

# ONSITE *journal*

Fall 2007

NEWS FOR THE DECENTRALIZED WASTEWATER INDUSTRY

Vol. 16 No. 4

## Featuring this Month:

- Leadership Changes
- Legislative Updates
- Installer Training Pilot Program

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# Water

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<sup>1</sup> Typical TN concentration in residential septic tanks is 68-75 mg/L, per Small and Decentralized Wastewater Management Systems, Crites and Tchobanoglous, p.183



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Initial research at Baylor University focused on utilizing 4 different configurations of Hoot systems.



Hoot has spent the last 6 years and millions of dollars in Research & Development working to get Total Nitrogen below 10 mg/L. During this time the Nitrogen issue has been marginalized and regarded by some as "less important than making sure a riser is screwed down."

Hoot set out to prove that cost effective Nitrogen Reduction could be achieved, and the technology made available at a price that people could afford.



In 2006, Hoot began 3rd Party NSF testing to "Prove" what was previously discovered through research. Cost effective, efficient Nitrogen Reduction to below 10 mg/L can be achieved.

As result the first (and only) system certified below 10 mg/L was born.

The Hoot-ANR is just one of a series of three treatment systems by Hoot that perform <10 CBOD<sub>5</sub> & <10 TSS at the lab and in the field. Additionally, Hoot offers two Nitrogen Reduction Technol-

ogies; one utilizing timed recirculation and another that achieves the maximum Nitrogen Reduction, for the most sensitive environments, that reduces Total Nitrogen as far as possible (5.8 mg/L under the Standard 245).

The Hoot-ANR utilizes a "patent pending" process that adds a food grade additive to provide additional carbon necessary to off gas as much Nitrogen as possible. This process is controlled by a controller, not homeowners.

By monitoring flow through the system, it ensures flow proportional dosing to provide reliable performance. Additional set points can be selected by the maintenance provider for a range of influent from of 35 to 75 mg/L TN.

Some recently advertised studies, NOT certifications, have allowed for system performance to be ignored for the first 16 weeks of the study. The NSF Standard 245 allows a maximum of only a 3 week startup. At the end of week 4, the Hoot-ANR achieved a 92% reduction. (2.7 mg/L TN)

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# ONSITE Fall 2007 journal

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## NOWRA's Growth and Its Voice | by Linda Hanifin Bonner, Ph.D.

Preparing this issue of the *Onsite Journal* (OSJ) has been a great experience in reflecting about NOWRA's growth as an organization over the past seven years and its evolution as the industry's voice. With this reflection are also the wonderful memories of working with NOWRA's members in furthering the Association's mission. It is also a perfect time to express my appreciation for the opportunity of supporting the Association in making its defined objectives become reality, and to thank you for your contributions in fulfilling the dreams of the organization's founders.

In 1991 a group of concerned individuals formed an organization so that the interests of the "PEOPLE and BUSINESSES" in the onsite industry would be represented as a collective body and to have a united national voice on the economic, political and regulatory issues affecting the future of the decentralized wastewater infrastructure. In 2007, NOWRA's growth and its voice on these very issues is positioned to make a difference in both the role, and direction in how decentralized systems will support a sustainable water resources environment. The growth has included many in this journey, and will take many more, working together, to continue the progress.

The diversity of interests and professions of the "People" in NOWRA are significant. To some, their understanding of the importance that their daily work of installing and servicing septic systems 24/7 in all of the adverse weather conditions has in supporting a sustainable water resources infrastructure is not often realized, or appreciated. But without this diversity of membership, NOWRA would not be the organization it is today.

NOWRA's growth from its diversity is evident in the pages in this issue of the OSJ. It is a true reflection of the many professional interests of the organization's members and how its voice in the industry is heard. The "Highlights of Industry Members" illustrates the national recognition NOWRA has achieved in the culmination of a 5-year effort to produce the Model Code Framework and conduct workshops over the past year. How a state's position on an issue detrimental to both protecting groundwater resources and the industry's economic interests was changed with input from this organization, and updates on state and federal legislation affecting this industry, is testimony to the direction provided from NOWRA's leaders.

The "State Association Updates" represents a significant area of NOWRA's growth as a national organization during the past seven years. Working with the states' representatives and John Thomas as the committee chair to support their

organization and development has been for me a tremendous privilege and focus to building the quality of NOWRA's voice. In a seven-year period, NOWRA's growth has gone from 2137 to 5146 members and from 10 affiliated state organizations to 26. The states leaders have an active role in determining NOWRA's future direction, and its members have also given an important voice in their messages and responses described in the NOWRA 2007 Member Survey.

The announcement of NOWRA's 2008 annual conference in the special insert further demonstrates its industry leadership. The quality and the diversity of the presentations and research under the leadership of Sara Christopherson has also brought the organization's work to a new nationally recognized level. In 2007, NOWRA hosted its first international program that together with the collaboration of other organization partners such as the International Water Quality Association (IWA), WERF, and WEF brought 17 countries together in the U.S. to address the future issues on sustainable water resources. That is a landmark achievement!

The growth and activities supporting NOWRA's leaders was often intense. In a 9-month period beginning June 2006, the NOWRA office staff of 3½ people managed the work load of organizing and marketing the August 2006 annual conference, the 2006 Installer Academy, and the 2007 March International Conference; in addition to the normal work of managing member services for the septic locator, processing memberships, producing the *Onsite Journal* and selling advertising and the 2007 Business Benefit Program. The December holidays were devoted to working with Ron Suchecki to update NOWRA's website and produce the new websites for the model code and the 2007 Water For All Life Program. Without his volunteer hours in providing this valuable technical support, these accomplishments could not have been realized. In NOWRA's office, Francis Hammersmith's dedicated hours as a volunteer staff in providing marketing services and working with the conference exhibitors has also been a valuable contribution to this work.

In the past seven years, the miles and meetings with NOWRA members have been many, and rich with experiences of professional relationships and valuable friendships. These gifts never leave and will always be treasured, as will the accomplishments of NOWRA's growth and its voice. I convey my sincerest thank you for the privilege of working with you and supporting NOWRA's growth and the quality of its voice during these seven years. Let's now look forward to the future. ■



I want to take this opportunity to convey several important messages to NOWRA's members and the industry about events that have occurred over the past few months.

## **Thank you Hanifin Associates, Inc.**

The NOWRA Executive Committee, Board of Directors, and the President would like to thank Linda Hanifin Bonner and the staff at Hanifin Associates, Inc. for the past seven years of association management and dedicated personal services and commitment provided to the Association on behalf of its membership. We wish everyone at Hanifin Associates, Inc., the best in their future endeavors.

Special thanks also goes to Francis Hammersmith for all his volunteer work with the business members and exhibitors at the annual conferences and additional support to the organization in many other areas.

Again, thanks to all and sincere best wishes for the future!

## **Welcome BTF Enterprises, Inc.**

As President of NOWRA, I would like to extend a hardy welcome from the NOWRA Board of Directors and Membership to BTF Enterprises, Inc., as they assume the duties of the association management for NOWRA.

Alan Gale of BTF has been selected to fill the role of Executive Director for NOWRA. The Executive Committee and Board of Directors are looking forward to working directly with Alan and all other BTF associates and staff.

The NOWRA task force that chose BTF Enterprises, Inc., spent many days reviewing and interviewing applicants; and I thank all the members of this group for their time spent on behalf of NOWRA. The task force recommended to the Board of Directors that BTF Enterprises, Inc., be selected as the new association management agency. The NOWRA Board of Directors voted and approved the recommendation at its September meeting. I especially want to thank Al Schnitkey and Howard Wingert for their efforts in developing a solid association management contract for the Association.

Welcome aboard Alan and BTF! We are looking forward to working with you to make NOWRA the National Leader in the Onsite/Decentralized Industry.

## **The Future is Ours**

The winds of change are blowing in the direction of a more decentralized/distributed infrastructure. As the world turns to

the green side, the nexus between water and energy emerges and drives the force to re-think the centralized paradigm.

NOWRA and the decentralized/distributed industry are positioned at the pinnacle of change. NOWRA has the expertise and practical experience to establish the Association as a national leader in this paradigm shift.

The time to act is now. It is OUR industry and we need to take control. We need to energize our existing members, recruit new members, get the message out to our state affiliates and start collaborating with our MOU partners and other interested parties.

NOWRA intends to do this with the help of BTF Enterprises, Inc. One of the strong points of BTF Enterprises, Inc., is their ability to help grow associations to their potential and move them into the future.

A quote from Glenn Zimmerman, President of BTF Enterprises, Inc.: "We did our own research when we considered submitting an application to the RFP process and were very impressed with the possibilities and importance of NOWRA's role as a growing association. We came away from the interview process with an excellent feeling that we would be a great fit for the association's needs."

The NOWRA Board of Directors has also created an External Affairs Committee with Mary Clark as the chairperson. The role of this committee is to build coalitions of support with partnering organizations and pursue collaborative programs and strategies to advance a framework for a national sustainable distributed/decentralized integrated water resource infrastructure.

NOWRA is moving forward and needs the support and help of its members to carry its ideals into the future. Now is the time to get involved and help set the future of the decentralized/distributed industry.

If you are interested in serving on any of our standing committees: Communications and Marketing, Conference, Education, Institutes of Learning, Model Code, State Leaders, Technical Practices, External Affairs, Finance, and Government Affairs, please contact Alan Gale at BTF Enterprises, Inc. (1-800-966-2942 or E-mail alan@btfenterprises.com).

Again, many thanks to all of the many people who work hard and devote numerous volunteer hours to make this association a recognized leader in the industry; and especially for your support to Tom and me in leading this organization. ■

## Colorado and Washington Model Code Regulator Workshops

In September and October, the NOWRA Model Code Task Force conducted two workshops in Denver, CO, and Yakima, WA. With funding support from the U.S. EPA, these workshops, conducted by NOWRA, are directed to educating and training regulators and policy officials on developing and changing codes affecting onsite systems. This program, which has been underway since January 2007, has also developed a special Model Code Education and Information website that includes all documents produced as well as updates about ongoing activities.

The workshops have been provided at no cost to regulators and provide an overview of the new Model Code Framework and how it can be used to address regulatory issues within state and local governments. All workshop participants receive a CD containing all documents and the appendices, and a workbook that includes the Framework's Executive Summary and Power-Point presentation. The workshops are conducted by NOWRA's principal leaders who have been involved in the development of these materials: Michael Corry, Richard Otis, Mark Hooks, Tony Smithson, and Linda Hanifin Bonner.

An overall report addressing the issues and topics on the workshops is being produced and will be placed on the model code website. The outreach program to date has included regulators from the states of Colorado, Ohio, Kentucky, Tennessee,

Florida, Maryland, Oklahoma, Massachusetts, Pennsylvania, Virginia, Delaware, West Virginia, North Carolina, Alabama.

In addition, presentations were made about the model code work at the Ground Water Protection Council Conference in San Diego, CA, and at the Association of State and Interstate Water Pollution Control Administrators annual meeting in Wisconsin in August.

## NOWRA Board Urges Georgia Water Council to Change Position on Septic Systems

In September, the Georgia Water Council issued a draft report entitled *Georgia's Water Resources: A Blueprint for the Future*. This document is intended to establish policy for the way the state of Georgia receives and uses its water resources. In a letter to Dr. Carol Couch, Council Chairman, NOWRA expressed its concerns that Georgia regulators are deeming septic systems as a consumptive water user within the State's proposal to treat wastewater via municipal sewer systems with surface discharge.

NOWRA informed the Council that it is not aware of any other states taking this position. NOWRA's primary concern is that the "consumptive water user" designation contradicts an existing body of scientific research. For example, a "White Paper" written by Ph.D. soil scientists and hydrologists from the University of Georgia reports that 91% of water discharged into the soil by onsite systems enters groundwater reserves. Recent studies conducted in Florida also document that wastewater recharge to streams can be rapid. We also understand that U.S. Geological Survey scientists have expressed their concerns regarding the accuracy of the "consumptive use" language and are calling for additional research.

NOWRA has strongly encouraged *The Water Council* to drop the consumptive use provision until a comprehensive, Georgia-specific study can (a) characterize said consumptive loss and (b) evaluate the benefits of shallow aquifer recharge. Groundwater recharge, including that from treated septic tank effluent, is an important contributor to river base flows during times of drought. It should also be noted that some areas of Georgia use groundwater as a potable water source. In those regions, the current plan promotes withdrawing groundwater and placing it in surface waterbodies. NOWRA believes this type of policy could lead to numerous unforeseen pollutant problems such as saltwater intrusion of groundwater in coastal areas. The result of this action is that the Council is now reconsidering many of the statements that have been presented in this report. NOWRA is continuing to monitor this issue. ■

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## NOWRA's New Association Management Team Announced

The NOWRA Board of Directors selected BTF Enterprises, Inc. of Santa Cruz, CA as their new association management agency effective October 1, 2007. Alan Gale, MBA of BTF has been selected to fill the role of Executive Director for NOWRA.

"All of us at BTF are very excited to be selected as NOWRA's new management firm. We look forward to getting up to speed with everything as soon as possible. NOWRA has some important challenges to deal with but more importantly NOWRA has so many wonderful opportunities. With a little patience and a commitment to excellence from everyone involved the future is very bright for this organization," pledged Gale.

"We were very impressed with BTF throughout the interview process. The whole team at BTF—executive staff, management and specialist support staff—possess the additional capabilities we were looking for to help us grow NOWRA into the future," says Jerry Stonebridge, NOWRA's president. "Alan's background and experience in organizational and project management should be a great fit for us."

BTF Enterprises, Inc is an association management company with successful experience in growing the revenue, mem-

bership and programs of the organizations they serve. The agency brings a new team of professionals to NOWRA for the association's work. "We did our own research when we considered submitting an application to the RFP process and were very impressed with the possibilities and importance of NOWRA's role as a growing association. We came away from the interview process with an excellent feeling that we would be a great fit for the association's needs," offered Glenn Zimmerman, President, BTF Enterprises. Zimmerman's role with the firm involves financial strategies, organizational development, leadership development and management. Julianne Vaughn, MBA, CMP, CMM, Vice President BTF added, "There is a lot to do right away, but we are ready to get busy!" Vaughn's focus with the firm is in the areas of business strategies and marketing and organizational development.

Hanifin Associates, Inc. (Edgewater, MD) and BTF have been co-managing NOWRA's activities during the month of October. NOWRA's Board of Directors sincerely thanks Dr. Linda Hanifin Bonner and the staff of Hanifin Associates, Inc. for the dedication of their work, quality of professional services, energies and personal commitment to NOWRA during the past seven years of its growth. ■

## Drought Conditions Force Reassessment of Water Supply and Treatment Strategies across the Country

Drought is spreading fast across the U.S. with 43 percent of the country now under drought conditions. The National Climate Data Center reported in mid-October that the drought parching the south and west has now spread to the Mid-Atlantic States. With these conditions expected to continue and some areas already in a water supply crisis, strategies for long term measures to protect and remediate our water supplies are critical.

One answer to the challenge of replacing the water we use is onsite or "decentralized" wastewater treatment as opposed to centralized sewers. Unlike central sewer systems, decentralized septic systems naturally treat and purify wastewater and replace 100 percent of the purified wastewater safely to the environment to recharge groundwater supplies. Currently, one in four households in the United States uses an onsite septic system to process household waste.

In a drought, a properly maintained septic system actually eases a water shortage by recharging local streams, ultimately returning water to reservoirs, according to Todd Rasmussen, a professor of hydrology at the University of Georgia in a recent article published in the *Gainesville (Ga.) Times*.

According to the U.S. Environmental Protection Agency,

"Properly managed decentralized wastewater systems can provide the treatment necessary to protect public health and meet water quality standards, just as well as centralized systems."

In most states, both onsite wastewater treatment systems and central sewers are used. The frequency of each depends on the area, population, and environmental concerns. Cost of a typical onsite system is between \$2500 - \$7500 to purchase and install plus around \$250 every 3 to 5 years to maintain. This compares to around \$20,000 per home over a 20 year period for a sewer hookup and usage fees.

"The public is getting misinformation about these wastewater workhorses," comments Mark Hooks, National Onsite Wastewater Recycling Association board member and regulatory consultant for Infiltrator Systems Inc. "What we want them to know is that septic systems actually help prevent drought and health issues and conserve energy—and, they don't overflow into our water bodies during power outages."

Information contacts: Mark Hooks at (888) 261-8265 or mhooks@infiltratorsystems.net, U.S. EPA at [www.epa.gov](http://www.epa.gov), or Small Flows Clearinghouse at [www.nesc.wvu.edu](http://www.nesc.wvu.edu). Infiltrator Systems Inc. is based in Old Saybrook, Connecticut.



# NOWRA Co-Sponsors Installer Training Pilot Program

In March 2008, NOWRA will sponsor one of the four planned Installer Training Programs, in conjunction with the Virginia Onsite Wastewater Association. The curriculum for this program is being developed by the Consortium of Institutes for Decentralized Wastewater Treatment (CIDWT). The CIDWT is also providing the materials for the NOWRA 2007 Installer Academy.

The CIDWT Installer Training Curriculum discusses the various treatment and distribution technologies available for managing wastewater onsite and establishes a benchmark for conducting installation. Standardization of installation practices helps you compete for jobs and clarifies communication with your clients.

The Consortium of Institutes for Decentralized Wastewater Treatment (CIWDT), often referred to as "The Consortium", is a group of professionals from educational institutions, training entities, private industry, regulatory agencies, as well as citizens' groups. These professionals cooperate on decentralized wastewater research and outreach training and education. CIDWT is working cooperatively with NOWRA and NEHA to establish and communicate a set of minimum guidelines for the installation of onsite wastewater treatment systems. The curriculum is designed to support the NEHA Certified Installer of Onsite Wastewater Treatment Systems (CIOWTS) credential. CIDWT has enlisted a group of installers from across the country to provide input on a guidance document and training materials. In cooperation with NOWRA and VOWRA, CIDWT will conduct the second of four pilot training events using these materials in March 2008. This is a unique opportunity for installers to take advantage of training while participating in a national curriculum development process. Participation will allow the CIDWT writing team to gauge the effectiveness of these critical training materials. The instructors for this program are nationally recognized for their expertise and effectiveness as educators and their ability to work with stakeholders to develop high-quality, peer-reviewed curriculum materials that are used both nationally and internationally.

## Who would benefit from this class?

These course materials will directly benefit professionals who install onsite wastewater treatment systems. Installers, regulators, and designers of onsite wastewater treatment systems will gain a better understanding of the activities related to proper installation and startup to maximize the efficacy,

longevity and performance of these systems. Some of the benefits you will receive are:

- Clarification of installation practices through the use of the installation and startup checklist. This will lead to an improved relationship with your clients.
- Improved communication allows you to respond to and meet your clients' wastewater infrastructure needs and maximize the use and value of their property.
- Collection and documentation of critical construction planning and job site safety information through use of the checklist forms.
- Performing your work to a National standard will help reduce your liability exposure.
- Standardization of services improves your ability to compete in the marketplace.

## Why participate in the Installer training courses?

This course will improve your ability to:

- Effectively evaluate the site conditions and system installation when developing a contract.
- Review a design plan and conduct a site review to successfully develop a bid and plan for construction.
- Evaluate site conditions with respect to OSHA construction safety practices.
- Use surveying practices to lay out the system, locate components and evaluate proper elevations.
- Recognize how site conditions influence equipment selection and installation methods.
- Understand how effective excavation, bedding, placement and backfilling methods help achieve stable, watertight components.
- Select and assemble pumping systems and properly adjust and verify control settings.
- Implement the critical practices needed for installation of advanced treatment system components.
- Install soil treatment areas at the proper elevation using appropriate materials while maintaining natural soil conditions.
- Use standardized checklists for verifying completion of installation process and subsequent startup activities.
- Appreciate how proper installation influences subsequent operation and maintenance activities and facilitates overall management of onsite wastewater treatment systems.

*continued on page 11*

## Abstracts for Posters Still Being Accepted for 2008 Conference

Even though the development of the conference program is underway, it is still not too late to submit an abstract for consideration in the NOWRA Annual Conference in Memphis, Tennessee, on April 7–10, 2008, either for a paper presentation or poster.



Two types of posters are open for considerations:

1. Technical topics including both case studies with limited data and research projects with a larger data set.
2. Policy topics dealing with regulations & policy, management, etc

Questions about the applicability of a topic should be discussed with Committee Chair, Sara Christopherson by email at [shc@umn.edu](mailto:shc@umn.edu) or by phone at 612-625-7243.

### Poster Abstract Deadlines

1. Abstract submittals are due by January 4, 2008
2. They will be submitted electronically to NOWRA's Education Chairperson at [shc@umn.edu](mailto:shc@umn.edu)
3. Confirmation of submission will be sent via email within one week of the abstract being received.
4. Poster formatting requirements will be provided by February 1.

Please visit NOWRA's website for abstract submittal details.

## Pre-Conference Symposium Focuses on Nitrogen

As a prelude to its 17th Annual Conference in Memphis, Tennessee, the NOWRA Technical Practices and Education Committees are featuring their second Nitrogen Symposium. This unique forum is designed to bring the onsite wastewater community together with the scholarly research community in order to create a pathway of communication. The Symposium begins Monday, April 7, 2008, with invited speakers, who are experts in their field, addressing nitrogen issues related to the onsite industry.

Among the topics being considered is a basic understanding of Nitrogen concepts such as: Nitrogen fate and dissipation; environmental risks; basic chemistry; atmospheric processes; effects on rivers, lakes and oceans; and sources. Also included will be: onsite sources and loads; fate and dissipation; nitrogen and engineered treatment processes; nitrogen and modeling; a mathematical process to estimate loads and risks; model processes; modeling fate in marine ecosystems and inland watersheds; and the latest efforts by this group experts.

At the end of the plenary presentations, a panel discussion will address questions from the audience. In the afternoon, conference attendees will present questions and comments, with the invited experts in the audience. Additional questions or participation requests should be directed to Matt Byers, Ph.D, Technical Practices Committee Chair – [mattb@zoeller.com](mailto:mattb@zoeller.com).

## Installer Training Program *(continued)*

### Training Format

This program is lecture-style with PowerPoint slides to aid in discussion. The main focus of the lectures are what items need to be verified and recorded on installation and startup checklists associated with each technology. The checklists provide a detailed guide to achieve a quality installation and are included in a training manual that will be provided to each participant.

### Continuing Education Credits

These course materials were not submitted for continuing

education credits. Please check with your certifying entity for approval for continuing education.

### Co-Sponsors

The co-sponsors of the program are U.S. Environmental Protection Agency; Water Environment Research Foundation; National Decentralized Water Resources Capacity Development Project; National Onsite Wastewater Recycling Association; National Environmental Health Association; and USDA-Cooperative State Research, Education, and Extension Service (CSREES). ■

### DELAWARE ONSITE WASTEWATER RECYCLING ASSOCIATION

The 11th annual DOWRA Conference “On-Site Wastewater, the Ever Changing Industry” was held October 23 & 24, 2007 at the Delaware State Fairgrounds in Harrington. For the first time in DOWRA history the conference sold out two weeks in advance making it the most attended Conference to date. Over 330 attendees representing contractors, designers, regulators, operators, engineers and soil scientist were gathered to share and gain knowledge of current industry practices and technologies.

The Conference featured over 20 different educational sessions presented by local, regional, and national presenters in a two tract schedule. Presentation topics included: rapid infiltration basins; pumps and controls, emerging technologies; septic 101; installation practices; soil surveys; mounding analysis; operation and maintenance; nutrient removal; WWTP operations; membrane filtration; and large system construction and operation. The Conference also hosted over 44 exhibitors.

The Conference schedule allowed something for everyone, and also included separate manufacturer education and endorsement time. Members attend the conference not only for the opportunity to gain over 10 Continuing Education Training hours, but also as an opportunity to network with other on-site professionals.

Each year the conference continues to grow and this is due to the great support of our members, manufacturers, and industry professionals.



With over 330 in attendance, DOWRA's 2007 Conference was its most attended conference ever.

### IOWA ONSITE WASTE WATER ASSOCIATION

#### SAVE THE DATE! 10th Annual Conference:

January 22–23, 2008 • Des Moines, Iowa

#### NEW THIS YEAR

- **Location:** Des Moines Airport Holiday Inn, 6111 Fleur Dr.
- **Certified Installer Onsite Wastewater Treatment System (CIOWTS) Testing.** This follows a Monday and Tuesday installation review presented by University of Minnesota's Sara Heger Christopherson and Dave Gustafson
- **Vendor presentations added to breakout sessions.** Three Platinum Plus sponsors/exhibitors will teach the ins and outs of their products during Tuesday and Wednesday workshops.

**CONFERENCE SPEAKERS** include Sara Heger Christopherson (Univ. of Minnesota), Christl Tate (NEHA), Dan Olson (Iowa DNR), Chris Boswell (Iowa DOT), Ken Sharp (Iowa DPH), Tom Ashton (American Manufacturing Co.), Bill Chandler (CSI Controls), Brian McQuestion (Hoot Systems), Rick Rogers (Rogers Electric), Mike Barker (MMS Consultants), Doug Bird (Bremer County Building, Zoning and Sanitation), Cali Beals (business consultant), Chuck Martinck (LaMair-Mulock-Condon Co.), Gene Pint (American Family Insurance)

#### TOPICS

- **Installation**—Wiring Pump Stations, Tanks, Preventive Maintenance, Pump Selection, Switches, Pump Control, Soil Analysis
- **Business**— Insurance, Employee Handbooks, IDOT Rules, Contractor Roundtable
- **Engineering**— Effluent Movement Through Soil, Drip
- **Regulations**— Implementing a Certification System, NEHA, New Waste Hauler Regulations, Sanitarian Roundtable

**CIOWTS:** Register by January 1, 2008 at [www.neha.org/onsite](http://www.neha.org/onsite) for testing and pay the testing fee to NEHA. IOWWA's two-day pre-exam review is limited to the first 50 members who sign up with IOWWA for the CIOWTS training along with the conference. You need not attend the CIOWTS training to sit for the exam on Tuesday afternoon at 3:30 p.m. **For questions about the IOWWA conference, visit [www.iowwa.com](http://www.iowwa.com) or contact Alice Vinsand, Inc. or call 515-225-1051.**

**IOWWA Membership:** In 2008, membership is reverting to the 2006 structure and will be for individuals rather than a general “per company” membership. Visit [www.iowwa.com](http://www.iowwa.com) to download the 2008 IOWWA membership form. You can also download the 2008 Conference registration form and the sponsor/exhibit form. Registration fee for the conference does *not* include your membership fee. Your winter newsletter also will carry complete registration information and materials.

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## KENTUCKY ONSITE WASTEWATER ASSOCIATION

Letter to members:

As many of you know, I resigned from KOWA earlier this year as a result of health issues and the need to lessen my day-to-day responsibilities. (I am doing great, by the way, and looking forward to more free time with my family.)

KOWA secured new management services from the Kentucky Rural Water Association and the transition is progressing well. We want to assure you that KOWA will continue to operate as an independent entity, led by the KOWA Board of Directors and its Committees. KOWA will continue to provide the quality services Kentucky's onsite industry has come to expect. In fact, with increased staffing and other networking resources, KOWA is setting the stage for improving current services and providing new ones. We encourage you to maintain your relationship with KOWA and its Board members and to get to know the new management, as well.

KOWA Office

3251 Spring Hollow Avenue

P.O. Box 1424, Bowling Green, KY 42102-1424

Phone: 270-715-0043; Fax: 270-796-8623

Website and e-mail addresses remain the same until further notice.

It has been my pleasure to work with you and all of you have my best wishes for future success! —Karen Purdom

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## MICHIGAN ONSITE WASTEWATER RECYCLING ASSOCIATION

### Abby Johnson Wins MOWRA Scholarship for 2007–08

Abby Lynn (Richmond) Johnson from Leslie, Michigan, a student in the Biosystems Engineering Program at Michigan State University, has been awarded this year's \$1,500 scholarship made available by the Michigan Onsite Wastewater Recycling Association (MOWRA). This is the third year now that MOWRA has awarded such a scholarship to a deserving student with interest in the decentralized wastewater field.

Abby, now about half-way through her college experience, has a perfect 4.0 GPA. In her application for the scholarship Abby says: "Decentralized wastewater systems represent a less invasive, more sustainable way of managing wastewater produced by populations, when compared to municipally run wastewater treatment facilities. It is this sustainability that interests me the most. My career focus is directed toward development and improvement of wastewater systems that protect the environment and increase sustainability."

We wish Abby the best in her pursuit of a career in this field. We hope to be able to introduce Abby to everyone at our annual Wastewater Education Conference at the Kellogg Center in January.

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## MOWRA 57th Annual Conference

- January 8–10, 2008 - Kellogg Hotel & Conference Center, Michigan State University, East Lansing, Michigan
- For exhibitor registration information, contact Dan Milan (989) 773-9938 or email: milantech@chartermi.net.
- The full conference program will be available at [www.meha.net](http://www.meha.net), [www.msta.biz](http://www.msta.biz), and [www.mowra.org](http://www.mowra.org) after November 15, 2007.

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## MINNESOTA ONSITE WASTEWATER ASSOCIATION

### Clarifying Septic System Licensing Requirements in Minnesota

For many years there have been 2 statutes in Minnesota that overlap or conflict with each other with regard to the licensing requirements governing the design, installation, operation, maintenance and inspection of SSTS (subsurface sewage treatment systems). With more and more multiple-household systems being used to solve wastewater problems, the licensing requirement issue needed to be resolved. In 2007 the Minnesota Onsite Wastewater Association initiated legislation to clarify these licensing requirements.

The legislation specified that until December 31, 2010, only an SSTS license is required to design, install, maintain, operate, or inspect an SSTS system with a flow of 10,000 gallons of water per day or less and established an SSTS Licensing Stakeholders Task Force charged with the task of finding an agreement between the parties involved. The task force is studying the impacts, qualifications, and questions revolving around Minnesota's new rule governing mid-sized systems and the professional engineers' statute with the results being reported back to the Legislature by the MN Pollution Control Agency. This report is intended to help the legislature pass new legislation to permanently define the SSTS licensing requirements.

MOWA's goal in this licensing clarification process is *to have the right people with the right skills, qualifications and authorization doing the work of designing, building, operating, and maintaining the small and mid-sized wastewater treatment systems needed to provide cost-effective protection of human health and the environment in Minnesota.*

The stakeholders task force is comprised of representatives of the Minnesota Onsite Wastewater Association; the Minnesota Society of Professional Engineers; the American Council of Engineering Companies; the Minnesota Association of Professional Soil Scientists; the Minnesota Board of Architecture, Engineering, Land Surveying, Landscape Architecture, Geoscience, and Interior Design; the Geoscience Professional Organization; the University of Minnesota Water Resources Center; the Association of Minnesota Counties; the League of Minnesota Cities; the Coalition of Greater

*continued on page 14*

Minnesota Cities; the Minnesota Association of Small Cities; and the Minnesota Association of Townships.

MOWA believes that without legislation to clarify these licensing requirements, small depressed communities, shore land residents, resorts, campgrounds, churches, gas and convenience stores, and rural restaurants will:

- Experience major problems finding qualified professionals from a restricted field of competition
- Incur significantly higher costs resulting in economic loss and financial hardship
- Encounter long delays in funding due to high costs and strained limited public funding sources
- Stall projects and never correct straight pipe discharges
- Lack local government staff qualified to review plans and inspect systems they are permitting

A series of six task force meetings have been scheduled. The first meeting clarified the charge from the legislature. Four major areas were defined: the new rules (especially 7081 governing mid-sized systems), the two statutes in question, the qualifications to do onsite work, and the impacts on the environment, public health, and the citizens of Minnesota. The report to the legislature will cover areas where the task force has reached agreement as well as a minority report where a clear consensus was not reached. Ground rules to conduct the meetings and ensure orderly and open discussion were established.

The second meeting addressed the statutes regarding professional engineering, professional geoscience' and professional soil science and the statute defining activities for licensed SSTS work. It also looked at issues relating to groundwater mounding assessment and the new "advanced designer" license.

The third meeting further discussed ground water mounding and nitrogen and phosphorous assessment. The task force also drafted a "Who Does the Work" matrix.

With the report to the legislature due in Feb '08, the task force is pressing forward to find a solution to the licensing requirements. The MOWA representatives on the task force are working closely with the Board of Directors and members as the meetings progress. As they said—"the industry of 10 to 15 years from now is being decided at these meetings."

As stated earlier, it is MOWA's goal throughout this process *to have the right people with the right skills, qualifications and authorization doing the work of designing, building, operating, and maintaining the small and mid-sized wastewater treatment systems needed to provide cost-effective protection of human health and the environment in Minnesota.*

MOWA's task force representatives to the task force are: Eric Larson, Septic Check, 320-983-2447; Ron Jaspersen, Willmar Precast, 1- 800-559-8527; Steve Schirmers, Schirmers Wastewater, 763-497-3566.

—Ken Olson, Executive Director

## TEXAS ONSITE WASTEWATER ASSOCIATION

TOWA is proud to announce the hiring of Tim Taylor as Management Consultant. He and his wife Georgia took over the operations of the organization in September. This year TOWA hosted 6 Basic Maintenance Provider courses throughout the State and has just completed their Superconference at the Ft. Worth Stockyards in November.

The Fall Superconference was a success with nearly 30 exhibiting companies and over 200 attendees. A legislative forum was also held, open to all TOWA members, with Joe Strouse of the TCEQ as the invited speaker. Joe also fielded questions directly from the membership on the rules process and enforcement issues.

Again this year TOWA will Co-Host the Texas Onsite Wastewater Research Council Conference in Waco March 4-5, 2008. The TOWTRC Conference will feature speakers from throughout the country. For more info: [www.txowa.org](http://www.txowa.org) or call (888) 398-7188.

## ONSITE journal

NEWS FOR THE ONSITE WASTEWATER RECYCLING INDUSTRY

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## VIRGINIA ONSITE WASTEWATER RECYCLING ASSOCIATION

VOWRA has signed an exclusive contract with Carmody Systems, a Wisconsin firm, to provide Virginia a complete, web-based management system. This system will have the capability for pre-notification of operations, maintenance or monitoring to the operator or owner. Licensed operators shall be required to enter reports into the system. The Dept. of Health will use the system to provide compliance monitoring of O&M system requirements throughout the state. The site can also be used by the general public to locate industry professionals for each county. Companies and industry professionals can also list their products and services.

## YANKEE ONSITE WASTEWATER ASSOCIATION

The Yankee Onsite Wastewater Association (YOWA) is pleased to announce the election of new Officers for 2008 and 2009: President Steven Corr, P.E. (Norton, MA), Vice President Russell Martin, P.E. (Augusta, ME), and Secretary/Treasurer Dan Ottenheimer (Gloucester, MA).

YOWA now has two vacant Board of Director positions due to the election of Steven Corr and Russell Martin. An election is currently taking place among the YOWA membership with results to be announced after January 1, 2008. Interim President John Higgins will now serve on the Executive Committee as Immediate Past President. Interim Vice President Tom Groves will continue to serve YOWA as a Board of Director. ■

### 2008 AFFILIATE MEETING SCHEDULE

**WISCONSIN PRECAST:** January 7–8 Madison, WI

**MICHIGAN:** January 8–10, Lansing, MI

**OHIO:** January 15–17, Columbus, OH

**MISSOURI:** January 21–23, Columbia, MO

**IOWA:** January 23, Des Moines, IA

**WASHINGTON:** January 25–26 Vancouver, WA

**WISCONSIN:** February 15–16 Waukesha, WI

**MINNESOTA:** March 3–5, Alexandria, MN

**TEXAS:** March 3–5, Waco, TX

**NEW ENGLAND:** March 11–13, Groton, CT

Visit [www.nowra.org/calendar.html](http://www.nowra.org/calendar.html)  
for details



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# Fall 2007 State & Federal Legislative Update

*While most legislative sessions do not begin until after the first of the year, this is the time during which committees are active in formulating the bills and holding hearings on issues to be considered in 2008. This is also a period in which the state associations are vigilantly preparing for these activities. As noted in the news updates below, numerous state groups are not waiting for the start of these sessions.*

## WISCONSIN

Recent legislation introduced in the state senate would expand the prohibited practices of county regulators. In addition to prohibiting regulators to perform soil tests within their own county, the new bill would prohibit governmental unit employees with duties related to septic systems from doing the following work: soil testing, septic system design, installation, repair and sales.

The intent of this bill is to eliminate the practice of county regulators from having a “side business” directly competing against those people they regulate in the onsite industry. The bill went before the Senate Environment and Natural Resources Committee October 9, 2007. Look for updates in WOWRA’s newsletter and on their website.

## MINNESOTA

Legislative efforts were successful in protecting designers of specific onsite systems (systems providing wastewater treatment for over three single family dwellings and other systems treating up to 10,000 gallons per day) from enforcement action for practicing engineering without a license. A Stakeholders Task Force has also been established to determine the impacts, qualifications and questions surrounding the new Rule (which expires December 31, 2010) in order to help pass legislation to permanently define the structure of the designer license.

As part of the Task Force, MOWA’s goal is to convince the stakeholders that additional training is needed for ALL the designers, professional engineer and non-engineer, and that training is specific to subsurface waste treatment. If you would like to comment or have questions regarding this issue, please contact a MOWA representative.

Big news on the SSTS Code Change Status! The Administrative Law Judge has ruled on the proposed rule changes and the rule-making will finally be wrapped up. The MPCA staff made a number of changes to the proposed rules, based on comments by the public, the ALJ and the MPCA final review. Changes were made relating to the effect of the rule on local units of government; technical requirements; and concerns regarding the use of permissive language, such as “may” or “should.” The judge approved all rule changes as stated, with one exception: the definition of “bedroom.” The judge wanted more specificity in the definition so the MPCA is working with the Advisory Committee and the judge to come to a mutually acceptable definition that will go into the final rule.

## FEDERAL UPDATE

Congress is currently looking to expand the Clean Water State Revolving Fund (CWSRF) to add \$14 billion for low-interest water project loans. However, many members of the onsite industry feel that grants—not just low-interest loans—should be part of the CWSRF. The National Rural Water Association (NRWA) wants the CWSRF to look more like the Drinking Water State Revolving Fund which has a loan-forgiveness framework and provides grant funding for needy areas. Many small water systems are in need of funding and loans only bring limited benefits – more grants are needed to truly help the small water agencies.

The House Natural Resources Committee recently approved legislation to create a 21st Century Water Commission that will develop a comprehensive strategy for meeting water needs. Approval by the House Transportation and Infrastructure Committee is still pending. The legislation requires state, local and federal governments to work with the private sector to focus on technology, infrastructure, drought management and water rights.

## National Associations Redirecting Efforts toward the “Green” Movement

With environmental concerns firmly in the public conscience, trade and professional associations are working to improve their image and their bottom line. They are challenging their members to clean up their impact on the earth, too. From construction trade groups offering education programs on sustainable building, to electronics associations implementing recycling programs for their members’ products; everyone, it seems, is going green.

The National Association of Home Builders is launching the National Green Building Program early next year, which includes standards and certifications for building environmentally sustainable structures; the Mechanical Contractors Association of America is holding LEED prep course through chapters to educate members on the green building rating program and coinciding professional certification in sustainable design; and the technology industry group CompTIA started a recycling program for members.

To enhance their role in the environmental safety debate, the Soap and Detergent Association is partnering with the Water Environment Research Foundation and the Centers for Disease Control and Prevention to conduct research and distribute information on how household draining of soapy water affects soil and groundwater quality and other health concerns. ■

# Structural Capacity of Onsite Septic Systems

By Douglas S. Hardesty

Director of Engineering, Infiltrator Systems, Inc.

Each year, onsite residential septic systems discharge billions of gallons of wastewater into the ground. Homeowners, regulators, and the community at large depend on these underground systems to do one specific thing—work. In fact, everyone involved with a residential onsite system, from the homeowner to those at the state level, use and depend on these “hidden” underground systems to work well. They also expect them to perform for periods of 30 or more years with minimal routine maintenance and inspection, little cost, and preferably, no expensive repairs or replacement.



The explanations of “working well” and “must perform” do not stop with simply discharging wastewater into the ground for all those years. These septic systems must have the structural integrity and the capacity to hold up for the long term. Companies that manufacture integral components for these systems (tanks, distribution boxes, leach field chambers, piping) design and engineer every component to last a specified number of years under specific conditions. These conditions are established to ensure the best system structural integrity possible. They begin with the installation and placement of the system itself. This is a key step in each systems potential life-span. Manufacturers also specify how a system should be used to educate homeowners about what they have in their yard and how to use the system properly. Next, they provide guidance on necessary routine inspections and maintenance that should be performed by qualified contractors.

But what is a clear definition of structural capacity? And does this definition mean the same thing to the homeowner as it does to the contractor? The answer is that it should. The clearest definition available is that used in the rating given to some of the components of a system—such as the H-10\* or H-20 rating. From a structural standpoint, onsite systems must be able to withstand the riggers of heavy construction equipment during installation. In fact, the most difficult day of an onsite system is its birthday—the day of installation. During

installation, the onsite system will experience more stress, higher loads, and more extreme conditions than it most likely will see in its intended life span. From bulldozers to backhoes, dump trucks and excavators, onsite systems are *first* designed to survive installation.

The photograph here is an example of a common installation test by product design engineers where they analyze and document the structural performance characteristics of an installed product while being driven over by construction equipment used during installation. The picture shows a common size backhoe running over a trench installed with Infiltrator Systems, Inc. Quick 4 chambers.



Design engineers look for signs of structural capacity trouble—where the onsite product is stressed or deformed (bent, crushed, twisted, fractured, cracked or collapsed) after being driven over a few times. Engineers use this valuable information gained from testing to improve the required performance characteristics of any area of the onsite product that exhibits any potential problems.

This photograph is an example of a common installation practice where dozers are used to backfill and cover the onsite system components after installation. The picture shows a common size dozer running over a bed installed with Infiltrator Systems, Inc. Quick 4 Equalizer 24 chambers.



*continued on page 18*

Mr. Douglas S. Hardesty received his BS in Mechanical Engineering from the University of Akron in Ohio and is currently the Director of Engineering / R&D for Infiltrator Systems, Inc. based out of Old Saybrook, Connecticut. Doug is an affiliate member of (SPE) the Society of Plastic Engineers, a member of (ASCE) the American Society of Civil Engineers, and a member of (ASTM) the American Society for Testing & Materials. Doug has over a decade of experience in designing and engineering large industrial products, both in the plastic and steel industries, requiring long term performance under extreme conditions.

\*The “H-10” rating simply means that a product has been tested to support a construction vehicle with an axle load of 16,000 lbs. / axle.

Once design engineers from companies who manufacture these types of products are able to solve and accomplish the structural requirements needed during the riggers of installation, they then move their focus and attention to another more challenging design aspect of onsite products—designing for long term structural performance under extended periods of time and heavy ongoing residual earth loads.

Designing and engineering onsite products for long term structural capacity is the *second* area of product design that is sometimes easily forgotten. It is also often a part of the design process where common mistakes are frequently made by engineers. Not every company follows the same practice nor do all companies engineer products in the same manner.

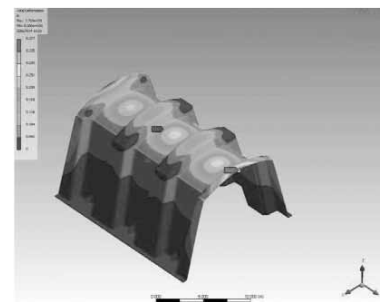
Onsite systems are installed in only a few days and then expected to last for periods up to 30 and even 50 years. It is up to the design engineers to “engineer” the onsite products for long term structural capacity. This product lifespan must meet the long term requirements over the time that the system will be expected to perform in the ground.

Long term performance is an area of product design that is very challenging. This is due to the various assumptions made regarding what the product might experience over its intended life.

Engineers study time-based material characteristics to understand how the material’s physical properties will change over time so that they can account for any change in performance if the material characteristics change. Design engineers also evaluate the earth loads on the product based on soil types and densities, soil temperatures, depth of installation, and numerous other design aspects that affect performance over time. All of these factors contribute and all are equally important to understanding the long term behavior of an onsite system. The average homeowner would be surprised at the amount of detailed engineering and analysis that goes into developing and engineering these onsite wastewater treatment workhorses.

The graphic shown here is an example of how some design or structural engineers “analyze” onsite products under specific

structural loading conditions. The picture shows a computer-aided design (CAD) image of an onsite product (leach field chamber) detailing a loading simulation using a finite element analysis (FEA) of a product under specific earth



pressures. The various colors shown in the image represent different levels of stress or deformation, depending on what the engineers are looking for in the analysis. As the colors change, the level of stress or deformation is shown by a specific color and the engineers can determine what areas of the product are under the most stress and which areas may deform under loadings. The picture shown is of a section of an Infiltrator Systems Quick 4® Equalizer® 24 chamber.

Since onsite system requirements vary by state and/or locality, these systems are designed to meet specific conditions when installed according to specific installation instructions. Before onsite systems or products of onsite systems are introduced into the market, they must go through a specific approval process.

It is also important to understand that not every product in an onsite system carries the same structural capacity or structural rating. Some components and products like septic tanks or distribution boxes may have specific ratings that are very different than leach field chambers.

As onsite systems continue to grow and the technology of onsite systems advances, it will be critical for everyone involved in the process of using these hidden systems to be better educated on performance during installation; have a solid understanding on long term performance over time; and most importantly, understand the structural capacities in order to design systems accordingly. Engineers, contractors, regulators and homeowners all share the same goal—they want these systems to perform well and perform well for a long time. ■

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# ONSITE *journal*

Fall 2007

NEWS FOR THE DECENTRALIZED WASTEWATER INDUSTRY

Vol. 16 No. 4

## Featuring this Month:

- **Leadership Changes**
- **Legislative Updates**
- **Installer Training Pilot Program**

## NOWRA 2008 Conference Program & Exposition

# Water

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# Join onsite industry professionals at the most important and influential water quality event of the year!

NOWRA's annual technical education sessions are widely recognized, both nationally and internationally, for the in-depth expertise provided by leading educators and speakers who have years of experience in establishing onsite wastewater systems for homes, communities, commercial developments and businesses. There is a distinct lineup of educational opportunities, interest group sessions, great speakers, an exhibit hall full of the latest technology—and much more! NOWRA works with many states to

secure approved CEU credits for its members. This information is provided on NOWRA's website.

The conference this year again offers numerous opportunities for networking with suppliers of the latest technology and equipment from all over North America. Where else can you learn about new industry products and services all in one location. All exhibit events and non-session activities occur in the Southwest Hall at the Cook Convention Center.

Get the real answers to the real issues facing you in today's water quality industry.

**TECHNICAL EDUCATION SESSIONS** provide a valuable opportunity to become knowledgeable about the latest technology from industry leaders. All theories need to be applied in the field and these professionals value your input. After all, the best systems are the ones developed in the classroom and laboratory by the universities and proven in the field by the contractor. Preliminary technical sessions focus on:

- Basics of Onsite Systems
- Cluster System Design and Application
- Performance and System Evaluation
- Standards, Regulations and Policy
- Successful Planning and Management
- WERF Projects Update
- Treatment Process Evaluations
- Innovative Technologies and Solutions
- Plus, an on-site tour of decentralized systems in the Memphis area!

These sessions are presented in several formats including panel presentations, research, case studies and workshops.

**NETWORK** with onsite industry colleagues throughout the United States who share your commitment to protecting and enhancing water quality.

**MAKE IMPORTANT CONTACTS** through interaction with colleagues, manufacturers and representatives in the onsite industry. The nation's leading companies within the exposition are available to answer questions and demonstrate cutting-edge technologies and services.

**EARN CONTINUING EDUCATION CREDITS** at sessions that provide experiential learning from comprehensive technical lectures and workshops. Experts in the onsite industry present the latest information necessary to advance your professional development.

**GREAT LOCATION** This year, NOWRA's conference attendees will stay at the beautiful Memphis Marriott Downtown Hotel. The hotel is directly connected to the Cook Convention Center. From the Marriott Hotel Lobby, you step into downtown Memphis to enjoy shopping, historical buildings and museums, and the sounds of music. A trolley system is also available to link with visits to blues clubs, museums, botanical gardens and more! All conference program events occur at the Cook Convention Center, located less than 15 miles from the Memphis International Airport. A variety of transportation methods exist for attendees traveling from the airport to the hotel, including taxi (approx. \$25 one-way), shuttle, bus and Amtrak train.



# Preliminary Conference Schedule



## MONDAY April 7, 2008

Pre-Conference Nitrogen Symposium

NOWRA Committee & Organization Meetings

Conference Registration

Registration and Set-Up for Exhibitors

### Pre-Conference Symposium Focuses on Nitrogen

As a prelude to its 17th Annual Conference in Memphis, Tennessee, the NOWRA Technical Practices and Education Committees are featuring their second Nitrogen Symposium. This unique forum is designed to bring the onsite wastewater community together with the scholarly research community in order to create a pathway of communication. The Symposium begins Monday, April 7, 2008, with invited speakers, who are experts in their field, addressing nitrogen issues related to the onsite industry.

Among the topics being considered is a basic understanding of Nitrogen concepts such as: Nitrogen fate and dissipation; environmental risks; basic chemistry; atmospheric processes; effects on rivers, lakes and oceans; and sources. Also included will be: onsite sources and loads; fate and dissipation; nitrogen and engineered treatment processes; nitrogen and modeling; a mathematical process to estimate loads and risks; model processes; modeling fate in marine ecosystems and inland watersheds; and the latest efforts by this group experts.

At the end of the plenary presentations, a panel discussion will address questions from the audience. In the afternoon, conference attendees will present their questions and comments, with the invited experts in the audience. Additional questions or participation requests should be directed to Matt Byers, Ph.D, Technical Practices Committee Chair (mattb@zoeller.com).

## TUESDAY April 8, 2008

NOWRA's President's Message

**Keynote Address:** Dimensions in Decentralization: From Innovative Technologies to Distributed Water Resources Management, *Craig Lindell*

### TECHNICAL SESSIONS

#### NOWRA Decentralized Systems Overview: A to Z

- The Evolution of Decentralized Wastewater Treatment Philosophy
- Wastewater Chemistry, Biology & Characteristics
- Soils and Site Evaluation Overview

#### Education & Training

- Examining Onsite Management in Lee County, Florida, *Bob Himschoot*
- Analyzing Wastewater Treatment System, *Bruce Lesikar*
- How Can the Engineering Community Increase the Use of Decentralized Technologies & Mngt? *Amy Macrellis*
- Dealing with Difficult People... How to Survive Life in the CAVE, *LuAnn Watson*

#### Cluster System & Application

- Cluster System Application: Case Study, *Roger Lacasse*
- Zero-Discharge Design for Onsite Wastewater, *Chia Shun "Rocky" Shih*
- The Need-To-Know's of Cluster System Design, *Larry Stephens*
- Bluff, Utah—Distributed Wastewater Management Concepts Prove Superior, *David Venhuizen*

#### Performance & System Evaluation

- Field Performance Assessment of Soils/Systems, *Mary Clark*
- Drip Dispersal in Imported Soils, *Randy Miles*
- Characterization of pH variations in Septic, *Clement Solomon*
- Microbial Fate and Transport of Seasonally Saturated Soil, *Chris Stall*

#### Evening Reception—Hosted by NOWRA Businesses & Exhibitors

### SPECIAL EVENT: BEALE STREET RECEPTION SILKY O'SULLIVAN'S — Wednesday, April 9, 2008

Free trolley ride to Beale Street (3-day pass)

Live music from 6:30–9:30 pm

2 drinks provided for reception

Silky O'Sullivan's present location on Beale Street, formerly the Gallina building, is over 100 years old and has more recorded history than any other building on Beale Street—formerly a saloon, bar and restaurant, poker room, racehorse room and hotel. A documented piece of the Blarney Stone from the Blakey Castle, Ireland, now resides in the south wall of the bar. So before you leave, join the millions who have kissed the Blarney Stone for good luck.

While visiting Silky O'Sullivan's, check out the Walk of Fame, which includes hand prints and signatures of such greats as Bob Hope, Ella Fitzgerald, Carl Perkins, and Johnny Cash. Also visit our Irish, beer-drinking goats, a mainstay of Beale Street. And don't miss the best of Memphis' live music, provided on the patio when the weather is ripe for dancing under the stars.

Silky O'Sullivan's—Where everyday is St. Patrick's Day!

For more information, visit Silky O'Sullivan's website: [www.silkyosullivans.com](http://www.silkyosullivans.com).



## WEDNESDAY April 9, 2008

### NOWRA Decentralized Systems Overview: A to Z

- Water Movement in Soil
- Application of Soil Surveys to Decentralized Wastewater Systems
- Septic Tank Overview: Function, Design, Construction, Inspection and Troubleshooting
- Aerobic Treatment Unit and Media Filter Overview
- Soil Treatment Principals and System Types

### Standards, Regulations & Policy

- Demand Response for the Water Industry, *Arpine Babloyan*
- Recent Trends in Decentralized Wastewater Management, *Valerie Nelson*
- On-site Systems in Tennessee, *Robert O'Dette*
- NSF/ANSI Standards Update, *Sharon Steiner*

### Successful Planning and Mangement

- Planning a Distributed Wastewater Management Concept in Flora Vista, New Mexico, *David Venhuizen*
- Developing Onsite Wastewater Management Programs, *Bruce Douglas*
- Innovative Loans Stimulate Septic System Renovation, *Terry Hull*
- Development & Deployment of IDNR's Database, *David Olson*

### WERF Projects Update

- NDWRCDP Overview & the Role of WERF in the Decentralized Field
- Analysis of Existing Community-Sized Decentralized Systems: Findings & Next Steps, *Victor D'Amato*
- Influent Constituent Characteristics of the Modern Waste Stream from Single Sources, *Mia Tucholke*
- Users Guide for Watershed Scale Modeling of Decentralized Wastewater Systems, *Mergistu Geza*
- Installation Training Curriculum, *Bruce Lesikar*
- Long Range Planning for Decentralized Wastewater and Stormwater Treatment Research: Workshop, *Valerie Nelson*
- Stormwater Benefits of Greenroofs and the Relative Contribution of Plants, *Robert Berghage*
- Sustainable Water Resources Management, *Robert Goldstein*

### Treatment Process Evaluations

- Treating Septage with Aerobic Micro Organism, *John Campbell*
- A Protocol for Evaluating the Effects of the Use of Water Softeners on Septic System Function, *Nancy Deal*
- Effluent Quality After Geotextile Filters Using Timed Pressure and Dosed Distribution, *Steve Dix*
- Biofilm Processes in Decentralized Wastewater Treatment Systems, *Isolde Roeske*

### Innovative Technologies and Solutions

- A New and Improved Septic Tank, *Kevin Chaffe*
- Flexible Solutions for Small WWTPs, *Micro Koppmann*
- Wastewater Renovation and Hydraulic Performance, *David Potts*
- Waste Water Treatment Through Aquaculture at Varanasi, India, *Priti Pandey*

**Evening Reception**—Silky O'Sullivans

## THURSDAY April 10, 2008

### NOWRA Decentralized Systems Overview: A to Z

- Pumps and Controls for Decentralized Systems
- Gravity & Pressure Soil Based Distribution Methods
- Operations & Maintenance of Decentralized Systems

### Miscellaneous Topics

- Sustainable Management of Wastewater, *Nanthi Bolan*
- Creating a Public-Private Partnership, *William Freed*
- Commercial OWWTS Failures and Solutions, *David Kalen*
- Reuse with Subsurface Drip Irrigation Fields—Issues & Opportunities, *David Venhuizen*
- Dimensions in Decentralization: From Innovative Technologies to Distributed Water Resource Mngt, *Craig Lindell*

### Innovative Technologies and Solutions

- The High Performance Biofiltration Concept the "Workhorse" Technology, *David Venhuizen*
- Evolution of Innovate and Alternative OWWs Use in Rhode Island, *George Loomis*
- The Evolution of Trickling Filter Media, *Ted Cotton*
- Pressure Dosed Drainfield Design & Analysis, *Thomas Kallenbach*

### Memphis Area Education Tour of Decentralized Systems

#### Plenary Sessions

- NOWRA Vice President Message
- Federal Policies for Decentralized Solutions, *Valerie Nelson*
- Closing Keynote Addresses

**Make this Conference a Special Visit—  
and bring the family for spring break!**

Memphis has numerous day trips to entertain the entire family. All of these outings can be accomplished in a day, bringing you back to the city for an exciting evening.

- **Mud Island**—A tram ride takes you to the unique Mud Island located on the Mississippi River. Here you can cool off in a giant replica of the Mississippi or tour the museum to learn the history of the river.
- **Sun Studio**—Tour the birthplace of Rock 'n' Roll! Tour guides take visitors through the rich history of rhythm, blues and its most famous acts including B.B. King, Ike Turner and of course Elvis Presley.
- **Graceland**—Visit Elvis' home, just minutes from the Convention Center! After your tour of the mansion, head down the street to the Heartbreak Hotel.



## CONFERENCE REGISTRATION INFORMATION

### Included with the Registration Fees

- **Full-conference** registration includes access to all education sessions, the technical exposition, break refreshments, Exhibitors Networking receptions, the Post Conference Session, Conference Proceedings and Wednesday's Special Event at Silky O'Sullivan's.
- **Daily** registration fee covers specific one-day access to education sessions and seminars, the Exposition, refreshment breaks, and Conference Proceedings.
- **Student** fee includes full conference registration and a student membership in NOWRA through 2007. Students must be attending college or graduate school full-time in a course of study related to onsite wastewater technology.
- **Guest** fee includes access to the technical exposition, hospitality area, refreshment breaks and that day's activities.

## REGISTRATION PROCEDURES

### DATES AND DEADLINES

- Registration must be RECEIVED with payment in full by the dates listed.
- Early registration: on or before **February 29, 2008**, no reduced-rate registrations will be accepted after **March 1, 2008**
- Regular Registration Fees begin March 1, 2008.
- No phone-in registrations are accepted. Changes in previously made registrations must be made in writing by email or fax.
- Registration forms may be mailed with payment by check (payable to NOWRA) or with credit card payment information, or faxed with credit card information. All pre-registration forms must be received by **April 1, 2008**, and accompanied by payment in full in order to be processed. Please visit our website **www.nowra.org** to register online.

### CANCELLATION POLICY

- Registration cancellations must be in writing, and are refundable only until **March 31, 2008**, but will be charged a processing fee of \$50.00. **No cancellations are accepted after April 1, 2008, and no refunds will be given after that date.** Returned check fee: \$30.00.

### NOWRA MEMBERSHIP

If you are not a current NOWRA member in an affiliated state association\* but would like to become one, you may purchase a 2008 membership through NOWRA at \$140/year and save on the full conference price! NOWRA individual membership forms are available on our website **www.nowra.org**. This annual membership is for one year, and ends December 31, 2008.

\*NOWRA membership is held on an individual, nontransferable basis. To register at member rates, you must have a current (2007) membership paid in full. All current members have been sent 2007 membership cards and numbers. To verify your membership, check with your State group or call the NOWRA office at 800-966-2942.



## IMPORTANT DATES TO NOTE!

Online Conference Registration begins on NOWRA's website on December 1, 2007.

### NOWRA Pre-Conference Activities

Sunday, April 6, 2008	NOWRA Board & Committee Chairs Meeting
Monday, April 7, 2008	Nitrogen Symposium (separate fee)
Monday, April 7, 2008	Committees and States Leaders Meetings

### NOWRA Conference Activities

<b>Tuesday, April 8, 2008</b>	NOWRA Technical Education Conference Program NOWRA Exposition Opens Exhibitor Reception
<b>Wednesday, April 9, 2008</b>	NOWRA Exposition – Contractor Open House Beale Street Reception at Silky O'Sullivan's ( <i>fee included in full conference registration</i> )
<b>Thursday, April 10, 2008</b>	NOWRA Field Education Session ( <i>separate fee</i> ) Special Conference Closing with Keynote Speakers

Exhibitor Registration materials are available for pick-up: Sunday, April 6, 2008 at 12 noon

Conference Registration opens: Sunday, April 6, 2008, 12 noon to 6 p.m.

Conference Registration opens: Monday, April 7, 2008 at 7:00 a.m.

## CONFERENCE FEES

### Full Conference - NOWRA Members and Partnering Organizations\*

Early (by February 29, 2008)	\$395.00
Regulators	\$295.00
Regular Member Rate (March 1, 2008)	\$495.00

### Full Conference – Non- Members

Early (by February 29, 2008)	\$495.00
Regulators	\$395.00
Regular Non-Member Rate (March 1, 2008)	\$595.00

### Daily Conference Rate (NOWRA Members and Partnering Organizations)

Early (by February 29, 2008)	\$250.00
Regulators	\$225.00
Regular Member Rate (March 1, 2008)	\$350.00

### Daily Conference Rate (Non-Member)

Early (by February 29, 2008)	\$350.00
Regulators	\$325.00
Regular Member Rate (March 1, 2008)	\$450.00
Special Student Fee	\$175.00

(includes NOWRA membership)

Spouse/Guest	\$125.00
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(includes awards lunch & opening reception, hospitality room and gift)

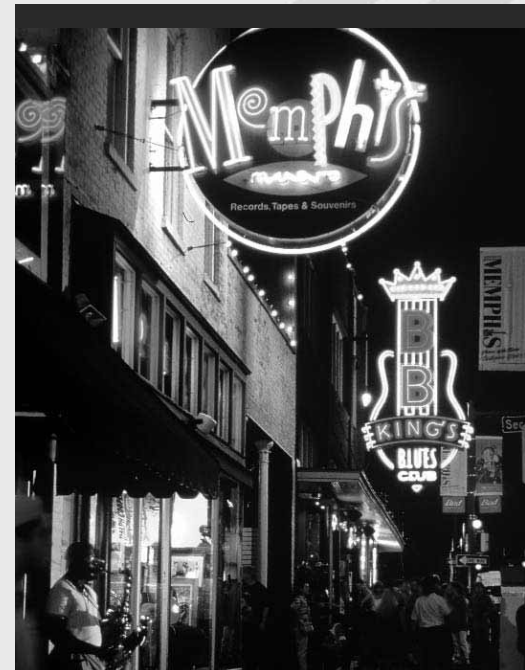
### Other Fees

Monday, April 7, 2008—**Pre-Conference Nitrogen Symposium:** \$125.00 (*not included in full conference registration*)

Tuesday, April 8, 2008—**Exhibitor Reception:** \$40.00 (*included in full conference registration*)

Wednesday, April 9, 2008—**Off-site Reception:** \$65.00 (*included in full conference registration*)

Thursday, April 10, 2008—**Onsite Systems Field Trip:** \$95.00 (*includes transportation and lunch*)



\*NOWRA Partnering Associations include: The National Association of Wastewater Transporters, the National Environmental Health Association, the National Groundwater Association, Rural Community Partnership, National Small Flows Clearing House, U.S. Environmental Protection Agency, Water Environment Research Foundation, National Association of Towns and Townships, Water Environment Federation.



# REGISTRATION FORM

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

Mail this form with check (payable to NOWRA) or fax your registration with credit card information. Registrations are only accepted with full payment in U.S. dollars. After **April 1, 2008**, registrations are **only** accepted onsite at the Conference.

Please print the following information

Membership Number \_\_\_\_\_

Full Name \_\_\_\_\_

Name for badge (if different from first name) \_\_\_\_\_

Company/Organization \_\_\_\_\_

Street Address \_\_\_\_\_

City \_\_\_\_\_ State/Province \_\_\_\_\_ Zip/Postal Code \_\_\_\_\_ Country \_\_\_\_\_

Daytime Phone \_\_\_\_\_ Fax \_\_\_\_\_

E-mail \_\_\_\_\_

### FEE SELECTION

**Monday Pre-Conference Nitrogen Symposium** (Separate from the Full Conference Fee) \$125.00 \$ \_\_\_\_\_

**Full Conference** (Tuesday–Thursday) *Does not include field trip; but does include opening reception & Wed. function*

NOWRA Member: \$395 (by 02/29/2008) • \$495 (after 02/29/2008) \$ \_\_\_\_\_

Non-NOWRA Member: \$495 (by 02/29/2008) • \$595 (after 02/29/2008) \$ \_\_\_\_\_

**Regulator (only)—Full Conference** (Tuesday–Thursday) \$ \_\_\_\_\_

NOWRA Member : \$295 \$ \_\_\_\_\_

Non-NOWRA Member: \$395 \$ \_\_\_\_\_

**Student Conference/Membership** (Does not include field trip, or receptions): \$175 \$ \_\_\_\_\_

**2008 NOWRA Membership Fee:** \$140 \$ \_\_\_\_\_  
*Only for those individuals who reside in a state without an affiliated state association.*

**Daily Conference Rate:**  Tuesday  Wednesday  Thursday

NOWRA Member: \$250 (by 02/29/2008) • \$350 (after 02/29/2008) \$ \_\_\_\_\_

Non-NOWRA Member: \$350 (by 02/29/2008) • \$450 (after 02/29/2008) \$ \_\_\_\_\_

Regulator (NOWRA member): \$225 \$ \_\_\_\_\_

Regulator (Non-NOWRA member): \$325 \$ \_\_\_\_\_

**Exposition Pass** (Access to Exposition Ballroom and Exposition Hall only): \$50 \$ \_\_\_\_\_

**Spouse/Guest** (Spouse/Guest Name \_\_\_\_\_): \$125 \$ \_\_\_\_\_

**Tuesday Exposition Reception** (Included in full conference fee): \$40.00 \$ \_\_\_\_\_

**Wednesday Offsite Reception** (Included in full conference fee): \$65.00 \$ \_\_\_\_\_

**Thursday Field Trip** (NOT included in full conference fee): \$95.00 \$ \_\_\_\_\_

**Total Amount Enclosed** \$ \_\_\_\_\_

**PAYMENT INFORMATION** (NOWRA EIN # 593099430)

My check in the amount of \$ \_\_\_\_\_ is enclosed (Check #: \_\_\_\_\_ )

Please charge my:  Visa  MasterCard | Credit Card Number \_\_\_\_\_

Exp. Date: \_\_\_\_\_ Security Code \_\_\_\_\_ Name on Card \_\_\_\_\_

Billing Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Signature (required) \_\_\_\_\_

# Update on the NOWRA's 2007 Member Needs Report

The results of the NOWRA 2007 Member Needs Survey have provided significant data to achieve the identified goals of the study. It gives the NOWRA Board of Directors and its States Leaders a strong base of knowledge for use in developing a plan to respond to member needs and direction for the organization in 2008. The conclusions for the Member Needs Report are presented in the purpose statements identified for the study.

## ***Understanding members' value, needs and expectations of NOWRA and the state associations***

NOWRA's members have clearly and consistently voiced their values and needs for association services as education and training and professional development. These needs have not changed in five years, are also in alignment with the trends of other national association members. Members join NOWRA and their state associations for the same reasons as individuals in other national organizations—for professional growth and development. And there does not appear to be a major difference in generational needs.

At the same time, serious gaps exist in the Association leaders' understanding of members' reasons to join an association and their values and needs for services and benefits. However, the gap is not as great between the states leaders and members as it is between the NOWRA Board and members. The largest gap exists in the NOWRA Board's understanding of members needs to have industry standards established for installation practices and operation and maintenance services, and to provide support and credibility for their education and training.

## ***Issues and opportunities for member services***

While NOWRA members value some services provided by states more, they also rated NOWRA's services as a high value. Members have consistently identified the need for higher levels of practitioner expertise as a priority. Other priorities stated by members are the needs for standards of practice for installation, operations and maintenance, and states requirements for education and training for licensing. These identified priorities clearly represent opportunities for NOWRA to both respond to member needs and fill an existing national gap in the industry.

Additional opportunities for NOWRA that were identified by members include:

- Supporting states education and training programs
- Delivering specialized training seminars
- Services to improve onsite standards

## ***Alignment of NOWRA's mission with member services and benefits***

This area is where the largest gap appears to exist. Comparing data in tables 2 and 3 shows that program services defined to

## **Purpose of the Member Survey**

The findings in the 2007 NOWRA Member Needs Report are the result of a 6-month study that questioned members about their values and needs of the national organization and their state association. The purpose is to:

- Understand member's values, needs and expectations of NOWRA and the state associations,
- Define the issues and opportunities for services to members, and
- Determine if the member services and benefits provided by NOWRA are in alignment with its mission.

The last official study of member needs was conducted in 2001. This data was used to develop NOWRA's 2002 strategic plan actions. In 2005 NOWRA's Board of Directors produced a new strategic plan that did not include any member needs research. In 2006, members of the NOWRA state leaders committee engaged in discussions about the services and benefits from NOWRA and direction of its programs. From that discussion, committee leaders agreed to sponsor a survey of the membership and core topics were identified.

fulfill NOWRA's current mission in the 2005-2006 strategic plan are not in alignment with identified 2007 member needs. NOWRA's 2005 mission statement is, "*To advance and grow the onsite and decentralized wastewater management industry by promoting sustainable wastewater recycling on a watershed basis through education and outreach.*" As developed, the mission is expansive to include a broader member network, while services (programs) identified in the initiatives are targeted to both NOWRA members and others. But it is not addressing current members needs.

The gap in aligning NOWRA's mission also exists in the understanding of the services members require to meet their needs. This gap exists because NOWRA members are more focused on immediate practitioner needs, while NOWRA's Board priorities are directed to the external factors that influence the economics of practitioners and the future. Similarly, in rating the priority of professional needs of members, the Board priorities are directed to those sources affecting the industry's work, while NOWRA members reflect immediate needs affecting professional growth and development. It is because of these gaps that NOWRA members question the value of their membership.

## **Next Steps**

The next steps in this process are for NOWRA's Board to make decisions regarding how to use the data provided in this report. Second, the Board should then engage with other stakeholders, such as the State's Leaders, a dialogue process to reach agreement on the approach to use to develop the Associations action plan. ■

To download the full report, go to [www.NOWRA.org](http://www.NOWRA.org)

# NOWRA Board Election Results Announced

Dear NOWRA Members,

It is our honor to introduce to you the newly elected NOWRA Board of Directors. These new board members will take office on December 1, 2007 and serve a 3-year term.

**Installer/Contractor Sector:** Ellen Vause and Peter Balas

**Engineering/Designer Sector:** Rodney Ruskin

**Academic/Researcher Sector:** Judith Sims

**Ellen Vause** has worked in the onsite business for thirty years and serves as president of Florida Septic, a family owned business, since 1987. She currently holds a Master Septic Tank Installers License with the State of Florida. Ellen has been an active member of the Florida Onsite Wastewater Association and is the current chairperson of the Public Relations Committee. She also serves as an industry representative on the State of Florida Department of Health Onsite Wastewater Department's Technical Review and Advisory Board, Research Review Advisory Committee, and the Variance Board.

**Peter C. Balas, PE (COO)** is a co-founder of IWS and has managed a variety of onsite water and wastewater projects for major clients using both design-build and construction project execution. Projects include regional shopping malls, retail strip malls, new home development, existing commercial development upgrades, industrial sites, school facilities, low income housing, and farm worker sites. Mr. Balas has consulted with Governor Schwarzenegger's office as an advocate for its clients. Prior to IWS Mr. Balas founded and owned a leading mobile environmental laboratory company servicing Fortune 500, DOD, and DOE clients internationally. Mr. Balas has a BSME from Rensselaer Polytechnic Institute, and an MBA from The Wharton School, University of Pennsylvania. Mr. Balas serves on the Board of Directors of the California Onsite Wastewater Association (COWA) and several privately owned bay area companies.

**Rodney Ruskin** is the C.E.O. of Geoflow, Inc., and Chairman of the Board of Geoflow Export, Inc. He has worked in the on-site industry for about seventeen years and has an M.S. from the Division of Engineering and Applied Physics, Harvard U. Rodney has served as a director of COWA for about seven years and has served on the Model Code, Drip Standards and State Leaders NOWRA committees. His main personal interest is to improve on-site technology.

**Judith Sims** is the coordinator of the Utah On-Site Wastewater Treatment Training Center at Utah State University as well as a faculty member in both the Utah Water Research Laboratory and the Department of Biological and Irrigation Engineering at Utah State University. They provide training in support of the mandatory Utah certification program for on-site wastewater professionals. Judith obtained her academic training in on-site wastewater treatment at North Carolina State University and studied, worked and taught in the field of land treatment of wastes for over 30 years. At the present time she has several state- and national-funded projects concerning implementation of on-site management programs at the local level. Judith is also beginning to investigate septage management practices in the State of Utah; with the goal of ensuring that septage is treated in a manner that will be protective of public health and the environment. They are also investigating the effectiveness of treatment of septic tank effluent in deep trenches, a type of treatment and disposal system commonly used in parts of the Intermountain West.

Please join us in welcoming your new board members.

Thank you to everyone for your continued interest in NOWRA. There are many ways to serve your industry. Involvement in a NOWRA Committee is a fantastic way to make an immediate and positive impact on your industry. Please contact the NOWRA Headquarters if you wish to discuss any opportunities.

Best regards,  
NOWRA EXECUTIVE BOARD

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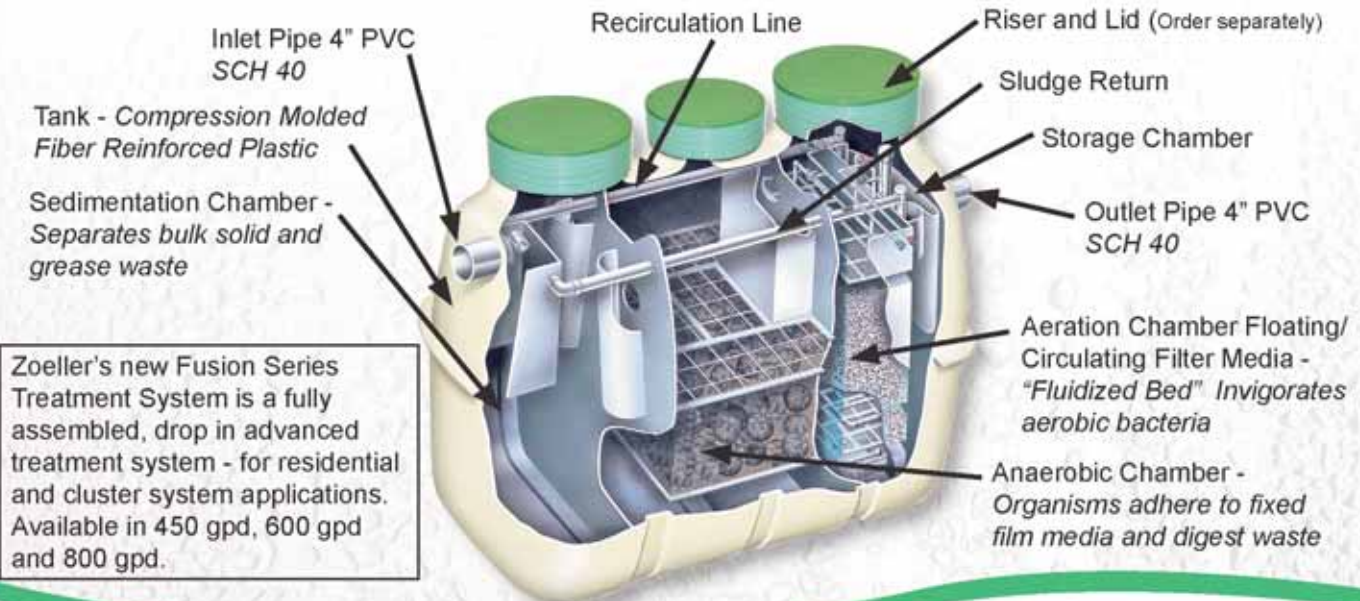
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**Better Water. Better World.**

### Visit Bio-Microbicsville, a growing community built on better ideas

With a worldwide emphasis on improving water quality, people everywhere are recognizing the need for new technologies and infrastructure to support growing populations and protect our fragile eco-system. Bio-Microbicsville was created to help explain the concepts of using existing, proven technologies in better ways to help make quick, sustainable and affordable infrastructure improvements. The world's population is growing and projected to nearly double by 2020. Water is a resource too precious to ignore. Take a tour of Bio-Microbicsville to learn more about how these advanced technologies can help you make better water... for a better world.

#### LagoonFAST<sup>®</sup>

wastewater treatment systems

Clever upgrade packages for high-performance treatment and enhanced nitrification of aeration ponds and lagoons.

#### MicroFAST<sup>®</sup>

wastewater treatment systems

Advanced wastewater treatment systems for individual homes, clustered subdivisions and other domestic, small-flow applications. Simple installation, proven performance.

#### RetroFAST<sup>®</sup>

wastewater treatment systems

Simple retrofit for conventional septic systems. Renovates failing systems, upgrades new systems.

#### HighStrengthFAST<sup>®</sup>

wastewater treatment systems

Meeting the unique challenges of high-strength commercial applications with robust, low-maintenance treatment modules.

#### SaniTEE<sup>™</sup>

wastewater screens

Innovative wastewater screens for primary solids filtration. Simple installation and easy cleaning with no removal required.

#### BioBarrier<sup>™</sup>

MEMBRANE BIOREACTOR

Designed specifically for residential, commercial and water reuse applications, the BioBarrier™ membrane bioreactor provides the highest quality effluent when it's needed most.



Non-corrosive, lightweight grease interceptors for commercial FOG removal.

#### BioSTORM<sup>™</sup>

stormwater treatment systems

Low-maintenance, packaged, stormwater treatment systems for separation of trash, oils, suspended solids and other pollutants from stormwater.

#### BioSTEP<sup>™</sup>

SCREENED PUMPING SYSTEMS

Versatile, pre-packaged pumping system transfers screened liquids in numerous applications. Simple installation, minimal maintenance, and multiple capacity options.

#### BMI fill MEDIA

Polypropylene fill media for cooling towers, wastewater and stormwater processes. Wider temperature range, improved UV-stability, chemical resistance and durability.

#### LIXOR<sup>™</sup>

Submerged Aeration System

Low-cost, reliable aeration system mixes and aerates using patented, submerged, non-clogging Venturi-type diffuser. Installs easily into new and existing basins.



### Innovative Ideas, Proven Products.

Bio-Microbics is a maker of innovative, affordable and reliable equipment for use in solving the growing challenges of the world's environmental problems. Meeting these challenges requires new ways of looking at old problems. At Bio-Microbics, we believe the innovative use of basic components, which are universally adaptable and based on proven technological principles, is an important part of a sustainable future for the planet.