Winter 2006

ONSITE journal

NEWS FOR THE ONSITE WASTEWATER RECYCLING INDUSTRY

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Vol. 15 No. 1

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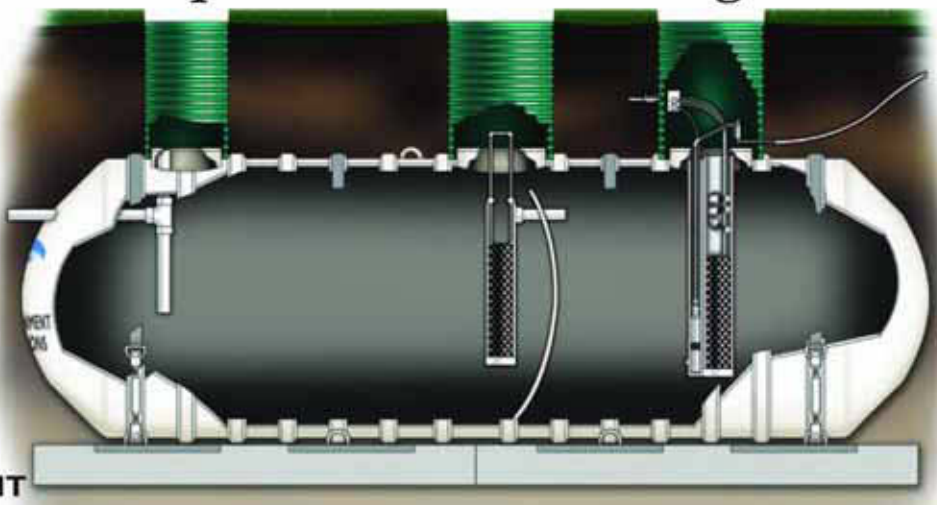

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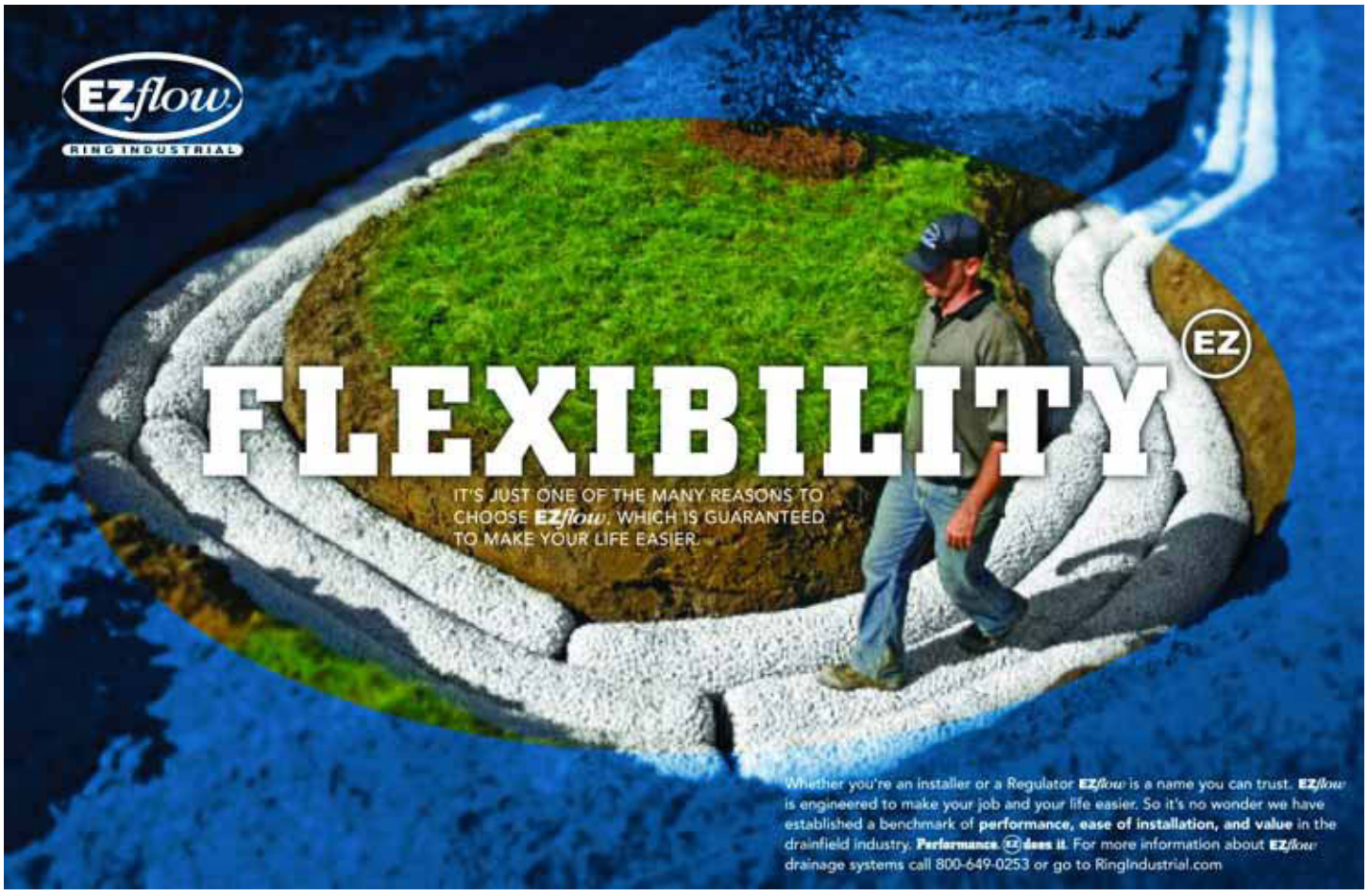
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Winter 2006

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ADVERTISERS' INDEX

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FEATURE

NOWRA IN ACTION

STATE ASSOCIATION UPDATES

NOWRA 15TH ANNUAL TECHNICAL EDUCATION CONFERENCE & EXPOSITION—DENVER, COLORADO

INDUSTRY EDUCATION FEATURES

Seeing the Forest Despite the Trees!

Richard J. Otis, P.E., Ph.D, *Vice President of Applied Technologies, Ayres Associates*

"If you don't know where you are going, you will end up someplace else." This nonsensical saying that is so pregnant with wisdom comes to mind when I think about where we are today in the "decentralized" industry. The reason is that I see a huge and important role for decentralized wastewater in the management of our water resources but we don't seem to be preparing for it. Like so many, we fail to see the forest for the trees. We focus so much on the "trees" of technologies that we fail to look up to see the broad "forest" of water quality protection. While we can't ignore the details of technologies, we will miss opportunities if we don't look up once in a while. "If we continue to do the things we've always done, we will end up where we have always been" (Another wise saying!). What I would like to do in this short article is describe to you where I think we should be going – so we end up where we should be!

The onsite industry has been slow to change. Our role has be to fill the gap left by municipal sewerage by providing very effective wastewater treatment for individual homes and establishments outside the sewer service districts. It's like we have played the role of wastewater scavengers, offering services to those not "fortunate" enough to be connected to sewer. We have done this by using passive, low-tech systems that require very little maintenance or attention. These systems were originally designed to prevent direct contact with the discharged wastewater by keeping the wastewater below ground and distant from any drinking water well. They haven't changed much since.

Serendipitously, it turns out that these traditional "septic systems" actually achieve remarkable treatment results despite the fact that they weren't purposely designed to do so! Thanks to the soils below the drainfields, nearly all, if not all, parasites and fecal coliforms are removed in just a couple of inches of soil. It appears that most viruses are also removed. Phosphorus is nearly completely removed in not all soils but most. Of the pollutants in domestic wastewater of which we have concerns, it is only nitrogen (in the form of nitrate) that escapes the system and leaches to the groundwater. Now I ask you: *What municipal treatment system, without advanced treatment can do so well?*

Unfortunately, onsite treatment systems don't have such a stellar reputation. Their reputation is one of being failure prone. Water quality agencies look down on "septics" and they only tolerate them until sewers can be extended and the "septics" can be abandoned. Central sewerage has gained "gold standard" status while onsite systems are viewed as the "tin standard". Onsites are often perceived as little more than holes in the ground that are installed only to protect public health, not water quality. They are expected to "fail" sooner or later with few corrective options other than total replacement or connection to sewers. The most egregious shortcoming is that states and counties have little idea where systems are and how they are performing. Hence, systems that are seeping onto the ground surface are allowed to do so indefinitely because of their anonymity. Certainly, central sewerage proponents can't be expected to think that onsite systems are doing their share to protect water quality!

As a nation, we are reaching the limits of what our traditional wastewater management practices can accomplish.

In the last decade, our industry has been actively addressing our image. We have developed treatment technologies that can remove most of the pollutants of concern. We have begun to implement performance management programs to institute accountability. We also have introduced the concept of "distributed treatment" to the onsite industry, coining the term "decentralized wastewater". We are making much needed progress, which is resulting in greater confidence and acceptance of onsite and cluster systems. These are significant advances, but I believe there is much more that we can, and should, do.

As a nation, we are reaching the limits of what our traditional wastewater management practices can accomplish. Our current paradigm of central sewerage offers two alternatives for providing wastewater treatment services: (1) publicly owned central sewerage typically with point discharges to surface waters or (2) privately owned individual onsite systems that discharge to groundwater after percolating through the soil. Since the passage of the Clean Water Act in 1972, well over $300 billion has been spent for construction of new or upgraded central sewerage facilities. US EPA estimates that more than $160 billion is still needed for unmet wastewater treatment needs. And these numbers don't include the costs for rehabilitation, replacement, and upgrading of a

Richard (Dick) J. Otis. P.E., Ph.D, is Vice President of Applied Technologies at Ayres Associates in Madison, Wisconsin office. He has been with the firm since 1986 with his primary emphasis in developing low-cost technological and institutional solutions to wastewater problems in unsewered areas. He is currently a member of the NOWRA Board of Directors, past chair of the NOWRA Technical Practices Committee; served on the National Water Resources Capacity Development Project, past chair of the Small Community Committee of the Water Environment Federation; and diplomat in the American Academy of Environmental Engineers.

significant portion of our nation's wastewater infrastructure that has reached, or is about to reach the end of its projected useful life. Clearly, our nation cannot afford to build central sewerage facilities in every community! The recognition of the limits to central sewerage places a large responsibility on us who work with individual onsite and cluster systems. Is our industry willing to accept this responsibility? If we don't respond, won't we be complicit in creating a group of second-class citizens by denying the treatment options and the financing necessary to eliminate sanitation hazards that lower their standard of living?

We need to step back from focusing on the "trees" of treatment technologies and practices to consider the whole "forest" of water quality protection.

A new model for providing all citizens satisfactory wastewater treatment services is necessary. What might this model look like? To envision what it might be, we need to be less myopic. We need to step back from focusing on the "trees" of treatment technologies and practices to consider the whole "forest" of water quality protection. Let me offer a model that makes sense to me, which involves both the decentralized concept and the watershed approach and how they would fit together.

As we define it in our industry, "decentralized" is a group of treatment technologies that are typically passive, small, soil-based onsite and cluster systems. This is not what "decentralized" is at all! If it were, we would have merely changed the names from "septic system," "sand filter," or "cluster" to "decentralized." This gains us nothing. Instead, we need to exploit the full potential of the decentralized concept. *Decentralized* is a management concept for distributed treatment facilities. It provides an approach for coordinating and overseeing performance of scattered treatment facilities helping to reach a common water quality protection goal. The technologies we call decentralized are only the tools we use to achieve the appropriate treatment at each treatment site. These technologies include onsite, cluster, and conventional sewerage, all under a single responsible management entity. By integrating the use of all the collection and treatment technologies available, and, yes, including the municipal technologies, we can provide more affordable facilities by limiting the extent of sewers and the degree of treatment needed in response to the receiving environment's assimilative capacity and the risks to water quality. A decentralized wastewater management district might include municipal treatment works, new developments in or around municipalities, scalping plants to relieve over-capacity interceptors, water reuse for designated areas such as office parks, isolation of waste streams that are difficult to treat, as well as scattered individual onsite systems.

A watershed is an area that is bounded by hydrologic divides that has no surface water inlet and only a single outlet. Watersheds are nature's boundaries that hold whatever precipitation falls in the watershed until it is able to reach the single outlet. In other words, *what happens in the watershed, stays in the watershed*—sort of.

Now, let's imagine what could happen if we applied the decentralized wastewater management concept to an entire watershed. The watershed might contain municipalities, small communities, crossroads commercial developments, scattered settlements, recreational lakeshore properties, and individual residential homes. If we formed a watershed authority to coordinate all the wastewater discharges within its boundaries, consider the benefits that would accrue! The watershed authority could:

- ✓ Prepare a comprehensive watershed water resources plan to coordinate activities within the watershed that could impact water quality to avoid incompatible decisions between all parties in the watershed
- ✓ Prioritize watershed problems and solutions
- ✓ Develop action plans
- ✓ Consider area wide risks from all systems and sources rather than just risks from individual systems
- ✓ Coordinate all wastewater discharges to meet TMDL limits in the most affordable and practical manner
- ✓ Integrate technologies to achieve affordability

continued on page 6

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Aren't these the things we agree need to be done?

If we are to succeed in implementing such a concept it will be necessary to involve the "big pipe" people and other groups that may be unaware of us or discount us. They are not the enemy! We often treat them as though they are, but we, and they, need to realize that what they offer is not appropriate for the types of situations for which we have something more appropriate to offer. The reverse is also true. We need them just as much as they need us. We cannot do this alone.

But, before we can expect the "other side" to accept us, we have some work to do. We need to stress protection of water quality as much as we do public health. This means we need to take treatment seriously and apply it appropriately as risk assessments and appropriate risk management plans dictate. We also have to insist on accountability of all owners, practitioners, and regulators. This means we must continue to push for performance codes based on risk management and the code's effective administration and enforcement. Until we are able to demonstrate our commitment to water quality, our industry will not be able to be considered equal partners in sustaining our valuable water resources.

We should be proud of what we can bring to the table. If you read between the lines of what I wrote above, I contend that central sewerage is not the "gold standard", it's decentralized wastewater management! Robert F. Kennedy, Jr., once said: "Some see things the way they are and say why. Others dream things that never were and say why not?" We need to be the ones to ask "Why not?" I don't know what the future will bring and whether what I have described will ever be accepted. What I do know is that we have the power to determine the future role of decentralized wastewater management. It's up to us. Take a step back from the trees and look at the forest. What do you see? ■

ONSITE journal
NEWS FOR THE ONSITE WASTEWATER RECYCLING INDUSTRY

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NOWRA IN ACTION

NOWRA State Meetings and Board Activities

Linda Hanifin Bonner, Ph.D., *NOWRA Executive Director*

During January and February, NOWRA Officers and Board members were visible at numerous state meetings—both updating state members about NOWRA's work—and participating in making technical session presentations. Meeting with state members is a priority of NOWRA's Board—and especially being able to convey the message that . . . ***NOWRA is Working for You***. NOWRA Officers and Directors made presentations at the Ohio, Michigan, Indiana, Iowa, Florida, Missouri, Oklahoma Installers Association and Washington State Conferences.

February presentations occurred in the southwest (Arizona hosting) Kansas, Tennessee, Nebraska, the Pumper and Precast Concrete shows, Minnesota and Wisconsin. March presentations focus on Texas, Minnesota, Oregon, North Dakota, Utah, Colorado, the State Onsite Regulators Association and Virginia. This is an important achievement—22 out of the 32 affiliated states have had meetings in the first three months of the year. Never before has a concentrated effort occurred in which NOWRA's Board members and officers purposely sought out the opportunity to speak to and meet with NOWRA members at the State meetings—the majority of whom do not attend a NOWRA annual conference. States with meetings in planning include California, Maryland.

In these presentations, Board members identify the ongoing activities to benefit NOWRA members and address those specific issues that are known to be important to the state. All states currently have a designated Board member attending each of the conferences and meetings through April. Announcements are made about the **new online membership directory** and **SepticLocator**, **membership recruitment,** and the **medical and life insurance** program—all for NOWRA members. While feedback received about these presentations and the ensuing interactions is positive, Board members also understand that this outreach effort is only the initial step in the overall process to more aggressively unit members of the decentralized industry.

A United State and NOWRA Membership

An underlying objective in these efforts is supporting state associations with their own membership recruitment and outreach. In its work on the strategic business plan, NOWRA's Board defined member communication a priority. As a result, several new initiatives have gotten underway. Printed materials, action lists and projects—all designed to support states in achieving their respective membership recruitment goals have been produced.

New "***Membership Recruitment***" materials and manuals were provided to state leaders at their October workshop in Cleveland, Ohio. States have also asked for ***regular news updates on NOWRA's activities*** for their news letters. Being completed in early February are ***new membership recruitment brochures***, the "***Septic Help" brochure*** and ***member/septic locator identify stickers***. Another priority in the communication program is major revisions over the coming year to NOWRA's website.

NOWRA's Communication Hub

Over the past months, efforts have been underway to restructure NOWRA's website is now being structured as the communications hub that unites all of the constituent members. The membership database is now on NOWRA's website and serves as an online directory service. New members from Ohio, Michigan, Washington and Maryland have already been entered into the directory. All 2006 Business Benefit members are in the system as well.

Membership Directory

In January NOWRA's new online member directory and ***SepticLocator*** was established. All current paid 2005 NOWRA/State members are listed in the directory and new ***SepticLocator.*** During the February/March start-up period, NOWRA members will respond to a postcard asking them to go online and update their member listings with professional categories, products and services. If a member does not wish to be listed in our online directory, there is the option to opt-out. Members also have an opportunity to upgrade their listing to an enhanced or premium business member listing for additional promotion of their company's onsite wastewater products and services.

State Website Support

As the ***SepticLocator*** is operational, priority attention will be given to getting states and NOWRA websites updated. In addition, NOWRA will have a new technical support staff person in February to provide this service.

continued on page 9

National Onsite Wastewater Recycling Association's

SEPTIC LOCATOR

The ***NOWRA SepticLocator*** went online February 15, 2006. This new service is a comprehensive listing of septic and onsite practitioners, regulators, product manufacturers, suppliers, and service providers derived from the membership directory of the National Onsite Wastewater Recycling Association (NOWRA). Septic and onsite system owners and product buyers can now easily locate local suppliers, equipment manufacturers, service providers, regulators and other industry practitioners. No other website offers this kind of direct access to onsite wastewater professionals and products. SepticLocator.com is also directly linked with TOOLBASE, the official information resources for the National Association of Home Builders as part of the new partnering program.

This information is also being provided to homeowners, builders, realtors, regulators and other interested audiences through a new brochure called "SEPTIC HELP." The brochure is being used in new releases and magazine articles and sent to health department offices and websites such as Google to help generate traffic to the site. Consumers searching for septic products and services will now be able to locate a local product or service provider based off their zip code, city, county or state.

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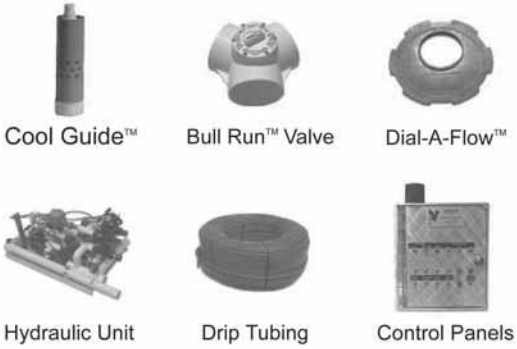

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Over the past months, many of the regular activities had to be placed on hold in order that the new technical structure supporting the expansion of the website could be completed.

By the time this information is received, new upgrades on the website will include:

- Access for state administrators to maintain their own membership records
- Ability for members to update their own records
- State website updates and organization
- Live-mail capabilities
- Online conference registration
- The development of NOWRA member technical resource library

Membership Recruitment

Also in January, an intensive membership recruitment and retention campaign was launched both on a national and state basis. States were provided with lists of past due and delinquent members from NOWRA's database, together with a recruitment letter and information about the ***new Septic-Locator and insurance program***. In addition, a new membership recruitment brochure has been produced and provided to states for their use.

NOWRA is also actively marketing to states where no associations exist. Support is also being provided in states where organizational efforts for affiliate associations is underway. These states include a New England consolidation of Maine, New Hampshire, Vermont, Massachusetts—now known as YOWA (Yankee Onsite Wastewater Association), Arizona (Arizona Onsite Wastewater Association), and New York. States where associations exist, but are not affiliated with NOWRA, are being recruited—include Utah, Oregon, Alabama, Georgia, Connecticut, and Oklahoma.

In 2005, NOWRA's membership totaled 5614. In 2006, this figure is targeted at 7500, with an overall goal of 10,000 members by the end of 2010. This goal is just a small segment of reaching out to the the nearly 70,000 employed in the decentralized industry.

NOWRA Business Benefit Program

Also in January, the marketing of NOWRA's 2006 Business Benefit Program got underway. The 2006 participation goal is 50 businesses—doubling the 2005 participation. This dramatic goal is hoped to be achieved through the new benefits being provided for NOWRA members.

State Education Programs

The Fall Issue of the Onsite Journal announced the availability of a new program to produce and deliver education and training for states. Developed by the NOWRA Education Committee, procedures are established in which the education and training needs of state members can be achieved.

State Leaders Mid-Year Meeting March 20–21, 2006

The mid-year workshop & meeting is scheduled for Monday, March 20 and Tuesday, March 21at the Adam's Mark Hotel, Denver, CO. The meeting will begin Monday at 1:00 p.m. and conclude at 5:00 p.m. March 21, 2006. A block of rooms is reserved for State Leaders. Please let the headquarters office know who from your group is attending. Identified topics at this time include: Financial management procedures; training for administrating state membership databases; NOWRA Institutes of Learning—State Education and Training Programs—How to manage & administer; Membership Recruitment and Retention Strategies.

2006 NOWRA Installer Academy

The scheduled date for NOWRA's 2nd Annual Installer Academy is December 4–6, 2006. It will be held again at The Riviera Hotel, Las Vegas, NV. Room rates are $59.00. More information will follow on NOWRA's website. An update on the successful 2005 program is provided on page 12.

Other NOWRA activities—making a national statement about the value of decentralized systems

- **NOWRA's Water Conditioning Symposium** (2005 Post Conference Session) is establishing a new collaborative endeavor with other organizations who are working to address these issues. NOWRA Technical Practices Committee Chairman, Matt Byers reports that a new task force has been established and will be working to determine an action plan to resolve many of the unanswered questions.

  A follow-up report on the 2005 Symposium is on page 10. NOWRA members can also find the Water Conditioning Symposium on NOWRA's Website.

- **NOWRA March Board of Directors Meeting** will be held on the 22nd and 23rd, at the Adam's Mark Hotel in Denver, Colorado—site of NOWRA's 2006 Conference. Primary agenda items being addressed is the organization structure of the newly formed 501 C(3) Education and Research Foundation and the implementation plan for the Institutes of Learning. On June 8–9, 2006, NOWRA's Board will be in Baltimore, Maryland, at the Marriott Waterfront Hotel—location of the 2007 dual Annual and International Conferences. ■

NOWRA IN ACTION

SUMMARY AND FOLLOW-UP

Water Softener Effects on Onsite Systems Symposium

Matthew E. Byers, Ph.D, *Chairman, NOWRA Technical Practices Committee*

On October 13th, 2005, NOWRA and the Water Quality Association (WQA) convened a symposium to address the topic of water softeners and septic systems. At issue was the perception that these two critical appliances may have certain incompatibilities. Speakers from both industries addressed the issue. From the WQA, or softener side, data were presented that supported a claim of no harm to the tank, system biota, and receiving soil. From the onsite side, cases where systems were compromised due to the presence of water conditioning devices were presented. Research papers and testimonials comprised the morning session, followed by an afternoon session of discussion. There were at least 125 people present representing both industries.

Highlights of the symposium included learning that each industry provides equipment that is going to be used at the same site by system owners. This should not come as a surprise to anyone. Thus, these industries must learn from each other how best to make this situation workable. Workable means the onsite system works in concert with the input stream and thus protects human health, protects the environment and is a good value for the consumer.

It was learned through presentation and discussion that an inadequate amount of discussion had taken place between these two industries. Two levels of need have emerged. 1) Immediate communication is needed to define what we already know about softeners and onsite systems and thus educate both industries on how to adjust each others systems to make them work harmoniously on site, and 2) through communication, research needs will be developed based on problems that persist in spite of the increased knowledge. This means there will likely be operational challenges that will be defined for which facts are simply lacking.

- Presentations were made dealing with the receiving soil environment. Data presented appeared to indicate that soils generally could assimilate softener inputs.
- Some advanced treatment units were presented to be impaired by the use of water conditioning equipment. After much discussion it was determined softeners and onsite systems could likely be adjusted to accommodate each other in many cases. This simply requires good knowledge of both appliances. There were cases discussed where slugs of regeneration wastewater may cause calcium carbonate precipitation in units under aerobic conditions. Several solutions were proposed such as by-passing such a sensitive system with the calcium laden regeneration water, as well as time dosing the regeneration waste into the system. Individual onsite treatment systems and devices likely have limits under which they can be operated. In areas where hard water or consumer choice dictates that a softener is required, the onsite system needs to be installed to accommodate those inputs. In fact, where water is hard, the softener may enable the use of some aerobic onsite systems, by removing the calcium that would have fouled the system without the softener. In such cases, the regeneration water must bypass the aerobic or advanced treatment unit.
- Calcium influence and precipitation of calcium carbonate was thoroughly discussed. The Calcium that would cause the fouling effect is not generated by the softener, but is a consequence of local water hardness. Thus, the net precipitate should be the same, softener or not.
- Softener systems were described as hydraulically overloading onsite systems. Discussion revealed the relative small quantities of water in softener recharge. However, some softener water feed systems were described as possessing ‘stuck valves’, thus contributing large quantities of water to the onsite system. Discussion revealed the remedy was simply maintaining the softener systems correctly, and using better grades of salt. A stuck valve is an easily corrected problem, not unlike a failed toilet valve.
- A thorough discussion of how softener function was accomplished. Modern softener systems including ‘demand initiated regeneration’ units were introduced to the group. These units are programmed to regenerate only when water use demands the regeneration. Thus, the number of regeneration cycles is related to actual water use. Number of cycles is

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directly related to the amount of regeneration water inputting the onsite system. These may be very compatible with onsite systems.

- Questions likely remain. Challenging sites must be investigated. Both industries agreed, such investigations will help define the extent of the challenge. It was proposed the task force be involved in such investigations.

Follow-up actions planned from the symposium will include several important steps.

- Creation of a task group that will ensure that the WQA and NOWRA continue discussion. To accomplish this, the NOWRA and the WQA will select members for the group.
- Creation of a summary paper from the symposium. This paper will be a brief that describes highlights of the symposium in detail. It will be reviewed by the presenters from the symposium as well as WQA representatives and some members from NOWRA Technical Practices Committee.
- NOWRA members of the task force will attend the WQA meeting in March.
- Task force will generate guidance materials to assist practitioners in using both technologies at the same site with a high probability of success.
- A statement of research needs will be generated. Through discussion, both industries will reveal to each other what is known and thus, what remains to be described. Research will likely yield a description of system limitations.
- The symposium was successful in that it initiated an overdue meeting between these two industries. The discussion was very productive. Both industries agreed that our collective goal is system functionality and satisfied customers. ■

Water Quality Association Annual Convention

On-Site, e.g., Septic Tank, Sewage Disposal System Issues

Tuesday, March 28, 2006 at the WQA Aquatech 2006 Annual Convention

Donald E. Stephens Convention Center, Chicago (Rosemont), Illinois

This important education session is a follow-up to NOWRA's Joint WQA Post Conference Water Conditioning Symposium. Under the direction of Frank Brigano, Chairperson of WQA Water Sciences Committee, the program, which begins at 2:30 p.m, includes several important speakers addressing key topics of interest.

- "Understanding Today's On-Site Wastewater Treatment Systems" is the lead off topic, presented by Dr. James Converse, professor emeritus of the University of Wisconsin–Madison.
- "The Effects of Salts on Drainfield Soils" is presented by Dr. E. Jerry Tyler, Professor of Soil Science also at the University of Wisconsin–Madison
- "A Wastewater Treatment Equipment Manufacturer's Perspective on Water Softeners and Wastewater Treatment Systems" is presented by Bill Cagle, Orenco Systems, Inc., Sutherlin, Oregon
- "A Perspective from the National Onsite Wastewater Recycling Association" is presented by Dr. Matthew E. Byers, Onsite Manager with The Zoeller Company, Louisville, KY

Following the presentations a "Panel Discussion" comprised of all previous speakers as well as Bob Boerner, Chairperson of WQA's Septic Tank Task Force (and with the Culligan Company in San Antonio, TX) will answer questions from the audience.

Additional information about the WQA's program can be found on their website – www.wqa.

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Reach NOWRA members by advertising in the
ONSITE journal
NEWS FOR THE ONSITE WASTEWATER RECYCLING INDUSTRY
For more information, call 1-800-966-2942

NOWRA IN ACTION

Successful First Annual NOWRA Installer Academy & Tradeshow

Sara Christopherson, *NOWRA Board Member and Chair of Education Committee*

The first annual National Onsite Wastewater Recycling Association (NOWRA) Installer Academy held December 13-16, 2005 in sunny Las Vegas can best be described in the words of one attendee: "Energetic, current, positive, and well-illustrated."

The first conference was well attended by more than 29 states, 2 Canadian Provinces and Puerto Rico.

This conference provides great networking opportunities for contractors. The event was kicked off with an opening night reception and each subsequent night free beer and snacks were provided in the exhibition hall where nearly 20 exhibitors were demonstrating key tools of the trade.

For many conference attendees the education sessions were the highlight of the conference. As one installer from Pennsylvania stated: "I have attended many onsite training seminars over the years. I learned more here in two days than in years of others. Keep up the good work!" The class sizes were kept small to maximize interaction between speakers and attendees.

There were four types of education sessions provided:

1. General technical training provided by Bruce Lesikar and Courtney O'Neil of Texas A&M and Dave Gustafson, Sara Christopherson and Dan Wheeler from U of Minnesota. Topics included troubleshooting, media filters, constructed wetlands, ATUS, drip distribution, soils, and more.
2. Ellen Rohr of Bare Bones Biz, Inc. presented a fun and powerful money-making program. Part One, "Where Did the Money Go?" showed NOWRA members how to 'de-mystify' their accounting and use their financial information to make better, faster, more profitable decisions. Part Two, "How Much Should I Charge?" focused on creating a WINNING Selling Price … and how to GET that price.
3. Special exhibitor training was provided by American Manufacturing , Bio-Microbics, Peterson Supply, Crest Precast Concrete and Wieser Concrete
4. The Jensen Precast Plant Tour which emphasized the proper manufacturing procedures for making quality concrete septic tanks.

Planning Already for Next Year!

In its first year the Installer Academy was such a success that 2006 planning is already underway. It will once again be held in the first part of December in Las Vegas. The education offerings will be expanded to include basic and advanced training in three areas: technical, practical and business. Technical sessions may include A to Z of Onsite Wastewater Treatment, Installation of Conventional and Non-Conventional Systems and Troubleshooting Systems. Practical skills may include OSHA Standards, Confined Space Entry, and Basics of Wiring while business training may include Intro to Business Practices, Winning Compensation and Bonus programs, and Buying, Selling and Getting OUT—Acquisition and Consolidation strategies.

Please see www.nowra.org or call 800-966-2942 for more information. ■

Mark your calendars!

NOWRA 2nd Annual

INSTALLER ACADEMY

December 4–6, 2006 • The Riviera Hotel, Las Vegas, NV

STATE ASSOCIATION UPDATES

NOWRA SPOTLIGHT ON AN EXCEPTIONAL STATE LEADER

Bob McKinney—Leading by Example

Bob McKinney holds the record—7 years—for the longest board term served with the Iowa Onsite Waste Water Association (IOWWA). In 1998, Bob was contacted by Brent Parker, Iowa Department of Natural Resources, to help create Iowa's onsite wastewater association. "He had a reputation for being a conscientious contractor who did a good job," says Parker, who has continued to respect McKinney. "Bob has always been active and involved in progressive ideas, in using new equipment and technologies, and in properly applying them."

McKinney served as IOWWA's first president in 1999, and again in 2003 and 2004. He's enjoyed seeing his industry pull together for a common purpose in Iowa. McKinney says onsite professionals around the state have been hungry for education and networking opportunities. "At our first conference in February of 1999, we had 178 members," he says. "There's been impressive growth every year, and now it's time to get the conference to 450 people."

Education has always been his passion. From the start, the IOWWA leadership didn't see training as a once-a-year conference activity. The association began as series of annually held workshops around the state. In 2005, the organization helped open the Iowa Onsite Wastewater Training Center on the campus of Des Moines Area Community College (DMACC). McKinney served as one of four IOWWA members on the center's advisory board. The center, which already has eight workshops planned for 2006, is sponsored by IOWWA, the Iowa Department of Natural Resources, USDA Rural Development, and DMACC Business Resources.

The January 2006 IOWWA conference fee included the organization's annual membership dues. This is the third year that the registration fee also included membership dues in NOWRA. McKinney once felt NOWRA was "more academic than we needed," but changed his mind when NOWRA "started to look at installers as needed members" and "had something to offer us." He's been a champion of support for NOWRA since then. He delights in meeting and learning with peers across the country at the NOWRA-sponsored annual conference, Installers Academy, or state leaders meetings.

McKinney currently heads two businesses, operates statewide, and has five employees. R.D. McKinney Plumbing and Excavating handles septic installation and services to city residents, and River to River Onsite Septic services septic systems.

McKinney may be off the IOWWA board for 2006, but his commitment continues. He remains a member of the Training Center Advisory Board, helping to shape curriculum and lead workshops. Plus, he continues to serve on the committee addressing the rewriting of Chapter 69 of the Iowa Code, the state regulation on the installation of private onsite sewage treatment systems.

"No matter what's needed, Bob's always an asset," said Doug Bird, 2005 IOWWA president. "He's knowledgeable, well known, and the one who always steps forward." McKinney joined Bird to lead the IOWWA effort to install onsite wastewater treatment equipment at the Heartland Hills Habitat for Humanity housing project near Waverly, Iowa, this year. "I don't think it could have happened without Bob." Said Bird. ■

State Association Meeting Reports and Announcements

➢ FLORIDA

FOWA's Winterfest 2006 "Fun in the Sun"

A surprising warm weekend in January greeted attendees for FOWA'S 2006 Winterfest. The Marriott Hutchinson Island was a fantastic property with a Caribbean Island look, excellent food, and an expression of hospitality that is not normally felt at a resort.

On Friday our CEU course was attended by 41 members, and 40 exhibitors welcomed attendees throughout the day. A special thanks to our instructors Karen Borgeson, with SJE Rhombus and Kevin Fender with Pat's Pump and Blower.

Our Saturday fishing tournament was a little rough with 4 to 6 foot seas, but everyone survived. 3 charter boats and 2 private boats with at least 5 fishing on each boat left the docks at about 8:00am. The only problem was the fish were not biting. Ellen Vause with Florida Septic caught a sailfish which she released, and Bob Anderson with Anderson Rentals caught 3 small dolphin.

That was it. All had "Fun in the Sun."

Thanks to our Winterfest sponsors:

- Refreshments in the Exhibit Hall—Mack Concrete
- CEU Course Refreshments—Infiltrator Systems
- Friday Luncheon—Averett Septic, Hoot Aerobic Systems
- Island Party and entertainment—Plastic Tubing Industries
- Saturday Cookout—Florida Septic
- Prizes for Deep Sea Fishing Tournament—Averett Septic

Your exhibitors support your Association and your industry. Please support them when you have the opportunity.

➢ IOWA

IOWA 8th Annual Conference Shows Growth and Success

The 8th annual conference of the Iowa Onsite Waste Water Association (IOWWA) in late January brought together 411 industry regulators, contractors, designers, operators, maintenance providers, and others interested in sharing state-of-the-art information. The conference also attracted 24 companies to exhibit their products and services.

"Most of our members come to the conference to learn and network," says IOWWA board member and conference chair Justin Volvath, Volrath Sales Company. "While only a small number of Iowa's counties even require ongoing education for their onsite contractors, IOWWA still continues to have tremendous growth and remains one of the largest onsite wastewater associations in the country."

There were many firsts to celebrate at the conference. Conference attendance rose about 400 for the first time. IOWWA introduced its first scholarship recipient, Jera Alexis Williams, a civil engineering student with an environmental emphasis at Iowa State University. Thanks to dozens of contributions of materials, services and labor, IOWWA leaders also reported a successful "phase one" of the association's efforts to install onsite wastewater equipment at the Heartland Hills Habitat for Humanity site. The association also pledged to increase involvement in legislative activities, including legislator meetings and reviewing proposed bills.

More than 20 different educational programs on business operations, training, technology, natural resources, and safety were presented by 18 different experts. "We've had top presenters from day one," said Bob McKinney, recalling the first gathering in 1999 and noting that the trend has continued each year. Dr. Mark Gross, associate professor in the Department of Civil Engineering at the University of Arkansas, provided the conference keynote: The National Perspective on the Decentralized Wastewater Industry. Other nationally recognized workshop presenters included Bill Stuth of Aquatest, Sara Christopherson of the University of Minnesota, and Brian McQuestion, NOWRA treasurer. Locally, a presentation was given by IOWWA members who worked together to evaluate and upgrade an existing treatment system for the Wapsie Valley High School near Fairbank, Iowa.

"I've had several manufacturers' representatives at the IOWWA conference tell me that we have the best state conference in the nation," says Brent Parker, Iowa Department of Natural Resources. "The format—with three diverse and professional presentations each hour—has worked from the start in attracting our audience and having something for everyone."

➢ KANSAS

The Kansas Small Flows Association Show was held in Wichita, Kansas, February 8-10, 2006. We had two pre-conference presentations. The first was held in conjunction with the Wichita Area Builders Association to educate local professionals and government officials on utilizing decentralized wastewater treatment options for clustered subdivisions. Dr. Richard Otis presented to the group and the session was well attended (about 36 people) and well received.

The second presentation was geared to the needs of County Commissioners and Health Officials and introduce them

to our new training program put on in conjunction with the NOWRA Institutes of Learning. The hope was to encourage counties to adopt a training program and/or use KSFA as a means to provide training. Mr. Raymond Peat gave an overview that addressed NOWRA and KSFA's role in the industry and then Mr. Tom Fritts went through the program with them briefly, explaining how we got involved and what our plans were for the future.

The Association put on the Basics of Onsite 101 training program on the 9th and approximately 85 people sat in the class with over 50 folks taking the test on Thursday morning. We have not gone through all the evaluation forms as yet, but the verbal kudos were plentiful! Dr. Jerry Stonebridge with Stonebridge Environmental gave the keynote and spoke of the different roles and responsibilities that all professionals have in the industry.

IMPORTANT REMINDERS TO STATE ASSOCIATION LEADERS

State Officer & Director Liability Insurance renewals are occurring, please contact NOWRA's office for assistance in getting your policies updated. This is a critical issue for States.

State Leaders Monthly Teleconference Meetings occur on the 4th Thursday of the Month.
Information is provide a week in advance. Call times: 4:00 p.m. EST; 3:00 p.m. CST; 2:00 p.m MST; 1:00 p.m.PST.

2006 State Leaders Committee Teleconference Meeting Dates

March—Spring Meeting

April 27, 2006

May 25, 2006

June 22, 2006

July—no meeting

August 26, 2006—All Day Work Session, NOWRA Conference

September 28, 2006

October 26, 2006

November 16, 2006

December 21, 2006

Running along side the Basics of Onsite class we had educational seminars that covered a diversity of topics that ranged from a Basics of Business presentation by the Wichita State Small Business Center, to the Watershed Management approach for reducing pollutants, to a panel discussion on watertight lids and riser installation.

All total about 150 people came to the show. We hope that continues to grow!

There is no new legislation proposed in the state right now. KDHE has given their support to our association as well as the new training program. They even gave target grants to their regulators to get them to attend the conference. We continue to work closely with them as we develop training materials.

➢ MICHIGAN

DEQ Continues Initiative to Eliminate Illegal Groundwater Discharges

The protection of the state of Michigan's valuable groundwater and surface water resources remains one of the most important goals of the Department of Environmental Quality. The DEQ's groundwater and surface water regulations play a vital role in protecting our drinking water and recreational surface waters.

In 2005, the DEQ implemented a strategy that identified facilities that were once permitted as groundwater dischargers, but had allowed their permit to expire. This initiative successfully addressed over 100 of these facilities and brought most of them into permit compliance, while the others are currently in the process of achieving compliance.

In 2006, the DEQ is introducing a second initiative that is aimed at gaining compliance from facilities that currently discharge to the waters of the state but have never obtained the necessary permit from the DEQ. The goal of this initiative is to provide an opportunity for these dischargers to voluntarily pursue compliance with the state of Michigan wastewater discharge laws by obtaining the proper permit and by immediately placing them into the DEQ's compliance tracking system via an administrative consent order. The initiative expires on September 30, 2006. Those that continue discharging wastewater illegally after that date will be subject to legal remedies available to the DEQ to gain compliance with the environmental regulations of the state.

"There are likely hundreds of facilities that are currently discharging wastewater to Michigan's surface or groundwaters without the proper permit," said DEQ Director Steven E. Chester. "This approach allows us to focus our efforts on protecting water quality by encouraging voluntarily compliance with Michigan's environmental regulations."

The goal of this initiative is to gain compliance from a large number of facilities, while fostering working relationships with them by helping to determine if they need a permit and if so, what type of permit. Participation in this program is good for the facility, and will continue to increase the effectiveness of the DEQ's efforts while saving taxpayer dollars. Groundwater and surface water permitting programs are partially funded through annual permit fees paid by the regulated community. Facilities that take advantage of this opportunity and obtain the necessary permit are increasing the agency's long-term capacity to provide technical and compliance assistance to the regulated community, rather than forcing the DEQ to embark on costly and adversarial enforcement efforts.

For more information, refer to the following Web page:

www.michigan.gov/deqwater and find the link under "Spotlight," or call Derrick Simmons at (517) 373-4014 or e-mail him at SimmonsD@michigan.gov.

continued on page 16

➢ OHIO

The OOWA annual convention was held on January 4 and 5, 2006 at the Holiday Inn – Dayton Mall in Miamisburg. There was excellent participation by exhibitors and the highest attendance rate to date. Twenty-five new contractors registered for the Installation Qualified Contractor program. The educational sessions offered a variety of topics for our diverse OOWA membership:

- 45% contractors / installers / maintenance / service providers
- 22% manufacturers / suppliers / vendors
- 20% regulators
- 8% designers / engineers / site evaluators / soil scientists
- 5% academic / research / other interested parties

The Awards Luncheon speaker was Senator Tom Niehaus, sponsor of Ohio's new sewage treatment system (STS) law. He complimented OOWA for their active support for passage of this long awaited legislation and encouraged the OOWA membership to continue their active involvement during the adoption of the STS rules mandated by the new law. The law requires that new rules be adopted by May of 2006.

In 2005, Senator Niehaus received the first OOWA Distinguished Service Award. The 2006 Distinguished Service Award was presented to Rick Novickis at the convention Awards Luncheon. New directors that took office at our annual membership meeting are Ty Cook, Tom Frank, Tom Grigsby, George Hess, Mike Morrow and Adam Voris.

Our next convention is scheduled for January 25-26, 2007 at the University Plaza Hotel in Columbus.

➢ WISCONSIN

On February 17 and 18th, over 400 members gathered to attend the WOWRA three-track training program featuring soils, system maintenance and a general business track.

Featured keynote speaker was Dr. James M. Robertson—Director of Wisconsin Geological and Natural History Survey and Wisconsin State Geologist

Other speakers and their topics included

- Dr. David Lindbo—North Carolina State University, Soil Morphology and Relations;
- Sara Christopherson—University of Minnesota, Common Causes and Solutions for Septic System Freeze-ups;
- James Converse—University of Wisconsin, Future of Onsite Wastewater;
- E. Jerry Tyler—University of Wisconsin, Soils for Wastewater Treatment;
- Bill Stuth, Sr—Aqua-Test Inc, Basic Troubleshooting for onsite Systems;
- Rick Apfel—Ayres and Associates—Large System Design

Panel discussions featuring regulators identifying problems in Wisconsin and a General forum focused on installation practices and problems in Wisconsin will also occur.

Sue Schambureck, incoming WOWRA President updated the membership on the progress of Wisconsin's "Privately Onsite Wastewater Treatment Systems (POWTS) Evaluator Certification Program". This program is sponsored by WOWRA to facilitate the standardization of POWTS system inspections in Wisconsin.

A cocktail party in the exhibit area occurred Friday night and with the annual banquet held on Saturday night. At that time, recognition and honors were given to outgoing president Brian McQuestion.

Wayne Mink

It is with great sadness that Wieser Concrete Products and its team says goodbye to our dear friend and valued colleague Wayne Mink. Wayne passed away Monday, January 9, 2006 at his home in Westfield, Wisconsin.

➢ WASHINGTON

WOSSA's 10th Annual Conference "Real Life Applications in Onsite" was successfully held in Ocean Shores, WA. With 400 attendee's, 47 Exhibitors and speakers, the two day event was filled with lot education for Installers, Designers and Operations and Maintenance Service providers. Attendee's had the opportunity to gain nearly 13 contact hours in various topics in the application of onsite technology.

The program featured two equipment rodeos' along with a pump truck rodeo for the first time in our history. The Ocean Shores Convention Center featured nearly a half acre of clear dirt for equipment to be tested and driven with prizes and awards being handed out at the end of the program.

This year's program also featured the associations "Second" Annual Auction for its Scholarship program. With nearly $30,000 dollars in donations of equipment and events, the auction produced nearly $26,000 dollars for the scholarship program and administration.

In addition to the equipment donated by various companies and manufacturers, this years Auction featured a two day Coyote Hunt by JR Inman, Past President of WOSSA, a Salmon Fishing trip by Matt Lee, the 2007 WOSSA Conference Chairman, several flights in a WW II war bird this summer and WOSSA's First Annual "Climb for Higher Education" to the summit of Mt Rainier, a 14,415 foot peak in Washington, by the association Executive Director, John Thomas, that raised $4,000.00 in corporate and individual member sponsorship to be completed in July of 2006.

The conference continues to grow and we gratefully acknowledge the generous support of our industry manufacturers, service providers, suppliers and regulators to its continued success. ■

STATE ASSOCIATION UPDATES Upcoming Meetings and Previews

Rhode Island Workshop on Wastewater Management

Save the date! On Tuesday, **March 14, 2006**, the University of Rhode Island Cooperative Extension will be hosting an all-day workshop at the Narragansett Bay Campus entitled ***Local Wastewater Management: Starting It, Running It, and Clearing the Hurdles***.

The workshop will highlight the struggles and successes of Rhode Island communities who have effectively implemented plans to protect public health and manage water quality from a watershed perspective.

It will run from 8:00 am until 5:00 pm, and attendance can be used to earn 4 Continuing Education Units. The cost for licensed designers and professionals is $150. The cost for government officials, community board members, nonprofits, and private citizens has been subsidized by the Block Island /Green Hill Pond Wastewater Project, and registration for these individuals is $25.

For additional information and to register visit: http://www.uri.edu/ce/wq/mtp/html/munitrai.html.

For further information contact: Lisa Philo, URI Cooperative Extension Water Quality Program, 401.874.5687

MOWPA Offers Training Program for Service Providers

The Maryland Onsite Wastewater Professionals Association (MOWPA) is conducting the Consortium's Operation and Maintenance (O&M) Service Provider Program on Friday and Saturday, March 24 & 25 at the Annapolis Radisson Hotel in Annapolis, MD. This program was established with a grant from the NDWRCDP to educate and train practitioners in the use of best practices for onsite wastewater treatment system service visits. The Maryland course uses the approach developed in this program which focuses primarily on single-family residential systems. The important message being imparted in this course is that through routine service visits and proper maintenance, and management, onsite wastewater treatment systems truly become a permanent and effective part of our wastewater treatment infrastructure.

This 2-day training course addresses the key aspects of O&M inspection procedures. It assumes that attendees have either completed the NOWRA Onsite Basics A to Z course, are knowledgeable about this work, or have been working in this profession for a period of 3-5 years. At the end of the course, two hours are set aside for participations to take an examination, which enables them to obtain a "Certificate of Completion" and continuing education units (CEU's.) that verifies their level of achievement as a NOWRA professional. Following the course, participants will be issued a card for use in promoting their professional status to future clients. Individuals are expected to participate in both days of the program.

The O&M service provider course includes materials that give participants the ability to evaluate each component of the onsite wastewater treatment system. This approach follows the concept that each onsite system is a treatment train with multiple technological options for each of the four main components. Operational checklists are provided for all the technologies that could be a component of the treatment train. This process allows the service provider to pick and choose the operational checklists that apply to each system's unique treatment train. Operational checklists guide the O&M service provider through a review of all the components during an O&M service visit.

Standards for admission to the course require completion of the NOWRA Onsite Basics A to Z , or demonstration of 3 years experience and expertise required to conduct O&M. A person's abilities may be measured with a certification exam that defines applicants' familiarity with the defined body of knowledge.

The program covers key aspects of O&M inspection procedures, data collection and the use of operational checklist forms. This information can then be integrated into the O&M professional's business model and used to analyze and report ongoing critical and essential information.

Day 1—Friday, March 24, 2006.
9 am to 4 pm

- Defining the role and function of an O&M Service Provider
- Understanding the terminology – what the words mean
- Safety Requirements
- Business Ethics & Professionalism
- Site Assessment Procedures

Day 2 —Saturday, March 25, 2006
8 am to 3 pm

- System Evaluation & Inspection
- Pre-Treatment Components, Tanks and Controls
- Advanced Components and Dispersal Systems
- Examination

The individuals providing this introductory course have been trained through the Consortium of Institutes for Decentralized Wastewater Treatment Program and are field experienced. Additional information and registration forms can be obtained by calling 410-798-0842.

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Call for Papers and Exhibit Registration

PLANNING, MANAGING AND OPERATING SEPTIC AND ONSITE SYSTEMS

Making Decisions to Implement the Chesapeake Bay Restoration Program

Sheraton Annapolis Hotel
173 Jennifer Road, Annapolis, MD 21401
APRIL 24–25, 2006

This 2-day conference includes a full general session, concurrent break-out sessions and exhibits each day. This notice provides information about the program and solicits presentations on defined topics and themes. It also includes an exhibitor registration form. Business companies are encourage to provide presentation abstracts.

This conference focuses on what policy officials, regulators, planners, home and business owners need to know about the various issues affecting septic systems, onsite technology. It is specifically directed to questions about the Chesapeake Bay Restoration program —septic systems and the new technologies. The following topics will be addressed through presentations and panel discussions.

- Addressing the issues affecting older septic systems with today's regulations
- What's involved in maintaining and servicing onsite systems—what are the costs?
- How are onsite systems managed — who does it – what are owners responsibilities?
- What is a responsible management entity (RME) and where are these programs being used – what are the successes and what are the pitfalls?
- What are the factors to take into consideration in applying for the funding to replace or upgrade older systems in the critical areas and coastal bays?
- What do local policy officials need to know about the right technology to use?
- What are the real facts about nitrogen and soil treatment—how does it really work?
- What are advanced systems, how do they achieve nitrogen removal, and what's available?

Overview

MOWPA is pleased to announce its 2nd annual conference that addresses critical issues of providing wastewater treatment through onsite technology and decentralized systems. These issues not only affect Maryland and its surrounding jurisdictions of Virginia, Delaware and Pennsylvania, but are also occurring throughout the US. Never before has a topic been so relevant to state leaders, home and business owners, developers, regulators and industry practitioners.

This conference takes the opportunity to focus on an important program underway in Maryland – implementing the new Bay Restoration Program. This unique legislation, adopted in 2004, provides funding to upgrade and replace failing and outdated septic systems in the Maryland critical areas and coastal bays. This program is creating both opportunities to address long term problems—and numerous questions about technology and managing systems. It is also stimulating a new awareness of technology available to support the wastewater infrastructure needs. Through this education approach, many of the questions about onsite systems and traditional septic tanks will be addressed by both national educators and professionals.

Emerging from its second year of activities, the Maryland association represents the professionals in an industry responsible for ensuring that both water quality is protected and that quality work is performed. Quality is achieved through education and training and commitment. MOWPA's activities over the past two years have demonstrated this commitment. It has accomplished important milestones in establishing education and training programs specifically on the needed technical skills and expertise for onsite practitioners. Planning efforts are underway to develop a comprehensive 2007 program that involves a collaborative partnership of Maryland environmental health directors, state officials and industry practitioners.

Proposed Session Topics

- Choosing an Onsite Wastewater Treatment System
- Alternatives for Communities and Individual Lots
- Affordable Systems
- Advanced Treatment Technology
- Answering questions about nitrogen and the treatment process
- Operations, Maintenance & Service Requirements—what system owners need to know
- Managing Onsite Systems—What is an RME?
  –What are the requirements, who can do it, presenting cases of successful practices
- Case Studies of Successful Projects in Maryland

Presentation Formats

- CASE STUDIES
- 30–45 MINUTE PRESENTATIONS
- ROUND TABLE DISCUSSIONS
- PANEL SESSIONS

Material Deadlines and Submittal Procedures

1. Abstracts are due by March 17, 2006.
2. Send as MS Word documents to lhbonner@hanifin.com which will be reviewed by the MOWPA Education Committee. If you are unable to email your submittal, please fax it to 410-798-5741. Confirmation of abstracts received will be provided by the MOWPA Office.
3. Individuals will be notified of selection by March 31, 2006 and provided with instructions regarding final presentation format.
4. Final papers are to be sent to the MOWPA office by April 17, 2006 in electronic format for publish as a proceeds.

New Publications Now Available for State & Member Use

NOWRA has produced five new products for State and member use. They include:

- "**SEPTIC HELP**" brochure promoting the NOWRA **SepticLocator**
- **Who is NOWRA?** brochure – that focuses on the representation of industry practitioners, our mission and principles that guide the direction of the organization,
- **Why Join NOWRA?** Brochure addressing the benefits and value of a NOWRA membership (which can also be incorporated into a "state-specific" document)
- **Bumper/Truck sticker** promoting NOWRA membership and the SepticLocator—that is important in the identify of your businesses.
- Homeowner's Onsite System Guide and Record Keeping Folder

All of these documents can be downloaded from the website for member use, or you can contact the NOWRA office for copies to be made available.

CALENDAR OF EVENTS

MARCH

6–8 Virginia Department of Health, Education Training, Koger Center, Richmond, VA

6–8 Texas Onsite Wastewater Treatment Research Council Conference, Waco, TX

6–10 State Onsite Regulators Association, San Francisco

10 Colorado Professionals in Onsite Wastewater Annual Conference, Grand Junction, CO

Oregon Onsite Conference

12 Minnesota Onsite Wastewater Annual Business Meeting, Rochester, MN

13–15 Minnesota Onsite Wastewater Conference. Rochester Mayo Civic Center in Rochester, MN. For more information call 888/810-4178 or visit MOSTCA's website

14 Delaware Onsite Wastewater Recycling Association Quarterly Board & Membership Meeting. Delaware State Fair Grounds, Harrington, DE Contact: Hilary Moore at 302/739-9948

14 Iowa Onsite Wastewater Association Board Meeting. For more information, please call 515/286-2267

16–17 Utah On-Site Wastewater Association 6th Annual Conference Center, Layton, UT 84041. Davis Conference Center, 1651 N. 700 West. Contact: Judith Sims

20–21 7th Annual Ontario On-site Wastewater Conference and Exhibition. *Removing the Barriers to the Onsite Industry.* Delta Kitchener Hotel and Conference Centre, Kitchener, Ontario, Canada. For more information: www.oowa.org or www.orwc.uoguelph.ca

24 Colorado Professionals in Onsite Wastewater Annual Conference, Golden CO

APRIL

11 Iowa Onsite Wastewater Association Board Meeting. For more information, please call 515/286-2267

MAY

9 Iowa Onsite Wastewater Association Board Meeting. For more information, please call 515/286-2267

JUNE

13 Delaware Onsite Wastewater Recycling Association Quarterly Board & Membership Meeting. Delaware State Fair Grounds, Harrington, DE. Contact: Hilary Moore at 302/739-9948

13 Iowa Onsite Wastewater Association Board Meeting. For more information, please call 515/286-2267

17 Wisconsin On-Site Wastewater Recycling Association, Summer Meeting

JULY

11 Iowa Onsite Wastewater Association Board Meeting. For more information, please call 515/286-2267

27–29 Florida 2006 Convention & Trade Show, Daytona Beach Convention Center, FL

AUGUST

8 Iowa Onsite Wastewater Association Board Meeting. For more information, please call 515/286-2267

26–31 NOWRA's 15th ANNUAL CONFERENCE. Adam's Mark Hotel in Denver, CO

SEPTEMBER

12 Delaware Onsite Wastewater Recycling Association Quarterly Board & Membership Meeting. Delaware State Fair Grounds, Harrington, DE. Contact: Hilary Moore at 302/739-9948

12 Iowa Onsite Wastewater Association Board Meeting. For more information, please call 515/286-2267

OCTOBER

10 Iowa Onsite Wastewater Association Board Meeting. For more information, please call 515/286-2267

24–25 Delaware Onsite Wastewater Recycling Association 10th Annual Conference and Quarterly Board & Membership Meeting. Delaware State Fair Grounds, Harrington, DE. Contact: Hilary Moore at 302/739-9948

NOVEMBER

14 Iowa Onsite Wastewater Association Board Meeting. For more information, please call 515/286-2267

DECEMBER

4-6 NOWRA 2ND ANNUAL INSTALLER ACADEMY. The Riviera Hotel, Las Vegas, NV

12 Iowa Onsite Wastewater Association Board Meeting. For more information, please call 515/286-2267

BETTER TOGETHER

Orenco® Fiberglass Tank

AdvanTex® Textile Filter

Ask about our new Tank and Treatment combo. A perfect fit.

Every tank tested twice for watertightness

Our tank and treatment combo is the first complete turnkey package for wastewater treatment that includes both a tank and a packed bed filter. Simplifies plumbing. Reduces installation costs and errors. Compact and durable.

Most importantly, the Orenco Tank and AdvanTex Textile Filter make raw wastewater up to 99% cleaner, producing clear, clean, odorless effluent with less than 10 mg/L BOD and TSS.
Even under peak loading conditions.

Go to our Web site (**www.orenco.com**) for more information about Orenco Tanks and **AdvanTex Filters**, and the name of your nearest AdvanTex Dealer. Or just call Orenco at **800-348-9843**.

Orenco Systems®
Incorporated

Changing the Way the World Does Wastewater®

800-348-9843
www.orenco.com

Covered by patent numbers 5,492,635; 5,480,561; 5,360,556; 6,540,920; 5,531,894; D461,870; D445,476

NOWRA
National Onsite
Wastewater Recycling Association

2006 CONFERENCE PROGRAM

REGISTRATION ANNOUNCEMENT

15th Annual Technical Education Conference & Exposition

NOWRA's 15th Annual Technical Education Conference takes place this year in the beautiful Colorado Rockies—traditionally known as the "Mile High City!" And why? Because Denver is located on the lee side of a massive mountain range, it has a beautiful mild dry climate—with 300 days of sunshine. In August, temperatures will be in the low 80's with very low humidity.

The Conference hotel is the Adams Mark Denver Hotel—which is the largest conference hotel in Colorado. Located downtown on Denver's famous 16th street pedestrian mall, visitors are a convenient four blocks from Denver's historic area and State Capital. During your stay, visiting the shops, restaurants and sites in the Denver historic area is easily accessible.

WASTEWATER TREATMENT THROUGH

INTEGRATED WATERSHED MANAGEMENT

August 28–31, 2006
Adam's Mark Denver Hotel

Make this Conference a Special Visit!

Within an hour or two of downtown Denver, there are numerous day trip adventures. All of these trips can be accomplished in a day, bringing you back to the city for an exciting evening.

- **42 miles west of Denver is the Victorian village of Georgetown**—which has more than 200 restored buildings in this quaint town. It also includes the Georgetown Loop—a narrow gauge steam locomotive that carries passengers up a narrow valley.
- **Summitt County boasts of four major resorts in their jurisdiction**—Lake Dillon, Breckenridge, Copper Mountain, Keystone & Frisco. In these areas are all forms of outdoor recreation: whitewater rafting, hiking, hot air ballooning, golf, horseback riding, just to name a few.
- **The largest ski town in Colorado**—Vail/Beaver Creek is an international pedestrian village that is even more delightful in summer when the streets are lined with outdoor cafes, flower baskets and numerous cultural events.
- **Who could pass up "Pikes Peak"** which also offers a scenic 24 miles train ride through the heart of the Royal Gorge Canyon.

Join onsite industry professionals at the most important and influential water-quality event of the year.

The 2006 NOWRA Conference offers an unparallel educational and training experience to individuals committed to achieving water quality results with decentralized systems. NOWRA also provides for industry practitioners and policy officials the largest and most comprehensive exposition of manufacturers and products in the United States. Here is where you get the real answers to the real issues facing you in today's water quality industry.

NOWRA's conference sessions are widely recognized for the in-depth expertise provided by educators and speakers who have years of experience in establishing onsite wastewater systems for homes, cluster and business developments. There is a diverse lineup of educational opportunities, interest group sessions, great speakers, an exhibit hall full of the latest technology—and much more.

The Experiential Training Program for Onsite Industry practitioners provides unique education forums for professionals assisting them in solving problems and learning of new methods to installation practices and/or maintenance. Plans for this year's program includes a tour of the Colorado School of Mines, hosted by the Colorado Professionals Onsite Wastewater Association. (Advanced registration is required for this program. See registration form to register.)

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:

- Soils and Watershed Management Issues, including sustainability, permitting and stakeholder collaboration
- Assessment tools or approaches to broader integrated evaluations
- Innovative Systems, Technologies, and Solutions
- Education Strategies and Applications
- System Performance and Evaluations
- Watershed Management Strategies and Applications
- System planning and management strategies to assure performance
- Regulations and the regulatory framework
- Basics of Onsite Systems—Operations & Maintenance

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.

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

CONTINUING EDUCATION sessions provide experiential learning from comprehensive technical sessions and workshops. Experts in the onsite industry present the latest information on every topic necessary to advance your professional development.

CONFERENCE REGISTRATION INFORMATION

Full-conference registration includes access to all education sessions and the technical exposition, break refreshments, Exhibitors Networking receptions, NOWRA Member Recognition & Awards Luncheon with invited guest speakers, the Post Conference Session, and Conference Proceedings.

Daily registration fee covers the specific one-day access to education sessions and seminars, the Exposition, refreshment breaks, and Conference Proceedings.

Guest fee includes access to the technical exposition, Awards Lunch, Exhibitors Welcome Reception, Hospitality Area, and refreshment breaks.

2006 CONFERENCE PRELIMINARY PROGRAM SCHEDULE

SATURDAY, AUGUST 26—Pre-meetings

7-8 am	NOWRA Golf Outing
8–9 am	Rooms available for Committee and Group Meetings

SUNDAY, AUGUST 27—Day 1

8 am—Noon	NOWRA Board of Directors Meeting
10 am–Noon	Exposition Set-up (Plaza Ballroom) Conference Registration
12 noon–1 pm	NOWRA Board & State Leaders Lunch
1-4 pm	State Leaders Meeting

MONDAY, AUGUST 28—Day 2

7–8 am	Conference Registration Breakfast in Foyer
8–10 am	General Session (Plaza Ballroom)
10–12 noon	Opening of NOWRA Exposition (Plaza Ballroom)
Noon–2 pm	Industry Awards & Service Recognition Luncheon (Grand Ballroom)
2–5 pm	Technical sessions
5-6 pm	Exposition Reception.

TUESDAY, AUGUST 29—Day 3

7–8 am	Conference Registration Breakfast in Foyer
8 am	Exposition Hall Open all day for public Contractors, Realtors, Builders
9 am–Noon	Technical Sessions (45 min break a.m.)
Noon– 1 pm	Luncheon for purchase in Exposition Hall
1–5 pm	Technical Sessions (45 min break p.m.)
5–6 pm	Exposition Social

WEDNESDAY, AUGUST 30—Day 4

7–8 am	Conference Registration Breakfast in Foyer
8 am–Noon	Technical Sessions (30 min break a.m.) Exhibitor Meeting—2007 Conference Booth Sale
Noon–2 pm	Lunch & Raffle in Exposition Hall Exhibit Hall Closes at 2 pm
2–5 pm	Technical Sessions (30 min break p.m.)

THURSDAY, AUGUST 31–Day 5

7–8 am	Breakfast in Foyer
8 am–4 pm	Post Conference Session
9am –4 pm	Experiential Field Education Trip
10 am –Noon	Consortium Glossary Workshop

See NOWRA's website for most current updates.
www.nowra.org

NOWRA 15TH ANNUAL CONFERENCE & EXPOSITION

Registration Information

REGISTRATION PROCEDURES

- Registration at the rates identified below must be RECEIVED with payment in full by the dates listed.
- *Early registration:* on or before July 31, 2006; no reduced-rate registrations will be accepted after August 1, 2006
- *Regular Registration Fees:* August 1 through August 25, 2006.
- *Onsite Registration Fee:* August 26 through August 31, 2006.
- No phone-in registrations will be 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 August 15, 2006, and accompanied by payment in full in order to be processed. Please visit our website www.nowra.org to register online.
- To register at member rates, you must have a current (2006) membership paid in full. All current members have been sent 2006 membership cards and numbers. To verify your membership, check with your State group or go to the NOWRA website and follow instructions listed. Independent members should verify through the NOWRA office. NOWRA membership is held on an individual, nontransferable basis.

CANCELLATION POLICY

Registration cancellations must be in writing, and are refundable only until August 25, 2006, but will be charged processing fee of $50.00. No cancellations are accepted after August 25, 2006 and no refunds will be given after that date.

NOWRA MEMBERSHIP

If you are not a current NOWRA member but would like to become one, you may purchase a 2006 membership through your state group or an individual basis through NOWRA at $140/year and save on the full conference price! NOWRA individual membership forms available on our website www.nowra.org. This membership is only good through December 31, 2006.

Student fee includes full conference registration and a student membership in NOWRA through 2006. Students must be attending college or graduate school full-time in a course of study related to onsite wastewater technology.

CONFERENCE SCHEDULES

NOWRA Conference begins Monday, August 28, 2006 at 8:00 a.m. and concludes Thursday, August 31, 2006 at 4:00 p.m.

Registration Location—Plaza Level of the Adam's Mark Denver Hotel.

Exhibitor Registration and materials are available for pick-up beginning Sunday, August 27 at beginning a noon.

CONFERENCE FEES

FULL CONFERENCE

NOWRA Members and
Partnering Organizations*
- Early (on or before July 31, 2006)— $395
- Regular (August 1–25, 2006)—$425
- On-site (August 26–31, 2006)—$475

Non-Members
- Early (on or before July 31, 2006)— $535
- Regular (August 1–25, 2006)—$565
- On-site (August 26–31, 2006)—$625

DAILY CONFERENCE RATE

NOWRA Members and
Partnering Organizations
- Early (on or before July 31, 2006)— $200
- Regular (August 1– 25, 2006)—$250
- On-site (August 26–31, 2006)—$300

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

Non-Member
- Early (on or before July 31, 2006)— $340
- Regular (August 1– 25, 2006)—$395
- On-site (August 26–31, 2006)—$445

SPECIAL STUDENT FEE—$125
(includes NOWRA membership)

OTHER FEES
- Post Conference Symposium
(Thursday, August 31, 2006)—
$150 for non-conference attendees
- Onsite Systems Field Trip—$95
(includes transportation/lunch)
- Spouse/Guest—$125 (includes awards lunch & opening reception, hospitality room and gift)
- Annual Membership Luncheon
(Monday, August 28—$75
- Opening Reception
(Monday, August 28)—$40
- Networking Social
(Tuesday, August 29)—$25
- Golf Tournament (Saturday, August 26)
Individual $125; Foursome $450.

Relax, have fun, and support NOWRA by participating in a great day of golf on a fabulous course.

NOWRA ANNUAL
GOLF
OUTING

Saturday, August 26, 2006
Tee off—8 am

Event includes:
fun, sun, beverages,
lunch, and range balls.

Cost is $125.00 per golfer
and $450 for a foursome.

We play rain or shine.
NO MAKE-UP RAIN DATE

NOWRA 15TH ANNUAL CONFERENCE & EXPOSITION

Conference Registration Form

Please print all of the following information:

Last Name_____ First 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_____ NOWRA Membership No. _____

REGISTRATION INFORMATION

Mail this form with a check (payable to NOWRA) or fax your registration with credit card information.

NOWRA
P. O. Box 1270
Edgewater, MD 21037-7270
or
fax credit-card-paid forms to
(410) 798-5741

INQUIRIES
800-966-2942

Registrations are only accepted with full payment in U.S. dollars.

Registrations can be done online visit our website www.nowra.org

After August 25, 2006, registrations are **only** accepted at the Conference

Please duplicate this form for additional registrations.

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

**Includes NOWRA membership

PLEASE REGISTER ME FOR THE FOLLOWING:

	NOWRA Members and Partnering Organizations*	Non-Member	Student**	TOTAL
FULL CONFERENCE				
❒ Early (on or before July 31, 2006)	$395.00	$535.00	$125.00	_____
❒ Regular (August 1–25, 2006)	$425.00	$565.00	NA	_____
DAILY CONFERENCE RATE				
❒ Early (on or before July 31, 2006)	$200.00/day	$340.00/day	NA	_____
❒ Regular (August 1–25, 2006)	$250.00/day	$395.00/day	NA	_____

OTHER FEES *(not included in Full Conference Registration fee)*

❒ NOWRA 2006 annual membership dues—$140 _____

❒ Post Conference Symposium, Thursday, August 31—$150.00 for non-conference attendees _____

❒ Onsite Systems Field Trip—$95.00 (includes transportation/lunch) _____

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

❒ Golf Outing, Sat. Aug. 26: ❒ Individual $125 ❒ Foursome $450 _____
❒ *Contact me about providing items for goody bags, door prize, or other sponsorship opportunities (beverage cart or photographs)*

The following events are included in the Full Conference & Daily Registration fees, however additional tickets may be purchased. Please indicate number of tickets needed.

❒ Annual Membership Luncheon, Monday, August 28: ___ tickets @ $75.00/each _____

❒ Opening Reception. Monday, August 28: ___ tickets @ $40.00/each _____

❒ Networking Social, Tuesday, August 29: ___ tickets @ $25.00/each _____

TOTAL DUE _____

❒ I plan to attend: *Onsite A to Z Systems Course* (Advanced sign up required)

❒ Exposition Pass—no charge (only access to Exposition Ballroom and Exposition Hall) available at registration desk. ___ Monday ___Tuesday ___ Wednesday

❒ Please check here if you require special accommodations to fully participate. Attach a written description of your needs.

PAYMENT INFORMATION (NOWRA EIN #593099430)

❑ Enclosed is a check for $ _____made payable to NOWRA. (Returned checks will be charged a $50 fee.)

❑ Please charge the following credit card: ❑ VISA ❑ MasterCard | Amount to charge credit card $_____

Credit Card Number _____ Exp Date _____ Security Code (on back of card) _____

Credit Card Billing Address _____
Street

_____
City State Zip

Authorizing Signature (required) _____ Print Name _____

NOWRA
National Onsite
Wastewater Recycling Association

15th Annual
Technical Education Conference
August 28–31, 2006

and

Exposition
August 28–30, 2006

INTEGRATED WATERSHED MANAGEMENT

ADAM'S MARK HOTEL
Plaza Ballroom
Denver, Colorado

Plan a family vacation to the beautiful Colorado Rockies!

Exposition Schedule and Information

Use this unique opportunity to learn from the experts—and network with your colleagues

FEATURED TOPICS:

- Innovative products, technologies and wastewater treatment solutions
- Successful planning and management strategies to assure performance
- Soil and site evaluation research and tools
- Advanced nitrogen and phosphorus removal technologies
- Companies with the latest products and equipment

The largest national educational program for wastewater professionals to gain knowledge, education and skills in the onsite and decentralized industry.

All technical sessions are taught by professionals with continuing education credits issued.

EXPOSITION RESERVATION FORM
NOWRA 15th Annual Technical Education Conference and Exposition

COMPANY/ORGANIZATION REGISTRATION INFORMATION

Company/Organization Name _____

Address _____

City _____ State _____ ZIP/Postal Code _____

Country _____

Phone Number _____ Fax Number _____

E-mail _____

Company name _____
(exactly as it should be listed on all printed materials)

CONTACT PERSON TO RECEIVE MATERIALS

Name _____ Title _____

Phone _____

E-mail _____

CONFERENCE BOOTH PERSONNEL

Attendee #1 _____
Name on badge Last Name First Name

Attendee #2 _____
Name on badge Last First Name

Attendee #3 _____
Name on badge Last Name First Name

Attendee #4 _____
Name on badge Last Name First Name

PLEASE NOTE! No changes will be accepted after August 1, 2006

PLEASE ACCEPT OUR REGISTRATION FOR THE FOLLOWING:

BOOTH SPACE RESERVATION

Booth Size	Qty	Rate	Total
1. ❑ 10 x 10 booth	_____	$1200	_____
2. ❑ 10 x 20 space (end)	_____	$2500	_____
3. ❑ 10 x 20 space (interior)	_____	$2200	_____
4. ❑ 10 x 30 space (interior)	_____	$3000	_____
Non-Member—add $500 per booth request			_____

1st Choice _____ 2nd Choice _____ 3rd Choice _____

All booths must be paid by July 1, 2006, or will be released.

ADDITIONAL SPONSORSHIP & BUSINESS PROMOTIONAL OPPORTUNITIES

❑ CyberCafé Promo—$500 per side _____

Company recognition handouts

❑ Attache bags—$1500 _____

❑ Name badge pouches—$1000 _____

Commitments for company promotional items must be received by May 15, 2006.

Conference Sponsors & Regulator Scholarship Fund
❑ $2,500 Platinum
❑ $1,500 Gold
❑ $750 Silver
❑ $500 Bronze _____

SPECIAL ADVERTISING RATES FOR CONFERENCE PROGRAM

❑ Full Page	❑ $1050 (b/w)	❑ $1250 (color)	_____
❑ 1/2 Page	❑ $800 (b/w)	❑ $900 (color)	_____
❑ 1/4 Page	❑ $500 (b/w)	❑ $600 (color)	_____
❑ Professional Business Card	❑ $250		_____

Back Cover and Inside Front & Back Covers—reserved

Subtotal $ _____

NEW MEMBER (please add $140 membership fee) $ _____

TOTAL AMOUNT DUE $ _____

I/we authorize NOWRA to reserve exhibit space/sponsorship/advertising for my/our use. I/we certify that the products to be displayed are used in the onsite industry. I/we acknowledge the payment and cancellations requirements contained in "Important Information for Exhibitors."

SIGNATURE REQUIRED _____

MEMBERSHIP INFORMATION

❑ NOWRA Member Number _____

❑ NEW MEMBER ($140 membership dues)

MAIL this completed & signed registration form with payment in full to:

NOWRA
P.O. Box 1270
Edgewater, MD 21037-7270

OR

FAX Credit-Card-Paid Forms to
410–798–5741

PAYMENT INFORMATION

❑ Enclosed is a check for $ _____ made payable to NOWRA. (Returned checks will be charged a $50 fee.)

❑ Please charge the following credit card: ❑ VISA ❑ MasterCard

Amount to charge credit card $_____

Credit Card Number _____ Exp Date _____

Security Code (on back of card) _____

Print Authorizing Name on Card _____

Credit Card Billing Address _____
Street Address

_____
City State Zip

Authorizing Signature (required) _____

EXPOSITION SCHEDULE AND INFORMATION

The NOWRA 15th Annual Technical Education Conference Exposition will be located in the Plaza Ballroom of the Adam's Mark Hotel, 1550 Court Place, Denver, CO 80202.

Exposition Schedule

Booth Set-Up	Sunday, August 27, 2006, 1:00 pm
Exposition Opening	Monday, August 28, 2006 10:00 a.m. to 12 noon
Exposition Hours	Monday, August 28, 2006 2:00 p.m. to 7:00 p.m.
Contractor Open House	Tuesday, August 29, 2006 8:00 a.m. to 6:30 p.m. Wednesday, August 30, 2006 8:00 a.m. to 2:00 p.m.
Breakdown	Wednesday, August 30, 2006, 2:00 p.m.

- Booth staffing during technical sessions is optional, everyone is urged to participate in the technical sessions.
- All activities and breaks will be held in the Plaza Ballroom at designated hours.
- Security will be provided during set-up and exhibit hours.
- The Plaza Ballroom will be locked during evening hours.
- NOWRA reserves the right to remove other materials and to reject a registration for any reason.

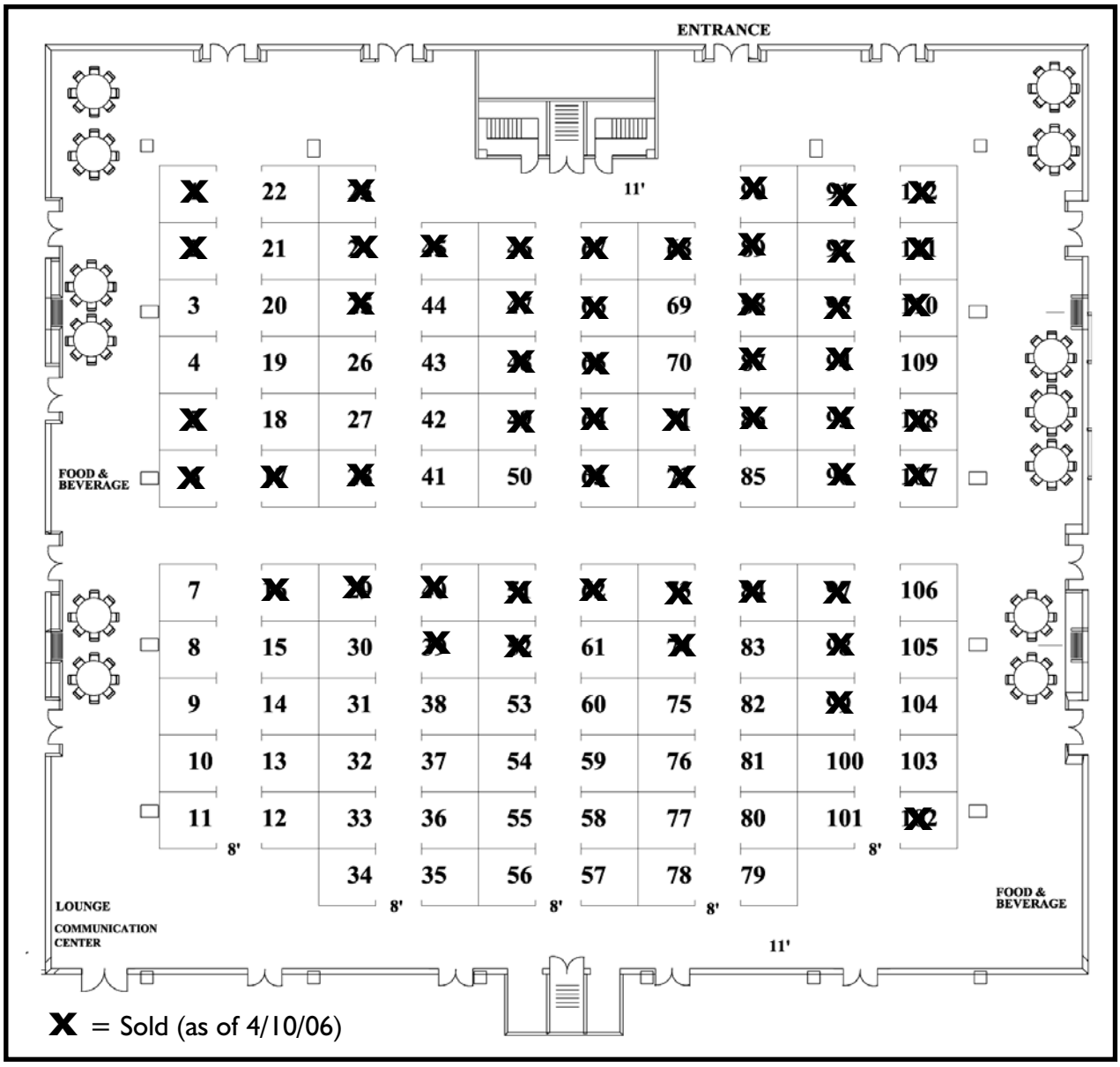
2006 NOWRA Member Booth Rates

(Non-Members add $500.00 per booth)

Location	Space Size	Rates	Included with Fees
Plaza Ballroom	10 x 10 booth	$1200	2 full registrations
	10 x 20 space (end)	$2500	4 full registrations
Double	10 x 20 space (interior)	$2200	4 full registrations
Triple	10 x 30 space (interior)	$3000	6 full registrations

- A full registration includes admittance to all technical sessions, reception, awards luncheon, breaks, one complimentary conference proceedings and conference handouts.
- Additional booth personnel registrations are $175.00 per person and are not considered full registrations.
- Member rates apply for booth registration; non-member rates add $500.00 per booth
- Reservations received after August 1, 2006 will be accepted on a space available basis, with an additional late fee of $200.00.
- All booths must be paid in full by July 1, 2006, or will be released from reservation.

continued on page 28



IMPORTANT INFORMATION FOR EXHIBITORS

Each exhibit booth space includes the following items:

- Company name and profile in the Exhibitors' Listing in the Conference Program
- Exposition Hall signage as of publication date.
- One 7" x 44" one-line, black on white identification sign to include booth number
- One 8' x 30" table topped in white vinyl and skirted on three sides (skirt color determined by NOWRA)
- Two chairs and wastebasket
- One-time use of the conference registrant list is provided via email
- Copy of proceedings with each full registration

All booths are set up as defined in the floor plan. Booth back drapes are 8' high with two 36" high side dividers, supported by a steel framework. All drapery is clean, properly hemmed and flameproof in accordance with local fire regulations. Ballroom has permanent carpet. Electricity arrangements are made through the Adam's Mark Hotel.

Reserving Space and Payment

Complete and sign the "Exposition Reservation Form." Mail it with your check (payable in U.S. $$) to NOWRA, P. O. Box 1270, Edgewater, MD 21037-7270; or fax the form with credit card payment. (410/798-5741).

Cancellations and Re-assignments

- If an exhibitor cancels on or before July 1, 2006, a full refund, less $150 processing fee, will be made.
- If an exhibitor cancels after July 1, 2006, there will be no refund, unless the Exposition is sold out and the space can be reassigned, in which case the exhibitor will pay 50% of the total contract fee.

Cancellation Procedures

1. Exhibitors must first contact the NOWRA office in writing to cancel space reservations.
2. A cancellation is not effective until it has been received in writing from the exhibitor.
3. Signed cancellations must be sent via facsimile (1-410-798-5741).

Conference Program Advertising

- The Conference Program will go to press July 15, 2006
- The deadline for advertising copy to be submitted to NOWRA is June 15, 2006

Company Visibility

Become a Business Benefit Program Member and Conference Sponsor at NOWRA's 15th Annual Technical Education Conference and Exposition and receive additional company visibility and recognition, and reduced rates. For additional information about sponsorship opportunities, contact the NOWRA office. Don't miss this wonderful marketing opportunity!

Confirmation and Exposition Packages

When registration is complete (and paid in full) exhibitors will receive confirmation and booth space assignment from the NOWRA office. Exhibitor packages will be mailed from Brede Exposition Services, beginning June 1, 2006, and include order forms for any other booth needs. Electrical and telephone is handled by the Adam's Mark Hotel.

Liability

NOWRA is not responsible for, and does not carry liability insurance for, the safety of your exhibit materials or equipment against theft, robbery, accidents, damage by fire or any other cause prior to, during, or subsequent to, the conference period. Valuables should be removed from all booths when not staffed. Please check with your insurance carrier regarding Conference coverage.

NOWRA 15TH ANNUAL CONFERENCE & EXPOSITION

Guest Room Registration Form

Stay at the Adam's Mark Hotel

The Conference hotel is the Adam's Mark Denver, which is the largest conference hotel in Colorado.

Located downtown on Denver's famous 16th Street Pedestrian Mall, visitors are a convenient four blocks from Denver's historic area and State Capital.

During your stay, visiting the shops, restaurants and sites in the Denver historic area is easily accessible.

All lodging reservations for NOWRA's Conference will be made directly with Adam's Mark Hotels and Resorts Reservations by calling: 1-800-444-2326 or by sending/faxing this registration form. Please remember to ask for the NOWRA group rate.

Cancellations must be made 72 hours prior to arrival. After this time, individuals will be charged for the first night of their reservation or forfeit their individual deposits.

Mail or fax this form to:
ADAM'S MARK HOTEL, 1550 Court Place, Denver, CO 80202
Fax: 303-626-2544
or call
Adam's Mark Hotels and Resorts Reservations at 1-800-444-2326

GUEST INFORMATION

Last Name _____ First Name _____

Company/Organization _____

Street Address _____

City _____ State _____ Zip/Postal Code _____

Country _____

Daytime Phone _____ Fax _____

Sharing Room with _____

Arrival Date _____ Arrival Time _____ Departure Date _____

Type of room: ❒ Single ❒ Double ❒ Triple ❒ Quad | ❒ Smoking ❒ Non-smoking

Special needs request: _____

PAYMENT INFORMATION

Credit Card: ❒ American Express ❒ Visa ❒ MasterCard ❒ Discover

Credit Card Number _____ Exp. Date _____

Name on Card _____

Signature (required) _____

HOTEL ROOM RATES*

	Single Rate	Double Rate	Triple Rate	Quad Rate
Deluxe Room	$119.00	$129.00	$139.00	$149.00

*Per night plus taxes (13.85%)

Hotel reservations by attendees must be received on or before August 4, 2006.

The hotel will review the reservation pick up for the event, release the unreserved rooms for general sale, and determine whether or not it can accept reservations based on a space-rate-available basis at the group rate after this date.

FIRST CONFERENCE ANNOUNCEMENT AND CALL FOR PAPERS

Integrated Water Resources Management & Decentralized Systems

A DUAL PROGRAM

National Onsite Wastewater Recycling Association 16th Annual Technical Education Conference and Exposition

AND PRESENTING THE

1st U.S. International Specialized Conference on Decentralized Systems and Applications

MARCH 10-15, 2007 • MARRIOTT WATERFRONT HOTEL • BALTIMORE, MARYLAND

SESSION TOPICS AND THEMES

(Subject to Updates)

Annual Conference

Management, Assessment and Monitoring of Decentralized Systems within a Watershed

Applications of Integrated Water Resources Management in Watersheds

Nutrient Reduction Strategies

Standards, Regulations and Policies

Wetlands Strategies for Integrated Water Resources Management

Facilitating a Sustainable Infrastructure of Distributed Systems in the US – What Is It – What Does It Mean – And How It Can Be Successfully Accomplished

Education and Training for the Onsite Industry—meeting the needs of the next generation

Social and Economic Factors of Citizen Involvement in Planning Decentralized Systems (Implementing the 3 basics of integrating citizens, watersheds and results)

Funding, Planning and Regulatory Reform

Innovative Solutions for Decentralized Wastewater Treatment

INTERNATIONAL PROGRAM

Research Results and Ongoing Strategies Applying Integrated Water Resources Management Practices to Small and Mid-Size Communities

Research and Case Studies of Applications of Distributed Systems Employing Integrated Water Resources Management Practices

Re-use and Reclamation Successes

Biomimicry Applications

Research Results on Groundwater Impacts of Pharmaceuticals and Other Medical Discharges

Policies and Regulations of a Sustainable Infrastructure

Economics and Sustainability of Land Development Using Integrated Water Resources Management

Future Applications and Sustainability

Science and Technology for Soft Path Applications

Integrating Public Health into the Watershed Agenda

PRESENTATION FORMATS

- 1- or 2-Day Topic Seminars and/or Workshops
- Case Studies
- 30–45 Minute Presentations
- Round Table Discussions
- Plenary Sessions

MATERIAL DEADLINES AND PROCEDURES

1. Abstracts submittals are due by July 30, 2006.
2. They should be sent as MS Word documents to shc@umn.edu and will be reviewed by the NOWRA Education Committee. If you are unable to email your submittal, please fax it to (612) 625-1263. Confirmation of all abstracts received will be provided by Sara Christopherson
3. Individuals will be notified of the Committee's selection by August 30, 2006 and provided with instructions regarding paper format.
4. Approved submittals are to be produced as papers and submitted to the Education Committee for review and editing by November 1, 2006.
5. Submittals that have been edited by members of the technical practices and education committees will be returned to the author by December 1, 2006.
6. Final papers are to be sent to the NOWRA Headquarters office by January 15, 2007 in electronic format.

ABSTRACT AND INFORMATION SUBMITTAL PROCEDURES

Please provide the following details as MS Word Documents.

1. Name of Lead Author and Presenter
2. Affiliation of Lead Author/Presenter
3. Address of Lead Author/Presenter
4. Phone number and email address of Lead Author/Presenter.
5. Names and emails of co-authors, if any.
6. Title
7. Abstract/Presentation Topic: Select the presentation format which best fits your submission
   a. 1- or 2-day topic seminars or workshops
   b. Case studies
   c. Research
   d. Forums and panel discussions
   e. Plenary sessions
8. Abstract/Presentation Category identified which best fits your paper and presentation from the topics in the table above or suggest an alternate.
9. 200-300 word description of the proposed paper/presentation and length of time. (Please do not send a PowerPoint presentation or the full text of the paper/presentation.)
10. A short biography that includes education degrees and description of experience as it relates to the onsite industry.

Designing and Installing for Ease of Maintenance and Improving System Longevity

James C. Converse, *Emeritus Professor, Biological Systems Engineering, University of Wisconsin-Madison*

While the 3 "Rs" continue to be the foundation of our education system, for onsite systems they have become the 3 "Ms"—monitoring, maintenance and management. Without incorporating the 3 "Ms" into the onsite system industry system longevity can and will be diminished which in turn increases the risk to the environment, public health and the cost to the owner and the public. For users, including the system owner, monitoring, maintenance and management of onsite systems is foreign. Statements like "I haven't ever had my septic tank pumped" are not unusual. This laissez-fair attitude is not without reason. The attitude by regulatory officials, both locally and nationally and the public, has been that onsite systems are a temporary issue until sewer comes.

In its report to Congress, EPA (1997) finally admitted that onsite systems have become an integral part of the wastewater infrastructure in this country. This is a large landmark in EPA history. In its report, EPA listed advantages and disadvantages of onsite systems but also listed the barriers that must be overcome (EPA, 1997). Congress, at the urging of EPA and others, provided research money for the advancement of onsite systems. EPA also concluded that if the onsite systems were to become a viable infrastructure industry, management was to be an integral part, which resulted in a management document issued by EPA which outlines 5 different management models that can be used in part or in whole by local jurisdictions (EPA 2003).

Since management is an integral part of the onsite industry, it behooves the designer to design and installer to install the system for ease of monitoring and maintenance. When these professionals are completing their tasks, they should have the mindset of a service provider in mind who is trying to monitor and maintain the system in the least possible time without compromising system functionality and performance. This discussion identifies ways that systems should be designed and installed so that monitoring and maintenance can be completed as simply and as easily as possible to minimize monitoring and maintenance costs.

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SYSTEM COMPONENTS

As with municipal wastewater treatment, onsite system design ranges from small to large and from very simple to very complex. Onsite can be subdivided into various components, which are: source, pretreatment, treatment and final dispersal to the environment. Within each of these components are many subcomponents that can be assembled into a "system." This information does not attempt to cover all of these components but will emphasize what may be considered as a "conventional system" if there is such a system.

SOURCES

Sources of wastewater are primarily residential or commercial. Quantity, quality and mass loading must be determined for each design and methods should be incorporated into the design and installation to monitor each component to make sure that inputs are maintained within the design parameters. Unfortunately adequate monitoring of the inputted influent is not performed except maybe in larger systems.

Quantity

Quantity is measured as gallons/day (gpd) inputted. Code flow, average flows, peak flows and metered flows are used in the design of the system. The system factor of safety is designed into the quantity. Code flows, typically found in codes, have the factor of safety of 1.5–2 built into the number. Metered flows, monitored by a water meter, must have a factor of safety of 1.5–2 times the metered flow. Peak flows need to be accounted for to make sure the system can handle it. The best approach for monitoring flow is a water meter installed on the water supply of the establishment measuring all water that eventually becomes sewage. Outside faucets and other sources that do not become sewage should be plumbed outside the water meter.

For pumped systems, an event counter and/or elapsed time meter can be used to estimate the flows. For the event counter, the net dose volume must be determined. For the elapsed time meter, the pump flow rate in gpm must be determined. Accuracy is a function of how well the net dose volume or flow rate was determined. However, when event counters are used, influent entering the pump tank will not be monitored when the pump is on. Fig. 1 shows a typical flow meter, event counter and elapsed time meter. Event counters and elapsed time meters can be stand along units or incorporated into a

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panels, they can be installed in the junction box while in more complete systems they are part of the control panel.

All systems must have a flow-monitoring component for ease of monitoring and maintenance. How else can the service provider adequately monitor the system?

Quality

Quality is a component that has been overlooked in the past but it is as equally important as quantity. Quality is measured as mg/L of a given concentration. Biochemical oxygen demand (BOD_5) and total suspended solids (TSS) are the parameters for measure organic matter. Fats, oils and greases (FOG) are monitored for sites such as restaurants that generate FOG. Typically FOG is not monitored for homes unless large quantities are used in the kitchen and/or significant quantities of lotions, shampoos, conditioners, liquid softeners and other products are used. Other parameters such as nitrogen species, phosphorus and alkalinity, pH, temperature and dissolved oxygen are monitored as appropriate. If there is a problem with a septic tank/soil absorption unit, monitoring the dissolved oxygen in the septic tank may give clues as to it robustness. Easy access must be available to monitor the influent/effluent to or from a given component. For example if the flow to the soil absorption unit is to be monitored, then access to the septic tank effluent must be provided.

Mass Loading

Mass loading is the component of most concern as it is a measure of the mass load that the system must process. Mass load is lbs/day of a parameter such as BOD and determined by:

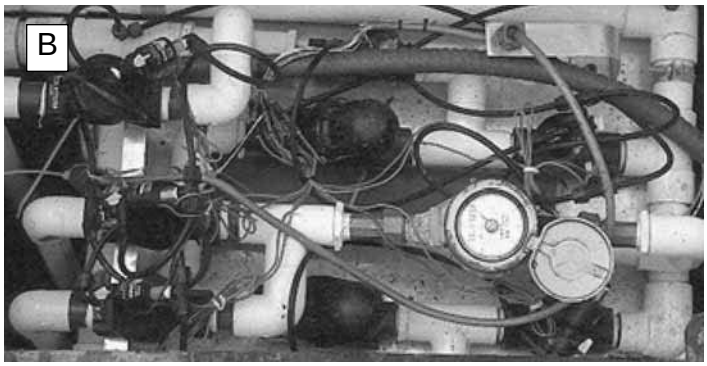
(lb/d) = Flow (gpd) X concentration (mg/L) X
8.34 lbs-L/mg / 1,000,000 gal.

For a flow of 500 gpd with a BOD concentration of 170 mg/L the mass load is:

Lb/d = 500 gpd X 170 mg/L X 8.34 lbs/mg-L /
1,000,000 gal. = 0.71 lb/d

All aerobic units can handle so many pounds of BOD and are sized accordingly. Soil treatment/dispersal units can handle so much oxygen demanding material. However, we typically load soil systems on gal/day but we assume that the BOD is below a certain value so we could calculate the organic load in lbs/day/ft^2.

The service provider should monitor mass load to the soil unit. Typically the average daily mass load should be no greater that ½ to 2/3 of design. Since we typically work with quantity, then the average daily flow should be no greater than ½ to 2/3 of the design flow rate. This assumes that the BOD in mg/L is below an assigned value such as 200 mg/L.



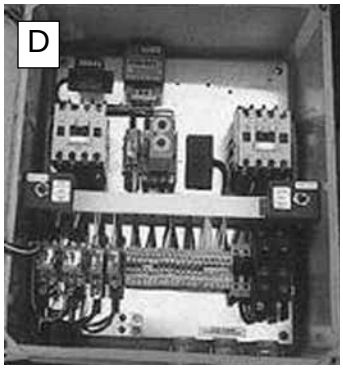


Fig. 1. Water meter, event counter and elapsed time meter (A). Water meter measuring flow to a drip field (B). Event counter in junction box measuring pumping events in a pump system (C). Event counter and elapsed time meter in control panel (D).

PRETREATMENT

Pretreatment of residential or commercial wastewater can be done via anaerobic digestion, aeration or a combination of both. The most popular pretreatment is anaerobic digestion via the septic tank. Higher quality effluent can be obtained with aerobic treatment.

Septic Tanks

Septic tanks are an integral part of most onsite systems with the exception of aerobic units that are usually preceded with trash tanks, a downsized version of septic tanks. Tanks can be made of concrete, fiberglass or plastic.

Tanks can be single compartment or double compartment tanks. Some newer designs include meandering tanks where the division wall is along the length instead of across the tank. Double compartment tanks with the effluent screen/filter in the second compartment are highly desired over single compartment tanks (Fig. 2) as they provide a better quality effluent especially TSS reduction (Rich et al., 2003). Also placement of the effluent screen/filter in the second compartment will increase the time between screen cleaning, which has been observed via field observations.

If a pump chamber is part of the system, then it should follow the second compartment as a third compartment or as a separate tank (Fig. 3). It should not be the second compartment of a two-compartment septic tank as that requires that the effluent screen/filter be placed in the first compartment, which will increase frequency of screen/filter cleaning. Pump vaults placed in the first or second compartment of septic tanks have been successfully used.

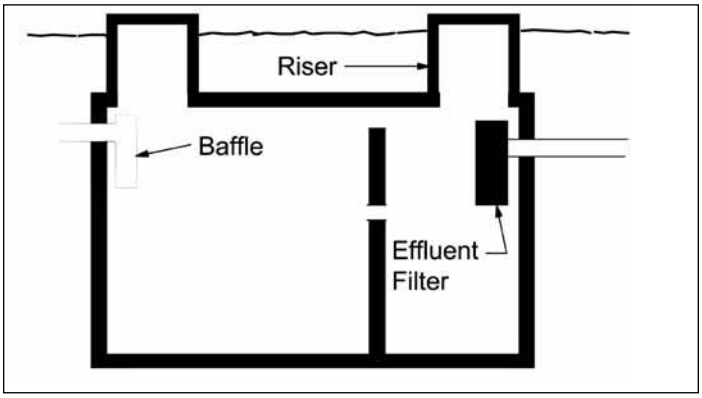


Fig. 2. Cross-section of a two-compartment septic tank with effluent screen/filter and risers to the ground surface. Preferred over a single compartment for extending the time between cleaning effluent screen/filter.

Aeration Units

Aeration units consist of ATU and media filters. There are many brands and varieties available. Each of them has certain maintenance requirements. The designer and installer should understand what is required for maintenance so that they can be installed for ease of monitoring and maintenance. Similar criteria as described for septic tanks are applicable for aeration systems. Easy accessibility to the various components is paramount. Stuth (2003) discusses how to design recirculating sand filters easier renovation and how to design single and filters to breath easier.

PUMP CHAMBERS

A watertight pump chamber is essential for successful long-term performance of onsite systems. Risers should be watertight and come to slightly above grade to avoid surface or ground water entering the tank. Pumps should be easily accessible from near the top of the risers for ease of maintenance. The force main should "goose neck" up into the riser with a union connection for easy remove of the pump (Fig. 4). In cold climates, a weep hole is required to drain the force main after each dose.

SANITARY SUMPS TO LIFT BASEMENT WASTEWATER

Tanks buried 6-8 ft are very difficult to service and are prone to ground water leakage especially if an elevated soil unit is required. In these situations, the sewer pipe should exit out the side of the basement wall with a sewer sump pump to lift wastewater generated in the basement. Pumps should be sized for small flows with small doses so as not to agitate the septic tank. An oversized two compartment septic tank should be installed.

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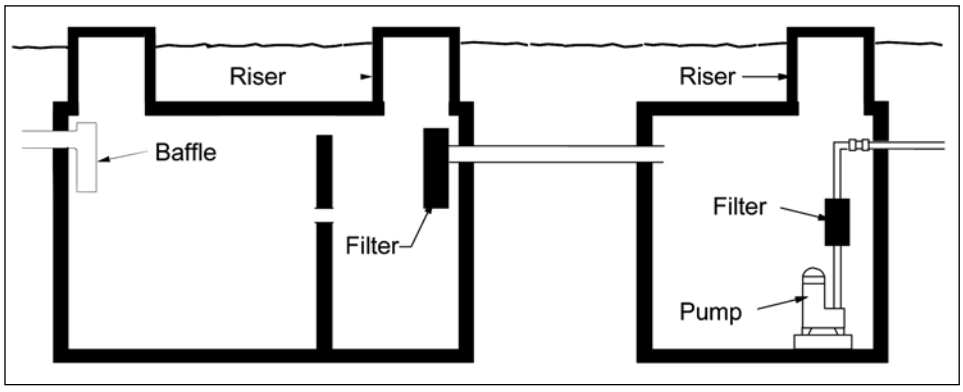

Fig. 3. Cross section of a two-compartment septic tank followed by a pump chamber. Risers should come to the ground surface or slightly above for ease of maintenance. The filter after the pump is optional but recommended for small diameter orifice distribution networks.

Fig. 4. A pump chamber using goose necks for each pump. In this case no easy disconnect such as a union was used. When the pump needs to be replaced, the horizontal pipe is cut and the pump is lifted out with the chain in this case.

SOIL TREATMENT/DISPERSAL UNITS

The soil serves as a treatment unit, polisher and dispersal of the effluent. For septic tank effluent it serves as a treatment and dispersal unit while for aerobically treated effluent it serves as a polisher and dispersal unit. When maintaining the system the soil treatment/dispersal unit must be inspected. Many times it is ignored or just a walk over is done to see if there is effluent on the surface.

The types of soil dispersal units can generally be divided into: in-ground units, shallow in-ground units, at-grade units or mounds. The type of unit selected will be dependent upon the separation distance from the infiltrative surface to the limiting condition such as seasonal saturation or bedrock. The infiltrative area is determined by the loading rate selected for a given soil/site condition and the design loading rate (gpd). Shallow, narrow absorption cells are the preferred design.

Observation Tubes or Inspection Ports

Normally, a biomat will develop at the infiltrative surface with septic tank effluent as the localized oxygen demand cannot be met. This biomat will continue to expand over the infiltrative surface until the biomat completely covers the infiltrative surface, and then ponding starts to occur. The rate at which this occurs will be dependent upon a number of factors such as loading rate, infiltrative rate and the method of distributing the effluent. A concentrated loading will develop a biomat more quickly than the same load spread out uniformly over a large surface area. Soil units accepting aerobically treated effluent may form a biomat resulting in ponding. The degree of ponding will be dependent upon the loading rate and the effluent quality (BOD_5 and TSS conc.).

In order to evaluate the status of the infiltrative surface, one must be able to monitor it. The best approach is to install observation tubes/inspection ports that extend from the infiltrative surface to the ground surface. Fig. 5 shows two examples of observation tubes/inspection ports. Basically, they are 3 or 4" PVC pipes with a cover and some method of anchoring them such as gluing a toilet flange or a tee to the PVC tube. For units with toilet flanges or rebar, slots must be cut in the sides near the bottom to allow ponded effluent to enter the tube. At least one, but preferably two observation tubes per cell must be installed to observe ponding.

Effluent Distribution

Effluent is distributed to the soil absorption unit either by 1) gravity distribution to 4" perforated pipes, 2) pumped dosed to 4" perforated pipes, 3) pressure distributed via small diameter laterals with small diameter orifices, 4) pressure manifold to 4" perforated pipe or 5) drip distribution. There are gravity flow devices that are available such as flow splitters, weirs, and tipping buckets that attempt to provide equal flow to each cell via the 4" perforated pipe.

Each method of distribution has its advantages and disadvantages. The best approach is to apply small uniform doses through out the day over a large surface area. Drip distribution is the best approach. Pressure manifolds to 4" perforated pipes provide equal distribution to each cell but not along the length of the cell. Pressure distribution is used in mounds to spread the effluent along the length of the mound.

Pump dosed to 4" perforated pipe is an attempt to distribute a more uniform application within the cell by applying a large dose per pump cycle. Gravity flow is the most popular way of distributing effluent to the absorption cells and is used wherever possible as it eliminates a pump and pump chamber.

However, biomat development will start to occur locally, almost immediately, because of the large oxygen demand that cannot be met locally. The biomat provides excellent treatment of the effluent and allows for unsaturated flow beneath the system. Thus from a treatment perspective, one should encourage biomat development. However, it will reduce the infiltrative capacity of the system.

Allowing ponded cells to rest can control biomat development. The theory is that when the ponding disappears, aerobic organisms take over and degrade the biomat allowing for the infiltration rate to increase. So why not install the gravity flow system to allow for periodic resting. Soil absorption units should be designed so that cells that have been loaded for a period of time can be taken out of service easily, by the service provider, on a regular basis so that the cells rest and allow the aerobic organisms to reduce the biomat. Regular cycling could be performed annually.

Gravity distribution to cells is accomplished by 1) manifold or header along one end of the parallel cells, 2) serial distribution down the slope, 3) distribution box on relatively level sites and 4) drop boxes down the slope. Figure 6 shows the 4 types of distribution that are commonly used. Only the distribution box and the drop box approach allows the service provider to take a cell out of service and are the only methods that should be employed in the design and installation of the soil dispersal unit.

Pressure distribution systems employing small diameter pipes and orifices must be flushed annually and orifices unplugged as appropriate. Thus, easy access to the distal ends of the pipes, such as turn-ups in valve boxes, are essential for ease of maintenance (Fig. 7).

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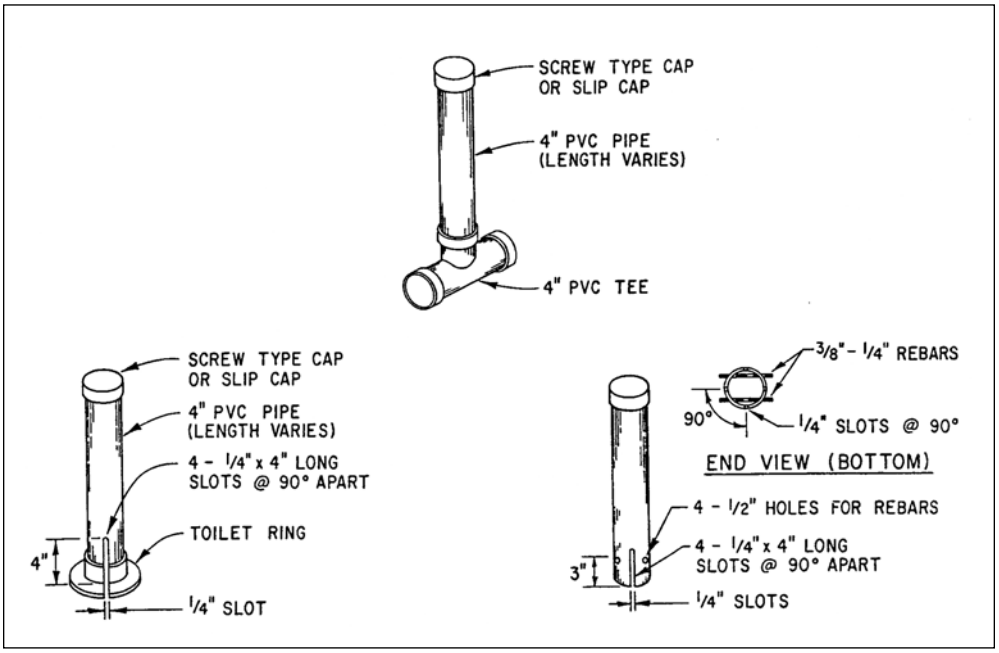

Fig. 5. Types of observation tubes or inspection ports to be placed at the infiltrative surface to monitor for ponding.

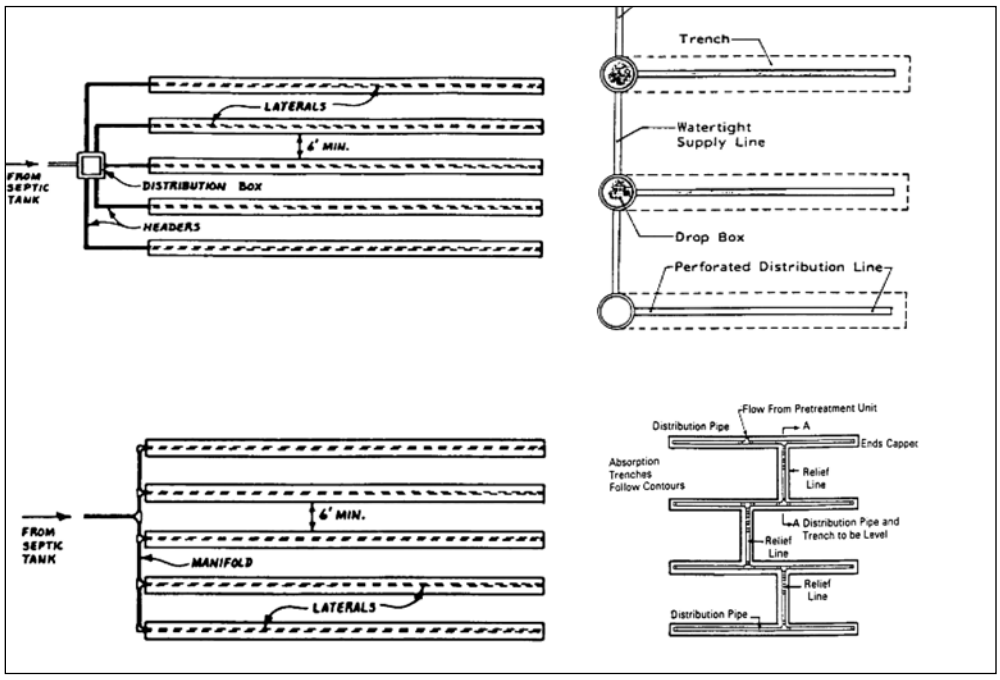

Fig. 6. Four methods of distributing effluent by gravity in soil absorption units. Distribution boxes and drop (top left and right) are the only methods that will allow cells to be taking off line to allow resting and are the only ones that should be used. The manifold (lower left) and the serial distribution (lower right) do not allow for cells to be taken out of service.

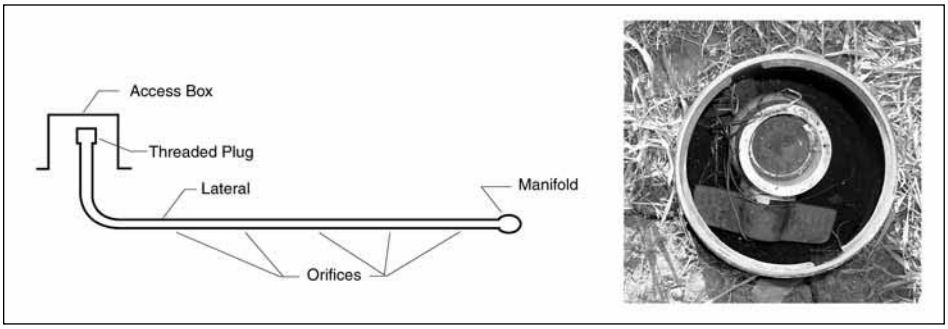

Fig. 7. Turn ups to assist in flushing of the pressure distribution laterals. *(Left fig. from Wisconsin State Code: Pressure Distribution Manual, 2001).*

EXAMPLES

The following are examples of things that were done by the installer or designer that makes it difficult to perform maintenance.

Example 1

Fig. 8 shows where a drip distribution headworks was placed in a pump chamber riser just to save putting in a box to hold the headworks which the designer had called for in the plans. However, the installer decided to modify the plans. When the pump is pulled to be cleaned all of the headworks must be removed, which will require additional time by the service provider. In fact in some jurisdictions, it may require the plumber to do it, as the service provider may not be qualified to do it.

Example 2

Valve boxes used in the field to house solenoid valves, check valves and headworks for drip systems should have a bottom in them or be placed on 4-6 inches of coarse rock to keep the rodents from burrowing into them and filling them with soil. In the colder climates, these valve boxes may have heaters in them to keep the units from freezing. The heat provides additional attraction for the rodents. The rodents may also destroy wiring and other components. Fig.9 shows the results of rodents in the box.

Fig. 8. Riser for a pump chamber where the drip distribution headworks was installed. The headworks must be removed before the pump can be pulled to be cleaned or replaced. The pump is housed in the vertical pipe located in the upper right of the figure. Obviously there is a problem with this system because the water is higher than normal.

Example 3

Figure 10 shows a distributive valve with 6 connections. When the valve needs to be replaced there are challenges to the service provider in trying to get it done because of all the rigid connections. If flexible PVC pipe had been used initially, it be much simpler to replace the valve with less cost and frustration.

Example 4

Fig. 11 shows a pump chamber following a septic tank containing construction debris being discharged to the onsite during construction. In this case the pump should not be hooked

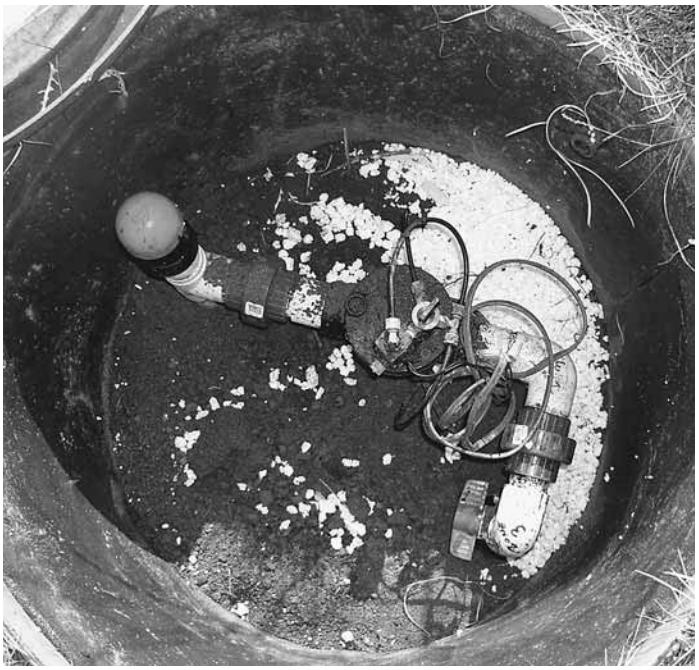

Fig. 9. Valve box with rodents partially filling with soil. The white material is insulation material from a bag of insulation that was removed for the picture. Rodents can destroy the tubing and wires. A 6" layer of larger stone beneath the unit and a couple of inches inside the box should discourage the rodents.

Fig. 10. Flexible PVC piping would make it easier to change out this distributive valve.

Fig.11. Construction debris in pump chamber from new home. Water is milky due to paint. Edge of valve handle is white, which should be black in the picture as is the side of the handle. *(Picture by Dan Bush)*

up until after all construction is completed. In the case of a gravity flow system, the septic tank outlet should be plugged until all construction is completed at which time all tanks, should be pumped and cleaned so construction debris does not enter the soil absorption unit.

SUMMARY

Monitoring, maintenance and management of onsite systems is critical for long-term performance. Maintenance of most onsite systems can be done fairly easily provided that the designer and installer designed and installed the system for ease of maintenance. The following is a summary of a few things that can be done to make maintenance easier.

1. Risers for all components such as septic tank, pump chamber, aeration units, access boxes must come to above the ground surface for easy access.
2. Observation tubes/inspection ports should be installed in each cell of the soil treatment/dispersal unit so ponding in the cell can be easily monitored.
3. Flow monitoring devices such a water meter, event counter and elapsed time meter should be installed to monitor flow to the components.
4. For gravity flow soil absorption units, distribution boxes or drop boxes should be used so that cells can be taken out of service and rested and easily put back into service.
5. For pressure distribution systems, the distal end of the lateral must be easily accessible such as with turn-ups in valve boxes for flushing and cleaning of the laterals.

Designers and installers should be service providers before they become a designer and installer as they may do things much differently. However, in some situations it may cost more to install a system for ease of maintenance so the owner may not want to do that but over the life of the system these extra costs translates into added maintenance costs because of the extra time required by the service provider to complete his/her task. ■

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The Evolution of Decentralized Treatment

Chambers Answer the Need for Protection of Environmental and Public Health

Dennis F. Hallahan P.E., *Technical Director, Infiltrator Systems, Inc.*

Introduction

The onsite industry as a whole has evolved dramatically over the past 15 years. The need for new approaches to decentralized applications and environmental demands have spurred this change and challenged scientists, engineers, regulators, and product manufacturers to develop new ways of thinking about how decentralized wastewater treatment is accomplished and managed. Another catalyst for change has been the high cost of available land in many urban areas and the limited availability of sewers. This has resulted in the need to develop areas away from conventional sewers.

Another catalyst for the onsite evolution is an increased awareness for the need to protect environmentally sensitive areas that has resulted in more restrictive building and development codes. These include the health codes that regulate onsite wastewater system design and installation. Growing awareness of nutrient damage to the environment from nitrogen and phosphorus, aquifer protection, and the value of water as a resource have come to the forefront. These codes have been and continue to be amended to preserve and protect public health and natural resources. They have also been the catalyst for new thinking in terms of onsite wastewater system design and the development and use of advanced wastewater treatment and disposal technology.

Factors that can impact a site and cause it to be considered environmentally challenging may include lot size, soil conditions, proximity to bodies of water or environmental preserves, physical barriers that impede onsite wastewater system construction, or regulatory restrictions that limit construction. The growing supply shortage of easy-to-build sites and the associated escalating prices are causing individual buyers, developers, and builders to purchase land that presents construction challenges in general and, more specifically, with onsite wastewater treatment and disposal.

Additionally, regulations for leachfield sizing and construction have changed to accommodate challenging development conditions. While over the last thirty years, codes have recognized the higher throughput rates of aggregate free products with septic tank effluent, many codes now include the sizing of the leachfield based upon the level of treatment provided. Advanced treatment of wastewater allows higher acceptance rates by the soil.

While the housing construction market is not within the scope of onsite wastewater system regulator responsibility, single-family home construction is a major element of the North American economy and is affected by onsite wastewater system regulation. Fluctuations in housing starts can have a profound effect on local and state economies. The relative ease or difficulty of site development can be a function of the standards by which onsite wastewater systems are sized and constructed. If regulations can keep pace with scientific and technological developments, historical constraints on single-family home construction can be responsibly amended or reduced through adjustments to regulations. Such adjustments can allow land development work to be considered on parcels that may not have been previously deemed developable.

Adjustments to regulations may include approving new treatment and disposal system technologies. An example of disposal system technology approval is manufactured leachfield products such as plastic leaching chambers, which provide a more efficient means of delivering wastewater to the subsurface. Additionally, with the creation of these new and revised regulations, the regulatory community at the state and local levels is increasingly embracing systems that incorporate advanced technologies.

To make responsible changes, regulators have to consider current research findings and integrate those findings into leachfield sizing and construction regulations. Historically, regulations for conventional stone and pipe leachfields were developed based less on science and more on a trial-and-error process. Many regulators are now reviewing the available scientific research findings and third-party testing data and

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Mr. Hallahan is currently Technical Director at Infiltrator Systems, where is responsible for government relations and technology transfer between Infiltrator Systems and the regulatory and design communities. Dennis also oversees a staff that is responsible for product research and testing for both universities and private consultants.

He received his MS in civil engineering from the University of Connecticut and his BS in civil engineering from the University of Vermont. Dennis is a registered professional engineer in Colorado and Connecticut. Dennis also holds patents for on-site wastewater products.

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reexamining onsite policy accordingly. This has resulted in a shift away from older onsite system designs to the approval of new technology and advanced applications for both treatment and disposal of wastewater. With the regulatory shifts have come further innovations in onsite wastewater systems, providing a dramatic increase in the number of options available. In combination with the shift to new technologies, regulators are revising codes that in turn affect land use policies. Adjustments to these policies have and will continue to be made based on local development and environmental objectives and philosophies.

Challenges for installers, engineers, system designers, and developers

Installers earn a living from onsite wastewater system installation. As the number of developable building lots using conventional means decreases, installers are relying on advanced systems and technological innovations to maintain their business. Where repair work is an installer's mainstay, chamber systems and advanced treatment options can provide a means for upgrading a failing system by using reduced space and with minimal site impact.

Similar to installers, engineers and onsite wastewater system designers rely on design work as their mainstay including onsite wastewater system design in many regulatory jurisdictions. With it increasingly difficult to find quality building lots for development, the onsite wastewater system engineer or designer is moving toward innovative, space-saving and flexible technologies that can be easily adapted to site conditions. A representative example is an articulating chamber product that can be installed at a reduced size and contoured to match the available landscape.

Where developers and builders rely on new construction for their business, the size and construction of the onsite wastewater system frequently influences the way land can be used and developed. The availability of advanced technologies in onsite wastewater systems has allowed developers and builders increased flexibility with respect to land use. Because these systems can occupy smaller spaces, developers and builders have more alternatives related to land use options.

New products and applications to the rescue

One of the greatest recent benefits of this has been a new generation of products that enhance treatment, ease installation, and reduce management dilemmas. Chambers have been at the forefront of this new product and applications movement because of their versatility and effectiveness.

Over the past 30 years, chambers have evolved dramatically in design and are now commonly used for onsite treatment in basic and advanced applications. The first chambers to be used commercially were constructed of concrete and installed in New England in the early 1970s. These initial concrete "gallery" chamber systems or "ameration chambers" (USEPA, 1980) were more efficient than previous traditional stone and pipe systems. They were, however, heavy and unwieldy to transport, and labor intensive to install. It became clear that an alternative material was needed to manufacture chambers that would not sacrifice strength, durability, and treatment performance.

The rapid advancement of plastics technology made plastic the next logical step in the evolution in chamber design. Several years of research and design culminated with the introduction of plastic chambers to the marketplace in 1987. Today, plastic chambers are manufactured by many different companies and have become widely accepted by installers, designers, and regulators in many countries. It is estimated that one in every four wastewater treatment systems constructed in the United States today is a chamber system. While the principals of treatment remain the same, plastic chambers offer tremendous benefits over their concrete predecessors and even greater benefits when compared to the older methods of installations that involved stone and pipe trenches.

Chambers Evolve in Response to the Need for New Applications

Advances in chamber design have resulted from the needs of the market and the direction of the regulatory community. Initially, chambers were used for the leachfield component of the onsite wastewater treatment system. As the needs of the industry evolved, designers and installers began to specify the technology for a number of differing applications. What they found is that the chamber is highly adaptable and effective for specialized system designs and treatment needs.

In addition to the traditional use in septic system leaching trenches and beds, chambers have been used in sand filters, mound systems, evapotranspiration beds, community (cluster) systems, constructed wetlands, large-scale wastewater treatment plants, with

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Cluster system.

pretreatment devices, and even on toxic waste remediation sites.

New chamber designs offer even more flexibility in system design and installation and provide enhanced onsite wastewater system treatment. In actuality, plastic chambers are going thru their fourth generation of evolution with the most current design one that offers maximum flexibility in installation, while retaining the highest levels of infiltration possible. Manufacturers have listened to their customers and the feedback over many years from contractors, regulators and designers. Improvements have been incorporated that allow the chamber to articulate at each joint, are easier to handle and install, transport more efficiently, less prone to soil intrusion and yet maintain its structural integrity.

Advanced Chamber System Designs and Applications

Community Systems Using Chamber Technology

Engineers designing large community systems have preferred specifying chambers due to their large storage capacity improved infiltration capacity and have more confidence in an engineered product rather than relying upon the unknown stone quality. Commercial facilities can be subject to large peak flows that the chamber can readily retain. These decentralized cluster septic systems serve multiple residential dwellings or commercial establishments. They use technologically advanced filters, pumps, tank configurations, and chambers to provide a higher level of treatment. Decentralized cluster systems treat wastewater and return it to the ground very near to where the wastewater was generated as opposed to transporting it long distances to a centralized sewer facility. The driving force behind this trend is the high cost of sewers and lack of quality land available nationwide. However similar to sewers these systems need a Responsible Management Entity (RME) to operate and maintain the system. Management will be the overall key to the future of the industry's success as a whole.

Sand Filters

Sand filters have been designed utilizing the benefits of chamber technology. Chambers provide increased distribution coverage, allowing the effluent to be applied over the entire surface area of the bottom of the chamber. A sand filter is a type of packed bed filter that has been used for over a century. Newer packed bed technologies consist of peat, textile, or foam media and are generally very reliable, providing good stable treatment.

Evapotranspiration Systems

Another common application for chambers is their use in evapotranspiration (ET) systems. In the arid western regions of the United States, systems have been specifically designed for evapotransipiration. With these systems, people have had the misconception that the solid arch at the top of the chamber would inhibit evapotranspiration. However, upon investigation of the physics of water and air movement through soil, it can be understood that evapotranspiration occurs with chambers for the same reasons it occurs in stone trenches. Once ponding occurs in the trench the effluent will flow laterally out the trench sidewall, allowing capillary action of the soil to take place. From capillary action, water is pulled upward in the soil matrix. The water then changes to vapor form (gas phase), which allows it to move vertically through the soil pores to the atmosphere.

Wetland Treatment Systems

Natural wetlands have been used as convenient wastewater discharge sites for as long as sewage has been collected. By the early 1970s, research into the treatment capabilities of

Wetland system.

Wetland system complete.

natural wetlands lead to the development of engineered, or "constructed" wetlands that replicated the cleansing capabilities of these natural ecosystems. Wetland treatment systems are typically used to polish treated wastewater, and are often designed as multi-function treatment and wildlife habitat systems.

These systems may be large commercial or community systems, or small wetland treatment cells serving an individual home. One of the most common types is the subsurface flow (SSF) constructed wetland. Effluent is treated through shallow subsurface channels in which emergent plants are established. The treatment cells produce a high quality treated effluent that is required to be disposed to the subsurface. Chambers have frequently been specified for the wetland cell and the subsurface disposal applications due to cost savings and chamber reliability as compared to older traditional construction options. In areas with sensitive soils, the ease and speed of installation and minimal construction traffic (less time to be exposed to rainstorms and construction machinery) can protect the structure of the soil and its infiltration capacity.

Wastewater Treatment Facilities

A great example of the use of chambers in extending the life of wastewater treatment facilities is in Bayham, Ontario at the Port Burwell Sewage Treatment Plant. Here the outfall discharges to a creek in close proximity to Lake Erie. Expansion of the plant required a major upgrade to the outfall extending out a distance into the lake. The creek could not assimilate the increase in minimum contaminants and therefore an outfall to the lake was proposed.

After an extensive investigation of options, an onsite solution was recommended to convert the outfall to an exfiltration bed utilizing chambers. The chamber system saved considerable cost and also provided additional pollutant removal. The benefit of installing an exfiltration bed at the treatment plant is the reduction in Phosphorous. Additional phosphorous will be removed by the natural ability of the soil to absorb the nutrient, thereby removing the impact to the sensitive lake environment.

Port Burwell.

Biofilters

Chambers are also now being specified in biofilters. A biofilter is a bed of organic media that is used to remove objectionable odors from the air. Odorous air vented from compost facilities, rendering operations, and pumping stations can be passed through a biofilter, removing ammonia and reducing sulfur compounds such as mercaptans, amines, and VOCs. These odors are biodegraded to odorless substances in the biofilter. Water flowing through biofilter will leach these nontoxic chemicals from the media, lengthening the life of the media. These biofilters benefit by the use of chambers compared to other past traditional methods. According to Lew Naylor, Ph D. of Black and Veatch chambers used in biofilters can improve air distribution through the media, provide more efficient drainage, increase media life, ease of construction of the biofilter, and simplify media replacement.

Remediation Site Clean-up

Environmental clean up sites have many treatment schemes, one of which is known as "pump and treat". In this scenario, contaminated groundwater is pumped to the surface, treated, and then discharged subsurface to recharge groundwater levels and maintain flow patterns. The size of the recharge bed is determined by the infiltration rate of the soil and the quantity of flow. Previous methods of recharging ground water included stone beds. However the fines associated with stone can have a significant adverse affect on the infiltration rate, thereby increasing the size of the recharge bed. Engineers have determined that if chambers are installed as the recharge solution the concerns regarding the adverse affect of fines can be minimized.

Conclusion

Engineers, designers, installers, and regulators now have many options to choose from in non-conventional, advanced onsite wastewater systems. With system management and the increase in options have come a broader acceptance and a new look at technologically advanced onsite wastewater systems by the onsite wastewater industry. However, change can come slowly and some seasoned onsite industry veterans continue to depend upon older technology for onsite system design, construction, and regulation.

As the need to develop areas away from sewers increases, there has been much progress in the development and the acceptance of advanced onsite systems and the science behind

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these technological advances. Most states and local health departments have created or revised regulations that accommodate advanced onsite systems, including chamber leachfields, at justified sizing reductions, as well as treatment units. Continued product testing and research are needed for advanced onsite wastewater treatment technologies to identify associated capabilities and limitations.

For manufactured leachfield products, this work includes third-party verification of dimensions, performance, and liquid storage capacity. For treatment units, this work includes investigation of the expected level of treatment during various usage conditions and long-term system reliability. These data will spur the continued development of more effective and cost efficient alternatives. These alternatives will provide options for onsite wastewater treatment that will enable better protection of natural resources and make possible building and usage of challenging sites.

The introduction of chamber technology over thirty years ago was a revolutionary step in the increased effectiveness and acceptance of standard and advanced onsite systems. The benefits of chambers are becoming recognized by many disciplines to solve a myriad of problems. Community systems have benefited with the increased storage capacity, sand filter performance has been enhanced by better distribution coverage, and wetland treatment systems reliability has been enhanced.

In the future we will surely see many new system designs and advanced treatment options developed in response to changing environmental and economical needs. As designers and engineers are challenged to create innovative solutions to the world's wastewater problems, chambers will be in the forefront of those solutions. This versatile product and its applications will continue to evolve to meet a vast range of challenges as the future unfolds. ■

ZABEL Spins Off Quanics, Inc.

On March 1, ZABEL announced that it has spun off Quanics, Inc., a new corporation focused on the emerging enhanced treatment system, engineering and utility market.

Quanics focuses on providing complete water solutions by using the latest technology, technical assistance and complete system packages. "Quanics' goal is to be the best water solutions problem solver in the industry," said Quanics President, Brian Borders.

Quanics' product line includes: prepackaged or custom simplex and duplex—STEP Systems; AeroCell, BioCoir, sand filter and wetland—Advanced Treatment Systems; and LPP, mound and drip irrigation—Pressure Dispersal Systems.

Zabel's focus is providing onsite products at the lowest customer cost, 24-hour shipment, with a no-hassle limited material and workmanship warranty. "The formation of Quanics and the refocusing of Zabel on its core filter market is an important step in the continued success of the Zabel organization," stated Harry Nurse, President of ZABEL and Chairman of the Board of Quanics, Inc.

Zabel's product line includes: Zabel Brand gravity effluent filters, filter alarms, filter packages and onsite accessories such as Zabel's Versa-Tee Baffle, Flow Directors, Flow Dividers, grommets, and carbon air filter vents.

Founded in 1990, ZABEL is recognized as the creator of the effluent filter market segment.

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EFFECTS OF ADDITIVES ON PERFORMANCE OF ONSITE WASTEWATER TREATMENT

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Additives have been available for many years to add to onsite wastewater treatment systems. Some professionals are convinced that they do great things while other professionals think that they are a waste of money. So who is right or are both parties right in that is some situations they work wonders while in other situations they are ineffective. The purpose of this one day symposium is to try to sort out the information that is currently available and see if we can draw any conclusions.

The tentative format is to have a series of presentations in the morning and early afternoon with a panel of speakers interacting with the audience to close out the symposium.

Topics discussed will be dictated by the abstracts that are received. Additives could included chemical, biological and enzymes. However others may surface in the abstracts.

Send all abstracts to James C. Converse.
E-mail attachment preferred to jcconver@wisc.edu
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Deadline: March 27, 2006

Individuals interested in participating in this forum with a presentation should provide the following information.

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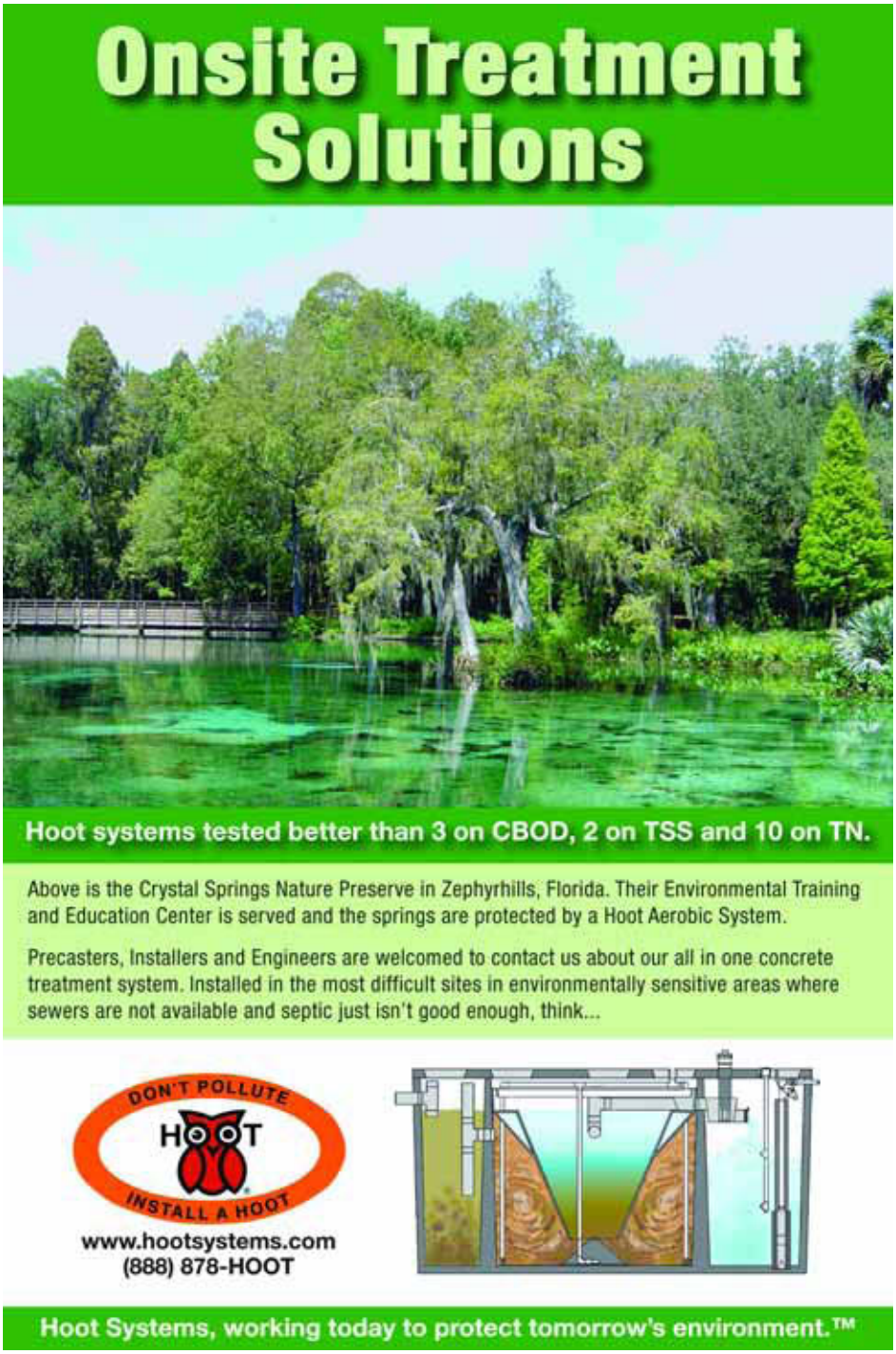

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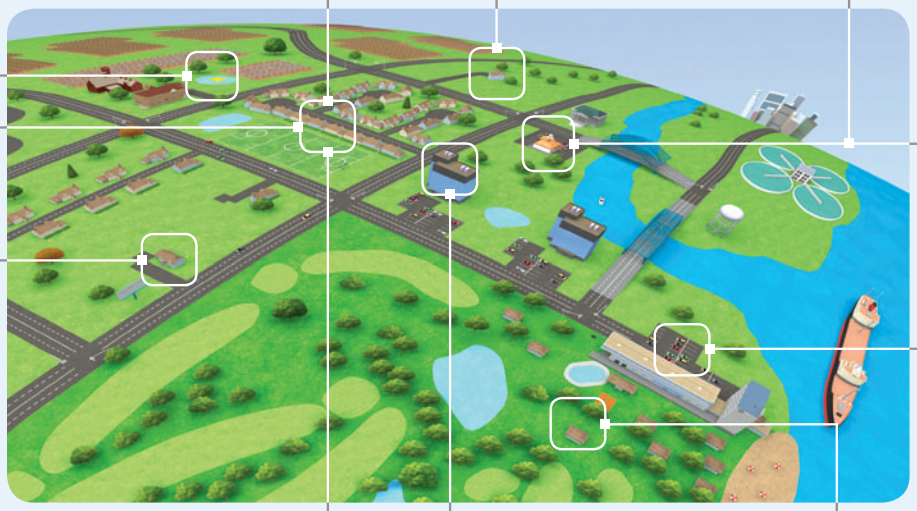

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