flocs 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
3:30 p.m. PARTICLE MODELING
Jim McQuarrie, Tetratech; 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, Tetratech; 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
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...
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
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**
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

Tuesday, June 21, 2022  
Room: Tuttle/Monroe
8:30 a.m. – 10:00 a.m.  
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
Session 02: Do Membrane Aerated Biofilm Reactors have an Edge for Addressing Climate Change?

Tuesday, June 21, 2022
10:45 a.m. - 12:00 p.m.
Room: Flagler
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
Session 03: Ballasted Floculation and Encapsulated Biomass
Tuesday, June 21, 2022        Room: Brickell
10:45 a.m. - 12:00 p.m.                 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
1:30 p.m. - 3:00 p.m.
1.5 PDHs
Room: Tuttle

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 Digestor 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
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
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
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
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
Session 09: There's Something about Densification
Tuesday, June 21, 2022        Room: Brickell
3:45 p.m. - 5:00 p.m.                 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
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
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 Laga Kakar, Steven N. Liss, Elsayed Elbeshbishy, Ryerson University

9:30 a.m. Facilitated Discussion

10:00 a.m. Session adjourns for networking break
Session 12: Optimization Using Sensors and Control
Wednesday, June 22, 2022
Room: Brickell
8:30 a.m. - 10:00 a.m.
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
Session 13: Harnessing Internal Carbon Sources
Wednesday, June 22, 2022
10:45 a.m. - 12:00 p.m.
Room: Monroe
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 Dagnnew, 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
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
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 Piacezzi, 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
Session 16: It's All About Carbon
Wednesday, June 22, 2022  Room: Monroe
1:30 p.m. - 3:00 p.m.  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
Onder 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
Session 17: Advances in Solids Treatment
Wednesday, June 22, 2022
1:30 p.m. - 3:00 p.m.
Room: Flagler
1:30 p.m. - 3:00 p.m.                   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
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 Musaazi, 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 Salveson, 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
Session 19: It's Not All About Carbon
Wednesday, June 22, 2022       Room: Monroe
3:45 p.m. - 5:00 p.m.                   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 Albrittain, 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
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.
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 Musaazi, 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
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
Session 23: Treatment of Emerging Contaminants
Thursday, June 23, 2022
Room: Flagler
8:30 a.m. - 10:00 a.m.
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.

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
Session 26: Advanced Treatment in Potable Reuse  
Thursday, June 23, 2022  
10:15 a.m. - 11:45 a.m.  
1.5 PDHs  
Room: Flagler

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
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 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.
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

Exhibitor Directory Continues on Next Page…
As of June 7, 2022

For Company Descriptions, view Exhibitors in the online planner:  
https://ipe22.mapyourshow.com

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
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 Bhatterai  
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
<table>
<thead>
<tr>
<th>Name</th>
<th>Affiliation</th>
<th>Role</th>
<th>Session or Workshop</th>
</tr>
</thead>
<tbody>
<tr>
<td>Erik Coats</td>
<td>University of Idaho</td>
<td>Facilitator Session</td>
<td>13</td>
</tr>
<tr>
<td>Bryce Danker</td>
<td>Hazen and Sawyer</td>
<td>Presenter Session</td>
<td>26</td>
</tr>
<tr>
<td>Michael Falk</td>
<td>HDR Inc</td>
<td>Presenter Session</td>
<td>04</td>
</tr>
<tr>
<td>John Copp</td>
<td>Primodal Inc</td>
<td>Presenter Workshop B</td>
<td></td>
</tr>
<tr>
<td>Jeff Danner</td>
<td>Innovatret</td>
<td>Presenter Session</td>
<td>08</td>
</tr>
<tr>
<td>Seraphim Falterman</td>
<td>North Carolina State University</td>
<td>Presenter Session</td>
<td>11</td>
</tr>
<tr>
<td>Roland Cusick</td>
<td>University of Illinois</td>
<td>Coordinator</td>
<td>Workshop D</td>
</tr>
<tr>
<td>Haydee De Clippeleier</td>
<td>DC Water</td>
<td>Presenter Workshop A, Facilitator</td>
<td>Session 22, Session 25</td>
</tr>
<tr>
<td>Rahil Fofana</td>
<td>DC Water</td>
<td>Presenter Session</td>
<td>22</td>
</tr>
<tr>
<td>Bob Dabkowski</td>
<td>Hach</td>
<td>Presenter Session</td>
<td>21</td>
</tr>
<tr>
<td>Dale de Kretser</td>
<td>GHD</td>
<td>Presenter Session</td>
<td>12</td>
</tr>
<tr>
<td>Glenn Fuller</td>
<td>Kern Oil</td>
<td>Presenter Session</td>
<td>20</td>
</tr>
<tr>
<td>Rimeh Daghrir</td>
<td>Centre des Technologies de l'eau</td>
<td>Presenter Session</td>
<td>23</td>
</tr>
<tr>
<td>Chris deBarbadillo</td>
<td>Black &amp; Veatch</td>
<td>Presenter Workshop A, Facilitator</td>
<td>Session 06, Session 11</td>
</tr>
<tr>
<td>Ali Gagnon</td>
<td>HRSD</td>
<td>Facilitator Session</td>
<td>13, Presenter Session 19</td>
</tr>
<tr>
<td>Martha Dagnew</td>
<td>Western University</td>
<td>Facilitator Session</td>
<td>02</td>
</tr>
<tr>
<td>Alonso Griborio</td>
<td>Hazen</td>
<td>Presenter Workshop A, Session 15</td>
<td></td>
</tr>
<tr>
<td>Jeseth Delgado Vela</td>
<td>Howard University</td>
<td>Facilitator Session</td>
<td>19</td>
</tr>
<tr>
<td>Nick Griswold</td>
<td>PERC Water</td>
<td>Presenter Session</td>
<td>08</td>
</tr>
<tr>
<td>Jens Dancer</td>
<td>Gross-Wen Technologies</td>
<td>Presenter Session</td>
<td>04, Session 08</td>
</tr>
<tr>
<td>Leon Downing</td>
<td>Black &amp; Veatch Water</td>
<td>Presenter Session</td>
<td>01, Facilitator Session 05</td>
</tr>
<tr>
<td>Rashi Gupta</td>
<td>Carollo Engineers</td>
<td>Presenter Session</td>
<td>17</td>
</tr>
</tbody>
</table>
Soklida Hong
The University of Utah
Presenter Session 04, Session 10

Annde 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
<table>
<thead>
<tr>
<th>Name</th>
<th>Company</th>
<th>Session Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mark Miller</td>
<td>Brown and Caldwell</td>
<td>Presenter Session 01, Facilitator Session 16</td>
</tr>
<tr>
<td>Han Nguyen</td>
<td>DC Water</td>
<td>Presenter Session 12</td>
</tr>
<tr>
<td>Coenraad Pretorius</td>
<td>GHD</td>
<td>Presenter Session 17</td>
</tr>
<tr>
<td>Brad Mrdjenovich</td>
<td>Veolia</td>
<td>Presenter Session 08</td>
</tr>
<tr>
<td>Per Nielsen</td>
<td>VCS Denmark</td>
<td>Presenter Session 14</td>
</tr>
<tr>
<td>Jeff Prevatt</td>
<td>Pima County</td>
<td>Regional Coordinator Workshop D</td>
</tr>
<tr>
<td>Sudhir Murthy</td>
<td>NEWHub Corp</td>
<td>Presenter Workshop A</td>
</tr>
<tr>
<td>Monica Oristian</td>
<td>Alexandria Renew</td>
<td>Facilitator Session 19</td>
</tr>
<tr>
<td>Gayathri Ram Mohan</td>
<td>Gwinnett County -</td>
<td>Department of Water Resources Coordinator Workshop D</td>
</tr>
<tr>
<td>Isaac Musaazi</td>
<td>Howard University</td>
<td>Presenter Session 18, Facilitator Session 23</td>
</tr>
<tr>
<td>Shuba Oza</td>
<td>Brown and Caldwell</td>
<td>Facilitator Session 23</td>
</tr>
<tr>
<td>Tanja Rauch-Williams</td>
<td>Carollo Engineers</td>
<td>Facilitator Session 21</td>
</tr>
<tr>
<td>Ajay Nair</td>
<td>Microvi</td>
<td>Presenter Session 03</td>
</tr>
<tr>
<td>Gregory Pace</td>
<td>Manhattan College</td>
<td>Presenter Session 25</td>
</tr>
<tr>
<td>Eric Redmond</td>
<td>Black &amp; Veatch</td>
<td>Presenter Session 04</td>
</tr>
<tr>
<td>Neri Nathan</td>
<td>Fluence</td>
<td>Presenter Session 02</td>
</tr>
<tr>
<td>Adam Parmenter</td>
<td>HDR Inc</td>
<td>Facilitator Session 27</td>
</tr>
<tr>
<td>Matt Reeve</td>
<td>SUEZ Water</td>
<td>Technologies &amp; Solutions Presenter Session 02, Session 08</td>
</tr>
<tr>
<td>Pusker Regmi</td>
<td>Brown and Caldwell</td>
<td>Facilitator Session 10, Presenter Session 13</td>
</tr>
<tr>
<td>Kate Newhart</td>
<td>West Point</td>
<td>Facilitator Session 12</td>
</tr>
<tr>
<td>Jeff Peeters</td>
<td>SUEZ Water</td>
<td>Technologies &amp; Solutions Presenter Session 02</td>
</tr>
<tr>
<td>Matthew Poe</td>
<td>HRSD</td>
<td>Presenter Workshop D</td>
</tr>
<tr>
<td>Nam Ngo</td>
<td>DC Water</td>
<td>Presenter Session 16</td>
</tr>
</tbody>
</table>
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\nPresenter 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
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
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
Current Methods
Always Available

Rapid access to the solutions you need.
One click away.

Standard Methods Online is the gold standard for the examination of water and wastewater. Now more easily accessible in its digital format, this peer-reviewed solution remains your go-to guide for all things compliance, while providing the timeliest updates. Essential information, analysis, and techniques are packed into one reliable platform.

Find solutions at standardmethods.org
Local Connections, Global Ideas

Our clients face tough decisions with limited resources. That’s why we support leading water associations—like WEF—to help make great things possible for our industry.

hdrinc.com | WEF Specialty Conferences Bronze Elite Sponsor