



# Buckeye Bulletin

Issue 1 2009

Ohio Water Environment Association  
Volume 82 No.1



*Featured Plant:  
City of Delphos MBR/ATAD Facility*

A publication of:



Water Environment  
Association

*Preserving & Enhancing  
Ohio's Water Environment*

Nonprofit organization

*In this issue:*

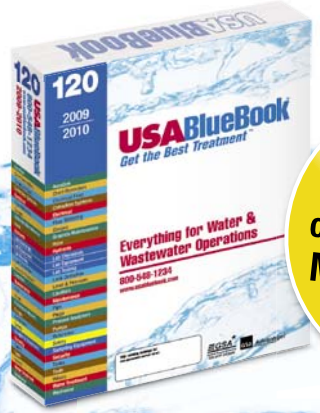
- \* *2009 Conference - Heading to Cincinnati*
- \* *Filaments - the Problem Children of Activated Sludge*
- \* *Leading the Way - Ohio Watershed Management*
- \* *Committee Updates*



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**Disclaimer**

The *Buckeye Bulletin (BB)* is the official publication of the Ohio Water Environment Association, Inc., a nonprofit corporation founded in 1926, dedicated to the improvement of water quality in Ohio and the continuing education of water professionals. It is one of the top five member associations of the Water Environment Federation. Subscription is through membership in OWEA.

The ideas, opinions, concepts and procedures expressed in this publication are those of the individual authors and not necessarily those of the Ohio Water Environment Association, its officers, general membership or the editor.

For further information on submitting articles or advertising, please contact our organization at:

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**On the Front Cover**

City of Delphos MBR/ATAD Facility

**Contact Hour Information:**

All OWEA training is submitted for contact hour approval.

Check out OWEA's website at:

[www.ohiowea.org](http://www.ohiowea.org) for a complete listing of OWEA approved training.

**Article Deadlines:** 1st day of January, April, July, and October

**Publication Dates:**

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**Next Buckeye Bulletin**

**Deadline:**

**April 1, 2009**

## 2009 Calendar of Events

### March 2009

- 1 Crystal Crucible Nominations Due
- 12 Government Affairs Workshop
- 13 Lab Analyst Exam App. Deadline
- 18 Executive Committee Meeting
- 19 Joint SE/SW Section Meeting
- 20 NE Lab Analyst Training Session
- 26 NEOWEA Meeting

### April 2009

- 10 SEOWEA Section Meeting
- 15 Executive Committee Meeting/Conf Call
- 22 NW Lab Analyst Training Session
- 24 Lab Analyst Exam
- 25 NEOWEA Operator's Review
- 30 SWOWEA Spring Operator Education Day

### May 2009

- 7 Collection Workshop
- 14-15 Ohio Stormwater Conference
- 14 NEOWEA Annual Business Meeting
- 20 Executive Committee Meeting
- 21 SEOWEA Section Meeting

### June 2009

- 10 SWOWEA Nearly Free O&M Seminar
- 22-25 2009 Annual Conference
- 22 Executive Committee Meeting

### July 2009

- 17 NEOWEA Biomass'ters Golf Event

### August 2009

- 7 NWOWEA Spouses & Friends Day

### September 2009

- 11 Lab Analyst Exam Application Deadline
- 23-24 Plant Operations/Lab Analysts Workshop
- 26 NEOWEA Clam Bake

## Executive Committee Meeting Dates

March 18, 2009  
 April 15, 2009  
 May 20, 2009  
 June 22, 2009

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Each of us is anticipating, and in some cases already experiencing, a challenging financial year. OWEA is committed to assisting our members in obtaining and receiving the most current information as it relates to the American Recovery and Reinvestment Act – federal stimulus funding. OWEA is also exploring additional options to provide affordable education assistance through various technologies and resources.

In an effort to keep our members informed of the latest changes and requests relating to the stimulus package, OWEA has been sending out eBlasts. We understand that many of you are receiving this information from various organizations as we all try to do our part, and at times the information becomes overwhelming.

With the signing of the stimulus package on Tuesday, February 17, by President Obama, Ohio's distribution for the Clean Water State Revolving Fund Program is \$224 million and the Drinking Water State Revolving Fund Program is \$58 million. Some of the anticipated types of funding include: Grants, Loans, Negative Interest Loans and Principal Forgiveness Loans. OWEA will keep you informed of the latest information available.

As of Tuesday, February 17, the State of Ohio launched <http://www.recovery.ohio.gov> to serve as Ohio's interactive headquarters for information pertaining to the stimulus package. You can submit a project proposal via this webpage and sign up for update notifications. This site will also host a "Frequently Asked Questions" section, upcoming technical assistance options, and regulatory posting updates. One website you may just want to save as one of your favorites. If OWEA can be of any assistance, please send your questions to [info@ohiowea.org](mailto:info@ohiowea.org) or call any of the EC Board and we will assist as needed.

OWEA is also looking at ways to provide educational credits as required for your operator's and engineer's licenses, during these difficult economic times. As mentioned in my December message, OWEA is sponsoring a WEF webcast for each section at no cost. WEF sponsored webcasts are listed on the WEF web site at [www.wef.org/ConferencesTraining/Webcasts/WebcastSchedule/](http://www.wef.org/ConferencesTraining/Webcasts/WebcastSchedule/). Please visit their web site and let your section officers know if there is training you are interested in viewing.

OWEA recently approved entering into a contract to host webcasts for our members. OWEA will be able to provide web training to 1000 sites across the state featuring topics of interest to our members. Please notify OWEA of training you would be interested in obtaining through a webcast at a reasonable cost. OWEA has set up a task group to outline a procedure for our EC, committees, sections, and members to submit, host and present a future webcast. Stay tuned for more information. OWEA is researching the development of a library of successful WEF sponsored webcasts for our members to use.

The OWEA Government Affairs Workshop is scheduled for March 12, 2009 in Columbus. A variety regulatory and



*Dianne Sumego*  
OWEA President

technology updates will be presented. OWEA, in conjunction with the Ohio Stormwater Watershed Association, will be sponsoring a Watershed Workshop May 14-15 in Mason, Ohio – stay tuned for further information. The Collection System Committee will be hosting their workshop on May 7 – a Call for Papers is included in this publication. Our Annual Conference is coming June 22-25 in Cincinnati this year. A variety of technical sessions, tours, and events are planned. We look forward to seeing you at these events.

OWEA has recently received approval from WEF on the changes we have implemented to our current Constitution and By-laws (C&B). Most

of the changes were required to bring OWEA up-to-date with our current operating procedures. The approved documents are posted on our website and will be included in our next Buckeye Bulletin, with voting at the Annual Business Meeting in June for approval by the membership. Based on the requirements of nonprofit organizations in Ohio and as stated in the ORC, we changed our C&B to the title of "Rules and Regulations". The OWEA Governance Committee is working on updating our Policy and Procedures, with the assistance of our sections.

OWEA would like to congratulate William Hill, Wastewater Manager for the City of Delaware and Keith Riley, Assistant District Chief of Ohio EPA NE District Office as our WEF Water Heroes! Bill and Keith were both nominated for the award and selected to be recognized on the WEF website. You can read more about Bill and Keith at [www.wef.org](http://www.wef.org). Bill, as many of us know him in Ohio, has been in the industry for 56 years. Bill has been an integral part of OWEA at all levels, from the section to state levels and a variety of committees. Bill is most noted for his contributions as being one of the founding fathers of OTCO. Keith has been in the industry for over 35 years, serving as an officer from the section level through OWEA, as a WEF Delegate, and a member of the WEF Board of Trustees. Most recently Keith has been recognized for his contributions and involvement with Water for People. Congratulations to both Bill and Keith! OWEA is honored to have each of you as active members and role models in our organization. A Water Hero as defined by WEF as follows: "They are the everyday professionals who protect public health and the environment by cleaning the world's water day after day".

OWEA is committed to assisting our members. If we can be of assistance, please contact us with your comments and suggestions.

**Please remember it is never too late to become a member of OWEA and become active in a committee which best represents your area of interest in our industry. We look forward to your participation and please feel free to contact me to discuss your thoughts and ideas for improving our organization.**

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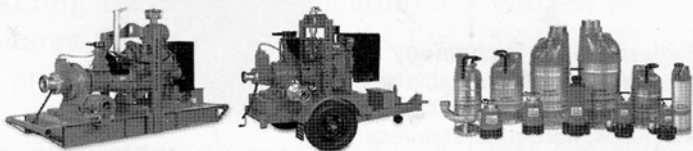
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Steve Morrison, Sr. WEF Delegate



Phil Anderson, Jr. WEF Delegate

## WEF DELEGATE REPORT

As winter wanes and spring approaches, it is time to refocus our efforts on our daily activities. This is also true for the Ohio Water Environment Association (OWEA) and the Water Environment Federation (WEF). Typically, the first several months of the year are very busy for OWEA and WEF. President Sumego and our committee chairs have reported on all the exciting happenings going on at OWEA in this issue of the Buckeye Bulletin. This article will summarize the activities at WEF that will likely have an impact on members of OWEA and WEF.

The WEF House of Delegates (HOD) is made up of 112 representatives appointed by the Member Association (MA). Your Delegates from OWEA, Steve Morrison and Phil Anderson, are OWEA's direct representatives to WEF. Your WEF Delegates are participating on several of the HOD work groups. The recommendations from these workgroups will most likely have a direct impact on the direction of WEF for the future. There are five (5) workgroups that will meet throughout the year. They are as follows:

- **Image Enhancement** – This group will evaluate what's been done to date, and what WEF and its members can do to maintain a positive image.
- **WEF – MA Relationship** – This group is seeking to define, improve and optimize the relationship between WEF and the MAs.
- **Funding, Infrastructure, and Asset Management** – This work group is charged with gathering information on what WEF's different committees and Communities of Practice (CoP) are doing within WEF on this topic.
- **WEFMAX Meetings** – This group will be looking at identifying future WEFMAX meeting hosts and looking at ways to enhance the MA Exchange portion of the meeting.
- **Communicating Value to the Industry** – This group will help define the value of the profession so that others might understand and be willing to give support to WEF.

As indicated above, WEF is addressing many of the areas that impact all of our members in the profession. These work groups will be meeting several times throughout the year so if you have any input that you would like to get to any of these working groups, please feel free to let us know.

The HOD and the WEF Board of Trustees (BOT) will work together to address the recommendations from these work groups.

Members of the OWEA Executive Committee will be attending one of several WEFMAX meetings during the first part of the year. These meetings are designed to bring together MA representatives from throughout the country to hear the latest happenings from WEF and, more importantly, exchange information with other MAs. OWEA will host a WEFMAX meeting during 2010 in Cleveland. This will be an opportunity for us to showcase OWEA and Cleveland.

The WEF provides numerous services to its members. Publications, Webcasts, and Specialty Conferences are just among a few. Most importantly, WEF represents all of our members in this profession and brings us together as we address environmental issues for our constituents. WEF will be working with the MAs during 2009 to further identify how to take advantage of the resources provided by WEF.

If you haven't been there yet, please visit the WEF website at [www.wef.org](http://www.wef.org). WEF is in the process of redesigning the website to make it more user friendly and helpful to its members. The website identifies the numerous publications, specialty conferences, and webcasts available to its members. We would like to urge all of our members to take advantage of the many services that are offered by WEF.

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# SUSTAINABILITY AND THE ECONOMIC STIMULUS PLUS EFFORTS TO CURB THE GREAT BRAIN DRAIN

*by Dale E. Kocarek, P.E., BCEE - OWEA Vice President*

In the last issue of the Buckeye Bulletin, I wrote an article on the concept of “sustainability” based on what I learned at WEFTEC07 and 08 and, more recently, from my company Stantec. For those of you who did not read this article, I posed several questions for philosophical consideration:

- What is sustainability?
- Is this for real, or is it a fad?
- Can one put this to practical use for the benefit of the public?

The Water Environment Federation (WEF) defines sustainability as the management of resources in a manner that meets our present needs, but does not compromise choices by future generations in using resources to meet their own needs. My definition is similar but slightly different. I view sustainability as the integration of efforts and systems to match the urban environment with a technology that takes into consideration cost, reliability, operator sophistication, and O&M requirements in a manner that helps protect, recover, or minimize the unnecessary expenditure of resources.

This article will be the second in a two part series on the subject of sustainability. Given that my previous one was devoted to the introduction, this one explores aspects of the concept that may be put to practical use. My first idea involves the creation of a hypothetical link between sustainability and potential funding opportunities available under President Obama’s proposed Economic Stimulus Funding Plan. My second is to present efforts by one utility provider to curb the “great brain drain” facing our industry to lower costs and provide better service.

## **Sustainability and the Economic Stimulus Package**

As we all know, one of the best ways to practice sustainability is to stay in compliance with permits issued under the authority of the Clean Water Act and its amendments. Not only is compliance a legal requirement, but the consequences of noncompliance are often expensive. One can also make the argument that chronic and acute episodes of noncompliance may deprive downstream users of their legal right to clean water consistent with WEF’s definition of sustainability.

Before I go further, I want to clarify that the subject of compliance and noncompliance is very complex. The reasons for noncompliance are varied from community to community. Most of the time, communities in enforcement actions are performing heroically in trying to come to terms with increasing regulatory requirements and century old sewer

systems in an era that is increasingly intolerant of wet weather overflows and general permit violations. This is compounded by the fact that virtually no grant money exists to correct these problems and that a century’s worth of problems must be corrected in a short period of time. What I wish to address is situations where a community may be teetering on the edge of compliance and where a well conceived capital improvements plan will help maintain compliance.

While it is sometimes true that “enforcement” action may win “points” for a community with some funding agencies, I have seen from experience that once a community enters the realm of enforcement, they are usually required to spend a lot of money on capital improvements in a compressed timeframe. Compliance schedules are further stressed by requirements to obtain complicated environmental permits, which adds time, expense, and uncertainty to the process, and reduces the time for actual construction.

With the risk of sounding too simplistic, I contend that if these same communities had the opportunity to space out improvements over a longer period of time by taking small incremental steps forward without being under the weight of a consent order, several things could potentially happen. First, the Ohio EPA may be able to exercise some discretionary authority to defer possible enforcement action for a period of time - given that progress is being made. Second, such an approach may create a cadre of simple “shovel ready” projects that may be put forth to be funded with programs emphasizing “readiness to proceed”. Based on what I have read and heard, I believe that it is these types of projects that may be emphasized under the proposed Economic Stimulus Funding Package.

At this time, one might feel compelled to ask: how can a community position itself to take advantage of the possible benefits put forth under the Economic Stimulus Funding Package?

To this, I offer the following steps as general advice and a place to begin.

1. As with anything done in the municipal sector, candidate projects must be identified and justified to community leaders. For utilities which do master planning in the form of facilities plans, asset management plans, or five year capital improvement plans, much of the initial work may already be done.
2. Modern community leaders are more likely to require managers and department heads to justify projects based on business case analysis. While the level of detail, complexity, and style of analysis may differ, the end result

is to present enough information in clear and simple terms to justify that a project is needed. During this process it is important for community leaders to be educated to understand that no piece of equipment lasts forever and that “assets” must be eventually retired despite the best of maintenance. The WEF series Water is Life-Infrastructure Makes it Happen is geared to do just that.

3. A project may be justified on the basis that it will pay for itself over a period of time, generally less than 20 years based on savings from energy consumption, reduced O&M, or even eliminate a full time position. Any project that can pay for itself in less than 10 years should be given immediate consideration for funding.
4. It should be noted that in other cases, it will be difficult to justify a project for funding based on payback alone within a 20 year time frame. Certain improvements are necessary to maintain an acceptable level of performance under the NPDES permitting system. In these cases, the “cost for noncompliance” may be estimated based on the past history of stipulated penalties assessed in consent orders, which may range from \$500 to \$1,000/day/parameter or even higher.
5. Once a project is identified and justified, the difficulty of obtaining necessary environmental permits must be considered. Since the Economic Stimulus Funding program shall likely emphasize projects that can go to construction in a near timeframe, it is important that communities be realistic in targeting projects with the fewest permits to obtain. For example, projects requiring only a permit to install will be generally ready for construction before those with NPDES permit modifications or 401 permits, particularly when the Antidegradation Rule and public hearings are required. Furthermore, section 401 permits engage participation of other agencies including US Fish and Wildlife, State Historical Preservation Office, the US Army Corps of Engineers, which promise additional studies that may be time consuming.

The following hypothetical case example is presented for the purpose of illustration. While simplistic in presentation style, this example addresses basic information generally sought by community leaders to make critical informed decisions and justify their decisions to the public.

*Example of Project Justification Statement:*

**Description:** New sludge thickening and jet aeration equipment to improve an existing aerobic digestion process and defer the construction of new tanks to provide 120 days of site storage.

**Justification:** Sludge thickening will allow Class B sludge to be produced on a consistent basis thereby eliminating the need to transport inadequately digested sludge to the landfill at \$35/Wet Ton. Furthermore, the project will implement an aeration system that will allow the plant to save energy and reduce operating costs.

**Elements:** New gravity belt thickener in unutilized garage, new blowers, sludge pumps, jet aeration/mixing equipment, and electrical, instrumentation and control modifications, and minor building modifications.

**Project Cost:** \$1,000,000 (estimated)

**Status:** Preliminary design was completed in 2008

**Timeframe:** Bid Project in summer 2009

**Savings:** \$95,000/year, 20 year lifecycle savings \$1,100,000 based on a reduction of power cost and tipping fees at the landfill. In addition, the addition of thickening and tank mixing equipment allows the existing sludge tanks to be used without capital expenditure.

**B/C Ratio:** 1.10 (> 1.0 so a positive payback occurs within 20 years)

**Permits:** Permit to install (PTI) and local building permit (No Section 401 or 404 permits, and no NPDES permit modification)

**Funding:** OWDA and sewer fund repair and replacement fund

Once again, while this example is rudimentary in nature, it illustrates the basic points of being both sustainable and small enough to be “shovel ready” to conform to anticipated requirements of the proposed Economic Stimulus Funding Plan.

**Efforts to Curb the Great Brain Drain**

To date, most discussions on succession planning in our industry are focused on the loss of certified operators, who have worked their way to become Plant Managers, Superintendents, and Shift Supervisors. Less is generally said about



maintenance personnel, who work behind the scenes to keep our collection and treatment systems in good working order and allow asset management systems, developed by utilities and consulting engineers, to live up to their full potential by allowing “assets” to be operated to their fullest extent and provide maximum value to the public.

The following case example is based on recent experiences from Montgomery County Water Services (MCWS) in creation of a new position to consolidate tasks for Maintenance Mechanic and Electrical & Instrumentation disciplines. The impetus for MCWS was to reduce operation costs and increase efficiency. Full details of MCWS efforts will be provided in the Water Environment Federation Operations Forum later this year in a set of articles written by Dale Kocarek and Mark Livengood.

On an industry wide basis, motivations by MCWS and other utilities to derive the most value from its human resources are based on the following:

1. Public expectation for maintenance professionals continues to increase at the same time as environmental regulations grow stricter. Tolerance in retaining personnel with marginal competence is becoming less acceptable at a time when open positions are being eliminated or frozen. As a result, if a utility is allowed only a certain number of positions, it is critical that the best staff be recruited and retained. Unfortunately, some utility service providers still adhere to the old process of seniority based promotions where a maintenance position is filled with personnel transferring from streets maintenance departments, with minimal knowledge of the equipment in complex water and wastewater treatment plants. This increases training time and pulls away supervisors from critical management duties until the employee is considered “trained.”
2. Despite benefits that may be derived from the Economic Stimulus Funding package, there remains a gap in need and funds available to provide necessary critical capital improvements to maintain the progress that we have seen since 1972. Utility service providers must continue to operate aging critical infrastructure for longer periods, and provide the excellent level of service the public and EPA has come to expect. This places additional burdens on maintenance personnel.
3. Asset management systems to track maintenance management and long term planning are based on assumptions that a reasonable effort will be made to extract the maximum value from an asset before it is retired from service. If capable staff is not available, the premise of asset management will not be successful.
4. Treatment systems are increasing in complexity and require a higher caliber of employee to perform. Instrumentation in the form of programmable logic controllers and SCADA are commonplace thereby requiring those in key positions to be computer literate, experienced in a myriad of mechanical repairs, and have at least a good working knowledge of basic instrumentation and controls. One can easily begin to see that this type of skill set can take years to develop.

For those of you in the Ohio WEA who may not be familiar, MCWS is a large professionally managed utility services organization that employs 220 persons in job classifications including management, customer services, laboratory, engineers and technicians, geographic information system/information technology (GIS/IT), heavy equipment operators, maintenance mechanics, electrical & instrumentation technicians, and treatment plant operators. Of these, 158 employees are represented by a union which negotiates terms and conditions of employment as part of a collective bargaining agreement.

In 2006, MCWS examined ways to consolidate maintenance mechanic skills set with electrical and instrumentation skills set. MCWS currently employs nine persons as maintenance mechanics and six persons work as electrical & instrumentation technicians, working in either field maintenance tasks (water booster station and sanitary sewage lift stations) or at the two water reclamation facilities. When alarm conditions occur at a water booster pump or sanitary sewage lift station, the system operator would call in personnel to investigate/correct the condition. Historically, alarm conditions were communicated in terms that could be caused by either mechanical or electrical problems making it difficult to sometimes determine which personnel to dispatch. Sometimes, one person would be called in to investigate the problem. If a mechanic was called in and the problem was mechanical, the problem would be addressed. However, if the problem was found to be electrical in nature, the responding mechanic would have to request an electrical and instrumentation technician respond. This would slow corrective time and in some instances, create additional operational risks. By consolidating mechanical and electrical corrective skills, most booster and lift station, as well as water reclamation facility maintenance tasks, could be addressed by a single person, thus reducing operating costs and reducing the time the utility systems were in alarm state.

In order to adopt this change, management needed to obtain the full support of the employee union. After researching the database of the State of Ohio job classification system, MCWS determined that a new classification specification would be needed to adequately address the skills, knowledge and abilities

*article continued on Page 12*

required of the new consolidated position. A new classification title of Electromechanical Maintenance Technician (EMT) was created and reviewed by the union and State of Ohio.

In summary, MCWS believes attracting persons with the skill sets needed to perform very well as an EMT will easily be accomplished and that efforts to create the new EMT position will further improve cost-control measures already adopted.

*About the author:*



*Dale Kocarek is a frequent contributor to the Buckeye Bulletin and has a regular column called the Kocarek Korner. He is a professional engineer with Stantec Consulting Inc and has been a WEF member for 25 years. Dale is the OWEA Vice President, the Chair of the Governance Committee, and the Chair of the Government Affairs Committee.*

*Dale may be contacted at Dale.KocarekW@Stantec.com.*

*The author wishes to thank Mark Livengood for his contributions on behalf of his employer Montgomery County Water Service (MCWS). Mark currently serves as the President-Elect of the Ohio Water Environment Association.*

## Ohio Stormwater Conference | 2009

May 14 -15, 2009  
The Manor House  
Mason, OH

Thanks to the efforts of OWEA's Watershed Committee, OWEA is a co-presenter of the 2009 Ohio Stormwater Conference.

Information/Registration available at:

<http://www.tinkerscreekwatershed.org/conference2009.php>

Questions or comments may be addressed to the OWEA Watershed Chairs:

John Aldrich  
[aldrichja@cdm.com](mailto:aldrichja@cdm.com), 216.579.0404

Phil Anderson  
[phil.anderson@arcadis-us.com](mailto:phil.anderson@arcadis-us.com), 419.473.1121 x404

## *Don't miss the* 2009 Government Affairs Workshop

March 12, 2009

### at the Columbus Hilton/Easton

Near Easton Town Center, I-270 Exit #33

**[www.hilton.com](http://www.hilton.com)**

3900 Chagrin Drive  
Columbus, OH 43219

### WORKSHOP SESSIONS

Ohio General Assembly Issues  
- Tom Niehaus, Ohio State Senator

Division of Surface Water Update  
- George Elmaraghy, P.E., Ohio EPA

Outlook on Wet-Weather Management  
Plans/Long Term Control Plans  
- Paul Novak, P.E., Ohio EPA

WRRSP Program Overview & Status  
- Bob Monsarrat, Ohio EPA, DEFA

Ohio River Nutrient Management:  
Current & Future Nutrient Controls  
- Peter Tennant, ORSANCO

Lake Erie:  
Current and Future Nutrient Controls  
- Jeff Reutter, Director Ohio Sea Grant

Aging Water Infrastructure:  
USEPA's Research Program  
- Daniel J. Murray, Jr., USEPA

SSO Policy & Enforcement  
- Steve Haughey, Esq., Frost Brown Todd

Technology Based Decisions in  
Achieving Nutrient Removal  
- Dale Kocarek, Stantec Inc.

### Earn Six Contact Hours

Register online at [ohiowea.org](http://ohiowea.org)

\$100 - Member  
\$150 - Nonmember  
(includes lunch)

## NW SECTION



*Frank D'Ambrosia, NW President*

It is with sadness that I must report that Emmett Mullins Jr., Assistant Superintendent of the Tiffin WPCC, passed away suddenly, possibly from over exertion related to snow removal. Emmett was serving as Laboratory Chair for the Northwest

Section. He leaves behind four children. Please keep Emmett and his family in your thoughts & prayers.

An industrial Waste and Pretreatment Meeting took place on Wednesday, December 3, 2008 at the Ohio EPA NW District Office. Presentations were given by Elizabeth Wick, Kathleen Cook, and John Hoffman. All attendees received three contact hours.

The March Section meeting will take place at the Lima WWTP. The March meeting traditionally highlights Industrial wastewater treatment. Something new for this

meeting is that you will be able to register for this meeting on-line at the OWEA website.

The May Section meeting will take place at the Van Wert WWTP. The annual golf outing will take place at this meeting. Also, new officers for 2009 – 2010 will be voted on at the May meeting.

The Northwest Section will also sponsor another Operator Education Day shortly before the Operator Certification examination in May, 2009.

Frank D'Ambrosia  
*archwwtp@tecexpress.net*

Section Only members - contact your section membership chair to update your information.

### NWOWEA

John Motycka  
*johnmotycka@wcoil.com*  
419.225.8048

### NEOWEA

Mark Hutson  
*mhutson@burnip.com*  
440.354.9700

### SWOWEA

David Reimer  
*david.reimer@cityofmiamisburg.com*  
937.847.6651

### SEOWEA

Greg Otey  
*greg\_otey@urscorp.com*  
614.464.4500

## SW SECTION



*David Reimer, SW President*

The SWOWEA met on November 13, 2008 for the Seventh Annual Plant Operations Seminar at the Crowne Plaza in Blue Ash. The 97 attendees enjoyed time with 16 exhibitors and technical sessions on Sycamore Creek

WWTP, grit, pretreatment programs, peak shaving, CMMS, tertiary filtration, succession planning, asset management and Class IV license experiences. Congratulations to the Plant Operations Committee for another successful seminar.

In December, the Executive Committee hosted our Past Presidents for Lunch at Parmizzano's Restaurant along with special guests OWEA President Dianne Sumego, OWEA President-Elect Mark Livengood, OWEA Vice President Dale Kocarek and OWEA Executive Administrator Judi Henrich.

The Industrial Pretreatment Seminar at the Robert's Conference Centre in Wilmington was held on January 29, 2009. Future meetings include a section meeting with SEOWEA at London on March 19, 2009, a section meeting on May 21, 2009 hosted by Oxford and the Spring Operator Education Day.

Please check the SWOWEA web site [www.swowea.org](http://www.swowea.org) for updated information.

David Reimer  
*david.reimer@cityofmiamisburg.com*

## SE SECTION



*Paul Matrka, SE President*

The Southeast Section has spent the cold and dark winter days preparing a strong program of meetings for 2009. Our first

meeting was held Thursday, February 12<sup>th</sup> in Jackson, Ohio. This was our industrial themed meeting, and as such we toured the pretreatment facilities at Bellisio Foods.

In March, the Southeast Section will team up with the Southwest Section for a joint meeting at the London WWTP. The improvements to the London WWTP are just being completed. These improvements feature a new Class A sludge digestion process and a new Egg-Shaped-Digester. This meeting is planned for Thursday, March 19<sup>th</sup>.

Also in March, the Southeast Section will be busy judging six District Science Fairs. Because of the SE Section's large geographical footprint, we are responsible for judging more science fairs than any other section in the OWEA. While this is a huge task, the SE Section has always been fortunate to have a great group of dedicated volunteers willing to spend a Saturday morning judging science fair projects, and at the same time promoting the wastewater industry.

*Paul Matrka*  
*paul@go-smith.com*

## NE SECTION



*John Leiendecker, NE President*

The Northeast Section has been busy the past several months planning for and hosting several meetings and seminars. A summary of the concluded events follows:

On November 13, 2008, 122 people attended a section meeting held in Youngstown. Tours of the WWTP and the EXAL Corporation were given in the morning followed by a lunch/business meeting along with technical presentations in the afternoon. The EXAL Corporation is the official supplier of aluminum bottles for Budweiser. So the next time you have a cold Bud in an aluminum bottle you can say you know where the bottle was made. The Northeast Section would like to thank our speakers: Denise Seman of the City of Youngstown WWTP and John Perko of MS Consultants for their excellent presentations at the section meeting.

The Northeast Section would also like to thank everyone at the Youngstown WWTP for all their efforts in helping with this section meeting. The contact hours for the section meeting were submitted to OEPA for 3.5 contact hours.

On January 22, 2009, the Northeast Section held its annual Operations Seminar at the Quality Inn Conference Center in Richfield, Ohio. This is the second year we have had the Operations Seminar at the Quality Inn Conference Center in Richfield (looks like we may have found a home). The meeting was well attended by 175 individuals (attendance was up 9% over last year).

Seminar topics included USDA funding, galvanize it, wastewater systems remote monitoring & control, septage-the good, the bad and the ugly, water and sewer funding issues, fluidized bed sludge incineration w/green energy, a disinfection alternative, and objective wastewater grit sampling and analysis. The contact hours for the seminar were submitted to OEPA for 6.0 contact hours. The Northeast Section would like to thank our speakers: Kelly Hettick, Philip Rahrig, James Klosz, Randy Bruback, Diane Downing, Robert Dominak, Jason Muessig, and Jimmie Griffiths for their exceptional presentations at the seminar. The Northeast Section would also like

to thank Randy Bruback of the City of Painesville and the rest of the Education Committee for putting this seminar together.

As well as coordinating activities for the February Industrial Waste Seminar, the Northeast Section continues to plan our upcoming March and May meetings and other events. NESOWEA's calendar of 2009 meeting and event dates follows:

March 20, 2009  
LAC seminar  
Elyria, Ohio

March 26, 2009  
Section Meeting  
Willoughby, Ohio

May 14, 2009  
Section Meeting/Annual Business Meeting  
Newton Falls, Ohio

July 17, 2009  
3<sup>rd</sup> Annual Biomass'ters Golf Outing  
Green, Ohio

If your facility is interested in hosting a NESOWEA meeting, please contact Bob Hrusovsky at (216) 621-2407.

*John Leiendecker*  
*john.leiendecker@cantonohio.gov*

## INDUSTRIAL WASTE AND PRETREATMENT

by Josh Wehring

**Northeast Section:** The 10th annual Industrial Waste Seminar was held February 26, 2009 in Richfield at the Quality Inn Conference Center. This has proved to be an impressive seminar and was well attended.

**Southwest Section:** The 20th annual Industrial Wastes Seminar was held on January 29, 2009 in Wilmington at Roberts Convention Centre. This event was attended by 138 people and 15 exhibitors and 4.5 contact hours were available for the attendees as a variety of Industrial Waste topics were presented.



Jim Albertz, SW Chair at SW Industrial Pretreatment Workshop.

**Northwest Section:** An Industrial Waste/Pretreatment meeting was held on December 3, 2008 at the Ohio EPA Northwest District office in Bowling Green with 30 people in attendance. This meeting was free and the presentations were submitted for contact hours. Another meeting is currently being planned, which will occur sometime in the last quarter of 2009. Information pertaining to this meeting will be forthcoming and posted on the OWEA website.

**Southeast Section:** An Industrial Waste/Pretreatment meeting is being planned for the Southeast Section by chairs Brian Coghlan and Brian Tornes. Information pertaining to this meeting will be forthcoming and posted on the OWEA website.

I encourage anyone interested getting involved with the Industrial Waste and Pretreatment committee, please contact your section chairperson. There are training opportunities and several events currently being planned that you may be able to help bring to fruition.

### COMMITTEE CHAIRS

#### STATE AND NORTHWEST CHAIR

Josh Wehring  
City of Fremont WPCC  
1019 Sand Road  
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jmwhehring@fremontohio.org

#### SOUTHWEST CHAIR

Jim Albertz, PE  
Senior Engineer  
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10925 Reed Hartman Highway  
Cincinnati, OH 45242

#### NORTHEAST CHAIR

Donna Kniss  
Ohio EPA NEDO  
2110 E. Aurora Road  
Twinsburg, OH 44087  
(330) 963-1200

#### SOUTHEAST CHAIR(S)

Brian Tornes  
Burgess & Niple, Inc.  
5085 Reed Road  
Columbus, OH 43220  
(614) 459-2050  
  
Brian Coghlan  
Bird & Bull Inc.  
2875 W. Dublin Granville Road  
Columbus, OH 43220  
(614) 761-1661

## YOUNG PROFESSIONALS

by Dan Martin

We are excited to offer Young Professionals the opportunity to attend the OWEA Conference for **free** on the afternoon of Tuesday, June 23, 2009. This opportunity covers 3 technical sessions and the afternoon break. YPs present will be eligible to win door prizes. Please contact Dan Martin for additional information: 513.469.6600 [dmartin@raconsultantsllc.com](mailto:dmartin@raconsultantsllc.com).

If you would like to support the conference in an even more visible way, YPs will have an opportunity to act as moderators and room monitors during the conference. Please contact Dan Martin (e-mail above) if interested.

We have also selected an informative slate of 3 student papers to be presented at the conference. Come see what the future has in store for treatment and water resources. See you at the conference!

The YP Committee met via WebEx conference call on December 17<sup>th</sup>. Some exciting initiatives are in the works around the state.

- Our **Ohio State Student Chapter** representative, Nick Elmasian, has been working on an Ohio OWEA/AWWA YP website. More information coming as this site evolves. Please contact Nick if you or a Student/YP you know would be interested to develop a student chapter at a local university: [nelmajian@gmail.com](mailto:nelmajian@gmail.com).
- The **SE Section** is looking at organizing a webcast seminar in the first half of this year. The YP committee will leverage the benefit of the knowledge that WEF conveniently offers. The

*continued on page 16*

YP Committee continued from page 15

committee is looking at either the “WWTPHydraulics” or “Pumping 101” seminars. Please contact Brandon Fox for more information on YP events in the SE Section: [bfox@co.fairfield.oh.us](mailto:bfox@co.fairfield.oh.us).

- In the fall, the **SW Section** took a tour of Sherman Dixie’s precast concrete manufacturing facility in Dayton. Special thanks to Sherman Dixie for the tour and 2-hour technical session. We are examining a social event for the Winter/Spring of 2009. Please contact Dan Martin for additional information: [dmartin@raconsultantsllc.com](mailto:dmartin@raconsultantsllc.com).
- The **NW Section** is planning an event to be held at Maumee Bay brewing company in downtown Toledo. It would include a tour of the microbrewery and happy hour to follow. Walter Ariss heads the YP committee for the NW Section: [Walter.Ariss@epa.state.oh.us](mailto:Walter.Ariss@epa.state.oh.us).
- In the **NE Section**, the wheels are turning to get a YP committee in place. Please contact Nick Bucurel for information: [NBucurel@pirnie.com](mailto:NBucurel@pirnie.com).

Special thanks to all the committee volunteers who make the YP committee vibrant! As always, if you have any suggestions or would like to get involved in the Young Professionals Committee, please contact Dan Martin at: 513.469.6600 or [dmartin@raconsultantsllc.com](mailto:dmartin@raconsultantsllc.com).

Dan Martin  
YP Committee Chair  
[dmartin@raconsultantsllc.com](mailto:dmartin@raconsultantsllc.com)

## LAB ANALYST COMMITTEE

by Eva Hatvani, LAC Chair  
and Nancy Taylor, LAC Co-Chair

The Voluntary Wastewater Laboratory Examinations were given on Friday, October 24 in both Cleveland and Columbus. Congratulations to those that passed!

### Class I

Thomas Gildone  
David Leffel  
Bridget Shiets  
Melinda Watkins

### Class II

Mark Ciccone  
William Collins  
Ryan Hill  
Lori Kyle  
William McCastle  
Charles Plummer

### Class III

Susan Brochak

### Activities for the Lab Analyst Committee

The lab committee will be judging the lab event for the Operations Challenge. Please note that the event will no longer be held in conjunction with the Annual OWEA Conference. It will be at the City of Delaware WWTP on May 28, 2009.

The annual lab workshop will be held in conjunction with the Operations and Maintenance Committee in the Fall of 2009. The event was very successful last year. We are looking for speakers and topics. Please contact Eva

Hatvani or Nancy Taylor if you are interested in presenting or have a topic you would like for us to look for a speaker to present.

The OWEA is also actively looking for articles to be submitted to the Buckeye Bulletin for publication. If you have written something you would like to see in our newsletter, please submit your paper suggestion to Eva Hatvani or Nancy Taylor.

### Looking for a SE Section Chair

We are in search of an individual that would like to be the SE Section Lab Analyst Committee Chair. If you know of anyone that is interested please call or email either Eva Hatvani or Nancy Taylor.

### 2009 Crystal Crucible Nominations

We are accepting nominations for the Crystal Crucible Society. The nomination forms are on the OWEA website. Please mail the nominations to Eva Hatvani, NEORSD, 4747 E. 49<sup>th</sup> Street, Cuyahoga Heights, OH 44125.

### **Lab Certification News**

Renewals for the certification program will be sent out in Fall 2009. Everyone is on a two-year renewal cycle. If you did not renew in 2007, you will not be mailed a renewal form because you were removed as your certificate has expired is no longer valid.

If you have moved, please contact Eva Hatvani at [hatvanie@neorsd.org](mailto:hatvanie@neorsd.org) or (216) 641-6000 otherwise we have no way of contacting you.



## LAC CONTINUED

### 2009 Exam Dates

April 24, 2009

Cleveland and Columbus – TBA

*Application Deadline:*

*March 13, 2009*

October 23, 2009

Cleveland and Columbus – TBA

*Application Deadline:*

*September 11, 2009*

1. Lab Certification information is posted on the OWEA website under Certification Programs: [http://www.ohiowater.org/lab\\_analyst.php](http://www.ohiowater.org/lab_analyst.php)
2. Applications can be obtained by calling Eva Hatvani at (216) 641-6000 or downloaded from the OWEA website.
3. The “Need-to-Know” information is posted on the OWEA website.
4. Please note new rules for certification section on the OWEA website. The test fee is \$95.00.

### Renewals

1. Renewal forms will be mailed at the end of 2009. Renewal fees will remain at \$25 for the two year renewal. Everyone is on the same cycle.
2. If you did not renew your certification by Dec. 31, 2007, you are no longer certified. To be reinstated, you must provide proof of holding a certificate and submit a fee of \$95.00. If you can not

provide proof of certification, you must retake all tests, in sequential order.

3. Call Eva Hatvani at (216) 641-6000 for information regarding renewals.

### NE LAC – Kathy Richards

The Northeast Section Laboratory Analyst Committee is finalizing our 2009 training schedule. Our first session will be hosted by Rich Goldsworth at the Elyria WPC lab on March 20<sup>th</sup> from 1:00-3:30. Two topics will be covered, “Wastewater Microbiology” and “Correct Use of Pipettes and Balances”. These have each been approved for 1 contact hour. We are considering a group cookout lunch prior to the session and would appreciate it if attendees would register as soon as possible.

In an effort to better serve our analysts, we have developed a fairly comprehensive questionnaire and ask that you take a moment to fill it out. It is posted on the OWEA website under the NE Section. Please feel free to forward a copy on to other labs that may not have Internet access. We would especially like to hear from the smaller facilities, for which we may not have contact information.

Wastewater Certification Laboratory Review Manuals are still available, either electronically or as a bound copy. There is an order form available on the OWEA website Lab Committee page. You can reach me at:

[NESOWEALAC@gmail.com](mailto:NESOWEALAC@gmail.com)  
330-928-1164 ext. 484.

### **STATE LAC COMMITTEE MEMBERS**

*If you have any questions about the activities in your section, please contact your section chair.*

#### **State Chairs**

Eva Hatvani  
216.641.6000  
[hatvanie@neorsd.org](mailto:hatvanie@neorsd.org)

Nancy Taylor  
740.349.6774 Ext. 205  
[ntaylor@ci.newark.oh.us](mailto:ntaylor@ci.newark.oh.us)

#### **Northeast Chairs**

Denise Seman  
330.742.8820  
[dseman@cityofyoungstownoh.com](mailto:dseman@cityofyoungstownoh.com)

Kathy Richards  
330.928.1164  
[richaka@ci.akron.oh.us](mailto:richaka@ci.akron.oh.us)

#### **Northwest Chair**

OPEN

#### **Southwest Chair**

Roger Rardain  
937.754.3075  
[roger.rardain@ci.fairborn.oh.us](mailto:roger.rardain@ci.fairborn.oh.us)

#### **Southeast Chair**

OPEN



*Nancy Taylor & Eva Hatvani*

## PLANT OPERATIONS COMMITTEE REPORT

by Jim Borton

The Plant Operations Committee held a conference call on November 12, 2008, to discuss the 2009 Operations Challenge. Several possible ideas were discussed and ultimately the format will provide an operator training day with some hands-on opportunities for additional contact hours as well as the traditional contest format. The event will be held Thursday, May 28<sup>th</sup> at the City of Delaware's WWTP. Look for more information on how to register in this issue of the Buckeye Bulletin.

To summarize the day's schedule, for the teams wishing to compete for the opportunity to travel to Orlando to represent Ohio WEA at WEFTEC.09, there will be practice time on the actual event equipment in the morning. While practice is occurring, technical sessions will be underway for those needing contact hours. After tech sessions are completed, the Operations Challenge will be held and additional hands-on technical sessions will be held in the contest area for those wanting to earn additional contact hours.



Wooster sCrappers



Operations Challenge 2006

As a side note, if you need contact hours, consider forming a team, as team members can earn up to 12 contact hours for participating. In addition to contact hours, the December 2008 WE&T magazine described how being a team member can improve job skills, improve communications, develop leadership skills and boost your career. (Find a link to this article at [ohiowea.org](http://ohiowea.org) on the Plant Operations Committee Page)

The Plant Operations Committee will be meeting in February to finalize the set up for the Operations Challenge/Operator Education Day as well as to select topics for the September Plant Operations Seminar. Look for more information on the Plant Operations/Laboratory Analyst Seminar in a later Buckeye Bulletin and in your mailbox. Save some travel/training budget for then as the seminar promises to be, as in the past, one of the premiere Operations and Laboratory training events this year.

If you have interest in putting an Operations Challenge Team together, judge the contest or present at one of the upcoming Plant Operations sessions, please contact Kim Riddell at (419) 234-4507 or Jim Borton at (330) 263-5293.

### 2009 OWEA Operations Challenge and Operator Training Day

May 28, 2009 at City of Delaware WWTP

- Earn Contact Hours
- Build Communications and Team Building Skills
- Boost Your Career
- Earn a chance to compete at WEFTEC.09 in Orlando



# OPERATIONS CHALLENGE 2009 and OPERATOR TRAINING DAY

Thursday, May 28, 2009 at the City of Delaware WWTP

## PURPOSE

To recognize excellence in wastewater treatment operations, maintenance, laboratory, safety and collection systems personnel. This year’s competition will be held at the City of Delaware WWTP. An operator training seminar will be held in conjunction with the competition this year. Attendees will have technical sessions in the AM while the teams are practicing and in the afternoon there will be more opportunity for hands-on contact hours during the competition. More details will be available in upcoming months.

## COMPETITIVE DIVISIONS

Division I consists of the following teams:

Any returning team (a returning team is defined as any team that includes at least two members of the team that competed in the previous year’s OWEA Operations Challenge), which placed first in any Division I event, and

Any returning team (as defined above), which competed in the previous year’s Division II competition and placed first overall or,

Any team that chooses to compete at the Division I level.

All other competitors would compete in Division II. Any team in Division II who wants to compete in Division I would be allowed to change to the higher division. Declaration for changing divisions must be made in writing on the application.

## REGISTRATION

Team registration is \$250. Includes lunch during the competition and admission and dinner at the awards banquet that evening for 5 people.

## THE COMPETITION

All teams will compete in all events. Each event will be judged and scored separately against established criteria. The scores of all events will be totaled and the champion team will be selected. Five separate competitive events will be held:

- Maintenance. Teams will be required to do various pump maintenance procedures and electrical tasks on a 4” Godwin Dri-Prime® model CD100M and related equipment.
- Collection Systems. Teams will cut out a “cracked” section of eight inch (8”) gravity PVC sewer pipe with water circulating through it. Drill a four inch (4”) hole in a piece of eight inch (8”) PVC pipe on a separate stand. Install a saddle connection with gaskets and two straps to represent a house connection. Cut and install the 8” PVC section with saddle and install the section with “flexible” repair couplings. Program a Sigma 900 max sampler. The water tightness of the repair will be evaluated.
- Safety. Teams will respond to an unconscious worker overcome by an unknown chemical in a manhole requiring rescue.
- Process Control. Teams will solve problems including process control “story” problems and multiple choice theory and math.
- Laboratory. Teams will perform the set up for a seeded BOD and calculations to complete a BOD bench sheet.

Each event will be timed separately and all team members are expected to participate.

### Team Entry Application Form - Operations Challenge 2009

Division: <input type="checkbox"/> 1 <input type="checkbox"/> 2	Team Member 1:
Sponsoring MA/OA:	Team Member 2:
Team Name:	Team Member 3:
Team Captain:	Team Member 4:
Company:	
Address:	Phone:
City: State: Zip:	Email:

Please mail the entry form with the \$250 Operations Challenge Registration Fee made payable to OWEA to:

OWEA  
1890 Northwest Blvd, Suite 210  
Columbus, OH 43212

**Register Online at [www.ohiowea.org](http://www.ohiowea.org)**

## WATER FOR PEOPLE

by Keith Riley



### Thanks to our Water For People Guardians:

#### 2008 Fund Raisers:

Jan. 08 MSD Donation	\$252
Mar. 08 NW Section Meeting	\$145
May 08 NW Section Meeting	\$230
May 08 SE Section Meeting	\$39
June 08 Woolpert Donation	\$69
June 08 Ohio EPA Donation	\$25
June 08 Synagro Donaton	\$10
June 08 Annual Conf. Golf Event	\$1,530
June 08 Annual Conf. Auction	\$2,695
July 08 NE Section Golf Event	\$562
Aug 08 NW Section Meeting	\$140
Nov 08 NW Section Meeting	\$300
Oct 08 NE OEHA Donation	\$100
<b>Total for 2008</b>	<b>\$6,097</b>

#### Break-down by calendar year combined OWEA and OAWWA

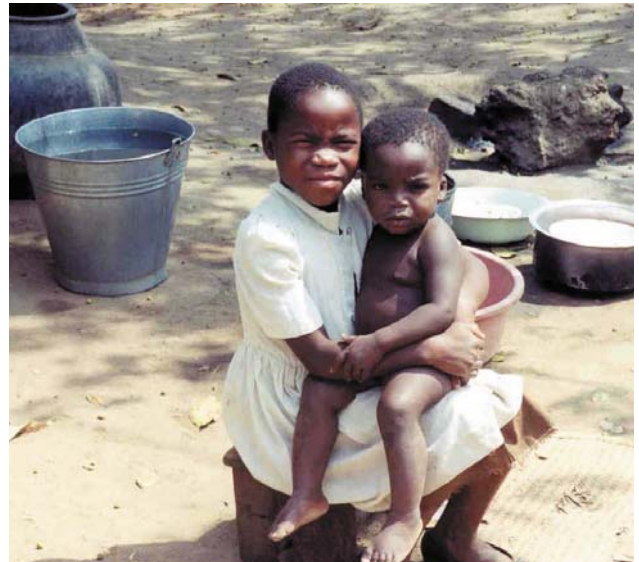
2003	OWEA \$1,288	OAWWA \$15,065	Total \$16,353
2004	OWEA \$3,441	OAWWA \$16,402	Total \$19,843
2005	OWEA \$5,870	OAWWA \$28,083	Total \$33,953
2006	OWEA \$6,587	OAWWA \$13,505	Total \$20,092
2007	OWEA \$6,568	OAWWA \$6,111	Total \$12,366
2008	OWEA \$6,097	OAWWA \$15,961	Total \$22,058

I would encourage everyone who raises any Water For People funds in 2009 to make sure they drop me an email to let me track and acknowledge your good works (keith.riley@epa.state.oh.us). Beginning this year, we are asking all funds raised to be mailed to the OWEA Office:

Ohio Water Environment Association  
1890 Northwest Blvd, Suite 210  
Columbus, OH 43212

I would encourage all the Sections to set their goals for supporting Water For People and plan their fund raising events. Your continued support of the good works of Water For People is very much appreciated.

Anyone that would like to donate an item toward the 2nd Annual Silent Auction fund-raiser at our June Annual Conference, please contact me or your Section Delegate.



## PROBLEMS THAT DON'T FLUSH AWAY – IT'S WORLD TOILET DAY

By Kate Fogleberg - Water For People Regional Manager-South America

On November 19, 2008, the world celebrated the 8th annual World Toilet Day today. While that may seem like a strange thing to highlight for those of us that never think twice about our toilets (unless we have to go and there isn't one around), for the 2.5 billion people in the world who do not have access to such a basic service, this is no laughing matter.

2008 was also the International Year of Sanitation. Again, most people may scratch their heads as to why

the United Nations decided to designate 2008 as a year devoted to sanitation. Toilets, and what we do on them, doesn't cause many people in developed countries to reflect on their purpose or benefits. But access to improved sanitation has been shown to reduce diarrhea in kids, who are most susceptible, by 22-36%.

Translating percentages into lives, this results in hundreds of thousands of kids living to see their fifth birthday. Last year, a poll conducted by the British Medical Journal

showed that sanitation -- not antibiotics, germ theory, or vaccines -- is considered to be the greatest medical advance in the last 150 years because of the associated public health benefits.

But it's not all about health. When I need to go to the bathroom, I look for somewhere private and convenient. Every year, more studies are released showing that from Ghana to Vietnam, these drivers -- privacy, convenience, and even social status -- are why people without sanitation choose to invest in improved sanitation and continue to use the facilities in a hygienic way. The World Health Organization estimates that for each \$1 invested into sanitation, the economic return is \$7 in costs saved treating illnesses and days of productive work lost.

It's not all about money, either. Girls around the world drop out of school as they get older if schools do not have sanitation facilities. Getting toilets into schools is a proven strategy at retaining young women, thus contributing to social and economic development of society.

Plus, environmentalists promote sanitation as a way to protect the planet. At any given moment, over 200 million tons of untreated wastewater are seeping into groundwater supplies and river-water that many people drink, bathe, and play in.

## THE FACTS

2.5 billion people lack adequate sanitation

Diarrhea can be reduced by 22-36% with improved sanitation

4,000 children die each day from water-related illnesses

Doing this -- getting sanitation to those who do not have it -- costs money, approximately \$10 billion a year until 2015 to meet the Millennium Development Goal for sanitation. \$10 billion, the same amount as 1/3 of the global spending on bottled water last year, to protect public health and improve private dignity around the world.

Hard lessons learned, and millions of dollars spent in

the past 30 years from Bangladesh to Panama, show that simply building latrines for "the impoverished" does not automatically translate into sustained use and hygienic management of toilets. Impoverished people are not a homogenous group of people waiting for "development" to happen to them. Rather, individuals have very different wants, needs, and abilities to pay. Promising programs from around the world have taken subsidies that were once used to give latrines away, and are investing that money in the development of a local private sector that meets the real demand of consumers who don't have a place to take care of their needs.

High in the Andes of Peru, I listened to Dona Liliana tell me how she has been embarrassed for years when her family from Lima would come visit, and she didn't have a place for them to go to the bathroom. Dona Liliana was a health promoter during the 1960s and 1970s and worked on a program giving away latrines from the Government of Peru. Even with her background in health and latrine promotion, her real desire for a bathroom came from the convenience and social status associated with access to a loo. Eager to improve her situation, she took out a loan from a local credit union to finance the cost of her bathroom. Within the same breath, she told me how she was going to pay off her loan in one year, and how everybody, even the poorest person in her barrio could afford to install their own bathroom IF they wanted to.

So it's going to take money, but it's also going to take thinking outside of the bowl to solve this massive global problem. Traditional approaches aren't making a dent in the number of people who can't simply get up and use a bathroom in their home, flushing away their wastes without a second thought about where they go. We need to be creative in how we "sell" sanitation, how we pay for sanitation, and even how we "celebrate" sanitation.



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## WELCOME

*new members who joined OWEA in  
November, December and January*

OWEA would like to extend a warm welcome to the following new members. If you see these folks at a section meeting or workshop, please welcome them to our organization.

Jason Andrews	Adam Korn
Timothy Ball	Daniel Lefter
Kevin Brady	Michael Lippert
Elizabeth Buening	Dennis Madden
Dennis Capo	Brad Malatesta
Jeremiah Cole	David Pigg
Mike Coy	Lyle Plumer
Josh Crow	Paul Rosile
Donna Eppelle	Youngwoo Seo
Anthony Farina	Gil Sherman
Jaelyn Gandee	Bridget Shiets
Phillip Garbade	Albert Shin
Josh Goodridge	Paul Svoboda
Robert Grob	Jing Tao
Dewey Harper	Perry Tudor
Timothy Hedges	Adolph Walker
Eric Hinton	Qianheng Wang
Melissa Holscher	Thomas Ward
Richard Iafelice	Harold Webb
Harrold Kastenkrause	Christopher Williams
Brian Kiess	Brenda Wooten
Amanda Koenig	Quing Ye
Paul Kopchak	

**Don't**  
Miss Out On Important News

**Update**  
Your Membership Profile

Maintain an accurate mail and email address so you receive timely communications from OWEA regarding upcoming events, important news affecting water environment issues, and your copy of the Buckeye Bulletin.

Please check your member profile at: [www.wef.org](http://www.wef.org) by clicking on the Membership link. You can also make changes to your OWEA/WEF membership account by contacting WEF directly at 1.800.666.0206 or by email at [csc@wef.org](mailto:csc@wef.org).

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# **Cincinnati in '09**

## Conference Highlights

Monday	June 22	<b>Golf Outing</b>	Weatherwax Golf Course
Tuesday	June 23	<b>Awards Breakfast</b> <b>Exhibit Hall/Exhibitor Forums</b> (earn contact hours) <b>Spouse/Guest Program</b> <b>OWEA Business Meeting</b> <b>Plant Tour</b> <b>Exhibit Hall Luncheon</b> <b>Meet &amp; Greet</b>	Hyatt Regency Cincinnati Hyatt Regency Cincinnati Newport on the Levee Hyatt Regency Cincinnati Mason WRP Hyatt Regency Cincinnati Great American Ballpark
Wednesday	June 24	<b>Technical Sessions a.m.</b> <b>Spouse Program</b> <b>Technical Sessions p.m.</b> <b>Reception/Social</b> <b>OWEA Annual Banquet</b>	Hyatt Regency Cincinnati Hyde Park Square Hyatt Regency Cincinnati Hyatt Regency Cincinnati Hyatt Regency Cincinnati
Thursday	June 25	<b>Technical Sessions a.m.</b>	Hyatt Regency Cincinnati



*2009 OWEA Conference*  
*June 23-25 at the Hyatt Regency Cincinnati*  
 Register online at **[ohiowea.org](http://ohiowea.org)**



Hosted by the Southwest Section. For information contact:

Tim Shaw  
 513.807.7256  
 aswater@cinci.rr.com

Dan Sullivan  
 859.426.5178  
 danny.sullivan@fuse.net

Ohio Water Environment Association  
 614.488.5800  
 info@ohiowea.org



## 2009 Attendee Registration - Register online at [ohiowea.org](http://ohiowea.org)

**Please check appropriate box for events you wish to attend for meal count purposes.**

- ◆ **Full Conference Registration** includes: events listed in box, scheduled conference meals, technical sessions, and exhibit hall entrance.
- ◆ **One Day Registration** includes scheduled conference meals, plus technical sessions and exhibits held that day.
- ◆ **One Day Registration only applies if you are attending one day.** If you attend Tues and Wed, a Full Conf Registration is required.
- ◆ Tickets will be collected at the door for each event and meal.

First Name	M.I.	Last Name
Badge Name		WEF Member #
Company Name		Title
Address		
City		State Zip
Email		Spouse/Guest (if attending)
Tel #	Fax #	<input type="checkbox"/> Ck if 1st Time Attendee

MEMBER	Before May 29	After May 29	NON-MEMBER	Before May 29	After May 29
<b>Full Conference</b> <input type="checkbox"/> Awards Breakfast <input type="checkbox"/> Plant Tour <input type="checkbox"/> Exhibitor Lunch <input type="checkbox"/> Meet & Greet <input type="checkbox"/> Annual Banquet	\$250	\$300	<b>Full Conference</b> <input type="checkbox"/> Awards Breakfast <input type="checkbox"/> Plant Tour <input type="checkbox"/> Exhibitor Lunch <input type="checkbox"/> Meet & Greet <input type="checkbox"/> Annual Banquet	\$350	\$400
<b>Tuesday-One Day Only</b> <input type="checkbox"/> Awards Breakfast <input type="checkbox"/> Plant Tour <input type="checkbox"/> Exhibitor Lunch <input type="checkbox"/> Meet & Greet	\$125	\$150	<b>Tuesday-One Day Only</b> <input type="checkbox"/> Awards Breakfast <input type="checkbox"/> Plant Tour <input type="checkbox"/> Exhibitor Lunch <input type="checkbox"/> Meet & Greet	\$175	\$200
<b>Wednesday-One Day Only</b> <input type="checkbox"/> Annual Banquet	\$125	\$150	<b>Wednesday-One Day Only</b> <input type="checkbox"/> Annual Banquet	\$175	\$200
<b>Retired Member</b> <input type="checkbox"/> Awards Breakfast <input type="checkbox"/> Plant Tour <input type="checkbox"/> Exhibitor Lunch <input type="checkbox"/> Meet & Greet <input type="checkbox"/> Annual Banquet	\$100	\$150	<b>Student</b> <small>Member/NonMember</small> <input type="checkbox"/> Awards Breakfast <input type="checkbox"/> Plant Tour <input type="checkbox"/> Exhibitor Lunch <input type="checkbox"/> Meet & Greet <input type="checkbox"/> Annual Banquet	\$50	\$75
<b>Spouse/Guest</b> <input type="checkbox"/> Awards Breakfast <input type="checkbox"/> Tues Spouse Event <input type="checkbox"/> Meet & Greet <input type="checkbox"/> Wed Spouse Event <input type="checkbox"/> Annual Banquet	\$150	\$200	<b>Extra Tickets</b> <input type="checkbox"/> Awards Breakfast <input type="checkbox"/> Exhibitor Lunch <input type="checkbox"/> Meet & Greet <input type="checkbox"/> Annual Banquet	\$25 \$30 \$60 \$80	\$30 \$35 \$65 \$90
<b>Conference Registration Total</b>				\$	

If you are submitting multiple Registration Forms, you may complete one **Composite Payment Form** (last page)

<input type="checkbox"/> P. O. #	<input type="checkbox"/> Ck #	<input type="checkbox"/> VISA or <input type="checkbox"/> Mastercard Accepted
<b>Make checks payable to OWEA and mail with form to:</b>		CC #
Ohio Water Environment Association 1890 Northwest Blvd, Suite 210 Columbus, OH 43212 or fax to: 614.488.5801		Exp Date
		Billing Zip Code
		Name on Card
		Signature

Registrations will be confirmed via email.



**2009 Conference Co-Chairs**  
**Dan Sullivan**, 513.515.6253, danny.sullivan@fuse.net and **Tim Shaw**, 513.807.7256, aswater@cinci.rr.com



## 2009 Golf Registration - Register online at [www.ohiowea.org](http://www.ohiowea.org)

**Where:** Weatherwax Golf Course  
 5401 Mosiman Road  
 Middleton, OH 45042

**Format:** 240 Golfers  
 30 Teams per Course  
 Four Person Scramble

**When:** Monday, June 22, 2009  
 9 - 10 a.m. Registration  
 Driving Range Open  
 10:30 a.m. Shotgun Start

**Food/Prizes:** Lunch and Dinner included  
 1st, 2nd, 3rd Place Prizes for each course  
 2 Longest Drive Prizes per course  
 2 Closest to the Pin Prizes per course

Company Name		
Address		
City	State	Zip
Contact Name:	Email:	
Tel #:	Fax #	

<b>Foursome Pricing</b> - print foursome names below		\$300	\$
1.	2.		
3.	4.		
<b>Individual Pricing</b> - print name(s) below, will be assigned to a team			
1.		\$75	\$
2.		\$75	\$
<b>Golf Sponsorships</b> (multiple sponsorships per event)			
Hole Sponsor		\$200	\$
Beverage Sponsor		\$500	\$
Gimmick Sponsor		\$400	\$
Lunch Sponsor		\$500	\$
Dinner Sponsor		\$750	\$
<b>Total Golf Amount</b>			<b>\$</b>

If you are submitting multiple Registration Forms, you may complete the **Composite Payment Form** (last page)

<input type="checkbox"/> P. O. #	<input type="checkbox"/> Ck #	<input type="checkbox"/> VISA or <input type="checkbox"/> Mastercard Accepted
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		Billing Zip Code
		Name on Card
		Signature

**Sign up soon!**  
**Limited to 60 teams.**



**2009 Golf Outing Co-Chairs**

Chris Weber, 513.677.8380, cweber@pirnie.com | Charlie Miller, 513.714.5238, charlie.miller@univarusa.com

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## 2009 Exhibitor Contract - Register online at ohiowea.org

(page 1)

Company Name		
Address		
City	State	Zip
Individual Responsible for Exhibit:		
X _____ Date: _____		
Signature (I have read and agree to Exhibitor Contract Terms on Page 2)		
Tel #:	Fax #	
Email:		
Company Website:		

<b>Exhibitor Pricing</b> (includes full conference registration for Individual Responsible for Exhibit)		
OWEA Member - WEF # Required	\$700	\$
WEF #:		
Non-member Rate	\$850	\$
Please indicate which events you will attend: <input type="checkbox"/> Awards Breakfast <input type="checkbox"/> Plant Tour <input type="checkbox"/> Exhibitor Lunch <input type="checkbox"/> Meet & Greet <input type="checkbox"/> Annual Banquet		
Additional Booth Attendant(s) - Includes lunch on 6/23 and exhibit hall pass		
Name 1:	\$35	\$
Name 2:	\$35	\$
Name 3:	\$35	\$
Name 4:	\$35	\$
<b>Total Exhibitor Amount</b>		<b>\$</b>

If you are submitting multiple Registration Forms, you may complete the **Composite Payment Form** (last page)

<input type="checkbox"/> P. O. #	<input type="checkbox"/> Ck #	<input type="checkbox"/> VISA    or <input type="checkbox"/> Mastercard Accepted	
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Ohio Water Environment Association 1890 Northwest Blvd, Suite 210 Columbus, OH 43212		Exp Date	Billing Zip Code
		Name on Card	
Or fax to: 614.488.5801		Signature	

Registration will be confirmed by email.



**Exhibit Hall - June 23, 2009**  
 Tuesday, 10:30 a.m. - 4:30 p.m.  
 AM and PM Breaks in Exhibit Area  
 Box Lunch in Exhibit Area  
 Exhibitor Forums with Contact Hours

**2009 Exhibitor Co-Chairs**

Brad Olsen, 513.677.6870, bolson@pirnie.com and Jennifer Emerick, 614.471.7310, jemerick@ggceng.com



2009 ANNUAL CONFERENCE EXHIBITOR CONTRACT - Page 2

**TERMS AND CONDITIONS**

1. We hereby contract to participate in the Tabletop and/or Equipment exhibits on Tuesday, June 23, 2009, at the Ohio Water Environment Association's (hereinafter referred to as "OWEA") Annual Conference and agree to pay the designated registration of \$700.00 for WEF members (\$850 for non-members) for 6' tables. The registration fee includes one full conference registration and admission to all conference activities for the responsible person.
2. Additional personnel participating in the exhibit will be charged \$35 (which includes lunch on June 23, 2009 and complimentary exhibit hall admission) and must register as additional exhibit booth attendants prior to the conference so name badges are available. Additional personnel interested in attending the social events and/or meals other than lunch on June 23, 2009 must purchase tickets at the registration desk. Use the enclosed "Attendee Registration Form" to pre-register additional personnel for the full conference.
3. We agree to all the terms of the "Liability & Responsibility Clause", which is part of this contract.

**LIABILITY AND RESPONSIBILITY CLAUSE**

1. In signing this Exhibitor's Contract, the exhibitor agrees to assume the entire responsibility and liability for losses, damages, and claims arising out of loss or damage to the exhibitor's displays, equipment and all other property brought upon the premises of and shall indemnify and hold harmless the OWEA, Cincinnati Hyatt Regency, the agents, servants, and employees of each organization for any and all such losses, damages, and claims.
2. The exhibitor also agrees that the OWEA, and/or the Cincinnati Hyatt Regency will not be responsible for any injury, loss or damage that may occur to the exhibitor, the exhibitor's employees or property, or to any other person prior, during, and subsequent to the period covered by the Exhibitor Contract; provided said injury, loss or damage is not caused by the willful negligence or wrongful act of an employee of the Cincinnati Hyatt Regency and agrees to expressly release the OWEA, Cincinnati Hyatt Regency and of such liabilities and to indemnify the OWEA, and/or the Cincinnati Hyatt Regency against any and all claims for such injury, loss or damage.
3. It is mutually agreed that it is the duty of each exhibitor to install his/her exhibit before the opening of the exhibit area on Tuesday, 8:00 AM, June 23, 2009; and to dismantle the exhibit before Tuesday, 6:00 PM, June 23, 2009.
4. By signing Page 1 of the Exhibitor Contract, I agree to above Terms and Conditions and Liability and Responsibility Clause.



**2009 Sponsor Registration - Register online at ohiowea.org**

Company Name		
Address		
City	State	Zip
Contact Name		
Tel #:	Fax #	
Email:		
Company Website:		

Overall Conference Sponsorships			
A	Titanium	\$3,000 and higher	\$
B	Platinum	\$2,000	\$
C	Gold	\$1,000	\$
D	Silver	\$500	\$
E	Bronze	\$250	\$
Help Sponsor These Events <i>(multiple sponsorship available for each event - larger sponsorships welcome)</i>			
F	Breaks	\$500	\$
G	Plant Tour Lunch - Mason WRF	\$500	\$
H	Spouse Program	\$500	\$
I	Meet & Greet - Great American Ballpark	\$1,000	\$
<b>Total Sponsor Amount</b>			<b>\$</b>

If submitting multiple Registration Forms, you may complete the **Composite Payment Form** (last page)

<input type="checkbox"/> P. O. #	<input type="checkbox"/> Ck #	<input type="checkbox"/> VISA or <input type="checkbox"/> Mastercard Accepted	
Make checks payable to OWEA and mail to:		CC #	
Ohio Water Environment Association 1890 Northwest Blvd, Suite 210 Columbus, OH 43212		Exp Date	Billing Zip Code
		Name on Card	
Or fax to: 614.488.5801		Signature	

*Thank you  
for your support!*



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- ◆ Conference Program
- ◆ OWEA Buckeye Bulletin
- ◆ OWEA Website
- ◆ Specific Event if Event Sponsor

**2009 Sponsor Co-Chairs**

Rich Engle, 513.785.7273, engler@ci.hamilton.oh.us | Bob Leventry, 513.887.5616, leventryb@butlercountyohio.org



## 2009 Composite Payment Form

Use this form if you are submitting payment for multiple registration forms.

*Attendee, Exhibitor, Sponsor, and Golf Registration available online at [www.ohiowea.org](http://www.ohiowea.org)*

Company Name		
Address		
City	State	Zip
Contact Name		
Tel #:	Fax #	
Email:		

Registrations Submitted:		
1	Sponsorship Form Total	\$
2	Exhibitor Form Total	\$
3	Golf Form Total	\$
4a	Attendee Form Total - Last Name _____	\$
4b	Attendee Form Total - Last Name _____	\$
4c	Attendee Form Total - Last Name _____	\$
4d	Attendee Form Total - Last Name _____	\$
4e	Attendee Form Total - Last Name _____	\$
<b>Total Payment Amount</b>		<b>\$</b>

<input type="checkbox"/> P. O. #	<input type="checkbox"/> Ck #	<input type="checkbox"/> VISA or <input type="checkbox"/> Mastercard Accepted	
Make checks payable to OWEA and mail to:		CC #	
Ohio Water Environment Association 1890 Northwest Blvd, Suite 210 Columbus, OH 43212		Exp Date	Billing Zip Code
		Name on Card	
Or fax to: 614.488.5801		Signature	

Questions, please contact:

OWEA Office, 614.488.5800, [info@ohiowea.org](mailto:info@ohiowea.org)  
 Dan Sullivan, 2009 Conference Co-Chair, 513.515.6253, [danny.sullivan@fuse.net](mailto:danny.sullivan@fuse.net)  
 Tim Shaw, 2009 Conference Co-Chair, 513.807.7256, [aswater@cinci.rr.com](mailto:aswater@cinci.rr.com)

**Thank you**



***Rounding 3rd . . . and heading to Cincinnati!***

# WEF Membership Application 2009



## Ohio Water Environment Association

Personal Information			
Last Name	M.I.	First Name	(Jr., Sr., etc.)
Business Name (if applicable)			
Street or P.O. Box <input type="checkbox"/> Business Address <input type="checkbox"/> Home Address			
City	State	Zip	Country
Home Phone Number		Business Phone Number	
E-mail Address to receive <i>WEF Highlights Online</i>		FAX Number	
<input type="checkbox"/> Please send me information on special offers, discounts, training and educational events, and new product information to enhance my career. <input type="checkbox"/> by e-mail / <input type="checkbox"/> by fax			
<b>Member Association (MA) Choice**</b>			
** By joining WEF, you also become a member of a local Member Association (MA). Please select the MA you wish to join from the list on the previous page.			

Employment Information (see back page for codes)			
1. ORG Code:	Other (please specify):	2. JOB Code:	Other (please specify):
3. Focus Area Codes:		Other (please specify):	
Signature Required for all new memberships			Date

Sponsorship Information		
WEF Sponsor Name (optional)	Sponsor I.D. Number	ACQ. Code for WEF use only   WEF08

Membership Information			
Membership Categories (select one only)	Member Benefit Subscription (select one only)	Dues	
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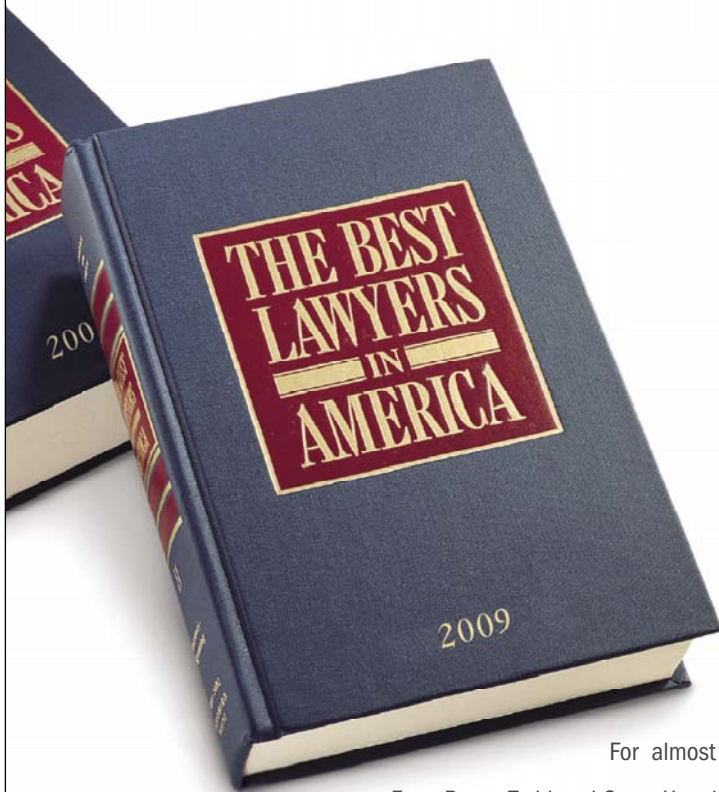
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## LEADING THE WAY - OHIO WATERSHED MANAGEMENT

*by Terry Dalrymple, PE, PS  
Montgomery County Water Services*

The goal of the Clean Water Act was to achieve clean water in rivers, streams and lakes everywhere in the country. Written at a time when the Vietnam War caused sharp divisions in the country, and in the Congress, the Act was one thing everyone could agree upon. Consequently, it was written to be very comprehensive. Anything that caused water pollution was addressed. The first priority was to stop pollution at point sources, such as pipes that direct flow to streams from industrial plants or water reclamation facilities. That led to a building boom in plant construction that has greatly improved water quality in Ohio's lakes and streams. But some people were not satisfied. The Clean Water Act also included improving water quality from non-point sources of water pollution, such as storm water runoff that drains to streams and lakes. As pollution from the point sources diminished, concern about pollution from non-point sources increased. These concerns lead to law suits which were an easy win for the plaintiffs. The judges read the law which says you shall clean the water, from both point and non-point sources. They ordered something to be done. Congress became involved and in 1988 passed an amendment to the Clean Water Act, called the Water Quality Act. The new law required non-point pollution prevention to be implemented in two phases. Phase I (1990) was somewhat specific in its requirements and applied to all cities with a population over 100,000. Phase II (2003) was less specific and applied to all areas outside the Phase I cities that were designated as urban areas by the census bureau. Both phases were implemented through the Ohio EPA permit process. Rural areas were not addressed by the law.



The difference between point sources and non-point sources of pollution can be seen at many water reclamation facilities. Plant operators have observed that water discharged from their plant into a stream is often cleaner and clearer than water flowing in the stream.

This contrast in water quality identifies an issue that has long plagued Ohio and others states. The issue is failure to manage water within a watershed. Water that flows across the land surface, collects and flows in streams and ultimately flows into either the Ohio River or Lake Erie is a system that has been in place since the ice age. In the days when Ohio was entirely covered with forests the system was stable and relatively clean. Watersheds today are different and constantly changing. Urbanization has brought about increased flows, erosion, sediment, flooding and related problems. These problems are preventable but they are not being effectively addressed. There are two reasons they are not being resolved: (1) solutions to the problems require money and (2) comprehensive management of watersheds is not enabled by Ohio law.



An important concept in watershed management involves the relationship between quantity and quality. They are inseparable in nature. In a stream the quantity of water impacts the quality of the water. As flow increases, erosion increases. That means more property damage along the stream and more

suspended solids in the stream. These solid particles moving with the water become carriers for bacteria, viruses, and other pollutants washed into the stream. Another way to say it, when a stream is dirty and looks polluted, it probably is polluted. The entire issue becomes even more important when you are a flood victim and the dirty water flows through the first floor of your house or business.

Mankind has repeatedly attempted to separate quantity from quality and ignore the relationship between the two. Consider the responsibilities assigned to existing water organizations. They are separated into either quantity or quality. Quantity: Corps of Engineers, conservancy districts, county engineers, city and township engineers. Quality: Federal EPA, Ohio EPA, county and city sanitary engineers. Often they do not work closely together to address both issues and sometimes rivalry between them becomes an issue when construction occurs in or near streams. Who is responsible for a comprehensive approach to watershed management? Apparently no one. Our lakes and streams are part of a complex and important utility used by all Ohioans, but that utility remains an orphan.



Our goal, in Ohio and across the country, should be to develop a comprehensive approach to watershed management. We should address flood control, erosion, pollution and its sources, planning, funding, protection of flood plains and all other dimensions of watersheds. A comprehensive approach will enable protection of the environment, private property, recreation, farm land and much more. A law should be developed and passed that will enable the formation of watershed districts operated by elected officials from jurisdictions within the watershed.

This need for a comprehensive approach to watershed management, and the need for new legislation, has long been recognized. The Ohio Storm Water Task Force, part of the Water Management Association of Ohio (WMAO) commissioned a study by Heidelberg College in Tiffin to study laws across the country in hopes of finding a successful program that could be adopted by Ohio. Their report “Analysis of Enabling Legislation from a Multi-jurisdictional Watershed Perspective” was issued several years ago. That report can be read at the WMAO web site ([www.wmao.org/oswtf/storm/legislation.htm](http://www.wmao.org/oswtf/storm/legislation.htm)). The report did not recommend specific changes to Ohio law. Those familiar with the problem have suggested that an existing section of the Ohio Revised Code could be expanded to enable control of watersheds. The section is 6105 – Watershed Districts. The section is written primarily for watershed planning but includes some provisions that are necessary to form a district. It lacks authority for funding, technical assistance and multi-jurisdictional management.

Recommended changes should be developed and reviewed by the public, state and local governments and industry. Developing a bill for consideration by the Ohio legislature will require input from many sources because many businesses and property owners could be affected. The legislation can not be “prescriptive” in its approach. In other words, it can not mandate change. It should only enable local jurisdictions to join together to form a watershed district and control both the quantity and quality of water in the watershed. Many storm water utilities have been started in Ohio in the past several years in response to Phase I and Phase II permit obligations. (The permits do not require formation of a utility.) In virtually every case the utility boundaries are that of a political jurisdiction and not a watershed boundary.



It may be necessary for Ohio to lead the way in this effort. Other states apparently are not moving in this direction. Results will be long in coming but eventually we may reach a time when the water that flows in Ohio streams has the same high quality as the water released from our water reclamation plants.

# CITY OF DELPHOS MBR/ATAD FACILITY PROFILE

by Kim Riddell

*Wastewater Superintendent*

Beginning in 2005, the City of Delphos began a wastewater treatment improvement project that now allows the community to adequately treat its high organic loadings, improve the effluent quality being discharged into Jennings Creek, and meet Total Maximum Daily Loadings (TMDL's) for the Auglaize River Watershed.

The City of Delphos, Ohio along with their engineers, designed the new wastewater treatment plant utilizing Enviroquip / Kubota flat plate membrane technology coupled with a 2<sup>nd</sup> generation ThermAer ATAD solids treatment system from Thermal Process Systems to address the current and future needs of the City, as well as the Directors Final Findings and Orders (DFFOs) filed against the City by the Ohio Environmental Protection Agency (OEPA) in 2002. The use of this treatment technology to address peak flows was a unique application at the time of design of the facility. Start-up of the new facility occurred in October 2006. The City received funding for this project from the Ohio EPA's Division of Environmental and Financial Assistance (DEFA). The plant has a design average day flow of 3.83 MGD with a peak 48-hour flow of

12 MGD and an 8-hour peak flow of 18 MGD. The ATAD system is designed for a loading of 8,700 lbs/day.

Capacity was a critical factor in the design of the new wastewater treatment facility. Although Delphos has a population of approximately 7,000, the wastewater treatment system needed to be capable of handling the wastewater equivalent loadings of a community the size of 50,000 people. In addition to the industrial loadings, the City of Delphos has a combined sewer system which provides for a large peaking factor at the plant. The average dry weather flows experienced by the facility are approximately 1.5 million gallons per day (MGD); however, when it rains, the plant experiences flows in excess of 8 times that. In addition to the new facility, the City of Delphos added on to an existing storm holding pond to increase the storm pond holding capacity for the City to 12 million gallons. Demolition of the existing trickling filter facility was also part of the total project.



The new (2006) state-of-the-art facility is the largest flat plate membrane bioreactor facility in the North America. It is also the only municipal membrane treatment facility in operation with an Autothermal Thermophilic Aerobic Digestion (ATAD) solids handling system.

Following is a step-by-step guide through the wastewater treatment processes of the City of Delphos:

## **Influent Pump Station**

Wastewater from the City enters the influent pump station located at the previous facility site through two lines: a 48 inch and a 12 inch gravity sewer. The wastewater flow is screened to remove large objects that could interfere with downstream pump performance. The pumping arrangement had to accommodate flow variations of approximately 400 gpm at night to a peak flow of in excess of 8,000 gpm during a storm



event. From the influent pump station wastewater flows through two 18 inch force mains under Jennings Creek and over to the headworks at the new facility.

### Headworks

Solids are further removed through 3 millimeter Andritz fine screens and a Schreiber aerated grit and grease removal system. This additional solids removal step is critical to the operations of the membrane system. Large or sharp pieces of debris could puncture or block flow to the membranes. The fine screens are completely redundant units rated for a future peak of 18 MGD each and these units can not be bypassed.

Also located in the Headworks Building is the JWC Muffin Monster Septage Receiving Station. Waste from independent septage haulers is screened to remove large materials and processed through the fine screens and then on to the rest of the plant. Software included with the system automatically collects flow data and assists management with the billing statements for the haulers.

### Membrane Bioreactor (MBR)

Biological treatment occurs in the anoxic, pre-aeration and aeration tanks of the Enviroquip / Kubota flat plate MBR process. This system houses 130 double stacked membrane units with 52,000 individual membrane plates within five trains.

In a conventional treatment facility organic matter is utilized by bacteria and transformed into inert matter



which can then be removed through clarification and/or filtration. During this process, ammonia is converted into nitrate. This treatment method leads to an effluent quality that meets typical NPDES requirements.

Membrane bioreactors, on the other hand, take the place of clarification and filtration typically installed in conventional treatment facilities. Membrane plates handle solids that typically pass through conventional treatment systems by physically blocking them from

*continued on page 40*

passing through to the effluent. The bioreactor also incorporates biological nutrient removal via the anoxic zones allowing for nitrification/de-nitrification processes. Alum is added to the process to assist with phosphorus removal. The system regularly produces effluent quality of <2.0 mg/l CBOD<sub>5</sub>, <0.4 mg/l TSS, <0.2 mg/l ammonia nitrogen, <0.04 mg/l total phosphorus with alum addition and <0.4 mg/l total phosphorus with no alum addition.

Using the concept of *biohydraulics*, the MBR System was designed to exceed biological treatment objectives over the range of expected operating conditions. Designed using the Storm Master™ configuration, the plant is also equipped with the Symbio® technology, which helps to promote simultaneous nitrification and denitrification (SNdN) in the supplemental aeration zone. Operating at low DO in SNdN mode can reduce operating costs and ensure optimum biological process performance. The Storm Master™ design is an important feature of the Delphos WWTP because it further reduces overall plant operating costs by putting offline membrane capacity to beneficial use. Utilizing the Storm Master™ design, Enviroquip and the City's engineers actually automated the plant to handle flows ranging from 300 gpm (0.4 MGD) to a maximum net capacity of 8,328 gpm (12.0 MGD). As a result, the effective turndown ratio of the plant is 28:1. The plant has already experienced minimum recorded flows of approximately 400 gpm and peak flows in excess of 8,000 gpm (during periods of high rainfall).

During normal flows, solids from the MBR trains are sent to a dedicated membrane thickener (MBT) train. In peak flow events, this fifth train receives influent flow and functions as another MBR train for treatment.

### Post-treatment Units

Effluent from the MBR system enters the Infilco Degremont vertical ultraviolet (UV) disinfection system to inactivate any remaining microorganisms in the effluent stream. Post aeration is also provided to add oxygen to the effluent which helps protect the animals and plants in the Jennings Creek after discharge.

### Autothermal Thermophilic Aerobic Digestion (ATAD)

Solids from the membrane thickener (MBT) are pumped to a gravity belt thickener to remove excess water and take the percent solids to approximately 3 - 5%. Those solids are then pumped into one of two Thermal Process

Systems ThermAer ATAD reactor tanks. The biological activity in these tanks increases the temperature (approximately 140 to 150 degrees Fahrenheit) and the solids are digested by the bacteria resulting in a "Class A" liquid biosolid material. From the reactor tanks, the liquid is moved through a heat exchanger and into a SNDR storage tank where the temperature is lowered to approximately 95 degrees Fahrenheit. This material is suitable for land application as a liquid or as a solid. In order to reduce disposal costs, two Ashbrook combination belt thickener/press units were installed and the liquid from the storage tank is run across a belt press unit where the solids content is increased to approximately 22 - 27%. This cake material can be more easily handled and utilized within the City parks system or for private use by farmers, landscapers, or homeowners in their gardens or flower beds. This system has been extremely effective for the city and has exceeded the expectations of plant personnel. The system regularly achieves total solids reduction in excess of 50% and volatile solids reduction in excess of 65%.

### Conclusion

The city worked with DEFA to secure the loan for the project that was estimated to cost \$29 million. The bids for the project came in at \$31,890,000 and it was determined after working with the auditor that the city would have to raise sewer rates 15% a year for four years beginning in February 2005 and ending in February 2008. The current sewer rate is \$68.78 for the first 1000 cubic feet and \$6.87 for each additional 100 cubic feet. This reflects just slightly over a 100% increase from the rates in 2004. Prior to that, the sewer rates had not been raised more than the consumer price index (CPI) increase each year for the past 15 years.

The final cost of the project was just slightly over \$30 million. The design took less than six months as was required by the OEPA Director's Final Findings and Orders. Construction began February 14, 2005 and the plant was commissioned on September 29, 2006 with the ATAD system start-up in December 2006. All things considered, the planning, design and construction went amazingly well and while it was a sharp learning curve since on a very tight timeline; the Delphos Wastewater Department can say that we got what we wanted and we like it.



## FILAMENTS

# THE PROBLEM CHILDREN OF THE ACTIVATED SLUDGE PROCESS

by Sam Jeyanayagam, PhD, PE, BCEE

## INTRODUCTION

In most cases, activated sludge operational problems can be attributed to an 'incorrect' biomass composition. Excellent examples of this are bulking and foaming, which have plagued the activated sludge process since its inception over 100 years ago. While much work has been undertaken to better understand the phenomena, our knowledge is still incomplete. This article reviews our present understanding of the causes and control of bulking and foaming.

The activated sludge is a living system. Microorganisms, which represent about 60 percent of the mixed liquor solids, co-exist with cell debris, inert and chemical solids, and other waste products (Figure 1). Bacteria are by far the predominant and the most important group. From bulking and foaming perspective, they can be subdivided into two general groups, floc-formers and filaments.

## MECHANISM OF FLOC FORMATION

Activated sludge organisms are 0.5 to 5 micron in size, colloidal in nature, and are incapable of settling as discrete particles. Bacteria tend to form flocs so that they can continue to access substrate and nutrients as the concentrations diminish. In addition, flocs provide protection against predation by protozoa and washout. One of the functions of the activated sludge process is to promote the organism's natural tendency to aggregate into flocs so that they can be easily separated in the final clarifier by the action of gravity. If cell aggregation does not occur, the dispersed solids will end up in the effluent, potentially resulting in permit violation. The floc development process, which begins in the aeration basin, is illustrated in Figure 2. Based on observations, Jenkins et al. (2004) described activated sludge floc formation to encompass two mechanisms:

- Microstructure Formation:** Individual cells bioflocculate or adhere to form a cluster of cells called the microstructure. It is generally accepted that exocellular biopolymers (EBPs) produced by floc-formers play a pivotal role in bioflocculation. EBPs are a collection of complex organic compounds that form a sticky film on the surface of individual cells, which allows them to stick to each other as well as to surfaces (slime growth). While all the factors that impact EBP production have not been identified,

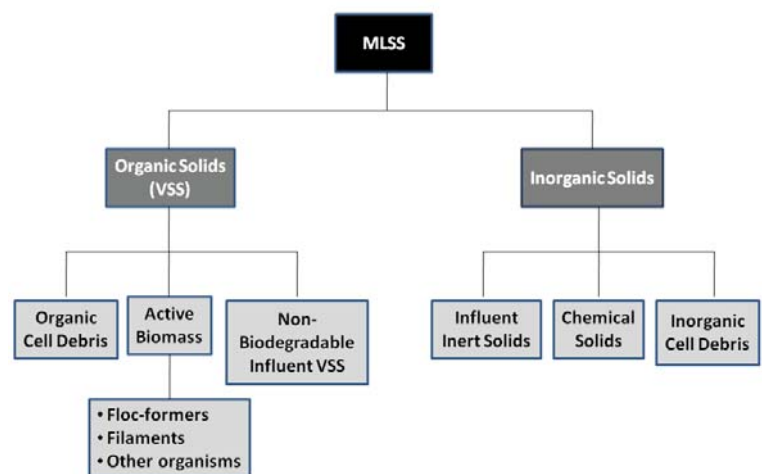


Figure 1: Components of Mixed Liquor

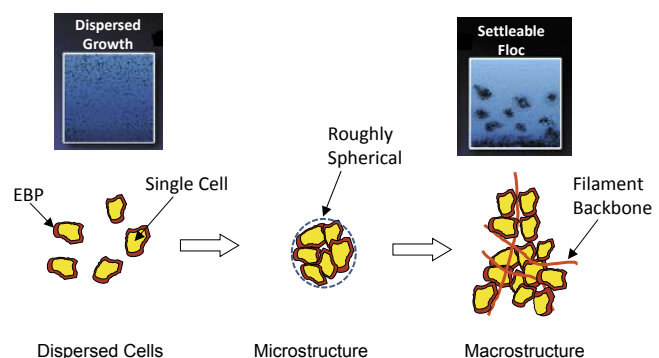


Figure 2: Activated Sludge Floc Formation

solids retention time (SRT) is known to have a significant impact. While SRTs of around 2 days are adequate for cBOD removal, such low values are likely to trigger dispersed growth due to the inability of the organisms to produce EBPs. Longer SRTs (3 days or longer) are generally needed to achieve bioflocculation. As illustrated in Figure 2, the resulting floc, held together by adhesion, is relatively compact and somewhat spherical in shape with no branching. In the absence of filaments, the floc is weak and susceptible to breakup. Particles of different sizes up to 75 microns are formed with different settling characteristics. The larger particles settle quickly while the smaller particles remain in suspension causing a turbid effluent.

- *Macrostructure Formation:* Filaments provide the ‘backbone’ to the floc strengthening it and allowing further growth. In essence, the microstructure is transformed into macrostructure as the bioflocculated spherical flocs attach to the filaments and become branched and compact structures (Figure 2). Because of the reinforcing effect of the filament network, macrostructures are larger, stronger, and more resistant to shearing. A proper balance between floc-formers and filaments ensures good macrostructure formation and a floc that settles quickly, and compacts well in the clarifier leaving a relatively clear effluent. Excess filaments give rise to bulking sludge (Figure 3A) with an open structure that traps water, settles slowly, and compacts poorly.

The final floc size is also determined by the extent of turbulence in the aeration basin. When surface aerators are used, the higher turbulence restricts floc sizes to 250 microns or less. Diffused aeration is more conducive for the formation of larger flocs, often in the 500- to 1000-micron range.

The above explanation focuses on the bacterial cells. In practice, inorganic solids are also captured in the floc matrix. This is an important feature of floc formation in activated sludge systems. The heavy inert solids act as ballast and enhance the settling characteristics of the sludge.

## SLUDGE VOLUME INDEX

Biological sludges, depending on process SRT, composition, density, and ability to flocculate, settle and compact differently. Before discussing the causes and control of activated sludge separation problems, it is useful to review commonly used measurements of sludge settleability. It should be noted that a perfect and universally accepted method to quantify settleability does not exist.

Sludge Volume Index (SVI) is one of the earliest methods developed for quantifying sludge properties. Due to its simplicity, it continues to be used as an approximate measure of sludge settleability in plant design and operation. The standard SVI is calculated by dividing the settled sludge volume after 30 minutes of settling by the mixed liquor suspended solids (MLSS) concentration. In essence, it is the volume (mL) occupied by 1 gram of solids under the test conditions. The widely accepted SVI values are:

<u>SVI, mL/g</u>	<u>Settleability</u>
<100	Very good to excellent
100-150	Moderate to good
>150	Poor

The drawback with the standard SVI test is that it is based on a single and arbitrary point (30 min) on the settling curve. As a result, it is possible for sludges with different settling characteristics to have the same SVI value. For example, Sludge A with excellent settling properties can be expected to complete the zone settling phase in 30 min or less. On the other hand, Sludge B with poor settleability will continue to settle beyond 30 min. If the 30 min settled volumes were the same for both sludges and the MLSS were identical, they would have the same calculated SVIs although Sludge A completed its settling phase long before Sludge B due to superior settling properties. In addition, wall effects cause inaccuracies in the standard SVI measurement since the settling columns used for the test have a very high wall area to volume ratio compared to full scale clarifiers. In an effort to overcome some the deficiencies of the standard SVI tests, the following modified protocols have been introduced:

- Diluted SVI (DSVI): MLSS sample is diluted with effluent to ensure that the 30-min settled volume falls in the 150 to 250 mL range.
- Stirred SVI at 3.5 g/L MLSS (SSVI<sub>3.5</sub>): MLSS sample is diluted or concentrated to 3.5 g/L (3,500 mg/L) and the settling column is slowly stirred at 1-2 rpm to avoid wall effects. The results of the SSVI<sub>3.5</sub> test are more reproducible than those of SVI or DSVI.

## SOLIDS SEPARATION PROBLEMS

Commonly encountered activated sludge solids separation problems may be explained in terms of microstructure or macrostructure failure (Jenkins et al., 2003) as shown in Table 1.

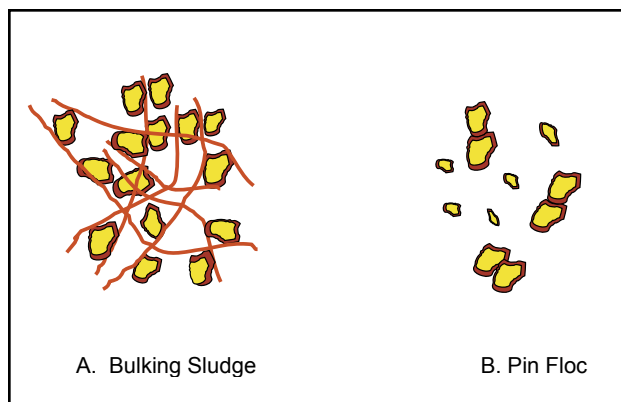
**Table 1: Causes and Symptoms of Common Solids Separation Problems**

Problem	Potential Cause	Symptom
Dispersed growth (Figure 2)	Microstructure failure. Cells do not flocculate and form settleable solids. A few clumps. Mostly isolated cells. Due to short SRTs (start-up condition).	High effluent solids.
Pin floc (Figure 3B)	Macrostructure failure. Compact, weak, & spherical floc. Larger flocs settle rapidly; Smaller particles do not settle or settle slowly. Potentially due to EBP consumption under long SRTs (endogenous) or mechanical disintegration of initially well-formed floc.	Low SVI; turbid effluent.
Filamentous bulking (Figure 3A)	Macrostructure failure. Excessive filaments result in open floc structure that entraps water & protruding filaments that prevent floc compaction. Poor settling and compaction. Caused by conditions that favor filamentous growth.	High SVI; low RAS and WAS solids. Clear supernatant at low sludge blanket. High sludge blanket (thickening failure) can lead to high effluent solids (clarification failure).
Rising sludge	Denitrification in sludge blanket generates nitrogen gas, which creates buoyancy to the settled sludge.	Relatively large floating effervescent (with gas bubbles) sludge mass.
Non-filamentous (viscous) bulking	Excessive EBP production caused by lack of nutrient/micronutrients or presence of toxic compounds.	Sludge with slimy consistency with poor dewaterability. Minimal solids separation. In severe cases, jelly-like build-up occurs on the weirs.

## BULKING SLUDGE CONTROL

Corrective strategies that can be implemented to control filamentous bulking (Figure 3A) fall under two categories:

- Specific methods: These are preventive strategies that aim at maintaining a proper balance between floc-formers and filaments by favoring the growth of the former and suppressing that of the latter.
- Non-specific methods: These are remedial methods that are implemented after the fact to cure the symptoms.



Figures 3A-3B: Activated Sludge Setting Problems

## Specific Methods

Conditions that trigger filamentous growth are specific to the organism. Hence, the proper identification of the causative filaments is essential for finding the correct control methods. A discussion of specific methods available for controlling sludge bulking is provided below.

### *Kinetic and Metabolic Selection*

One of the most effective control strategies takes advantage of the different kinetic and metabolic requirements of floc-formers and filaments. Figure 4 shows the growth kinetics of these two bacteria. It is clear that at low substrate (cBOD) concentration ( $S_1$ ), such as those encountered in complete mix systems, filaments have a higher specific growth rate. This has been attributed to the larger surface area per unit of bacterial mass for the filaments, which allows them to access the substrate in low concentrations more efficiently than floc-formers. On the other hand, in systems where the substrate concentration is high ( $S_2$ ), as in plug-flow reactors and SBRs, floc-formers grow faster and outcompete filaments. Hence, kinetic selection of floc-formers can be achieved by configuring the bioreactor with multiple compartments to create a concentration gradient. The high substrate concentration (or high F:M ratio) at the beginning of the bioreactor provides floc-formers a kinetic advantage allowing them to grow at a significantly higher rate than filaments. Kinetic selectors do not eliminate filamentous organisms but inhibit their growth. It appears that in order to realize a noticeable improvement in SVI, three or more stages are required in the aeration basin.

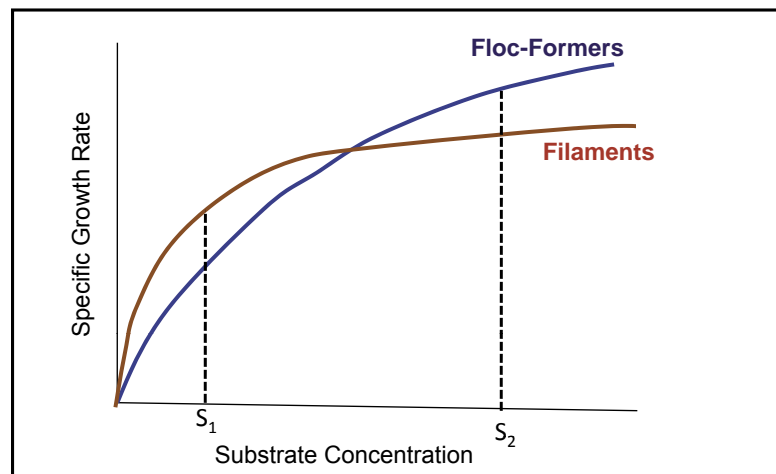


Figure 4: Growth Characteristics of Floc-Formers and Filaments

Metabolic selection takes advantage of the ability of certain organisms to obtain energy by more than one metabolic pathway. For example, some floc-formers are able to take-up readily biodegradable substrate under anoxic or anaerobic environment. This differentiates them from filaments, which require strict aerobic conditions to metabolize the food. The effectiveness of metabolic selection can be further enhanced by combining it with kinetic selection by staging the anaerobic and anoxic zones to provide a concentration gradient. However, it should be noted that if the anaerobic or anoxic environment is too small, all of the readily biodegradable substrate will not be removed resulting in low substrate concentrations in the subsequent aerobic zone, a condition that could trigger filamentous growth.

From a design and operations perspective, the concept of kinetic selection is the basis for using aerobic selectors while metabolic selection is the basis for including anoxic or anaerobic selectors. Biological nutrient removal (BNR) plants incorporate anaerobic and anoxic zones. Hence they practice metabolic selection as part of the nutrient removal process. Table 2 summarizes design guidelines for aerobic, anoxic, and anaerobic selectors (IWA 2008).

Table 2: Selector Design Guidelines (IWA, 2008)

Parameter	Value
<b>Aerobic Selector</b>	
Stages	≥3
Contact Time, min	10-15
F:M Ratio, lb COD/lb MLSS.d	12 (1 <sup>st</sup> Stage); 6 (2 <sup>nd</sup> Stage); 3 (3 <sup>rd</sup> Stage)
DO Conc., mg/L	≥2
<b>Anoxic Selector</b>	
Stages	≥3
Contact Time, min	45 – 60
F:M Ratio, lb COD/lb MLSS.d	6 (1 <sup>st</sup> Stage); 3(2 <sup>nd</sup> Stage); 1.5 (3 <sup>rd</sup> Stage)
Substrate requirements, rbCOD/NO <sub>3</sub> -N	7-9
<b>Anaerobic Selector</b>	
Stages	≥3
Contact Time, min	60-120
Substrate requirements, rbCOD/PO <sub>4</sub> -P	9-20

rbCOD – Readily biodegradable COD

### Other Specific Control Methods

In addition to selectors, other specific methods that control sludge bulking are briefly outlined below. The focus here is to eliminate conditions that encourage filamentous growth.

- **SRT Control:** It is not uncommon for activated sludge systems to be operated at excessively long SRTs. By reducing the operating SRT to a value necessary for meeting process objectives, long SRT filaments will be washed out of the system. One approach is to adopt automatic SRT control, which would allow the actual SRT to be maintained as close as possible to the design SRT. Another approach is to waste mixed liquor directly from the bioreactor. Because MLSS is more dilute than the clarifier underflow, continuous wasting would be possible and small changes can be made to the wasting rate to maintain the desired SRT. The drawback to this practice is that the downstream solids handling facilities will need to be sized to handle a larger volume of unthickened WAS.
- **Nutrient Addition:** Filamentous growth caused by nutrient deficiency may be corrected by adding macro-nutrients (N & P) or micronutrients (Ca, Mg, Fe, etc.).
- **Adequate DO:** Low DO filaments often develop in oxidation ditches with point source (surface) aerators due to the occurrence of low DO zones. While this condition can be remedied by adding supplemental aeration, doing so will eliminate anoxic pockets within the mixed liquor, which offers the opportunity to realize energy savings and nitrogen removal. Low DO filaments also occur in plug flow BNR systems due to backflow. For example, in a 15 feet deep aeration basin, the expansion due to air bubble volume will increase the water level of the aerobic zone by 4 to 6 inches thereby creating a reverse gradient for the backflow of oxygen-rich mixed into the anoxic or anaerobic zone. This can be prevented by proper baffle and hydraulic design.

### Non-Specific Methods

Non-specific methods treat the symptoms of filamentous bulking. The outcome is generally immediate. Because no effort is made to resolve the root cause of the settling problem, non-specific methods may need to be repeated periodically to reap the benefits on a continuous basis. Examples of non-specific methods include:

### *RAS Chlorination*

The feature that makes filaments efficient scavengers of low concentration substrate namely, relatively large surface area per unit of bacterial mass, also makes them vulnerable to chlorine. This is the basis for RAS chlorination, which selectively:

- Kills filamentous organisms that are on the surface of the floc
- Damages the filaments that protrude through the floc. Consequently, the organism though not dead, is rendered incapable of out-competing floc-formers due to the loss of their ability to scavenge.

Every activated sludge plant should include the provision for RAS chlorination to provide operational flexibility to control filamentous growth. Recommended dose ranges for RAS chlorination are presented in Table 3.

**Table 3: RAS Chlorination Dose Guidelines (Jenkins et al, 2004)**

<b>Chlorine Dose, lb Cl<sub>2</sub>/10<sup>3</sup> lb MLSS.d</b>	<b>Remarks</b>
2 to 3	SVI generally under control. Maintenance dose to kill newly formed filaments each day.
5 to 6	High SVIs. Kills excess filaments over several days. Generally no impact on effluent quality.
10 to 12	Very high SVIs. Kills filaments rapidly. May also result in dispersed growth leading to poor effluent quality. Should be not be used continuously.

While the above table provides general dose guidelines for RAS chlorination, site specific requirements should be determined cautiously to ensure no process impacts. In the author's experience, although nitrification is inhibited first, it also recovers sooner when chlorine feed is terminated or reduced. The impact on enhanced biological phosphorus removal (EBPR) appears to persist longer. A continuous chlorine dose range of 0.7 to 1.0 lb Cl<sub>2</sub>/lb 10<sup>3</sup> MLSS.d has been found to be safe for EBPR.

Other chemicals that have been applied to the RAS to control filaments include hydrogen peroxide, ozone, and proprietary filamenticides.

### *Increase of Settling Velocity*

The practical ramification of excessive filaments is reduced settling velocity of the floc, which impacts clarification capacity. Often this problem can be resolved by adding chemicals or additives to the final clarifier to increase the specific weight of the floc and enhance the activated sludge settling characteristics (reduce SVI) as outlined below:

- When inorganic coagulants (iron or aluminum salts) are added to the clarifier, they react with alkalinity to form a hydroxide precipitate, which acts like a 'fish net' gathering bulking sludge and enmeshing dispersed particles. This 'sweeping' action results in the formation of larger and heavier particles that settle quickly. Due to varying operating conditions, a wide range of chemical dose (7 to 60 mg/L) has been reported to be necessary to control SVIs. Jar tests should be performed to determine site-specific dose requirements. The drawbacks include: additional solids production, increased inert solids (chemical precipitate) in MLSS, alkalinity consumption, and potential interference with UV disinfection.
- Addition of relatively low dose (1 to 2 mg/L) of cationic and/or anionic polymers has been shown to be effective in lowering SVIs. Unlike iron and aluminum salts, polymers do not increase sludge production. Overdosing or prolonged dosing can cause a decline of sludge settleability. It is recommended that jar testing be initiated to develop polymer dose.

- In facilities that include primary clarification, bypassing part of the flow around the primary clarifiers to the aeration basins would provide a supply of heavier inert solids. These solids will be incorporated into the mixed liquor thereby increasing sludge settleability.

## BIOLOGICAL FOAMING

It is not unusual to encounter surface foam in activated sludge systems. In a well operating system, light tan foam often covers up to about 25 percent of the reactor tank. Excessive foam is unsightly, can interfere with operations, and could potentially lead to compliance issues. Independent national surveys have indicated that filamentous foaming is a problem in up to 72 percent of the plants surveyed in North America. In addition, plant surveys and author's experience indicate that foaming is most prevalent during seasonal changes. Spring and fall (temperature range: 14 to 22°C) appear to be the most vulnerable periods.

Although our knowledge of foam formation is not complete, we know that despite popular belief, foaming is not caused by a single filamentous organism called *Nocardia*. In addition to various species of *Nocardia*, the causative microbes include several species of *Rhodococcus*, and *Microthrix parvicella*. Because these and other foam-causing organisms cannot be differentiated under a microspore, they are collectively called 'nocardiaforms' or nocardia-like filaments. They all possess features that promote foam formation:

- Presence of mycolic acid in the cell wall that imparts hydrophobic or poorly wettable characteristic with high propensity to attach to air bubbles.
- Ability to use a variety of substrates such as oils, fats, and grease.
- Slower growth rates requiring longer SRTs than floc-formers

## Foaming Mechanism

Foam formation seems to occur when the concentration of nocardiaforms in the MLSS exceed a certain threshold value. Due to their hydrophobicity, filamentous organisms in the mixed liquor attach to the rising air bubbles and are transported to the surface of aeration basin due to increased buoyancy. As this process continues, it results in the formation of a surface foam layer that is continuously enriched with filamentous organisms transferred from the mixed liquor by the rising air bubbles. As a result of enrichment, much higher concentrations of nocardiaforms have been measured in the foam ( $10^{12}$  microcolonies/mL) relative to the mixed liquor ( $10^6$  microcolonies/mL). The surface foam that is formed in this manner is often characterized as a three-phase dispersion of air, water, and hydrophobic solids (mostly nocardiaforms but could also include other solids). The resulting foam is very stable and resistant to breakage. At a specific gravity of 0.7 (lighter than water), it stays buoyant yet not too light to be blown away by normal wind speeds.

Surfactants from industrial operations that are poorly biodegraded will persist in the aeration basin and further enhance the magnitude of the foaming problem.

## Foam Control Strategies

A brief discussion of some of the foam control methods is presented below:

- SRT control is one of the most effective ways to reduce foaming. Since nocardiaforms are slower growing, one operational strategy would be to decrease SRTs to values that would washout these organisms without compromising treatment goals. It should be noted that adopting SRT control after the onset of foaming may not always be effective because most of the nocardiaforms are in the foam layer (see discussion above) and relatively few in the MLSS. For this reason, SRT control should be implemented as a proactive strategy.

- Poorly designed inter- and intra- zone baffles in BNR bioreactors can restrict the movement of foam. The trapped nocardiaforms will have very long SRTs and proliferate rapidly because of their ability to use a variety of substrates such as oils, fats, and grease, which are also trapped with the foam. Design engineers should pay special attention to ensure clear passage for foam through the bioreactor and complete removal in the final clarifiers by using full-radius surface skimmers. Collected foam should not be recycled. Doing so will reseed the system.
- Chlorination of the RAS and MLSS has been used successfully. The effectiveness of this method, however, is dependent on when and where chlorine is applied. If stable foam has already formed, a majority of nocardiaforms would exist in the foam layer above the water surface and is unlikely to be exposed to the chlorine applied to RAS or MLSS. In this case direct application of chlorine to the surface of the foam (see below) would be more effective. RAS or MLSS chlorination can still be practiced as a maintenance strategy to control the filament levels in the MLSS and avoid fresh surface enrichment of nocardiaforms.
- Direct application of concentrated chlorine spray to the foam surface kills nocardiaforms quickly. An engineered system is needed to contain the chlorine spray and to direct it to the desired point of application.
- Selective foam wasting entails physically removing the foam directly from the surface of the aeration basin or mixed liquor channel. This approach provides no opportunity for foam to stagnate and exacerbate the problem. An engineered system for foam collection and conveyance is required.
- Selectors described above for bulking sludge control have been found to be effective for foam control under certain operating conditions.
- Solids processing can potentially lead to foaming. Polymer overdosing to maximize cake solids concentrations during dewatering operations can cause carryover of excess polymer (with the centrate or filtrate) to the aeration basin, where it could trigger foaming. Likewise, poor solids capture during thickening and dewatering can result in the recycle of fine solids, which have been reported to produce 'volcanic' or 'pumice-like' foam.

## CONCLUSION

To-date, more than 30 different filamentous species have been observed in the activated sludge process. Some of them are identified by a number because their characteristics are not yet known. As our detection capability grows, it is conceivable that new species would be 'discovered'. Our present understanding is that in low numbers, filaments contribute to the treatment efficiency while too many filaments result in a deterioration of sludge settling characteristics and excessive foaming. In the author's experience, filament identification over time to account for population shifts is invaluable for the adoption of the correct control/elimination strategy. The design engineer should work in collaboration with the plant staff to implement site specific methods to resolve bulking and foaming issues.



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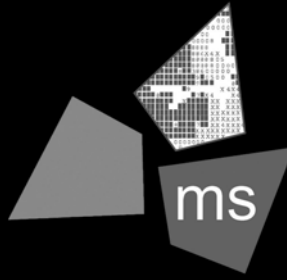
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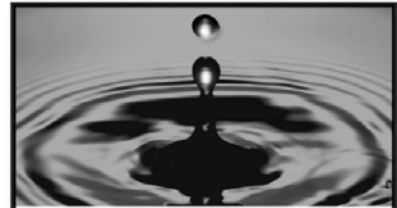


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# OHIO EPA'S CESSATION OF REGULATED OPERATIONS (CRO) PROGRAM

## Why was the CRO program created and which businesses must comply?

Abandoned factories and warehouses can be attractive playgrounds for children and shelters for vagrants. Unfortunately, some businesses abandon industrial facilities without cleaning or securing the dangerous chemicals that were stored, used or treated there. If someone releases these harmful chemicals into the environment, they may cause imminent or substantial threat to public health or the environment.

In 1987, vandals entered the abandoned Dayton Tire and Rubber facility to remove copper cores from several large transformers. This action resulted in the release of polychlorinated biphenyl (PCB) oil, which made its way into a nearby creek. The clean up cost \$8 million and took three years. The manufacture of PCBs was stopped in the U.S. in 1977 because of evidence they build up in the environment and can cause harmful health effects. This and similar incidents led to the creation of the Cessation of Regulated Operations (CRO) program.

If your business is required to submit hazardous chemical reports to the State Emergency Response Commission (SERC) and you stop operations temporarily or permanently you need to comply with the CRO law. The law is codified at Ohio Revised Code Chapter 3752 and Ohio Administrative Code Chapter 3745-352.

## What does cessation of regulated operations mean?

Cessation means discontinuing or stopping regulated operations. Regulated operations refers to the production, use, storage or handling of regulated substances.

## Are some businesses exempt from CRO?

Public utilities, oil/gas production operations and underground storage tanks regulated by the State Fire Marshal's Bureau of Underground Storage Tank Regulation (BUSTR) are exempt from CR. Authorities other than Ohio EPA regulate discontinuing or stopping operations at these types of entities.

## What are my responsibilities as an owner or operator?

You must take responsibility for the regulated substances at your facility when you permanently cease regulated operations (for example moving, selling or closing your business).

### Within 30 days you must:

- Notify Ohio EPA, the local emergency planning committee (LEPC) and the local fire department;
- secure the facility; and
- designate a contact person.

### Within 90 days you must:

- submit a chemical inventory form;
- submit current list of chemicals or Material Safety Data Sheets (MSDS) if chemicals are not on the inventory form;
- remove all regulated substances from the facility; and
- certify removal to the director of Ohio EPA.

## What if I'm only going to stop operating temporarily?

As long as you resume operations within a year, you are not required to comply with all of the CRO program requirements. However, within 45 days you must certify to the director of Ohio EPA that you will resume within a year. If you intend to resume operations but it will take longer than a year, you must receive a waiver from the director.

## If the owner/operator of the facility does not comply, who is responsible for the facility complying with CRO?

- The first mortgage holder
- A fiduciary (holds legal title to the facility for an estate or trust, or can be a lessee)
- Indentured trustee
- Appointed receiver

In general these entities will need to submit a notice to Ohio EPA, the LEPC and local fire department. They will also need to secure the facility until they no longer hold an interest in the property or all regulated substances have been removed.

For more information on CRO, visit our web site at: [www.epa.state.oh.us/dhwm/guidancedocs.html](http://www.epa.state.oh.us/dhwm/guidancedocs.html) Or contact Ralph McGinnis at (614) 644-3065 or [ralph.mcginnis@epa.state.oh.us](mailto:ralph.mcginnis@epa.state.oh.us).

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