

# CENTRAL STATES WATER

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



**81st Annual Meeting**  
**May 19-22, 2008**

Sheraton South Hotel, Bloomington, MN



**Metropolitan WWTP plant tour**  
Thursday, May 22



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# CSWEA

## 81st Annual Meeting

### Minneapolis, MN

Dennis Lindeke



**Y**ou should all be registered by now for the CSWEA 81st Annual Meeting in Minneapolis. Thanks to Doug Henrichsen, the local arrangements chair and his committee, it is shaping up to be an excellent event this year. Jason Benson and the technical program committee have selected an excellent group of timely papers. Special recognition also goes to the MN Section Operations and Collection Systems Committee's for providing speakers for these respective sessions. The exhibits will be a one-day, focused event this year. Thanks go to Kevin Regan for coordinating this year's vendor program. Also at the exhibits will be our annual silent auction for Water for People. Exhibitors, as well as individuals, are urged to donate an item for this most worthy cause.

We have a couple of great keynote speakers this year. Dr. James Barnard, a pioneer in the development of the biological phosphorus removal process, will give the opening address. And Paul Douglass, TV meteorologist and author, will give the Farewell Breakfast talk on the topic of climate change. Patti Craddock has been working on your after-hours entertainment, which starts with BBQ and Blues in the Park on Tuesday night. Following the awards banquet on Wednesday evening, we will have the improvisation group Comedy Sportz Workshop. The annual golf outing will be at a top local course, the nearby Braemer Golf Club. It is hosted again this year by Phil Parsons, who has been doing this for the MN section for many, many years. For those who do not golf, we will be having a casual bike ride and picnic lunch on a nearby state trail.

#### Membership

One of my initiatives as president was to increase membership, especially in the young professionals area. We

have indeed had modest growth, with about 30 new members joining in the past year, mostly in the MN section. Go Gophers! Thanks to those who have encouraged someone to join, and let's keep up this effort.

#### Year in review

This column is my last as the current CSWEA President. The gavel now passes on to the able hands of Tim Tack of Illinois, followed by Rusty Schroedel from Wisconsin in 2009. It has been the highlight of my 33-year career to serve as president of this association. The work we do day to day and the volunteer hours we give to this humble profession make a big difference in the quality of life for the public, as well as the state of our water environment. Just think back to what the nation's water environment was like about 40 years ago when the Clean Water Act was initiated. We have come a very, very long way in these 40 years, but to be sure, there is much more work to be done. This is why we need people like you who are dedicated professionals and active, happy volunteers to continue this needed work of protecting and improving our water environment. To meet this ongoing need, CSWEA along with the state sections and WEF now has an average of two training events per month in our region. This includes the annual meeting, the education seminar, the Midwest Water Industry Expo, State Section events, WEFMAX and the list goes on. We also support many student and young professional activities. My sincere thanks goes out to all of the executive committee members, state section chairs, state committee members and all who serve in any capacity to further this profession. The state section level is actually where most of the great work is done. Special thanks are reserved for Eric Lecuyer, our Executive Director, who guides us through all of these challenges with a steady hand.

See you in Minneapolis! **CS**

*"It has been the highlight of my 33-year career to serve as president of this association."*



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# New Initiatives

Eric R. Lecuyer



By now CSWEA members should have received a mailing with some proposed Constitution and By-Laws amendments and introducing you to the nominees for leadership positions in Central States, with the position of 2nd Vice President, WEF Delegate, Treasurer and YP Representative – What? YP Representative? Wait a minute, that's new! Yes, CSWEA is on the move again and under the leadership of the Executive Committee, two new initiatives are being proposed to our members that will be voted on at the 81st Annual Meeting. The first is to create a new position on the Executive Committee specifically to represent our Young Professionals, much as the Professional Wastewater Operator Representative (PWO), represents our operators. This exciting initiative, if adopted, will ensure that there is an element of youth on the Executive Committee and this will help the Executive Committee make decisions that may impact our younger and newer members. The proposed amendments to the by-laws are as follows: Young Professional Members (YP) shall be a person who is involved in the water environment profession in any capacity or is actively engaged or interested in one or more of the objectives of the Association as defined in the Constitution and is 35 years of age or less.

The YP Representative shall represent the Associations Young Professional members. The term of

the YP Representative shall be Two (2) years, which shall start immediately following the close of the Annual Meeting, at which the election of officers is conducted, and continue until a successor qualifies. The YP Representative shall not be eligible to serve consecutive terms.

The YP Representative shall be elected at large without reference to State of residence by a majority vote of the members at the Annual Business Meeting of the Association.

The CSWEA Executive Committee endorses the YP Representative amendment and urges your support for this exciting initiative. In fact, a nominee has been selected for the

position (Rachel Lee, of Wisconsin) and should the YP Representative position be created, that nomination will be voted on as well at the 81st Annual Meeting

The second initiative is a major departure for CSWEA and will create a new membership category of Associate Member. An Associate Member will be a member of CSWEA only, and will not be a WEF member. This will provide the opportunity for new members to join and be introduced to CSWEA as well as WEF. CSWEA continues to be strongly committed to WEF and would encourage all members to be both CSWEA and WEF members, but we have found that some categories of potential members are much more interested in being

**“CSWEA is on the move again and under the leadership of the Executive Committee, two new initiatives are being proposed to our members that will be voted on at the 81st Annual Meeting.”**





CSWEA members than WEF members. The Executive Committee has grappled with this initiative for some time and has concluded that no harm will come to CSWEA or WEF with this membership category. We realize that any number of existing CSWEA/WEF members may choose to be CSWEA-only members, which may result in some membership number decrease with WEF and on the same hand, we expect to attract many more new members from which both CSWEA and WEF will benefit. The specifics of this membership category include the following: Associate members are not eligible voting members of the Association. Associate Members may not serve as an officer of the Association or its Sections.

Associate Members are Central States Water Environment Association members only and are not members of the Water Environment Federation. An Associate Member shall be any person employed or interested in the advancement of knowledge relating to the objectives of the Association. An Associate Member shall have all the rights and privileges granted by the Association including rights to serve on committees but excluding the rights to hold Association and Federation office, serve as Chair/Vice-Chair of a Committee, or serve on the Nominating Committee. An Associate member shall not be an eligible voting member of the Association. This member shall be entitled to receive publications of the Association as authorized by the Executive Committee for the Associate Member category.

Associate Members annual dues shall be billed directly to the members by the CSWEA Executive Director and shall be payable within 1 (one) month of the Associate Members anniversary date.

The CSWEA Executive Committee has carefully considered the impacts of the Associate Member category and has endorsed these amendments to the Constitution and By-Laws and urges your support of this new membership category, which will be voted on at the 81st Annual Meeting.

Finally, CSWEA members attending the Annual Business Meeting at the 81st Annual Meeting will have the opportunity to elect an outstanding slate of nominees to critical leadership roles. The nominees include Jim Miller (MN) for 2nd Vice President, Scott Trotter (IL) for WEF Delegate 2011, Carol Strackbein (WI) for Treasurer, and as previously mentioned Rachel Lee (WI) for Young Professional Representative (if approved). Each of the

nominees has been proven leaders in their various past roles at the committee, Section or CSWEA level and deserve your consideration. Each of the nominees is a pacesetter, a person who leads rather than follows and each has a strong track record of getting things done. They will be outstanding members of the Executive Committee and will help ensure that our Association remains a top WEF Member Association. [CS](#)

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# Midwest Water Industry Expo

By Dan Lynch and Dan Duchniak

The 3rd Annual Midwest Water Industry Expo is now in the books and once again was a complete success. We continue to grow in attendance and also completely sold out of all vendor space. We expect to continue to grow this event and improve on it for next year. If you were not there you missed a great experience, so plan on coming next year. You won't regret it.

The expo was enjoyed by both the attendees and the exhibitors who found the experience to be very productive and valuable. Everyone left looking forward

to next year. This year's emphasis was on improving the vendor talk sessions and generating more traffic throughout the exhibit hall. The expo is intended to be a means to bring utility personnel (or anyone in this profession) into contact with equipment suppliers and manufacturers to promote the free exchange of information. Essentially our goal is to bring a quality water and wastewater exposition to the upper Midwest so operators and others can see equipment that they would not normally have a chance to see.

The expo is the exhibitors' opportunity to present their goods and services to their customers and potential customers early in the year when purchases are being considered and to provide the opportunity for open dialogue with the vendors for awareness of upcoming projects and Utility needs. The 3rd Annual Midwest Water Industry Expo has accomplished what it set out to do.

So besides the numerous comments from vendors and attendees alike that the expo was a hit, here are some facts. The 3rd Annual Expo:





“The expo is intended to be a means to bring utility personnel into contact with equipment suppliers and manufacturers to promote the free exchange of information.”



- Held a fundraising raffle that gave away well over \$5,000 in prizes including two 32-inch flat screen televisions, an auto GPS system and many other cool prizes.
- Will donate the raffle proceeds, of over \$2,300, to Water for People and Wisconsin Water for the World on behalf of Central States and WWA.
- Completely sold out of exhibit space.
- This year's good weather allowed for 75 walk-up registrations.
- Held 32 half-hour vendor presentations where vendors could talk specifically about the products they represent.

With those statistics, planning has already begun for next year's expo. There are many who make this event a success and many thanks to those who helped make the expo a success. Thanks to the vendors who exhibited. These companies put a lot of time and money into events like these and that effort is appreciated by all. We are very appreciative of everyone who exhibited and hope many more will join us next year. The expo could not have been called a success without the large number of operators and other water professionals who attended. We had a diverse attendee list that

included individuals from Wisconsin, Illinois, Minnesota, and Iowa. Finally, the Expo Committee, with a lot of help from WWA's Membership Services Coordinator, Jill Duchniak and Mulcahy/Shaw's Kristina Glocke, did a tremendous job of pulling everything together. Putting on a show like this requires a committee of volunteers and we would like to thank all of those involved, it is a tribute to the membership of both organizations. Thank you to everyone who came and we hope to see you next year. Please contact either Dan if you would like to help with the Expo Committee. CS

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# CSWEA's 81st Annual Meeting

Sheraton South Hotel, Bloomington, MN

May 19-22, 2008



Photos courtesy Bloomington, MN CVB

## Message from the President

Welcome to the 81st Annual Meeting of the Central States Water Environment Association. We decided to return to the twin cities area this year after several years in out-state locations. You will find the location convenient, as it is only about 10 minutes west of the airport and the Mall of America. The facilities will also be an excellent venue for us. Everything at the Sheraton is under one roof and on the same floor.

The Local Arrangements Committee, under the leadership of Doug Henrichsen, and the Technical Program Committee, under the leadership of Jason Benson, has been working very hard to organize a top-notch educational program. And Patti Craddock has scoped out some fun after-hours entertainment activities for us.

The exhibits will be a focused one-day event this year. We will be doing the five-minute vendor talks again this year, following the success last year at Madison. See Kevin Regan, the exhibits chair, with any related questions. There will again be the Water for People silent auction in the exhibit hall. All exhibitors, consultants and individuals are strongly encouraged to donate an item to the silent auction.

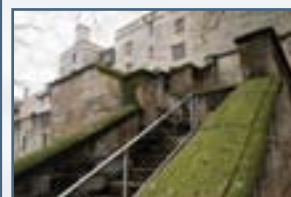
Recreational options will include the golf tournament, fun run or a bike ride. Please enjoy one of these.

On Thursday, following the Farewell Breakfast, there will be an optional tour of the Metro Plant in St. Paul. If you plan to attend this, due to security reasons, you will need to provide your name and birth date in advance.

If you can, please bring a new associate or young professional to this event and introduce them to our great organization and the work we do to protect the water environment.

See you there.

Dennis Lindeke  
President, CSWEA





# Conference Highlights

## Monday, May 19

### **Golf Outing** 11:00 a.m. to 5:00 p.m.

Braemar Golf Club, 6364 John Harris Drive, Edina, MN 55439. Phone: (952) 826-6799. [www.braemargolf.com](http://www.braemargolf.com). Conveniently located about two miles west of the Sheraton near the intersection of Interstate 494 and Highway 169. Braemar Golf Course has been rated among the top 75 public golf courses in the nation by *Golf Digest* and has also been named by *Golf for Women Magazine* as one of its top 100 Women Friendly Courses. Braemar has hosted numerous state and national amateur tournaments and championships. In addition, the course hosted the last regular PGA tour stop event. Registration begins at 10:30 a.m. Lunch will be served at 11:00 a.m. Start at noon with 18-hole scramble format. Registration (\$95/player) includes prizes, half golf cart and lunch.



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### **Meet & Greet** 6:00 p.m. to 10:00 p.m.

Renew old friendships and meet new faces on Monday night in the Garden Court at the Sheraton South Hotel. Refreshments and light snacks will be provided and awards for the Golf Outing will be announced. Following the event, several companies are anticipated to be hosting hospitality suites in one of the Cabana Rooms near the Garden Court.

## Tuesday, May 20

### **5K Walk/Run** 7:00 a.m. to 8:45 a.m.

A pleasant way to start your conference. Encounter mature woodlands, breathtaking prairie and beautiful lakes as you follow a well-marked route through Hyland Lake Park Reserve. Prizes for the fastest two times and closest to the estimated time will be awarded. Treats at the finish line.

### **Opening Session** 9:00 a.m. to 10:00 a.m.

#### **Welcome Address** 9:00 -9:05

#### **Keynote Address "Future of Nutrients"** 9:05 -10:00

by Dr. James Barnard, Black & Veatch

Dr. Barnard is a pioneer in the development of the biological phosphorus removal process, which is now in standard use worldwide. He will be discussing the future of nutrient removal and the concept of nutrients as a diminishing resource.

### **Spouse/Guest Program** 8:00 a.m. to 10:00 a.m.

A hospitality room will be located at the Sheraton South Hotel. Continental Breakfast will be available from 8:00 - 10:00 each morning. Free shuttle service to the Mall of America will also be provided from the Sheraton.

### **Technical Sessions** 10:15 a.m. to 11:45 a.m. (No afternoon sessions)

There will be three concurrent technical sessions (A, B & C) in the Bloomington, Veranda East & West rooms in the morning. Technical sessions will not be offered in the afternoon to allow vendors to exhibit their equipment without competition.

### **Exhibits/Sponsors** 12:00 p.m. to 5:00 p.m.

Exhibits showcasing the latest technology in wastewater collection, treatment and monitoring equipment and other related services will be on display. Vendor talks will be scheduled during the day, see schedule as posted.

**Lunch** 12:00 p.m. to 1:00 p.m. will be provided for all conference participants in the exhibit hall.

**Exhibits** 1:00 p.m. to 5:00 p.m. Exhibits will be provided by several companies along with 12 special vendor talks.

**Exhibitor/Sponsor Reception** 4:00 p.m. to 5:00 p.m. Snacks & beverages will be provided.

### **Tuesday Night Social Event** 6:30 p.m. to 9:00 p.m. BBQ and Blues in the Park

The Tuesday night social event will be held at East Bush Lake Park located about two miles south of the Sheraton. Buses will be provided for transporting you to the park from the Sheraton and back again, and will be cycled about every 20 minutes.



While you eat you will be entertained by a local blues band, the Guzzlers. Following the event, several companies are anticipated to be hosting hospitality suites in one of the Cabana Rooms near the Garden Court of the Sheraton.

## Wednesday, May 21

### State Section Meetings 7:30 a.m. to 8:45 a.m.

Please come to your respective state section meetings that will be conducted in either the Atrium 7, 8 or Edina Rooms of the Sheraton South Hotel. A buffet breakfast will be served. Find out what your state section and committees are doing and how you can be involved. We welcome new faces and new ideas, so all CSWEA members are encouraged to attend.

### Technical Sessions 9:00 to 11:45 a.m./1:45 to 4:00 p.m.

There will be three concurrent technical sessions (D, E & F) in the morning; and three concurrent technical sessions (G, H & I) in the afternoon; in the Bloomington, Veranda East & West rooms.

### Spouse/Guest Program 8:00 a.m. to 10:00 a.m.

A hospitality room will be located at the Sheraton South Hotel. Continental Breakfast will be available from 8:00 - 10:00 each morning. Free shuttle service to the Mall of America will also be provided from the Sheraton.

### CSWEA Association Luncheon 12:00 p.m. to 1:30 p.m.

Mr. Chuck Weir, Treasurer for the Water Environment Federation (WEF), a technical, scientific, and educational water quality organization headquartered in Alexandria, Virginia, will be the guest speaker. Following the WEF comments, there will be the Golden Manhole Award Induction ceremony and the induction of the new 7Ss. Applaud these members as they come up front to recognize their worthiness of belonging to these prestigious and select groups. The luncheon will conclude with introduction of the 2007 Operation Challenge teams.

### CSWEA Annual Business Meeting 4:10 p.m. to 5:00 p.m.

The Annual Business Meeting will be held on Wednesday beginning at 4:10 p.m. Business meeting includes the association, section and committee reports.

### Annual Awards Banquet & Evening Entertainment 6:00 p.m. to 10:00 p.m.

Please join us for the Annual Awards Banquet & Entertainment. Social hour begins at 6:00 p.m., followed by Dinner being served at 7:00 p.m. Awards will be presented after dinner. Immediately after dinner, hang around for entertainment by ComedySportz. You can run but you can't hide from the ridicule.

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## Thursday, May 22

**Farewell Breakfast** 8:30 a.m. to 10:30 a.m.



**Farewell Breakfast Speaker** – Paul Douglas, Meteorologist with WCCO will be speaking. Mr. Douglas is a top local TV and radio meteorologist and author. He will be speaking on the topic of climate change and the effect on the water environment.

**Treatment Plant Tour** 10:30 a.m. to 12:00 p.m.

The staff of the Metropolitan Council Environmental Services (MCES) invite you to attend a tour of the Metropolitan (Metro) WWTP in St. Paul, the largest of their eight (8) treatment facilities. The Metro plant has a rated capacity of 250 mgd and is also currently the largest biological phosphorus removal (BPR) plant in the world. Recent improvements to the plant



have included headworks renovations, conversion of the liquid treatment process to BPR, implementation of new sludge incineration facilities, odor control improvements, and other miscellaneous improvements. Travel to the Metro plant is on your own. Because of the recent emphasis on security, you will need to provide your name and birth date information to register a minimum of 24 hours before the plant tour. So, please stop by the registration desk at the conference to register for the tour, as last-minute registrations cannot be accommodated for security reasons. Additional information and maps to the plant will be available at the registration desk.

## Special Events – Exhibit Area

### Vendor Talks

Twelve vendors will have the opportunity to put on a five-minute presentation at their booth to a group of conference attendees. Each attendee will be given one door prize raffle ticket for each presentation they attend. The door prize will be a flat screen TV, which will be drawn at approximately 4:30 p.m. on Tuesday (you must be present to win). Check the daily presentation schedule posted at the exhibit area entrance for current presentations. There will also be smaller door prizes randomly awarded to attendees in the exhibit hall.

### Water for People Silent Auction

This year, auction items donated by exhibitors and individuals will be displayed at the exhibitor's booth entitled "Water for People – Silent Auction". A master list of auction items, exhibitor's name, and booth number will be displayed in the exhibit area too. There is still time to donate an item. Interested in donating? Contact Kevin Regan at 651-777-4041. Items donated after May 9 will not be listed on the master list displayed at the conference.

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# 81st Annual Meeting **Keynote Speaker** **James L. Barnard** Ph.D., Pr. Eng., BCEE



For over 40 years, Dr. James L. Barnard has traveled the world researching and implementing better ways to conserve water resources and improve wastewater treatment. His groundbreaking application of bacteria to remove both nitrogen and phosphorus from water revolutionized wastewater treatment processes, allowing treatment plants to employ Barnard's

biological nutrient removal (BNR) as a more economic and environmentally friendly alternative to traditional chemical treatment. By enabling nutrient removal with a natural biological process, BNR makes it possible to return treated wastewater to receiving waters with minimal detrimental impact to environmental quality.

Deemed "the Father of BNR," Barnard not only created the process, but also actively designs and supervises the

construction and start-up of BNR systems in various parts of the world, constantly adapting his innovative technology to varying climates, existing infrastructure, and environmental pressures. Another of Barnard's most notable achievements includes his 10-year service on the Nitrogen Technical Advisory Panel for the New York City Department of Environmental Protection, where he helped guide a \$50 million BNR research and development program for the Upper East River and Jamaica Bay areas.

Barnard received a Ph.D. in Environmental Engineering and Water Resources from Vanderbilt University in Tennessee, an M.S. in Environmental Health Engineering from the University of Texas at Austin, and a B.Sc. in Engineering from the University of Pretoria in South Africa, and both a B.Sc. and B.Eng. in Civil Engineering from the University of Stellenbosch in South Africa. At present, he serves as a Global Practice and Technology Leader for Advanced Biological Treatment at Black & Veatch Corporation in Kansas City, Missouri.

In his keynote address, Dr. Barnard will discuss the future of nutrient removal and the concept of nutrients as a diminishing resource.

**Tuesday, May 20 9:05 - 10:00 a.m.**

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# Charles V. Weir to Visit CSWEA's Annual Meeting



**Charles V. Weir** the 2007-2008 Treasurer of the Water Environment Federation (WEF) will be the official WEF visitor at CSWEA's 81st Annual Meeting. Please be sure to say hi to Chuck and share your thoughts on WEF and its impact on our profession.

He is currently General Manager of East Bay Dischargers Authority, a joint-powers public agency that provides wastewater treatment and disposal services to southern and eastern Alameda County, located on the east side of San Francisco Bay, Calif.

With more than 30 years' experience in the operation, maintenance and management of wastewater treatment systems, Chuck has also held positions with the City of Sunnyvale, Calif., State Water Resources Control Board, and the City of Riverside, Calif.

A WEF member since 1973, he has been a member of the

Board of Trustees, House of Delegates and served as vice chair and chair of the Long Range Planning Committee. Chuck has also been a member of the Government Affairs Committee, the Awards, & Technical Practices Committee, presented papers at WEFTEC, and served as editor of WEF's MOP OM-10, Activated Sludge manual.

In addition, he has also been an active member of the California Water Environment Association (CWEA) serving as president, treasurer, board member and chair of several CWEA committees including long range planning and operator training and technical certification.

A recipient of several WEF awards, including the prestigious WEF Service Award (1992 and 2000), Quarter Century Operators' Club (1999), Outgoing Director Award (2004), Arthur Sidney Bedell Award (2004), and Past Chair Award from the Long Range Planning Committee (2005), Chuck is a member of the Select Society of Sanitary Sludge Shovelers. A Grade V Wastewater Treatment Plant Operator in California, he has a B.S. in chemistry and biochemistry from the University of California and is a credentialed California Community College instructor.



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# Technical Program

## Tuesday, May 20

### Technical Session A: Renewable Resources

Moderator: **Pavel Hajda**

- 10:15-10:45 Upper Midwest Municipality Turns to Wastewater Reuse to Supply Ethanol Plant  
Eric Dodds/AE2S, Bruce Grubb/City of Fargo
- 10:45-11:15 Application of Six Sigma Approach for Developing a Clean-In-Place Process with an Ultrafiltration Membrane System in a Wastewater Reuse Project  
Clay Watson/Gold'n Plump
- 11:15-11:45 The Implementation of Biogas Treatment Technologies to Meet Natural Gas Pipeline Quality Standards  
Bob Peplin/Sebesta Blomberg

### Technical Session B: Instrumentation and Control

Moderator: **Beth Vogt**

- 10:15-10:45 Realizing the Full Value of Your Automation, Instrumentation, and Process Controls  
Robert Bianchi/EMA
- 10:45-11:15 Implementing an Integrated Electronic Operations and Maintenance Information System for a Water and Wastewater Utility  
David Arnott/Ruekert Mielke
- 11:15-11:45 Web-Hosted SCADA: Open Architecture Solution Provides Full Automation and Control Benefits While Lowering Capital and Operating Expenses and Headaches  
Chris Cole/Healy-Ruff Co.

### Technical Session C: Design

Moderator: **Steve Reusser**

- 10:15-10:45 Planning and Implementation of a Treatment Plant Expansion and Upgrade to Meet the Needs of the City of Rochester, Minnesota  
John Glatzmaier/CH2M HILL
- 10:45-11:15 Innovative Project Approaches Using 3D Design  
Scott Fronek/Black & Veatch, Carol Mordorski/MCES
- 11:15-11:45 How Design Decisions Can Significantly Impact Your Pumping Energy Costs  
Ned Paschke/University of Wisconsin-Madison

No Technical Sessions will be held Tuesday afternoon during the Exhibition time.

## Wednesday, May 21

### Technical Session D: Sludge Processing

Moderator: **Scott Fronek**

- 9:00-9:30 Focused-Pulsed Treatment of Waste Activated Sludge: Application of Biosolids Reduction and Increased Membrane Production  
James Banaszak/OpenCEL
- 9:30-10:00 Thick Stillage for Enhanced Membrane Production in Existing Anaerobic Digestion  
Patrick Rein/Rein & Associates
- 10:00-10:30 Full Scale Application of Novel Sludge Ozonation Process for Achieving Up to 80% Excess Sludge Reduction at a 25,000 m<sup>3</sup>/day Municipal Wastewater Treatment Plant  
Malcolm Fabiyi/Praxair, Inc.
- 10:30-10:45 **Break**
- 10:45-11:15 An Energy Efficient ATAD Process  
Roger Gyger/Mixing and Mass Transfer Technologies
- 11:15-11:45 Anaerobic Digestion: Application of New Multi-Stage Digestion Technologies  
Jay Kemp/Earth Tech

### Technical Session E: Collection Systems I

Moderator: **William Boyle**

- 9:00-9:30 The Final Frontier for I/I Removal  
Richard Nelson/CH2M HILL
- 9:30-10:00 Standardized Approach to Pipe Inspection and Assessment  
John Nelson/Visu-Sewer
- 10:00-10:30 Marine Manhole Rehabilitation is Out of Sight  
Thomas Kispert/McMahon Associates, Inc.
- 10:30-10:45 **Break**
- 10:45-11:15 Milwaukee Metropolitan Sewerage District Inline Storage System Expansion  
David Bennett/Brown & Caldwell
- 11:15-11:45 Sanitary Sewer Overflows: Big Prevention in a Small Footprint  
Craig Schuenemann/Earth Tech

### Technical Session F: Nutrient Removal

Moderator: **Beth Vogt**

- 9:00-9:30 Phosphorus and Nitrogen Control: Where We are Going and How to Get There  
Steve Arant/Earth Tech
- 9:30-10:00 A Comparative Review of Biological Phosphorus Removal (BPR) Wastewater Treatment Technologies Used in Minnesota  
John Friel/Barr Engineering Corp.
- 10:00-10:30 Transition for Pure Oxygen Activated Sludge Treatment to Nitrifying Activated Sludge System  
Vernon Witthuhn/Strand Associates, Inc.
- 10:30-10:45 **Break**



- 10:45-11:15 Taking the Mystery Out of Troubleshooting an Enhanced Biological Phosphorus Removal System  
Troy Stinson/Strand Associates, Inc.
- 11:15-11:45 Effect of Varying Flows on Biological Nutrient Removal  
KC Upendrakumar/CDM

### Technical Session G: Collection Systems II

- Moderator: **Tim Keegan**
- 1:45-2:15 CMOM – Tim Keegan, Brown & Caldwell
- 2:15-2:45 FOG – Todd Carlson, City of Duluth
- 2:45-3:00 Break
- 3:00-3:30 I/I – Alva Rankin, SEH
- 3:30-4:00 Zero Backup Maintenance Program – Tom Fournier

### Technical Session H: Regulatory

- Moderator: **Scott Fronek**
- 1:45-2:15 What Do We Do When Designated Uses Are Not Attainable? The Kokomo Use Attainability Analysis (UAA) for Bacteria  
Jane Carlson/Strand Associates, Inc.
- 2:15-2:45 Betting Against Stringency Mismatches in Water Quality Standards and Effluent Limits  
Pavel Hajda/Baxter & Woodman, Inc.

- 2:45-3:00 Break
- 3:00-3:30 Comprehensive Emission Testing for Low Level Toxics Conducted at a Municipal Biosolids Incinerator Facility  
Daniel Busch/Green Bay Metropolitan Sewerage District
- 3:30-4:00 Addressing Nonpoint Nutrient Loadings Through Community Manure Management – A Feasibility Study in Dane County Wisconsin  
Rachel Lee/Strand Associates, Inc.

### Technical Session I:

#### Student Competition Winners Presentations

- Moderator: **Dan Busch**
- 1:45-2:15 Speaker 1 (Will be listed in the pocket Conference Schedule)
- 2:15-2:45 Speaker 2 (Will be listed in the pocket Conference Schedule)
- 2:45-3:00 Break
- 3:00-3:30 Speaker 3 (Will be listed in the pocket Conference Schedule)
- 3:30-4:00 Speaker 4 (Will be listed in the pocket Conference Schedule)



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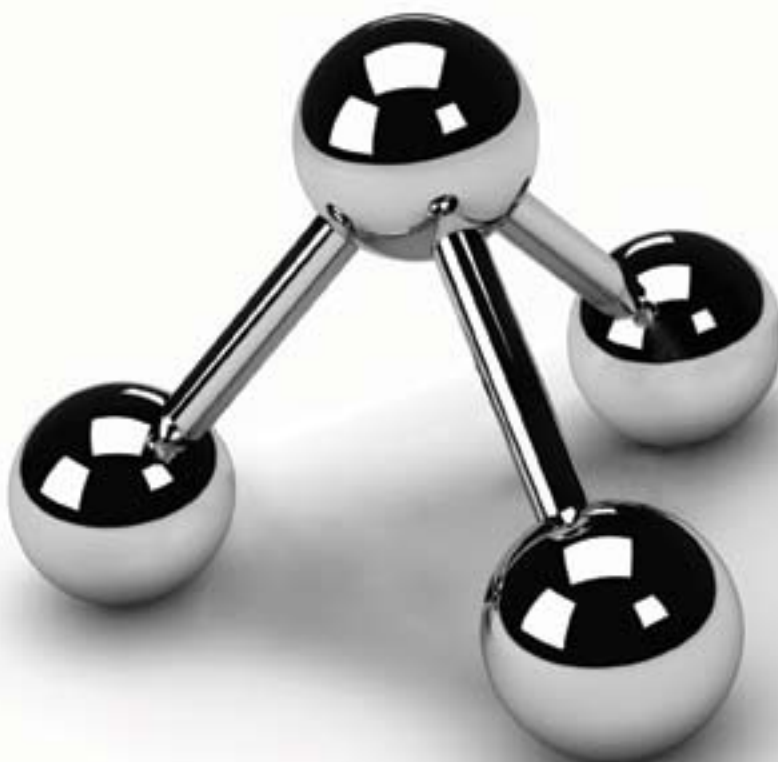
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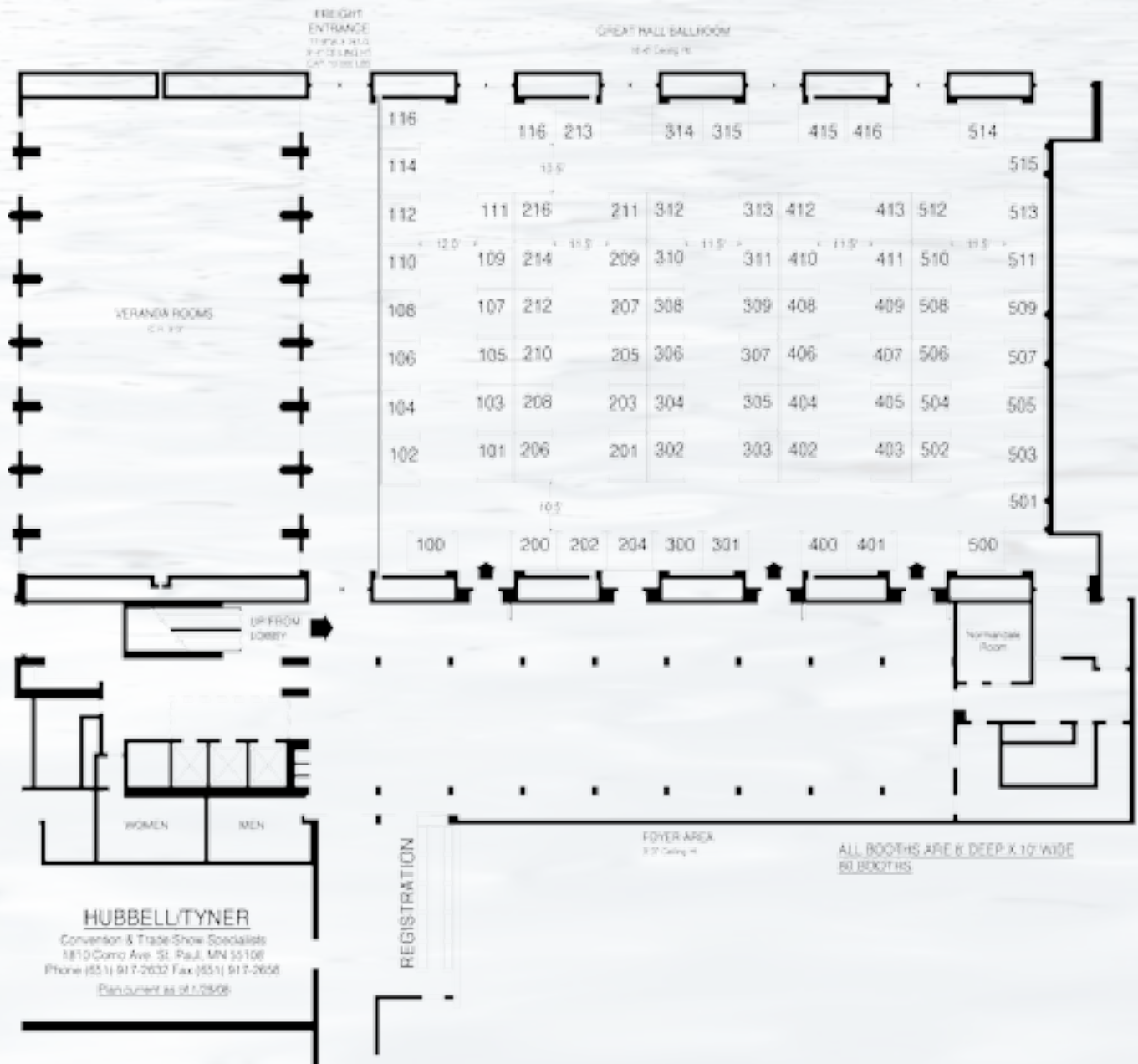
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Jerry Myers, Regional Manager

# Young Professional News

By Rachel Lee

Recently the CSWEA Wisconsin Section Young Professionals Group had their first event of the year. On January 31, 17 young and seasoned professionals braved snowy conditions for the Aeration and Process Theory Workshop held at ITT – Sanitaire in Brown Deer, WI. This was an excellent opportunity for YPs to meet fellow local professionals in the industry and also learn about aeration and activated sludge process. During the two-hour session topics such as fine and coarse bubble aeration, nitrification, and calculating oxygen demand were discussed as well as a general overview of the complete activated sludge process. The event was also attended by the 2007 WWEMA (Water and Wastewater Equipment Manufacturers Association) Chairman, Ken George, who opened the meeting

and welcomed the attendees. Despite the weather everyone had a good time networking, eating dinner, and learning about activated sludge wastewater treatment.

We would like to extend a big thank-you to the presenters Jessica Noegel, Paul Schuette, and Scott Mulinix from ITT – Sanitaire and to Rachel Lee from Strand for organizing and advertising for the event. ITT – Sanitaire has been designing and manufacturing SANITAIRE Aeration Systems and ABJ SBRs for the municipal and industrial waste treatment industries since 1967. Sanitaire products have been sold to more than 4,000 communities and industries through a worldwide network of sales and technical representatives.

This was the first Young Professionals event since the August outing to a Milwaukee Brewers game. Look for

future YP events in the upcoming months including the YP Meet & Greet on April 1 and YPX on July 18. The YP Meet & Greet will be after CSWEA's 13th Annual Education Seminar in Madison, WI and will provide a great opportunity for YPs to network and develop professional and mentor relationships with others in the industry. The YP Exchange (YPX) will be a one-day workshop at the Kalahari Resort in Wisconsin Dells to provide a forum for communication among YPs in the region and foster active membership in the organization.

The Wisconsin YP Group is rapidly expanding is looking for new members. If you or someone you know is interested in attending an event or becoming a YP member please contact Rachel Lee at [rachel.lee@strand.com](mailto:rachel.lee@strand.com) or any of the CSWEA-WI board members. CS



Attendees Phil Bzdusek and Trevor Ghylin commented that the workshop was well done and that they learned a few new things about aeration.



Kelly Olson and Kate Ziino enjoy a light moment at the workshop.



Paul Schuette discusses the difference between coarse and fine bubble aeration.

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# Save the date: CSWEA CSX & YPX '08

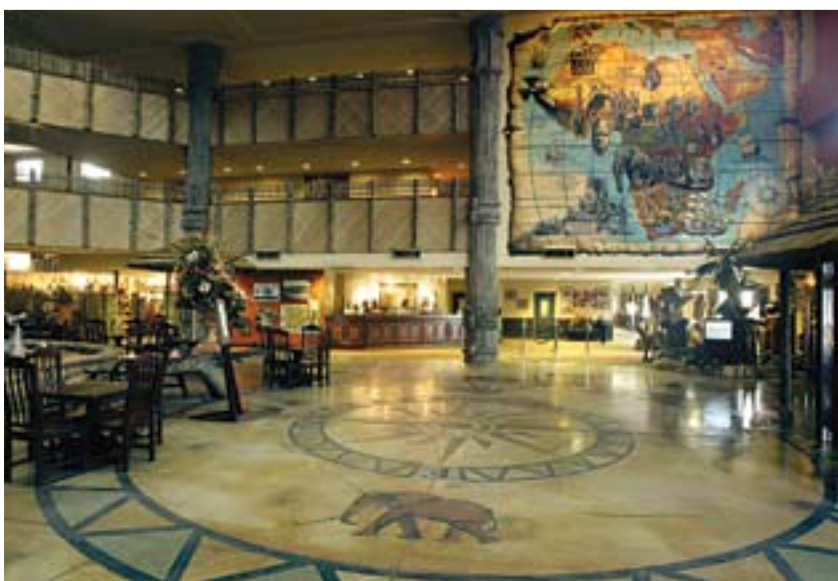
## July 18 & 19, 2008

The 2008 CSWEA Committee and Section Exchange, and Young Professional Exchange is scheduled for July 18 & 19, 2008 at the Kalahari Resort and Conference Center, in the Wisconsin Dells, WI. CSWEA leaders, including section and association committee members, chairs, state section officers and CSWEA officers, as well as interested members are invited to attend this two-day brainstorming sessions conducted in a casual and comfortable setting. Several highly successful initiatives were conceived during past CSXs and this event has become a not-to-miss event on our leadership calendar. The event begins at noon on Thursday, with a deli lunch and recesses to a family pizza party with all invited. Plenty of social time provides for interaction and informal discussions and the exchange of ideas between committee members from each of the state sections or other committees, resulting and the development of even more great ideas. The best part is you can bring the family so they can play in the water park and join in on the pizza party, for a mini-vacation while dad or mom participates in the CSX.

This year, CSWEA will also be hosting a Young Professionals Summit (YPX) on Friday, July 19, 2008, at

the Kalahari Resort in Wisconsin Dells. All young professionals in the water and wastewater fields are encouraged to attend. The program will focus on building skills that are useful for working with teams, improving communications, and leading projects. The day-long event will include lunch and a networking happy hour afterwards with CSWEA member association and section leaders. More details

about the event will be available on the S&YP page of the CSWEA website in the coming months. We hope to see you there! CS



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# One for All and All for One

By Gary B. Scott, CPM, M,  
Illinois Section Safety Chair,  
WEF Safety & Occupational Health Committee Liaison

A silhouette of a person jumping from a wooden dock into a body of water at sunset. The sun is low on the horizon, creating a warm, golden glow. The person's arms are outstretched, and their legs are bent in mid-air. The dock has two metal handrails. The water reflects the sunset light.

**R**ecently I was thinking about all the different types of professions, people, equipment, and energy it takes to protect our water environment. While thinking and planning for your upcoming spring and summer enjoyment, whether fishing knee-deep in your favorite stream, playing golf at your local course, sunning on the beach, or zipping up and down a lake in your ski boat, do you feel wonder and satisfaction in the impact your profession is having on the environment?



Many communities across CSWEA operate and maintain wastewater treatment facilities that serve to protect our environment, and discharge to water bodies that we all enjoy throughout the year. In conjunction with the operation of these facilities, CSWEA members work with federal and state agencies to monitor and modify regulations and standards that our facilities must meet. We have a large responsibility to provide self-enforcement ensuring that the standards developed are met. As many communities know, those standards are not static; they continue to evolve and change as we learn more about our environment and how our activities impact the environment around us.

Periodically, communities must make changes and improvements to their treatment systems to continually comply with these changing standards, or respond to our communities' needs. Oftentimes a change will be a simple operational correction to limit local odors, or to take advantage of efficiencies built into our systems. Another type of change might be the capital replacement of a single piece of equipment with some newer technology, something more biologically or mechanically efficient, or which handles a larger capacity. And oftentimes it is even necessary to construct new process units or expand facilities to meet growth demands and newly promulgated standards.

Each change is made to improve the product being returned to the streams, lakes, and sometimes lawns for the enjoyment of our communities: permitted effluent water. To meet these standards, many different people and professions are assembled together to form a team to achieve this common goal. Our operators and maintainers are the frontline warriors in our treatment systems and ensure they are operating smoothly and effectively. Daily, these teams check the system's biologic operation and complete maintenance operations to keep these systems running at optimal effectiveness, work to extend the life of the systems, and keep our facilities looking more like parks than industrial waste facilities with little expectation of notoriety.

While village boards, city councils, and treatment facility managers are generally charged with being the fiscal managers of the system, these teams of unsung heroes provide the first line of defense against the outbreak of disease, health of ecologic systems, and achievement of water

standards which allow for a great part of our spring and summer outdoor enjoyment experiences.



Scientists and laboratory technicians are necessary to provide the data to show us how we are doing and where we need to improve. They are our probes and sensors reporting how these systems are performing. Engineers aid in analyzing, designing, and improving biologic and infrastructure systems so that permit standards can be consistently achieved. And we cannot forget the contractors, suppliers, and manufacturers who bring reality to many of the visions cast for improvements to our



collection and treatment systems.

Each of these people has a vital role in the process of protecting and sustaining the environment for the benefit and enjoyment of all. Much like spokes on a wheel, each has a single critical mission without which the system would become unbalanced and unable to function properly. So the next time you are out enjoying the environment, stop and pause for a minute to reflect and give thanks for all those who work with you in this great profession from top to bottom. And, the next time you face a challenging period in your system, remember we are all in this together. **CS**

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# A Natural Solution

## Catching Rain in Visivan Village, Guatemala

By David Stevenson Photos by Tim Ryan

**In the midst** of a light but constant sheet of rain, two young smiling Mayan girls stand in the middle of the schoolyard. One in a red coat, the other in pink, both wearing rich, hand-woven skirts that stop just above their ankles. Leaning toward each other, hands joined, they form a bridge for all the pushing, squealing smaller children to squirm playfully through below. Off to the side two young boys play tag, slipping and sliding as they shift directions in the mud.

Nearby the rain falls on the corrugated tin roof of their schoolhouse, rolls down into a gutter that collects and funnels it into a pipe that gravity feeds it into the cistern that sits below by the school building. Filled, the cistern holds more than 500 gallons of water that can be used for drinking and washing children's muddy hands, as well.

Here in the small village of Visivan, rain is an almost daily reality. The village is situated high in the mountains, 11,500 feet above sea level, and receives more than 100 inches of rain per year. But before the recently completed Water For People-supported rain catchment project (and associated cisterns), when the rains came, the waters were lost, rolling freely down the mountainside.

To meet family needs for drinking, washing clothes, dishes, and bathing, villagers often walked 20 to 30 minutes each way carrying heavy jugs of water gathered from natural springs. These trips might be made as many as five times a day. Unfortunately, the water they collected was often unsafe and carried microbiological contaminants that could cause diarrhea and other debilitating, and even deadly, diseases.

### Searching for a solution

Mayan people have populated the rich, rugged mountains and valleys of the Cuchumantes Mountains in Guatemala's Western Highlands for centuries. Like the rains, disease and death were felt to be natural as well – until last year. That's when the village leaders contacted Water For People partner Aqua Para la Salud (a local NGO) to support them in pursuing a practical, affordable solution to help meet Visivan's water needs.

Various political candidates had promised the people of Visivan a water system for years, but a lack of groundwater and uncooperative landowners unwilling to sell or share their springs meant the promises never came true. Following a study, it was

determined rainwater catchment tanks would be the most effective technology for the community.

The rain catchment solution was as natural as it was simple. It involved attaching PVC gutters to the roofs of individual homes (and the school) to catch rainwater during the rainy months. A PVC pipe was attached to the gutter to feed the rainwater to a closed concrete cistern that was constructed next to each house. The cistern could hold up to 530 gallons of water and would have one or more faucets.

The rain catchment solution provides a plentiful, convenient supply of water during the long rainy season and helps bridge supply needs during the dry months. As a precaution, villagers are encouraged to boil collected rain water for drinking and cooking to ensure its safety. The rain catchment solution reduces the community's reliance on unsafe, remote water sources and enables villagers to concentrate on more productive endeavors.

### Building it together

Together the community and Aqua Para la Salud representatives developed a project proposal. The proposal included a work plan that identified how com-



A natural solution: the rain flows down the roof, is captured in a gutter and flows through a pipe into a cistern near each house.



Water for washing clothes, washing hands, cooking and drinking is close at hand, giving villagers more time for family, work, school, and play.



A natural part of Visivan village life—playground giggles, games, and rain.



*Washing Hands – Visivan children take the hygiene education portion of the project to heart.*

munity members would be involved, what contribution they could provide, and how the community would help maintain the system once installed. Aqua Para la Salud would provide technical assistance, materials, hygiene education training, and skilled labor. Visivan residents were to provide additional local materials, construction labor, and participate in hygiene education training. Water For People was contacted and agreed to help fund the project and assist with its implementation.

The project began January 3, 2007, and was completed May 4, 2007. Aqua Para la Salud masons began by training various Visivan residents to help train other village participants. Each homeowner was involved in the construction of their rain catchment gutters, pipes, and cisterns. Everyone pitched in – including the children – to complete the rain catch-

ment system for the school.

It was a project begun and completed together with the goal of creating a safe water supply for all. The end result was a stronger community.

### Rain catchment and more

Now, all 31 families and the school have a convenient water source at their fingertips all year long. This means that families such as that of Juan Ramirez, a teacher in the school, his wife Catarina de Paz Matom, and their four children can spend more time together. The rain catchment system frees Juan up to spend more time planting corn, black beans, and vegetables in his garden for his family. Catarina can focus more on her weaving and caring for the children. And the children are free to go to school – and play and laugh as much as they wish.

The hygiene education program helped school children learn the importance of hand washing, and how and when to wash their hands effectively. The hygiene component was important for teaching villagers the basic steps (boiling, solar disinfection) to follow during dry season, when the cisterns run low, to ensure the water they gather from other sources is clean and safe as well. Families learned the importance of household cleaning, dishwashing, and personal hygiene. Additionally, they learned more about sanitation, various common diseases, and how to recognize them.

With less time spent gathering water and armed with more knowledge about hygiene, families are spending less money

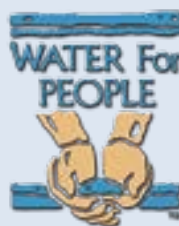
on healthcare and more on food, education, and clothing.

### All the difference

The Visivan rain catchment project is about more than year-round access to clean water. It's about empowering a community and responding to people's desire to meet their own water needs in a way that fits their particular situation. Community members participated in the process, which gave them ownership and the ability to sustain their system for the long term. Additionally, the hygiene education component helped inform the whole community and changed habits, ensuring good health for generations to come.

We're sure the laughter of little children will continue to echo through these high mountains far into the future. And we know that their simple, natural rain catchment solution will continue to enhance their quality of life.

### About Water For People



Founded in 1991, Water For People is a Denver-based private, nonprofit international development organization that supports

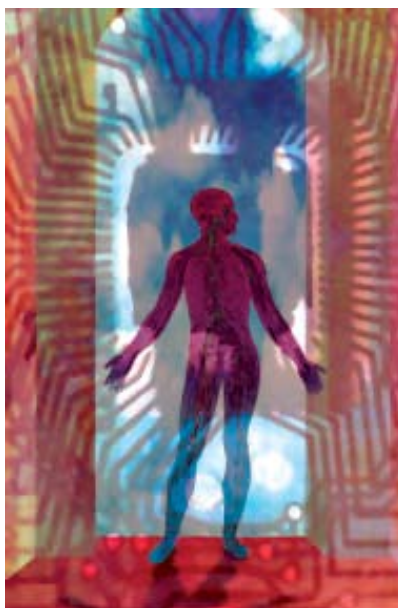
safe drinking water and sanitation projects in developing countries. Water For People partners with communities and other nongovernmental organizations to help people improve their quality of life by supporting sustainable drinking water, sanitation and health and hygiene projects. Water For People supports projects with professional development advice, financial support and volunteer technical services. Typical projects include protected spring-fed community water systems, gravity-fed systems, wells with hand pumps, latrine construction, operator training, and hygiene education. Water For People is currently working in Latin America, Africa and Asia. In 2007, Water For People supported the provision of safe and sustainable drinking water resources and/or sanitation facilities benefiting more than 108,000 people in the developing world. More information is available at [www.waterforpeople.org](http://www.waterforpeople.org).

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# Water For People Increases Impact and Revenues in 2007

Water For People had a record year in 2007, significantly increasing its impact in the developing world. The international development organization supported 188 communities, directly benefiting more than 108,000 people with access to safe water and improved sanitation. Thousands more received hygiene education that will ensure improved health for years to come.

Year-end beneficiary reports from each of Water For People's seven active country programs showed dramatic growth in the number of people and communities served over the course of the year. The organization is on target to meet the ambitious goals set forth in its five-year strategic plan (2007-2011) to reach 1,000 new people per day by 2011.

According to Ned Breslin, Director of International Programs at Water For People, much of the growth can be attributed to a strategic regional focus recently adopted in each program country. "Water For People is targeting county-sized regional areas in each country with the goal of 100 percent water and sanitation coverage within each region," he says. "As a result, we have become much more efficient and have been able to dramatically increase our impact."

In 2007, Water For People announced plans to expand into five new countries by 2011, including Ecuador, Nicaragua, the Dominican Republic, Rwanda, and Uganda. Programs were successfully launched in Ecuador and Nicaragua in 2007 and the organization will begin work in

Rwanda and the Dominican Republic in 2008. Work in Uganda is scheduled to launch in 2009.

The growth in services was matched by an equally impressive increase in donor support in 2007. Water For People 2007 revenues (unaudited) exceeded \$5.2 million against a budget of \$5.1 million, representing more than a 20% increase over 2006. "We are so grateful for the trust and incredible support of our donors who share our vision of a world where no one suffers or dies from a preventable water-related disease," said Colleen Stiles, CEO of Water For People. "Together, we are putting an end to the needless suffering and death that is devastating people in the communities where we are working. We are having a tremendous impact, and we've only just begun." CS

## Water For People 2007 Beneficiaries

Country	Water	Sanitation	Total Number of Beneficiaries
Bolivia	6,741	840	7,581
Guatemala	2,916	2,821	5,737
Honduras	5,138	3,876	9,014
India	41,429	22,788	64,217
Malawi	9,250	11,538	20,788
Nicaragua	143	675	818
Ecuador	300	0	300
<b>TOTAL</b>	<b>65,917</b>	<b>42,538</b>	<b>108,455</b>

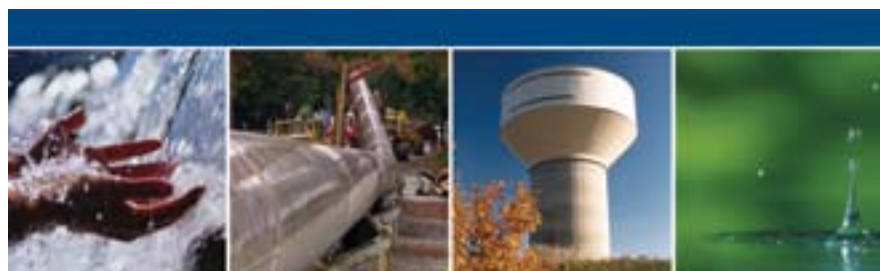
## Communities Served by Year

Year	Communities Served
2007	188
2006	75
2005	78
2004	56
2003	51

David Stevenson is a freelance writer who lives in Denver, Colorado. He has participated in numerous community work projects with the people of the Dominican Republic, Venezuela, and the San Luis Valley in southern Colorado.

Tim Ryan ([www.timryanpictures.com](http://www.timryanpictures.com)) is a freelance photographer/producer/ director with a unique vision inspired by the world around him and people he meets. His photography and video assignments take him to North America, Latin America, Europe, and Africa for corporate, nonprofit, education, travel, outdoor, and editorial clients.

CSWEA is a supporter of Water for People and raised funds through a number of events each year. Be sure to participate in our silent auction at the 81st Annual Meeting.



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# WEF NPDES Seminar

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# Wisconsin Collection System Planning Committee Announces New Format

By Kari L. Dennis, PE

Since 1988 the Collection System Seminar, jointly sponsored by the Wisconsin Section of CSWEA and the Wisconsin Wastewater Operators Association (WWOA), has informed and educated wastewater, storm water, and sanitary district operators, consulting engineers, and others on issues, processes, products, and equipment related to collection systems. The Collection System Planning Committee is pleased to announce that there will be two seminars in 2008. The Inaugural Northwoods Collection System Seminar is scheduled for August 14, 2008, at the Holiday Inn Convention Center in Marshfield, Wisconsin. The Marshfield event will be in addition to the 21st Annual Classic Collection System Seminar that will take place on June 5, 2008 at Turner Hall in Watertown, Wisconsin.

Both seminars will include technical presentations in the morning, a luncheon, and an afternoon vendor demonstration and exhibit session. Registration materials, including seminar topics, will be mailed out in April. Vendors wishing to exhibit or have demonstrations at one or both seminars can download exhibitor information at [www.cswea.org](http://www.cswea.org). Attendee registration information will also be posted online when it is available. CS



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## PARTNER-SHIP AT THE PORT

TWO COMPANIES COLLABORATE  
(TWICE) TO ADDRESS PORT FACILITY PROJECT CONCERNS

*By Steve Akkala*

Moffatt & Nichol (M&N) has been involved with the development of port facilities for more than 60 years and has seen the size of equipment grow. The company faced the task of designing yard improvements for a portion of the backland areas at the Georgia Port Authority's Garden City Terminal. The rehabilitation project required the installation of new highmast lighting and provisions for fiber optic security lines.

### HANDLING THE LOAD

The equipment operating within the project limits consisted of rubber-tired gantry cranes generating loads of more than 100,000 lbs. Maintenance personnel wanted a cover that was easily accessible and met extra heavy-duty loads. M&N had experience at several other port facilities using spring-assisted lids made of various metals. The majority of the spring-assisted covers on the market, however, were being deformed because of heavy wheel loads.

While maintenance department crews enjoyed the spring-assisted lids' accessibility, the deformation from over-loading often caused the vaults to get filled with water and other maintenance issues. Deformation at the corners also posed a tripping hazard. Finding and implementing an easy access cover that was heavy enough to withstand the loads became critical.

### PROBLEM COVERED

M&N asked Neenah Foundry Co. about the development of a lid that would meet load requirements and still provide a spring-assisted opening. M&N selected the 36 x 36-in. spring-assist manholes for the electrical and fiber optic pull boxes associated with making necessary connections at each highmast light pole.

The covers are aircraft-rated and easy to open and latch, and the seal keeps most water out. Field personnel had only good things to say about the new covers.

### TEAMING UP FOR ENGINEERING SUCCESS

This was not the only port facility collaboration between M&N and Neenah. For another port project, M&N asked Neenah to develop an extra heavy-duty trench grate system that would be easily used in a cast-in-place or precast application.

The company needed a system that could retain the grate without any small parts but still be removable for cleaning. There had been instances where standard trench grates' bolts were left out after maintenance work and equipment bounced the grates out of the frame – a dangerous condition that could cause a serious accident.

M&N shared these concerns with Neenah, which answered them with the LiftMate trench grate system. The new frame allowed the system to be fully integrated into the structure of the trench and made it easier for contractors to get the bearing required to accommodate heavy wheel loads associated with moving containerized goods. The new trench grate system retains the frame even if the bolts are removed.

# Effect of Iron Addition on Thermophilic-Mesophilic Anaerobic Digestion

By Jay S. Kemp, P.E., BCEE, Earth Tech, Inc.; Dennis Egge, City of Janesville and Daniel Zitomer, PhD, P.E., Marquette University

## ABSTRACT

Under some conditions, thermophilic anaerobic digesters produce effluent with elevated volatile fatty acids concentration (i.e., >1500 mg/L). The acids can be problematic since they cause odor, represent residual substrate that has not been converted to methane, and can exert a significant BOD<sub>5</sub> when conveyed to an aeration tank via filtrate/centrate from biosolids thickening/dewatering. Therefore, methods to reduce the acids concentration would be helpful. In the work described, the direct addition of ferric chloride to the thermophilic stage of a full-scale temperature-phased anaerobic digestion system correlated with a sharp drop in volatile fatty acids (VFA) concentrations in the digesting biosolids. Addition of a blend of metallic micronutrients, including iron, produced a similar drop in VFA level observed in the pre-design pilot study of the temperature-phased system. Several metals may provide a stimulatory effect to reduce acids concentration. Iron, in the form of ferric chloride also provides struvite deposition control and reduces hydrogen sulfide (H<sub>2</sub>S) in the digester gas. In this paper, the practical benefits of adding iron and other trace nutrients to TPAD systems is described. In addition, the work serves as an example of linking university laboratory studies and full-scale operations to improve biosolids processing.

## BACKGROUND

The City of Janesville, WI Wastewater Utility owns and operates an 18 MGD wastewater treatment facility with screening, grit removal, primary clarifiers, activated sludge with biological phosphorus removal (bio-P), anaerobic

*(Editor's note: This is a summary of the winning Radebaugh Award paper from the 80th Annual Meeting, and the authors will receive their award at the 81st Annual Meeting in Minneapolis. The full paper with figures can be found at [www.CSWEA.org](http://www.CSWEA.org))*

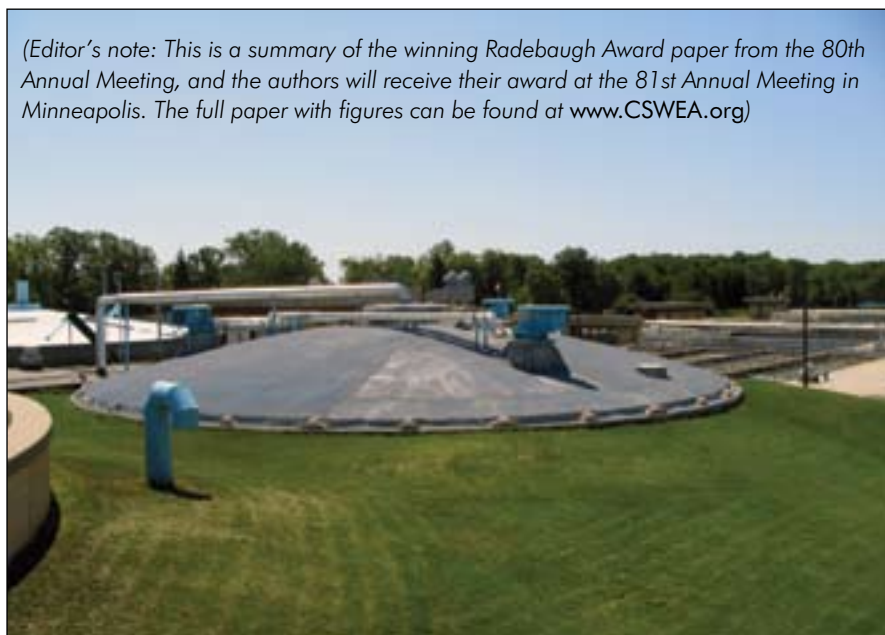


Figure 1 Janesville Thermophilic digester

digestion and centrifuge dewatering. The plant serves a population of over 60,000 along with several significant industrial users.

As part of the rehabilitation and upgrade of the 70-ft-diameter primary anaerobic digester, the city evaluated converting the digester to operate in the thermophilic temperature range (55-60 C). The process includes maintaining the 85-ft diameter tank as a mesophilic digester. The two primary digesters operated in series form a temperature-phased digestion (TPAD) system.

The full-scale thermophilic digester has a volume of 86,200 cu ft. Average raw sludge production is nine dry tons per day. The feed sludge, a blend of primary sludge and thickened waste activated sludge, contains approximately 85 % volatile solids.

The Janesville process has 13 days detention time in the thermophilic digester and approximately 25 days in the mesophilic digester at average sludge loadings. At these detention times the thermophilic digester is providing most of the sludge stabilization and the success of the process depends upon a healthy population of methane-forming bacteria in the thermophilic reactor.

## PILOT PLANT STUDY

To gain more insight into the process performance, a pilot study of the process was conducted by Marquette University. The pilot study was performed to compare mesophilic and temperature phased/staged digesters with identical SRT values side-by-side. An elevated VFA concentration was observed during the testing.



## Pilot plant study methods

TPAD and B-STAD systems were composed of 8-L thermophilic (55°C) and 16-L mesophilic (35°C) units. These were operated in parallel with a 24-L mesophilic digester (see Figure 3). In each system, a 15-day solids retention time (SRT) was maintained by daily wasting/feeding of sludge (4.0% total solids; 81% volatile) composed of a 70/30% v/v blend of primary and thickened waste activated sludge from the Janesville treatment facility. The pH in the thermophilic phase of the TPAD system was initially 6.5 or lower. To increase the pH, feed sludge was supplemented with 4 g/L  $\text{NaHCO}_3$ . During a subsequent operating period, alkalinity addition was discontinued, and feed sludge was supplemented with micronutrients - Fe, Co, Ni, Mo, Mn, I, V, Ca, Cu, Zn, Al, W, B, and Se - in an effort to reduce VFA concentrations and increase pH (Speece, 1996). Data collected after 45 days were deemed to be at quasi-steady state. Solids, pH, fecal coliform, and VFA data were determined by standard methods (Standard Methods, 1998).

## Pilot plant study results and discussion

The effluent VFA concentrations for each digester are presented in Figure 4. The thermophilic digester produced high VFA concentrations, whereas the mesophilic control digester produced the lowest. In addition, the concentrations of long-chain VFAs (LCVFAs), such as butyric and valeric acid, were higher in both the thermophilic and mesophilic phases of the TPAD with alkalinity as compared to the other configurations.

In the TPAD with alkalinity, the second-phase mesophilic digester also produced elevated total VFA concentrations (composed mostly of acetic and propionic acid) in comparison to the other configurations (see Figure 4). It is possible that the LCVFAs produced thermophilically inhibited acetic and propionic acid fermentation in the subsequent mesophilic phase. Others have written that undissociated VFAs inhibit methanogenesis (van Lier et al., 2001); however, conclusive reports regarding LCVFA toxicity are difficult to find. Also, "the symptoms of nutrient deficiency and toxicity are similar, making it easy to misinterpret a nutrient deficiency as being a toxicity problem," (Speece, 1996). For this reason, nutrients were added to the TPAD system.

Comparing only mesophilic stages/phases, the TPAD with alkalinity supplementation produced the highest VFA concentrations, whereas nutrient addition and B-STAD operation resulted in a decrease in mesophilic VFA concentrations. Since the persistence of high VFA concentrations in anaerobic systems is often indicative of nutrient deficiency (Speece, 1996), it is reasonable that the decrease is due to nutrient supplementation. For the B-STAD system, recirculation from the mesophilic to the thermophilic stage may have provided active biomass to the thermophilic stage. Others have reported that TPAD biomass retains significant thermophilic activity after it is held in the mesophilic phase (Vandenberg and Ellis, 2002). Therefore, it

is probable that B-STAD recycle increased the active thermophilic biomass within the thermophilic digester.

## Pilot plant study conclusions

The conclusions of the pilot testing were that the TPAD with nutrient amendment and B-STAD systems achieved lower final effluent VFA concentrations than the TPAD with alkalinity and no nutrient addition. In addition, the TPAD system without nutrient supplementation required approximately 4 g/L of  $\text{NaHCO}_3$  alkalinity to maintain a pH value above 7 in the thermophilic phase during start-up. The TPAD system receiving trace nutrient supplementation required no alkalinity addition to maintain neutral pH values.

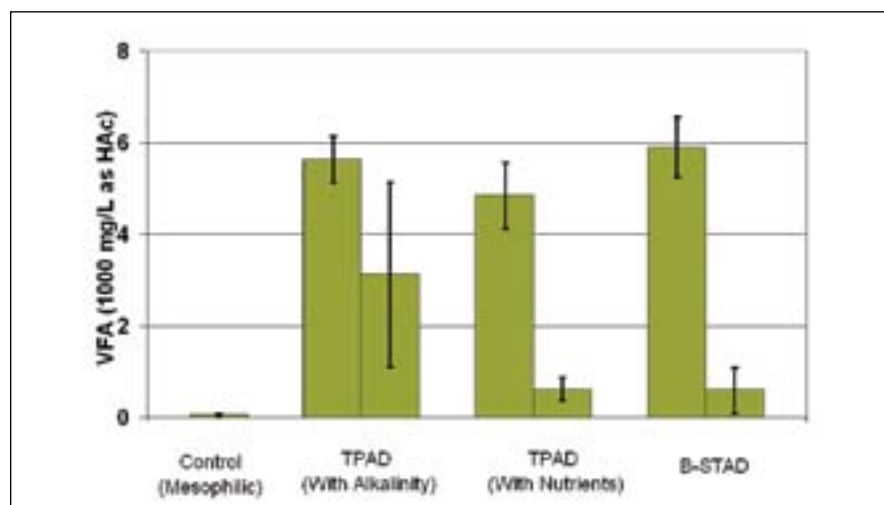


Figure 4 Digester VFA concentrations



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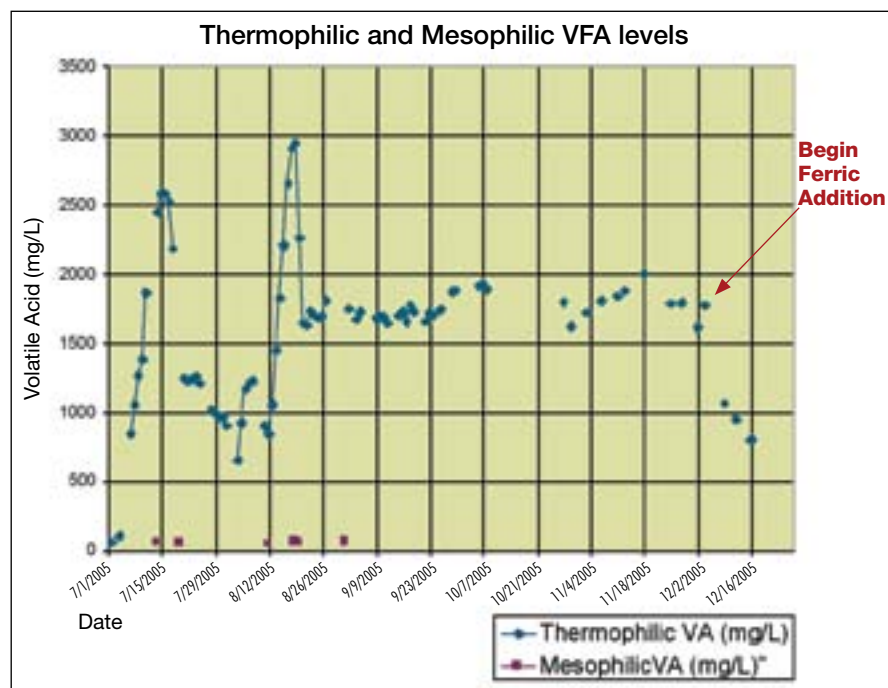


Figure 6 Decrease in effluent VFA concentration upon addition of ferric chloride to the digester



## FULL SCALE SYSTEM

### Design of full-scale thermophilic-mesophilic digestion process

The findings of the pilot test confirmed the applicability of the TPAD modification to the Janesville solids treatment process. There were two main differences between the Janesville full-scale design concepts and pilot reactors:

1. Detention time: The pilot reactors were set up to match the minimum parameters for the TPAD process: five-day thermophilic and 10-day mesophilic detention times. Because the Janesville full-scale system employed existing digester tanks, the detention time, at current loadings, was much longer in the full-scale design.
2. Continuous vs. batch feeding: The full scale system was conceived of as a continuous flow-through system. Limited storage of primary and thickened waste activated sludge prevented going to a batch type of system. For the pilot digesters, batch feeding was the only practical way to load the reactors.

### Startup of the full-scale system

Feeding of the full-scale thermophilic reactor began in July of 2005. The digester was initially filled with mesophilic sludge and operated as a mesophilic tank. The temperature was raised from 35 C to 55 C in about three days.

During startup, the feed sludge was proportioned between the thermophilic and mesophilic digesters, gradually increasing the feed to the thermophilic digester until all the feed sludge was conveyed to the thermophilic stage. The feed was limited to prevent organic overloading as a population of thermophilic methanogens developed. The controlled loading to the digester was effective and methane production was established. The volatile solids loading to the thermophilic stage was 178 lbs VS/ 1000 cu ft with 100% of the feed sludge going to the thermophilic stage. The VFA concentration reached as high as 2952 mg/L and averaged 1784 mg/L over the first four months of operation. The volatile fatty acids to alkalinity ratio (VFA/A) peaked at 0.81 and leveled out at 0.4 to 0.5. At no time did the pH drop below 7.10 so the addition of alkalinity was not considered necessary; however, lower levels of VFA were needed for optimum digestion. The volatile acids and gas production were very carefully monitored during the startup period. Figure 5 shows the relationship between VFA concentration and gas production during the startup phase.

From Figure 5, the inverse relationship between volatile acid levels and gas produc-



tion can be seen. Following the peak VFA levels, the thermophilic digester stabilized at a relatively high level of volatile acids. It was clear the pilot plant result of high VFA levels in the thermophilic reactor seemed to be repeated in the full-scale process.

Because one of the process goals was to increase gas production, better performance from the thermophilic digester was desired. Any VFAs in the digester effluent represented VFAs that were not being converted to methane. We suspected that the persistent VFAs were probably propionic and acetic acids, and perhaps longer chain VFAs as were seen in the pilot plant results.

## Metals limits in biosolids and micronutrient considerations

The blend of iron, nickel and cobalt and other constituents was added to the pilot thermophilic digester and had a positive effect on reducing volatile acids. The City of Janesville industrial pretreatment program includes local limits on several metals that are regulated in the plant effluent and the biosolids produced by the digestion process. Nickel (Ni) is a regulated metal and the city already receives significant Ni contributions from industrial users. The CFR Part 503 Regulations for land application of biosolids have an Exceptional Quality (EQ) level of Ni in biosolids as 420 mg Ni /kg total solids. Any added Ni would require recalculating local limits to allow for the additional Ni in the biosolids.

## Struvite formation and control

Struvite is a solid precipitate: magnesium ammonia phosphate ( $MgNH_4PO_4$ ). Digesting sludge can become supersaturated with respect to struvite formation because of available soluble ammonia, magnesium and phosphorus and plates out as deposits in piping and process equipment. The supersaturation of struvite can be prevented by removing phosphorus (P) from solution. One method is to selectively precipitate P using iron.

The anaerobic digester modifications at Janesville were designed with the capability to add ferric chloride directly to the anaerobic digesters. Ferric chloride is used at the plant for backup mainstream phosphorus (P) removal, although the biological phosphorus removal process is working well and ferric addition is not frequently used for mainstream P removal.

The design for struvite control was based upon the work of Mamais, et al. (1994) in which an optimal ferric chloride dosage for struvite control was sought. The minimum dosage required to obtain understaturated conditions for struvite formation was 13.5

mM of  $FeCl_3$  or 100kg/ton (200lb/ton) of solids (Mamais et al., 2004). At Janesville, the dosage was gradually increased to about five gallons per day resulting in a dosage of 475 mg/L (109 lb  $FeCl_3$  per ton), or about half of the dosage determined by Mamais et al. (1994). This dosage has proven to be effective at struvite control. It may not be necessary to undersaturate the sludge for struvite because the occurrence of and mechanism for struvite deposition are site specific.

## Results of iron addition

Figure 6 illustrates the impact of ferric addition on the VFA levels in the thermophilic digester.

Within two weeks, approximately one sludge age, the VFA level had dropped from 1,800 mg/L to 810mg/L. As shown in Figure 7 below the trend of VFA level continues into the next year of operation.

The average VA concentration in 2006 was 564 mg/L in 2006 and 586 mg/L in 2007. The temperature of the thermophilic digester has been increased in 2007.

The bar chart in Figure 8 illustrates the overall trend in volatile solids reduction across the TPAD process. January through July of 2005 represents mesophilic only, while the other ranges show the performance of the TPAD process since startup. The VS reduction has increased from 43% to 57%, an increase of 31% in VS reduc-

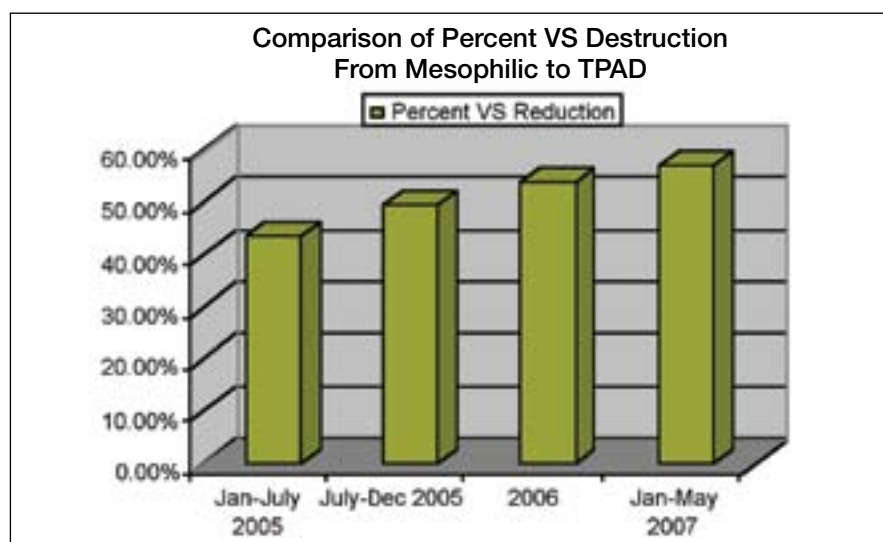


Figure 8 VS reduction over time in the full-scale process

(Note: "Jan-Jul" = single-stage mesophilic process, whereas all other bars represent the new TPAD system)



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tion due to the new TPAD system.

Recent analyses have shown that  $H_2S$  concentration in the digester gas has dropped to 100 parts per million (ppm) from 1,200 ppm analyzed in 2001 before any iron addition, during mesophilic-only digestion. The iron will react with excess sulfide and prevent the sulfide from being volatilized into the digester gas.

## CONCLUSIONS

In full-scale operation, the decrease in thermophilic-stage volatile solids correlated strongly with the addition of ferric chloride. From the pilot plant results, it was seen that the addition of metallic micronutrients had a positive effect on reducing volatile acids and stimulating methanogenesis. The iron in the ferric chloride appears to have a similar effect in the full scale digester. The reduction in volatile acid concentration also correlates to an increase in gas production, also suggesting that the methanogen activity has increased. The ferric chloride is used for struvite control but has been found to have additional benefits. The reduction of  $H_2S$  in the digester gas provides for longer bed life in the iron sponge gas scrubbers.

In approximately two years of operation the Janesville TPAD system has achieved a higher percentage of volatile solids destruction and gas production than mesophilic only digestion.

Future work may include identifying other micronutrients and determining optimal dosages for iron addition. Nickel addition can be considered although the impact on the biosolids product quality must be considered. CS

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# Take the Plunge

Bill Marten

**E**ngineering – A Great Way to Help People”: When I started out as a freshman at UW-Madison back in the mid-’70s, that was the College of Engineering’s motto. Those words have stuck with me through the years, and perhaps you will recognize a variant of them in the motto I decided to adopt in closing each of my chair messages: “Protecting our water environment, amongst friends, what a great way to help people and our planet!”

I truly mean those words, and while I greatly enjoy the work and challenges of being a wastewater consulting engineer, the thing I have found most rewarding and enjoyable has been my involvement in professional society activities through the years. But it was not always so...

As the picture above attests, there was a time when speaking at conferences, working on committees, or chairing the Wisconsin Section were the farthest things from my mind. Even when I was in graduate school doing research in an area that was cutting edge at the time, and is still quite current (nitrification/denitrification and biological phosphorus removal), the thought of actually presenting our work in front of a group of wastewater professionals chilled my blood.

However, as I got to working in the field, observed co-workers active in CSWEA and other organizations, and was encouraged to do so myself, I finally took the plunge and got involved with a committee. And you know, the result was I found all those folks from other firms, municipalities, agencies and universities that seemed so intimidating were, amazingly enough, nice, friendly, normal folks. My involvement with them has been one of the key rewards of this career, and has made me countless friends who I may otherwise never have had the pleasure to know, or at least know apart from the more formal roles we play as clients, competitors, regulators and educators.

So what is my point? Well, as I look around the Wisconsin



Section, I (and many others) have been concerned for some time over the “graying” of our section. Much of our active membership have been boomers, and will be fading from the scene in the next decade or two.

The good news is we have an active Students and Young Professionals committee (headed up by Rachel Lee at the section level and our own Dan Busch at the association level) who are finding great ways and activities to encourage

our young professionals to get involved. In addition, we do have a number of post-boomer generation folks who are becoming active in section and association activities.

But we need more. WEF, CSWEA and the Wisconsin Section offer lots of opportunities for involvement, and we need our next generation to start filling in, as we boomers slowly make our way toward the sunset. I know there may be a thousand reasons not to get involved, especially when young, whether it be shyness, anxiety, lack of time, etc. But I can truly say, from my own experience (having had those same excuses), that getting involved in CSWEA and the Wisconsin Section has been one of the smartest, and most rewarding things I have done in my career. And I think that once you have taken the plunge, you will feel the same way in a few years.

So please, take the plunge, and get involved! It is really easy to do; contact any of the officers or committee chairs (you can find their names and contact info on the CSWEA website), come to a board meeting, or plan to attend the next Young Professionals event (see the calendar of events). We sure can use the help, and look forward to getting to know you.

Protecting our water environment, amongst friends, what a great way to help people and our planet.

P.S. A treat to anyone who can identify me in the picture. Bonus treats if you can identify the guys in the back row, farthest right and third from right positions. [CS](#)

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# A New Leader

Sue Baert

I know everyone is talking about it but when we have this much snow and cold weather it is worth mentioning. Brr! My kids are having a great time, though. I have wet snow pants, gloves and socks all over, along with the occasional puddle of water from their boots. That is typical life at the Baert household.

On January 16, the annual Government Affairs conference was held at the Holiday Inn in Willowbrook. The weather cooperated and we had a great conference. Thanks again to Jay Patel, Lou Kollias, John Lamb, Deb Ness, Laurie Riotte, Bob Johnson, and Roger Gyger for organizing another wonderful conference.

I attended WEFMAX, March 13-15, in Bloomington, Minnesota. A lot of interesting brainstorming ideas were discussed.

In Dekalb on April 10, the section hosted a collection systems seminar. Some of the topics discussed were: facility



planning, SSES/cross flooding, service lateral policy, large diameter cleaning, emerging technologies, CMOM, GIS, sewer metering/modeling, and Water Is Life. Thanks to everyone for an informative seminar. I extend a special thanks to Mark Eddington, IL section collection systems chair, for all the planning.

Central States and the Illinois Water Environment Association are co-hosting a lab safety equipment and QA/QC seminar. Watch the website for the specific time and date for a lab seminar in mid-summer. Thank you to

everyone that has helped me throughout the year. All the effort you have put forth has enabled the Illinois section to stay strong. It is hard to believe that I am in the home stretch as the IL section chair. In May, at the 81st Annual Meeting in Bloomington, Minnesota, I turn the chair position over to Roger Gyger. Good luck, Roger, it is a challenging but very rewarding position. CS

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# Get Involved

John Glatzmaier



**B**y now, everyone should be shaking off those winter blues and finishing up their taxes. Time to start planning all those fun spring and summer activities, so don't forget to include Central States on your calendar.

I just got back from the 25th Annual Innovative Approaches to Wastewater Operations Problems conference, and it was an outstanding event. Johathan Yuhus, KARE 11 meteorologist, was the keynote speaker and he addressed Minnesota climate issues. The one-day conference was well attended by operators and other professionals and there were a lot of interesting topics covered. Many thanks to Larry Rogacki and all the hard-working, dedicated folks on the conference planning committee.

Coming up May 19-22 is the 81st Annual Meeting at the Sheraton South

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Hotel, in Bloomington, MN. Dr. James Barnard will give the keynote address, and he will be discussing the future of nutrient removal and the concept of nutrients as a diminishing resource. There is a great list of presentations and exhibitors, so you will be able to get up-to-date on all the latest happenings in the industry. And if that weren't enough, there will be plenty of fun activities including: a golf outing at the Braemer Golf Club, a lively meet-and-greet, the Tuesday night social event, the Wednesday night banquet, and a tour of


the Metropolitan Council Environmental Services' Metro Plant. Hope to see you there.

Other events that will be coming soon include:

- June 18-19, 2008: CSWEA/MWOA Laboratory Seminar: new MN Dept. of Health regulations, St. Cloud, MN
- July 2008: MWOA Annual Meeting, location to be determined
- Fall 2008: CSWEA/MWOA Collection System Workshop, location to be determined
- November 6, 2008: Conference on the Environment, Earle Brown Center, Brooklyn Center, MN


As professionals in the wastewater industry we have many opportunities to learn, grow, and give back to our communities, and Central States can help you attain your goals. I encourage you to become involved in Central States, attend a conference, and find out what is new and exciting in your profession. Currently, there are several leadership positions open in the MN Section. They are:

- Secretary/Treasurer
- Committee Chair – Student & Young Professionals (S&YP) Committee
- Committee Chair – Biosolids Committee

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## APRIL

- 1** CSWEA 13th Annual Education Seminar Activated Sludge – It's About Efficiency and Optimization  
Speaker Reception March 31  
Seminar April 1, 2008, Madison, WI
- 8** MN Section CSWEA/MWOA  
Collection System Seminar, Location TBA

## MAY

- 19-22** 81st CSWEA Annual Meeting  
Sheraton Bloomington Hotel, Minneapolis, MN

## JUNE

- 5** WI Section CSWEA Collection System Seminar  
Watertown, WI
- 10-11** WEF/CSWEA NPDES Permit Workshop, Milwaukee, WI
- 17** IL Section CSWEA Lab Workshop, Crystal Lake, IL
- 18** WI Section Industrial Waste/Pretreatment Seminar  
Oshkosh, WI
- 18-19** MN Section CSWEA Laboratory Seminar, Topic: New  
MN Dept. of Health Regulations, St. Cloud, MN

## JULY

- 17-18** CSWEA Committee and Section Exchange, CSX'08  
Kalahari Resort and Conference Center,  
Wisconsin Dells, WI
- 18** CSWEA's 1st Annual Young Professionals Exchange,  
YPX '08, Kalahari Resort and Conference Center,  
Wisconsin Dells, WI



## AUGUST

- TBA** WI Section CSWEA Management Seminar, Richfield, WI
- 14** WI Section CSWEA Northern Wisconsin Collection  
System Seminar, Holiday Inn Convention Center,  
Marshfield, WI
- TBA** IL Section CSWEA Operations Seminar, Location TBA

## SEPTEMBER

- 9-10** CSWEA/USEPA Advance Asset Management Workshop,  
Madison, WI
- TBA** MN Section CSWEA/MWOA Collection  
System Workshop, Location TBA

## OCTOBER

- 18-22** WEFTEC '08, Chicago, IL

## NOVEMBER

- TBA** IL Section CSWEA Maintenance & Safety Seminar,  
Location TBA
- 6** MN Section CSWEA 23rd  
Annual Conference on the Environment,  
Earl Brown Heritage Center, Brooklyn Center, MN

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**C**SWEA Past President Carol Strackbein recently announced her retirement from ITT Saintaire, where she served as Sales Administration Manager for over 37 years and assisted many operators, facility managers and others when they were in need of replacement or repair parts. Carol was in charge of the after-market sales department and convention planning. She will continue to serve as a leader of CSWEA and is the nominee for Treasurer for the 2008-09 administrative year. Carol has formed a consulting company, CSS Consulting, LLC, and specializes in planning special activities for corporations including meeting planning, planning convention or association functions, exhibit booth design and setup. Carol can be contacted at [cstrackbein@earthlink.net](mailto:cstrackbein@earthlink.net).



Submit member news to Eric Lecuyer at [erlec@prodigy.net](mailto:erlec@prodigy.net)



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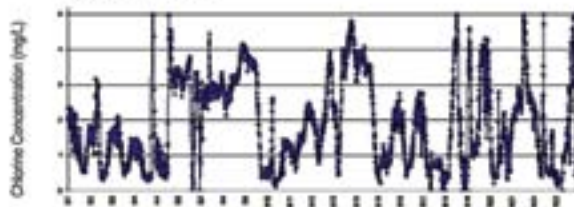
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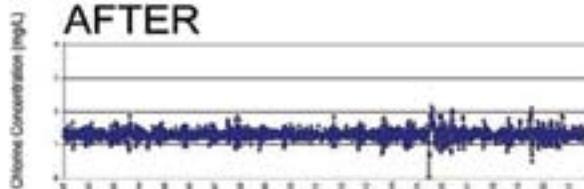
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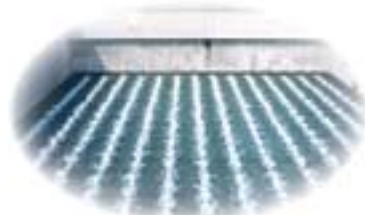
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