International Ozone Association

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Atlanta Marriott Buckhead Hotel and Convention Center

August 26-29, 2019

CONFERENCE PROGRAM

Special thanks to our Local Host:

Gwinnett Water Resources

Thank you to the following sponsors for their support of the 2019 IOA-PAG Conference!

Welcome – Eric C. Wert, Ph.D., P.E.

President, International Ozone Association – Pan American Group

Thank you for attending the 2019 International Ozone Association – Pan American Group (IOA-PAG) Conference at the Atlanta Marriott Buckhead Hotel and Convention Center! We have a great Conference Program organized by our Administrative and Communications Officer (ACO: Jennifer Fuel) with strong support from Atlanta locals (Denise Funk, Andrew Hodgkinson, and Chloe Cooper).

Two of the most commonly cited benefits of attending an IOA Conference are the strong Technical Program and the great networking opportunities. This year's Technical Program features two parallel sessions with presentations focused on drinking water and water reuse applications. Several sessions highlight the synergy between ozone and biofiltration to meet different water quality objectives, while others investigate the growing interest in ozone for cyanotoxin treatment. On Tuesday afternoon, Round Table Discussions allow attendees to learn more about innovative technology and industrial applications. Please participate in these smaller group discussions and ask more questions than during the usual podium presentations.

There will be many networking opportunities throughout the conference including the Exhibitor's Reception (Monday), Networking Reception at the Georgia Aquarium (Tuesday), and Conference Reception (Wednesday). Please plan to attend these events which are included with your Full Registration. The Exhibit Hall features (19) companies providing equipment related to ozone generation, mass transfer, and monitoring for municipal and industrial applications. Please visit with our exhibitors to learn more about the best new and exciting ozone technologies.

Finally, the IOA-PAG relies on volunteer support to develop and share new knowledge surrounding the ozone industry. We encourage you to contribute to the IOA by participating at a future IOA conference, submitting your work to Ozone: Science & Engineering, or by serving on a committee (Technical, Municipal, Membership, Conference, Young Professionals, etc). If you are interested in getting more involved in the IOA-PAG – please contact a member of the Executive Operating Committee (EOC), our ACO (Jennifer Fuel), or stop by the registration desk for more information.

Enjoy the Conference!

Eric C. Wert, Ph.D., P.E.
Southern Nevada Water Authority
IOA-PAG President, 2018-2019

Schedule at a Glance

	Sunday 8/25/2019	Monday 8/26/2019	Tuesday 8/27/2019	Wednesday 8/28/2019	Thursday 8/29/2019
8:00 AM	Registration				Technical Tour (8AM-3PM)
9:00 AM	IOA-PAG EOC Mtg	IOA PAG Board Meeting	Opening Session	Technical Sessions	
10:00 AM		All Things Ozone Workshop	Coffee Break		**IMPORTANT NOTES:** Tour bus will return to the hotel by 4 PM. Due to the routing, There will NOT be a stop at the airport following this years tour.
11:00 AM			Technical Sessions		
12:00 PM			Lunch		
1:00 PM	IOA Int'l Exec. Mtg	IOA Int'l Board Meeting	Technical Sessions		
2:00 PM					
3:00 PM	Int'l Committee Mtgs		Coffee Break		Legend: Meetings; Technical Program; Special Event
4:00 PM		Committee & Task Force Meetings	Roundtable Discussions	Technical Sessions	
5:00 PM			Networking Reception - Georgia Aquarium	Conference Reception	**Exhibitors Schedule** **Setup** Monday 12:00 - 5:00 PM **Exhibits Open** Tuesday 9:45 AM - 5:00 PM Wednesday 8:00 AM - 3:45 PM **Tear Down** Wednesday 3:45 - 6:00 PM
6:00 PM					
7:00 PM		Exhibitors Reception			
8:00 PM					
9:00 PM					
10:00 PM					

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Program at a Glance

Sunday, August 25, 2019

9:00 – 12:00 PM	IOA-PAG EOC Meeting	Heritage C
1:00 – 3:00 PM	IOA International EOC Meeting	Heritage C
3:00 – 5:00 PM	Committee Meetings	Heritage C

Monday, August 26, 2019

8:00 – 5:00 PM	Registration Open	Prefunction
9:00 – 4:30 PM	Ozone Basics Workshop	Buckhead A/B
9:00 – 12:00 PM	IOA-PAG Board Meeting	Suwannee
1:00 – 4:00 PM	IOA International Board Meeting	Suwannee
4:30 – 6:30 PM	Committee & Task Force Meetings	Augusta
7:00 – 10:00 PM	Welcome Exhibitor's Reception	Heritage Ballroom

Tuesday, August 27, 2019

7:00 – 5:00 PM	Registration Open	Prefunction
7:00 – 8:30 AM	Breakfast	Lenox Dining (1st Floor)
8:30 – 9:30 AM	Opening Plenary	Buckhead A
9:45 – 10:30 AM	Break – Exhibit Hall	Heritage Ballroom
10:30 – 12:00 PM	Technical Sessions	Buckhead A/B
12:00 – 1:30 PM	Lunch	Lenox Dining (1st Floor)
1:30 – 3:00 PM	Technical Sessions	Buckhead A/B
3:00 – 3:45 PM	Break – Exhibit Hall	Heritage Ballroom
3:45 – 5:15 PM	Round Table Discussions	Heritage Ballroom
5:30 – 9:00 PM	Networking Reception	Georgia Aquarium

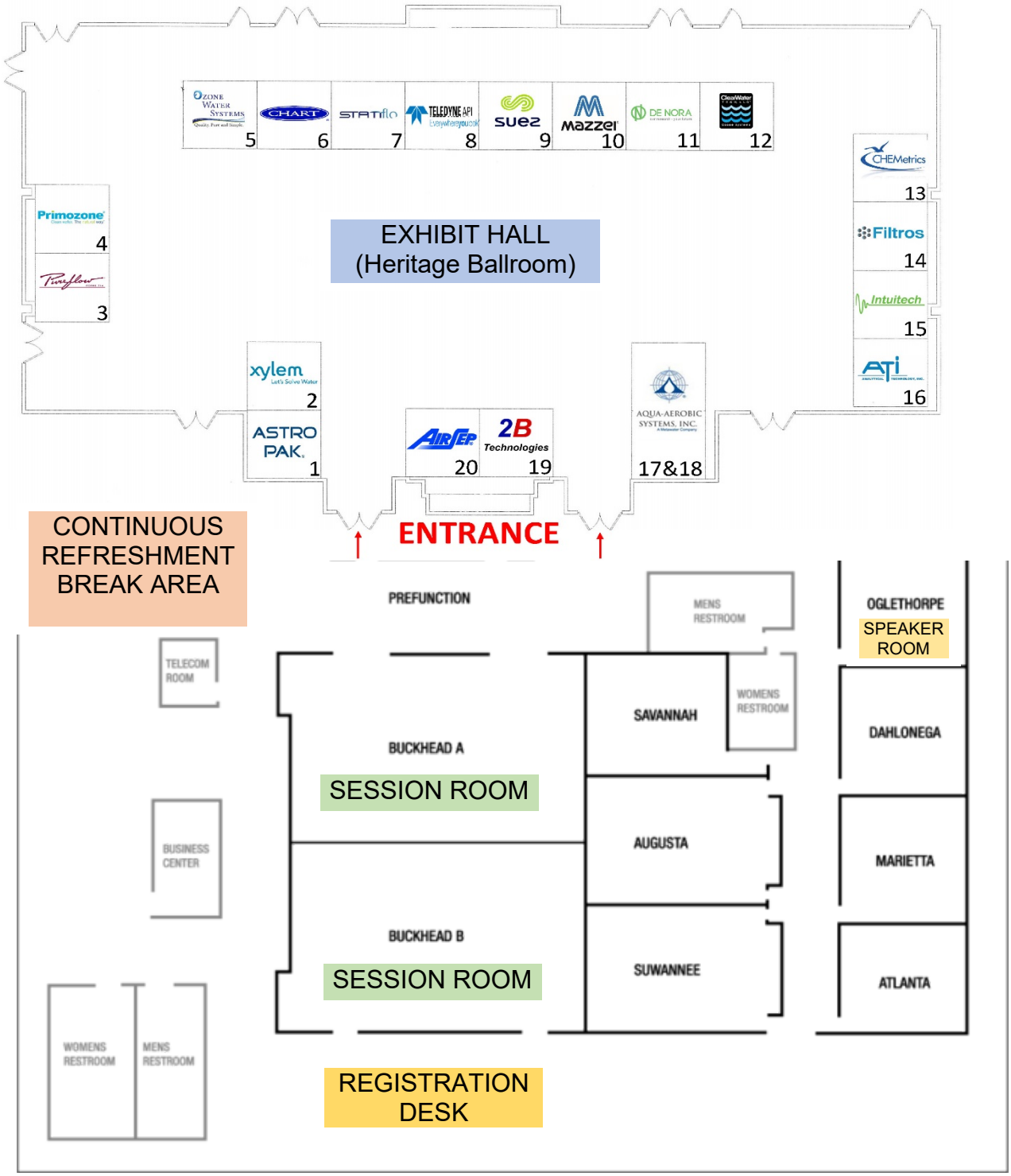
Wednesday, August 28, 2019

7:00 – 8:30 AM	Breakfast	Lenox Dining (1st Floor)
8:00 – 11:00 AM	Registration Open	Prefunction
8:45 – 9:45 AM	Technical Sessions	Buckhead A/B
9:45 – 10:30 AM	Break – Exhibit Hall	Heritage Ballroom
10:30 – 12:00 PM	Technical Sessions	Buckhead A/B
12:00 – 1:30 PM	Lunch	Lenox Dining (1st Floor)
1:30 – 3:00 PM	Technical Sessions	Buckhead A/B
3:00 – 3:45 PM	Break – Exhibit Hall	Heritage Ballroom
3:45 – 5:15 PM	Technical Sessions	Buckhead A/B
5:30 – 6:30 PM	Conference Reception	Winning Edge Dining Room (1st Floor)

Thursday, August 29, 2019

8:00 – 4:00 PM	Technical Tour – Gwinnett County Facilities (Please arrive by 7:45am, Bus will depart from Tour Bus Lobby)

Conference Area Map (Atrium Level)



Lunch will be served each day in the Lenox Dining Room.
Please take the elevators to the 1st Floor.

IOA-PAG Committees

Thank you to our IOA-PAG Committees for your contributions throughout the year! For more information about joining an IOA committee, please contact the committee chair or stop by the registration desk.

Executive Operating Committee

Eric Wert, President, Southern Nevada Water Authority
Ben Kuhnel, President-Elect, Arcadis
John Overby, Past President, Ozone Water Systems
Saad Jasim, Vice President, City of White Rock
Denise Funk, Vice President, Gwinnett County Department of Water Resources
Keisuke Ikehata, Vice President, Texas State University
Daniel Smith, Vice President, University of Alberta
Nick Burns, Secretary, Black & Veatch
Jim Klein, Treasurer, Airsep/Chart Industries

Conference Committee

Mission: To coordinate aspects of conference planning (registration, exhibit hall, sponsorships, receptions, food and beverage, audio/visual needs)

Jennifer Fuel, Chair, Southern Nevada Water Authority
Denise Funk, Co-Chair, Gwinnett County Department of Water Resources
Shelbi Barnett, Southern Nevada Water Authority
Chloe Cooper, Jacobs
Renee Garret, Astro Pak
Heather Harris, Astro Pak
Andrew Hodgkinson, Jacobs
Paul Overbeck, Retired
Eric Wert, Southern Nevada Water Authority

Technical Program Committee

Mission: To develop a high-quality conference program representing the interests of the IOA membership.

Eric Wert, Chair, Southern Nevada Water Authority
Chloe Cooper, Jacobs
Denise Funk, Gwinnett County Department of Water Resources
Fred Gerringer, Hazen and Sawyer
Glenn Hunter, Process Applications Inc.
Keisuke Ikehata, Texas State University
Djanette Khiari, Water Research Foundation
Gaspar Leznik, Retired
Justin Mattingly, Water Research Foundation
Russ Navratil, Henrico County
Erik Rosenfeldt, Hazen and Sawyer
Barbara Schilling, SUEZ
Vijay Sundaram, Stantec

Membership Committee

Mission: To develop strategies to improve membership value and increase IOA-PAG membership

Angelo Mazzei, Chair, Mazzei Injector Company
Daniel Smith, Vice Chair, University of Alberta
Nick Burns, Black & Veatch
Jennifer Fuel, Southern Nevada Water Authority
Denise Funk, Vice President, Gwinnett County Department of Water Resources
Barry Loeb, International Ozone Association
Rene Novins, Mazzei Injector Company
Eric Wert, President, Southern Nevada Water Authority

Municipal Committee (Monday, August 26; 4:30-5:30PM; Augusta Room)

Mission: To develop guidance to improve the design, operation, and maintenance of municipal ozone systems

Bill Mundy, Chair, Regional Municipality of Halton
Ben Kuhnel, Co-Chair, Arcadis
Nick Burns, Black & Veatch
Denise Funk, Gwinnett County Department of Water Resources
Joe Huang, AECOM
Glenn Hunter, Process Applications Inc.
Ron Joost, Carollo
Bob Kim, Xylem
Joe Nattress, Jacobs
Christopher Schulz, CDMSmith
Craig Thompson, West Yost Associates
Brian Townsend, Black & Veatch
Eric Wert, Southern Nevada Water Authority

General Information

Registration Desk

Conference Registration desk will be open during the following times at the locations indicated below:

Monday, August 26	8:00 – 5:00 PM
Tuesday, August 27	7:00 – 5:00 PM
Wednesday, August 28	8:00 – 11:00 AM
Thursday, August 29	Closed - Please call Jen Fuel at 480-529-3787 for any registration needs.

Exhibit Hall

The Exhibit Hall will be in the Heritage Ballroom, and will be open during the following times:

Monday, August 26	7:00 – 10:00 PM (Exhibitor's Reception)
Tuesday, August 27	9:45 – 5:00 PM
Wednesday, August 15	8:00 – 3:45 PM

Wifi Access in Conference Area

Please join the network "Marriott_Conference" using the password "ozone" to access wifi in the meeting spaces.

Mobile App Details

Customize your conference schedule and keep connected on-site through IOA's Mobile App. It includes the conference schedule, session descriptions, maps, and exhibitor information. Getting started is easy. Download the "IOA GA19" App on your mobile device

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Badges

Delegates, speakers, exhibitors and guests must wear their identification badges at all times to gain admission to the conference sessions and tradeshow. In the event that your badge is lost or misplaced, a replacement may be obtained at the Registration desk during published hours at a cost of $15.

Cell Phone Policy

Please mute or turn off cell phones, pagers, etc. during conference presentations.

Conference Proceedings

Copies of all papers will be available online at www.ioa-pag.org for all registered conference attendees approximately one month following the conference. Authors are invited to submit their paper, or an expanded version of their paper, for peer review and consideration for publication in *Ozone: Science & Engineering.* Submissions can be made at http://mc.manuscriptcentral.com/bose.

Insurance

The Organizing Committee and the International Ozone Association (IOA) will accept no liability for personal injuries sustained by or for loss or damage to property belonging to Conference participants, either during or as a result of the Conference or during the Technical Tour.

Lost and Found

Check with the IOA registration staff if you have lost or found an item and need assistance. You may also check with the hotel's registration desk.

Photography

Photographs will be taken during the Conference. By registering for this event, you agree to allow IOA to use your photo in any IOA-related publication or website.

Smoking

The Conference has been designated a non-smoking area. Smoking is only allowed outdoors, in designated areas.

Speaker Ready Room

All speakers are required to stop by the speaker ready room (Oglethorpe) to upload your presentation prior to the start of your session. We will not be loading presentations via USB drives at the start of the session.

Moderators

All moderators can pick up their session information packets in the speaker ready room (Oglethorpe) prior to the start of your session.

All Day Meeting Package

This year, your registration includes an all-day meeting package!

Coffee Breaks:

Morning service features an elaborate continental breakfast including fresh coffee, specialty teas, and decaffeinated coffee, sodas, bottled water, assorted juices, fruit yogurts, sliced fresh fruits, cold cereal, and a variety of pastries and bagels.

Afternoon service features whole fresh fruits, sweets, and specialty items along with other healthy alternatives. All breaks consider our health-conscious guests with low-fat options.

Breakfast:

A full American breakfast is served in the Lenox Dining room (Tues.- Wed.) 7:00 – 8:30am. At lunch our hot and cold theme buffet is offered complete with salads, deli platter and dessert stations.

Young Professionals

New this Year!!! We are excited to announce some activities for Young Professionals!!

Monday - Exhibit Hall Walk During Welcome / Exhibitor Reception
Please join Ben Kuhnel (Arcadis; IOA-PAG President-Elect) during the Welcome / Exhibitor Reception on Monday for a walk around the exhibit hall to meet ozone technology manufacturers and make some new connections. There will be an announcement around 7 pm then the group will walk around to the exhibitors booths to discuss how the various technologies and equipment support the ozone industry.

Tuesday - Lunch
Join IOA members for lunch on Tuesday for discussions about ozone, IOA, industry career paths, etc. We will have tables reserved at the Conference Lunch in the Lenox Dining Room.

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Upcoming IOA Events

2019 IOA World Congress

The 2019 IOA World Congress will be held from October 20-25, in Nice, France. Information about the conference will be available in future issues of Ozone News and on the EA3G website (http://www.ioa-ea3g.org/congress/).

2020 IOA Pan American Group Conference

The next IOA-PAG Conference will be held from August 17-20, 2020, at the South Point Hotel and Casino in Las Vegas, NV. Information about the conference will be available in future issues of Ozone News and on the PAG website (www.ioa-pag.org).

2021 IOA World Congress

The 2021 IOA World Congress will be held from August 30-September 3, 2021 in Windsor, Ontario, Canada. Information about the conference will be available in future issues of Ozone News and on the PAG website (www.ioa-pag.org).

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Shoal Creek Filter Plant – Gwinnett County, GA

CDM Smith provided design and construction services for the Gwinnett County Shoal Creek direct filtration WTP, a 98-mgd preozone facility with an installed ozone generation capacity of 6,630 pounds per day at 8% ozone concentration. The ozone design includes high-concentration, oxygen-fed ozone generation system and sidestream venturi injection dissolution and ozone contacting system. With respect to the latter, CDM Smith designed a unique J-Tube ozone dissolution and contacting system that provides 1-log Cryptosporidium inactivation at an ozone design dose of 2 mg/L, with improved ozone mass transfer efficiency and ozone residual stability.

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Memorial Scholarship Awards

Since 2015, the IOA-PAG has been holding a silent auction at our annual Conference to fund a Memorial Scholarship Award in the honor of past IOA leaders including Dr. Rip Rice, Mr. Kerwin Rakness, Dr. Gordon Finch, and others.

Through your support of this program, the IOA-PAG is pleased to announce that (4) students received a complimentary registration to this year's conference in order to present their ozone research.

Congratulations to the 2019 Memorial Scholarship recipients!

- Michael McKie, University of Toronto
  - Session 4: Simutaneous Optimization of Ozone-Biofiltration Systems
- Aswathi Paradeep, University of Kansas/Black & Veatch
  - Session 5: Thorough Bench-Scale Testing Leads to Robust Ozone System Design at WaterOne
- Samantha Hogard, Virginia Tech
  - Session 6: Pilot-Scale to 1-MGD: Lessons Learned During Start-Up of the SWIFT Research Center
- Octavio Trejo-Chavero, Technologico de Estudios Superiores de Coacalco
  - Poster Session: Blue Acid 74 IC Removal by Means of Cheap Porous Material Assisted with Ozone

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Harvey Rosen Award

The Harvey Rosen Award recognizes the best paper published in Ozone Science and Engineering since the last IOA World Congress. Congratulations to the authors (Kerwin Rakness, Glenn Hunter, Julia Lew, Bill Mundy, and Eric Wert) for their manuscript titled "Design Considerations for Cost-Effective Ozone Mass Transfer in Sidestream Systems".

The paper also reminds us of the many contributions made by IOA member Kerwin Rakness. The dedication reads "This publication is dedicated to coauthor Kerwin L. Rakness, who passed away on June 9, 2016. Throughout his career, Kerwin exemplified outstanding technical engineering skill, brilliant diplomatic talent, and constructive leadership within the water industry. He graciously taught numerous professionals, including utility managers, operators, technicians, consultants, academics, manufacturers, and regulators, how to effectively use ozone technology to protect human health for millions of people around the world. Many of his experiences were shared in his AWWA book titled "Ozone in Drinking Water Treatment: Process Design, Operation, and Optimization," which is a key reference for anyone working in the municipal ozone field. Kerwin was also very passionate about sharing his experiences and knowledge through the International Ozone Association (IOA)."

OZONE: SCIENCE & ENGINEERING
2018, VOL. 40, NO. 3, 159–172
https://doi.org/10.1080/01919512.2018.1424532

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Design Considerations for Cost-Effective Ozone Mass Transfer in Sidestream Systems

Kerwin L. Rakness[a†], Glenn Hunter[a], Julia Lew[b], Bill Mundy[c], and Eric C. Wert[b]

[a]Process Applications, Inc., Ft Collins, Colorado, USA; [b]Southern Nevada Water Authority, Las Vegas, Nevada, USA; [c]Regional Municipality of Halton, Oakville, Ontario, Canada

ABSTRACT

Ozone dissolution system design is important for meeting transfer efficiency (TE) goals. Large sidestream pump flow (L) and high venturi inlet pressure improves TE but increases operating cost. Ozone TE was examined at a 25 gpm (97-Lpm) pilot-scale sidestream system with ($SS_{w\text{-}dg}$) and without ($SS_{wo\text{-}dg}$) degas separation. Under constant ozone dose conditions, process operating parameters were varied including sidestream gas/liquid (G/L) ratio, venturi-inlet water pressure, venturi-outlet water pressure, feed gas pressure, and ozone gas concentration. Performance results included determination of TE, ozone exposure (CT_{HDT}), and hydraulic detention time (T_{HDT}). Several design aspects of sidestream ozone systems were examined to improve mass transfer by using remixing devices, protecting ozone gas piping from corrosion, calculating sidestream ozone residual, and driving force for mass transfer. Moisture contamination of ozone supply lines may cause corrosion and/or decomposition of ozone gas that releases heat and destroys ozone. Ozone gas piping design is critical to prevent trapping water that might enter gas pipe during power outage or when units are offline. During plant operation below design flow, multiple constant speed pumps or variable speed pumps were evaluated to reduce overall operating costs.

ARTICLE HISTORY
Received 20 October 2017
Accepted 1 January 2018

KEYWORDS
Corrosion; Cost; Design; Energy; Operation; Ozone; Pressure; Pump; Remixing; Safety; Sidestream; Transfer Efficiency; Turndown

Monday, August 26, 2019

Workshop

"All Things Ozone – Planning, Design, Maintenance, and Training"

The International Ozone Association (IOA) will host an ozone workshop on Monday, August 26, 2019 for participants who are both new and experienced with ozone. Utility managers, operators, consulting engineers, manufacturers, regulators, and academics interested in ozone water treatment will find this workshop useful.

9:00 – 9:30 AM	**Benefits and Applications for Ozonation** *(Erik Rosenfeldt, Hazen and Sawyer)*
9:30 – 10:00 AM	**Planning: Advancements in Pilot-Scale Ozone Testing** (Brock Emerson, Intuitech)
10:00 – 10:30 AM	**Design: Overview of AWWA Standard** *(Ron Joost, Carollo)*
10:30 – 10:45 AM	**Break**
10:45 – 11:15 AM	**Design: Ozone Contacting and Control Strategies for Disinfection and Oxidation Applications** *(Chris Schulz, CDM Smith)*
11:15 – 11:45 AM	**Operation: Lessons Learned** *(Russ Navratil, County of Henrico)*
11:45 – 12:00 PM	**Open Discussion with Workshop Presenters**
12:00 – 1:00 PM	**Lunch**
1:00 - 2:15 PM	**Maintenance: Ozone Preventive Maintenance** (*France Meder & Dan Dycha Teledyne)*
2:15 – 2:30 PM	**Break**
2:30 – 3:00 PM	**Training: Developing and Maintaining a Good Program for New and Experienced Staff** *(Glenn Hunter, Process Applications, Inc.)*
3:00 – 3:30 PM	**Safety: Ozone and Oxygen Safety** *(Ron Joost, Carollo)*
3:30 – 4:00 PM	**Cost: Ozone System Costs for Municipal Water Treatment Applications** *(Bill Mundy, Halton Region)*
4:00 – 4:30 PM	**Open Discussion with Workshop Presenters**
4:30 PM	**Adjourn**

Monday, August 26, 2019

Welcome Reception at the Exhibit Hall

Join us for drinks, appetizers and entertainment in the Exhibit Hall from 7:00-10:00 PM for the Welcome Reception!

Piano Requests by David Deal:

David Deal is a real estate agent by day, and a dueling piano artist by night. He was classically trained in his native Florida, where instructors at the Harrison Center for the Arts in Lakeland helped him shape his natural gift for tickling the ivories. David has worked at Howl at the Moon dueling piano bar in Orlando, FL and Jellyrolls located on the Walt Disney World Boardwalk. He moved to Atlanta to be closer to family, and now performs at the Park Bench Buckhead. Come ready with your song requests!

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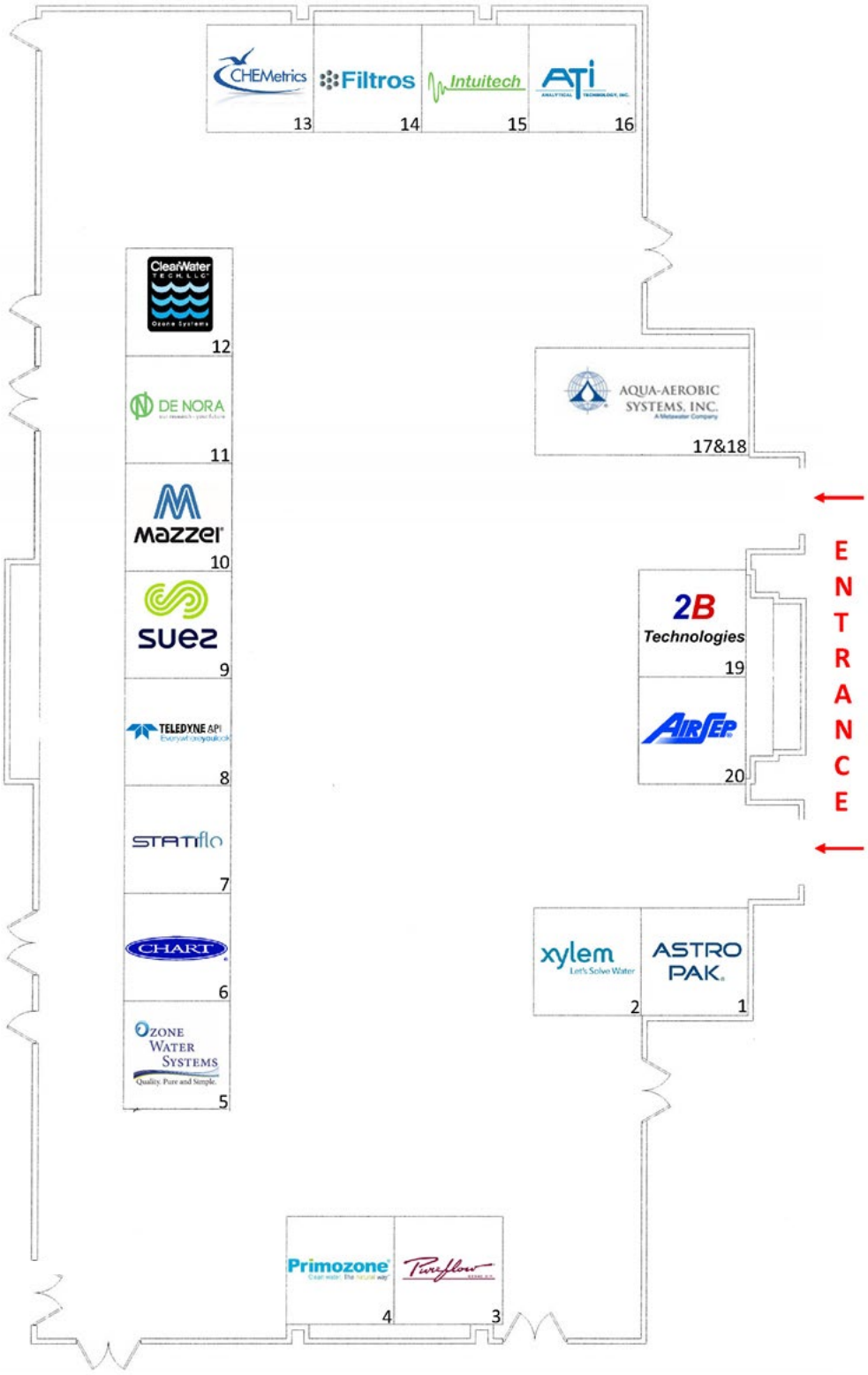
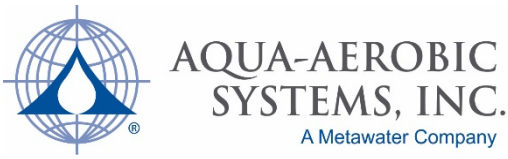
Exhibit Hall Map – Heritage Ballroom



2019 IOA-PAG Conference Exhibitors

	SUEZ 600 Willow Tree Road Leonia, NJ 07605 Tel: (201) 767-9300 www.ozonia.com	9
	AirSep Corporation 260 Creekside Drive Buffalo, NY 14228-2075 Tel: (716) 691-0202 www.airsepcpd.com	20
	Mazzei 500 Rooster Drive Bakersfield, CA 93307 Tel: (661) 363-6500 www.mazzei.net	10
	Xylem-Wedeco 124 Commerce Drive Freedom, PA 15042 Tel: (724) 584-7797 www.xyleminc.com	2
	Astro Pak 270 E Baker Street, Suite 100 Costa Mesa, CA 92626 Tel: (888) 278-7672 www.astropak.com	1

Exhibitor Information		Booth Number
	Analytical Technology 6 Iron Bridge Drive Collegeville, PA 19426 Tel: (610) 917-0991 www.analyticaltechnology.com	16
	**Aqua-Aerobic Systems, Inc.** PO Box 2026 Loves Park, IL 61130 Tel: (815) 654-2501 Fax: (815) 654-2508 www.aqua-aerobic.com	17/18
	Chart Inc. 407 Seventh Street NW New Prague, MN 56071 Tel: (952) 758-4484 www.chartindustries.com	6
	CHEMetrics, Inc. 4295 Catlett Road Midland, VA 22728 Tel: (540) 788-9026 www.chemetrics.com	13
	Clear Water Tech 850 Capitolio Way, Suite E San Luis Obispo, CA 93401 Tel: (805) 549-9724 www.cwtozone.com	12

Exhibitor Information		Booth Number
	De Nora Water Technologies 3000 Advance Lane Colmar, PA 18915 Tel: (215) 997-4000 www.denora.com	11
	Filtros 603 W. Commercial Street Rochester, NY 14445 Tel: (585) 586-8770 www.filtrosltd.com	14
	Intuitech PO Box 17321 Salt Lake City, UT 84117 Tel: (801) 487-9255 x14 www.intuitech.com	15
	Ozone Water Systems 5401 South 39th Street Phoenix, AZ 85040 Tel: (480) 421-2400 www.ozonewatersystems.com	5
	Primozone 737 Ventura Drive Satellite Beach, FL 32937 Tel: (321) 890-4347 www.primozone.com	4

Exhibitor Information	Booth Number
Pureflow 6739 Washington Ave Whittier, CA 90601 Tel: (800) 926-3426 www.pureflowozone.com	3
Statiflo Corp. 75 South Church Street, 6th Floor Pittsfield, MA 01201 Tel: (413) 684-9911 www.statiflo.com	7
Teledyne API 9970 Carroll Canyon Road San Diego, CA 92131 Tel: (858) 657-9800 http://www.teledyne-api.com	8
2B Technologies 2100 Central Avenue Suite 105 Boulder, Colorado 80301 Tel: (303) 273-0559 http://www.twobtech.com	19

Tuesday, August 27, 2019

(Opening Session begins at 8:30am in Buckhead A)

Keynote Speaker – Melissa Meeker

"Gwinnett's Water Innovation Center – Collaboration Advancing Water Technologies"

With an aggressive focus on water supply resiliency, Gwinnett County (located immediately to the north east of the City of Atlanta) is boldly developing a Water Innovation Campus to meet the water resource needs of our vibrant and growing region. At nearly one million people, Gwinnett is considered one of the most diverse and fastest growing places in the US. The water need projections for residential, agricultural and industrial users in our region are formidable, and the need for innovative solutions to maximize efficiencies in our facilities is clear. Our approach is to integrate applied research, emerging technologies, collaboration with academia and industry, job training, and active and inclusive outreach.

Melissa Meeker is the Director of the *Water innovation Center @Gwinnett* and has more than 25 years of comprehensive experience in water resources management, with an emphasis on alternative water supply development and research, workforce development and public engagement. Melissa previously served as the Chief Executive Officer of The Water Environment and Reuse Foundation and was instrumental in the merger of three critical water-related research foundations.

She also served as Executive Director of the South Florida Water Management District and Deputy Secretary of the Florida Department of Environmental Protection, with responsibility for overseeing statewide water and environmental restoration policy, including Everglades restoration. Meeker has a BS in Biology and a MS in Environmental Resource Management.

Tuesday, August 27, 2019

Morning Technical Sessions

Session 1 – Ozone Design and Operation
Room: Buckhead A
Moderator: Nick Burns, Black & Veatch

Start	End	Title, Author(s), Affiliation(s)
10:30	11:00	**Designing a 320-MGD Ozone Disinfection System for Houston's Northeast Water Purification Plant** Chris Schulz (CDM Smith); Daniel Bond
11:00	11:30	**Improving Ozone Systems at Two East Bay Municipal Utility District WTPs** Ron Joost (Carollo); Ali Sheikholeslami (EBMUD); Michael Hartlaub (EBMUD)
11:30	12:00	**Using Ozone and Turbidity Optimization to Achieve Additional 1-log Cryptosporidium Inactivation/Removal** Glenn Hunter (Process Applications Inc); Jennifer Bunton (Process Applications Inc); Wendy Simone (Passaic Valley Water Commission)

Abstracts can be found on the Conference App

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The expansion and addition of ozone to Hong Kong's award-winning Tai Po Water Treatment Works set new standards for water quality, public safety, environmental sustainability and supply resilience.

BLACK & VEATCH

Tuesday, August 27, 2019

Session 2 - Reuse and Contaminants
Room: Buckhead B
Moderator: Saad Jasim, City of White Rock

Start	End	Title, Author(s), Affiliation(s)
10:30	11:00	**Overcoming Challenges in Ozone-Biofiltration Treatment Systems for IPR Applications** Vijay Sundaram (Stantec, University of Nevada Reno)
11:00	11:30	**The 4th Treatment Step – Our Way to Reuse in Europe?** Jens Scheideler (Xylem Inc.); Achim Ried (Xylem)
11:30	12:00	**Simultaneous Ozone and Granular Activated Carbon Treatment of Micropollutants during Potable Reuse of Municipal Wastewater Effluent** Hooman Vatankhah (Montrose Environmental Group); Christopher Bellona, Oscar Quinones, Eric R.V. Dickenson

Lunch will be served in the Lenox Dining Room

(1st Floor of the Marriott)

Tuesday, August 27, 2019

Afternoon Technical Sessions

Session 3 – Ozone Applications in Georgia
Room: Buckhead A
Moderator: Glenn Hunter, Process Applications Inc.

Start	End	Title, Author(s), Affiliation(s)
1:30	2:00	**Ozone for Indirect Potable Reuse in Gwinnett County, Georgia** Denise Funk (Gwinnett County Department of Water Resources); Justin Garmon; David Atkins
2:00	2:30	**Ozone Treatment of Large Water System: Operating Experiences with Aging Equipment** Dora De Taboada, John A. Patterson (Dekalb County Department of Watershed Management); Michael Diaz (Arcadis)
2:30	3:00	**Ozone at the Georgia Aquarium** Alan Grosse (Georgia Aquarium); Parker Ivey

Tuesday, August 27, 2019

Session 4 – Biofiltration
Room: Buckhead B
Moderator: Vijay Sundaram, Stantec

Start	End	Title, Author(s), Affiliation(s)
1:30	2:00	**Monitoring Activity and Diversity of Microbial Communities Found in Ozone Biofiltration Systems** Christina Alito (HDR); Jennifer Hooper (CDM Smith); Chance Lauderdale (HDR)
2:00	2:30	**Recent Advances in Biological Filtration Monitoring** Jennifer Hooper (CDM Smith); Chance Lauderdale (HDR); Christina Alito (HDR); Kyle Vickstrom (CDM Smith); Patrick Evans (CDM Smith); Lauren Weinrich (American Water)
2:30	3:00	**Simultaneous Optimization of Ozone-Biofiltration Systems** Michael McKie (University of Toronto); John Armour (Peterborough Utilities Group); Susan Andrews (University of Toronto), Robert Andrews (University of Toronto), Liz Taylor-Edmonds

Tuesday, August 27, 2019

Roundtable Discussions and Poster Session

After great success from last year's conference, the International Ozone Association (IOA) is bringing back an expanded roundtable session focusing on industrial ozone applications, ozone control strategies and other topics overlapping municipal and industrial ozone usage. Ozone integrators, equipment distributors, consulting engineers and academics looking expand their ozone knowledge will find these roundtables of interest. You will be able to visit three tables during this session.

Session 5 – Round Table Discussions and Poster Session
Room: Exhibit Hall Moderator: Barbara Schilling (SUEZ)

Start	End	Title, Author(s), Affiliation(s)
3:45	5:15	***ROUND TABLES:***

Round Table #1 – Ozone in Pharmaceutical Water Systems
Joe Manfredi; Dina Manfredi (GMP Systems)

Round Table #2 – Safe and Economical Application of Ozone in Swimming Pool Systems
Cameron Tapp (Clearwater Tech)

Round Table #3 – Dissolved Ozone Measurement in Challenging Applications; Ozone Safety Measurement in Remote Applications
Dan Dycha (Teledyne)

Round Table #4 – Ozone Use in Dentistry
Dr. Phil Mollica (Mollica Dentistry)

Round Table #5 – Ozone and Food Safety
John Overby (Ozone Water Systems)

Round Table #6 – Ozone + Biofiltration – Letting Microbes Work So You Don't Have To
Mike McKie (University of Toronto)

Round Table #7 – Oxidation of Cyanotoxins with Ozone
Dr. Saad Jasim (City of White Rock, BC)

POSTERS:

Poster – In-Package Ozone Treatments of Raw Chicken Breast Meat
Hong Zhuang (USDA-ARS); Brian Bowker; Michael Rothrock; Kelli Hiett; Kurt Lawrence; Gary Gamble; Kevin Keener

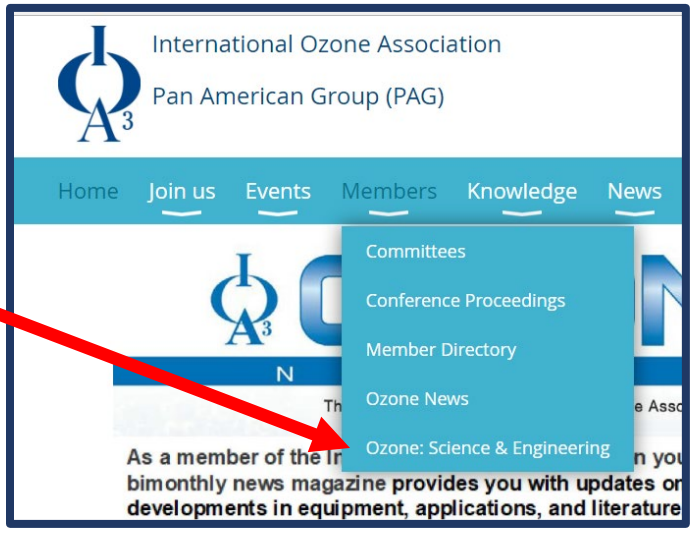
Poster - Blue Acid 74 IC Removal by Means of Cheap Porous Material Assisted with Ozone
Octavio Trejo-Chavero (Tecnologico de Estudios Superiores de Coacalco, Tesco); Maria Teresa Torres Mancera; Cecilia Mercado Zuniga; Raquel E. Hernandez Sanchez

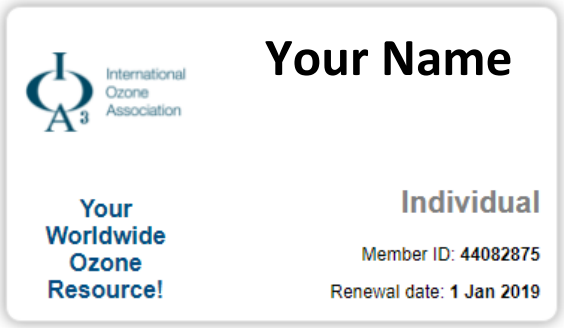
The IOA-PAG Website

(www.IOA-PAG.org)

Members

Receive OPEN ACCESS to Ozone: Science & Engineering by visiting the website portal

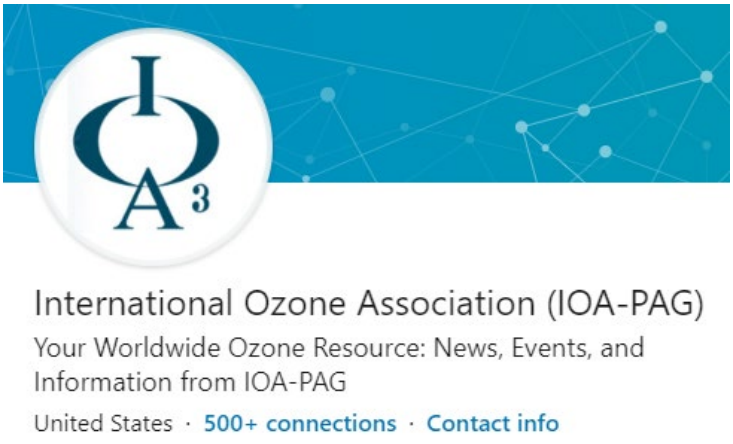




Are you receiving our monthly emails?

Please be sure to add admin@ioa-pag.org to your email safelist.

Receive the Latest updates from IOA-PAG



International
Ozone
Association
Networking Reception
At Georgia Aquarium
August 27, 2019
Aquarium Admission Time: 6 PM
Reception in Ocean Voyager Gallery Theater: 7 PM - 9 PM
Includes Dinner and Drinks
Event includes access to all the aquarium exhibits and small group behind-the-scenes tours of the aquatic life support systems featuring ozone
Georgia Aquarium houses tens of thousands of animals across hundreds of species, all of which reside in more than 10 million gallons of water, making it the largest aquarium in the Western Hemisphere. You don't want to miss this experience!
GEORGIA AQUARIUM

Transportation Option to Georgia Aquarium

MARTA is included with your registration

9:00 PM - 9:30 PM (30 min)

M Gold

9:05 PM from Lenox Transit Station

19 min every 20 min

SCHEDULE EXPLORER

9:00 PM **Atlanta Marriott Buckhead Hotel & Conference Center**
3405 Lenox Rd NE, Atlanta, GA 30326

Walk
About 5 min , 0.2 mi

9:05 PM **Lenox Transit Station**

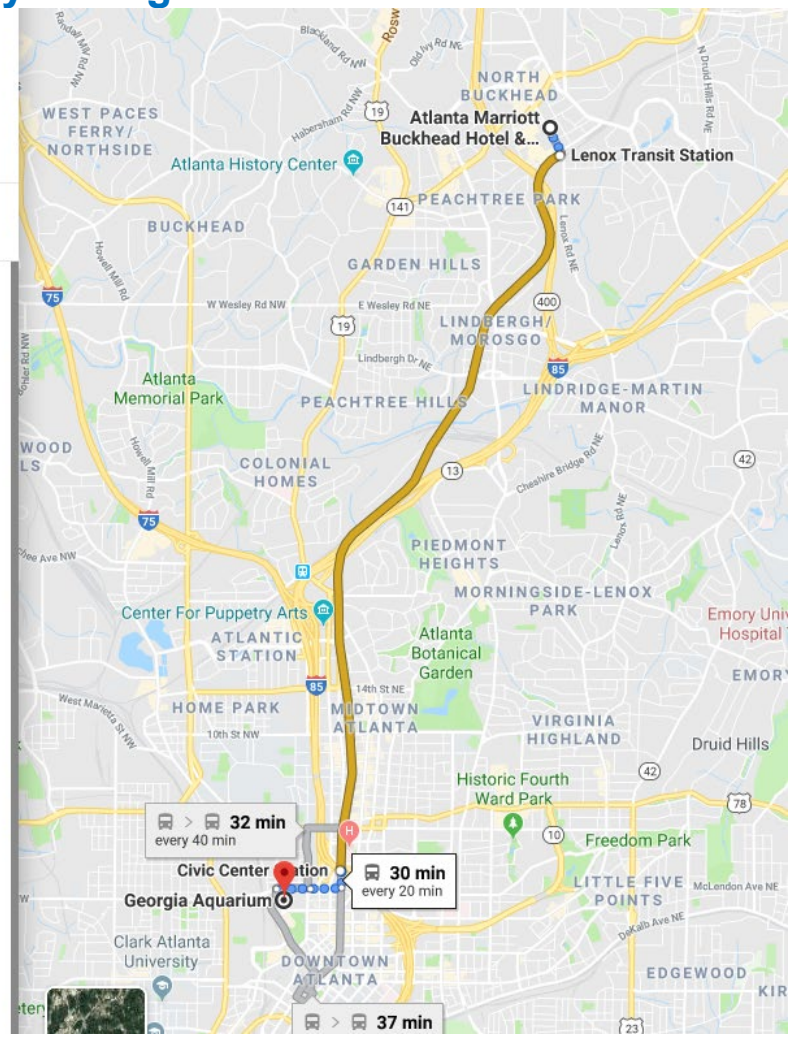
M Gold Gold Southbound to Airport Station
11 min (5 stops) · Stop ID: 908717

9:16 PM **Civic Center Station**

Walk
About 14 min , 0.6 mi

9:30 PM **Georgia Aquarium**
225 Baker St NW, Atlanta, GA 30313

Tickets and information
MARTA - 1 (404) 848-5000



Please note there is a 15-minute walk from the MARTA station to the Georgia Aquarium.

Wednesday, August 28, 2019

Morning Technical Sessions

Session 5 – Cyanobacteria Treatment
Room: Buckhead A
Moderator: Eric Wert, Southern Nevada Water Authority

Start	End	Title, Author(s), Affiliation(s)
8:45	9:15	**How Green is My Water – Addressing Harmful Algal Blooms through Ozone and Peroxone** Peter D'Adamo (HDR)
9:15	9:45	**Oxidation of Cyanotoxins for Desalinated Water Effluent** Saad Jasim (SJ Environmental Consultants (Windsor) Inc.)
9:45	10:30	BREAK (45 Minutes)
10:30	11:00	**Evaluation of Ozone Treatment of Surface Water for Geosmin and MIB Removal for Wellington Water Treatment Plant, Colorado** Sergiy Popov (SUEZ); Rich Fulton (Wellington WTP); Victor Sam, Terry McEnany (Stantec); Rupa Lamsal, Denise Horner (SUEZ)
11:00	11:30	**Passing the Smell Test – With Ozone AOP** Salvador Dominguez (Xylem Inc.); Bob Kim; Ralph Franco; Jennifer Barrington (Anderson Regional Joint Water System)
11:30	12:00	**Thorough Bench-Scale Testing Leads to Robust Ozone System Design at WaterOne** Aswathi Pradeep (Black & Veatch)

Wedeco SMO evo and PDO evo ozone systems are now 25% more energy efficient. Thanks to the Effizon® evo 2G electrode, no money is lost from downtime. This next generation electrode technology is capable of reaching ozone concentrations up to 15wt% and does not require extra maintenance and service. Suitable for the treatment of municipal water and wastewater as well as industrial water, the SMO evo series is ideal for small to medium ozone capacities while the PDO evo systems are capable of producing larger quantities of ozone (max 300kg/h / 15800 ppd).

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Wednesday, August 28, 2019

Session 6 – Reuse and Contaminants Room: Buckhead B Moderator: Denise Funk, Gwinnett County		
Start	**End**	**Title, Author(s), Affiliation(s)**
8:45	9:15	**Pilot Scale to 1-MGD: Lessons Learned During Start-Up of the SWIFT Research Center** Samantha Hogard (Virginia Tech)
9:15	9:45	**Organics Oxidation, Disinfection, Bromate Formation, and n-Nitrosodimethylamine Generation: The Balancing Act of Ozonation Processes Explored Through Bench-Scale Ozonation Experiments** Peter Buehlmann (Virginia Tech)
9:45	10:30	BREAK (45 Minutes)
10:30	11:00	**Impact of Ozone and Biological Filtration on NDMA Formation (WRF 4491 and 4669)** Ben Kuhnel (Arcadis)
11:00	11:30	**Non RO Based Treatment Trains for Reuse – A Solution for Inland Facilities** Jens Scheideler (Xylem Inc.)
11:30	12:00	**Advanced Oxidation Processes to Reduce Exposure to Pathogens and Contaminants in Reclaimed Water at a Transit Car Wash Facility** Chandra Mysore (Jacobs)

Wednesday, August 28, 2019

Afternoon Technical Sessions

Session 7 – Ozone Design and Operation
Room: Buckhead A
Moderator: Ben Kuhnel, Arcadis

Start	End	Title, Author(s), Affiliation(s)
1:30	2:00	**Start-Up of Loudoun Water's New Ozone-Biofiltration Water Plant – Does a Double Ozone Dose Make a Difference?** Christopher Schulz (CDM Smith); Geraro Castaneda (Loudoun Water); Tom Barrack; Jessica Edwards-Brandt
2:00	2:30	**Model Based Development of a Pipeline Contactor for High Turndown and High Ozone Dose Applications** Srikanth Pathapati (Mazzei Injector Company)
2:30	3:00	**Real-Time Monitoring and Measurement Challenges for Residual Dissolved Ozone** Srikanth Pathapati (Mazzei Injector Company); James Jackson
3:00	3:45	BREAK (45 Minutes)
3:45	4:15	**Welcome to the Modern Age: Upgrading Existing Air Based Ozone Systems to LOX** Bryan Townsend (Black & Veatch); Nick Burns
4:15	4:45	**Pilot Testing and Preliminary Design of an Ozone Biofiltration Facility** William Dowbiggin (CDM Smith); Brandon Flint; Bob Angelotti (UOSA)
4:45	5:15	**How Advanced Modeling (CFD) Can Enhance Ozone System Design** Achim Ried (Xylem); Joachim Anton

Join us in the Winning Edge Private Dining Room

(1st Floor of the Marriott) for the Conference Reception

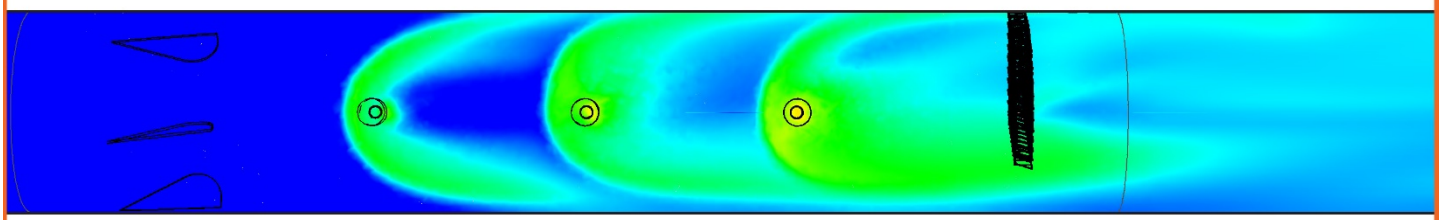
from 5:30-6:30PM for appetizers and drinks!

Wednesday, August 28, 2019

Session 8 – Advanced Oxidation Processes and Contaminants
Room: Buckhead B
Moderator: Dan Smith, University of Alberta

Start	End	Title, Author(s), Affiliation(s)
1:30	2:00	**Ozone for the Removal of Arsenic and Manganese in Groundwater Source** Saad Jasim (City of White Rock)
2:00	2:30	**Fine Tuning an Ozone System Treating Hydrogen Sulfide** Ronald Joost (Carollo)
2:30	3:00	**Photo Chemical Ozone Generation with Xenon Excimer Lamps – A Paradigm Shift for Ozone Generation** Nicole Brueggemann (Xylem Services GmbH)
3:00	3:45	BREAK (45 Minutes)
3:45	4:15	**Ozonation Combined with Hydrodynamic Cavitation to Degrade Cyanide in Aqueous Solutions** Javier Paul Montalvo Andia (San Pablo Catholic University)
4:15	4:45	**Electrochemical Assisted Ozone/Advanced Oxidation Process for Organic Contaminants in Water** How Ghee Ang (National University of Singapore)
4:45	5:15	**Oxidation Combined with Biofiltration for Algae Related Taste & Odor Issues – A Multiple Barrier Concept for an Emerging Challenge** Jens Scheideler (Xylem Inc.)

new Mazzei® PFR+



- *RAPID, THOROUGH Mixing & Contacting*
- *Increased Mixing UNIFORMITY*
- *LOW Head Loss & Energy Costs*
- *HANDLES HIGH Ozone Doses & Turndown Rates*
- *REDUCES Excess Ozone Production*

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Thursday, August 29, 2019

Technical Tour

Shoal Creek Filter Plant and F. Wayne Hill Water Resources Center

Gwinnett Water Resources

Shoal Creek Filter Plant

Gwinnett County distributes safe drinking water to over 900,000 citizens through a network with more than 3,500 miles of water mains and 250,000 service connections. There are two water production plants included in the county system. Visitors will tour the Shoal Creek Filter Plant (SCFP) which uses ozone for primary disinfection and improved filter performance. SCFP's ozone system is sized for 1-log removal credit of *Cryptosporidium* using three 2400 lbs/day ozone generators, a sidestream injection downflow tube ozone dissolution system, and two 1 million gallon serpentine baffled contactors. SCFP also houses two pilot plants, which are small scale versions of the full scale treatment process. The pilots are used to conduct applied research and to optimize treatment processes.

Thursday, August 29, 2019

F. Wayne Hill Water Resources Center

The F. Wayne Hill Water Resources Center (WRC) is one of the largest ozone and membrane wastewater treatment facilities in the world, with the ability to process up to 60 million gallons of wastewater per day. The facility includes traditional wastewater treatment processes followed by chemical clarifiers, ultrafiltration membranes, pre-ozone, biologically active carbon filters, and final ozone to produce very high quality reclaimed water that is returned to Lake Lanier, the water supply for Gwinnett County and many other Atlanta metropolitan communities.

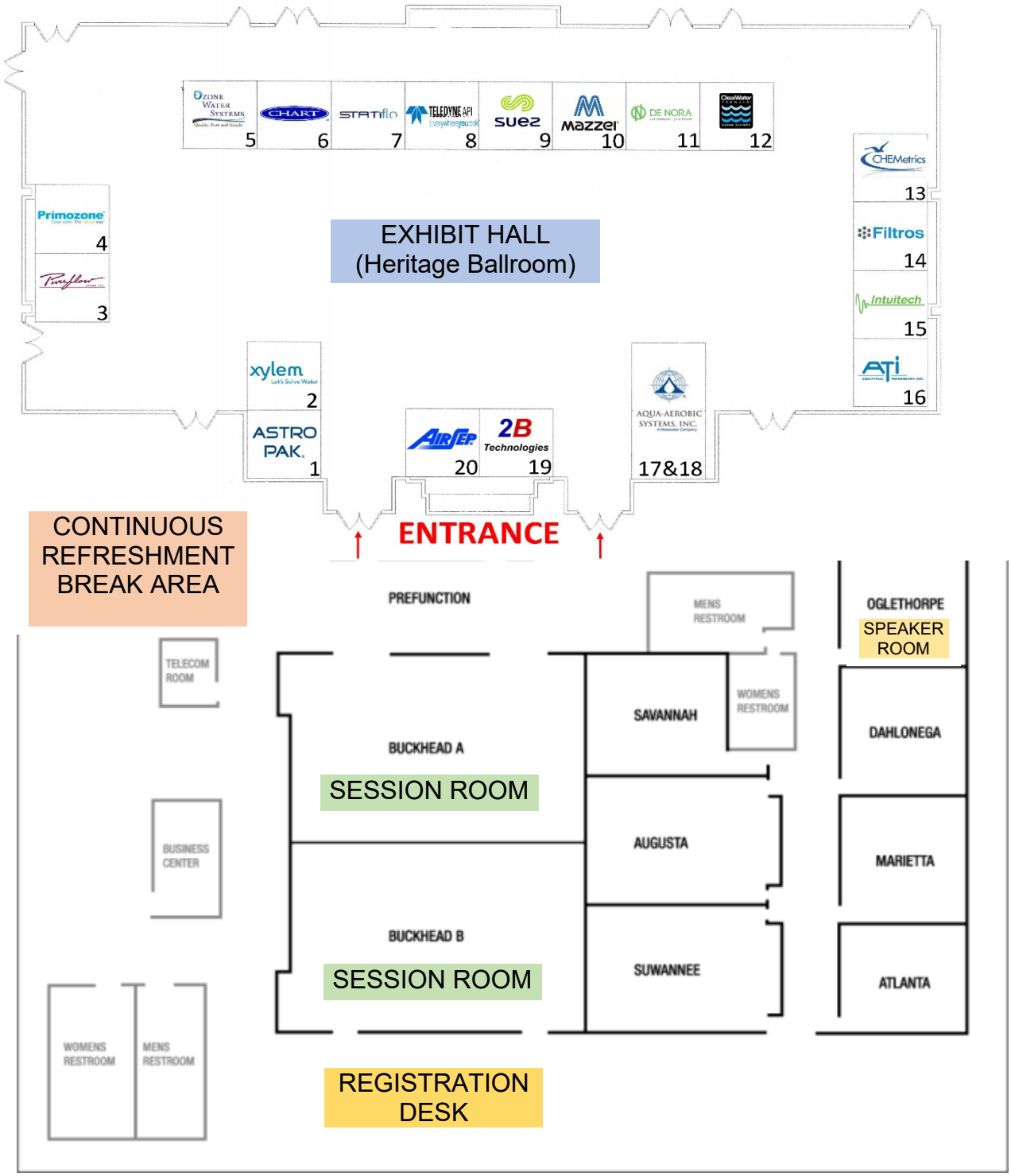
Technical Tour Schedule:

8:00 AM	Meet at hotel lobby for transportation to Shoal Creek Filter Plant
9:30 AM	Overview and tour of Shoal Creek Ozone Facilities and pilot plants
11:30 AM	Lunch at Shoal Creek Filter Plant
12:30 PM	Board bus for transportation to F. Wayne Hill WRC
1:00 PM	Overview and tour of F. Wayne Hill WRC
2:30 PM	Depart for hotel**
4:00 PM	Expected arrival at hotel**

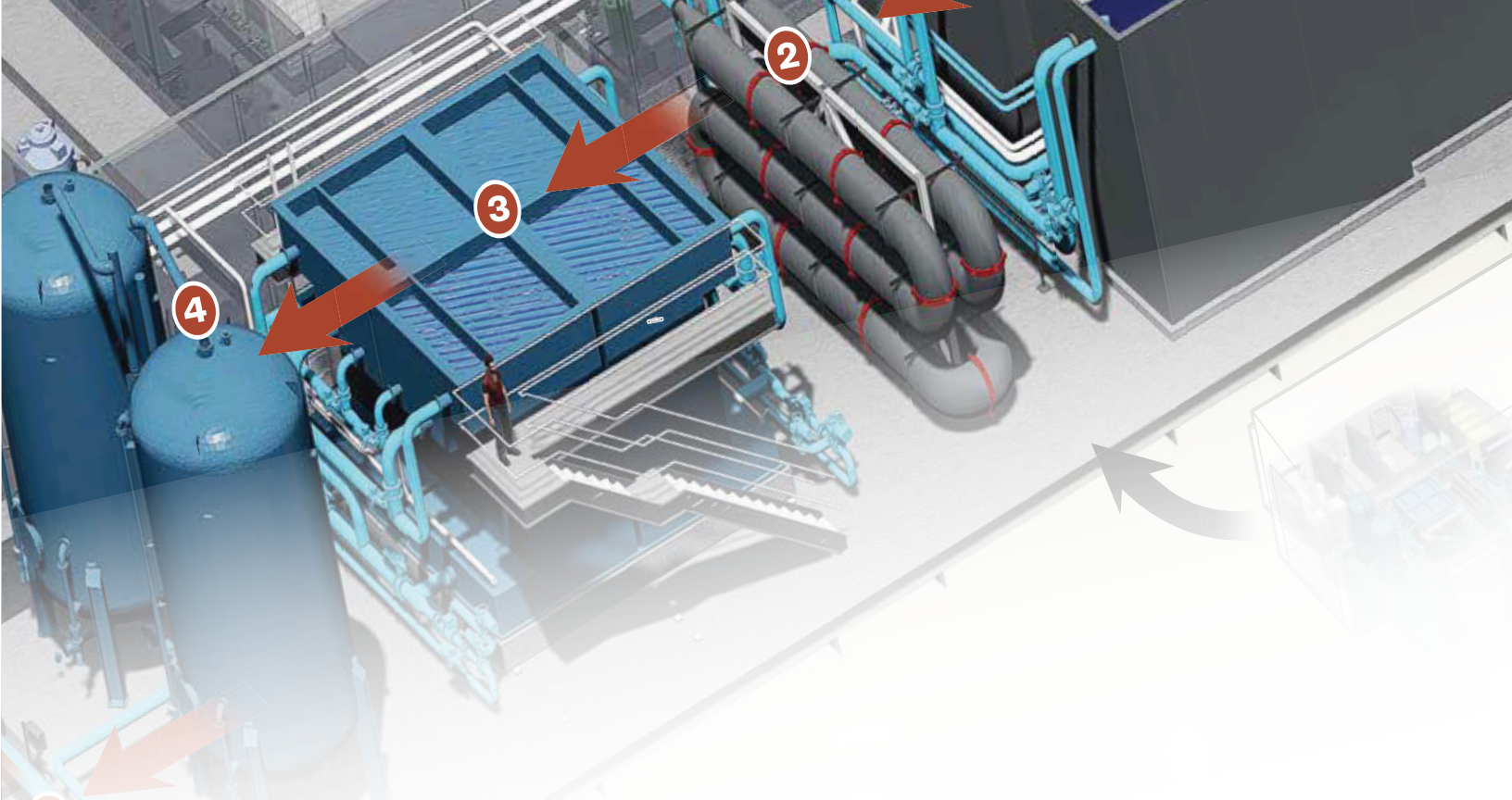
****IMPORTANT NOTE: The bus will NOT be stopping at the airport this year. We recommend that tour attendees take the MARTA (train) from the hotel station to the airport due to potential traffic delays.**

Notes

Conference Area Map (Atrium Level)



Lunch will be served each day in the Lenox Dining Room.
Please take the elevators to the 1st Floor.



Realize More

There is no one-size-fits-all reuse application. A true integrated water approach requires innovation and flexibility to balance water quality and supply needs.

To ensure a high-quality water supply, we think beyond membranes, developing effective, customized solutions utilizing ozone and carbon for treatment.

If you're trusted to protect public health and the environment, we can help.