Residuals and Biosolids Conference 2014

Sustainability Made Simple: Facilitating Resource Recovery

Austin, Texas, USA
18 - 21 May 2014

TABLE OF CONTENTS

Houston’s Biosolids: Production to Market ................................................................. 1
Zappi, Paul Andrew

Howard F. Curren AWTP Biosolids Dewatering Technology Evaluation ........................................................................................................ 2
Porter, Jacob; Schmidt, Dan; Bullard, Bullard

Applying European Experience To Screen And Select A Sustainable Dewatering System For Green Bay ........................................................................................................................................... 20
Oerke, David

Gable, Joshua J.; Yoshida, Hiroko; Park, Jae K.

Biosolids Dewatering and Drying by Novel Use of a Breathable Membrane Process ................................................................................................................................................... 64
Dentel, Steven K.; Marzooghi, Solmaz; Saxena, Shray; Carvalho, Nathalia Aquino; Ahneman, Tracie E.; Imhoff, Paul T.

Irreversible Impact of Temperature on Rheological Behaviour of Anaerobic Digested Sludge ........................................................................................................................................ 69
Eshtiaghi, N.; Faroo, Ehsan; Parthasarathy, Rajarathan; Bande, J. C.

Lessons Learned on Organic Solid Waste Digestion and Composting Projects in Europe ............................................................................................................................... 76
Cabrall, Christian; Eveillard, Francois; Treguer, Ronan; Efremenko, Boris; Meniere, Remy

Palo Alto, CA’S Integrated Source-Separated Organisms Management Solution to Achieve Zero Waste Goals ................................................................................................................................................ 88
Whitlock, Drury D.; Green, David W.; Deunna, Leswin; Allen, Jamie; Knapp, Mathew; Bobel, Phil

Feasibility of High Strength Waste Co-Digestion for the San Francisco Public Utilities Commission ............................................................................................................................ 101
M Abu-Orf, M.; Goss, C.T.; Casares, E.; Fong, M.; Jones, B.M.; Ho, C.H.; Tse, R.; Chiu, C.; Ying, K.; Berde, M.

Effect of Food Waste Co-Digestion on Dewatering, Cake Quality and Digestion Parameters .......................................................................................................................... 117
Rajagopalan, Ganesh; Consultants, Kennedy-Jenks; Higgins, Matthew; Miller, Andre; Brown, Jeff; Goepfer, Robert; Mohamed, Mona

High Solids Anaerobic Digestion Process to Treat High Strength Municipal and Industrial Organic Waste ........................................................................................................................................ 135
Viswanathan, Sudhakar; Kim, Jongmin

Diggestion Pretreatment - Gas and VS Destruction and Cake Quality ............................................................................................................................... 144
Novak, John T.; Muller, Christopher D.; Wilson, Christopher A.

Characterizing Polymer Thickened Biosolids for Pumping Applications ............................................................................................................................... 158
Hilts, Brian; Pine, Marilyn; Dorsch, Glenn

Modeling Thermally Pretreated Mesophilic Anaerobic Digestion ............................................................................................................................... 169
Suzuki, Ryu; Wadhawan, Tanush; Murthy, Sudhir; Wett, Bernhard; Takacs, Imre; Higgins, Matthew

The Different Solutions Proposed by Thermal Hydrolysis Process: Successful Implementation of LD, DL and DLD Configurations on Several WWTP ............................................................................................................................... 173
Chauzy, Julien; Kline, Michele; Cabrall, Christian; Dimassimo, Rick; Eveillard, Francois

Second Generation Thermal Hydrolysis Processes ............................................................................................................................... 186
Mills, Nick; Punter, Keith; Fountain, Paul; Shana, Achane; Martiniczka, Helen; Nilsen, Paul; Jahre, Oski, Sabeha; Thorpe, Rex

Continuous, Real Time Analysis Of Firing Rate and Cake Solids From Fluid Bed Incinerator Flue Gas Data ........................................................................................................................................ 199
Michael Lewis, F.; Strickland, Matthew R.; Hooche, David A.

Gains in Operating Efficiency Achieved With the Implementation of Continuous, Real-Time Analysis of Firing Rate and Cake Solids from Fluid Bed Incinerator Flue Gas Data ........................................................................................................................................ 211
Strickland, Matthew R.; Michael Lewis, F.; Heffin, Rene K.; Quast, Dave; Davern, Nicholas; Fronek, Scott D.

Pyrolysis of Wastewater Biosolids: Lab-Scale Experiments and Modeling ........................................................................................................................................ 218
McNamara, Patrick; Koch, Jon; Zitomer, Daniel

Utilizing Recovered Heat to Economically Produce Class A Biosolids ........................................................................................................................................ 232
Wilson, Steve; Lough, Dale; Ritter, Harry; Peterson, John; Dick, Frank

Implementation of a Medium Temperature Belt Dryer in North Carolina to Produce Class A Biosolids – Case Study ........................................................................................................................................ 243
McKinnon, B.; Weinert, D.

Meeting “New” SSI MACT 129 Limits ............................................................................................................................... 267
Queiroz, Gustavo; Cheslek, Heather; Rowan, James; Patrick Schlotzhauer, C.; Welp, James

Evaluating the Future of Biosolids: Louisville MSDs Decision ........................................................................................................................................ 281
Bates, Robert; Novak, Alex; Worley, Sharon; Burch, Robin; Fallert, Joe
Continuous Process: Solar Drying of Biosolids at Tooele City Water Reclamation Facility, UT ........................................292
Olson, Dan; Weinert, Dieter

Demonstrated Mercury Reduction for SSI MACT Using Mercury Adsorption Modules ........................................306
Higgins, Brian; Pomerehan, Marcel; Rundolph, Pamela; Bauer, Tim; Kolde, Jeff; Barilla, Paul

Keeping Recovered Energy from Biosolids Within the Fence: When Does it Make Sense? .........................316
Goss, Terry; Abu-Orf, Mohamad

Renewable CNG with Combined Heat and Power Provides Flexible End use for Biogas .........................324
Kemp, Jay S

Co-Digestion to Feed the Energy Engine: A Major Texas Plant Moves Toward Energy Independence ..........341
Ripley, Leonard E.; Fichera, Sebastian “Buster”; Cavagnaro, Peter V.

Energy Recovery at Blue Lake WWTP – An Award Winning Experience ..............................................................350
Scanlan, Patricia; Mordorski, Carol; Simons, Dave; Joseph, Scott; Fronnek, Scott; Hoener, Webster; Massart, Neil; Neun, Gary

Integrating Major Components of a New Landfill Gas System – Coordination of Multiple Contracts for Gas Treatment, Pipeline Transmission and Turbine Energy Generation – An Update .......................................................363
Schroedel, Ralph B. "Rusty"; Martin, Michael J.; Solberg, Cary J.; Krill, William

Ledged or Unleaded: Considering an Alternative Use of Biogas at the Columbia Boulevard Wastewater Treatment Plant .................................................................379
Holland, Jeremy; Larocque, Stephanie; Han, Vu; Gueissaz-Teufel, Muriel; Sato, Paul; Bill, Eric; Bill, Karen

Austin Water Utility’s Hornsby Bend Biogas-to-Energy CHP Project – Commissioning and Startup ...............403
Bogusch, Adam; Grubbs, Richard T.

Biosolids Composting Technology: Where It Has Come from and Where it is Going ........................................417
Williams, Todd O.

Providing Operational Flexibility by Adding Lime Stabilization as a Backup for Sludge Incinerator ...............425
Neugebauer, Anna; Bennett, Steve; O’Shaughnessy, Maureen; Loomis, Peter; Schafer, William

Effect of Pre-treatment using Ultrasound and Hydrogen Peroxide on Digestion of Waste Activated Sludge in an Anaerobic Membrane Bioreactor .................................................................433
Joshi, Priyanka Dilip; Parker, Wayne

High Pressure Homogenization and Temperature Phased Anaerobic Digestion for Enhanced Biogas Conversion from Municipal Waste Sludge .................................................................451
Wahidunnabi, Abdullahal K.; Eskicioglu, Cigdem

Enhanced Biogas Production Using Ozone – Lysis Reactor Design and Integration with Anaerobic Digestion of Biosolids ........................................................................................................471
Fabiyi, Malcolm; Novak, Richard A.; Jampala, Soujanya; Shah, Purvish

Can we Minimize Biosolids Production in Activated Sludge Systems by Process Manipulations- Process Sustainability and Nutrient Removal .................................................................481
Huang, Pei; Goel, Ramesh

The Successes and Challenges of the First North American Full Scale Post Aerobic Digester .........................485
Bauer, Heidi; Johnson, Bruce R.; McClymont, Adam; Oerke, David

Digestivore™: Killing Four Birds with One Stone ........................................................................................................498
Woo, Bryen; Crane, Kevin

One-Stage Deammonification Process - MBBR Versus IFAS Configurations - Development Updates and Application Considerations .................................................................................................507
Zhao, Hong; Bell, Justin; Thesing, Glenn; Priveteau, Simon; Christensson, Magnus; Veuillet, Frederic; Ochoa, Juan; Lemaitre, Romain

A Unique Retrofit to Treat Centrate with RAS Reaeration at the Kitchener WWTP ..............................................523
Bicudo, Jose R.; Seaman, Laura; Brown, Trevor; Ross, Deborah; Briggs, Troy; Saint, Warren; Mehmood, Khalid

Large-Scale Nutrient Harvesting: Making the Case for Resource Recovery in Atlanta ........................................533
Macrina, Jo Ann J.; Stephens, Stephens; Glenn, Sandra; Booker, Randy; Haney, Chris; Bissitt, Annie; Wirtel, Steve

Management of Foam Formation at the Des Moines Co-Digestion Facility .........................................................544
Hammit, Royce

Management of Rapid Rise Foam Formation at a Codigestion Facility .................................................................545
Gabel, Dale; Noltemper, Doug

Rise and Fall in Digesters Fed with Thermally Hydrolysed Sludge .................................................................547
Fountain, Paul; Maceo, Flavia; Solheim, Odd Egil; Panter, Keith

Digester Gas Hold-up and Rapid Rise Foam Formation .....................................................................................558
Chapman, Thomas; Streher, Andy; Truong, Phuong; Krugel, Steve

Insights into Rapid Volume Expansion in Anaerobic Digesters Associated with Gas Holdup ...........................570
Higgins, Matthew J.; Beigtdal, Steven; Murthy, Sudhir N.; Nielsen, Paul Jahre

Foam Busters: Investigating the Causes of Foaming in Anaerobic Digesters ....................................................577
Stiebels, A.; Noguera, D.; Lange, C.; Pavlostathis, S.; Kilian, R.
What is your Flare Philosophy? – Impacts on Digester Gas System Design
Schoedel, Ralph B. “Rusty”; Hull, Ted; Jacobsen, Eron

The Multiple Benefits of Phosphorus Recovery
Shaw, Andrew; Koch, Dave; Wirtel, Steve; Britton, Ahren

Finding the Right Fit – CoGenie CHP Optimization Model
Polo, Christine; Rowan, Jim; Long, David; Scanlan, Patricia; Santha, Hari; Burchett, Bobby; Marshall, Steven; Godlewski, Vic

Massachusetts Water Resources Authority’s Path to Full Resource Recovery
Donovan, John F.; Parry, David L.; Spargimino, Eric M.; Duest, David

Investigating Anaerobic Co-Digestion of Sewage Sludge and Food Waste Using a Bench-Scale Pilot Study
Kuo-Dahab, Wonye Camilla; Amirhorz, Parvez; Zona, Meredith; Duest, Dave; Park, Chul

Mesophilic Anaerobic Co-Digestion of Municipal Wastewater Sludge with Grease Trap Residues
Yalcinkaya, Sedat; Malina, Joseph F.

Impact of Free Long Chain Fatty Acids on Completely Mixed Anaerobic Digesters Treating Municipal Sewage Sludge
Zhu, Kuang; Novak, John T.

Anaerobic Digestion Startups and Process Changeovers for Class A and Advanced Processes
Schafer, Perry; Muller, Chris; Willis, John; Beattie, Michael; Chapman, Tom

Relationship Between Performance and Microbial Community Structure in Two-Phase Anaerobic Digestion
Shimada, TooHio; Epperson, David; Smith, Adam; Raskin, Lutgarde

Examination of Digester Gas Production on an Hourly and Minute Time Scale
Auerbach, Eric; Kunetz, Thomas E.; Pagilla, Krishna; Mande, Arun

Alexandria Renew Enterprises Utilizes a Pasteurization System to Achieve Exceptional Quality Class a Biosolids
Yin, Hong; Fancher, Adrienne; Liu, Yanjin

Nitrogen Migration from Deep-Row Biosolids Incorporation on a Hybrid Poplar Tree Farm
Felton, Gary K.; Kays, Jonathan S.

Effect of Nitrogen-Based Biosolid Application on Tree Growth, Water Quality, and Soil Phosphorus in Hybrid Poplar Plantations
Kays, Jonathan S.; Felton, Gary K.; Ward, Daniel L.

Evaluation of Long-Term Storage Conditions on Fecal Coliform and Odors for Clackamas County
Muller, Christopher D.; Spencer, Kathryn; LaPieve, Mona; Higgins, Matthew; Beightol, Steven; Brandt, Robin

Addition of Metal Salts to Reduce Odor Causing Volatile Sulfur Compounds and Pathogens from the Anaerobic Digestion of Municipal Waste Sludge
Abbott, Tim; Eskicioglu, Ogden

Overcoming Obstacles at the City of Raleigh’s Neuse River Wastewater Treatment Plant Land Application Site
N/A

Explaining Sources of Biosolids Odors at Wastewater Treatment Plant (WWTP) by Utilizing Real-Time Odor Monitoring System and Statistical Models
Janpengpen, Amnum; Yomnak, Torthakul; Ramirez, Mark; Peot, Christopher; Veeraklaew, Tawiwat

Biosolids Beneficial Use Options for the Edmonton Region, Alberta
Mangory, Alan; Curran, David; Sacluti, Fernando

Utilizing Biosolids Marketing to Improve your Bottom Line
Hardy, Kevin M.; Have, Eric M

Driving Innovation by Challenging the Marketplace: Palo Alto’s Organics Processing in 2020
Kropp, Matthew

Fertilizing Outside the Box: Marketing EQ Biosolids beyond the Agricultural Industry
Callahan, Jennifer; Boudeman, Lisa

Bio-P, Digestion and Dewatering: Midwestern Case Studies
Downing, Leon; Marten, Bill; Lynne, Eric

Improving Dewaterability of Digested Sludge from EBPR Facilities
Benisch, Mario; Schauer, Peter; Neethling, JB

Does Bio-P Impact Dewatering After Anaerobic Digestion? Yes, and Not in a Good Way!
Higgins, Matthew; Bott, Charles; Schauer, Peter; Beightol, Steven

Struvite Reduction and Harvesting Study at Deer Island Treatment Plant
Spargimino, Eric; Donovanan, John; Parry, David; O’Brien, Daniel K.; Duest, David F.

The Effects of an Antimicrobial on Anaerobic Digestion Microbial Communities
McNamara, P.J.; LaPara, T.M.; Novak, P.J.