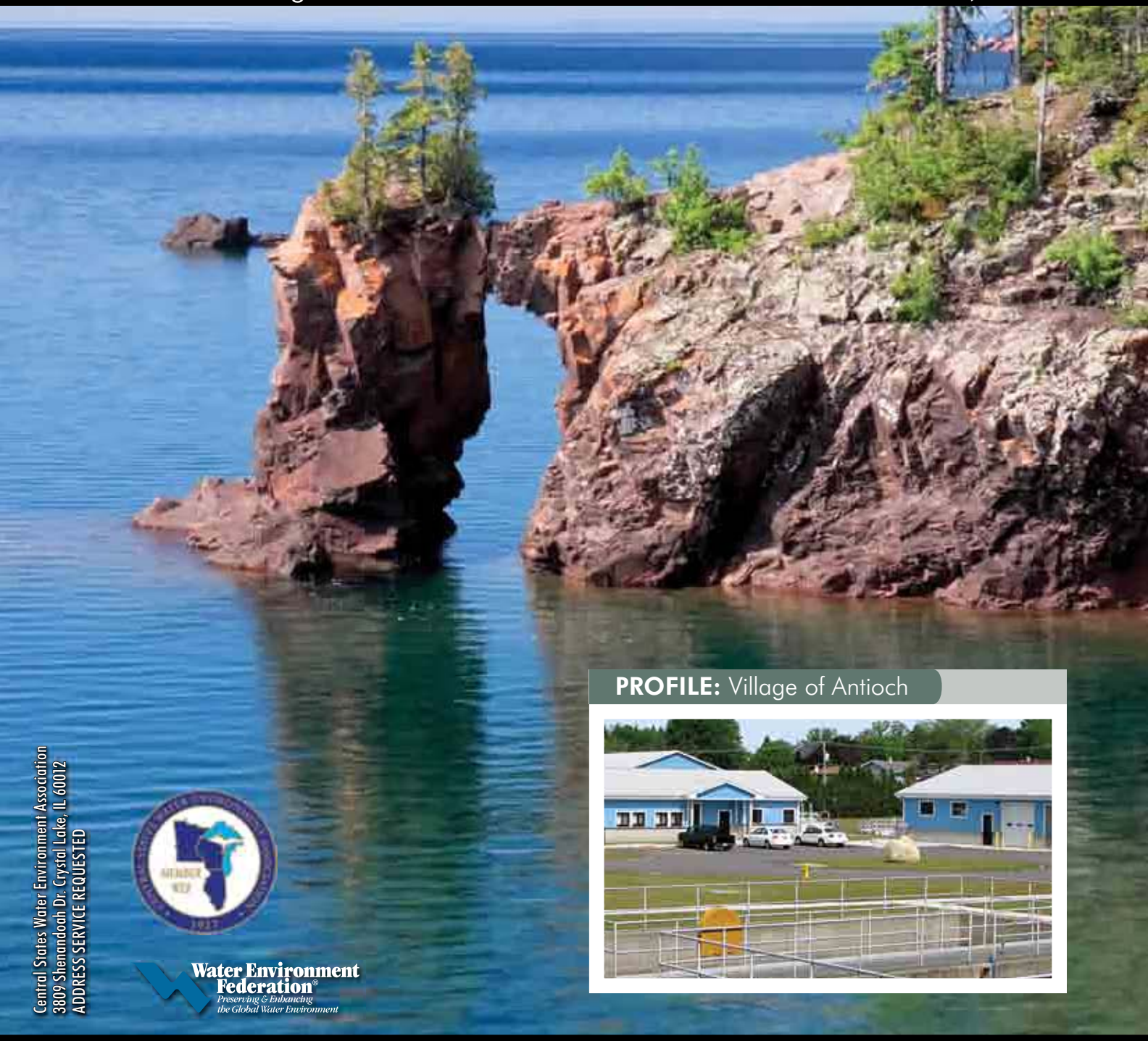
CENTRAL STATES WATER

The Official Magazine of the Central States Water Environment Association, Inc.



PROFILE: Village of Antioch

Central States Water Environment Association
3809 Shenandoah Dr. Crystal Lake, IL 60012
ADDRESS SERVICE REQUESTED

Water Environment Federation®
Preserving & Enhancing the Global Water Environment

Ho hum...
another Natgun tank.

All we do is design and build precast, prestressed concrete storage tanks. And we never get tired of it. May we build one for you?

2.83 MG Natgun open top equalization tank for the Village of Roselle, IL. Engineering by Roy Holub Associates, Woodstock, IL.

NATGUN | DYK INCORPORATED
Divisions of DN Tanks

847-782-0357
www.natgun.com
505 North Riverside Drive
Gurnee, IL 60031

619-440-8181
www.dyk.com
351 Cypress Lane
El Cajon, CA 92020

IN THIS ISSUE

FEATURES

DEPARTMENTS

Messages

CSWEA News

Section News

Published by:

Craig Kelman & Associates

Tel: (866)985-9780 / Fax: (866) 985-9799
www.kelman.ca
Managing Editor: Cheryl Parisien, cheryl@kelman.ca
Design/Layout: Stacia Harrison
Advertising Sales: Al Whalen, awhalen@kelman.ca
Advertising Co-ordinator: Lauren Campbell
Federal tax# 23-7378788

Central States Water, the official magazine of the Central States Water Environment Association, Inc., is published four times per year. Send comments, news items, gloss photographs or digital images to Eric Lecuyer, cswea@ymail.com

Send undeliverable addresses to: CSWEA, 3809 Shenandoah Dr., Crystal Lake, IL 60012

Administrative Year 2010-11

FLYGT

Efficiency is great. Sustained high efficiency is priceless.

Flygt N-pumps take on the toughest applications and get the job done.

Every component is designed and manufactured to deliver sustained high efficiency. Thanks to patented N-technology with its innovative self-cleaning impeller, Flygt N-pumps deliver the highest total efficiency. This drastically lowers your energy bill and reduces unplanned maintenance costs.

That adds up to total peace of mind – and big savings over the long term. Simply put, choose the most efficient wastewater pump for non-stop performance. Choose Flygt.

For more information contact your Flygt product sales professional.

ITT Water & Wastewater
14125 South Bridge Circle,
Charlotte, NC 28273
704-409-9700

FLYGT Products
8402 W. 183rd St., Suite A
Tinley Park, IL 60487
708-342-0484

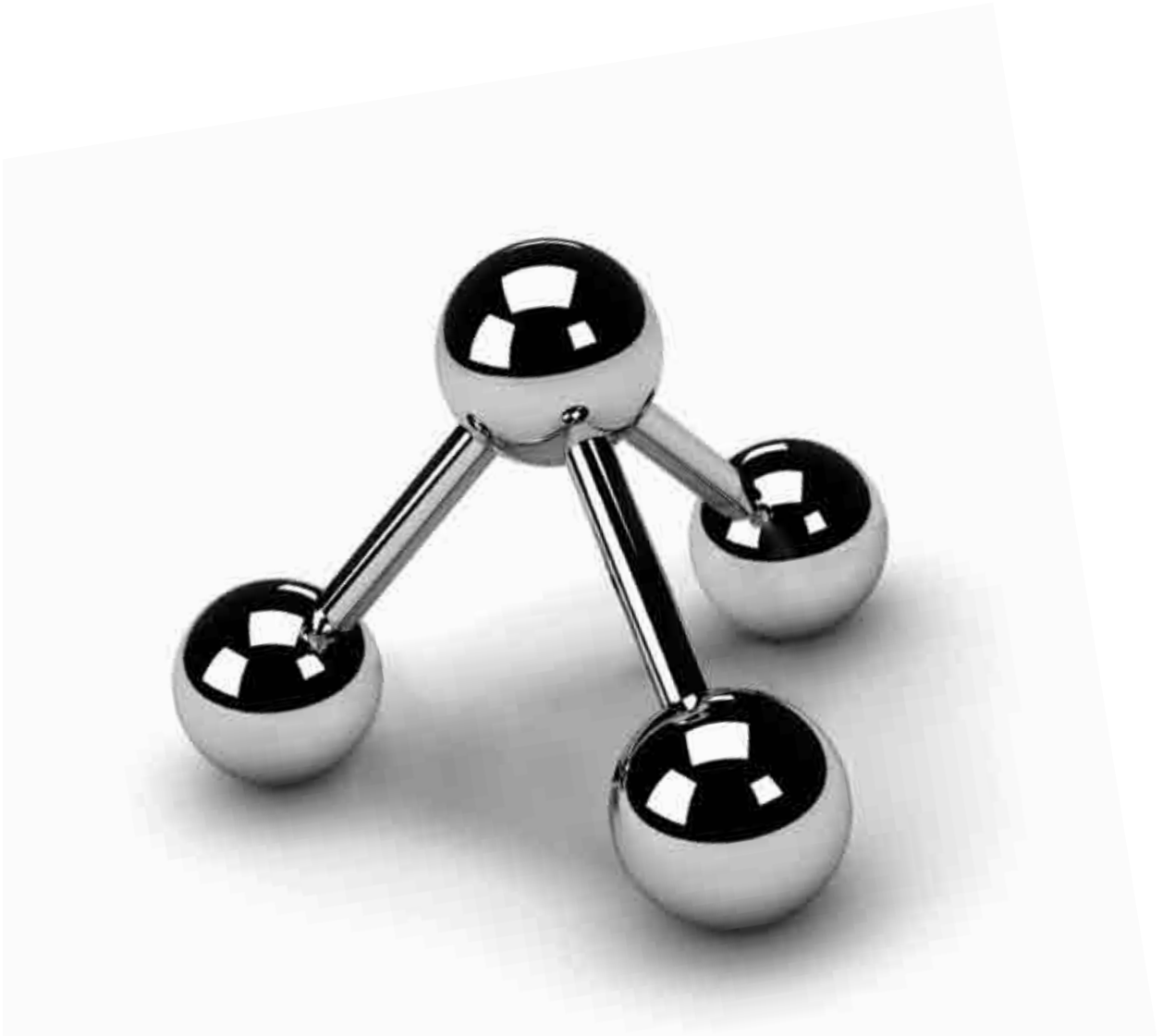
FLYGT Products
N27W23291 Roundy Drive
Pewaukee, WI 53072
262-544-1922

Visit us online at www.flygtus.com

ITT

ITT is a global provider of water handling and treatment solutions in more than 140 countries. The company designs and delivers energy-efficient solutions and related services for water and wastewater transport, biological treatment, filtration, and disinfection. ITT maintains one of the industry's most extensive sales and service organizations to ensure it meets more than one customer's needs locally.

Flygt | Leopold | Sanitaire | WEDECO



ELEMENTS OF YOUR SUCCESS

Vision. Value. Passion. Integrity. Relationships. Attitude.

These elements make up the structure of AE2S. What does that mean to you? Extreme client service, trusted relationships, a shared vision for your future, and passion for every project. They all translate into your success.

Advanced Engineering and Environmental Services, Inc. (AE2S) Offices:
Eagan Maple Grove Moorhead
Bismarck Dickinson Fargo
Grand Forks Williston Watford City
Great Falls Kalispell
www.ae2s.com

WATER ENGINEERING
MUNICIPAL ENGINEERING
LAND DEVELOPMENT
SURVEY/MAPPING/GIS
FINANCIAL/ASSET MANAGEMENT
INSTRUMENTATION & CONTROL
ELECTRICAL ENGINEERING
STRUCTURAL ENGINEERING

AE2S®
Think Big. Go Beyond.

An Action-packed Meeting

By Beth Vogt

Central States Water Environment Association members take action every day protecting communities and the environment, and I am thrilled to be a part of such an incredible group. The 84th Annual Conference of CSWEA in Minnesota was a great opportunity to share actions, experiences, and technologies to advance our knowledge toward fulfilling our shared mission. It was also a chance to get together with old and new friends while enjoying interesting and fun activities. I would like to thank Jim Miller and the conference committee chairs including Sandy Mass, Jason Benson, and Kevin Regan as well as the many other committee members (John Center, Todd Carlson, Greg Guerrero, Susan Danzl, Rachel Radloff, Bill Johnson, Keith Redmond, Bill Spain, Tracy Hodel, Steve Reusser, Rick Manner, Pavel Hajda, Trevor Ghylin, and Bill Boyle) who worked to provide an excellent experience for everyone. The conference was a great success from start to finish.

We certainly began and ended our conference in interesting and appropriate ways with our opening and closing speakers (Cindy Hagley and Chris Kleist) giving us insights into the unique environments of Lake Superior and the Boundary Waters and the impacts human activities have on these special places. The weather was perfect for our outdoor events – the golf, sporting clays, and 5K run/walk. Thanks to all of our conference and special event sponsors. I would also like to thank all the exhibitors and presenters for sharing their experiences and technologies to advance the knowledge of all attending. I am always impressed by the work everyone is doing, how much there continually is to learn, and the willingness of people to share their knowledge. Speaking of sharing, CSWEA was able to raise nearly $800 for Water For People through buy-ins at the Tuesday night Poker Tournament and the Silent Auction. Thanks to all the St. Cloud Technical College Students for running the poker tables and those who donated to the silent auction.

In touring the State Section meetings, it was obvious that each of the sections is working hard to support the membership with events, award nominations, and monitoring regulatory changes. At the Annual Luncheon, our WEF visitor, Ed McCormick, provided us with insights into the strategic direction of WEF and the new WEF Executive Director, Jeff Eger. New officers were elected, including Patti Craddock as 2nd Vice President and Jeff Mayou as PWO Representative at the Annual Business Meeting. Congratulations to these exceptional individuals – I look forward to serving with you. Thanks to the executive committee leaders, Jim Miller and Charlie LaRocca, who have completed their terms. I hope you will continue to lend us your knowledge in the future. To support CSWEA in meeting the needs of the membership, a vote was taken and passed at the Business Meeting to increase active, PWO, corporate, and dual member dues from $20 to $25, beginning in January 2012. The Annual Banquet featured the WEF and CSWEA award presentations by Scott Trotter, WEF Board of Trustees member, and Jim Miller. Congratulations to all the award winners! Your service deserves recognition, and I hope you take the time to let your organizations and communities know of these honors. The evening was capped off with dancing and karaoke. I learned that many of you are very good singers, and it is confirmed that I really am not!

Finally, my most sincere gratitude to Eric, Anne, Alaine, and Emily Lecuyer for all they do to organize and implement the mission of CSWEA all year long. Many thanks! The whole Lecuyer family was in motion throughout the conference to keep things going smoothly. Many past presidents have told me how critical Eric has been to their success. I can see how fortunate I am, and all of us are, to have Eric keeping CSWEA on track, focused, and organized. When you get a chance, please take some time to thank the Lecuyer family as well.

> "I am always impressed by the work everyone is doing, how much there continually is to learn, and the willingness of people to share their knowledge."

Continued on page 8

Continued from page 7

> "My most sincere gratitude to Eric, Anne, Alaine, and Emily Lecuyer for all they do to organize and implement the mission of CSWEA all year long."

Just before our entertainment, Jim Miller "carefully" passed me the red suspenders and gavel. I am truly honored to serve as president of CSWEA. In accepting this honor, I indicated that to me it is about actions, and that CSWEA has always represented service in action to me. In keeping with that view, it is my goal to focus on action in my term as president. There are many great events that CSWEA and the state sections host every year and I hope to see many of you at these activities. On July 21 and 22, we will hold CSX'2011 at the Kalahari Resort in the Wisconsin Dells. I encourage all committee members to participate in this exchange and for everyone to offer ideas to the leadership as we look for more ways to support the membership. These discussions lead to new and improved events such as the 2011 YP Leadership Academy.

My involvement with CSWEA over the years has been very rewarding, allowing me to develop many friendships, learn from exceptional individuals, and support our industry. I recognize everyone has many priorities pulling at their limited time. However, supporting the individuals who perform a noble profession every day through this great organization is a valuable use of our time. I encourage everyone to find one action you can take – a committee to participate in, a young professional to encourage to be active, an additional event to attend, or a deserving individual/organization to nominate for an award – and take the time to do it. I plan to take these actions myself. CS

Click HERE to return to Table of Contents

LARGE-SCALE DISINFECTION

The new **TrojanUVSigna™**. It's ideal for those municipalities wanting to upgrade their wastewater disinfection system or convert from chlorine. The system provides high UV output, high electrical efficiency and the lowest lamp count (thanks to TrojanUV Solo Lamp™ Technology). It's also easy to operate and maintain. Quartz sleeves are automatically cleaned with ActiClean™. Lamp replacements are simple. And if you need to lift a bank from the channel, just activate the Automatic Raising Mechanism.

Energy efficiency, fewer lamps and worry-free maintenance. That's UV innovation. That's TrojanUVSigna™.

Learn more at trojanuv.com/signa.

TROJAN UV

MEASURE

At Master Meter, we're creating the future of water management. Our Octave® ultrasonic meter uses the Sound of Science™ to accurately measure use of this precious resource. Our approach is a reflection of the way we work closely with clients to develop customized technology products and revenue solutions for measuring, collecting, and managing water. Highly flexible and innovative, *Master Meter is defining the Science of Precise Measurement to make every drop of North America's water measure up.*

iPad Giveaway • ENTER TO **WIN!** • No Purchase Necessary • Only one entry per person • www.mastermeterpromo.com

Promo Code: WEACS07

PLEASE CONTACT BARRY SCHERER • MASTER METER PRODUCT SPECIALIST • UNDERGROUND PIPE & VALVE • (800) 262-2773

Please Come to CSX!

Eric R. Lecuyer

One of the most critical events hosted by CSWEA each year is what's known as CSWEA-CSX (Committee and Section Exchange), and you are all invited! CSX literally is a strategic planning event and our most successful past events have helped shape our association. This event was started under the leadership of Scott Trotter when he was president, and the format and central, (WI Dells) location is intended to make it possible for folks to attend either or both of the two half-day sessions. CSX'11 will kick off at noon on Thursday, July 21 with a working lunch and recess at around 5:00 p.m. That evening we'll host a 6:00 p.m. pizza party for all attendees, along with their guests. Friday morning we will reconvene at 8:00 a.m. and adjourn at noon. As I understand it, there is often a gathering of CSXers at one of the adult beverage establishments on the property where allegedly most of the best ideas are hatched. (Somebody should take notes; wet bar napkins covered with some form of hieroglyphics don't count.) Whether these are truly good ideas or not, the opportunity for networking and interaction with other CSWEA leaders is not to be missed. Did I mention that CSX is hosted at the Kalahari Resort at the Wisconsin Dells? Folks attending are encouraged to bring along their families for a little mini-vacation and fun in the water park and connected indoor amusement park where there is plenty of fun and games for all to enjoy. CSX is open to all CSWEA members. All CSWEA and Section leaders, including officers, committee chairs and committee members are encouraged to attend.

> "While our annual meetings remain strong, we recognize the need to change with the times and that the annual meeting model that has been followed for as long as anyone can remember may no longer serve our members, exhibitors and presenters in the most effective and efficient manner."

In the past, CSX has tackled a range of topics and produced a number of great ideas, actionable ideas to better serve our membership and strengthen our association. At CSX'11, CSWEA President Beth Vogt, along with 1st Vice President Randy Wirtz, wish to focus on a limited number of topics, most importantly in re-tooling our annual meetings. While our annual meetings remain strong, we recognize the need to change with the times and that the annual meeting model that has been followed for as long as anyone can remember may no longer serve our members, exhibitors and presenters in the most effective and efficient manner. The ongoing economic downturn resulting in limited travel and training budgets as well as the association landscape have combined to increase competition for our members' attention. With WEFTEC being hosted in Chicago every other year beginning in 2013, we will face additional and very formidable competition for our travel and training/marketing and business development dollars.

Re-tooling the annual meeting has been a topic of discussion for years and that discussion has been driven in the most part due to dissatisfaction over one thing or another; not enough traffic in the exhibit area, too many things going on at once, not enough sessions for collection system or treatment plant operators, to name a few. Some ideas have been bandied about over the years: Change the format, revise how technical papers are solicited, or host the annual meeting in a centrally located venue each year. Some of those ideas may have value, but they need to be fully analyzed with the pros and cons carefully considered to assure that the best interest of the association and its members are served. Our association must book venues three years out from each annual meeting, and much of the format of each annual meeting is cast with that booking. So as with any successful transition, progressive change will likely occur incrementally, rather than through abrupt and radical change. As a mentor of mine often states, evolution, not revolution, breeds success. You can have a voice in this discussion by attending CSX'11. Remember, you are all invited and we look forward to seeing you there. CS

July 21-22, 2011

CSWEA CSX & YPX

All Central States leaders, CSWEA officers, Section officers and committee chairs and members, as well as any interested or involved members, should plan to attend our seventh annual Committee and Section Exchange and Young Professional Exchange, CSWEA CSX&YPX'11. The dates are July 21-22, 2011 and will once again be held at the Kalahari Resort in the Wisconsin Dells. The event is designed to provide for the informal exchange of ideas between Sections and committees over two half-days, beginning at noon on Thursday and ending at noon on Friday. The focus of the agenda will be on retooling our committees and major events to make them more meaningful to our members. In addition to the working sessions, ample time is set aside for networking and social time. The meeting is arranged so that family members can take advantage of the water park while mom or dad attends to CSWEA business. Central States provides a pizza party for everyone on Thursday evening. Make your plans to attend now, and feel free to contact President Beth Vogt or Executive Director Eric Lecuyer for additional information.

Room rates are again $199 per night; phone 877-253-5466 to make reservations.

Again this year, CSWEA YPX'11, (Young Professionals Exchange) will be incorporated as part of CSX on Friday, July 22, but all are invited to participate in both days of the event. Contact Rich Hussey for additional information or to suggest topics to be covered at YPX'11. CS

KRÜGER

Did You Know?

Kruger can retrofit discfilters into almost any existing tertiary filtration system.

See website for more details.

A Perfect Fit

The traveling bridge sand filters at the Oconomowoc, WI Wastewater Treatment Facility were reaching the end of their life. After evaluating various alternatives, Kruger's Hydrotech Discfilters were selected for their mechanical simplicity, ease of installation, and ability to expand the plant's capacity from 9 MGD to 12 MGD.

401 Harrison Oaks Blvd., Suite 100
Cary, NC 27513
Phone: 919.677.8310
Fax: 919.677.0082
krugerincmarketing@veoliawater.com
www.krugerusa.com

VEOLIA WATER
Solutions & Technologies

IT'S TIME TO THINK ABOUT

DISINFECTION ON DEMAND

WITH ACID-FREE CHLORINE DIOXIDE

FEATURES

- Disinfection on demand
  - No free chlorine
  - No storage
  - No acid
  - No gas
  - No corrosion
- Penetrating selective oxidant
  - Biofilms
  - Bacteria
  - Viruses
  - Pathogens
- Membrane biofilm remediation

BENEFITS

- Odor control
- Effective over a pH range of 4 – 10
- Low operating costs
- Does not form
  - Trihalomethane
  - Haloaceteic acid
- Reacts with
  - Iron
  - Manganese
  - Hydrogen Sulfide

PureClO$_2$® Electrochemical Generator

It's Time to come clean with Pureline and Crane Engineering

PureLine

CRANE ENGINEERING

Contact Kyle Pfaffendorf at **920-257-0118** or **k.pfaffendorf@craneengineering.net** to arrange an on-site demonstration.

CSWEA/IWEA to host

16th Annual WEFTEC Welcome Reception at WEFTEC'11

CSWEA and IWEA members are invited to join us for this year's WEFTEC'11 CSWEA/IWEA Reception, Sunday, October 16, 2011. The reception will be held from 5:30 to 7:30 p.m. at the JW Marriott at L.A. Live. Our joint WEFTEC welcome reception has become a not-to-miss event for members and friends attending WEFTEC and offers an outstanding kick-off each year. The reception will be held in the Gold Ballroom Salon 4 of the WEFTEC'11 headquarters hotel in Los Angeles. All members and supporters of CSWEA and IWEA are invited to attend.

Global Technologies, Local Solutions.

Degremont Technologies offers trusted, globally proven solutions for your water treatment challenges.

HEADWORKS | BIOLOGICAL | SEPARATIONS | MEMBRANES | OXIDATION DISINFECTION | BIOSOLIDS | INDUSTRIAL SYSTEMS

INFILCO

Represented in Illinois by Drydon Equipment Inc.
2445 Westfield Drove, Suite 100 • Elgin, IL 60124-7840
Phone: (224) 629-4060

Represented in Minnesota by Treatment Resources, Inc.
794 Spring Hill Ct. • PO Box 25846 • Woodbury, MN 55125
Phone: (651) 702-2692

84th AWARD WINNERS ANNUAL MEETING

PROMOTING SUSTAINABLE INFRASTRUCTURE MANAGEMENT WHILE ENCOURAGING POLLUTION PREVENTION STRATEGIES

LABORATORY ANALYST EXCELLENCE AWARD

David Piquett
City of Hartford, Wisconsin

WILLIAM D. HATFIELD AWARD

Mary Fralish
City of Mankato, Minnesota

ARTHUR SIDNEY BEDELL AWARD

Dennis Lindeke
Metropolitan Council, Minnesota

WEF HONORARY LIFE MEMBERS

Gene Erickson, Peter Wachs and **Richard Otis**

WEF SERVICE AWARDS

Barton Jones, WEF Delegate at Large, '07-10
Scott Trotter, WEF Delegate '09-11
Jim Miller, CSWEA President, '10-11

YOUNG PROFESSIONAL OF THE YEAR AWARD

Rachel Radloff
Bonestroo

BILL BOYLE EDUCATOR OF THE YEAR AWARD

Dr. Cynthia Welsh, EdD
Cloquet High and Middle School, MN

CSWEA SERVICE AWARDS

Tom Sigmund, WI Trustee, '09-11 / **Charlie LaRocco,** PWO Rep. '09-11

OPERATIONS AWARD

Minnesota Section
Jeffery Knutson, City of St. Peter, MN

Wisconsin Section
Robert Sherr, Lake Mills, WI

Illinois Section
Jason Treat, Village of Antioch, IL

COLLECTION SYSTEM AWARD

Illinois Section
John McDonnell
Thorn Creek SD, Chicago Heights, IL

Minnesota Section
Sandy Mass
City of Duluth, MN

Wisconsin Section
Tom Steinbach
City of Oconomowoc, WI

ACADEMIC EXCELLENCE AWARD

Evan Hunter,
University of Minnesota, Duluth

Greg LeFevre,
University of Minnesota, Twin Cities

Carl J. Sorensen,
Minnesota State University, Mankato

7 S SOCIETY

GOLDEN MANHOLE SOCIETY

Click HERE to return to Table of Contents

STUDENT PAPER COMPETITION UNDERGRADUATE

Alex Gorzalski
University of Wisconsin, Madison
Propidium Monoazide (PMA) for Live/ Dead Distinction of Microbial Communities in a Pilot-Scale Water Treatment System

INDUSTRIAL ENVIRONMENTAL ACHIEVEMENT AWARD

Malt-O-Meal
Northfield, MN
Katy Gillispie

CENTRAL STATES WATER SCHOLARSHIP AWARD

Megan Corrado
Optimization of Phosphorus and Magnesium Release from Waste Activated Sludge

GUS H. RADEBAUGH AWARD

Navaneethan Navaratnam
Scott Royer, Peter R. Topczewski, and **Daniel Zitomer**
Anaerobic Co-Digestion for Increased Renewable Energy

STUDENT DESIGN COMPETITION

University of Illinois, Urbana-Champaign
Marika Nell, Jacob Becraft, Yana Genchanok, and **Kimberly Parker**
Project: South Dakota Water Project

STUDENT PAPER COMPETITION GRADUATE

Mark Ludwigson,
University of Wisconsin, Milwaukee
Paper: Sustainability Comparison Framework with Reduced Subjective Bias and Application to Two Odor Control Systems

SPONSORS

PLATINUM
Brown and Caldwell
Greeley and Hansen

GOLD
AECOM

SILVER
AE2S
Black & Veatch
CH2M HILL
Donohue Associates
LAI, Ltd.
Strand Associates, Inc.
Symbiont

BRONZE
Engineering America, Inc.
Environmental Dynamics, Inc.

GOLF HOLE SPONSORS
Donohue Associates
Hobas Pipe USA
Natgun Corporation
Vessco, Inc.

WATER FOR PEOPLE SILENT AUCTION
Craig Kelman & Associates – *Central States Water Magazine*
HCP, Inc.
Janski Consulting, LLC
Mulcahy/Shaw Water
Strand Associates, Inc.

84th ANNUAL MEETING EXHIBITORS

THANKS

THANKS TO OUR 84TH ANNUAL MEETING EXHIBITORS

Advanced Drainage Systems, Inc.
AE2S
AllMax Software Inc.
Applied Technologies, Inc.
Biorem Technologies, Inc.
Bolton-Menk, Inc.
Bonestroo
Carus Corporation
CDM
Coating Resources, Inc.
Cretex Specialty Products
CSWEA
CUES
Cummins NPower, LLC
Donohue & Associates
Eaton Mechanical Sales
Energenecs
Engineered Sales Company
Engineering America, Inc.
Environmental Dynamics, Inc.
Environmental Health Products & Service
Era Laboratories, Inc.
Foth Infrastructure & Environment, LLC
General Repair Service
HDR Engineering, Inc.
HOBAS Pipe USA
HR Green
Hydro Logic Environmental, Ltd.
ICS Healy Ruff
IDEXX Laboratories
In Control, Inc.
Integrated Process Solutions, Inc.
International Paint
ITT Flygt
Jim Jolly Sales, Inc.
Kruger, Inc.
Lakeside Equipment Corporation
Lemna Corporation
LHB, Inc.
MVTL
Natgun Corporation
PPG Protective and Marine Coatings
Process Equipment Repair Services, Inc.
Pure Technologies US, Inc.
Quality Liquid Feeds, Inc.
Rain for Rent
RedZone Robotics
Short Elliott Hendrickson, Inc.
Siemens Water Technologies
Sioux Valley Environmental
Swanson Flo Systems
Tech Sales Company
Therma-Stor/Quest
Thermal Process Systems
Trojan Technologies
Unison Solutions, Inc.
Van Bergen & Markson, Inc.
Vessco, Inc.
Visu-Sewer, Inc.
Wonderware Midwest
WSB & Associates, Inc.

Pollardwater.com

Underground Locator Experts

Call for free Catalog

Find it all at
www.pollardwater.com

Phone 800-437-1146

2011-12 CSWEA EXECUTIVE COMMITTEE

President
Beth Vogt
Greeley and Hansen
312-578-2321
bvogt@greeley-hansen.com

1st Vice President
Randy Wirtz
Strand Associates, Inc.
608-251-4843
randy.wirtz@strand.com

2nd Vice President
Patti Craddock
Short Elliott Hendrickson, Inc.
651-490-2067
pcraddock@sehinc.com

Treasurer
Doug Henrichsen
Brown and Caldwell
651-468-2077
dhenrichsen@brwncald.com

Immediate Past President
Jim Miller
Foth I&E LLC
Eagle Point II
612-961-2505
jim.miller@foth.com

WEF Delegate '13
Dave Raby
HR Green
Court International Building
651-659-7741
draby@hrgreen.com

WEF Delegate '14
Ralph B. (Rusty) Schroedel
AECOM
920-912-1227
rusty.schroedel@aecom.com

PWO Representative '13
Jeff Mayou
City of Marinette
715-732-5184
jmayou@marinette.wi.us

YP Representative '12
Rich Hussey
LAI Ltd.
847-392-0990
rich@leyassociates.com

Illinois State Section Trustee '12
Gary Scott
Glenbard Wastewater Authority
630-790-1901 ext. 124
gscott@gbww.org

Minnesota State Section Trustee '12
John Glatzmaier
CH2M HILL
651-365-8526
john.glatzmaier@ch2m.com

Wisconsin State Section Trustee '13
Bill Marten
Donohue & Associates
414-217-6909
wmarten@donohue-associates.com

Executive Director
Eric R. Lecuyer
CSWEA
815-954-2714
cswea@ymail.com

CSWEA STANDING COMMITTEES 2011-12

General Awards Committee
Randy Wirtz, Co-Chair
Strand Associates
608-251-4843
randy.wirtz@strand.com

Patti Craddock, Co-Chair
Short Elliott Hendrichson
651-490-2067
pcraddock@sehinc.com

Academic Excellence Sub-Committee
Patti Craddock, Chair
Short Elliott Hendrichson
651-490-2067
pcraddock@sehinc.com

Local Arrangements Committee 2012
Gary Scott
Glenbard Wastewater Authority
630-790-1901
gscott@gbww.org

Nominating Committee
Chuck Hansen
Peterson & Matz
847-844-4405
pmatz@aol.com

Technical Program Committee
Rick Manner
Urbana & Champaign Sanitary District
217-367-3409
rfmanner@u-csd.com

Public Education Committee
Roger F. Gyger
M2T Technologies
630-983-7653
rgyger@m2ttech.com

Students Committee
Beth Vogt
Greeley and Hansen
312-578-2321
bvogt@greeley-hansen.com

Young Professionals Committee
Rich Hussey
LAI, Ltd.
847-392-0990
rich@leyassociates.com

Joint Expo Committee/ MARC Committee
Tom Mulcahy, Chair
Mulcahy/Shaw Water
262-241-1199
tmulcahy@mulcahyshaw.com

Membership Committee
Ed McCall
CDM Inc.
312-346-5000
mccallej@cdm.com

Education Seminar Committee
Scott Fronek, Chair
Black & Veatch
952-545-6695 ext. 15
FronekSD@BV.com

IL SECTION OFFICERS AND COMMITTEE CHAIRS 2011- 2012

Section Chair
Dean M. Wiebenga
Peterson & Matz
847-844-4405
Deanpmi@aol.com

Vice Chair
Jim Huchel
City of Crystal Lake
815-356-3700 ext. 4168
jhuchel@crystallake.org

Click HERE to return to Table of Contents

2nd Vice Chair
Mark Eddington
DeKalb Sanitary District
815-758-3513
MEddington@dekalbsanitarydistrict.com

Secretary/Treasurer
Shelly Cumbow
Danville Sanitary District
217-442-3193
shellyc@danvillesanitary.com

Trustee to CSWEA '12
Gary B. Scott
Glenbard Wastewater Authority
630-790-1901 ext. 124
gscott@gbww.org

Immediate Past Chair
Eddie McCall
Camp Dresser McKee
312-346-5000
mccallej@cdm.com

Government Affairs Chair
Carl Fisher
Baxter & Woodman, Inc.
815-459-1260
cfisher@baxterwoodman.com

Government Affairs Vice Chair
Tom Lentz
North Shore Sanitary District
847-623-6060
tolentz@northshoresanitary.org

Collection System Chair
Derek Wold
Baxter & Woodman, Inc.
708-478-2090
dwold@baxterwoodman.com

Collection System Vice Chair
Mike Holland
Trotter and Associates, Inc.
630-587-0470
m.holland@taiengr.com

Membership Chair
Eddie McCall
CDM
312-346-5000
mccallej@cdm.com

Membership Vice Chair
Steve Fiepke
Village of Algonquin
847-658-2754
stevefiepke@algonquin.org

Safety Chair
Gary B. Scott, CPMM
Glenbard Wastewater Authority
630-790-1901 ext. 124
gscott@gbww.org

Safety Vice Chair
Doc Burke
AW Chesterton Seal
630-516-9090
burkew@chesterton.com

Operations Chair
Jim Huchel
City of Crystal Lake
815-356-3700 ext. 4168
jhuchel@crystallake.org

Operations Vice Chair
Steve Fiepke
Village of Algonquin
847-658-2754
stevefiepke@algonquin.org

Public Education Chair
Joe Robinson
North Shore Sanitary District
630-969-0664
mdressel@dgsd.org

Young Professionals Chair
Rich Hussey
LAI, Ltd.
847-392-0990
rich@leyassociates.com

YP Vice Chair
Dan Small
Strand Associates
815-744-4200
daniel,small@strand.com

Student Chair
Scott Trotter
Trotter & Associates
630-587-0470
s.trotter@taiengr.com

Industrial Wastes Committee Chair
Randy Patchett
Burns and McDonnell
630-724-3276
rpatchett@burnsmcd.com

Industrial Wastes Committee Vice Chair
Ken Krueger
City of Crystal Lake
815-359-3700 ext. 4169
kkruger@crystallake.org

MINNESOTA SECTION OFFICERS AND COMMITTEE CHAIRS 2011-12

Section Chair
John Friel
Short Elliott Hendrickson, Inc.
651-490-2140
jfriel@sehinc.com

Vice Chair
Rob O'Connell
HDR, Inc.
763-278-5990
robert.oconnell@hdrinc.com

Secretary/Treasurer
Alison Sumption
H. R. Green Company
651-644-4389
asumption@hrgreen.com

Trustee to CSWEA
John Glatzmaier
CH2M HILL
651-365-8526
john.glatzmaier@ch2m.com

Immediate Past Chair
Ted Field
TKDA
651-292-4574
Ted.Field@TKDA.com

Government Affairs Committee Chair
Greg Johnson
Bolton & Menk
651-704-9970
gregjo@bolton-menk.com

Collection System Committee Co-Chairs
Todd Carlson
City of Duluth P.W. & Utilities
218-730-4051
tcarlson@ci.duluth.mn.us

Chris Kleist
City of Duluth P.W. & Utilities
218-730-4063
ckleist@ci.duluth.mn.us

Industrial Wastes Committee Chair
Clay Watson
Gold'n Plump Poultry
320-240-6616
cwatson@goldnplump.com

Membership Committee Chair
Tracy L. Ekola, PE
Short Elliott Hendrickson, Inc.
320-229-4406
tekola@sehinc.com

Operations Committee Chair
Tim Korby
LHB Corporation
218-727-8446
tim.korby@LHBcorp.com

Public Education Committee Chair
Patti Craddock
Short Elliott Hendrickson, Inc.
651-490-2067
pcraddock@sehinc.com

Laboratory Committee Chair
Patti Mettler
City of Mankato
507-387-8667
pmettler@city.mankato.mn.us

Biosolids Committee
John Graupman, PE
Bolton & Menk, Inc.
507-625-4171
johngr@bolton-menk.com

S&YP Committee
Rachel Radloff
Bonestroo
651-967-4698
Rachel.Radloff@bonestroo.com

Student Coordinator
Dave Johnson
WLSSD
651-490-2062
dmjohnson@sehinc.com

YP Coordinator
Susan Danzl, PE
Short Elliott Hendrickson, Inc.
651-490-2064
sdanzl@sehinc.com

MWOA Trustee
Brian J. Mehr
City of Hutchinson, Wastewater Dept
320-234-4233
bmehr@ci.hutchinson.mn.us

WISCONSIN SECTION OFFICERS AND COMMITTEE CHAIRS 2011-12

Section Chair
Jane Carlson
Strand Associates
608-251-4843
jane.carlson@strand.com

Vice Chair
Bill Oldenburg
Green Bay MAD
920-438-1079
boldenburg@gbmsd.org

Secretary/Treasurer
Dave Arnott
Ruekert-Mielke
262-542-5733
darnott@ruekert-mielke.com

CSWEA Trustee
Bill Marten
Donohue & Associates
414-217-6909
wmarten@donohue-associates.com

Immediate Past Chair
Keith Haas
Racine Water and Wastewater Utilities
262-636-9434
keith.haas@cityofracine.org

Government Affairs Committee Chair
Brandon Koltz
Symbiont
414-291-8840
brandon.koltz@symbiontonline.com

Collection System Committee Chair
Randy Belanger
Visu-Sewer, Inc.
262-695-2340
rbelanger@visu-sewer.com

Membership Committee Chair
Jay Kemp
AECOM Water
608-836-9800
jay.kemp@aecom.com

Safety Committee Chair
Jerry Hirt
Alpha Terra Science
920-892-2444
jerryhirt@alphaterra.net

Operations Committee Chair
Troy Larson
Strand Associates
608-251-4843
Troy.Larson@strand.com

Public Education & Awareness Committee Chair
Dale Doerr
City of Sheyboygan
920-459-3464
dale.doerr@sheboyganwwttp.com

Student/Young Professionals Committee Chair
Eric Lynne
Donohue & Associates, Inc.
920-803-7375
elynne@donohue-associates.com

Watershed Management Chair
Julie McMullin
Brown and Caldwell
414-203-2904
jmcmullin@brwncald.com

Industrial Wastes Committee Chair
Brian Molenaar
Strand Associates
608-251-4843
brian.moelnaar@strand.com

Spring Biosolids Symposium Representative
Jay Kemp
AECOM Water
608-836-9800
jay.kemp@aecom.com

WWOA Liaison
Dennis Egge
City of Janesville, retired
608-755-3121
deggman@sbcglobal.net

WWEA Chair
Tom Mulcahy
Mulcahy/Shaw Water
262-241-1199
tmulcahy@mulcahyshaw.com

Click HERE to return to Table of Contents

Eliminate Valve Pits

PumpMate™

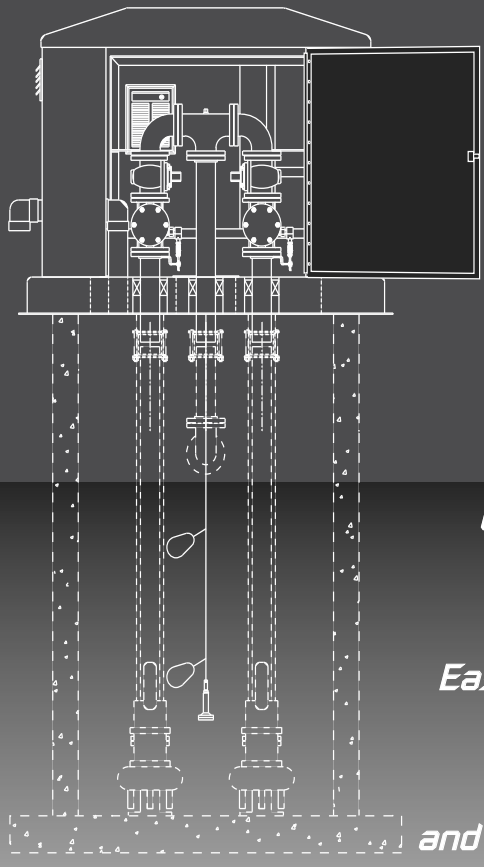
Submersible Pump, Valve & Control Stations

No More Wet Valve Pits!

Optional By-Pass Piping

Controls and Valves Protected and Dry

- Controls In Enclosure
- Concrete and Fiberglass-Base
- Textured Enclosure
- Encapsulated Insulation
- Pumps from Major Manufacturers
- Transducer, Floats or Bubbler
- Available in 4 in. and 6 in. piping
- Sentry Controller
- Immediate Delivery



PumpMate's one piece above ground design means Easy Installation and Maintenance.

USEMCO®

Box 550, 1602 Rezin Road,
Tomah, Wisconsin 54660
Phone: 608-372-5911
Fax: 608-372-5016
Visit us at: www.usemco.com

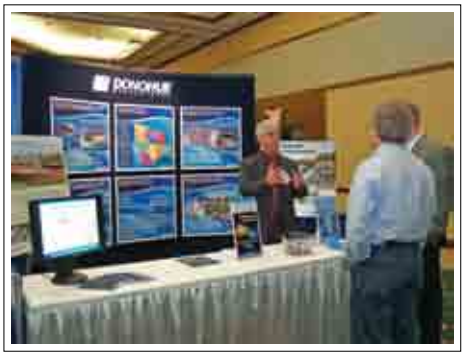
Contact USEMCO for the representative in your area

5K RUN/WALK

Kate Ziino (winner with a difference of 0:05); Al Whalen (tied for second place with a difference of 0:36); Rod Evanson (tied for second place with a difference of 0:36); Jim Shaw (third place with a difference of 0:52); Jay Kemp; Jeff Brochtrup; Steve Reusser; Scott Mulinix; Bill Krill.

Thanks to volunteers Jesse Anibas, Dustin Maas, and Dave Johnson, and to Hobas Pipe for donating the shirts.

Click HERE to return to Table of Contents



CSWEA's 16TH ANNUAL EDUCATION SEMINAR

EMERGING ACTIVATED SLUDGE TECHNOLOGIES AND OPERATIONAL STRATEGIES

The 2011 Education Seminar featured national and regional experts from various universities, wastewater utilities, and consulting engineers, primarily focused on the central topic of activated sludge in our wastewater industry. The keynote message was on the future of activated sludge, as it relates to energy efficiency and effluent quality. Other main topics focused on ways to enhance the activated sludge process through new technologies such as integrated fixed film systems and membrane bioreactors. The topic of emerging contaminants and their fate through the activated sludge system was also discussed. The 16th Annual Education Seminar was one of the most memorable and the proceedings can be found at *www.cswea.org/papers*.

If you missed the 16th Education Seminar, you will not want to miss the 17th, next April 3, 2012 again at the Monona Terrace Convention Center in Madison, WI to hear experts who will explore current issues related nutrient removal.

Click HERE to return to Table of Contents

CSWEA'S 2ND ANNUAL DIGESTER FOAMING WORKSHOP

CSWEA's 2nd Anaerobic Digester Foaming Workshop was hosted by Strand Associates at their Madison, WI office on April 20, 2011. The purpose of the workshop was to have a meeting of wastewater professionals to discuss anaerobic digester foaming, monitoring, and methods tried to correct foaming problems. The goals were to: determine causes of anaerobic digester foam, determine mitigation methods, and determine what others have done to monitor and attempt to correct foaming problems. Following a review of the results of the 2011 digester foaming survey provided by Randy Wirtz, brief case studies were presented documenting the occurrences, potential causal factors, and mitigation efforts. During a working lunch, several groups were formed to discuss the following questions:

(1) What parameters do you measure to help predict, monitor or measure the intensity of digester foaming?

(2) What have you done to try to correct foaming problems? What was effective and what was not effective?

The workshop was concluded following a discussion of breakout questions. Each group had a designee briefly discussing their groups answer questions. Facility managers and operators on hand, the true victims of digester foaming sincerely appreciated the opportunity to share their experiences and hear from others on their experiences.

CSWEA is planning a third workshop during the Midwest Industry Expo in February of 2012 to further explore this issue and provide feedback and information for operators on potential mitigation methods. CSWEA is pleased that WERF has funded a research effort on this difficult operational phenomenon.

Proceedings from this workshop are posted online. **www.cswea.org/digester/**

Energy and Water 2011

Efficiency, Generation, Management, and Climate Impacts

Conference: July 31–August 3 | Exhibition: August 1–2
Hyatt Regency McCormick Place | Chicago, Illinois, USA

On the surface, energy and water may seem to be separate entities, but are actually deeply connected. Sustainable management of either resource demands consideration of the other. The Water Environment Federation and its cooperating partners, serving both the energy and water sectors, are pleased to announce a conference that provides insight into all facets of these overlapping issues. Sessions are composed of interactions with cutting-edge technology entrepreneurs, electric utilities' views on future water demands, the U.S. EPA's Climate Ready Utility Program, the latest research on energy recovery from wastewater plants, state of the industry for biofuels from algae and biosolids, and much more.

What to Look Forward to at Energy and Water 2011

- Opening General Session highlighting Integrated Resource Management (IRM)
- Workshop A: The Water, Energy, Air, Soil, and Transportation Nexus
- Workshop B: Pathways to Accelerating an Efficient and Low Carbon Water Future
- Workshop C: Greenhouse Gas Inventorying and Management for Wastewater Treatment: A How-To Guide with Industry Experts
- 20 Technical Sessions Presented by the Best in the Business
- Tabletop Exhibition of the Latest and Greatest in Water and Energy Technology and Services
- Up to 0.6 CEUs and 13.5 PDHs worth of Educational Credits to Earn

Water Environment Federation the water quality people™ · ACEEE · CEE · Alliance to Save Energy Creating an Energy-Efficient World · IMAGINE H2O · Alliance for Water Efficiency · IWEA · WERF Water Environment Research Foundation Collaboration. Innovation. Results.

This conference is held by the Water Environment Federation in cooperation with the American Council for an Energy-Efficient Economy, the Consortium for Energy Efficiency, the Alliance to Save Energy, Imagine H20, the Alliance for Water Efficiency, the Illinois Water Environment Association, the Central States Water Environment Association, and the Water Environment Research Foundation.

Registration now open online!
Register online by July 20th or come onsite to register.

www.wef.org/Energy

BIOGAS
SHAND&JURS

an L&J TECHNOLOGIES company

Waste Gas Burners/Flares • Anaerobic Digester Cover Equipment • Digester Gas Stream Equipment

Candlestick Flares

Flare Touch Screen Control Panel

Enclosed Flare

P/V Vent, Flame Arrester & Safety Selector Valve

Pressure Regulator Flame Trap Assembly

Take Complete Control of Your Digester Gas

As municipalities place a high priority on "Going Green," conserving and utilizing digester gas is more important than ever. Shand & Jurs Biogas can help upgrade wastewater plants to greatly reduce emissions of valuable digester gas. Our patented Expanda-Seal™ technology on our pressure relieving equipment, including pressure/vacuum conservation vents and emergency pressure vents, will increase the conservation of the digester gas for maximum plant utilization. Be sure to inquire about our new "T" Series Touch Screen Flare Control Panel available for both Candlestick and Enclosed Flares.

With nearly 90 years of field-proven experience in vapor control, Shand & Jurs can provide you the control that you need with equipment that is specifically designed to be corrosion resistant to digester gases. Shand & Jurs Biogas manufactures a complete line of Digester Gas Safety and Gas Train Equipment as well as Waste Gas Burners. Located in the greater Chicago area, Shand & Jurs manufactures and tests all of our equipment and utilizes local USA suppliers.

5911 Butterfield Road
Hillside, IL 60162 USA

www.sandj.com

tel: (708) 236-6000
fax: (708) 236-6006

Village of Antioch
Wastewater Treatment Facility

2011 IL Operations Award Winner

By Jason Treat

Service area

The Antioch WWTF provides wastewater transportation and treatment services for the Village of Antioch, situated in Lake County, Illinois. The present service area has a service population of approximately 14,000 people. The village owns and operates 21 lift stations which transport wastewater to the treatment facility.

Wastewater treatment plant operations

The Antioch WWTF recently finished an upgrade of the entire facility. The old plant was completely abandoned, with the exception of re-using aeration basins for aerobic digesters, and using a circular clarifier as a gravity thickener.

The Antioch WWTF operates a biological nutrient removal (BNR) process, which is a version of the University of Cape Town (UCT) variation. The UCT process consists of anaerobic, anoxic, and aeration zones. The BNR process was chosen based on the need to meet permit requirements for the removal of BOD5, TSS and phosphorous removal and nitrification. The plant is rated to treat a daily average flow of 2.0 MGD, and a maximum daily flow of 9.2 MGD.

The WWTF uses a rotating drum screen to screen rags, trash and large solids in the influent. Screened flow continues to the BNR process, which again utilizes the UCT variation to reduce phosphorous in the final effluent. Prior to secondary clarification, alum is used to remove any remaining phosphorous prior to disinfection by UV and discharge to the receiving stream, which is the Sequoit Creek. Sludge is processed by aerobic digestion, and then dewatered using a two-meter belt filter process. Dewatered sludge is stored in a sludge storage barn, and land applied twice per year.

Following is a more in-depth description of the process:

The Antioch WWTF has a design average flow (DAF) of 2.0 MGD, and design maximum flow (DMF) of 9.2 MGD. The Antioch WWTF is a biological nutrient removal (BNR) facility. The BNR process is a single stage nitrification system, and is designed to remove phosphorous biologically, with chemical addition (alum or ferric chloride) as a final polishing step. Alum is currently used.

Raw influent flow enters the plant through a force main and into the headworks building where it is measured using an area velocity meter. Once the flow is measured, it is cleaned of rags and debris using a Lakeside Raptor fine screen. Flow leaves this building, and flows by gravity directly to the three aeration basins, which make up the BNR system.

The aeration basins consist of three zones: the anaerobic zone, the anoxic

zone, and the aerobic zone. The wastewater enters the anaerobic zone and is mixed with mixed liquor recycle from the anoxic zone. Here the influent wastewater and microorganisms are combined in the absence of oxygen, either free or in a combined form. In the absence of oxygen, the microorganisms release phosphorous while consuming and storing food.

The second zone of the UCT process is the anoxic zone. Here microorganisms are returned to the process from the final clarifiers as RAS. The anoxic zone is utilized to denitrify the RAS. The resulting mixed liquor is recycled to the anaerobic zone. This provides nitrate free mixed liquor to the anaerobic zone. Recirculation is accomplished by use of a variable speed axial flow submersible pump.

The third zone of the UCT process is the aerobic zone. The microorganisms continue to consume food, nitrify ammonia to nitrates, and also provide luxury uptake of phosphorous compounds.

Chemical feed is available to remove any remaining phosphorous, if needed.

Once the flow leaves the BNR process, it flows by gravity to the secondary clarifiers, where solids are allowed to settle. These solids are either returned to the BNR system as return activated sludge (RAS), or wasted to the gravity thickener where solids are allowed to settle, and eventually pumped to the aerobic digesters. Clear water flows over the weirs of the secondary clarifiers, and continues on to the UV system. The UV system consists of a Trojan ultraviolet system, where the DNA of the fecal coliform bacteria is altered by ultra-violet wavelengths, leaving the bacteria unable to reproduce. Once the flow passes through the UV system, it continues on through the Parshall flume, where it is metered before flowing to the receiving stream.

Discharge limits are as follows:		
	Monthly Average	Daily Maximum
CBOD5	10/mg/l	20 mg/l
TSS	12 mg/l	24 mg/l
Fecal Coliform	400 per	100 ml
Ammonia Nitrogen		
April-May/Sept-Oc	1.5 mg/l	4.2 mg/l
June-August	1.1 mg/l	4.2 mg/l
Nov-March	1.5 mg/l	2.4 mg/l
Phosphorous	1.0 mg/l	2.0 mg/l
Copper	.034 mg/l	.055 mg/l
Silver		.005 mg/l

Biosolids are processed at the facility by the following methods: Approximately 30-40,000 gallons of waste activated sludge is pumped to the gravity thickener five days/week. The sludge is allowed to settle in the gravity thickener, and eventually pumped to the aerobic digesters (four total) at a concentration of 3-4%. The sludge is then pumped to the Komline Belt Filter Press, which is located in the dewatering building. The Belt Filter Press squeezes the water from the sludge, with average cake solids from the press averaging 18-20%. The cake is then stored on site in the sludge barn, and is hauled off site twice/year and applied to farm fields.

In-service training and upgrading of subordinate operators

Plant personnel are trained in both wastewater operations and laboratory procedures. The village actively supports the continual development of its employees. Examples of this commitment are as follows:

- The lab was recently updated with state of the art lab equipment, which allows for most routine plant process analysis to be conducted on site. In order to ensure quality control, staff went through a thorough training program, detailing and outlining proper lab methods and procedures.
- Plant personnel regularly attend seminars, outside training courses and workshops relating to wastewater treatment. Training on all of the plant equipment has taken place over the last year,

Click HERE to return to Table of Contents

Mark Elfering, Mik Semans, and Jason Treat

and staff is familiar with all aspects of maintenance of the equipment.

- The village provides financial assistance by reimbursing employees for the tuition, fees and books associated with job-related education.
- The village sponsors employees' participation during typical working hours in outside workshops, seminars, conferences, classes and training. The employees are encouraged to stay abreast of the changes throughout the industry, and attend workshops frequently.
- Plant personnel are involved in various professional organizations, including Fox Valley Operators Association (FVOA), Central States Water Environment Association (CSWEA), and Illinois Association of Water Pollution Control Operators (IAWPCO). The village encourages involvement in these organizations, along with allowing and encouraging direct involvement in committee work.
- The operation of the facility is currently overseen by two Class 1 operators.

In-plant studies and routine operation data

The plant uses a single excel spreadsheet for keeping track of and reporting all discharge monitoring reporting (DMR) parameters. The spreadsheet automatically calculates all data and displays it into appropriate format, such as mg/l, pounds, min/max, etc. Once the information for the month is entered onto the spreadsheet, the DMRs are then submitted electronically to the IEPA. While other spreadsheets, bench sheets and other forms of documentation are used for gathering plant data, this single spreadsheet makes the task of gathering and reporting necessary DMR information simple, while allowing the operator a quick reference to critical operational data.

A supervisory control and data acquisition (SCADA) system monitors and controls plant processes and equipment. Dissolved oxygen (DO) levels in the aeration basins, for example, are controlled and monitored through the SCADA system, and blower speeds are increased or decreased in order to maintain a pre-determined DO range. This control allows for efficient and cost effective methods of operation of the aeration system.

Preventive maintenance, emergency operations and safety practices

The facility currently uses a computerized maintenance management system (CMMS) to ensure preventive maintenance (PM) is regularly performed on all major plant equipment. Completed PMs are entered into the system, and important information such as equipment hours, costs associated with maintaining the equipment, and parts are kept track of.

The facility also uses an outside vendor to perform regularly scheduled vibration analysis of major equipment. Once the vibration analysis is performed, detailed reports are provided which provide the condition of the equipment, along with any problems noted during the analysis. This allows for trending of the equipment to be done, which in turn allows for shutdown and repair of the equipment before any major damage is done to the equipment.

The facility has two sources of electrical feeds to the plant, and also houses a natural gas generator, which is used for emergency back-up power. The generator is exercised twice/month in order to ensure it is ready for use. Important information such as hours, oil levels, etc. is kept regularly to ensure peak performance. The village takes part in a capacity-based load response (CBLR) program with the electrical utility, in which the village may be called upon to use the generator to supply electrical power to the entire plant during high peak demand periods, thereby reducing the demand on the power grid. Taking part in this program ensures the generator is run under load, thereby eliminating the need to actually perform load bank testing on an annual basis. The CBLR also is a source of revenue for the village. CS

By Gary Forsee, IEMA

Illinois Codifies Land Application and Disposal Regulations for Radium Treatment Residuals

On December 7, 2000 the U.S. Environmental Protection Agency (USEPA) finalized their drinking water standards for removal of radionuclides. The regulations became effective in December of 2003 and drinking water treatment facilities were mandated to meet the five picocuries per liter (pCi/L) limit for combined radium. As radium is removed from the raw water and manifests itself either in the drinking water treatment media or at a wastewater treatment facility; the management of these treatment residuals is the subject of regulations recently promulgated by the Illinois Emergency Management Agency's (IEMA) Division of Nuclear Safety (DNS). The following seeks to provide a brief background with regard to the genesis of the rulemaking; address the main provisions of 32 Illinois Administrative Code 330.40(d), and provide details on how the Illinois Emergency Management Agency is seeking to implement this rule with minimal impact to the water treatment industry while ensuring worker protection and environmental preservation.

Among the traditional functions of IEMA-DNS is the licensure of radioactive materials users, oversight of radiological site remediations, and response to radiological incidents. Because of its historical use in both medical and industrial radiation sources, individuals or organizations possessing and using radium have long been licensed by the agency and its predecessors. Although there was no quantity of radium that was considered exempt from licensure, IEMA chose not license the removal of radium at water treatment facilities due to the fact that prior to the USEPA combined radium drinking water standards, radium removal was often incidental and the quantities of radium generated were comparable to environmentally encountered levels. The level of radium accumulation in soil as a result of land application of radium bearing sludges was low. Since IEMA is not responsible for permitting public water supplies or water pollution control facilities, a 1984 Memorandum of Agreement (MOA) was established with the Illinois EPA (IEPA). Based on the MOA, water and sewage treatment facilities producing radium residuals would be exempt from the licensing requirements of what was then the Illinois Department of Nuclear Safety and the IEPA would control the accumulation of radium in soil from land application of sludges through their permitting system.

In 2010, responding to a petition from the City of Joliet, the Illinois Pollution Control Board ruled the Memorandum of Understanding between IDNS and IEPA unenforceable. Since the only avenue of regulatory oversight available to IEMA is licensure, the rulemaking was necessary to provide an exemption from licensing for municipalities producing treatment residuals with elevated concentrations of radium. Specifically, persons producing or possessing residuals or sludge resulting from the treatment of water or sewage and containing naturally occurring radium from groundwater are exempt from licensure provided they contain a combined radium (Radium-226 and Radium-228) concentration less than or equal to 200 pCi/g (picocuries per gram, dry weight basis). Ultimately, the exemption came about in response to petitions for higher land application rates for radium, agency response efforts at landfills and scrap yards handling treatment residuals and equipment contaminated with radium, the need to create awareness and the agency's responsibility to protect the health and safety of municipal workers. Specific details on requirements for land application, field sampling, disposal, and annual reporting were codified in the resulting rule. The following seeks to provide a summarized overview of the various provisions of the rule. The

Click HERE to return to Table of Contents

> **The registration process ensures the regulated community is aware of the regulation and functions to verify the source water and treatment methods being used at that facility.**

text of the rule, 32 Illinois Administrative Code 330.40(d), can be found on the IEMA website *www.state.il.us/iema/legal/emergency.htm*. Additionally, a copy of the guidance document, which outlines detailed information and the implementation strategy on each aspect of the exemption, is contained at *http://tier2.iema.state.il.us/WaterTreatment/Login.aspx*.

Exemption overview

The first provision of the exemption stipulates that those entities producing or in possession of residuals or sludge resulting from the treatment of water or sewage and containing naturally occurring radium from groundwater with concentrations of combined radium less than or equal to 200 pCi/g (dry weight basis) must register directly with the agency. IEMA has preliminarily determined which facilities this includes. The registration process ensures the regulated community is aware of the regulation and functions to verify the source water and treatment methods being used at that facility. Registration can be performed online at the website listed above. It is imperative that each municipality verify this information, as it provides the basis on which the regulated community is defined. There are no fees for registration, reporting, or disposal under Section 330.40(d). The following explains how IEMA is determining which facilities must register and comply with Section 330.40(d).

For those questioning the origin of radium in their treatment residuals, the explanation can be seen in IEMA's process of defining the regulated community. The initial wording of Section 330.40(d) was meant to exempt a large scope of entities from licensure. However, it also created a large number of entities which are required to register with IEMA. Due to the fact radium is naturally present to some level in nearly all aquifers, any facility treating groundwater and generating a sludge or spent media (at the drinking water or wastewater facility) would theoretically fall under the scope of Section 330.40(d). Therefore, distinctions have been made to further clarify which municipalities must comply with Section 330.40(d) and thereby lessen the regulatory burden on others. The phrase "from the treatment of water or sewage" has been defined by IEMA to be using a treatment technology capable of concentrating radium. Simple disinfecting and/or adding fluoride will not place a drinking water treatment facility under the scope of this rule due to the fact the treatment does not have the capability to increase radium beyond its environmentally encountered levels. The phrase "containing naturally occurring radium from groundwater" has been defined by IEMA to be a facility drawing water from aquifers known to contribute elevated levels of radium to the source water. Typically, these are deep bedrock aquifers in Northern Illinois; however, it can include any aquifer which causes a drinking water treatment facility to exceed the combined radium drinking water standard. Additional discussions on the treatment technologies and aquifers defined by IEMA are available in the guidance document.

Data used to determine the regulated community indicates there are approximately 1,801 active community water supplies in the state of Illinois. Of those, 1,175 use a groundwater source and, therefore, fall under the scope of Section 330.40(d). Approximately 528 of these drinking water treatment facilities utilize a treatment process capable of concentrating radium. Spent media or treatment residuals generated from these 528 facilities must comply with the provisions in Section 330.40(d). There are specific exclusions which are detailed in the guidance document. Of the 528 drinking water facilities identified, there is a subset of 194 that also draw water from an aquifer identified as having the potential to contribute elevated amounts of radium in the source water. If a wastewater treatment facility receives a waste stream from one of these 194 drinking water facilities, then they are required to register as well and must comply with the provisions in Section 330.40(d).

Registration is also required of landfill operators who receive residuals containing radium and land applicators who apply

residuals containing radium for an agronomic benefit.

Treatment residual sampling and disposition

The combined radium concentration in a treatment residual is measured in picocuries per gram (pCi/g) on a dry weight basis. A picocurie is $1x10^{-12}$ Curies, a measure of radioactivity. Radium concentrations in sewage sludge observed in Illinois range from a few pCi/g up to 139 pCi/g. Sediments in backwash holding tanks tested at drinking water treatment facilities have yielded radium concentrations from 38 pCi/g to over 700 pCi/g. Instances where residuals have accumulated radium above 200 pCi/g are dealt with on a case by case basis in order to find an economical, environmentally sound, and protective manner in which to handle and disposition the materials. However, consistent generation of such residuals may require licensure. Sludge with radium concentrations up to 100 pCi/g can be land applied for soil conditioning or disposed in a landfill. Sludge with a concentration above 100 and less than or equal to 200 pCi/g will elicit a no-cost site investigation from IEMA to determine if worker exposure issues are present. Landfill disposal is the likely disposition path for these residuals.

Wastewater facilities receiving a waste stream from one or more of the 194 drinking water treatment facilities identified above, will be required to perform representative sampling of their sludge for radium. Many wastewater treatment facilities already perform radium sampling as a condition of their IEPA land application or NPDES permit. However, not all do. IEMA encourages wastewater treatment facilities to familiarize themselves with the exemption and their individual requirements. Contact information for IEMA staff is available at the end of this article.

Municipalities not sampling for radium on a routine schedule are finding the sample turnaround time can take up to eight weeks. Forward planning is critical in obtaining a sample prior to the day you need to dewater or haul to a field. IEMA will utilize the most recent, representative analysis to determine compliance.

Landfill requirements

As mentioned previously, treatment residuals with a total radium concentration of 100 pCi/g or less may be disposed at a municipal landfill. Although landfill owners can refuse to accept residuals containing radium; IEMA is actively working with the owners to provide them with the necessary information and ensure the acceptability of this material. Residuals disposed in a landfill must meet the waste acceptance criteria for the landfill.

Residuals that are easily dispersible may require stabilization to prevent dispersion during transport and landfill placement. The landfill must cover the residuals containing radium with at least 10 feet of uncontaminated material at the time of landfill closure (end of facility operations).

Land application requirements

Water and wastewater treatment residuals with a total radium concentration of 100 pCi/g or less may be land applied for soil conditioning purposes. The primary concern with land application is the accumulation of radium in the soil to levels that would necessitate a US EPA site remediation. Natural radium background in soil in Illinois is approximately 2 pCi/g. The exemption allows for an increase in soil concentration of 1 pCi/g to a maximum soil radium concentration of 3.0 pCi/g. This ceiling limit was selected to limit the potential radiation exposure for future residents, allow for the unrestricted future use and prevent contamination that would require a remedial action or deed restrictions. *(The USEPA requires a site with soil radium concentrations of 5 pCi/g above background to be remediated.)* On a practical basis, the ceiling level is kept lower to afford averaging across the entire field. In this manner, treatment residuals from multiple generators can be taken to a single field without tracking the exact location of each. To require tracking the applications of each generator to each specific segment of a field would greatly increase application costs and likely remove the generator from this avenue of reuse. Moreover, averaging across an entire field compensates for portions that may be slightly above 3.0 pCi/g. This alleviates land applicators needing to land apply around (and sample) small portions of an entire field.

The background combined radium concentration must be determined for fields being land applied treatment residuals containing radium. Fields that were land applied in the spring of 2011 were to be sampled by June 1, 2011. Fields not used this spring are sampled prior to their next use. The rule, supplemented by the guidance document, contains specific sampling procedures that correspond to existing IEPA procedures or the Illinois Agronomy Handbook. This pre-applica-

tion concentration is used as the starting point for calculating soil radium concentration increases and when the field either needs to be resampled (at a soil concentration increase of 0.8 pCi/g or a total soil radium concentration of 2.8 pCi/g) or is no longer eligible to receive residuals containing radium (3.0 pCi/g). It is important to note that IEMA will allow a single, representative composite sample to be taken to determine this background sample. Since many soil samples can cost $200 or more, this concession was deemed acceptable solely to ease the monetary impact on already burdened municipalities. Specific sampling procedures and site characteristics apply – please refer to the guidance document or call IEMA for further details.

The exemption requires the landowner or authorized agent sign a form acknowledging that residuals containing radium are being applied to their land. The form is intended to provide assurances that this will not result in any adverse impacts on the land including deed or land use restrictions. The guidance document provides the specific language of the notification. It will be imperative that applicators work with landowners to avoid misinformation about radium which may lead to inadvertently shutting off avenues of disposal that should otherwise remain available. IEMA is setting up informational meetings at various venues and is willing to assist in this effort upon request.

The soil concentration increase is calculated based on the application rate and the radium concentration. The guidance document provides the calculation method used to determine the soil concentration increase; however, it is identical to that of the calculations used for Illinois EPA metals loadings. The increase limit applies to the sum of all land applications by all generators. A 1 pCi/g increase equates to a total of 1778 microcuries of total radium applied per acre of farmland used. However, this amount is reduced if the initial soil concentration is greater than 2 pCi/g. As the information above would indicate, the radium is tracked on a field basis.

Reporting

On at least an annual basis, producers of residuals containing radium must report the quantity of residuals produced; their radium concentration and disposal method. IEMA is in the process of developing an online reporting system; however, in the interim, IEMA will accept Illinois EPA semi-annual sludge reports with the appropriate radium data. While reporting is ultimately the responsibility of the wastewater treatment facility, the reporting may be done by the contractor employed to remove the sludge from the facility (e.g. land applicator). The reporting requirement is placed upon all registrants (i.e., wastewater treatment facilities land applying as well as drinking water treatment facilities replacing a sand filter.)

Wastewater treatment facilities that produce sludge with total radium concentrations of 3 pCi/g or less may manage their residuals without further restriction from this exemption. This is due to the fact that the land application of residuals with this concentration will never raise the soil radium concentration above the 3 pCi/g limit. IEMA continues to refine the scope of the regulated community by sampling, data collection, and site visits. Refer to the guidance for other case specific exclusions.

Summary

IEMA works to protect the environment and the public from the effects of ionizing radiation. Staff members provide technical guidance and assistance in cleaning up contaminated sites, are on-site inspectors in nuclear power generating facilities, provide 24 hour environmental monitoring, inspect and enforce a vast number and scope of licensed radioactive material users, as well as characterizing radiological hazards. However, admittedly, IEMA is new to the water treatment industry and recognizes several of the treatment processes and operational procedures have a yet un-quantified effect on radium solubility and its fate in treatment residuals. Moreover, the variety of drinking water and wastewater treatment facilities cannot be fit to a single regulatory box. Through continued sampling, site visits, and dialogue with the water and wastewater treatment industry it is IEMA's goal to refine the implementation and scope of Section 330.40(d) and to further characterize the deposition of radium in the environment. Through a concerted effort of IEMA and the environmental stewardship demonstrated by the wastewater industry, the regulation of radium treatment residuals can be done in an efficient, practical manner that has minimal impact to the bottom lines of municipalities while ensuring the safety of both the public and the environment.

Land applicators, landfills, and water and wastewater treatment facilities are encouraged to review the exemption and guidance to determine their specific requirements. If you have any questions you may contact the author by email at *Gary.Forsee@illinois.gov* or by phone at 217-782-1326. CS

1st Annual CSWEA Leadership Academy Shows Great Promise

On April 4 Central States hosted its first annual Leadership Academy for Young Professionals in Madison, WI at the Monona Terrace. Establishing a seminar during tough economic times and with no track record so members were not sure what to expect (what a great idea I decided to invoke as I became the YP Chair; it must have been one of those late-night sessions that I decided this would be a good idea. I should have missed that CSX in the Wisconsin Dells

By Richard Hussey

a few years back when this idea was brought up as a potential seminar by various members). However, not including the speakers, we had 26 attendees at the seminar. We felt this was an ideal number of attendees to kick off the first seminar of its kind for Central States and build on it for future years.

With speakers such as Richard Meeusen (CEO of Badger Meter), Andy Richardson (CEO of Greeley & Hansen and Past President of AWWA), Tom Sigmund (Executive Director of GBMSD), Rusty Schroedel (Vice President of AECOM), George Tchobanoglous (Ph.D PE, Professor Emeritus, University of California, Davis, CA), Scott Trotter (President of Trotter & Associates and WEF Board of Trustees Member) and Garrett VanGosen (YP Member and ITT Sanitaire Applications Engineer) it was destined to contain a wealth of knowl-




edge and great perspectives on the careers and challenges within the water and wastewater industry. I again thank them all for their time and inspiring presentations. In addition, I must also thank Matt Allen, Beth Vogt, and Gary Scott for their assistance in assembling this seminar.

After the seminar, we forwarded a brief summary to the attendees asking them various questions and their input relative to the seminar. Overwhelmingly, CSWEA received great feedback and high ratings. A few of the comments were: "The CSWEA YP Leadership Academy was a phenomenal learning and networking experience. It was great to hear advice and the experience of environmental leaders (CEOs and directors) in the Midwest. I had fun, gained invaluable advice and met a bunch of other young professionals who I will continue to network with throughout my career," (Trevor Ghylin, P.E. CH2M Hill); and "The environment is a passion of mine, and after the conference I realized this was the perfect industry for me to make a difference in. The people involved with CSWEA and their YP program are very knowledgeable, but more importantly they are all eager to extend a hand and share their knowledge. I wasn't too sure what to expect going into it, but the YP Leadership Academy surpassed my expectations in information and awareness of the need for young people in our profession," (Andy Pakosta Glenbard Wastewater Authority); and "The YP Leadership Academy was a great way for me as a young professional to get to know some of my peers as well as get some valuable career advice from more experienced professionals. Attending the YP Leadership Academy was a great way to start getting involved in CSWEA and was very helpful in providing some guidance for my career in the water/wastewater industry," (Mike Holland Trotter & Associates); and "Don't go out drinking all night after the YP Leadership Academy if you plan on going to the Education Seminar the next day," (Anonymous).

We look forward to the Second Annual Leadership Academy and welcome those who would like to forward potential topics or presentations and those who would be interested in the presentations from the first seminar. We hope to continue to build this seminar with increased YP participation and the seminar becomes as prestigious as the Annual Education Seminar. I hope our members strongly encourage YP participation and consider this event for some or all of their YPs by budgeting this event next year. CS

SUMMER IN THE SUN: THE WORK GOES ON

By Gary B. Scott, CPMM
Glenbard Wastewater Authority
Illinois Section Safety Chair

As you may have noted, I write often about OSHA standards as they relate to our industry, and today they lead me into one of OSHA's most recently developed safety programs, *Preventing Heat Illness in Outdoor Workers.*

Every year, thousands of workers become sick from exposure to heat, and some even die. **These illnesses and deaths are completely preventable if you take time to pay attention to your working staff.** OSHA's has developed a nationwide outreach campaign to raise awareness among workers and employers about the hazards of working outdoors in hot weather. The resources and information available thru their web page *www.osha.gov/SLTC/heatillness/index.html* gives workers and employers information about heat illnesses and how to prevent them.

I'll bet you didn't know that heat is the number one weather-related killer in the US. On average, more than 1,500 people in the U.S. die each year from excessive heat. This number is greater than the 30-year mean annual number of deaths due to tornadoes, hurricanes, floods and lightning combined. In the 40-year period from 1936 through 1975, nearly 20,000 people were killed in the United States by the effects of heat and sun.

Central States summers are almost always hot; most summers see heatwaves in one section or another of our home states. But most importantly, they tend to combine both high temperature and high humidity for the most damaging effects, and yet some of the worst have been catastrophically dry. In the disastrous dry-heatwave of 1980, more than 1,250 people died. In the heatwave of 1995, more than 900 deaths in the Chicago, Illinois area were attributed to high heat and humidity. And in August 2003, a record month-long heatwave in Europe claimed an estimated 50,000 lives in twelve (12) countries.

So, how does heat affect the human body?

Human bodies dissipate heat by varying the rate and depth of blood circulation, by losing water through the skin and sweat glands, when blood is heated above 98.6 degrees. The heart begins to pump more blood, blood vessels dilate to accommodate the increased flow, and the bundles of tiny capillaries threading through the upper layers of skin are put into operation. The body's blood is vrequired to evaporate the sweat is extracted from the body, thereby cooling

SERIOUS HEAT DISORDERS AND WHAT TO DO

Heat exhaustion: Heavy sweating, weakness, skin cold, pale and clammy. Pulse is abnormal and barely perceptible. Normal temperature is possible. Fainting and vomiting likely. **First aid:** Get victim out of the sun. Lie down and loosen clothing. Apply cool, wet cloths. Fan or move victim to air-conditioned room. Give **sips of water**. If nausea occurs, discontinue use.

Heat stroke (or sunstroke): High body temperature (104° F or higher). Hot dry skin. Rapid and strong pulse. Possible unconsciousness. **First aid:** heat stroke is a severe medical emergency. Summon emergency medical assistance immediately. Delay can be fatal. Move the victim to a cooler environment. Reduce body temperature with cold bath or sponging. Use extreme caution. Remove clothing, use fans and air conditioners. **Do not give fluids**.

it. Under conditions of high temperature (above 90 degrees) and high relative humidity, the body is doing everything it can to maintain its 98.6 degrees inside. The heart is pumping a torrent of blood through dilated circulatory vessels; the sweat glands are pouring liquid, including essential dissolved chemicals like sodium and chloride onto the surface of the skin. Most people think, boy where's that water cooler! But there's more to it than that.

Heat disorders generally have to do with a collapse of the body's ability to shed heat by sweating, or the chemical imbalance caused by too much sweating and loss of essential dissolved chemicals. When heat gain exceeds the level the body can remove, or when the body cannot compensate for fluids lost through perspiration, the temperature of the body's inner core begins to rise and heat-related illness may develop. Ranging in severity, heat disorders share one common feature: the individual has overexposed or over exercised for his age and physical condition in the existing thermal environment.

Studies indicate that, other things being equal, the severity of heat disorders tend to increase with age. Heat cramps in a 17-year-old may be heat exhaustion in someone 40 and heat stroke in a person over 60. Heat exhaustion is the rapid release of heat from the body. Heat stroke is extremely dangerous as the body reacts to save itself from high inner core temperatures. I don't know about you, but I'm over 55. I know I can still work hard, but I must remember to think about these things when I work outside.

Worker safety

Outdoor workers can be especially vulnerable to excessive heat. Use recommended practices (planning, prevention, and response) when working under hot conditions such as drinking fluids, changing work/rest schedules to lengthen breaks, cooling down in shade, and looking out for co-workers, particularly those who work alone. Check weather forecasts ahead of time so that you can be better prepared.

Each National Weather Service (NWS) Office will issue heat-related warnings as conditions warrant. The Heat Index (HI) is sometimes referred to as the "apparent temperature." The HI, given in degrees F, is a measure of how hot your body feels when relative humidity is added to the actual air temperature.

To wrap this up, we as workers and employers need to give great attention to these signs and symptoms when work planning. Reinforce the necessity of the following easily remembered safety guidelines for outdoor workers during those hot summer days:

- Slow down. Strenuous activities should be reduced or planned for the coolest time of the day.
- Dress for summer. Lightweight light-colored clothing reflects heat and sunlight.
- Drink plenty of ***non-alcohol*** fluids often. Many drinks like Gatorade have additives to help maintain essential chemical compounds.
- Rest in the shade.
- Report heat symptoms early.
- Know what to do and when to take action. CS

So, during this summer time in Central States be prepared for the heat. Work, drink, and think. Don't fall victim to heat-related illness.

Click HERE to return to Table of Contents

Representing Minnesota

Rebecca Southern and Cara Kowalchyk
Investigating use of Pseudomonas putida Fu1 to clean up toxic furan agricultural byproducts in soil to prevent runoff

Breck School
Science Teacher, Lois Fruen
Sponsored by the Central States Water Environment Association

Representing Wisconsin

Shannon Marcoux
Residence Time of Green Fluorescent Protein in a Biosand Filter

Divine Savior Holy Angels
Science Teacher, Betty Jo Azpell
Sponsored by the Central States Water Environment Association

CSWEA Sends Aspiring Water Scientists from Minnesota and Wisconsin to the U.S. Stockholm Junior Water Prize National Competition

The Water Environment Federation (WEF) proudly announces the 2011 state winners of the U.S. Stockholm Junior Water Prize (SJWP) – the most prestigious youth award for a water-related science project (see complete list below). WEF member associations selected and will sponsor state winners and their science teachers to attend the national competition, hosted by the Illinois Water Environment Association, June 23-25, 2011 at the Palmer House Hilton in Chicago.

The purpose of the SJWP program is to increase students' interest in water-related issues and research and to raise awareness about global water challenges. The competition is open to projects aimed at enhancing the quality of life through improvement of water quality, water resources management, water protection, and water and wastewater treatment.

"WEF congratulates all our talented state winners and wish them the best of luck at the national competition next month," said WEF President Jeanette Brown. "We also greatly appreciate the support and commitment of our member associations, which makes this program so successful."

The U.S. winner will receive $3,000 (USD) and an all-expense-paid trip to Stockholm, Sweden for the international competition as well as the opportunity to present their research to water quality experts at WEFTEC® 2011, WEF's 84th annual technical exhibition and conference, this October in Los Angeles, CA. In addition, the U.S. winner's school will receive $1,000 toward enhancing science education and up to three finalists will receive $1,000 each.

WEF is pleased to announce the new Bjorn von Euler Innovation in Water Scholarship Award, sponsored by ITT Corp., a $1,000 scholarship to be awarded to the SJWP state winner who demonstrates a passion for education, spirit of creativity, and innovation. WEF also welcomes the U.S. Virgin Islands sponsored by the Virgin Islands Water and Power Association, as a new participant in the program.

In the United States, WEF and its member associations organize the national, state, and regional SJWP competitions with support from ITT Corporation (also the international sponsor), The Coca-Cola Company, and Delta Air Lines.

The national winner will represent the United States at the international competition in Stockholm, Sweden during World Water Week, August 21-27, 2011. The international winner will receive $5,000 (USD) presented during a royal ceremony by the prize's Patron HRH Crown Princess Victoria of Sweden. For more information about SJWP, visit *www.wef.org*. CS

THE FOLLOWING PAPER WON THE RADEBAUGH AWARD AT THE 84TH ANNUAL MEETING

Anaerobic Co-Digestion for Increased Renewable Energy

N. Navaneethan1, P. Topczewski2, S. Royer3 and D. Zitomer1

1 Department of Civil and Environmental Engineering, Marquette University, P.O. Box 1881 Milwaukee, WI 53201 (E-mail: *navaneethan.navaratnam@mu.edu; daniel.zitomer@mu.edu*)

2 Milwaukee Metropolitan Sewerage District, 260 W. Seeboth St., Milwaukee, WI 53204 (Email: *ptopczewski@mmsd.com*)

3 Veolia Water Milwaukee, LLC, 700 E. Jones St., Milwaukee, WI 53154 (Email: *scott.royer@veoliawaterna.com*)

ABSTRACT

Co-digestion is now being used to digest a mixture of wastes at many municipal wastewater treatment plants. In this way, more organic carbon is added to make efficient use of existing digesters. The objectives of this study were to identify and compare potential co-digestates, determine synergistic and antagonistic co-digestion outcomes, quantify performance of co-digestion for selected wastes and estimate economic benefits. Over 80 wastes were identified from 54 facilities within 160 km of an existing municipal digester. High BMP values (>370 ml CH_4/gCOD) were observed for seven of the wastes: (1) cookie production, (2) meat production dissolved air flotation (DAF) float, (3) whole stillage from corn ethanol production, (4) syrup from corn ethanol production, (5) trube from beer brewing (6) yeast from beer brewing, and (7) mustard production waste. Performance was investigated using bench-scale digesters receiving primary sludge with and without co-digestates. Methane production rates were 105 and 66% higher when co-digestates were present, but were anticipated to increase only 57 and 23% due to the additional COD. Therefore, significant synergistic outcomes were observed during co-digestion. Co-digestion of the most promising wastes with primary sludge in full scale was estimated to generate enough electricity to power more than 2500 houses.

INTRODUCTION

Anaerobic biotechnology is often applied to treat waste from one location, such as a municipality or industry. However, co-digestion of a mix of material from multiple locations can also be employed. When multiple co-digestates are properly blended, more organic carbon can be digested at a facility to produce more methane and renewable energy.

Co-digestion using municipal anaerobic digesters is especially promising since many exist and are distributed around the world. Often, excess digestion capacity is available, and equipment is in place to use additional biogas for heat and power. Co-digestates considered by others for addition to municipal sludge include municipal solid waste, food waste, and restaurant waste. By adding these co-digestates, municipal digesters can become regional renewable energy facilities. However, co-digestion costs, including conveyance and biosolids management, should be compared with benefits to help assess the sustainability of any co-digestion program.

The work described herein was performed to assess anaerobic co-digestion of various wastes with municipal sludge as a sustainable energy technology. Objectives were to (1) identify potential co-digestates, (2) determine synergistic, antagonistic and neutral effects, and (3) determine economic benefits. Ongoing work includes investigating changes in microbial community structure during co-digestion of various materials as well as implementing co-digestion after full-scale testing.

METHODS

Potential co-digestates

A market survey was performed to identify high-strength wastes produced within a 160-km radius of the Milwaukee Metropolitan Sewerage District (MMSD) South Shore Wastewater Reclamation Facility (Oak Creek, WI, USA).

BMP and ATA testing

The BMP protocol of Owen et al. (1979) was used to screen co-digestates in terms of the volume of methane produced per unit of waste at 35°C and 1 atm. Anaerobic toxicity assays (ATAs) were performed to determine the potential inhibitory or stimulatory affect of each waste on maximum methane production rate from acetate.

Bench-scale anaerobic digesters

Three pairs of bench-scale digesters (Control, Co-Digester 1, and Co-Digester 2) were operated. Control digesters were fed synthetic primary sludge, whereas Co-Digesters 1 and 2 each received co-substrates in addition to synthetic primary sludge. All digesters were 4.5-L vessels containing 2.5 L of active volume initially seeded with biomass from a full-scale anaerobic digester (South Shore Wastewater Reclamation Facility). Digesters were operated with daily feeding at a solids retention time (SRT) of 15 days and were continuously mixed using magnetic stirrers (150 rpm) in a temperature-controlled room (35°C). After Day 55, Co-Digester 1 systems were fed the following five co-digestates (described in Table 1) in addition to synthetic primary sludge: float (3.1 mL/d, 0.52 gCOD/d), can crushing waste (2.8 mL/d, 0.22 gCOD/d), thin stillage (4.9 mL/d, 0.76 gCOD/d), flavorings yeast (1 mL/d, 0.26 gCOD/d), and acid whey (3.7 mL/d, 0.54 gCOD/d). Co-Digester 2 systems were fed with synthetic primary sludge and flavorings yeast waste (4 mL/d, 1.05 gCOD/d).

Cost-benefit analysis

A simple cost-benefit analysis was performed for co-digestates. The net worth of each co-digestate was calculated as the sum of the estimated value of methane produced (0.21 United State Dollar (USD)/m^3CH_4 @ 35°C), GHG avoided (0.003 USD/kg CO_2) and treatment charges (0.28 USD/kg COD and 0.28 USD/kg TSS) less the sum of waste conveyance (0.16 USD/m^3-km) and solids handling and disposal (0.110 USD/dry TS kg). The CO_2 avoidance was estimated assuming fuel switching from bituminous coal (emission factor = 0.088 kg CO_2/ MJ).

RESULTS AND DISCUSSION

Identification of most promising co-digestates

There were 81 wastes from 54 facilities identified during the market survey. The types of wastes (and percent of the total number of wastes) were as follows: food production (76%), corn ethanol production (8%), brewing and malting (7%), and other wastes (9%). Other wastes included algae removed from lakefront areas, zoo animal waste, and soap production wastes. Food wastes were from meat products, dairy and cheese production, flavorings production, frozen foods, snack foods, candy, soy products and mustard production. From preliminary screening, 26 wastes (see Table 1) were chosen for characterization based upon the significant volume produced, high COD concentration, and/or proximity to the digester.

The BMP results for the 26 wastes are presented in Figure 1. Methane was produced from all the co-digestates tested, with average BMP values ranging from 20 to 418 mL CH_4/g COD and 51 to 580 mL CH_4/gVS. High BMP values (>370 ml CH_4/gCOD) were observed for seven of the wastes: (1) cookie, (2) float, (3) whole stillage, (4) syrup, (5) trube (6) brewery yeast, (7) mustard waste (see Figure 1). Low BMP values (< 100 ml CH_4/gCOD) were observed for oil and hydraulic fluids, metal cutting, soap, boiler cleaning and dried manure wastes (Figure 1).

The ATA results for various wastes include synergistic, antagonistic, neutral and mixed outcomes based on a comparison of maximum methane production rates when calcium acetate was

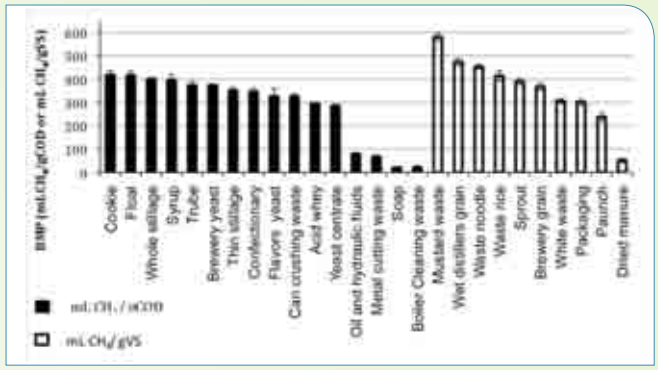


Figure 1. Biochemical methane potential
(BMP) results for 26 promising co-digestates
Error bars represent standard deviation of triplicate measurements. The CH4 volume is reported at 35°C, 1 atm. Some error bars are too small to be visible.

the main co-digestate (see Figures 2 through 5). Antagonism was observed for soap waste (IC_{50}= 2%), boiler cleaning wastewater (IC_{50}= 9.5%), metal cutting waste (IC_{50}= 12%), oil and hydraulic fluids waste (IC_{50} > 15%), and cookie waste (IC_{50}> 50 %) (see Figure 3). Neutral outcomes were observed for float, brewery yeast and acid whey wastes (see Figure 4). Moreover, some wastes such as trube, brewery yeast and flavorings yeast wastes demonstrated mixed outcomes, with a synergistic effect observed at low concentrations and an antagonistic effect observed at higher concentrations (see Figure 5).

Cost-benefit analysis

The results of the economic benefit analysis are presented in Figure 6. The economic analysis resulted in high positive benefits for seven co-digestates: (1) syrup, (2) brewery yeast, (3) flavorings yeast, (4) trube, (5) float, (6) whole, and (7) acid whey. However, to select co-digestates for further study, other waste characteristics were considered, including the volume of waste produced, the reliability of waste availability over time, apparent toxicity, and availability of other sustainable disposal methods (i.e., sale as animal

Waste	COD (mg/L or other as marked)	TS (%)	Description	Distance to Facility (miles)
Flavorings yeast	216,000	15.7	Food flavorings production	8
Yeast centrate	35,000	0.6		
Sprout	127,000*	14.3		
Oil and hydraulic fluids	77,000	2.6	Metal recycling facility	13
Float	133,000*	12.5	Dissolved air flotation float from meat production	16
Paunch	105,000*	10.6	Meat production	
Dried manure	449,000*	86.4		
Trube	203,000	9.9	Beer fermentation	18
Brewery yeast	313,000	16.2		
Brewery grain	107,000	20.1		
Soap	47,000	2.0	Soap production	18
Boiler cleaning waste	33,000	5.7	Coal-fired boiler heat exchanger cleaning solution	30
Metal cutting waste	75,000	2.3	Machine shop	30
Mustard waste	59,000*	8.53	Mustard production	33
Packaging waste	972,000*	76.8	Off spec candy from packaging operation	44
White waste	1,089,000*	90.1	Floor sweepings from candy production	
Acid whey	148,000	12.7	Cheese production	49
Confectionary	23,000	1.9	Candy production	55
Waste rice	287,000*	22.7	Frozen food production	61
Waste noodle	502,000*	35.3		
Wet distillers grain	206,000*	31.1	Corn ethanol production	69
Syrup	399,000	30.4		
Whole stillage	155,000	14.5		
Thin stillage	137,000	9.1		
Can crushing waste-ILL	76,000	6.1	Soft drink production	75
Cookie	13,000	0.6	Industrial bakery	95

Table 1. Waste characteristics and facility descriptions for potential co-digestates

* These values are in units of mg/kg (wet)

	Control	Co-Digester 1	Co-Digester 2
Primary sludge flow (m^3/day)	1890	1890	1890
Co-digestate flow (m^3/day)	0	192	12
Total methane (ML/day)	15.1	34.1	17.7
Methane energy[a] (1000MJ/day)	530	1190	620
Estimated CO_2 emissions avoidance[b] (tonnes/year)	17000	38200	19900
Average U.S. homes provided electricity[c] (houses)	2000	4500	2340

Table 2. Estimated energy production and carbon dioxide avoidance from co-digestion

[a] Assuming methane heat content of 0.035 MJ/L CH_4 at 35°C (930 BTU/ft^3)

[b] Assuming switching from bituminous coal and coal emissions factor of 0.088 kg CO_2/MJ (Hong and Slatick, 1994)

[c] Assuming average U.S. household electricity usage of 90 MJ/d (25kWh/d) and biogas–to-electricity conversion efficiency of 34% (10000 BTU/kWh) (Speece,1996)

Click HERE to return to Table of Contents

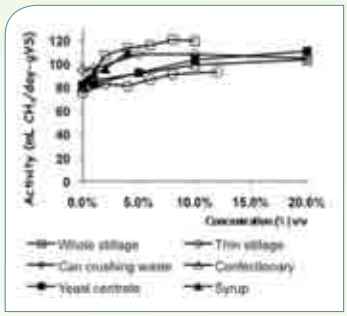


Figure 2

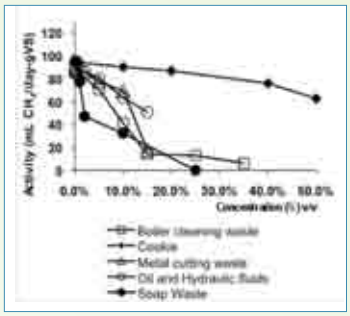


Figure 3

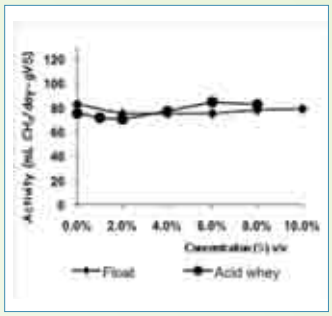


Figure 4

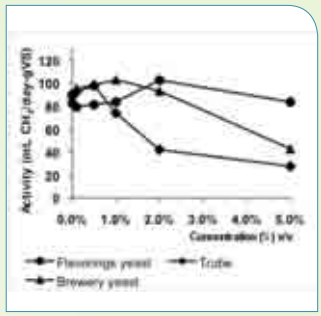


Figure 5

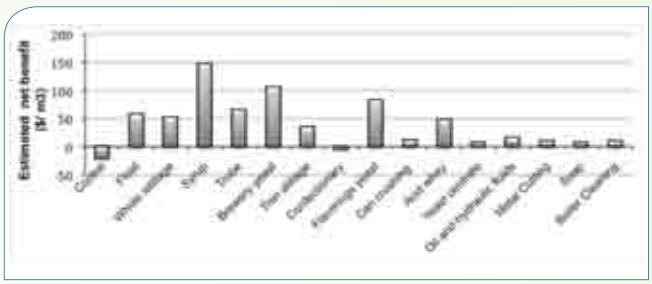


Figure 6. Co-digestate cost-benefit analysis results

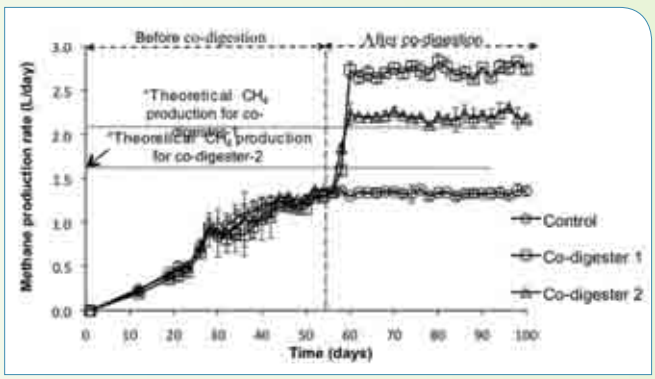


Figure 7. Methane production rate of digesters

*Theoretical CH_4 production = CH_4 production from control + theoretical CH_4 production of co-digestates which was calculated using BMP values of co-digstates

feed or food additive). Based upon all factors, the five most promising wastes for further bench- and pilot-scale testing were as follows: (1) float, (2) flavorings yeast, (3) thin stillage, (4) acid whey and (5) soft drinking can crushing waste.

Performance of bench-scale co-digesters

The average methane production rates of Control, Co-Digester 1 and Co-Digester 2 systems are presented in Figure 7. During the co-digestion period (Days 55 to 100), methane production rates of Co-Digester 1 and 2 systems increased by 105% and 66% in comparison to the Control systems, respectively. Of course, when extra organic carbon was added to the co-digesters, the methane production rate was expected to increase. But the extra methane production from the additional co-digestate carbon was theoretically anticipated to be 57% and 23% greater from Co-Digesters 1 and 2, respectively. Therefore, the additional methane resulting from synergism in Co-Digesters 1 and 2 was 48% and 43% of the Control methane production.

Bench-scale digester results were used to estimate the energy production and carbon dioxide avoidance from full-scale co-digestion that will be pilot tested within three months (see Table 2). Co-Digester 1 and 2 scenarios were estimated to result in a decrease in net CO_2 emissions assuming that biogas replaces coal as fuel (see Table 2).

Conclusions

Promising co-digestates can be identified based on waste characteristics as well as the volume of waste produced and apparent toxicity. A simple net benefit analysis of promising co-digestates is one tool to select materials for full-scale co-digestion. The co-digestion of five wastes (float, spent yeast, thin stillage, acid whey and soft drink can crushing waste) in addition to primary sludge is potentially feasible in full-scale. Co-digestion of these wastes increased biogas production significantly more than that

the value predicted based upon BMP values alone. In conclusion, co-digestion is one method to increase renewable energy production via anaerobic digestion.

REFERENCES AND BIBLIOGRAPHY

- Alatriste-Mondragon, F., Samar, P., Cox, H. H. J., Ahring, B. K., and Iranpour, R. (2006) Anaerobic Codigestion of Municpal, Farm and Industrial Organic Wastes: A Survey of Recent Literature. *Water Environ. Res.,* 78(6) 607-636.
- APHA (American Public Health Association), AWWA (American Waterworks Association), and WEF (Water Environment Federation) (1998) *Standard Methods for the Examination of Water and Wastewater,* 20th Edition
- Bailey, R. (2006) City of Riverside, California Grease to Gas to Power, City of Riverside California.
- Bjornsson, L., Murto, M., and Mattiasson, B. (2000) Evaluation of Parameters for Monitoring a Co-Digestion Process. *Appl. Microbiol. Biotechnol.,* 54, 844-849.
- Di palma, L., Medici, F., Merli, C., and Petrucci, E. (1999) Anaerobic Co-Digestion of Sewage Sludge and Municipla Solid Waste from Markets: Experimental Results. *Journal of Solid Waste Technology and Management, 26(1), 10-13.*
- Edelmann, W., Engeli, H., Gradenecker, M. (2000). Codigestion of Organic Solid Waste and Sludge from Sewage Treatment. *Water, Sci. & Tech.,* 41(3), 213-221.
- Einola, J. K., Luostarinen, S. A., Salminen, E. A., and Rintala, J. A. (2001) Screening for an Optimal Combination of Municipal and Industrial Wastes and Sludges for Anaerobic Co-Digestion, *Proceedings of the 9th World Congress, Anaerobic Digestion 2001, Anaerobic Conservation for Sustainability,* Antwerpen, Belgium, September 2-6, 357-362.
- Hamzawi, N., Kennedy, K., and McLean, D.D. (1998). Anaerobic Digestion of Co-mingled Municipal Solid Wastes and Sewage Sludge. *Water Sci. and Tech.,* 38(2), 127-132.
- Hong, B.D., Slatick, E. R. (1994) Carbon Dioxide Emissions Factors for Coal. *Quarterly Coal Report,* U.S. Energy Information Administration: Washington, D.C., 1-8.
- Lafitte-Trouque, S., and Forster, C. F. (2000) Dual Anaerobic Codigestion of Sewage Sludge and Confectionary Waste. *Bioresource Technol.,* 71, 77-82.
- Maeng, H., Lund, H., and Hvelplund, F. (1999) Biogas Plants in Denmark: Technological and Economic Developments. *Applied Energy,* 64, 195-206.
- Owen, W. F., Stuckey, D.C., Healy Jr, J. B., Young, L. Y., and McCarty, P.L. (1979) Bioassay for Monitoring Biochemical Methane Potential and Anaerobic Toxicity. *Water Res.,* 13, 485-492.
- Rintala, J. A., and Jaervinen, K. T., (1996) Full-scale Mesophilic Anaerbic Co-Digestion of Municipal Solid Waste and Sewage Sludge: Methane Production Characteristics. *Waste Management & Research,* (14)2, 163-170.
- Sosnowski, P., Wieczorek, A., and Ledakowicz, S. (2003) Anaerobic Co-Digestion of Sewage Sludge and Organic Fraction of Municipal Solid Wastes. *Advances in Environmental Research,* 7(3), 609-616.
- Speece, R. E. (1996) *Anaerobic Biotechnology for Industrial Wastewaters;* Archae Press: Nashville Tennessee.
- Zitomer, D., Adhikari, P., Heisel, Craig., and Deneen, D. (2008) Municipal Anaerobic Digesters for Codigestion, Energy Recovery, and Greenhouse Gas Reductions. *Water Environ. Res.,* 80 (3) 229-237. CS

WEF Recognizes Excellence in Water Quality Through New Fellow Program

Water Environment Federation®
the water quality people®

Program honors the professional achievements, stature and contributions of WEF members to the water profession

The Water Environment Federation (WEF) is proud to announce the first recipients of the WEF Fellow Recognition Program. Approved by the Board of Trustees last July, the new program honors the professional achievements, stature, and contributions of WEF members in various fields of water expertise. A total of 17 WEF members were approved by the Board to be honored during this inaugural year.

"WEF takes a great deal of pride in the vast knowledge base of our members and in honor of that, felt it was very important to provide a distinguished recognition program," said WEF President Jeanette Brown. "We are very pleased to celebrate not only the personal achievements of this year's Fellows, but also the invaluable role WEF has as a leading water quality organization."

The Fellow Recognition Program recognizes professional accomplishments in the professional segments served by WEF, and reinforces WEF's reputation as a valuable water quality resource, due in large part to the expertise of its diverse membership. Some areas of recognition include design, education, operations, regulation, research, and utility management/leadership.

The WEF Fellow Recognition program is an element of WEF's respected Awards & Recognition program. Fellow recipients will be recognized during WEFTEC®, WEF's annual technical exhibition and conference, and will be permitted to use the WEF Fellow designation following their name, in a professional capacity. CS

2011 Inaugural WEF Fellow Recipients

Pedro Alvarez
Rice University
Civil & Environmental Engineering
Houston, TX

Walter Bailey
DC Water & Sewer Authority
Washington, DC

James L. Barnard
Black & Veatch
Leawood, KS

Paul L. Bishop
National Science Foundation
Arlington, VA

Pen-Chi Chiang
Institute of Environmental Engineering
National Taiwan University
Taipei, Taiwan

Stephan D. Frank
Metro Wastewater Reclamation District
Denver, CO

Paul L. Freedman
Limno Tech
Ann Arbor, MI

Thomas E. Kunetz
Metropolitan Water Reclamation District of Greater Chicago
Chicago, IL

Eric R. Lecuyer
Central States WEA
Crystal Lake, IL

Bruce E. Logan
Penn State University
University Park, PA

Nancy G. Love
University of Michigan
Ann Arbor, MI

Tim Madhanagopal
Orange County Utilities South Water Reclamation Facility
Orlando, FL

John T. Morris
Morris Water Resources Consultants
San Marino, CA

John T. Novak
Virginia Poly Institute & State University
Blacksburg, VA

Krishna R. Pagilla
Illinois Institute of Technology
Chicago, IL

James Tony Parrott
Metropolitan Sewer District of Greater Cincinnati
Cincinnati, OH

Spyros Pavlostathis
Georgia Institute of Technology
Atlanta, GA

JULY

CSWEA CSX'11
Committee and Section Exchange
July 21-22, 2011
Kalahari Resort and Convention Center
Wisconsin Dells, WI

MWOA Annual Conference
July 26-29, 2011
Grand Rapids, MN

WI Section CSWEA Northwoods Collection System Seminar
July 28, 2011
Marshfield, WI

WEF, CSWEA, IWEA, CEE, ACEE & WERF
Energy and Water 2011
July 31-August 3, 2011
Chicago, IL

AUGUST

FVOA Mini Conference
August 18, 2011
Algonquin, IL

SEPTEMBER

IL Section Operations Seminar
September 7, 2011
Thorn Creek Sanitary District
Chicago Heights, IL

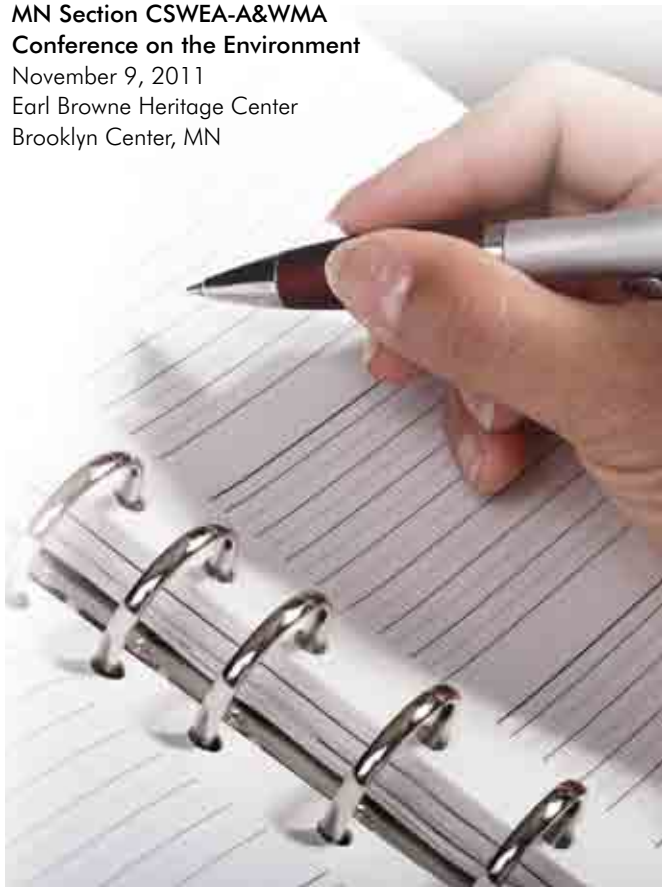
OCTOBER

WEFTEC'2011
October 15-20, 2011
Los Angeles, CA

CSWEA-IWEA Welcome Reception
October 16, 2011
J.W. Marriott at L.A. Live
Los Angeles, CA

NOVEMBER

MN Section CSWEA-A&WMA
Conference on the Environment
November 9, 2011
Earl Browne Heritage Center
Brooklyn Center, MN



OVERHEATING ?

Control Panels or Enclosures

COMPACT
cabinetcooler
HEAT EXCHANGERS FOR SEALED ELECTRICAL ENCLOSURES

- replaces air conditioning ✓
- replaces compressed air ✓
- easy installation ✓
- low maintenance ✓
- below ambient cooling ✓

Available in NEMA 12, 4, 4X stainless steel washdown

10% OFF your first order, offer applies to end users only

Promo Code: **K4-6CS-MG**
EXP 7/15/2011

norenproducts.com/cs
650.322.9500

USA

BSI ISO 9001:2008 FM 35849

c UL US LISTED

THERMAL SOLUTIONS
NOREN
Products Innovated

Enjoy Water

By Jane Carlson

I'm happy to serve as your Wisconsin Section Chair for 2011- 2012. It's a great honor because I happen to really appreciate water and this organization.

I've always loved water. Growing up, I had the good fortune to spend most summers at a northern Michigan lake. It was clear and cold and full of perch. We kids were constantly in the water. Eventually I became aware that not all waters were as beautiful as that northern lake. I wanted to help fix that, and have never regretted my career choice.

I've always really liked CSWEA and the Wisconsin Section in particular. It's hard to imagine any professional group more dedicated and fun-loving than us. I was introduced to CSWEA in the late 1980s by a "seasoned" professional. I joined a committee at his urging and met more people. More recently I've served as a member and chair of other committees and have participated in many meetings and events. We active members should remember how we started and encourage others to join and participate.

> "I'd like to thank our past Section Chair, Keith Haas, for his dedication and service. Keith is a great role model and I'm happy that he'll remain active on the board for the next year or more."

I'd like to thank our past Section Chair, Keith Haas, for his dedication and service. Keith is a great role model and I'm happy that he'll remain active on the board for the next year or more. Through the hard work of Keith, Secretary-Treasurer Dave Arnott, GAC Chair Brandon Koltz, and many others, the Section accomplished much this past year in the regulatory arena and beyond. Thanks to Tom Sigmund for serving as our Trustee and experienced guide.

Past Chair Jim Beier rolled off the board in May, and his service was truly appreciated. He will soon be leaving the state to provide a much greater service to our country, and we wish him well and look forward to his safe return.

I'd also like to thank past Section committee chairs Bill Oldenburg (Industrial Waste), Andrew Craven (Collection Systems), and Trevor Ghylin (Students and Young Professionals). They did outstanding jobs organizing seminars and events and planning for smooth transitions to new committee chairs. Our committees are the heart and soul of this organization and are very strong. I encourage all members to review the committee information on our website *(www.cswea.org/wisconsin/)* and get involved if possible.

Speaking of committees, as vice chair, Bill Oldenburg is charged with updating our Section's Strategic Plan. He will soon form a small committee for this purpose. Please let Bill or me know if you would like to help. Past strategic plan updates are on our website.

The Annual Meeting in Brooklyn Park, MN in May was a big success. We hope to see you at a summer event. Consider participating in CSX this July to collaborate with other State Section leaders for the continued improvement of our organization. The Northwoods Collection System Seminar is in July and Management Seminar is in August. Watch for the Brewers S&YP event and summer board meeting in August, too.

Through the years, I've continued to appreciate water and all its uses, from swimming to skiing to brewing beer. I still want to protect and restore it. I believe we CSWEA members are true environmental advocates because our daily actions are geared to doing just that. I hope you can take some time to enjoy water this summer. CS

Significant Goals

By Dean Wiebenga

The CSWEA Annual Meeting is in the books. I would like to commend the Minnesota Section for hosting the conference this year and a job well done.

I am honored to serve as the Illinois Section Chair. As Vice Chair I was able to begin the strategic planning sessions for the Section that will be occurring in the coming years. Our Strategic Planning Committee developed a strategy and plan, set goals and set steps to accomplish our goals. The most significant goal of the plan is to create depth on the committee rosters and broaden the knowledge on each of the committees. A committee of one is often overwhelmed and can find it difficult to move forward rather than maintain the status quo.

Our Section has started talking about the topics we want to tackle in the coming year. Carl Fischer, Baxter and Woodman will take the lead of the Government Affairs Committee with Tom Lenz of North Shore Sanitary District. They will work together with the IWEA and regulators to address the regulatory issues that impact our region.

The Collection System Committee, led by Derek Wold of Baxter and Woodman, has put together an excellent technical conference held in conjunction with the IAWA and the Fox Valley Operators Association. The committee has done an excellent job of building this in to a MUST ATTEND event.

The Operations Committee is planning on an open forum discussion at the Operations Seminar to be held September 7, 2011 at the Thorn Creek Basin Sanitary District. Committee Chair Jim Huchel, Crystal Lake has done a great job of building this committee.

The success of any organization depends on the commitment and involvement of the members. We intend to get members involved in our organization so they will see the value of attending seminars and share that value with their superiors and other professionals. We already have more people involved in our committees: our goal is to have committees of three or four people. With this increased involvement, we will better understand what you are looking for in a seminar. I encourage you to attend a seminar and/or contact one of the Section Chairs and let them know your needs. With your help we can build a Section that will move forward rather than maintain the status quo.

Finally, significant thanks to Gary Scott, Glenbard Wastewater Authority, for his continued hard work as Illinois Section Trustee. To Eddie McCall, CDM, for his efforts as Illinois Section Chair and building the Illinois Section by increasing outreach to other organizations.

I hope by the next issue baseball will still be meaningful in Chicago! CS

> "We intend to get members involved in our organization so they will see the value of attending seminars and share that value with their superiors and other professionals."

Click HERE to return to Table of Contents

Investing in the Future

By John Friel

Thanks for your interest in the MN Section and for taking the time to read this message. Hopefully this finds you well and enjoying a warm summer day. I will try to provide you with some useful updates and insights on the upcoming year. But first, I would like thank Ted Field for his service and leadership as the MN Section Chair during the past year. It was especially exciting to follow in his footsteps and become the new MN Section Chair at the 84th Annual CSWEA Meeting right here in Minnesota. Many thanks should also go out to the local arrangements and technical program committees, and all the other volunteers involved with making the annual meeting another success.

MN Section Meeting highlights – Legislative fly-in and Membership Committee plans

At the Annual CSWEA Meeting the Minnesota Section held a breakfast meeting, which included the treasurer's report from Alison Sumption and updates from the committees. Rob O'Connell was also elected as the new vice chair. The government affairs committee provided an update about the recent WEF/AWWA legislative fly-in to Washington D.C. Mr. Pete Moulton represented our MN Section along with Mr. Dave Wagner and Mr. Bob Cockriel from MN AWWA. Mr. Moulton provided a summary of his trip and highlighted some of the initiatives discussed. He was impressed by the support, knowledge, and awareness of water and wastewater issues held by our senators, house representatives, and their staff. Tracy Ekola, the Membership Committee Chair, shared plans related to strengthening our membership, which includes an initiative to reach out to the universities across the state to increase awareness in WEF and CSWEA among students.

S&YPs: get out of the cube for some fun

The Students and Young Professionals (S&YP) Committee has built some momentum in the past year by hosting a plant tour and assisting at the annual meeting. The committee has networked with other S&YP type committees in other organizations to look into joint events. The S&YP committee has plans for more events in the upcoming year. A summer event is in the works. Please contact Rachel Radloff *(rradloff@bonestroo.com)*, MN Section S&YP Committee Chair, Susan Danzl *(sdanzl@sehinc.com)*, MN Section YP Coordinator, Dustin Maas *(dmaas@sehinc.com)*, CSWEA S&YP Committee – MN Section Representative, or Dave Johnson, Students Coordinator, if you would like to know more about the committee and upcoming events.

***Blueprint Minnesota: Liquid Assets* – filming this summer and airing this fall!**

This past year Ted has provided updates about the support and investment our section has provided for the production of the *Blueprint Minnesota: Liquid Assets* documentary project. This project is significant in raising awareness about how critical our wastewater, drinking water, and stormwater infrastructure is to Minnesota. The *Liquid Assets* documentary is an investment in our future. I am happy to report the documentary is scheduled to be filmed this summer and is planned to air on TPT this fall. Please check out *www.blueprintminnesota.com* for updates and related information on the project. I think once this is completed it will become a valuable resource we can be proud of and can share with the public.

MWOA Conference: head north July 26-29, Grand Rapids

The 35th annual MWOA conference is scheduled for July 26-29, in Grand Rapids. It should be another great conference in northern Minnesota. The conference registration form is available on the MWOA website, *www.mwoa.net*.

Conference on the Environment: mark your calendar, November 9

Planning for our annual Conference on the Environment (COE) co-hosted with the Upper Midwest Section of the Air and Waste Management Association is already under way. The conference is scheduled for Wednesday, November 9 at the Earle Brown Center in Brooklyn Center. There is still plenty of room for more volunteers to help with the planning of this conference. Please consider volunteering or submitting an abstract or suggestions for topics to be covered. Please contact Ted Field *(ted.field@TKDA.com)*, COE Planning Committee Co-Chair and MN Section Immediate Past Chair, to volunteer or receive more information.

Website and committees: check it out and please get involved

Many more people deserve credit for dedicating their time and efforts to CSWEA and the MN Section. They are the people who make this a great professional organization. If you would like to know more about the organization, I encourage you to please check out the CSWEA website *(www.cswea.org)* and click on the Minnesota Section page. There are many committees and numerous opportunities for everyone to get involved. Please contact any of the committee chairs or myself *(jfriel@sehinc.com)*. We'd love to hear from you. Until then, thanks for your interest and have a great summer! CS

COMPANY	PAGE	TELEPHONE	WEBSITE
Advanced Engineering and Environmental Services (AE2S)	6	763-463-5036	www.ae2s.com
AECOM	30		www.aecom.com
Alden Pool and Municipal Supply Company	46	800-253-7235	
American Flow Control	15		www.acipco.com
Aqua Backflow	56	866-777-2124	www.aquabackflow.com
Baxter & Woodman, Inc.	54	815-459-1260	www.baxterwoodman.com
Berryman Equipment Company	56	800-605-0099	www.berrymanequipment.com
Black & Veatch	52	IL 312-346-3775 Min 952-545-6695	www.bv.com
Bolton & Menk, Inc.	28	507-625-4171	www.bolton-menk.com
Bonestroo	39	651-636-6400	www.bonestroo.com
Brown and Caldwell	38		BrownandCaldwell.com
CDM	40		www.cdm.com
Clark Dietz, Inc.	47	262-657-1550	www.clark-dietz.com
Crane Engineering	14	920-733-4425	www.craneengineering.net
Crawford, Murphy & Tilly, Inc.	57	217-787-8050	www.cmtengr.com
Degremont Technologies	16	804-756-7600	www.degremont-technologies.com
Donohue & Associates, Inc.	OBC	920-208-0296	www.donohue-associates.com
DYK Incorporated	IFC	800-227-8181	www.dyk.com
Energenecs	35	800-343-6337	www.energenecs.com
Farnsworth Group	54	309-663-8435	www.f-w.com
Force Flow	34	800-893-6723	www.forceflow.com
Foth	3	800-236-8690	www.foth.com
Greeley and Hansen	41	800-837-9779	www.greeley-hansen.com
Hawkins, Inc. (Water Treatment Group)	45	612-331-9100	www.hawkinsinc.com
Howard R Green Company	56	888-368-4389	www.hrgreen.com
Integrated Process Solutions, Inc.	29	218-435-1703	www.ipsamerica.biz
ITT Water & Wastewater USA Inc. - Flygt Products	5	IL 800-661-9944 WI 800-232-1417	www.flygtus.com
ITT Water & Wastewater USA Inc. - Sanitaire Products	IBC	414-365-2200	www.sanitaire.com
I.Kruger, Inc.	13	919-677-8310	www.krugerusa.com
L&J Technologies Company	32	708-236-6000	www.shandandjurs.com
LAI, Ltd.	47	847-392-0990	www.LeyAssociates.com
Master Meter	10	817-842-8000	www.mastermeter.com
McMahon Associates, Inc.	44	920-751-4200	www.mcmgrp.com
Metropolitan Industries, Inc.	45	800-323-1665	www.metropolitanind.com
M.E. Simpson Co. Inc.	54	800-255-1521	www.mesimpson.com
Mulcahy/Shaw Water, Inc.	20	262-241-1199	www.mulcahyshaw.com
Noren Products	55	866-936-6736	www.norenproducts.com
Northern Lake Service Inc.	41	800-278-1254	www.nlslab.com
Oldcastle Precast	37	888-965-3227	www.oldcastleprecast.com/wastewater
Pollardwater.com	21	800- 437-1146	www.pollardwater.com
Power Prime Pumps-Rain for Rent	29	800-647-7246	www.powerprime.com
Process Equipment Repair Services, Inc.	42	262-629-1059	
Ruekert-Mielke	42, 52	262-542-5733	www.ruekert-mielke.com
Short Elliott Hendrickson (SEH)	29	800-325-2055	www.sehinc.com
Smith & Loveless Inc.	8	800-898-9122	www.smithandloveless.com
Strand Associates, Inc.	44	608-251-4843	www.strand.com
Symbiont	47	414-291-8840	www.symbiontonline.com
TKDA	58	651-292-4400	www.tkda.com
Trotter & Associates Inc.	12	630-587-0470	www.taiengr.com
Trojan Technologies	9	888 220 6118	www.trojanuv.com
Unison Solutions, Inc.	51	563-585-0967	www.unisonsolutions.com
University of Wisconsin-Madison	3	800-783-6526	www.epd.engr.wisc.edu
USEMCO	25	608-372-5911	www.usemco.com
Van Bergen & Markson, Inc.	45	800-422-0791	
Walker Process Equipment	47	800-9WALKER	www.walker-process.com
WeirWasher/Gilltrading.com	42	866-447-2496	www.weirwasher.com
WSB & Associates, Inc.	49	763-541-4800	www.wsbeng.com

Central States Water would not be possible without the advertising support of these companies and organizations. Please think of them when you require a product or service. We have endeavoured to make it easier for you to contact these suppliers by including their telephone numbers and, where applicable, their websites. You can also go to the electronic version of ***Central States Water*** at *www.cswea.org* and access direct links to any of these companies.

CSWEA Associate Membership Application

Contact Information

Last Name	MI	First Name	(Jr., Sr., etc.)

Business Name (if applicable)

☐ Business Address ☐ Home Address
Street or PO Box

City	State	Zip	Country

Home Phone Number	Business Phone Number	FAX Number

E-mail Address

Employment Information

Employer	Job Title
Environmental Focus	Other focus or interest (please specify)

Signature (required for all new memberships) | Date

Associate Membership in Central States Water Environment Association

CSWEA Associate Membership Benefits include: Central States Water Magazine and Member price for CSWEA and Section Events

☐ I am a Young Professional (35 yrs or younger, less than 10 work experience)
☐ Please send me info on YP Events

Dues cover a one year period, and must be renewed annually.

Renewal notices will be sent one month prior to anniversary date.

DUES
$ 20.00

Payment Information

☐ Check/Money Order enclosed. Make check payable to Central States Water Environment Association.

OR Visit www.CSWEA.org to join on-line and pay by credit card.
Visa, Master Card & American Express Accepted.

Mailing Information

Send Form & Payment to: Central States Water Environment Association, 3809 Shenandoah Drive, Crystal Lake, IL 60012
Call 815-954-2714 for additional information or visit www.CSWEA.org

Water Environment Federation®
Preserving & Enhancing the Global Water Environment

Join CSWEA & WEF Now! Membership Application

Last Name	MI	First Name	(Jr., Sr., etc.)
Business Name (if applicable) ☐ Business Address ☐ Home Address			
Street or PO Box			
City	State	Zip	Country
Home Phone Number	Business Phone Number	FAX Number	
E-mail Address			

☐ **Please send me information on special offers, discounts, training, and educational events, and new product information to enhance my career.** ☐ **by email /** ☐ **by fax**

Member Association (MA) Choice: Central States Water Environment Association

Employment Information

Employer Code	Other (please specify)	Job Title Code	Other (please specify)
Environmental Focus		Other (please specify)	
Signature (required for all new memberships)		Date	

Sponsorship Information

WEF Sponsor Name & Sponsor ID Number:	ACQ.Code for WEF use Only GENI

Membership Information

Membership Categories *Select one only*	**Member Benefit Subscriptions Include**	DUES
☐ **Professional (Active)**		$ 108.00
Individuals involved in or interested in water quality	✓ *WE&T (including Operations Forum)*	
	✓ *WEF Highlights Online*	
	✓ Central States Water Magazine	
☐ **Young Professionals Package**		$ 67.00
YP=<35 yrs of age, < 10 yrs work experience can receive 50% discount for 1st three years of membership	✓ *WE&T (including Operations Forum)*	
	✓ *WEF Highlights Online*	
	✓ *Central States Water Magazine*	
☐ **Professional WW Operations (PWO)**		$ 67.00
Individuals involved in the day-to-day operation of wastewater collection, treatment or laboratory facility, or for facilities with a daily flow of < 1 mgd or 40 L/sec.	✓ *WE&T (including Operations Forum)*	
	✓ *WEF Highlights Online*	
	✓ *Central States Water Magazine*	
☐ **Student**		$ 30.00
Students enroll for a minimum of six credit hours in an accredited college or university. Must provide written documentation on school letterhead verifying status, signed by an advisor or faculty member.	✓ *WE&T (including Operations Forum)*	
	✓ *WEF Highlights Online*	
	✓ *Central States Water Magazine*	
☐ **Corporate**		$ 370.00
One person is entitled to receive member benefits. Companies engaged in the design, construction, operation or management of water quality systems. Designate one membership contact.	✓ *WE&T (including Operations Forum)*	
	✓ *Water Environment Research (Print)*	
	✓ *Water Environment Regulation Watch*	
	✓ *WEF Highlights Online*	
	✓ *Central States Water Magazine*	
Executive		$ 315.00
Upper level managers interested in an expanded suite of WEF products/services.	✓ *WE&T (including Operations Forum)*	
	✓ *World Water & Environmental Engineering*	
	✓ *Water Environment Research (On-Line)*	
	✓ *Water Environment Regulation Watch*	
	✓ *Utility Executive*	
	✓ *Biosolids Technical Bulletin*	
	✓ *Central States Water Magazine*	

Additional Subscriptions

Consider including additional WEF resources in your membership package! Check the appropriate subscription and include the subscription cost in your payment.
NOTE: Prices listed reflect a substantial member discount!

☐ *WE&T (including Operations Forum)*	$55.00	$
☐ *World Water*	$75.00	$
☐ *World Water (Water Reuse and Desalination*	$55.00	$
☐ *Water Environment Research Online: $75, Print: $100, Both: $125*		$

Payment

☐ **Check/Money Order enclosed**	☐ **Charge**	**Credit Card Number**	TOTAL DUE	$
(Made payable to WEF in US funds)	☐ VISA	Exp. Date		
	☐ American Express	Signature		
	☐ MasterCard	Daytime Phone		

Mailing Information

Send Form & Payment to: Water Environment Federation • Member Service Center • PO Box 18044, Merrifield, VA 22118-0045
For more information, call 1-800-666-0206 (U.S. and Canada) or + 1-703-684-2452 (all other countries) • Fax + 1-703-684-2428 • www.wef.org

Total Process Treatment Solutions

SANITAIRE®

SANITAIRE® and ABJ are world leaders and industry standard in wastewater treatment plants throughout the world with equipment operating in thousands of facilities. Years of dedicated and knowledgeable engineering have led to the development of our various process treatment solutions.

Fine Bubble Aeration Equipment

- High oxygen transfer capabilities and low operating costs
- Proven piping and support system for long-term reliability
- Ceramic disc and membrane disc configurations available
- Minimal maintenance requirements

Sequencing Batch Reactors (SBRs)

- Continuous flow operation yields smaller basin volumes, equal loading between basins and allows for single basin operation
- Enhanced biological nutrient removal with the use of pre-react selector zone
- Low cost operations with high-efficiency SANITAIRE® fine bubble diffusers
- Easily expandable to account for increasing future plant flows

Oxidation Ditch

- Excellent effluent quality including biological nutrient removal
- No submerged mechanical aerator devices
- Lower maintenance costs than comparable technologies
- Low cost operations with high-efficiency SANITAIRE® fine bubble diffusers

DrumFilters

- Low energy consumption - power only required during backwash cycle
- Wide range of capacity: 100 - 2,500 gpm per unit
- All corrosion resistant components for long term reliability
- Minimal maintenance requirements

Visit us online at
www.sanitaire.com/us

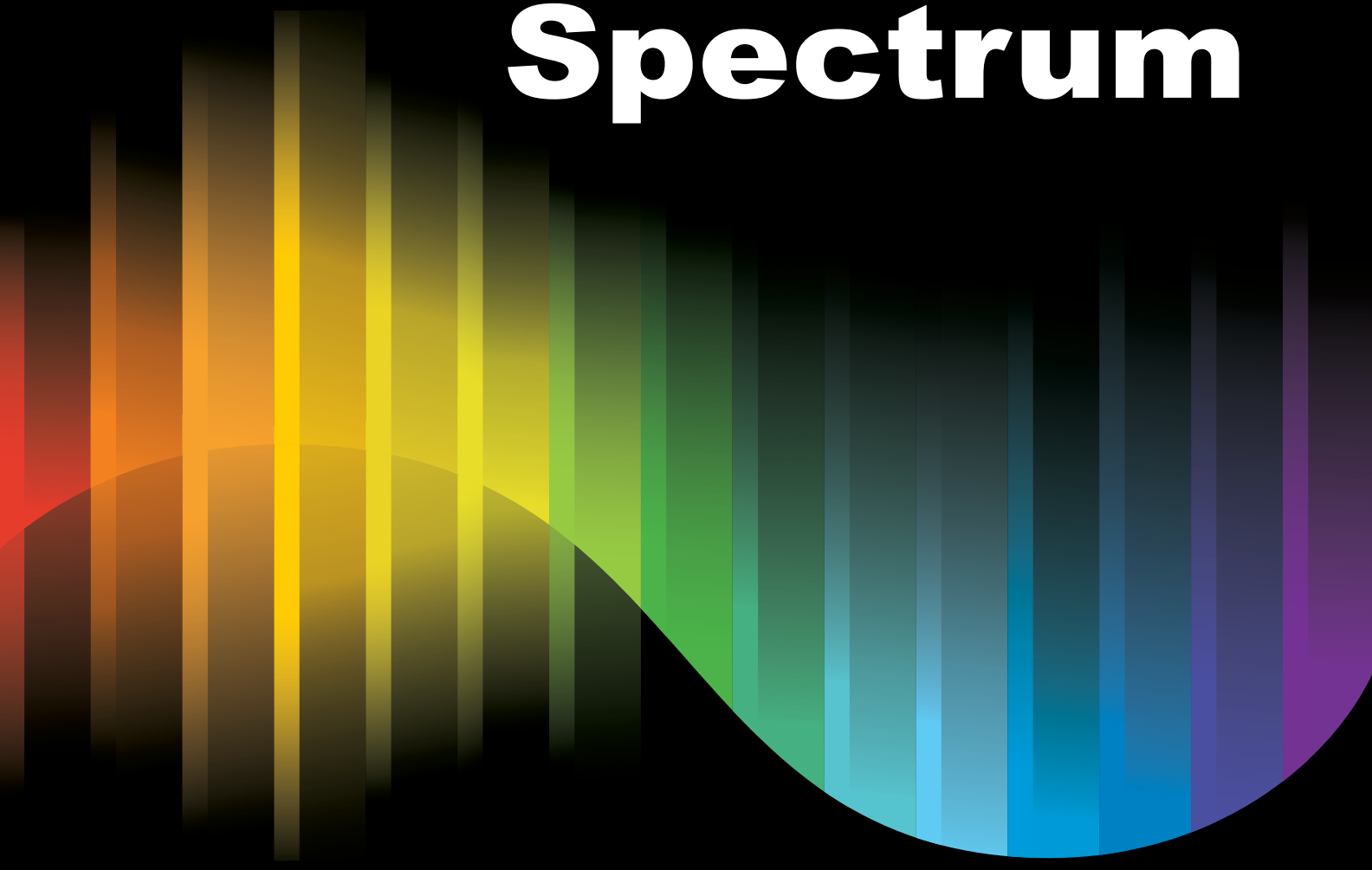
9333 North 49th Street
Brown Deer, WI 53223
414.365.2200
info@sanitaire.com

ITT

ITT is a global provider of water handling and treatment solutions in more than 140 countries. The company designs and delivers energy-efficient solutions and related services for water and wastewater transport, biological treatment, filtration, and disinfection. ITT maintains one of the industry's most extensive sales and service organizations to ensure it meets more than one customer's needs locally.

Flygt | Leopold | **Sanitaire** | WEDECO

Covering the Spectrum



Donohue & Associates' team of experienced engineers and operations specialists cover the full wastewater spectrum: from the laterals to the treatment facility outfall, from the smallest systems to the largest, from planning to system optimization and troubleshooting, from design to start-up, from municipal to industrial, from dry weather to wet weather, and everything in between.

DONOHUE® & ASSOCIATES

www.donohue-associates.com
1-888-736-6648

Madison, WI • Milwaukee, WI • Sheboygan, WI • Fort Wayne, IN • Indianapolis, IN • Chesterfield, MO
Champaign, IL • Chicago, IL • Rock Island, IL • St. Louis Park, MN • Willmar, MN

Creative Award–Winning Solutions