

**RESEARCH**

**THE LIFEBLOOD OF INNOVATION**



19<sup>th</sup> ANNUAL  
**WATERREUSE**

RESEARCH CONFERENCE

THE WATERFRONT BEACH RESORT | HUNTINGTON BEACH, CA • MAY 4-5, 2015

#ReuseResearch

# MONDAY, MAY 4 | 2015

7:45 a.m. – 3:00 p.m.	Registration Open – <i>Waterfront Ballroom Foyer</i>	
7:45 a.m. – 8:30 a.m.	Continental Breakfast – <i>Dolphin Room</i>	
8:30 a.m. – 9:45 a.m.	<b>Opening Session</b> Moderator: <i>Doug Owen, ARCADIS</i> Room: <i>Waterfront Ballroom A-C</i> Keynote: <i>Frances Spivy-Weber, Vice Chair, State Water Resources Control Board</i> Speakers: EPA - ORD's Safe and Sustainable Water Resources Research Program: Future Directions <i>Chris Impellitteri, U.S. Environmental Protection Agency</i> Water Research Foundation's One Water Direction - <i>Chris Rayburn, Water Research Foundation</i>	
9:45 a.m. – 10:15 a.m.	Networking Break – <i>Dolphin Room</i>	
9:45 a.m. – 10:15 a.m.	Poster Presentations – <i>Dolphin Room</i>	
	<b>A1</b> <b>Ensuring the Safety of Direct Potable Reuse</b>  Moderator: <i>Andrew Salveson, Carollo Engineers</i> Room: <i>Waterfront Ballroom D&amp;E</i>	<b>B1</b> <b>Innovative Treatment Technologies</b>  Moderator: <i>Jean Debroux, Kennedy/Jenks Consultants</i> Room: <i>Pacific Ballroom</i>
10:15 a.m. – 10:45 a.m.	Achieving Reliability in Potable Reuse through Enhanced Treatment and Monitoring  <i>Brian Pecson, Trussell Technologies</i>	Pilot Scale Operation Does not Always Reflect Full Scale Implementation  <i>Diane Gatzka, West Basin Municipal Water District</i>
10:45 a.m. – 11:15 a.m.	From Groundwater Recharge to Surface Water Augmentation, and Direct Potable Reuse in California  <i>Brian Bernados, California State Water Resources Control Board</i>	Treatment Options for Water Reuse in the Food Industry: A Bench-Scale Study of Leafy-Green Washwater  <i>ShihChi Weng, Johns Hopkins University</i>
11:15 a.m. – 11:45 a.m.	Quantitative Relative Risk Assessments for Direct Potable Reuse  <i>Margie Nellor, Nellor Environmental Associates, Inc.</i>	Pilot Test of Nanofiltration Membranes for a Novel Approach to Water Reclamation  <i>Robert McCandless, Brown and Caldwell</i>
11:45 a.m. – 12:15 p.m.	What Monitoring Tools do we Need to Ensure the Safety of Direct Potable Reuse?  <i>Allegra da Silva, CDM Smith</i>	Integrated UV Oxidation and Ceramic Membrane Treatment for Challenging Waters  <i>Josh Alvey, University of Alaska, Anchorage</i>

# MONDAY, MAY 4 | 2015

12:15 p.m. – 1:15 p.m.	Awards Luncheon and Subscriber Meeting Room: <i>Waterfront Ballroom A-C</i>	
	<b>A2</b> <b>DPR Operations and Water Quality</b>  <i>Moderator: Mehul Patel, Orange County Water District</i> Room: <i>Waterfront Ballroom D&amp;E</i>	<b>B2</b> <b>Reuse Planning and Case Studies</b>  <i>Moderator: Zach Gallagher, Natural Systems Utilities</i> Room: <i>Pacific Ballroom</i>
1:15 p.m. – 1:45 p.m.	<b>Readying Operations for Direct Potable Reuse</b>  <i>Troy Walker, Hazen and Sawyer</i>	<b>Achieve Increased Production Reliability and Production Capacity by up Rating the Recycled Water Filtration</b>  <i>Jessica Zadeh, South Bay Water Recycling</i> <i>Gordon Williams, Trussell Technologies</i>
1:45 p.m. – 2:15 p.m.	<b>Real-time and Online Integrity Monitoring of Reverse Osmosis Membranes for Direct Potable Reuse Applications</b>  <i>Joe Jacangelo, MWH</i>	<b>Pilot Testing El Paso’s Advanced Purified Water Treatment Plant</b>  <i>Caroline Russell, ARCADIS</i>
2:15 p.m. – 2:45 p.m.	<b>Evaluation of Source Water Control Options and the Impact of Selected Strategies on Direct Potable Reuse</b>  <i>Alan Rimer, Black &amp; Veatch</i>	<b>Evolution of Reuse Planning in the City of Riverside</b>  <i>Steve Friedman, HDR</i>
2:45 p.m. – 3:15 p.m.	<b>Odorous Compounds: A Potential Barrier to Potable Reuse?</b>  <i>Florence Bonvin, University of California, Berkeley</i>	<b>Expanding Tucson’s Recycled Water Program from a Foundation of Past Success</b>  <i>Corin Marron, ARCADIS</i> <i>Jeff Biggs, City of Tucson Water Department</i>
3:15 p.m. – 3:45 p.m.	Networking Break – <i>Dolphin Room</i>	
3:15 p.m. – 3:45 p.m.	Poster Presentations – <i>Dolphin Room</i>	

**MONDAY, MAY 4 | 2015**

	<b>A3</b>	<b>Panel Discussion: Critical Control Points for Potable Reuse</b>  Moderator: <i>Jim Crook, Environmental Consultant</i> Room: <i>Waterfront Ballroom D&amp;E</i>	<b>B3</b>	<b>Low Energy Treatment Schemes</b>  Moderator: <i>Eric Owens, West Basin Municipal Water District</i> Room: <i>Pacific Ballroom</i>
3:45 p.m. – 4:15 p.m.		<i>Troy Walker, Hazen and Sawyer</i>  <i>Dave MacNevin, Tetra Tech</i>		Development and Testing of a Novel Low-Energy Wastewater Treatment Process for Producing High-Quality Product Water  <i>Robert Zellers, University of Nevada, Reno</i>
4:15 p.m. – 4:45 p.m.		<i>Mehul Patel, Orange County Water District</i>		Impacts of NPXpress Process on Energy, Nitrous Oxide Emissions, and Microbial Ecology in Wastewater Treatment Plants  <i>Mark LeChevallier, American Water</i>
4:45 p.m. – 5:15 p.m.		<i>Andrew Salveson, Carollo Engineers</i>  <i>Roshanak Aflaki, City of Los Angeles Department of Public Works</i>		Emerging Technologies, Energy Use, and Approaches for Advanced Oxidation and Disinfection  <i>Andrew Salveson, Carollo Engineers</i>
5:30 p.m. – 7:00 p.m.		Welcome Reception – <i>Hotel Pool</i>		



## TUESDAY, MAY 5 | 2015

7:45 a.m. – 3:00 p.m.	Registration Open – <i>Waterfront Ballroom Foyer</i>	
7:45 a.m. – 8:30 a.m.	Continental Breakfast – <i>Dolphin Room</i>	
	<b>A4</b> <b>Treatment for Indirect Potable Reuse</b>  Moderator: <i>Tom Richardson, RMC Water and Environment</i> Room: <i>Waterfront Ballroom D&amp;E</i>	<b>B4</b> <b>Disinfection Byproducts</b>  Moderator: <i>Ben Stanford, Hazen and Sawyer</i> Room: <i>Pacific Ballroom</i>
8:30 a.m. – 9:00 a.m.	<b>Comparison of Two Disinfection Strategies Prior to Soil Aquifer Treatment for Potable Reuse</b>  <i>Reymundo Trejo, Upper San Gabriel Valley Municipal Water District</i> <i>Shane Trussell, Trussell Technologies</i>	<b>Chlorinated and Brominated Disinfection Byproducts of Selected Pharmaceuticals and Personal Care Products in Secondary and Tertiary Treated Wastewaters from Southern California</b>  <i>Eric Nelson, Sanitation Districts of Los Angeles County</i>
9:00 a.m. – 9:30 a.m.	<b>A Full-Scale Demonstration Study Comparing UV/Chlorine and UV/H<sub>2</sub>O<sub>2</sub> for the Treatment of 1,4-Dioxane in Potable Reuse</b>  <i>Alan Royce, Trojan Technologies</i>	<b>Rejection of N-nitrosamines and their Precursors during Reverse Osmosis Membrane Treatment in Water Reclamation Plants</b>  <i>Haruka Takeuchi, Kyoto University</i>
9:30 a.m. – 10:00 a.m.	<b>Treatment Sustainability as a Tool in Water Reuse Treatment Train Configuration</b>  <i>Keel Robinson, Xylem</i>	<b>Predicting DBP Formation Using Hybrid QM/MM Computational Methods</b>  <i>Harry Ridgway, AquaMem Scientific Consultants</i>
10:00 a.m. – 10:30 a.m.	Networking Break – <i>Dolphin Room</i>	
10:00 a.m. – 10:30 a.m.	Poster Presentations – <i>Dolphin Room</i>	
	<b>A5</b> <b>Novel Technologies for Potable Reuse</b>  Moderator: <i>Shane Trussell, Trussell Technologies</i> Room: <i>Waterfront Ballroom D&amp;E</i>	<b>B5</b> <b>Pathogens and Disinfection</b>  Moderator: <i>Joe Jacangelo, MWH</i> Room: <i>Pacific Ballroom</i>
10:30 a.m. – 11:00 a.m.	<b>Removing Trace Organic Contaminants Using Biofiltration in Potable Reuse Systems</b>  <i>Marco Velarde, Southern Nevada Water Authority</i>	<b>Lessons Learned from UV System Performance Audits for Reuse Applications</b>  <i>Traci Brooks, Carollo Engineers</i>

## TUESDAY, MAY 5 | 2015

11:00 a.m. – 11:30 a.m.	<p>Role of Chlorine Radical Species in Advanced Oxidation Process Treatment of Wastewaters for Direct or Indirect Potable Reuse</p> <p><i>Stephen Mezyk, California State University at Long Beach</i></p>	<p>Occurrence of Legionella in Reclaimed Water</p> <p><i>Mark LeChevallier, American Water</i></p>
11:30 a.m. – 12:00 p.m.	<p>Forward Osmosis Membrane Bioreactor Performance for Wastewater Treatment Applications</p> <p><i>Ally Freitas, University of Nevada, Reno</i></p>	<p>Next Generation Sequencing Reveals Potential Surrogates for Performance Monitoring of Graywater Recycling Systems</p> <p><i>Brian Zimmerman, U.S. Environmental Protection Agency</i></p>
12:00 p.m. – 12:30 p.m.	<p>Peroxone Mineralization of Non-Biodegradable Organics for Direct Potable Water Reuse</p> <p><i>Tingting Wu, University of Alabama, Huntsville</i></p>	<p>Disinfection and Regrowth of Model Pathogens in a Graywater Reuse Treatment System</p> <p><i>Susan De Long, Colorado State University</i></p>
12:30 p.m. – 1:30 p.m.	<p>Luncheon Presentation – The Momentum of DPR: Drought, Technology, and Acceptance Accelerating the Path Forward</p> <p>Room: <i>Waterfront Ballroom A-C</i></p> <p><i>George Tchobanoglous, University of California, Davis</i></p>	
	<p><b>A6</b> <b>Development of a Framework for Direct Potable Reuse Guidelines</b> <i>Results of the NWRI/WateReuse Association Expert Panel</i></p> <p>Moderator: <i>Jeff Mosher, National Water Research Institute</i> Room: <i>Waterfront Ballroom D&amp;E</i></p>	<p><b>B6</b> <b>Desalination Technologies and Concentrate Management</b></p> <p>Moderator: <i>Saied Delagah, USBR</i> Room: <i>Pacific Ballroom</i></p>
1:30 p.m. – 2:00 p.m.	<p><i>George Tchobanoglous, University of California, Davis</i></p> <p><i>Andrew Salveson, Carollo Engineers</i></p> <p><i>Shane Trussell, Trussell Technologies</i></p>	<p>Application of Electrodialysis for By-Products Recovery from Saline Brine to Balance Costs of Zero Discharge</p> <p><i>Elisabeth Vaudevire, PWN Technologies</i></p>
2:00 p.m. – 2:30 p.m.	<p><i>Joe Cotruvo, Joseph Cotruvo &amp; Associates</i></p> <p><i>Ellen McDonald, Alan Plummer Associates</i></p>	<p>Improved Bubble Column Desalination and Sterilization</p> <p><i>Muhammad Shahid, University of New South Wales, Australia</i></p>
2:30 p.m. – 3:00 p.m.		<p>Sweeping Gas Membrane Distillation in Flat Sheet Membrane Contactor</p> <p><i>Vicky Karanikola, University of Arizona</i></p>

**TUESDAY, MAY 5 | 2015**

3:00 p.m. –  
3:30 p.m.

Networking Break – *Dolphin Room*

3:00 p.m. –  
3:30 p.m.

Poster Presentations – *Dolphin Room*

3:30 p.m. –  
4:45 p.m.

**Closing Research Needs Plenary Session**

Moderator: *Mark LeChevallier, American Water*  
Room: *Waterfront Ballroom A-C*

*Phil Rolchigo, Pentair*

*Joan Oppenheimer, MWH*

*George Tchobanoglous, University of California, Davis*

*Chris Impellitteri, U.S. Environmental Protection Agency*

*Michael Wehner, Orange County Water District*

4:45 p.m. –  
5:00 p.m.

Conference Summary and Closing Remarks  
*Melissa Meeker, Executive Director, WaterReuse*



**WATERREUSE**

# POSTER PRESENTATIONS

## **Are Ceramic Membranes Better Choice for Treating Highly Challenging Feed Water**

*Ufuk Erdal, CH2M HILL*

## **Challenges for Large Scale Application of Microbial Fuel Cell for Wastewater Treatment Prior Irrigation Water Reuse**

*Carole Abourached, Oregon State University*

## **Deep Well Placement of Biosolids with Other Waste Water Residuals**

*Diane Jones, City of Los Angeles*

## **Depth Filtration with Microfiber Cloth Enhances Performance of Ultrafiltration as Pretreatment to Seawater Desalination Systems**

*Terence Reid, Aqua-Aerobic Systems*

## **Effects of Pre-Ozonation on Organic Fouling Reduction in Nanofiltration (NF) Brine**

*Minkyu Park, University of Arizona*

## **Novel Photothermal Nanocomposite Membranes for Direct Solar Membrane Distillation**

*Jinjian Wu, Rice University*

## **Optimization of Ozone-Biological Activated Carbon Treatment for Potable Reuse Applications**

*Ashley Selvy, University of Nevada, Las Vegas*

## **Optochemically-Realistic Greywater: Synthetic Water Matrices for Characterization of Direct Photochemical Greywater Recycling**

*Vivek Rao, University of California, Berkeley*

## **Regional Stormwater Capture and Reuse for Upper Newport Bay Estuarine Resource Protection and Aquifer Recharge, Newport Beach, CA**

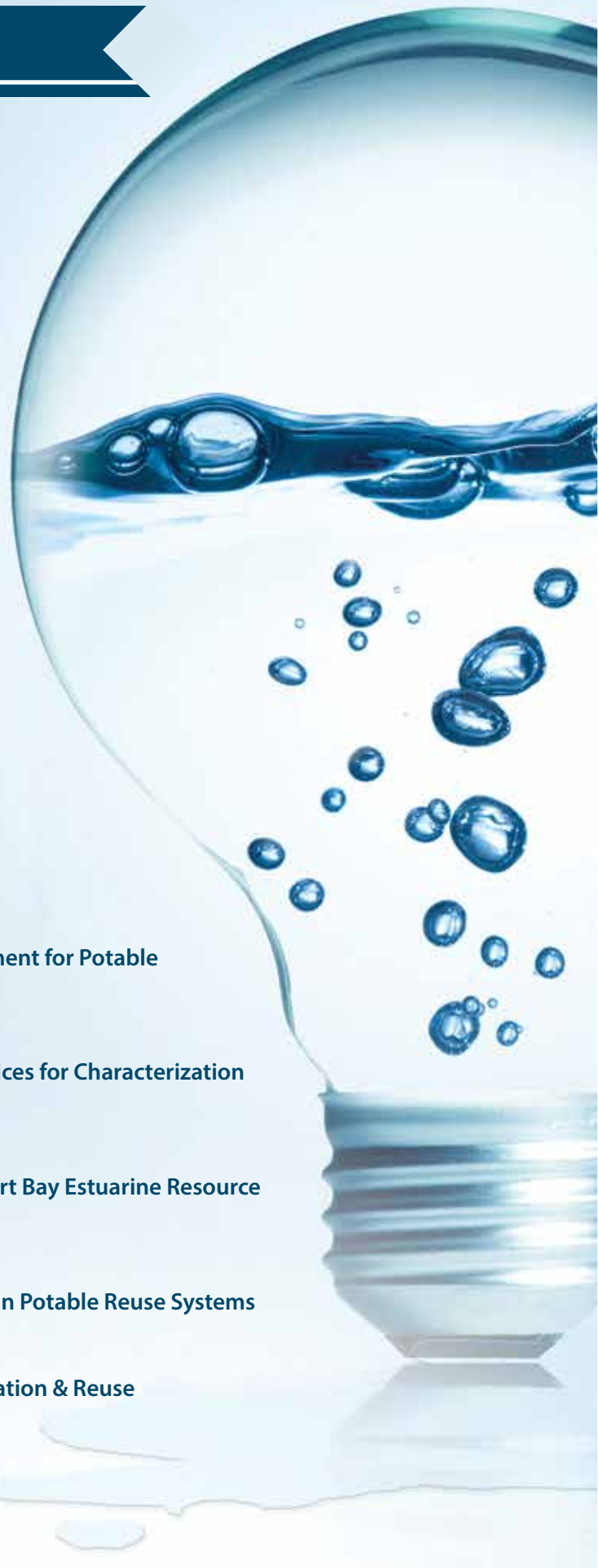
*John Dodge, Daniel B. Stephens & Associates, Inc.*

## **Using Carbon Adsorbents to Remove Perfluoroalkyl Acids in Potable Reuse Systems**

*Mandu Ime Inyang, Las Vegas Valley Water District*

## **Water Savings, Reliability & Readiness via Satellite Reclamation & Reuse**

*Jonathan Lanciani, Sustainable Water*





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With eight offices throughout California, **RMC Water and Environment** specializes in water recycling projects, including indirect potable reuse. We are experts in user and demand studies, master planning, customer retrofit, alternative treatment evaluations, blending and exchange options, alternative supply and use studies, and recycled water facilities planning and design.

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SPI  
Three Valleys Municipal Water District  
Upper San Gabriel Valley Municipal Water District  
Western Municipal Water District

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This year's Monday Luncheon will feature a salute to WaterReuse Research Foundation donors providing unprecedented philanthropic support to the organization and its mission during 2014 and 2015.

## DISTINGUISHED LEADERSHIP AWARD – PLEDGE OF \$250,000

*To help the WaterReuse Research Foundation transform organizationally, to grow and meet the needs of a future of greater water reuse.*



## LEADERSHIP AWARD - CONTRIBUTION OF \$100,000

*In support of research projects focused on the human and environmental risks associated with existing and proposed innovative agricultural reuse concepts.*



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**4-5 November, Brisbane, Australia**

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- Feature senior industry and research leaders from the U.S. and Australia
- Highlight international alignment of current applied research
- Identify future challenges to delivering water security
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A full program will be out soon.

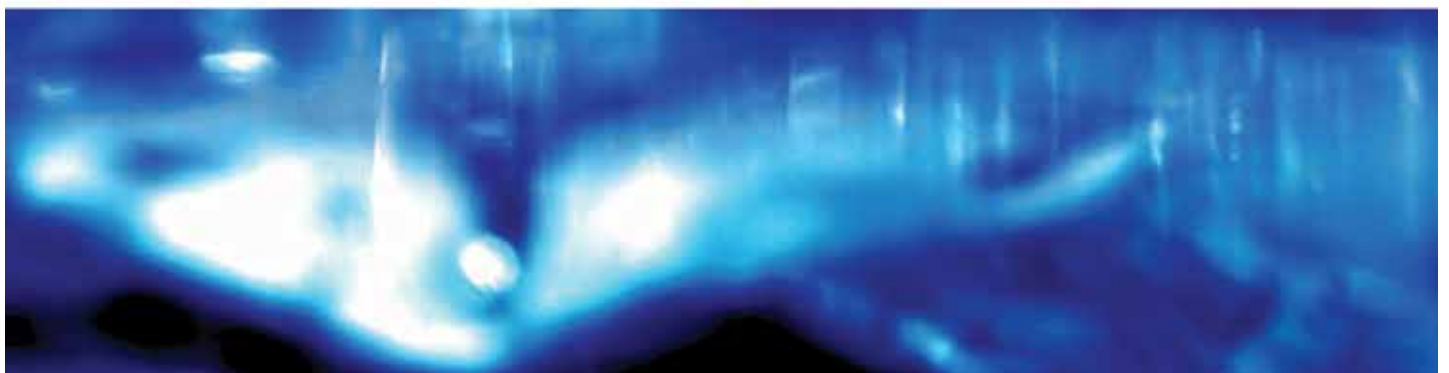


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# WATEREUSE

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