



Residuals and Biosolids Conference 2017

The Future of Biosolids and Bioenergy

April 8-11, 2017
Washington State Convention Center
Seattle, Washington, USA



This conference is held by the Water Environment Federation in cooperation with the Pacific Northwest Clean Water Association and Northwest Biosolids.

OPENING GENERAL SESSION

**Sunday, April 9, 2017
9:00 AM – 10:00 AM**

**Detailed information on the Opening General Session will be
provided shortly.**

TECHNICAL PROGRAM

Featured Mobile Session (Held on the exhibition floor)

Sunday, April 9, 2017

10:45 AM – 12:15 PM

Mobile session presentation details will be provided in February.

TECHNICAL PROGRAM

Session 1: Facilities Operation

Sunday, April 9, 2017

10:45 AM – 12:15 PM

- 01A 10:45 AM Understanding the Role of Mixing and Viscosity in Rapid Volume Expansion Due to Gas Holdup in Anaerobic Digesters**
Nick Bartek, Matthew Higgins, Bucknell University; Sudhir Murthy, DC Water; Steven Beightol, Bucknell University; Ahmed Al-Omari, DC Water
- 01B 11:15 AM Quantification of Struvite Content of Biosolids is Necessary to Avoid Bias in the Assessment of Digester and Dewaterability Performance**
Christopher Wilson, Hampton Roads Sanitation District; Wendell Khunjar, Hazen and Sawyer; Alexandria Gagnon, Hampton Roads Sanitation District; Ron Latimer, Hazen and Sawyer
- 01C 11:45 AM Driving Operational Improvement through the Use of Dashboards: A Regional Biosolids Pelletizing Facility Perspective**
Amber Batson, CDM Smith; Nathan Mayer, Raymond Schauer, Solid Waste Authority of Palm Beach County
- Alternate The Trials and Tribulations of Commissioning a Large Biosolids Facility; An Operational Perspective**
Kenneth Schnaars, Brown & Caldwell

TECHNICAL PROGRAM

Session 2: Anaerobic Digestion Pretreatment

Sunday, April 9, 2017

1:30 PM – 4:45 PM

- 02A 1:30 PM Optimising THP - The Intermediate Thermal Hydrolysis Process**
Ester Rus, Aurelien Perrault, Nick Mills, Achame Shana, Thames Water; Paul Nilsen, CAMBI
- 02B 2:00 PM Solubilization of Organics Due to Thermal Hydrolysis Pretreatment Leading to Stable Mesophilic Anaerobic Digestion**
Manisha Berde, Domenech Jolis, San Francisco Public Utilities Commission
- 02C 2:30 PM Does Operation at Increased Ammonia Concentration Impact Hydrolysis Rates?**
Baoqiang Li, The George Washington University; Adrian Romero, DC Water; Elizabeth Manning, The George Washington University; Matthew Higgins, Bucknell University; Ahmed Al-Omari, Sudhir Murthy, DC Water; Rumana Riffat, The George Washington University; Haydée Clippeleir, DC Water
- 3:00 PM Networking Break**
- 02D 3:45 PM Are Thermal Hydrolysis Digesters Robust Because of Their Unique Microbial Communities?**
Joshua Mah, John Novak, Virginia Tech
- 02E 4:15 PM Free Nitrous Acid Pretreatment of Thickened Waste Activated Sludge Improves Anaerobic Degradability**
Elsayed Elbeshbishy, Frances Okoye, Ryerson University; Dang Ho, Siva Sarathy, Trojan Technologies; Wayne Parker, University of Waterloo

TECHNICAL PROGRAM

Session 2: Anaerobic Digestion Pretreatment (Continued)

Sunday, April 9, 2017

1:30 PM – 4:45 PM

Alternate 1 Thermal Hydrolysis Reduces Carbon Footprint and Operating Costs
William Barber, Cambi, Inc.

Alternate 2 Batch Vs. Continuous Thermal Hydrolysis: Which Is Right for You?
Sudhakar Viswanathan, Chris Thomson, Rich Dimassimo, Robert Clay, Veolia Water Technologies; Dr. Jongmin Kim, University of Texas Rio Grande Valley; Dr. Nicholas Landes, Freese and Nichols

TECHNICAL PROGRAM

Session 3: Nutrient Management

Sunday, April 9, 2017

1:30 PM – 4:45 PM

- 03A 1:30 PM Status on Post Digestion Phosphorus Recovery- Date from Eight Airprex® Pilot Test in the US**
Gerhard Forstner, CNP Technology Water and Biosolids Corp
- 03B 1:40 PM Pilot-scale Evaluation of Airprex for Digestate Treatment**
Blair Wisdom, Brad Van Anderson, Isaac Avila, Troy Gottschalk, Kurt Carson, Liam Cavanaugh, Metro Wastewater Reclamation District
- 03C 2:05 PM Enhanced Dewatering with Struvite Recovery: Pilot Testing of AirPrex® Technology at Miami's South District WWTP**
Brian Stitt, Terry Goss, AECOM; Manual Moncholi, Miami Dade WASD; Mohammad Abu-Orf, (formerly) AECOM
- 2:30 PM Facilitated Discussion**
- 3:00 PM Networking Break**
- 03D 3:45 PM Construction and Startup Lessons of the Rocky Mountain Region's First Anammox Sidestream Centrate Treatment System**
Matt Gough, HDR; Tom Dingeman, Sean Cooney, City of Greeley
- 03E 4:15 PM Nutrient Recovery from (Digested) Residuals: Towards a Generic Roadmap for Setting Up an Optimal Treatment Train**
Céline Vaneeckhaute, Université Laval; Evangelina Belia, Primodal Inc.; Filip Tack, Erik Meers, Ghent University; Peter Vanrolleghem, Université Lava

TECHNICAL PROGRAM

Session 3: Nutrient Management (Continued)

Sunday, April 9, 2017

1:30 PM – 4:45 PM

- Alternate 1 Utilization of Municipal Waste and Biosolids as Sources of Phosphorus for Land Restoration Projects**
Principal Mdolo, Lilongwe University of Agriculture and Natural Resources

- Alternate 2 Extractive Nutrient Recovery is a Viable Nutrient Control Alternative for Water Resource Recovery Facilities**
Wendell Khunjar, Hazen & Sawyer PC

TECHNICAL PROGRAM

Session 4: Biosolids Planning Around THP

Sunday, April 9, 2017

1:30 PM – 3:00 PM

- 04A 1:30 PM Selection of a Thermal Hydrolysis Process for The City of Calgary's Bonnybrook Wastewater Treatment Plant**
Jennifer Peters, Kim Fries, CH2M; Kari MacDonald, The City of Calgary; Ryan Roberts, Stantec Consulting
- 04B 2:00 PM Reinventing Your Biosolids Management Program and Unlocking Resource Recovery with Thermal Hydrolysis - The City of Raleigh's Journey**
C M. Bullard, Amy Hanna, Hazen & Sawyer; Greg Knight, Kent Lackey, Black and Veatch; Perry Schaefer, Brenan Buckley, Brown & Caldwell; T. J. Lynch, Aaron Brower, City of Raleigh
- 04C 2:30 PM A Commitment to Improving the Odors of DC Water Biosolids Leads to Improved Acceptance**
Bill Brower, DC Water; Al Razik, Maryland Environmental Service; Christopher Peot, DC Water
- Alternate 1 The Ultimate Combination of Sustainable Biosolids Treatment Technologies**
Dale Gabel, CH2M
- Poster Developing a Large-scale CAMBI Biosolids Marketing and Distribution Program**
Ronald Alexander, R Alexander Associates Inc.; Chris Peot, DC Water

TECHNICAL PROGRAM

Session 5: Biosolids Management and Planning

Sunday, April 9, 2017

1:30 PM – 3:00 PM

- 05A 1:30 PM Business Case Concept Portfolio Supporting a 90 dtpd Biosolids Reuse Program**
Alicia Gilley, Steve Rogowski, Metro Wastewater Reclamation District
- 05B 2:00 PM Biosolids on Trial**
James Slaughter, Beveridge & Diamond PC
- 05C 2:30 PM Creating Cost-Effective Centralized Solids Management**
Perry Schafer, Natalie Sierra, Steve Wilson, Brown and Caldwell
- Alternate Low-Cost, Low-Tech Biosolids Treatment Options**
Christa Meingast, Eric Seagren, Jennifer Becker, Michigan Technological University
- Poster Bay Area Biosolids to Energy Coalition The SF Bay Area's Regional Approach to Biosolids Management**
Sarah Deslauriers, Bay Area Biosolids to Energy Coalition

TECHNICAL PROGRAM

Session 6: Biosolids Products for Treatment

Sunday, April 9, 2017

3:45 PM – 4:45 PM

- 06A 3:45 PM Biosolids Products for Bioretention Systems**
Sally Brown, Julia Jay, University of Washington
- 06B 4:15 PM Biosolids Reuse: Continuous Flow-Through Column Testing of Biosolids-Derived Biochar to Sorb Micropollutants**
Lee Kimbell, Anna Avila, Yiran Tong, Brooke Mayer, Patrick McNamara, Marquette University

TECHNICAL PROGRAM

Session 7: Biosolids Science and Microconstituents

Sunday, April 9, 2017

3:45 PM – 4:45 PM

- 07A 3:45 PM Trace Organic Contaminants in Biosolids: Recent Survey, Risk Analysis and Communication Tools**
Kate Kurtz, Roberta King, Ashley Mihle, King County; Sally Brown, University of Washington; Mark Cullington, Heather Brunelle, Laura Kennedy, Dana Devin-Clarke, Kennedy/Jenks Consultants; Maile Lono-Batura, Northwest Biosolids
- 07B 4:15 PM PBDEs in Class a Biosolids Produced from Thermal Hydrolysis and Anaerobic Digestion Processes**
Xuanzhao Wang, Natasha Andrade, Alba Torrents, University of Maryland, College Park; Mark Ramirez, Chris Peot, DC Water
- Alternate Hydrothermal Processes for Simultaneous Bioenergy Recovery and Destruction of Bioactive Microconstituents from Biosolids**
Young Hwan Shin, University of Illinois; Lance Schideman, Illinois Sustainable Technology Center; Yuanhui Zhang, Peng Zhang, Michael Plewa, University of Illinois

TECHNICAL PROGRAM

Session 8: Thermal Processes

Monday, April 10, 2017

8:30 AM – 11:45 AM

08A 8:30 AM Can Autocatalytic Pyrolysis of Wastewater Biosolids be Energy Neutral and Generate Value-added Products?

Zhongzhe Liu, Simcha Singer, Daniel Zitomer, Patrick McNamara, Marquette University

08B 9:00 AM Gasification for Biosolids Disposal and Power Generation

Jeff Snyder, PHG Energy

08C 9:30 AM Innovative Technology Reduces Mercury Emissions to Keep Ohio's Sewage Sludge Incinerators Hot and Costs Cool

Scott Reed, Black & Veatch; Robin Rupe, Northeast Ohio Regional Sewer District; Sara Cramer, Metropolitan Sewer District of Greater Cincinnati; Connor Smith, Black & Veatch; Gustavo Queiroz, U.S. EPA

10:00 AM Networking Break

08D 10:45 AM Energy Recovery from Thermal Oxidation of Wastewater Solids: Triple Bottom Line Evaluation

Anna Munson, James Welp, Webster Hoener, Black & Veatch; Robert Dominak, Friar Consulting

08E 11:15 AM Sewage Sludge Gasification as an Alternative to Incineration

Andrew Jones, GV Jones & Associates Inc.

Alternate Duffin Creek and Cleveland Experience – New fluid bed sewage sludge incinerators equipped with state of the art equipment and steam turbine

Euan Fergusan, York Region; Brad Dobson, Duffin Creek Water Pollution Control Plant; Dan Hancock, Tom Shively, Tom Vasel Southerly Wastewater Treatment Center; Ky Dangtran, Levent Takmaz, SUEZ

TECHNICAL PROGRAM

Session 9: Anaerobic Digestion

Monday, April 10, 2017

8:30 AM – 11:45 AM

- 09A 8:30 AM Can Hydrolysis Limitation Be Overcome Through Understanding the Impact of Physics in Anaerobic Digestion?**
Elizabeth Manning, Adrian Romero, Baoqiang Li, The George Washington University; Ahmed Al-Omari, DC Water; Matthew Higgins, Bucknell University; Rumana Riffat, The George Washington University; Sudhir Murthy, Haydee De Clippeleir, DC Water
- 09B 9:00 AM Application of Rapid Volume Expansion Research to Full-Scale Design**
Steven Krugel, Brown and Caldwell
- 09C 9:30 AM Making Room for Energy Neutrality**
Michael Theodoulou, Nicholas Bonkoski, Dorian Harrison, GE Power
- 10:00 AM Networking Break**
- 09D 10:45 AM Application of Rheological Data for Non-Newtonian Biosolids; The Use of “Differential Viscosity” for Mixing Simulation and System Calculations of Non-Newtonian Biosolids**
Marilyn Pine, Kent Keeran, Glenn Dorsch, Vaughan Co., Inc.
- 09E 11:15 AM Digester Cover Selection and Safety: Balancing Risk and Reward**
Matthew Williams, John Maley, HDR; Benjamin Miller, Clark Construction
- Alternate 1 Parameters Influencing Anaerobic Digestion of Sewage Sludge**
Stefano Giacalone, Peter Winter, Thames Water; Stephen Smith, Imperial College London
- Alternate 2 Extracting Energy from Sludge in UK: Recent Experience**
Keith Panter, Ebcor Ltd

TECHNICAL PROGRAM

Session 10: Dewatering

Monday, April 10, 2017

8:30 AM – 11:45 AM

- 10A 8:30 AM Innovative Biosolids Conditioning Ahead of Belt Filter Presses to Improve Dewatering Performance**
John Rickermann, CH2M; Charles Volk, Lehigh County Authority
- 10B 9:00 AM Development of a Laboratory Based Method to Predict Dewaterability**
Zwelani Ngwenya, Matthew Higgins, Steven Beightol, Bucknell University; Sudhir Murthy, DC Water
- 10C 9:30 AM Paradigm Shift if Dewatering Operations Moved to the Center of the Plant Universe**
William Wehner, Murthy Kasi, Mario Benisch, HDR; Anthony Perriera, City of Boise; James Wodrich, HDR
- 10:00 AM Networking Break**
- 10D 10:45 AM Dewatering Biosolids at two Biological Nutrient Removal Plants with a Volute Press**
Rickey Schultz, HDR
- 10E 11:15 AM Using a Long Term Piloting Program to Establish Performance Criteria at Miami's South District WWTP**
Charles Goss, Brian Stitt, AECOM; Manuel Moncholí, Miami-Dade Water and Sewer Department; Mohammad Abu-Orf, formerly AECOM
- Alternate 1 Reducing Dewatering Costs: Case Studies of Successful Optimization**
Rashi Gupta, Steve Walker, Carollo Engineers; Mike Brehm, Bryan Stevenson, Ken Tagney, Matthew Verosik, Eastern Municipal Water District
- Alternate 2 Screw Press Maximum Dewaterability and Energy Consumption**
Harald Neumann, Dieter Weinert, Edward Fritz, Huber Technology

TECHNICAL PROGRAM

Session 11: Bioenergy and Energy Management I: Cogeneration

Monday, April 10, 2017

8:30 AM – 11:45 AM

- 11A 8:30 AM Challenges and Opportunities for Approaching Net Zero Energy and Improving Resiliency of a Unique Solids Handling Facility in California**
Dan Frost, Nitin Goel, Central Contra Costa Sanitary District; Peter Burrowes, Irina Lukicheva, Summer Bundy, CH2M; Jamie Pigott, Carollo Engineers
- 11B 9:00 AM State of the Art Review of Digester Gas Treatment and Upgrading Technologies**
Christine Polo, Jay Kemp, Greg Knight, Dave Long, Black & Veatch; Kevin Jankowski, Cary Solberg, Milwaukee Metropolitan Sewerage District
- 11C 9:30 AM From Biogas to Boiler Fuel: Cleaning Up Digester Gas Biologically at a Large Scale**
Melissa Woo, Engin Guven, Samir Mathur, CDM Smith; Tom Jacobs, Trinity River Authority
- 10:00 AM Networking Break**
- 11D 10:45 AM To Treat or Not to Treat Post Combustion Exhaust**
Jason Wiser, Brown and Caldwell
- 11E 11:15 AM Evaluation of Biogas to Energy Options for Edmonton's Gold Bar Wastewater Treatment Plant**
Nicholas Szoke, Stantec; Alfredo Suarez, EPCOR Gold Bar Wastewater Treatment Plant
- Alternate Stirling Engine Co-Gen: Gas Scrubbing Not Required**
Brian Mitchell, Michael Moe, WesTech Engineering Inc.

TECHNICAL PROGRAM

Session 12: Bioenergy and Energy Management II: Biomethane

Monday, April 10, 2017

1:30 PM – 4:45 PM

- 12A 1:30 PM Update on Biogas Upgrading Project for City of Portland**
Jeremy Holland, HDR; Paul Suto, Vu Han, Muriel Gueissaz-Teufel, City of Portland, Bureau of Environmental Services
- 12B 2:00 PM A Greener Future for the City of Raleigh Turning Biosolids into Vehicle Fuel**
Greg Knight, Black & Veatch; Michael Bullard, Hazen & Sawyer; Kent Lackey, Christine Polo, Jay Kemp, Black & Veatch; Aaron Brower, TJ Lynch, City of Raleigh
- 12C 2:30 PM What's The Best Use of Your Digester Gas? Well, It Depends...**
Ian McKelvey, Eron Jacobson, Peter Zemke, Brown and Caldwell; John Smyth, King County
- 3:00 PM Networking Break**
- 12D 3:45 PM Biogas Testing: Critical Techniques to Minimize Capital and Operating Costs**
Jeremy Holland, HDR; Sherman Chao, Analytical Solutions, Inc.; Vu Han, Paul Suto, City of Portland, Bureau of Environmental Services
- 12E 4:15 PM Next Generation Resource Recovery: Co-Digestion to Renewable Natural Gas (RNG) Pipeline Injection at the Des Moines WRF**
Dustin Craig, CDM Smith; Larry Hare, Wastewater Reclamation Authority; Laurel Schaich, CDM Smith
- Alternate 1 Converting Biogas into Energy and Vehicle Fuel**
Adam Klaas, Unison Solutions, Inc.
- Alternate 2 Power or Fuel: Renewable Natural Gas a Feasible Alternative**
Trung Le, Joseph Marino, Trent Montemayor, Greeley and Hansen

TECHNICAL PROGRAM

Session 13: Thermal / Thermochemical Hydrolysis Processes

Monday, April 10, 2017

1:30 PM – 4:45 PM

- 13A 1:30 PM Using Thermo-Chemically Hydrolyzed Biosolids for Co-digestion**
Joshua Registe, Josh Perez, Jeanette Brown, Manhattan College; George Nakhla, Western University, Ontario, Robert Sharp, Manhattan College; Ajay Singh, Lystek
- 13B 2:00 PM Kenosha's Energy-Optimized Resource Recovery System**
Joseph Hughes, Centrisys Corporation; Dr. -Ing Andreas Duennebeil, PONDUS Verfahrenstechnik GmbH
- 13C 2:30 PM Impact of Thermo-Chemical Hydrolysis On Sludge Viscosity, Floc Morphology, and Dewaterability**
Peiyu Tan, Centrisys Corporation, Zhongtian Li, CNP-Technology Water and Biosolids Corporation
- 3:00 PM Networking Break**
- 13D 3:45 PM The Sludge Ozonation for Different Types of Mixed Liquor Under High and Low Ph Conditions by A Plug-flow Reactor**
Xiaoyu Zheng, Eric Hall, University of British Columbia
- 13E 4:15 PM A Tale of Two Cities: How Climate, Drivers, and Budget Affect Thermal Hydrolysis Design**
Thomas Nangle, Kristina Warren, CDM Smith

TECHNICAL PROGRAM

Session 14: Biosolids Facility Planning

Monday, April 10, 2017

1:30 PM – 4:45 PM

- 14A 1:30 PM Planning Your Class A Biosolids Program: Design Considerations and Lessons Learned in Pierce County, Washington**
Melissa Newell, Pierce County Public Works
- 14B 2:00 PM Beginning A Complete Renewal of San Jose's Biosolids Processing Facilities**
Adam Ross, Brown and Caldwell; Mariana Chavez-Vazquez, City of San Jose; Lloyd Slezak, Brown and Caldwell
- 14C 2:30 PM Sustainable and Cost Effective Biosolids Management Planning at OCSD**
Daniel Buhmaster, James Clark, Black & Veatch; Tom Chapman, Natalie Sierra, Brown and Caldwell; Sharon Yin, Tom Meregillano, Orange County Sanitation District
- 3:00 PM Networking Break**
- 14D 3:45 PM Comprehensive Biosolids and Bioenergy Planning at the City of San Mateo WWTP**
Cameron Clark, Irina Lukicheva, Anna James, Kathy Rosinski, CH2M; Cathi Zammit, City of San Mateo, California; Dave Parry, CH2M
- 14E 4:15 PM Biosolids Trends in Tennessee: A Roadmap for The Future?**
Robert Odette, State of Tennessee

TECHNICAL PROGRAM

Session 14: Biosolids Facility Planning (Continued)

Monday, April 10, 2017

1:30 PM – 4:45 PM

Alternate 1 A Big Picture Approach to Addressing Multiple Improvement Triggers for both Short- and Long-term Multi-Facility Master Planning

Vera Gouchev, Paul Knowles, Robert Sharp, Matthew Van Horne, Emanuel Psaltakis, Hazen and Sawyer; Thomas Lauro, Westchester County, New York Department of Environmental Facilities

Poster Detailed Market Analysis Helps Focus Capital Decisions for Orange County Sanitation District

Natalie Sierra, Brown and Caldwell; Ron Alexander, RAA; Steve Wilson, Brown and Caldwell; Tom Meregillano, Sharon Yin, Deirdre Bingman, Jeff Mohr, Orange County Sanitation District; Dan Buhrmaster, Black and Veatch

TECHNICAL PROGRAM

Session 15: Thermal Hydrolysis- Dewatering

Monday, April 10, 2017

1:30 PM – 3:00 PM

- 15A 1:30 PM Mechanistically Understanding the Dewatering Fundamentals: Impact of Biological Systems & Thermal Hydrolysis on Cake TS & Polymer Demand**
Mahmudul Hasan, The George Washington University; Qi Zhang, Ghent University; Rumana Riffat, The George Washington University; Ahmed Al-Omari, Sudhir Murthy, DC Water; Matthew Higgins, Bucknell University; Haydee De Clippeleir, DC Water
- 15B 2:00 PM Effect of Phosphorus Release and Thermal Hydrolysis Pretreatment on the Dewatering Properties of a Bio-P Biosolid in Anaerobic Digestion**
Jeffrey Nicholson, Virginia Tech/ HRSD; Steven Beightol, Matthew Higgins, Bucknell University; Charles Bott, Hampton Roads Sanitation District
- 15C 2:30 PM The Role of Soluble P, Iron Dosing and Eps on THP-Ad Dewatering Performance**
Ester Rus, Paul Fountain, Nick Mills, Achame Shana, Thames Water; Obinna Molokwu, Manocher Asaadi, AD Technologies

TECHNICAL PROGRAM

Session 16: Codigestion: The Latest Information You Should Know

Monday, April 10, 2017

3:45 PM – 4:45 PM

This panel discussion will share the latest information to consider when implementing a codigestion program. Attendees will gain a better understanding of recent developments and experience on this rapidly changing and expanding aspect of resource recovery at wastewater treatment plants.

The panel, which includes specialists in the field of codigestion, will cover the following key issues: external drivers, material sourcing and contracts, material receiving and pre-treatment, digestion, biogas handling, nutrient management, dewatering, energy production, and numerous operational considerations. The moderator will take the panel through each of these areas, while facilitating an interactive discussion with the audience.

Panel Participants

Ganesh Rajagopalan, *Kennedy/Jenks Consultants*

Greg Chung, *West Yost Associates*

Joerg Blischke, *Black & Veatch*

Chris Muller, *Brown & Caldwell*

Alicia Chakrabarti, *East Bay Municipal Utility District*

TECHNICAL PROGRAM

Session 17: Beneficial Use

Tuesday, April 11, 2017

8:30 AM – 11:15 AM

- 17A 8:30 AM Development of Kodiak Alaska's Successful Composting Program**
Todd Williams, CH2M; Mark Kozak, City of Kodiak; Lori Aldrich, Alaska Department of Environmental Conservation; Bud Alto, Floyd Damron, CH2M
- 17B 9:00 AM Using Lime to Beneficially Manage Wastewater Treatment Plant Residuals: A Review and Assessment of the Practice for Producing an Exceptional Quality Product**
James Smith Jr, Independent Environmental Consultant
- 17C 9:30 AM Producing High Value Carbon Products from Municipal Solids Generated from Chemically Enhanced Primary Treatment**
Wendell Khunjar, Hazen & Sawyer PC
- 10:00 AM Networking Break**
- 17D 10:15 AM Class B Land Application to Dryland Wheat: A Long-term, Highly Successful Public-private Partnership**
Jake Finlinson, King County; Dave Ruud, Boulder Park, Inc.; Andrew Bary, Craig Cogger, Washington State University
- 17E 10:45 AM Biosolids for Urban Agriculture**
Sally Brown, University of Washington; Kristen McIvor, Pierce County Conservation District; Jake Finlinson, King County; Dave Ruud, Boulder Park, Inc.; Andrew Bary, Craig Cogger, Washington State University

TECHNICAL PROGRAM

Session 17: Beneficial Use (Continued)

Tuesday, April 11, 2017

8:30 AM – 11:15 AM

- Alternate 1 The Effect of Solids Retention Time, pH & Mixing Intensity on Glycerol & Biodiesel Waste Fermentation in Semi-Continuous Side-stream Prefermenters**
Marzieh Ghasemi, Andrew Randall, University of Central Florida
- Alternate 2 Long-term Impacts of Biosolids Application On Soil Quality and Plant Species Composition At The Ok Ranch, Jesmond, BC**
Emma Avery, Maja Krzic, University of British Columbia; Brian Wallace, Reg Newman, BC Ministry of Forests, Lands, and Natural Resource Operations
- Poster Vermicomposting of Biosolids and Beneficial Reuse - New Zealand Commercial Case Studies from 4 Communities over 8 Years!**
Max Morley, Michael Quintern, Noke Limited - MyNOKE

TECHNICAL PROGRAM

Session 18: Biosolids Marketing and Communication

Tuesday, April 11, 2017

8:30 AM – 11:15 AM

- 18A 8:30 AM Know What You Don't Know - Using Social Media and Market Research to Inform Loop Communication Strategies**
Ashley Mihle, King County Wastewater Treatment Division
- 18B 9:00 AM Class "A" Part Two: After Achieving Class A Status, Our Path to Building a Sustainable Class A Program**
Shannon Ostendorff, Scott Thompson, City of Bend;
Mark Cullington, Kennedy/Jenks Consultants; Tim Truax, City of Bend; Sally Brown, University of Washington
- 18C 9:30 AM A Strong Network: The Growing Success of Biosolids Groups in North America**
Maile Lono-Batura, Northwest Biosolids; Ned Beecher, North East Biosolids & Residuals Association
- 10:00 AM Networking Break**
- 18D 10:15 AM Not All Dryer Products Are Created Equal**
Lisa Boudeman, Trudy Johnston, Material Matters
- 18E 10:45 AM Merging Innovation and Resource Recovery into Daily Operations**
Manon Fisher, San Francisco Public Utilities Commission; Natalie Sierra, Brown and Caldwell; Ben Jordan, Individual Consultant; Karri Ving, Wastewater Enterprise
- Alternate 1 Communicating Biosolids: A Social Science Research Update**
Ned Beecher, North East Biosolids & Residuals Association

TECHNICAL PROGRAM

Session 19: Invited US Department of Energy's Activities and Partnerships

**Tuesday, April 11, 2017
8:30 AM – 11:15 AM**

Energy-Positive Water Resource Recovery at the DOE

Recognizing wastewater and related solids as both an organic resource and a significant user of electricity, the DOE is pursuing two related tracks of R&D and technical assistance. Along with manure, food wastes, and other organic sources, municipal sludges are a valuable feedstock for the production biofuels, bioproducts, and biopower. Over the last 18 months, the DOE has developed a comprehensive resource assessment that both quantifies and locates potential sources of these feedstocks, with an eye towards developing distributed conversion strategies. As part of this overall effort, the DOE and the Pacific Northwest National Laboratory contributed to a WE&RF project that resulted in the production of high-quality renewable diesel from municipal sludges. Additionally, the DOE has launched a wastewater “accelerator” program, and has ramped up its efforts to provide technical assistance and programmatic support to enhance the energy efficiency of water resource recovery facilities. This session will describe these efforts in more detail, and give participants an opportunity to interact with DOE and national lab personnel on these topics

TECHNICAL PROGRAM

Session 20: Codigestion

Tuesday, April 11, 2017

8:30 AM – 11:15 AM

20A 8:30 AM Codigester Feeding Pattern Drives Long-chain Fatty Acid Degradation Kinetics and Microbial Community Structure

Ryan Ziels, David Beck, H. David Stensel, University of Washington

20B 9:00 AM Resource Recovery Cooperative for the Security of Consistent, High Quality Codigestion Feedstock

David McNeil, City of Tempe Water Management

20C 9:30 AM Codigestion Study Helps Turn Industrial Pre-Treatment Problem to Renewable Energy Benefit
Scott Hardy, Hazen & Sawyer; David Ornelas, El Paso Water Utility; Spyros Pavalostathis, Georgia Institute of Technology; Edward Keenan, Brandt Miller, Michelle Brown, Chamindra Dassanayake, Hazen and Sawyer

10:00 AM Networking Break

20D 10:15 AM Effects of Biosolids Addition and Alkalinity Sources on High-Solids Anaerobic Co-digestion of Food Waste and Green Waste

Phillip Dixon, Paula Bittencourt, Bethany Loya, Meng Wang, Sarina Ergas, University of South Florida

20E 10:45 AM Lifting the Fog from FOG Receiving

Rashi Gupta, Daniel Meacham, Phil Parkins, Carollo Engineers; Travis Peacock, Anthony Montoya, Albuquerque Bernalillo County Water Utility Authority

Alternate 1 How much can I digest? A Review of Process Loading Limits for Co-digestion and their Implications for Planning and Operations

Christopher Muller, John Willis, Perry Schafer, Steve Krugel, Tim Mills, Adam Ross, Thomas Chapman, Brown and Caldwell

Alternate 2 Synergistic Effects of Codigesting Preprocessed Food Waste Slurry

Michael Keleman, InSinkErator; Mingu Kim, Mohammad Chowdhury, George Nakhla, Western University