

# **Residuals and Biosolids Conference 2013**

Emerging Opportunities for Sustainable  
Resource Recovery

Nashville, Tennessee, USA  
5 - 8 May 2013

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## TECHNICAL PROGRAM

### Session RB 1: Advances in Stabilization Technologies

Monday, May 6, 2013

1:30pm – 4:45pm

Room:

2.5

204

PDHs

**Moderators:** Greg Woodward, Stantec  
Roy Smith, Guthrie Sales & Service, Inc.

**RB1A 1:30pm**      **San Francisco Sequencing Batch Reactor Temperature Phased Anaerobic Digestion: Efficient Adaptation to Class A Biosolids .....1**  
Drury D. Whitlock, David W. Green, CH2M HILL; Bonnie M. Jones, Alexandre Miot, San Francisco Public Utilities Commission; Tim L. Bauer, Douglas Barber, CH2M HILL

**RB1B 2:00pm**      **Achieving Biogas Generation and Minimized Sludge Production Using a High-Rate Anaerobic Sidestream Reactor (ASSR) Process - Pilot Study .....27**  
Aaron Brennan, Heonseop Eom, Chris Watt, Dong-Hyun Chon, Chul Park, UMass Amherst

**RB1C 2:30pm**      **Assessment of Methane Production during Marine Transportation of Wastewater Solids.....47**  
Christopher A. Wilson, Greeley and Hansen

**3:00pm**      **Networking Break**

**RB1D 3:45pm**      **Upgraded Digester Mixing: Achieving Sludge Minimization while Renewing a Key Asset.....64**  
Rebecca Schaefer, Christopher A. Wilson, Joe M. Gorgan, Greeley and Hansen

**RB1E 4:15pm**      **Fate of Nonylphenol Compounds during Aerobic and Anaerobic Digestion of Sludge.....77**  
Seçil Ömeroğlu, Hande Bozkurt, F. Dilek Sanin, Middle East Technical University

**4:45pm**      **Adjourn**

**Alternate 1**      **Accelerated Composting Methods and Equipment .....15**  
Fred P. Mussari, BCR Environmental Corporation; James E. Smith, Jr, U.S. EPA, retired; Darren Midlane, Harvest Quest International; Robert Finch, Michael Norris, BCR Environmental Corporation

### Networking Reception – Center/East Exhibit Hall

Immediately following the conclusion of this session, please join us for the Networking Reception held in Center/East Exhibit Hall from 5:00pm – 6:30pm

## TECHNICAL PROGRAM

### Session RB 2: Facilities Operation, Management, and Planning

Monday, May 6, 2013

1:30pm – 4:45pm

Room:

2.5

205

PDHs

**Moderators:** Bob Forbes, CH2M HILL  
Michael Bullard, Hazen and Sawyer

**RB2A 1:30pm Economic Methods Matter - Appropriate Analysis Can Overcome the Biggest Barrier to Biogas Use .....87**

John L. Willis, Karen Durden, Brown & Caldwell; Mike Ellenbaas, Black and Veatch; Lauren Fillmore, WERF; Lori Stone, Marc Walch, Brown and Caldwell

**RB2B 2:00pm Making the Case for Sustainable Biosolids Management Solutions: A Roadmap for Fourteen Facilities .....93**

Matthew Berg, CH2M HILL; Bruce Cole, Ken Wesson, Jeff Ray, Tiffany Currie, North Texas Municipal Utility District; Jenna Covington, Brigit Buff, Dru Whitlock, Todd Williams, CH2M HILL

**RB2C 2:30pm To Haul or Not to Haul? Capacity and Class A Biosolids Processing Expansion at the Haifa, Israel Wastewater Treatment Plant .....102**

Matthew P. Van Horne, Michael Bullard, Hazen and Sawyer

**3:00pm Networking Break**

**RB2D 3:45pm Biosolids Processing and Distribution: Challenges Continue .....121**

Robert Bates, Louisville Metropolitan Sewer District

**RB2E 4:15pm Benefits and Costs of Co-Digestion for a Large Utility .....139**

John F. Donovan, David Parry, CDM Smith; Daniel K. O'Brien, David Duest, Massachusetts Water Resources Authority

**4:45pm Adjourn**

### **Networking Reception – Center/East Exhibit Hall**

Immediately following the conclusion of this session, please join us for the Networking Reception held in Center/East Exhibit Hall from 5:00pm – 6:30pm

## TECHNICAL PROGRAM

### Session RB 3: Beneficial Use

Monday, May 6, 2013

Room:206

1:30pm – 3:00pm

1.25

PDHs

**Moderators:** Tazio Qubeck, Brown and Caldwell  
Trudy Johnson, Material Matters

- RB3A 1:30pm**      **Sustainable Solution to the Disposal Epidemic: Beneficial Use of Water Treatment Residual in Manufactured Topsoil .....140**  
Jennifer Callahan, Trudy Johnston, Material Matters, Inc.
- RB3B 2:00pm**      **Why the Fertilizer Industry Could Use a Little Biosolids .....157**  
John F. Donovan, CDM Smith Inc.; Jeffrey C. Burnham, VitAg Corporation
- RB3C 2:30pm**      **Over 20 Years of Successful Beneficial Use: Adapting the Management System Approach: Los Angeles Experience .....171**  
Diane Gilbert-Jones, City of Los Angeles
- 3:00pm**      **Adjourn**



## TECHNICAL PROGRAM

### Session RB 5: Public Support

Monday, May 6, 2013

3:45pm – 4:45pm

1

Room:

205

PDH

**Moderator:** Steve Wilson, Brown and Caldwell

**RB5A 3:45pm**      **Improving Public Communication and Outreach at the METROGRO Farm .....223**

Alicia Gilley, Kelley Merritt, Bryan Mitchell, Metro Wastewater Reclamation District

**RB5B 4:15pm**      **New Biosolids Technologies and Processes for Developing .....230**  
**Countries**

Richard D. Kuchenrither, University of Colorado Boulder; Lori Stone, Black & Veatch; Roger T. Haug, Loyola Marymount University; Lauren Fillmore, Amit Pramanik, WERF

**4:45pm**      **Adjourn**

### **Networking Reception – Center/East Exhibit Hall**

Immediately following the conclusion of this session, please join us for the Networking Reception held in Center/East Exhibit Hall from 5:00pm – 6:30pm

## TECHNICAL PROGRAM

### Session RB 6: Odor and Pathogen Control

Monday, May 6, 2013

3:45pm – 4:45pm

1

Room:

206

PDH

**Moderators:** Todd O. Williams, CH2M HILL  
Yinan Qi, Black & Veatch

**RB6A 3:45pm**      **Novel BioElectro™ Process for Biosolids Sterilization .....257**

Eham Takhtehfouladi, Maria Elektorowicz, Concordia University;  
Robert S. Reimers, Tulane University; Jan A. Oleszkiewicz,  
University of Manitoba

**RB6B 4:15pm**      **Treatment of Odor by a Seashell Biofilter at Lake Wildwood WWTP .....280**

Samantha M. Abraham, UCLA; Scott Joslyn, Nevada County Sanitation  
District; Irwin Suffet, UCLA

**4:45pm**      **Adjourn**

**Alternate 1**      **Sanitary Assurance at Biosolids Composting Facilities: Development of a  
Temperature Contact Time Test Protocol .....264**

Pulat Isobaev, Daryl McCartney, Kristine Wichuk, Norman Neumann, University  
of Alberta

### **Networking Reception – Center/East Exhibit Hall**

Immediately following the conclusion of this session, please join us for the Networking  
Reception held in Center/East Exhibit Hall from 5:00pm – 6:30pm



## TECHNICAL PROGRAM

### Session RB 7: Thermal Processes

Tuesday, May 7, 2013  
8:30am – 10:00am

Room:  
1.25

204  
PDHs

**Moderators:** Robert Bates, Louisville Metropolitan Sewer District (KY)  
Scott Carr, CDM Smith

- RB7A 8:30am**      **Thermal Drying to Achieve Class A Biosolids Can be a Viable Option for Medium Sized Generators - A Case Study in Bowling Green, Kentucky .....298**  
Kristi Schnell, Ronald Abraham, Kenneth Baker, Gresham Smith and Partners; Scott Neighbors, Bowling Green Municipal Utilities
- RB7B 9:00am**      **The Duffin Creek Biosolids to Energy Experience - Lessons in Energy Recovery .....328**  
Peter Burrowes, CH2M HILL; Brad Dobson, Regional Municipality of Durham; Euan Ferguson, York Region; Robert Christopher, Serge Larocque, CH2M HILL
- RB7C 9:30am**      **A Comparison of Conventional Heating and Microwave Irradiation for Enhanced Biogas Production from Municipal Biosolids .....346**  
Seyedeh Neda Mehdizadeh, Cigdem Eskicioglu, Hanna Hamid, University of British Columbia-Okanagan
- 10:00am**      **Adjourn**
- Alternate 1**      **Meeting the New SSI MACT Regulations - A Case Study .....317**  
Jay R. Surtj, Peter Burrowes, CH2M HILL

## TECHNICAL PROGRAM

### Session RB 8: Success Stories and Lessons Learned

Tuesday, May 7, 2013  
8:30am – 11:45am

Room:  
2.5

205  
PDHs

**Moderators:** Kevin Colvette, CH2M Hill  
David Oerke, CH2M Hill

- RB8A 8:30am PCBs in Biosolids: Monitoring In a Large Urban WWTP Using a Newly Developed Practical Extraction Procedure .....366**  
Devrim Kaya, Middle East Technical University/ Kocaeli University; Filiz Karakaş, F.Dilek Sanin, Ipek Imamoglu, Middle East Technical University
- RB8B 9:00am Composting Success at Spotsylvania County .....386**  
Todd O. Williams, CH2M HILL; Doug Crooks, Spotsylvania County
- RB8C 9:30am Speedway, Indiana, WWTP Biosolids Upgrade: Storage Nitrification/Denitrification Reactor Results in Ammonia Loading.....393**  
**Reduction**  
Cynthia L. Fort, American Structurepoint Inc; Norman Berry, Town of Speedway
- 10:00am Networking Break**
- RB8D 10:45am Sustainable Biosolids Management in South Florida: Lessons Learned from the Design, Construction, and Operation a Regional Biosolids Pelletization Facility Fueled by Landfill Gas .....406**  
Amber M. Barritt, CDM Smith; Raymond H. Schauer, Solid Waste Authority of Palm Beach County
- RB8E 11:15am How to Make Improvements When The Cupboard is Bare: Energy Service Contracting .....423**  
Patricia A. Scanlan, Bob Wimmer, Pete Thomson, Justin Dickstein, Black & Veatch; Tom Appleman, UOSA; Jesse Moffat, FWSA; Dennis Clough, ESG
- 11:45am Adjourn**
- Alternate 1 The Shafdan Digestion and Cogeneration Project .....371**  
David L. Parry, Scott Vandenburg, CDM Smith

## TECHNICAL PROGRAM



### Session RB 9: Research and Development Activities

Tuesday, May 7, 2013  
8:30am – 11:45am

Room:  
2.5

206  
PDHs

**Moderators:** John Willis, Brown and Caldwell  
David Parry, CDM Smith

- RB9A 8:30am**      **Investigation of the Impacts of Thermal Activated Sludge Pretreatment and Development of a Pretreatment Model .....436**  
Gillian R. Burger, Wayne J. Parker, University of Waterloo
- RB9B 9:00am**      **Second Law Analysis of Resource Recovery from Wastewater .....458**  
David L. Parry, CDM Smith
- RB9C 9:30am**      **Simultaneous Sludge Disintegration and Carbon Source Generation for Enhanced Biological Phosphorous Removal Using Ozonation**    
Devendra P. Saroj, University of Surrey; Adriana Inchauste-Daza, Carlos Lopez-Vazquez, UNESCO-IHE Institute for Water Education
- 10:00am**      **Networking Break**
- RB9D 10:45am**      **“Second Generation” ATAD Success Stories - “Show Me The Data”- Several Years of Performance Data from Two Case Studies of Conversion from “First Generation” to “Second Generation” ATAD Systems .....491**  
David W. Oerke, CH2M HILL; Chad Olsen, McMahon Associates; Jim Kirk, Grand Chute Menasha West Sewerage Commission; Parker Newbanks, Candi Burbridge, Eagle River Water and Sanitation District; Heidi Bauer, CH2M HILL
- RB9E 11:15am**      **An Approach to Dewatering Optimization using UV/Visible Spectrometry by Monitoring Residual Polymer in Centrate .....508**  
Banu Ormeci, Fares Almomani, Carleton University;  
Peter Gallant, ENDETEC/Veolia Water Solutions and Technologies;  
Richard DiMassimo, Jeffery Privott, Kruger Inc.
- 11:45am**      **Adjourn**

## TECHNICAL PROGRAM

### Session RB 10: Bioenergy from Residuals I

Tuesday, May 7, 2013  
8:30am – 11:45am

Room:  
2.5

209/210  
PDHs

**Moderators:** Aaron Stephens, Material Matters, Inc.  
Dustin Craig, CDM Smith

- RB10A 8:30am**      **Pilot Study of Siloxanes Removal from Digester Biogas through  
Various**                      **Adsorbents** .....518  
Yuanming Tsai, Sunil Mehta, Infilco Degremont, Inc; Jordi Raich-Montiu, CETaqua; Charles B. Bott, William J. Balzer, Hampton Roads Sanitation District; Peter A. Burrowes, CH2M HILL
- RB10B 9:00am**      **Sometimes Average isn't Good Enough: Understanding the Impact  
of Variability on Energy Recovery from Digester Gas** .....541  
James H. Long, Charles M. Bullard, Hazen and Sawyer; Chris Shamel, Frank Crump, City of Winston-Salem
- RB10C 9:30am**      **Restaurant Trap Waste Characterization and Full Scale FOG Co-  
Digestion at the San Francisco Oceanside Plant** ~~541~~ 541  
Alexandre Miot, Bonnie Jones, Karri Ving, San Francisco Public Utilities Commission; Morayo Noibi, Carollo Engineers; Irina Likicheva, Domenech Jolis, San Francisco Public Utilities Commission
- 10:00am      **Networking Break**
- RB10D 10:45am**      **Clean Combustion of Sludge Derived Fuel Part 1 of 2 - Concept to  
Pilot** .....581  
Roger T. Haug, Loyola Marymount University; F. Michael Lewis, F. Michael Lewis Inc.
- RB10E 11:15am**      **Clean Combustion of Sludge Derived Fuels: Part 2 of 2 Pilot to  
Practice** .....601  
F. Michael Lewis, F Michael Lewis Inc.; Roger T. Haug, Loyola Marymount University; Lee Lundberg, Veolia Water
- 11:45am      **Adjourn**

**Alternate 1    What Can Solids Do for You? - Shifting Towards Solids as an Energy  
Resource.....534**

Eric Auerbach, Malcolm Pirnie Inc; Thomas E. Kunetz, Metropolitan Water Reclamation District of Greater Chicago; Rob Van Evra, City of Columbus Division of Sewerage and Drainage; James Keller, Buffalo Sewer Authority



## TECHNICAL PROGRAM

### Session RB 12: Collaboration to Advance Energy Sustainability Initiatives

Tuesday, May 7, 2013  
1:30pm – 3:00pm

Room:  
1.5

204  
PDHs

**Moderators:** Doug Yarosz, Brown and Caldwell  
Patricia Scanlan, Black & Veatch

- RB12A 1:30pm**      **A National Survey of Biogas use at Wastewater Treatment Plants in the United States: The Results.....655**  
Yinan Qi, Black & Veatch; Ned Beecher, North East Biosolids and Residuals Association (NEBRA); Lori Stone, Black & Veatch
- RB12B 2:00pm**      **Road to Energy Neutrality – WERF is Paving the Way with a Focus on Biosolids Energy .....667**  
Ralph Eschborn, AECOM; Paul Kohl, Philadelphia Water Department; Steve Tarallo, Black and Veatch; Lauren Fillmore, Water Environment Research Foundation
- RB12C 2:30pm**      **Nineteen Agencies Team to Convert Biosolids to Energy for Regional Solution .....680**  
Robert A. Gillette, Todd C. Jordan, Carollo Engineers; Caroline Quinn, Delta Diablo Sanitation District; EJ Shalaby, West County Wastewater District
- 3:00pm**      **Adjourn**

## TECHNICAL PROGRAM

### Session RB 13: Biosolids Land Application, Land Reclamation, and Nutrient Management

Tuesday, May 7, 2013

1:30pm – 4:45pm

Room:

2.5

205

PDHs

**Moderators:** Jeffrey J. LeBlanc, WeCare Organics, LLC  
Michelle Hatcher, CDM Smith

- RB13A 1:30pm**      **Fate and Removal of Steroidal Hormones during Advanced  
Advanced Municipal Biosolids Treatment Process .....688**  
Hanna Hamid, Cigdem Eskicioglu, University of British Columbia
- RB13B 2:00pm**      **Long Term Monitoring Results for the METROGRO Farm Near Deer  
Trail, Colorado .....717**  
James E. Johnson, Arlisa Michael, Alicia Gilley, Metro Wastewater  
Reclamation District
- RB13C 2:30pm**      **Case Study: Nutrient Trading Options for Satisfying NPDES Cap  
Load in the Chesapeake Bay Watershed .....732**  
Aaron B. Stephens, Jennifer Callahan, Material Matters, Inc
- 3:00pm**              **Networking Break**
- RB13D 3:45pm**      **Mine Land Reclamation and Biosolids: A Perfect Match .....744**  
Trudy Johnston, Material Matters, Inc.; Jennifer Callahan, Material  
Matters, Inc.; Michael Deily, Harrisburg Advanced Wastewater Treatment  
Facility
- RB13E 4:15pm**      **Too Much Nitrogen? .....764**  
Dale D. Gabel, CH2M HILL; Dave Meyer, Tim Woodard, Kent Brugler,  
City of Westminster; Jim Jordahl, Heidi Bauer, Kerry Meyer, CH2M HILL;  
Thomas Borch, Colorado State University
- 4:45pm**              **Adjourn**

## TECHNICAL PROGRAM

### Session RB 14: What's the Future For Biosolids? Findings of a New WEF/WERF Report

**Tuesday, May 7, 2013**

**1:30pm – 3:00pm**

**Room:**

**1.5**

**206**

**PDHs**

WEF and WERF have collaborated with CDM Smith, Black & Veatch, Hazen & Sawyer and CH2M Hill Inc. to examine the future of biosolids treatment with specific regard to resource recovery. This effort is summarized in a new publication, funded by the US EPA that addresses policy and planning, technical and communication/outreach needs to advance resource recovery. The document focuses on organics, nutrients, and energy recovery, but also examines emerging recovery areas such as bio-plastics. Perspectives on these issues will be reviewed and discussed by a select panel of contributors, along with a moderator, concluding with questions and answers from the audience as a means to formally roll out and promote the study.

- 1:30pm**      **Introduction**  
John Donovan, CDM Smith
- 1:35pm**      **Policy and Planning: Building a Framework for Resource Recovery**  
Lynne Moss, CDM Smith
- 1:45pm**      **Organics Recycling: A New Perspective**  
Lynne Moss, CDM Smith
- 1:50pm**      **Energy Recovery**  
Christine Polo, Black & Veatch
- 2:00pm**      **Changing Perspectives: From Nutrient Removal to Nutrient Recovery**  
Ron Latimer, Wendall Khunjar, Hazen and Sawyer
- 2:10pm**      **Enabling the Future: Investing in People, Quality and Communications**  
Ned Beecher, North East Biosolids & Residuals Association
- 2:20pm**      **Panel Discussion**  
John Donovan, CDM Smith
- 3:00pm**      **Adjourn**



## TECHNICAL PROGRAM

### Session RB 15: Bioenergy from Residuals II

Tuesday, May 7, 2013  
1:30pm – 4:45pm

Room:  
2.5

209/210  
PDHs

Moderators: Mohammad Abu-Orf, AECOM  
Richard Tsang, CDM Smith

**RB15A 1:30pm**      **The Tale of Two Digesters: Hydraulic Versus Compressed Biogas .....786**  
**Mixing**

Richard W. von Langen, RVL Associates, Inc.; Richard Althouse, Fairfield Suisun Sewer District; Glenn Dorsch, Vaughan Company; Brad Rockwell, Rockwell Equipment and Engineering, Co.

**RB15B 2:00pm**      **An Update to the City and County of Honolulu Biosolids Management Plan - A Focus on Energy and Solids Minimization .....812**

Charles T. Goss, Mohammad Abu-Orf, Jeremy Koch, Jordan Fahmie, AECOM

**RB15C 2:30pm**      **Maximizing Opportunities for Beneficial use of Biogas for Pima County, Arizona .....826**

Jing Luo, Pima County; Gary Newman, Brown and Caldwell, Inc; Michael Gritzuk, Private Consultant; Eron Jacobson, Brown and Caldwell, Inc; Jerry Bish, Greeley and Hansen, LLC; Fernando Sarmiento, Greeley and Hansen, LLC; Jackson Jenkins, Pima County

**3:00pm**      **Networking Break**

**RB15D 3:45pm**      **Positive Business Case for Codigestion and Resource Recovery Facilities in Australia without Pre-Existing Anaerobic Digesters .....843**

John Kabouris, Tim Shea, Kate Simmonds, CH2M HILL

**RB15E 4:15pm**      **Co-Thickening and Cogeneration in The Electric City .....863**

Vincent Apa, CDM Smith

**4:45pm**      **Adjourn**

**Alternate & Poster**      **Development, Implementation and Demonstration of The Co-digestion of Source Separated Food Waste by The City of Tacoma .....798**

Christopher Muller, Brown & Caldwell; James Parvey, Lewis Griffith, City of Tacoma, WA; John Burke, David McBride, Donald Stallman, Brown and Caldwell

## TECHNICAL PROGRAM

### Session RB 16: Biosolids Management Approach: A Panel Discussion on Technology Selection Specific to End Use

Tuesday, May 7, 2013  
3:45pm – 4:45pm

1

Room:

204  
PDH

**Moderators:** Chris Peot, DC Water  
Tazio Qubeck, Brown and Caldwell

In this panel discussion, representatives from three utilities will discuss the approaches behind recent updates to their biosolids management programs. Inherently, every utility has a unique combination of evaluation criteria (economic, political, environmental, social, geographical, etc.) that are used to select the chosen technology and ultimate end use of its biosolids. Experience and lessons learned from these utilities and the ensuing discussion are intended to provide insight to those who are contemplating an update to their biosolids management approach.

- **Biosolids Management System at the Moccasin Bend WWTP in Chattanooga, TN .....N/A**  
Matthew L. Snyder, Alice Cannella, City of Chattanooga, TN
- **Indirect Heat Drying at Bowling Green Municipal Utilities in Bowling Green, KY .....N/A**  
Michael Gardner, Bowling Green Municipal Utilities
- **Biosolids Processing at the Morris Forman Water Quality Treatment Center in Louisville, KY .....N/A**  
Robert Bates, Louisville Metropolitan Sewer District

## TECHNICAL PROGRAM

### Session RB 17: Why Must We Manage Biosolids as a Nutrient Resource

**Tuesday, May 7, 2013**  
**3:45pm – 4:45pm**

**1**

**Room:**

**205**  
**PDH**

The U.S. Department of Agriculture and The U.S. Environmental Protection Agency in cooperation with State Departments of Agriculture, Environment, and Conservation and Land Grant Universities have initiated a long term project to reduce the load of nutrients entering streams and rivers throughout the nation. A comprehensive nutrient management strategy involves application of a science, technology and management -based framework to assess and reduce nutrient losses to waters of the U.S while optimizing crop yield and quality. A nutrient management plan is designed to optimize nutrient use for crop production and reduce nutrient introduction to surface water from both point and nonpoint sources in a scientifically sound and cost effective manner.

Farmers involved in nutrient management programs have demonstrated that voluntary management practices are reducing the loss of fertilizer from fields. Their goal is to better manage nutrients to make them available for plant growth rather than drain into shallow groundwater and surface waters. The application of comprehensive nutrient management planning processes to biosolids management has started in many jurisdictions and discussion with state personnel indicate these plans will be an essential part of future land based biosolids management efforts. This session presents a general assessment of nutrient content of biosolid material and biosolid derived products, examples of research results documenting consequences of land treatment efforts, and implementation efforts for nutrient management planning at the state level.

#### **Presenters:**

Robert Rubin, North Carolina State University

Forbes Walker, University of Tennessee

Patricia Turman, USDA-NRCS

## TECHNICAL PROGRAM

### Session RB 18: Featured Session: Local Metro Water Services Panel

**Wednesday, May 8, 2013**  
**8:30am – 11:45am**

**Room:**  
**2.5**

**205**  
**PDHs**

**Moderators:** Heather Crabtree, Metro Water Services  
Doug Yarosz, Brown and Caldwell

In this special panel discussion, representatives from Nashville's Metro Water Services (MWS) will present the history and evolution of biosolids management at MWS facilities, focusing on the challenges and opportunities encountered during and after implementation of a system-wide Biosolids Management Upgrade.

The planning discussion will feature project drivers, design considerations and the evaluation process that led to the selection and design-build delivery of the \$125M Central Biosolids Facility. Highlights of this facility include circular dissolved air flotation co-thickening, anaerobic digestion and thermal drying.

Now 5 years since the facility was completed, MWS will share lessons learned throughout the project. Operations staff will discuss their experience during the commissioning period as well as the current operation of the facility. The panel will conclude with discussion related to the facility damage resulting from the Nashville flood of May 2010 and emergency operating protocols that are implemented when solids handling facilities are flood damaged.

- 8:30am**      **Welcome**  
Scott Potter, Metro Water Services
- 8:35am**      **The History and Evolution of Biosolids Management .....N/A**  
David Tucker, Metro Water Services
- 9:05am**      **Biosolids Facility Planning and Implementation .....N/A**  
Ron Taylor, Metro Water Services  
Shannon Lambert, Barge Waggoner Sumner and Cannon, Inc.
- 10:00am**     **Networking Break**
- 10:15am**     **Biosolids Facility Commissioning and Lessons Learned .....N/A**  
Roy Denney, Metro Water Services
- 10:50am**     **Flood Recovery by the Book, While Writing the Book.....N/A**  
Bob Wimmer, Black & Veatch
- 11:25am**     **Question & Answer**
- 11:45am**     **Adjourn**

#### Additional Paper

**Phosphorous Release and SCVA Production from non-BNR Co-thickened Sludge Using Short Term Fermentation .....703**  
Francesco Zurzolo  
Jan A. Oleszkiewicz