The 2018 International Symposium on Potable Reuse will bring water industry professionals from around the world to discuss the most important and challenging issues associated with both direct and indirect potable reuse. The event is designed to engage attendees as active participants in facilitated discussions to foster collaboration, the exchange of ideas, and the advancement of the global discourse.

WHO ATTENDS
• Water reuse, wastewater, and drinking water treatment professionals
• Water utility management and executives
• Local, state, and federal government agencies
• Water quality specialists
• Public affairs managers
• Scientists & Researchers
• Academics & Students
• Industry Consultants

The 2018 International Symposium on Biological Treatment will explore the latest developments in biological treatment technology, operations, and monitoring strategies. This symposium will dissect the benefits of engineered and passive biological systems from both the research and utility perspectives.

WHO ATTENDS
• Water Treatment Professionals
• Microbiologists
• Local, state, and federal government agencies
• Academics & Students
• Scientists & Researchers
• Industry Consultants

TECHNICAL SESSIONS

INTERNATIONAL SYMPOSIUM ON POTABLE REUSE
January 22–23, 2018 | Austin, TX
awwa.org/potablereuse

INTERNATIONAL SYMPOSIUM ON BIOLOGICAL TREATMENT
January 24–25, 2018 | Austin, TX
awwa.org/biological

TECHNICAL SESSIONS

MON01 Opening Plenary Session
MON02 Source Control
MON03 Focus on Microbiology
MON04 Water Quality Characterization
MON05 Monitoring Methods and Technologies
MON06 Public Engagement
MON07 Water Quality Analytics and Metrics
MON08 Potable Reuse Posters

TUE01 Day 2 Plenary Session: History of Reuse
TUE02 Novel Potable Reuse Strategies
TUE03 Progression of Advanced Oxidation
TUE04 Environmental Buffers: A Critical Assessment
TUE05 Ozone-BAC Processes
TUE06 Resource Regulation and Risk
TUE07 Treatment Frontiers
TUE08 Closing Plenary Session

WED01 Opening Plenary Session
WED02 Biofiltration in Reuse Applications
WED03 Biological Groundwater Treatment Part I: Optimization
WED04 Emerging Approaches for Biofiltration
WED05 Biological Groundwater Treatment Part II: Implementation
WED06 Converting to Biofiltration
WED07 Biological Groundwater Treatment Part III: Success Stories from the Field
WED08 Biological Treatment Posters

THU01 Impact of Temperature on Operational Strategies
THU02 Monitoring and Control of Biofiltration
THU03 Biofilters and Oxidants: Improved System Performance
THU04 New Metrics for Biofiltration
THU05 Improving Biological Processes Part I: Means and Methods
THU06 Evaluating Biological Processes
THU07 Improving Biological Processes Part II: Operations and Impacts
THU08 Innovative Approaches to Biological Processes
<table>
<thead>
<tr>
<th>Time</th>
<th>Track 1 Planning and Implementation</th>
<th>Track 2 Treatment and Monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30–10:00 AM</td>
<td><strong>MON01: Opening Plenary Session</strong></td>
<td><strong>MON02: Source Control</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Opening Remarks:</strong> Brent Alspach, Arcadis, Conference Chair Robert Mace, TCEQ</td>
<td><strong>Moderator:</strong> Bruce Husselbee, Hampton Roads Sanitation District</td>
</tr>
<tr>
<td></td>
<td>“Fifty Years of Pipe-to-Pipe DPR: The Windhoek Reclamation Experience,” Pierre van Rensburg, Windhoek Goreangab Operating Company</td>
<td><strong>MON03: Focus on Microbiology</strong></td>
</tr>
<tr>
<td>10:00–10:30 AM</td>
<td><strong>MON02: Source Control</strong></td>
<td><strong>Moderator:</strong> Grace Jang, Water Research Foundation</td>
</tr>
<tr>
<td>10:30 AM–12:00 PM</td>
<td><strong>MON04: Source Control</strong></td>
<td><strong>MON05: Monitoring Methods and Technologies</strong></td>
</tr>
<tr>
<td>10:30 AM</td>
<td>360 Source Control—Using Principles From Water And Wastewater To Develop An Enhanced Source Control Program For Potable Reuse Penny Carlo, Carollo Engineers, Inc.</td>
<td><strong>Moderator:</strong> Kevin Hardy, National Water Research Institute</td>
</tr>
<tr>
<td>10:50 AM</td>
<td>HRSD’s Data Driven and Communicative Source Control Strategy to Ensure Finished Water Quality for its 120 MGD Managed Aquifer Recharge Program Chris Wilson/ Craig Forbes, Hampton Roads Sanit Dist.</td>
<td>**Use of Next Generation Sequencing to Track Removal of Microorganisms in an Advanced Water Treatment Facility Menu Leddy, Orange County Water District (OCWD)</td>
</tr>
<tr>
<td>11:10 AM</td>
<td>TBD</td>
<td>**Occurrence and Attenuation of Sensory Compounds in Recycled Water: Comparison to Drinking Water Al Jia, Metropolitan Water District of Southern California</td>
</tr>
<tr>
<td>11:30 AM</td>
<td>Facilitated Discussion with Audience and Speakers</td>
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<tr>
<td>12:00–1:30 PM</td>
<td><strong>MON04: Water Quality Characterization</strong></td>
<td><strong>MON06: Public Engagement</strong></td>
</tr>
<tr>
<td>1:30–3:00 PM</td>
<td><strong>Moderator:</strong> Jeff Mosher, Water Environment &amp; Reuse Foundation</td>
<td><strong>Moderator:</strong> Patsy Tennyson, Katz &amp; Associates</td>
</tr>
<tr>
<td>1:30 PM</td>
<td>Microbial Quality and Risk: Assessment of Alternative Sources of Drinking Water Impacted by Waste Water Emily Bailey, University of North Carolina</td>
<td><strong>MON07: Water Quality Analytics and Metrics</strong></td>
</tr>
<tr>
<td>1:50 PM</td>
<td>Pathogen Reduction and Variability In Wastewater Treatment to Establish Log Removal Credits for Direct Potable Reuse Carla Cherchi, MWH Americas, Inc.</td>
<td><strong>Moderator:</strong> Megan Plumlee, Orange County Water District</td>
</tr>
<tr>
<td>2:10 PM</td>
<td>Studying an Unplanned Indirect Potable Reuse Scheme to Design a Planned One in a Similar Hydro-Ecological Context Emmanuel SOYEUX, Veolia Recherche &amp; Innovation</td>
<td>**Markers for Adequate Reduction of Viruses Throughout Direct Potable Reuse Schemes Bradley Schmitz, National University of Singapore</td>
</tr>
<tr>
<td>2:30 PM</td>
<td>Facilitated Discussion with Audience and Speakers</td>
<td>**Non-Targeted Analysis to Characterize Trace Organics in Reverse Osmosis and UVAOP Product Waters of a Potable Reuse Facility Eunha Hoh, San Diego State University</td>
</tr>
<tr>
<td>3:00–3:30 PM</td>
<td><strong>MON06: Public Engagement</strong></td>
<td>**Advanced Analytics and Water Quality for Direct Potable Reuse for a Demonstration Facility in San Francisco Andrew Salveson, Carollo Engineers</td>
</tr>
<tr>
<td>3:30–5:00 PM</td>
<td><strong>Moderator:</strong> Patsy Tennyson, Katz &amp; Associates</td>
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<tr>
<td>3:30 PM</td>
<td>Panel Discussion</td>
<td><strong>MON08: Water Quality and Metrics</strong></td>
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<tr>
<td>3:50 PM</td>
<td>Caroline Scruggs, University of New Mexico</td>
<td><strong>Moderator:</strong> Megan Plumlee, Orange County Water District</td>
</tr>
<tr>
<td>4:10 PM</td>
<td>Mark Milian, Data Instincts, Public Outreach Consultants</td>
<td>**Markers for Adequate Reduction of Viruses Throughout Direct Potable Reuse Schemes Bradley Schmitz, National University of Singapore</td>
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<td>4:30 PM</td>
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</tbody>
</table>
| 8:30–9:30 AM | **Day 2 Plenary Session—Potable Reuse: Past, Present, and Future**  
**Moderator:** Erica Brown, Association of Metropolitan Water Agencies  
PAST: Chanute 1956: America’s First Foray in Potable Reuse  
John Gaston  
PRESENT: Successes and Challenges of Today’s Potable Reuse Facilities  
Mike Markus, Orange County Water District  
FUTURE: Re-Imagining Wastewater Treatment for Direct Potable Reuse  
Desmond Lawler, University of Texas |                                                                                                   |
| 9:30–10:00 AM| **Networking Break**  
**TUE02: Novel Potable Reuse Strategies**  
**Moderator:** Rick Warner, Washoe County Dept. of Water  
Direct Potable Reuse as an Effluent Management Strategy  
Dennis Lozano, Murfee Engineering, Inc.  
Source Water Quality Requirements for Conventional Treatment of Stormwater, Graywater, and Treated Wastewater for Potable Reuse  
Christopher Hill, Arcadis  
Findings and Practical Implications of an On-Site DPR Pilot Study in Ohio: 2013–2016 and Beyond  
Philip Schmidt | **TUE03: Progression of Advanced Oxidation**  
**Moderator:** Kati Bell, Stantec  
The UV-Chlorine AOP in Potable Reuse: When Does It Make Sense?  
Adam Festger, Trojan Technologies  
Impact of The UV Photolysis Of Chloramines on 1,4-Dioxane Removal: New Insights into Potable Water Reuse  
Haizhou Liu, University of California, Riverside-Chem & Env Eng  
Understanding the Impact of Monochloramine Photochemistry on UV/H2O2 Process Performance in Water Reuse Applications  
Mihaela Stefan, Trojan Technologies |
| 10:00–11:30 AM | **TUE04: Environmental Buffers: A Critical Assessment**  
**Moderator:** Emily Remmel, National Association of Clean Water Agencies  
Public Health in Potable Reuse: The Benefits of Reservoirs  
Brian Pecson, Trussell Technologies  
The Role of Environmental Buffers in Potable Water Reuse  
Xueying Wang, UNC Charlotte, CEES  
Preliminary Tests for Direct Water Reuse at the Torreele Facility In Belgium  
Emmanuel Van Houtte, Intercommunale Waterleidingsmaatschappij Van Veurn | **TUE05: Ozone-BAC Processes**  
**Moderator:** Marlo Berg, TCEQ  
Removal of Contaminants During Pilot-Scale Ozone, Biological Activated Carbon, and Granular Activated Carbon for Potable Reuse  
Edgard Verdugo, Southern Nevada Water Authority  
Potable Reuse Ozone-BAC Systems: Simultaneous DBP Precursors and CECs Control, and Design Optimization  
Ruth Marfil-Vega, American Water  
Is Adsorptive Phase GAC Needed After Ozone/BAC for Potable Reuse?  
Robert Angelotti, Upper Occoquan Service Authority |
| 11:00 AM     | Facilitated Discussion with Audience and Speakers | Facilitated Discussion with Audience and Speakers |
| 11:30 AM–1:00 PM | **Lunch on your own** |                                                                                                       |
| 1:00–2:30 PM | **TUE06: Resource Regulation and Risk**  
**Moderator:** Pat Sinicropi, WateReuse Association  
Panel Discussion  
L’Oreal Stepney, Texas Commission on Environmental Quality  
Peter Grevatt, U.S. Environmental Protection Agency  
TBD | **TUE07: Treatment Frontiers**  
**Moderator:** Harold Fravel, American Membrane Technology Association  
Enzymatic Treatment of Pharmaceuticals and Personal Care Products in Wastewater  
John Haugland, University of Texas At Austin  
Recovering More Usable Water and Reducing Concentrate with Photobiological Treatment Followed by Secondary Reverse Osmosis  
Keisuke Ikehata, Pacific Advanced Civil Engineering  
Space Habitation Closed Loop Wastewater Recycling Systems: Applications to Terrestrial Needs  
W. Andrew Jackson, Texas Tech University |
| 2:30–2:45 PM | **Networking Break** |                                                                                                       |
| 2:45–4:15 PM | **TUE08: Closing Plenary Session**  
**Potable Water Reuse: The View from 2038**  
**Closing Remarks:**  
Brent Als chop, Arcadis, Conference Chair |                                                                                                       |
Bench-Scale Testing Of Conventional Drinking Water Treatment Of Wastewater Effluent, Stormwater And Blends With Surface Water
Kyle Thompson

Blending With DPR Water: Impacts On Drinking Water Distribution Systems
Justin Sutherland, Carollo Engineers

Challenges For Orange County’S Groundwater Replenishment System Final Expansion Project
Sandy Scott-Roberts, Orange County Water District

Evaluating Opportunities And Challenges In Developing An Advanced Treatment Demonstration Program: HRSD’S SWIFT Case Study
Lauren Zuravnsky, HRSD

Microfiltration Of Tertiary Effluent For Potable Reuse: Modeling Of Fouling And Mechanisms Of Physically Irreversible Fouling
Kunal Gupta, Texas A&M University

Optimizing Treatment And Protecting Public Health By Leveraging Data And Analytics For Potable Reuse
Jason Curl, CH2M

Partial Nitritation In Membrane Aerated Biological Reactors (Mabrs) Treating High Strength Wastewater
Dylan Christenson, Texas Tech University

Permitting the First Full Advanced Treatment IPR Project for DirectGroundwater Recharge in Florida
Jarrett Kinslow, Tetra Tech

Prospects And Challenges For Sensor Based Control Systems In UV Advanced Oxidation Treatment Systems
Gordon Knight, Trojan Technologies

Renewably Powered Potable Reuse
Christopher McVey, University of California, Santa Cruz

Upstream Wastewater Discharges Impact Two –Thirds Of Surface Water Treatment Plants In Texas, USA
Thuy Nguyen

Virus Control Using Iron Electrocoagulation
Kyungho Kim
# Schedule

## Biological Treatment

**Wednesday, January 24, 2018 | Austin, Texas**

**AWWA.ORG/BIOLOGICAL**

<table>
<thead>
<tr>
<th>Time</th>
<th>Track 1</th>
<th>Track 2</th>
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</table>
| **8:30–10:00 AM** | **WED01: Welcome and Opening Plenary Session**  
The Big Questions from Utilities, Universities, Suppliers, Regulatory, and Consulting | **Networking Break** |
| **10:00–10:30 AM** | **WED02: Biofiltration in Reuse Applications**  
Moderator: Jason Carter, Arcadis |
| **10:30 AM–12:00 PM** | Impacts of Operational Parameters and Water Quality  
On Biofiltration for Potable Reuse Systems  
Leigh Terry  
**WED03: Biological Groundwater Treatment Part I: Optimization**  
Moderator: Brian Noma, Minnesota Department of Health  
Biological Treatment Simultaneously Addresses Multiple Contaminants:  
Ammonia, Arsenic, Iron and Manganese  
Darren Lytle, EPA Office Research and Development | Impacts of Operational Conditions in Ozone-Biofiltration Systems  
On Disinfection Byproduct Formation and Mitigation  
Daniel Gentry, University of Nevada Las Vegas  
Nitrification in Biofilters Treating Groundwater is Stimulated by Dosing of Copper  
Florian Wagner, Technical University of Denmark |
| **10:30 AM** | Impacts of Operational Conditions in Ozone-Biofiltration Systems  
On Disinfection Byproduct Formation and Mitigation  
Daniel Gentry, University of Nevada Las Vegas  
Nitrification in Biofilters Treating Groundwater is Stimulated by Dosing of Copper  
Florian Wagner, Technical University of Denmark | Biological Treatment: Optimization of Nitrification in Biological  
Rapid Sand Filters for Drinking Water Production  
Hans Albrechtsen, Technical University of Denmark |
| **10:30 AM** | Impacts of Operational Parameters and Water Quality  
On Biofiltration for Potable Reuse Systems  
Leigh Terry | Biological Treatment Simultaneously Addresses Multiple Contaminants:  
Ammonia, Arsenic, Iron and Manganese  
Darren Lytle, EPA Office Research and Development |
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On Biofiltration for Potable Reuse Systems  
Leigh Terry | Biological Treatment Simultaneously Addresses Multiple Contaminants:  
Ammonia, Arsenic, Iron and Manganese  
Darren Lytle, EPA Office Research and Development |
| **11:00 AM** | **WED04: Emerging Approaches for Biofiltration**  
Moderator: Chris Owen, Tampa Bay Water |
| **1:30–3:00 PM** | Biofiltration Knowledge Base and Current State of the Industry (WRF 4459)  
Jason Carter, Arcadis | Two-Staged Fixed-Bed Biological Groundwater Treatment:  
From Piloting to Full-Scale Implementation  
Jess Brown, Carollo Engineers |
| **1:30 PM** | Biofiltration Knowledge Base and Current State of the Industry (WRF 4459)  
Jason Carter, Arcadis | Two-Staged Fixed-Bed Biological Groundwater Treatment:  
From Piloting to Full-Scale Implementation  
Jess Brown, Carollo Engineers |
| **2:00 PM** | Biological Filtration for Simultaneous Removal of Multiple Contaminants (WRF 4559)  
Eric Dickenson, Southern Nevada Water Authority | Sunny Slope Water Company Implements an Innovative Biological Nitrate Removal System  
Andrew Findlay, Microvi Biotechnologies |
| **2:30 PM** | TBD | Biological Filtration of Groundwater for Low-Level Hydrogen Sulfide Removal  
Keisuke Ikehata, Pacific Advanced Civil Engineering |
| **3:30–5:00 PM** | **WED06: Converting to Biofiltration**  
Moderator: Chris Owen, Tampa Bay Water | **WED07: Biological Groundwater Treatment Part III: Success Stories from the Field**  
Moderator: Brian Noma, Minnesota Department of Health |
| **3:30 PM** | Converting Conventional Filters to Biofilters (WRF 4496)  
Orren Schneider, American Water | Biological Filtration for Ammonia and Iron Removal With Greensand  
Manganese Treatment for the City of St. Martin, Minnesota  
Jeremy Wurpts, Tonka Water |
| **4:00 PM** | A Tale of Two Conversions: Dallas Water Utilities East Side WTP  
Kimberlie Brashear | Cold-Tolerant Microbial Community and Mn Oxides in a Successfully  
Accelerated Biofiltration Unit at Low On-Site Temperatures  
Wonjae Chang, University of Saskatchewan |
| **4:30 PM** | Converting From Conventional Filtration to Biological Filtration at the 160 Mgd Bachman WTP  
Greg Pope, Carollo Engineers | An Investigation on Operational and Process Aspects of Low Temperature Iron (Fe)  
and Manganese (Mn) Biofilters to Reduce the Long Acclimation Period  
Babak Roshani, Delco Water |
<p>| <strong>5:00–6:30 PM</strong> | <strong>Networking Reception/Poster Session</strong> | <strong>Networking Reception/Poster Session</strong> |</p>
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<tr>
<td><strong>8:30–10:00 AM</strong></td>
<td><strong>THU01: Impact of Temperature and Operational Strategies</strong>&lt;br&gt;Moderator: Eva Nieminski, Utah Department of Environmental Quality</td>
<td><strong>THU02: Monitoring and Control of Biofiltration</strong>&lt;br&gt;Moderator: David Tracey, Luminultra</td>
</tr>
<tr>
<td>8:30 AM</td>
<td>Biofiltration at Low Temperatures - Does it Work?&lt;br&gt;Peter Huck, University of Waterloo Civ. Eng.</td>
<td>Practical Monitoring Tools for the Biological Processes in Biofiltration (WRF 4620)&lt;br&gt;Jennifer Hooper, CDM Smith</td>
</tr>
<tr>
<td>9:00 AM</td>
<td>Environmentally Sustainable Scenarios for Biofilters: Evaluating the Effects of DOM Character, Extended EBCT and Temperature&lt;br&gt;Leigh Terry</td>
<td>Using ATP to Monitor and Optimize Biofilter Performance&lt;br&gt;Ashlee Donaher, Luminultra Technologies Ltd.</td>
</tr>
<tr>
<td>9:30 AM</td>
<td>Impact of Shutdown Procedures, Source Water Quality and EBCT on Manganese Removal Through Biofilters Under Winter Conditions&lt;br&gt;Lyda Hakes, Alameda County Water District</td>
<td>Integrating ATP Analysis With Metagenomics for Understanding Biofiltration&lt;br&gt;Amina Stoddart, Centre For Water Resources Studies Dalhousie Unive</td>
</tr>
<tr>
<td><strong>10:00–10:30 AM</strong></td>
<td>Networking Break</td>
<td></td>
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<tr>
<td><strong>10:30 AM–12:00 PM</strong></td>
<td><strong>THU03: Biofilters and Oxidants: Improved System Performance</strong>&lt;br&gt;Moderator: Eva Nieminski, Utah Department of Environmental Quality</td>
<td><strong>THU04: New Metrics for Biofiltration</strong>&lt;br&gt;Moderator: David Tracey, Luminultra</td>
</tr>
<tr>
<td>10:30 AM</td>
<td>Breaking Convention: Optimizing Chlorine and Other Oxidants for Improved Biofilter Performance (WRF 4555)&lt;br&gt;Chance Lauderdale</td>
<td>Identification and Quantification of Enzymes Pertinent to Biodegradation in Drinking Water Biofilters&lt;br&gt;Michael McKie</td>
</tr>
<tr>
<td>11:00 AM</td>
<td>Optimizing BAF and Ozonation Downstream of Softening to Combat Cyanotoxins&lt;br&gt;Ashley Evans</td>
<td>Rapid Characterization of Organic Matter For Understanding Impact of Enhanced Biofiltration&lt;br&gt;Nicolas Peleato, University of Toronto</td>
</tr>
<tr>
<td>11:30 AM</td>
<td>Ozone-Biofiltration for Controlling Extreme Taste and Odor Events In Arlington, TX&lt;br&gt;Chris Schulz, CDM Smith Inc.</td>
<td>Developing New Metrics to Understand the Availability of Carbon for Biological Processes&lt;br&gt;Lindsay Anderson, Dalhousie University-Civil &amp; Resource Engineering</td>
</tr>
<tr>
<td><strong>12:00–1:30 PM</strong></td>
<td>Lunch on your own</td>
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<td><strong>1:30–3:00 PM</strong></td>
<td><strong>THU05: Improving Biological Processes Part I: Means and Methods</strong>&lt;br&gt;Moderator: Jennifer Hooper, CDM Smith</td>
<td><strong>THU06: Evaluating Biological Processes</strong>&lt;br&gt;Moderator: Mary Jo Kirisits, University of Texas at Austin</td>
</tr>
<tr>
<td>1:30 PM</td>
<td>Improving Nitrification, Hydraulics, and Disinfectant Resistance&lt;br&gt;With Biofilter Nutrient Optimization (WRF 4555)&lt;br&gt;Christina Alito, HDR</td>
<td>Concurrent Removal of Multiple Chemical Contaminants via Biofiltration of Surface Water (WRF 4559)&lt;br&gt;Katherine Greenstein, Las Vegas Valley Water</td>
</tr>
<tr>
<td>2:00 PM</td>
<td>Impact of Phosphorus Limitation on the Microbial Community and Headloss in Bench-scale Drinking Water Biofilters&lt;br&gt;Sarah Keithley, Tighe &amp; Bond</td>
<td>Biofilter Scaling Procedures for Organics Removal – A Potential Alternative to Pilotung&lt;br&gt;Mary Jo Kirisits, University of Texas at Austin</td>
</tr>
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<td>2:30 PM</td>
<td>Comparative Analysis of Performance of Biological Activated Carbon (BAC) Filters With and Without Ozonation (Mn)&lt;br&gt;Peta Thiel, Research Lab Services</td>
<td>Evaluation of Selection for Opportunistic Bacterial Pathogens During Biofiltration in Full-scale Drinking Water Treatment Plant&lt;br&gt;Lutgarde Raskin, University of Michigan</td>
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<td><strong>3:30–5:00 PM</strong></td>
<td><strong>THU07: Improving Biological Processes Part II: Operations and Impact</strong>&lt;br&gt;Moderator: Jennifer Hooper, CDM Smith</td>
<td><strong>THU08: Innovative Approaches to Biological Processes</strong>&lt;br&gt;Moderator: Mary Jo Kirisits, University of Texas at Austin</td>
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<tr>
<td>3:30 PM</td>
<td>Biological Filtration: NDMA Control or Source of Precursors? (WRF 4669)&lt;br&gt;Sarah Page, Arcadis U.S., Inc.</td>
<td>Is It Time To Replace Biological Activated Carbon With Biological Ion Exchange Filters?&lt;br&gt;Nargess Amini, École Polytechnique De Montréal</td>
</tr>
<tr>
<td>4:00 PM</td>
<td>Examination of Biofiltration Operation Strategies for Organics Removal&lt;br&gt;Michael McKie</td>
<td>Impact of Solution Chemistry and Surface Weathering on GAC As an Electron Acceptor in Biological Treatment Systems&lt;br&gt;Asef Redwan, Texas Tech University</td>
</tr>
<tr>
<td>4:30 PM</td>
<td>Where Does Atrazine Go When The TOC Removal Capacity Is Exhausted In Your Filters? (WRF 4559)&lt;br&gt;Ruth Marfil-Vega, American Water</td>
<td>Effect of Oyster Shell and Organic Substrate on the Performance of a PPAD Process&lt;br&gt;Erica Dasi, University of South Florida</td>
</tr>
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</table>
Biofiltration for Ammonia and Nitrate Removal
Ronit Erlitzki, Noaz Sourcing Ltd. Co.

Biological Removal Of Hexavalent Chromium From Drinking Water Sources
Giridhar Upadhyaya, Carollo Engineers

Biostimulation Strategies To Enhance Manganese Removal In Drinking Water Biofilters
Inês Breda, Skanderborg Forsyning A/S

Evidence Of Methanotrophic Co-Metabolic Removal Of The Herbicide Bentazone In Enrichments From A Rapid Sand Filter
Mathilde Hedegaard, DTU Environment

Fate Of Oxidant Residuals During Operation And Backwashing Of Pilot-Scale GAC Biofilters (WRF 4555)
Eric Wert, Southern Nevada Water Authority

Groundwater Biological Filtration for Multi-Contaminants in Iowa
Ronit Erlitzki, Noaz Sourcing Ltd. Co.

High Recovery Biological Denitrification for Groundwater
Ronit Erlitzki, Noaz Sourcing Ltd. Co.

Optimizing Organics And Cecs Removal Using Ozonation And Biofiltration For Aquifer Recharge
Ramola Vai Dya

Potential For Pesticide Removal In Biological Rapid Sand Filters From Groundwater-Based Waterworks
Mathilde Hedegaard, DTU Environment

Rapid Monitoring For Pathogens In Potable Water
Paul McCright, OEX, Inc

Riverbank Filtration As A Tool For Expanding Water Supplies
Daniel Haddock, INTERA

Softening & Biofiltration Do Mix!
Nicholas Burns, Black & Veatch

Tests With Willow Trees For Treatment Of Reverse Osmosis Concentrate At The Torreele Reuse Facility In Belgium
Emmanuel Van Houtte, Intercommunale Waterleidingsmaatschappij Van Veurn
REGISTRATION
Early Registration Deadline: Friday, Dec 8, 2017

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<th>Nonmember Rate through Dec 8</th>
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<tr>
<td>Full-Conference (One Symposium)</td>
<td>$495</td>
<td>$695</td>
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<tr>
<td>Full-Conference (Both Symposia)</td>
<td>$595</td>
<td>$795</td>
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<td>One-Day Only</td>
<td>$375/$325</td>
<td>$575/$525</td>
</tr>
<tr>
<td>Student</td>
<td>$60</td>
<td>$90</td>
</tr>
<tr>
<td>Professor</td>
<td>$395</td>
<td>$595</td>
</tr>
</tbody>
</table>

LOCAL HOST

CONTINUING EDUCATION CREDITS
AWWA awards attendees Continuing Education Units (CEUs) for technical sessions. If you would like to have further information regarding AWWA CEUs and PDHs, visit awwa.org/credits.

HOTEL INFORMATION
AT&T Executive Education and Conference Center
244 W 20th St.
Austin, TX 78705

AWWA has negotiated a group room block rate of $214/night plus taxes.