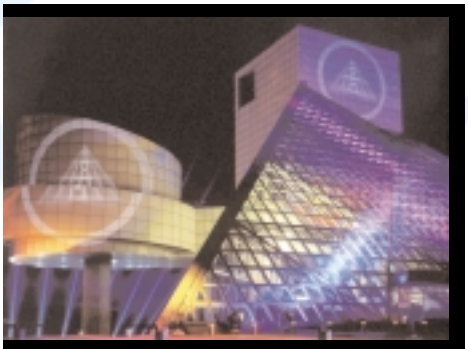
ONSITE journal
Winter 2005
NEWS FOR THE ONSITE WASTEWATER RECYCLING INDUSTRY



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Vol. 14 No 1
NOWRA National Onsite Wastewater Recycling Association

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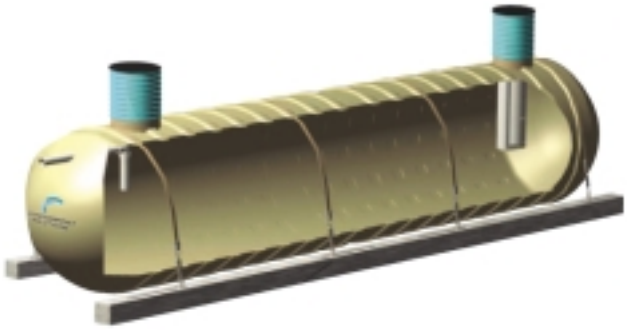

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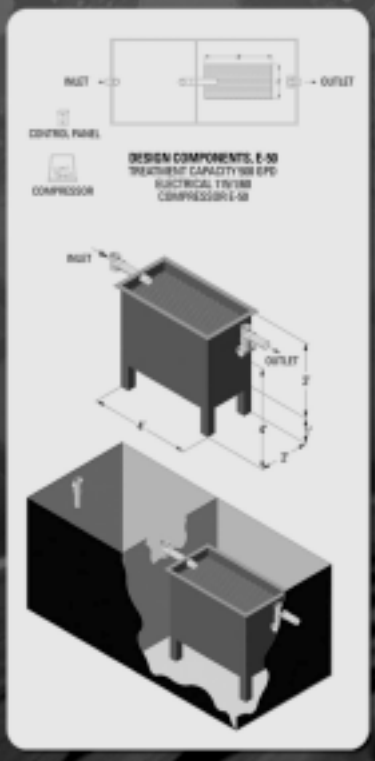

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2005 NOWRA Board and Committee Members

President
Peat, Raymond
Bio-Microbics, Inc.
8450 Cole Parkway
Shawnee, KS 66227
Phone: 800/753-3278
Mobile: 913/449-7505
rpeat@biomicrobics.com

Past President
Frank, Tim A.
Tim Frank's Septic Tank Cleaning
P.O. Box 277
Huntsburg, OH 44046
timfrankseptic@alltel.net

Vice President
Stonebridge, Jerry
Stonebridge Construction
P.O. Box 594
Freeland, WA 98249
Phone: 360/331-6101
stonebrg@whidbey.com

Secretary – Treasurer
McQuestion, Brian
Lake Shore Burial Vault
783 Tipperary Road
Hartford, WI 53027
Phone: 262/781-6262
lakeshore1@gclinet.com

Executive Director
Hanifin Bonner, Linda
P.P. Box 1270
Edgewater, MD 21037
phone - 800-966-2942
lhbonner @ hanifin.com

Directors

Bassett, Gene
E.C. Bassett Co.
P.O. Box 100
Edgewood, NM 87051
Phone: 505/281-3155
bassettec@aol.com

Byers, Matthew E.
Zoeller Pump Co .
P.O. Box 16347
3649 Cane Run Rd.
Louisville, KY 40256
Phone: 800/928-7867
mattb@zoeller.com

Christopherson, Sara
University of Minnesota
1390 Eckles Ave
St. Paul, MN 55108
Phone: 612/625-7246
shc@umn.edu

Converse, James C.
Biological Systems Engr.
University of Wisconsin
460 Henry Mall
Madison, WI 53706
Phone: 608/262-1106
jcconver@wisc.edu

Edvardsson, Tina
MicroSepTec, Inc.
360 Forbestown Road
Oroville, CA 95966
Phone: 530/589-9929
tedvardsson@microseptiv.com

Groves, Tom
New England IWPPCom
100 Foot of John St
Lowell, MA 01852
Phone: 978/323-7929
tgroves@neiwpcc.org

Himschoot, Robert
Crews Environmental
P.O. Box 27
Ft Myers, FL 33902
Phone: 239/323-1986
roberth@crewsenvironmental.com

Kaminski, Roman A.
WI Dept. Comm.-Safety & Bldgs.
2715 Post Road
Stevens Point, WI 54481
Phone: 715/345-5334
rkaminski@commerce.state.wi.us

Otis, Richard
Ayres Associates
1802 Pankratz Street
Madison, WI 53704
Phone: 608/249-0471
otisr@ayresassociates.com

Smithson, Anthony
Lake County Health Department
3010 Grand Ave
Waukegan, IL 60085
Phone: 547/377-8032
Asmithson@co.lake.il.us

Stephens, Larry D.
Stephens Consulting Services, Inc.
P.O. Box 708
1549 Haslett Rd.
Haslett, MI 48840
Phone: 517/339-8692
scscons@yahoo.com

Suchecki, Ron
Hoot Systems, Inc.
2885 Hwy 14
East Lake Charles, LA 70607
Phone: 254/299-0821
sucheckie@hootsystems.com

Thompson, Carl
Infiltrator Systems
6 Business Park Road
P.O. Box 768
Old Saybrook, CT 06475
Phone: 860/577-7106
cthompson@infiltratorsystems.net

Committee Chairs

Borgeson, Karen
Communications and Information
SJE Rhombus
22650 County Highway #6
Detroit Lakes, MN 56501
Phone: 218/847-1317
KarenB@sjerhombus.com

Byers, Matthew E.
Technical Practices
Zoeller Pump Co .
P.O. Box 16347
3649 Cane Run Rd.
Louisville, KY 40256
Phone: 800/928-7867
Emattb@zoeller.com

Christopherson, Sara
Education
University of Minnesota
1390 Eckles Ave
St. Paul, MN 55108
Phone: 612/625-7246
heger001@umn.edu

Corry, Michael
Model Code
Corry Associates
16 N Carroll St. Suite 920
Madison, WI 53703
Phone: 608/257-1787
nowracode@sbcglobal.net

Guy, Brenda R.
Business Advisory Committe
Delta Environmental Products, Inc.
P. O. Box 969
8275 Florida Blvd.
Denham Springs, LA 70727
Phone: 225/665-1666
bguy@deltaenvironmental.com

McQuestion, Brian
Finance
Lake Shore Burial Vault
783 Tipperary Road
Hartford, WI 53027
Phone: 262/781-6262
lakeshore1@gclinet.com

Novickis, Richard
Conference Host Committee
Cuyahoga Board of Health
5550 Venture Avenue
Parma, OH 44130
Phone: 216/201-2001
rnovickis@ccbh.net

Thomas, John
State Leaders
Washington Onsite Association
7201 N 25th
Tacoma, WA 98046
johnthomas49@msn.com

Thompson, Carl
Government Relations
Infiltrator Systems
6 Business Park Road
P.O. Box 768
Old Saybrook, CT 06475
Phone: 860/577-7106
cthompson@infiltratorsystems.net

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Winter 2005

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National Onsite Wastewater Recycling Association

Vol. 14 No. 1

ADVERTISERS' INDEX

** IFC – Inside Front Cover; IBC – Inside Back Cover; BC – Back Cover*

NOWRA National Onsite Wastewater Recycling Association

NOWRA Headquarters
P.O. Box 1270
Edgewater, MD 21037-7270
Phone: 800|966-2942 or 410|798-1697
Fax: 410|798-5741
E-mail: NOWRA@hanifin.com
Website: www.nowra.org

FEATURES

INDUSTRY REPORTS

STATE PROGRAMS

NOWRA STATE GROUPS KICK OFF '05 WITH MAJOR ACTIVITIES

The traditional round of state meetings, conferences and education programs occurring in the early winter months of 2005 were not only highly successful – but is also sending a message about the growing recognition of the increasing importance of the work of the onsite industry. Here's a snapshot of activities in some of the State Groups, with greater detail – most of whom are working to produce strategic action plans that define key membership and fundraising activities.

In addition, State Leaders continue participating in their monthly teleconference meetings to address issues affecting their work. The most significant project discussed in the past two months has been the "Practitioner Certification Program." Any concerns and items affecting the State programs have been addressed. This document is now ready to go to the NOWRA Board for action at their March 31 Business meeting.

North Carolina (COWA) under new leadership of Steve Branz is tackling head-on renewed efforts to get the Association more active and involved in building its membership. Several meetings have occurred during the past month with the result of new plans for a larger membership meeting scheduled in the future addressing needed activities and programs for the coming year. One of the older members has stated that COWA faces a major challenge in its work with the presence of a strong university; however, it is quite clear, that the regulators and industry members want certification requirements.

Florida (FOWA) activities with the state legislature have focused on developing a request for a certification process of portable restrooms. With the advent of a successful FOWA conference in February, the Association has begun laying ground work to remove requirements from existing legislation that public sewer must be used for wastewater and not onsite systems. Additionally, the Association is seeking replacement for position of Education Director, currently held by Kevin Sherman, that will be vacated in 2006. FOWA is advertising the position, preparing to conduct interviews this summer, with the goal is to select the new Director by July 2005 to work with Kevin in a training process (allows a 6 months transition).

Nebraska (NOWWA) had its most successful conference in its joint endeavors with the Nebraska Well Drillers Association attracting 320 registrants (181 contractors) for the combined education programs. NOWWA has increased their membership in 2004 from 53 to 85. The Association is also participating in State DEP hearings on rules to put in place a certification of all practitioners. The majority of continue education programs will transition to association to conduct. NOWRA's Executive Director provided the keynote speech at the conference addressing NOWRA programs and activities, and also worked with Board members to initiate a 2005 planning process that will be continued at a special early summer session. NOWWA has elected new officers with Stan Krose and Tony Mendez assuming the leadership positions.

Colorado (CPOW) under the leadership of President Jim Rada finalized its strategic action plan, which is now ready for adoption. NOWRA's Ex.Dir, Linda Hanifin came to CO in November to facilitate the Board in their work and to accomplish this task. The results of this effort are already emerging with a clear direction on its work. CPOW now has a powerpoint presentation about CPOW to promote the onsite industry. They are currently planning two spring conference(s) – one in Golden and one in Front Range. He also mentioned that he has been interviewed by pumper magazine on CO activities. It reports on CPOW's approach with the state health dept to create an advisory committee as a collaborative effort to identify opportunities for funding systems in a program – how they plan to build CPOW's role in the industry that the state should be carried out. He has posted a message on Board to learn if anyone has adopted a code of ethics – what have been their experiences with implementation. As references, NOWRA's code of ethics and that of the State of Washington has been received.

The **Washington** Onsite Association (WOSSA) reported having their most successful conference ever – with over 300 members attending sessions and 40 exhibitors. John Thomas, Executive Director noted that within the several days, a significant high energy and the association made a good profit. WOSSA has also introduced a scholarship program for members where high school students can apply for grants (if membership). Funds were raised through contributions/auctions – donations accumulated a pool of $30,000. WOSSA are also working on legislative

bills affecting hood canal – where septic systems are being blamed for pollutants; but the big problems are enforcement and funding (see separate article).

Kansas Small Flows Association (KSFA) reported on a successful conference with increased contractor participation to 40 in 2005. Vice President Alison Blodig also states that KSFA is looking to implement a training program and has begun working with John Thomas (WOSSA) and other state groups for a cross training process. The Association leadership is planning a retreat to organize its conference and to begin the grant writing process. They are forming a relationship with Kansas Association of Counties, which began with a round table discussion at their meeting titled, "we can build a wwt for anything – anywhere". This approach gained a lot of attention with builders and realtor association. They are continuing to pursue a working relationship with KDHP, with little participation overall and only some small interest being expressed

Tennessee (TOWA) completed its annual conference in February with 70-90 attendees. With Dr. Jerry Tyler presenting his program on soils. Vice President, Jennifer Brodgdon, reported that this year, the conference had many more regulators than ever before. The Association is also working to get CEU's legislated in the state.

California (COWA) President, Steve Braband reported the Associations planned May 23 conference is well underway with expectations of a larger program than in previous years. The focus of the Association's Spring Conference is based on the results of member survey – not what was anticipated – with members stating that they want to get on with more continued education programs, and less attention to the issue of the environmental regulatory process. At the same time, COWA is also preparing testimony on state assembly bill on an onsite code with the final draft the 3rd week of March. They are finishing EIR the 3rd week of Aug. One major problem is that the state was not including certification for onsite industry; they are working this year on volunteer basis with environmental health association with hope to integrate into county regulations. The goal is to not have competitive training session.

Virginia's (VOWRA) directors recently completed a two-day workshop facilitated by NOWRA Executive Director, Linda Hanifin, which resulted in the framework for its first strategic action plan. This plan is scheduled for adoption before the March meeting. The Plan elements begin with a voluntary installers registration program – with regulators and environmental health support – and moves to certification in state in 2006. The 2nd priority in the plan is to establish a VA training program and center, which currently is encountering competing interest with the state health dept.

VOWRA President Mike Lynn reports that Board members have also been active regarding legislation in the state and are working to change the state code this year that allows local jurisdictions to create a program for type 2 & 3 systems. If this program exists, then maintenance is required – if not, it gives the health dept the ability to pursue civil action if it does not occur. This program assures that systems must be in compliance – less painful – more doors open. VOWRA's Conference will occur in March in conjunction with Caanan Valley Institute and includes 2 field trips planned in the Blue Ridge mountains on a trip system w/secondary treatment as well as conducting the "Onsite A to Z" course as a prelude to the inspectors course. Mike also reference the article in the installers magazine about a truck safety certification program for pumpers and is interested in learning about other NOWRA member's opinion about this program.

The **Maryland** (MOWPA) association, officially charted September 2004, has completed its second education session and is planning a third in June. The interim officers also completed its initial strategic action plan and is working with a Maryland state senator to on a bill requiring education and training and certification for practitioners and point of sale inspections. Maryland's membership is now up to 142.

Arizona (AOWA) is also another state, taking steps to re-organize their Association and build a membership base. Under the leadership of Paul Miller, Jack Bale and Joelle Wirth, a core group has been meeting monthly to identify the membership strategies to move forward, the education programs to pursue and future industry needs. This group is planning a strategic planning session in the near future.

STATE LEADERS

NOWRA - EPA Joins With Other Industry Organizations to Reduce Water Pollution

On January 12, 2005, NOWRA President, Raymond Peat, joined Assistant Administrator for Water Ben Grumbles, and officers from organizations involved in decentralized industry issues, to formalize an agreement that will ultimate work to improve capacity issues for more than 25 million homes nation-wide. Through this memorandum of understanding, the following organizations are committed to working together in information exchange and technical assistance. The National Onsite Wastewater Recycling Association (NOWRA), National Environmental Health Association (NEHA), National Environmental Services Center, National Association of Wastewater Transporters, National Rural Community Assistance Partnership and the National Association of Towns and Townships.

"This agreement will help solidify our national partnership to protect drinking water supplies and local water quality through promoting change in the way these waste water systems are managed," said Grumbles. "I am pleased to formally recognize the contributions these partners make to achieve results in protecting public health and improving water quality."

In comments representing the voice of the onsite industry, NOWRA President Raymond Peat acknowledged that this initiative was a welcome opportunity to ensuring that the economic needs of the public are adequately addressed. He emphasized how NOWRA's effort in developing the Model Performance Code will be instrumental in leading the much-needed regulatory reform.

The memorandum of understanding is a first step that EPA is taking in cooperation with other with national organizations to advance a program affecting onsite system practitioners and the public. Onsite systems today provide treatment capability to more than 25 percent of homes across the country. They are used in over one-third of all new housing and commercial development. When properly sited, designed and maintained, these systems are capable of producing higher quality wastewater than municipal systems. At the same time, it is estimated that nation-wide, 10 to 20 percent of older septic tanks installed in the 1940's and 50's are not adequately treating wastewater due to inadequate site location, design and maintenance, and often cause groundwater pollution.

The program strategy that accompanies the MOU identifies EPA's vision, mission and actions to improve the performance of decentralized wastewater treatment systems. The MOU and strategy are intended to advance the management of these systems within the states and facilitate collaboration between EPA headquarters, EPA regions, state and local governments and national organizations representing practitioners and assistance providers. Through the use of performance-based codes, decisions made by policy officials about the location and type of decentralized systems will provide better protection of public health and water resources.

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Effects of Water Conditioning Wastewater on Performance of Onsite Wastewater Treatment

NATIONAL SYMPOSIUM PLANNED – OCTOBER 13, 2005

There are two trains of thoughts in the onsite wastewater treatment and the water conditioning industries. The general belief held by the water conditioning industry is that the wastewater generated by the water conditioning unit does not have an effect on the performance of the onsite wastewater treatment system receiving this wastewater. A position advanced by some members in the onsite industry feel that there is an impact to the system; and encourage the property owner not to discharge the water conditioner wastewater into the domestic wastewater stream leaving the house or business. At the same time, there are also different types of wastewaters generated by the water conditioning device which depends on the level of treatment and the type of elements being removed. The U.S. EPA 2000 manual presented information on this issue but did not provide any recommendations.

Sponsored by
National Onsite Wastewater Recycling Association

October 13, 2005

Post-Conference Session of the
National Onsite Wastewater Annual Technical Education Conference and Exposition
October 10-13, 2005 - Cleveland Ohio

CALL FOR SYMPOSIUM PAPERS
CALL FOR PAPERS ABSTRACTS
DUE MAY 31, 2005

Topics to be discussed/presented at the symposium include:

1) Water conditioning discussion for non-water conditioning professionals engaged in the onsite industry;
2) Onsite discussion for non-onsite professionals engaged in water conditioning industry;
3) Research papers related to influence of water chemistry adjustments on onsite system processes; and,
4) Development of current research needs related to the influence of water chemistry adjustments on onsite system processes.

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

1. Name of Presenter
2. Affiliation of Presenter
3. Address of Presenter
4. Phone number and e-mail address of Presenter
5. Abstract/Presentation Title
   a. Title
   b. 200-300 words description of the proposed paper and presentation. *(Do not send Power Point or the full text of the paper)*
6. Short biography that includes education degrees and description of experience as it related to the water conditioning and/or onsite industry

Send all abstracts to James C. Converse via Debby Sumwalt (dsumwalt@ wisc.edu)

E-mail attachment preferred or by fax to 608-262-112.

Deadline. May 31, 2005.

Onsite Management a Priority at Table Rock Lake

-by David L. Casaletto

If we are to be successful in protecting our waters by replacing failing septic systems with advanced onsite and decentralized wastewater treatment systems, we MUST find the best ways to insure the systems are properly managed and maintained.

Table Rock Lake, a large reservoir in southwest Missouri's beautiful Ozark Country, is on EPA's 303(d) list of impaired waters due to elevated levels of phosphorus. Water quality in the reservoir (as measured by water clarity and nutrient concentrations) has slowly declined since the dam was built in the early 1950's. The geology of the watershed consists of thin, poor soils over limestone bedrock. The regional topography is karst, which is characterized by numerous sink holes, springs, caves and other interconnected subterranean regions. Unfortunately, the thin soils provide little treatment for septic tank effluent, so wastewater from poorly functioning septic systems can easily enter the lake with very little treatment. This article describes measures the residents of southwest Missouri are taking to eliminate this problem and promote the long-term viability of their lake.

People Pressure

The Table Rock Lake area is a booming tourist destination. The lake provides a multitude of recreational activities for the region, such as boating, swimming, and world-class fishing. A recent estimate by the Missouri Department of Natural Resources puts the tourism impact at between 30 million and 40 million visitor-hours per year. The estimated annual revenue from tourism in the counties surrounding the lake exceeds $900 million. However, much of this revenue depends on maintaining excellent water quality in the reservoir. Further complicating matters is the huge growth in the region's population. Within the lake's watershed are some of the fastest growing counties in Missouri. The growth has benefited the local economy, but most houses are being built around the lake using onsite systems as the main choice of treatment. Thus, tourism and population growth presents the greatest challenges to the improvement of water quality in Table Rock Lake.

A home in the trees on Table Rock Lake with a conventional septic system, Untreated septic effluent hits shelf rock and enters the lake without any indication of failure to the homeowner. The normal lake level would usually cover this discharge.

The Missouri Department of Natural Resources (MDNR) regulates discharges in the state from wastewater treatment plants with capacities in excess of 3,000 gpd, MDNR has instituted a limit of 0.5 ppm phosphorous in surface discharged wastewater effluent in the nine counties of southwest Missouri. Large wastewater treatment plants have already implemented phosphorus reduction steps. Phosphorous levels in the lake are already responding to this reduction. However, results from a study in 2001 demonstrated that septic effluent is one of the causes in the deterioration of the lake's water quality.

National Community Wastewater Decentralized Demonstration Project (NCWDDP)

Based in part on the 2001 study that identified poorly treated septic tank effluent as a cause of water quality degradation, Table Rock Lake Water Quality, Inc., a not-for-profit corporation, was awarded a grant of $2 million by the Environmental Protection Agency (EPA) for a NCWDDP. While the project tasks include the installation

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and monitoring of advanced wastewater systems (see the project workplan online at: http://www.trlwq.org/demo.htm), one of the most important tasks is to demonstrate and compare ownership, management and maintenance of onsite systems. The EPA publication Voluntary National Guidelines for Management of Onsite and Clustered (Decentralized) Wastewater Treatment System (online at http://www.epa.gov/owm/septic/pubs/septic_guidelines.pdf) details 5 levels of management of onsite systems. The demonstration project is evaluating Level 3, the operating permit model and Level 5, the Responsible Management Entity (RME) Ownership Model. In Level 3, limited-term system operating permits are issued to the property owner and are renewable for another term IF the owner of the wastewater system demonstrates that the system is in compliance with the terms and conditions of the permit. In the case of the project, the condition is that the system owner has contracted with a maintenance company to provide routine maintenance and inspection of the system, or the property owner has demonstrated the ability to properly maintain their system. (The region includes a number of resorts and resort owner are, by necessity, very handy and capable of maintaining their own on-site systems). At the end of the demonstration project, a report outlining the project's conclusions and suggestions will be given to the local regulatory authorities for their consideration. Under Level 5, the wastewater system is no longer owned by the property owner. A RME owns, operates and maintains the wastewater system. The property owner grants a utility easement to the RME to enter their property to service the equipment. The property owner's only responsibility is to pay the monthly fee to the RME. This fee includes routine maintenance, reserve for repair and overhead.

A study in 2001 demonstrated that septic effluent is one of the causes in the deterioration of the lake's water quality.

Road construction reveals how little soil there is around Table Rock Lake.

Ozarks Clean Water Company (OCWC)

The demonstration project team found it impossible to test EPA's Level 5 without actually having a RME own, operate and maintain systems. With the help of the local electric cooperative, White River Valley Electric Cooperative, a new not-for-profit sewer company, OCWC, was formed in March 2004. Missouri state statues allows for not-for-profit sewer companies to be formed and operated in a similar fashion to rural electric cooperatives. OCWC is governed by a Board of Directors, each serving a two-year term. The directors will be elected by the members of OCWC. OCWC will accept ownership of new and existing systems, both individual onsite and clustered. The initial monthly rate is $28.53 per connection with some coverage exclusions for individual onsite systems (due to travel time). The rate for a simple onsite system, such as a conventional septic system, is $18.53 per month. OCWC has also been given preliminary approval by MDNR to access Missouri's State Revolving Fund (SRF) to provide low-interest money for onsite and decentralized system repair and construction.

The OCWC Board of Directors have been aggressive in setting a path to meet the region's on-site wastewater treatment needs. Thus, OCWC will not only serve as the RME for the Level 5 wastewater systems installed as part of the demonstration project, but is also owning, operating and maintaining systems outside the project. OCWC has received the greatest outside interest from housing developers. Like many other parts of the country, developers in the area are required to build wastewater treatment systems to serve their housing development but have no desire to be in the wastewater treatment business. Under a typical arrangement, the developer will donate the wastewater treatment system to OCWC and

require each new home buyer be an OCWC member. An 80-home development has already signed with OCWC and others are in the works. Existing home owner associations that now own wastewater treatment systems have also expressed interest in joining OCWC.

Upper White River Basin Watershed Improvement District (UWBWID)

This year the Missouri legislature passed House Bill 1433 that formed a political subdivision in the nine counties included in the Upper White River Basin Watershed, which drains into Table Rock, Taneycomo and Bull Shoals Lakes in southwest Missouri. The primary purpose of this district is to provide for the installation and maintanence of decentralized onsite wastewater treatment systems in those areas of the watershed not served by sewer districts or municipal wastewater treatment systems. This district will also provide access to the low-interest SRF loan funds to individuals and companies for purchase of the onsite systems. The district is overseen by a board that consists of residents from each of the nine counties, members of which will be selected by their respective county commissioners. Inclusion in the district is completely voluntary. The bill also allows for the district to impose a property tax subject to a vote of district members.

A demonstration site reveals how little is left of an old metal septic tank. all the water was leaving through holes in the bottom of the tank. The homewoners has agreed to deed their new treatment system to and join Ozarks Clean Water Company.

Other provisions in the law require all onsite installers to be registered with the Missouri state health department, allow counties to require maintenance or pumping of all septic tanks within their jurisdiction, require laboratories performing wastewater analysis to be registered by the state health department, and relax the rules that govern investigation of complaints of sewage leaking from onsite systems thereby making it easier to resolve those complaints.

A Time of Change

Because many of these efforts are new, the final results will not be know for a few years, but it is easy to see that the way southwest Missouri and the Table Rock Lake area deals with onsite and decentralized wastewater treatment is changing. It is a change that is coming to all areas of the nation. In southwest Missouri, local people are dealing with a local problem to protect the environment while still promoting economic and population growth in a true win-win solution.

David L. Casaletto is the Executive Director of Table Rock Lake Water Quality, Inc. and Program Coordinator for the National Community Wastewater Decentralized Demonstration Project. He is Secretary/Treasurer of Ozarks Clean Water Company and Treasurer of Missouri Smallflows Organization, the local Missouri chapter of NOWRA. David resides on the shores of Table Rock Lake. Contact him at dcasaletto@lvbw.net or 417-739-4100.

A new 1500 gallon 2 compartment concrete tank with advanced treatement replaces the old metal tank (above right).

Advanced treatment and rip irrigation for a 4 home cluster is one solution to problem soils

PRETREATMENT OF SEPTAGE AND GREASE TRAP WASTES

Addressing the needs of the septic tank pumper

by A. Thomas Ferrero, Jr.

Historically the pumpers themselves have been responsible for those wastes they put into their tank trucks. For years a high percentage of these wastes have been deposited upon the land. Not always for its beneficial reuse – usually just for disposal, and sometimes under some permitting scenario but often under no regulatory oversight at all. With the promulgation of the Federal 40 CFR Part 503 regulations in 1993 a movement began towards legitimate beneficial reuse of septage, but progress has been slow. Today 'illegal' (at least not permitted) land application of septage and grease trap wastes accounts for more gallons disposed than many want to admit.

In areas where neighbors forced a pumper out of the land application business, wastewater treatment facilities started taking their waste streams, usually not of their own (wastewater treatment facility's) desires but usually because of intervention by a local politician. The charge to the haulers was typically based on what was acceptable to the haulers rather than any rational relationship to the costs associated with the treatment of these wastes. The idea was to encourage use of the wastewater treatment facility and discourage illegal dumping on the land or into a remote manhole somewhere in the collection system. Wastewater treatment facilities got in the habit of accepting these wastes and acknowledged that all they accepted was septic tank waste (septage) since grease trap and car wash wastes cause them operational and compliance problems. The haulers, being a creative bunch, have gotten very good at camouflaging almost anything to the point they can rationalize calling it 'septage'.

> The EPA believes there is currently only 50% of the treatment capacity needed once the regulated management program takes effect ...clearly there is a need for dedicated facilities.

Now, regulated management programs for household septic systems and food service facility grease traps are on the rise. With these programs comes an increase in volume of these wastes needing to be properly treated and dispersed into the environment. The United States Environmental Protection Agency has stated that they believe there is only 50% of the treatment capacity available in this country for all the wastes that will be generated when regulated management programs take effect. Clearly there is a need for dedicated facilities able to accept those wastes that the septic tank pumpers like to put into their trucks.

For dedicated facilities, either publicly or privately owned, to be sited there are a few parameters that must be evaluated.

First, from a cost standpoint these facilities are greatly effected by the volume of waste they handle. While the incremental cost of treating one gallon of waste may be similar, the high capital intensity of these facilities makes them not affordable in areas where low volumes are produced. Extremely rural areas may have to accept the fact that these wastes must be trucked a considerable distance to the nearest facility. Conversely, high volumes help reduce the cost per gallon charged to the haulers.

Second, there needs to be a reasonable competitive marketplace. If the local wastewater treatment facility is charging the haulers less than actual treatment costs to accept their septage the area is not conducive to siting a facility that will accept septage and other waste streams. Since the volumes of septage will be the foundation of revenue for these facilities (septage volumes usually are three or four times the grease trap waste volumes in an area) a facility will not be affordable to users if they cannot attract a large percentage of the waste volumes generated in the area.

And last, there must be the support of the regulatory agencies that will permit and regulate the facility and a political mindset that appreciates the need for

such a facility. It is always easier for the politicians to say 'Not in my backyard', but many take their responsibilities seriously and can become strong proponents for the project.

CASE HISTORY:

HOW A SITUATION DICTATED NEEDED CAPACITY FOR SEPTAGE AND GREASE TRAP WASTES IN NORTHERN CENTRAL INDIANA

St. Joseph and Elkhart counties are the state's highest septic system populated counties. As of the 1990 Census, St. Joseph County has in excess of 28,000 septic systems, with Elkhart taking second place with more than 27,000 septic systems. No one knows the exact number but growth over the last decade would indicate that these numbers are considerably higher today. As a result, treatment capacity for septage was limited and often many miles from where the wastes were generated. In addition, there was no consistent legal treatment for grease trap wastes in the area.

A facility needed to be permitted both by the Indiana Department of Environmental Management (IDEM)(Permit to Construct) and the City of Elkhart (Industrial User Discharge Permit). IDEM shared the vision of such a facility and had a permitting scenario that was not cumbersome. The IDEM permit was issued in less than two months after submission. Partnering with the City of Elkhart Board of Public Works, United Wastewater Management (United) resurrected a mothballed pretreatment facility owned by the City and turned it into a merchant facility that accepts septage and grease trap wastes. In addition to leasing the facility to United, the City invested in capital improvements to the project in the form of a five-year note with United.

About twenty years ago in the Philadelphia suburbs I raised the question, "How do you get septage into a wastewater treatment facility that does not accept septage?" Through a research of regulations, a document called a sewer use ordinance was located that clarified what could and what could not be discharged into the municipal collection system. Direct discharge of septage into the municipal collection system would surely not meet the criteria of any sewer use ordinance in the country. But by pretreating the septage to the point where an effluent is created that does meet the sewer ordinance it is possible to get an industrial user discharge permit that will allow for discharge of all but a small percentage of the total volume. [use as a side bar]

The United facility in Elkhart, Indiana is a permitted industrial user of the City of Elkhart municipal collection system. The process at the facility is to manage the input from the local septic haulers by a sampling protocol, manifest system, recordkeeping, screening and grit removal, flow equalization, chemical conditioning and dewatering. The filtrate from the belt filter presses is further clarified and discharged to the municipal sewer collection system under an Industrial User Discharge Permit. Currently the sludge cake is being landfilled. Figure 1 gives an overview of the process flow.

The flow equalization tanks and belt filter presses were in place. Upgrades to the facility were mostly for the receiving station which includes a containment area, automatic screening, and grit removal. A containment area is necessary in the area where the trucks are off loaded. Every time the haulers remove the cap from their discharge valve they lose some material onto the ground. Sometimes it is a few drops, other times it could be a few gallons. Everything that falls onto the ground is rinsed down and ends up in the treatment process. Spill containment was one of IDEM's firmest requirements.

Sampling protocol consists of monitoring every load discharging into the facility. The discharge flows through an open channel where the facility operator can see and smell what is being discharged. The policy is that if the waste is reported to be septage and it looks like septage and smells like septage it probably is septage. Similarly, if the waste is reported to be septage but it looks and smells like grease trap wastes then a sample is taken and the discharger may be surcharged for the analytical charges and additional treatment fees that apply to grease trap wastes. Loads will be rejected if the material does not look and smell like septage or grease trap

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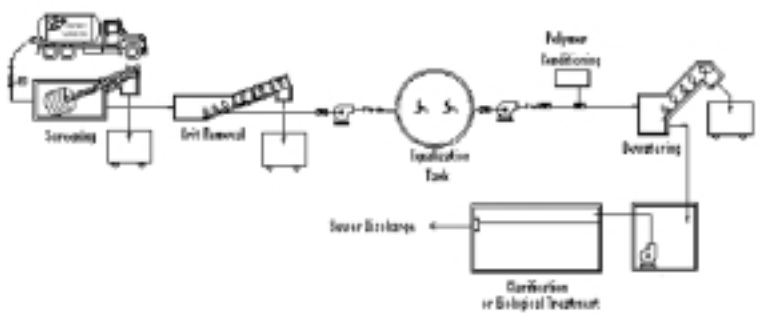
FIGURE 1 - Process Flow



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waste. Since the haulers understand the close scrutiny of every load there has been no reason, to date, to surcharge or reject any loads.

While not required by any regulation, the facility has implemented a manifest system. Haulers document each load as to the source, type, and volume of the discharged material. Mixed loads, that is loads with both septage and grease trap waste, are accepted and documented accordingly on the manifest. The input volume is recorded by use of an inline flow meter. The haulers are invoiced on a gallonage basis every week.

The first unit process is screening of the material; with automatic screening accomplished by a Lakeside Fine Screen. There are many products on the market today for screening septage, but most become blinded with the grease that accumulates in septic tanks (much less what accumulates in restaurant grease traps!). The Lakeside Fine Screen is an excellent unit for this application. While the unit may allow more small particles to pass through the screen it does an excellent job at removing the larger debris that takes up space in tanks and clogs pumps. A less expensive manual bar screen could have been used instead of the automatic fine screen but the concern for employees health and well-being precluded such an option.

The next unit process is grit removal, accomplished through the use of a grit classifier. Be assured that these wastes are loaded with grit. If you do not address it up front, you will surely address it when pipes and pumps clog with grit and tank space is overwhelmed with grit. Removing it from these spots is not fun job!

Onsite were two 70,000 gallon sludge holding tanks with 20 hp mixers. After flowing through the screening and grit removal equipment the waste is accumulated in these tanks. This is necessary for two reasons. One, it attenuates the flow from the tank trucks which discharge at a rate between 200 and 300 gallons per minute (we press at about 100 gallons per minute). Two, the components of each truck load vary but the blended average is very consistent. This is important for conditioning and dewatering the material.

The blended waste stream is then conditioned with polymer and dewatered using the two 2 meter Von Roll belt presses that existed in the facility. Although years ago we said septage and grease trap waste could not be dewatered, the technology of today has advanced the state of polymers and dewatering equipment to make it doable. Blends with up to 30% grease trap waste by volume are easily dewatered. The sludge cake produced is about 25% solids on a dry weight basis. Currently the sludge is landfilled since the facility has no means of further treating the sludge to produce a beneficially reused biosolid. Unfortunately landfill tip fees are relatively inexpensive in northern Indiana so the capital investment necessary to produce a Class A or B biosolid cannot be justified.

Capture on the belt presses is not as good as one would like to see. Therefore, we send the filtrate through several clarifiers prior to its discharge into the municipal collection system. On a schedule settled solids are pumped back from the clarifiers into the equalization tanks. The facility Industrial User Discharge Permit requires self monitoring and reporting of the effluent quality. Some parameters are measured monthly, others quarterly, some semi-annually, and a few on an annual basis. The original monitoring requirements were more extensive but a good compliance history allowed the City to reduce some of these requirements. There had been concerns that our discharge would not meet the FOG requirement of less than 100 mg/l, but in fact our discharge has never exceeded 20 mg/l! Of the parameters for which we are surcharged, BOD averages about 500 mg/l, TSS is always less than 50 mg/l, ammonia-nitrogen less than 50 mg/l, and phosphorous less than 25 mg/l.

The facility had previously been used to pretreat high strength pharmaceutical wastes and had a poor track record for odor problems. Septage and grease trap waste pretreatment is also an odor generating operation and neighbors voiced their concern. United had known from the start that odor management was a prerequisite to opening the facility. All unit processes are located in a building. Trucks unload through a 4" discharge hose connection that terminates inside the receiving building. The only piece of equipment outside is the sludge rolloff.

Odor is managed by the use of an exist-

Table 1 Septage characteristics

Parameter*	Range	Average	Suggested design value
BOD5	440-78,600	6,500	7,000
TSS	310-93,400	12,900	15,000
Ammonia-N	3-116	97	150
Total PO4	20-760	210	250
Oil & Grease	210-23,400	5,600	8,000
PH	1.5-12.6		6.0
Copper	0.3-34	8.27	8.0
Lead	2-8.4	5.2	10
Zinc	2.9-153	27.4	40

***Reported in mg/l except ph which is in standard units**

ing blower that evacuates air from the press room, receiving area, and vents on the equalization tanks and clarifiers. The existing wet stack scrubbing system was 'scrubbed' in lieu of installing a 2500 square foot biofilter. Previous experience with biofilters with their associated low costs of construction and operation led to this odor management process. Also, the thoughts of bringing 'unnatural' chemicals on site did not appeal. The few odor complains that the facility has had were all prior to the finished construction of the biofilter. Most of the complaints were caused by careless operator management. One example is the practice of cleaning the clarifiers with a vacuum truck while neighbors were working outside about 50 yards downwind! Pumps have been installed to move the settled solids back to the equalization tanks without the venting of fowl air. Once the neighbor called with an odor complaint when no abnormal operations were taking place. The operators were surprised to find one of the haulers had stopped to wash his truck with smelly facility effluent water! These and other examples are proof that best management practices are vital to odor management.

For recordkeeping and invoicing United uses an internet based database to compile all input and output data. Information is kept regarding the sources of every gallon that enters the facility and the final deposition of the sludge cake produced. The software is evolving. The goal is to allow access to this data by regulators, customers, and waste generators over the internet.

COST OF TREATMENT

Septage has highly variable characteristics. Data generated by the US EPA during the development of the 40 CFR Part 503 regulations regarding land application of septage is shown in ***Table 1***.

Merchant facilities can calculate the cost of treatment by dividing their total costs by the amount of gallons processed. Adjustments can, and should, be made for variable waste streams, i.e. grease trap wastes have two or three times the percentage of solids and organic strength as does septage. Assumptions must be made, and the results are never perfect, but at least a good attempt can be made at developing an equitable pricing structure. At the United facility pricing is five cents per gallons for septage and twelve cents per gallon for grease trap waste. Remember this is a privately owned merchant facility and a profit margin is incorporated into these charges.

A municipal wastewater treatment facility may have a greater task at developing a pricing structure. Since treating septage and grease trap waste is not all they do, there are an infinite amount of variables to consider.

One reasonable mechanism for calculating cost to treat septage is to use the existing sewer ordinance's surcharging rates. Most municipalities already expend the effort to calculate these rates. And, this seems fair since that is what a municipality would charge an industrial user if that was the quality of the waste being discharged to the collection system.

Table 2 shows the rates the United facility pays the City of Elkhart for exceedences over a base level.

Using the USEPA suggested design valuesi and the above surcharges, the cost to treat 1,000 gallons of septage is calculated in Table 3.

Table 2: City of Elkhart Sewer Use Surcharge Rates

Parameter	*Surcharge Rate*	*In Excess of Base Level (mg/l)*
BOD5	$0.1820 per pound	250
TSS	$0.3199 per pound	250
NH3-N	$0.2380 per pound	25

That is in excess of $52 per thousand gallons of septage or about 5.2 cents per gallon. Most times when you do this type of analysis of costs at a wastewater treatment facility that accepts septage you will find the cost in the range of 5 to 7 cents per gallon. But seldom is that what the facility is charging the haulers! I cannot image the rate payers being happy with their subsidizing septage treatment.

When the haulers stop being subsidized and start to realize and accept the fact that it costs to treat these wastes properly, then we will see private industry 'step up to the plate' and work to solve these environmental problems.

Merchant facilities provide benefits for all. Pretreating these wastes prior to introduction into the municipal wastewater treatment facility 1) simplifies operations at these facilities, 2) minimizes their environmental and regulatory concerns that a 'hot' load will upset their system, 3) probably gives them financial rewards by not subsidizing trucked in loads, and 4) minimizes their issues with truck traffic and odors. And, maybe best of all, management no longer has to deal with invoicing, collecting from, and generally dealing with hauler issues. Haulers benefit by having a facility that accepts a wider range of wastes than do most municipal

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Table 3 Cost to treat 1,000 gallons of septage

	ppm	x	Mga	x	#/gal	x	$/#	=	$
BOD5	7,000		0.001		8.34		0.1820		10.63
TSS	15,000		0.001		8.34		0.3199		40.02
NH3-N	150		0.001		8.34		0.2380		00.30
PO4	250		0.001		8.34		0.5950		01.24
Total									52.19

wastewater treatment facilities. Merchant facilities are service based operations that must satisfy their customers needs with regard to longer acceptance hours, shorter turnaround times, guaranteed capacity (don't tell them it is raining today and they cannot dump!). And for the driver's convenience most facilities have restrooms, soda and snack machines, and a driver's lounge. And, maybe best of all from the hauler's viewpoint, a merchant facility is a place where the haulers are welcomed.

References

† Water Environment Federation (1997) Septage Handling, Manual of Practice No. 24; Alexandria, Virginia.

Tom Ferrero is a consultant with Ferrero & Associates, LLC and Chief Operating Officer of United Wastewater Management, Inc. United is committed to developing, constructing, owning, and operating septage, grease trap, and grit trap treatment facilities for the industry. The facility described in this paper is the United Wastewater Recovery Center of Elkhart located at 1143 Oak Street in Elkhart, Indiana. He is an active NOWRA member, former member of the Board of Directors and Secretary-Treasurer.

NORTH AMERICAN 'S FIRST 100% PERFORMANCE-BASED ONSITE WASTEWATER REGULATION ENACTED(2)

by Frank Hay

The first Onsite Wastewater Regulation in North America to change from a prescriptive code to a performance-based code was enacted by the Government of British Columbia in Canada in July 2004.

The new Sewerage System Regulation in British Columbia (BC) was enacted in July 2004 with an enforcement date of May 31, 2005. The 9 month enforcement delay was required to allow all of the industry members to get their formal education and training from the Westcoast Onsite Wastewater Training Centre (WOWTC) as administered by the B C OnSite Sewage Association (BCOSSA), and to complete the registration process as set down in the regulation.

Professional reliance concepts are used in the new regulation by placing specific duties, responsibilities and accountability on those who provide the goods and services to the public. In addition, for the first time, there are regulatory provisions that require the system's owner or user to be held accountable for the system's operation and maintenance. Operation and maintenance applies to all types of systems – septic tanks, secondary treatment units and tertiary or advanced treatment units.

In exchange for these new duties to the industry and the system's user, the permit process is replaced with a process that requires that the system's planner / designer is to file with the authorities documents of (a) what is being planned or designed, (b) the operation and maintenance requirements by the owner and (c) certification that the system is installed in accordance with the filing document.

The regulation further provides that ONLY authorized persons are to plan, design, install and maintain onsite systems. An authorized person is either a Registered Practitioner or a Professional.

How Did this Regulatory Reform Occur ?

Basically, 2 things working separately simply came together. One of the things was that the new government of the day, elected in 2001, had fiscal responsibility and de-regulation as priorities of its administration.

De-regulation took the form of a new Ministry created to oversee de-regulation in all of the government's ministries. The onsite sewage wastewater industry was regulated through the Ministry of Health's prescriptive-based Sewage Disposal Regulation and permit issuance process.

Fiscal responsibility took the form of in-depth review of costs in relation to achieved health outcomes. The fiscal review of the prescriptive Sewage Disposal Regulation revealed that at least 20% of financial and human resources was spent by the local health

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authorities, whereas the health outcome was barely measurable at 1%. People were more at a direct risk for disease from food and drinking water than from sewage.

The second thing that was going on was that BCOSSA was operating, since 2000, the Westcoast Onsite Wastewater Training Centre in partnership with the Royal Roads University in Victoria, BC and BCOSSA was operating a voluntary certification program based on experience, education and references.

Mr. John Rowse, B.A.A., C.P.H.I.C., M.A., Project Manager, Land Use for the Ministry of Health Services was directed to create the regulatory reforms needed under the government's priorities. Mr. Rowse had been engaged in the regulatory reform issues under the previous government administration using the prescriptive code model. When the new administration was elected the priorities changed and Mr. Rowse was challenged by the government to think "outside the box" on these issues.

After 2 _ years, Mr. Rowse created the new Sewerage System Regulation using the performance-based code approach. In BC, this innovative approach is the first of its kind within any Ministry of the Government and is the first of its kind in the onsite wastewater industry in North America to our knowledge.

Mr. Rowse satisfied the government priorities by considering the BCOSSA education and certification program and developing the Regulation that now is enacted.

How Does the Regulation Work ?

There are 3 types of Treatment Methods are set down in the Regulation:

Type 1 is a septic tank

Type 2 is a secondary treatment unit

Type 3 is treatment unit that meets BOD/TSS of 10 mg/l each and fecal Coliform of 400 CFU/100ml

The regulation requires that only authorized persons perform any function in the onsite system. An Authorized Person is either a Registered Practitioner or a Professional.

A Registered Practitioner is registered with the registration agency and must meet 3 basic criteria that are:

1. Educational & Training as required by BCOSSA at WOWTC.
2. Verification of experience and references
3. Meeting the requirements of the Code of Ethics and professional development.

A Registered Practitioner may plan for

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sites with a domestic residential sewage flow of up to 2,400 us gals per day that require a Type 1 or Type 2 Treatment method. A Registered Practitioner may install and maintain Type 1, 2 or 3. The following are the categories of a Registered Practitioner:

Planner
Installer
Maintenance Provider

A Professional may design for sites that require a Type 3 Treatment Method and are for non-residential wastewater flows.

The Planner or Designer will file with the authorities the plan / design complete with the required operation and maintenance plan for the system's owner / user to follow.

The Ministry of Health Services is to publish the Sewerage Systems Standard Practice Manual for the Registered Practitioner and Professional to use as a guideline. This Manual is amendable from time to time as determined by a committee established by the Ministry of Health Services that is to include representatives from industry.

Is there Grandfathering ?

The short answer is no. Every existing site assessor / planner, installer and maintenance provider is to meet the educational requirements of BCOSSA and go through the registration process. Those who have successfully completed the WOWTC courses from 2000 to the present will have those courses recognized as meeting the educational requirements.

What is the Role of the Public Health Inspector ?

The role of the public health inspector is likely to be:

1. To receive the filing of the plan with the operating and maintenance plan and ensure that the person filing the document is an authorized person.
2. To respond to health complaints or system malfunctions
3. To issue orders for the repair or replacement of the system.
4. To issue fines under the Offences Act.

What Does the Future Hold?

Being a new program, it is expected that the next few years will consist of watching, monitoring and altering the program and process until the problems are identified and resolved.

From there it is intended that, with a pool of qualified Registered Practitioners and Professionals to service the needs of the industry, local governments can begin to consider onsite wastewater systems as a viable and reliable method of infrastructure for land use planning and development.

Summary

The BCOSSA is excited about what the future can hold for the industry, general public and governments as the performance-based regulation unfolds and reveals the benefits to be gained by all. However, with this opportunity comes the responsibility and management to ensure a raising of the standard to the highest possible level.

Protecting public health, the environment and the drinking water resource is to be paramount in moving forward with a performance-based code using professional reliance and government fiscal responsibility.

Website addresses to view the various agencies and associations working together to meet the goals of the Sewerage System Regulation are:

www.bcossa.com
www.royalroads.ca/wowtc
www.owrp.asttbc.org

Frank Hay is President of BC OnSite Sewage Association; Vice-Chairman Royal Roads University Advisory Board for Onsite Wastewater Management; Chairman of the BC Onsite Wastewater Registration Board;

Member of the BC Sewerage System Standard Practice Manual Standing Committee; and President of Pinnacle Environmental Technologies Inc.

SOLVING A TECHNICAL CHALLENGE : READER ASKS THE INDUSTRY FOR ADVICE

How do you approach a problem of managing large volumes of food waste?

What are the experiences that onsite industry professionals have with typical wastewater characteristics for a submarine/sandwich food processing facility? The facility will be preparing cold sandwiches for the retail market, that contains processed and non-processed meats and vegetables, dressings, etc.

Preparations occur in a small kitchen with some cooking on the premises of poultry and beef; but most of the processed cold cuts are pre-cooked; and there are no deep frying operations. Workers will assemble and package the subs and there will be some food

products (bits of meat, cheese, vegetables, etc) which can be expected to fall on the floor over the course of a day. This work area will have a daily sanitation and wash down of the counter tops and floor into the floor drain system.

This is a new facility which will be connecting to a small cluster sewage treatment system. The sewage system consists of a septic tank effluent gravity sewer and an OSI Advantex textile filter treatment system (AX-20 modules). This facilities wastewater could generate 25% of the total flow to the sewage system. All the other users are office complexes (ie. call centers, light manufacturing).

The sewage system designer for the park was told that it would be a dry park (ie. no food processing or heavy industry). Sewer discharge limits (BOD, FOG, etc.) were established to protect the park owners (the government) and the sewage system. There are concerns that the facility may significantly exceeded its limits and cause problems for the sewage treatment system.

As an example, the two pot sinks from the kitchen go to an outside grease interceptor tank with 5 days retention. The pot sinks from the kitchen go to an outside grease interceptor tank sized for 5 days retention. Nothing else goes into the grease interceptor. The floor drains, toilets, hand basins all go directly to the septic tank which is sized for 3 days HRT based on expected peak flow.The consultant for the sandwich shop had no idea what the wastewater characteristics might be except to say that "From a BOD standpoint this plant should be relatively low levels as the vast majority of the water consumed is during daily sanitation and wash down procedures which will be heavily diluted".

The other concern are the chemicals being used during the daily wash down/sanitation procedures -- acidic cleaners/sanitizers (ie. phosphoric acid) and basic cleaners (ie.sodium hydroxide, sodium hypochlorite). The quantities anticipated range from 0.25 to 2 gallons per day each of 4 products.

The primary question is whether these products will be sufficiently diluted so that they don't have an adverse impact on the microbiology in the septic tank and on the ATU system. All normal

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sources on high strength wastewater were examined, but no information could be located for this specific type of facility. What are the expectations for operations; if the chemicals cause problems, how should this problem be addressed without telling workers they can't use them -- which won't be an option due to Dept. Health requirements. M What's the best direction to pursue?

Kelly

REPONSE FROM NOWRA MEMBERS

Response #1

On one project, I designed, installed, and am currently operating an 1800 gpd …… system serving a Subway restaurant located in a small commercial building. The Subway restaurant is typical in addition to having an ice cream scooping operation. . The restaurant is allotted 700 gpd and the rest rooms in the other part of the building are allotted 225 gpd. Chemical cleaners with quaternary ammonia are traditionally used.

Overall, the system has been in operation for a year at design loading. Three quarterly effluent samples prior to drip have the following ranges: BOD 11 - 18 mg/l, Ammonia N 11 - 15 mg/l, Nitrate N 6 - 7 mg/l.

Mike

Response #2

We have had experience with similar sites. Mike's summary is on target.

Fixed film reactors are also your best bet in situations like this; however, if nitrogen is an issue -- be prepared to be surprised. There are alternatives to quaternary ammonia based cleaners and national chains have options to change their sanitary routines. If you need a list please contact us off line. We can also provide you with a list of what not to use.

All small food operations such as these examples are different. They also frequently experience dramatically different seasonal flows. However, for those like Subway where little onsite processing and disposal occurs the carbonaceous loading should be modest.

Two things we watch for are periodic contract cleaning and excessive disposal of products like milk or salad dressings.

Our experience is that whenever possible, do composite sampling. We actually require a PE to sign a design sheet, and to consider daily and seasonal peak flows. Material Safety Data Sheets are required for all their cleaning and sanitary routines. If unobtainable for a new site, composite samples are requested from a similar store in the chain. In addition, the nature of the foods and the markets they serve alter the waste streams dramatically. Here is a sense that seasonal specialties such as Ice cream can double the actual flow from winter to summer. It can also dramatically alter the BOD concentrations.

McDonalds will generally have a flow double that of a Wendy's because of the breakfast business. Wendy's may surprise you with a higher BOD because salad dressings are frequently washed into their systems. However, with good house keeping we would expect 1000 BOD on a McDonalds and between 600 and 800 on BOD on a Wendy's or a Hardee's. We expect spikes to 2500 mg/l BOD from time to time.

Arby's like your sandwich shop has residential wastewater characteristics. However, wherever you have facilities attached to a gas and go you can expect the nitrogen to be much higher because of the nature of the activity at the site. Arby's corporate cleaning regimen uses a 7% solution of Quarternary Ammonia. Your client may be fighting a mandate from his corporate office. It has to be fought.

FOG we expect to be between 50 and 100 mg/l but on an Arby's we would expect it to be much lower and on a Mc Donald's we expect it to be in the high end of the range.

We always sample for pH but we only expect to see a problem in baking operations like doughnut shops. Here we expect to see a ph of 4 or less.

The more you work in this business the more conservative you become. We have seen 250 mg/l influent TKN on a Home Depot and 500 mg/l TKN on a Roadway trucking terminal. We have also seen an influent pH of >9 mg/l on a US Postal distribution center. Most state design criteria do not incorporate this kind of information. I honestly don't know if anyone has tried to publish anything on it.

At one time the Health Department Director in Alabama, and I looked at the code for a 90 seat McDonald's and then sized the disposal field based on the organic loading assuming a residential septic system loading rate per square foot as the base that we know functions reasonably well.
Design code required a 3500 square foot field. The revised loading rate in good soils required a 25000 square foot field and in poor soils it required an 82000 square foot field. That's right; almost 2 acres. Secondary treatment required a 2500 square foot field.

Years ago a McDonald's engineer and I calculated that for McDonald's secondary treatment was about a 2 to 2.5 year return on investment assuming the field would fail in an average of 5 years.

You just have to do the work. The client may not like the answer in approximating the range; however, when the system is overloaded the client will be looking for you and the manufacturer to make it right at your expense.

– Craig

An Editorial Opinion:

A Word on the Relationship of Zoning Regulations to Decisions about Wastewater Treatment Capacity Options

Humans generate waste. Waste generated by humans is toxic to them and can cause stress upon the receiving environment. Dealing with this challenge is called sanitation. Many strategies have been developed to provide sanitation procedures for treatment of waste such as sewer, septic and decentralized approaches. Each sanitation approach has merit and was developed to fill specific niches. In considering the application of these strategies, wastewater treatment poses minimal limitations to development of property. It is evident that local policy officials must now implement zoning restrictions based on community standards, and not their perceptions of what can or cannot be accomplished regarding the availability of wastewater treatment capacity.

Thus, wastewater treatment capacity and zoning regulations clearly have different purposes, They have different enabling statutes and processes The use of wastewater treatment regulations to advance the zoning agenda of interested parties, may result in harm to the public interest.

Wastewater treatment regulation is designed to protect public health and the natural environment from the effects of sewage. The objective of wastewater regulations should be to allow treatment solutions to any structure in any location provided the public health and environment are protected. Technologies and methods now exist to meet this objective. These technologies and methods also require maintenance that should be part of regulations. If any applicable wastewater regulations do not allow the use of the full range of useful, proven technologies and require periodic maintenance, then those regulations likely need to be updated.

Land use regulation in the form of zoning is a political process. It is designed to transfer the power to determine land use from the landowner to some other entity to support the common good. Zoning laws are accompanied by many procedures and safeguards for both landowners and their neighbors. The process is often highly political, contentious and may result in decisions that are divisive. Historically, planning and zoning boards have used the wastewater capacity issue as a crutch to prevent, limit or otherwise control development. Given the availability of current technology for onsite wastewater treatment systems to provide that capacity in a more focused approach, that crutch is becomes diminished.

There exist many current examples. Decisions to develop land in one community are often opposed by the governments of neighboring communities. The urban government officials may desire to block rural development to maximize their own development potential, but lack the zoning power to do so. These officials may gain that power by blocking access to water and wastewater infrastructure capacity for suburban or rural housing developments . They may also use their control of water and wastewater authorities to trade access to services for annexation of neighboring areas. In this case, onsite treatment systems are unwelcome alternatives. However, the onsite system capacity approach offers a reasonable cost, technologically effective solution that is effectively integrated with watershed management and sustainable development policies.

Within the scenario of onsite systems, there are two approaches to wastewater service: individual home units and cluster systems. Each is appropriate in different situations. Cluster systems are particularly useful in areas of highly variable soil conditions, where a large portion of the area is not suitable for soil dispersal of the wastewater. The wastewater is transported through a local collection system to a treatment plant and dispersed in an area of suitable soil. The developer and local planning agencies then have the flexibility to design a full range of subdivisions, from large estates to high-density housing. These are the same options enjoyed by urban planners with municipal sewer and water services.

The technologies for onsite systems has advanced to a stage that it is at least as safe, both for the environment and public health, as municipal sewage collection and treatment; and as such should be treated as an equal choice in the consideration of providing wastewater capacity within the various conditions.

Colorado

New direction, leadership, professionalism, outreach, information sharing, education and training.....

All of these expressions reflect the desires of the first Board of Directors of Colorado Professionals in Onsite Wastewater (CPOW) for the onsite wastewater systems industry in Colorado. CPOW, a professional association of individuals from all sectors of the Colorado onsite wastewater industry, was incorporated in August of 2004. An affiliate of the National Onsite Wastewater Recycling Association (NOWRA), CPOW was formed to address issues that beleaguer Colorado's onsite wastewater industry.

Due to the locally-controlled nature of onsite wastewater systems (OWS) regulatory programs in Colorado, professionals in the field have been challenged for decades with issues surrounding the need for centralized leadership, outdated regulations, acceptance of new technology, education of OWS users, technical competence of professionals and geographical consistency of regulations and standards, just to name a few. Since the mid-1990's, a core group of professionals in the field have attempted to rally the profession around these issues. However, without central leadership to establish solid direction and to rally support in influential political circles, these efforts have met with limited success. In 2001, Jane Norton, Executive Director of the Colorado Department of Public Health and Environment (CDPHE) appointed the Individual Sewage Disposal Systems (ISDS) Steering Committee, to address issues regarding potential water quality impacts from OWS and the adequacy of current efforts to minimize such impacts.

The steering committee, whose members represented a wide range of expertise and interests related to onsite wastewater systems, created a report to the Colorado State Board of Health and the Colorado Water Quality Control Commission, which includes a summary characterization of onsite wastewater system impacts and a series of thirteen specific recommendations to address the risk factors identified in the summary characterization. The entire ISDS Steering Committee Report can be reviewed at http://www.cdphe.state.co.us/op/wqcc/SpecialTopics/ISDS/ISDSRecommendations020214.pdf. During the early formative stages of CPOW, the Board of Directors chose to utilize this document as the primary guidance for direction of CPOW's efforts over the next several years.

Several months of thought, discussion and downright hard work on the part of the CPOW Board have culminated in the completion of the first CPOW Strategic Plan. The Board of Directors has defined the mission and core values of the organization, identified strengths and weaknesses of the current organization as well as opportunities and challenges for success and developed a strong strategy for achieving specific goals over the next 1-3 years. The strategic plan will soon be available online at www.cpow.us . The CPOW Board wishes to acknowledge the support of NOWRA, especially Executive Director Linda Hanifin Bonner for her assistance in facilitating the development of this initial CPOW strategic planning document.

In addition to development of the strategic plan, CPOW Board members have also developed a couple of new marketing tools to promote CPOW to prospective members. Collaborative efforts have also begun with NOWRA to help streamline some of the business aspects of the organization including membership and website development. New partnerships are also being explored with the Colorado League of Women Voters, AWARE Colorado, and other programs involved with gathering and disseminating information and education about onsite wastewater issues. The Board is also working toward development and adoption of a CPOW code of ethics. Plans are also well underway for CPOW's second annual spring educational meetings to be held in Grand Junction March 4th and in Golden March 25.

GROUP MEETING – APRIL 4-5 – KANSAS CITY

FOCUSES ON MANAGING TRAINING PROGRAMS, GRANT WRITING AND MEMBERSHIP RECRUITMENT

Following on the heels of success from the first meeting in August, which was followed by the November session in Albuquerque, leaders representing 16 of NOWRA 32 state groups will meet in Kansas City for additional skills and support in association management. A preliminary session begins Sunday afternoon with instructions on implementing a Training Management System. The objective of this session is to provide the State Groups that are ready to begin this process (Kansas, Missouri, Nebraska, Texas, Maryland, Virginia) with guidance and direction needed to effective operate and manage training programs. Topics to be covered include funding and staff resource mechanisms, and how state groups get these programs established.

On Monday, the Group addresses member status & trends, year-end report on strategic process, budgeting and programs. They will also discuss the Onsite Industry Practitioner Certification Program. Raymond Peat, NOWRA President will attend the program and report on NOWRA Board Strategic Planning Session. This report will be followed by a presentation from NOWRA's Communications and Marketing Committee who are developing the materials for NOWRA's membership and marketing program.

Also being addressed are Association /membership insurance needs – security issue; Directors & Officers Liability, Content – Off-site file storage – emergency needs, protecting critical documents and organization procedures; NOWRA Future Conference locations & timeframe. Attendees will spend time learning grant writing and administration procedures – where to find them how to write them, how to get them and how to manage them – and the paperwork involved!

Iowa

IOWA HEARTLAND HABITAT FOR HUMANITIY

Habitat for Humanities has acquired a vacant air base housing complex by Waverly, Iowa which consists of 23 vacant military homes. The homes are in need of repair and new sewage treatment systems. The IOWWA Board decided that this would be a worthwhile project for IOWWA to undertake.

We are in the process of developing a plan for sewering these homes. Currently the thought is to cluster the homes by sharing septic tanks and pre-treatment system which will drain into a shared absorption field.

It is anticipated to have the first 3 – 4 homes occupied by June of 2005.

IOWWA is in need of donations of materials such as pumps, pipe, septic tanks, pre-treatment systems, and secondary treatment components.

We will be using this site to provide installers training during the actual installation of the systems and plan to continue using it to provide maintenance training. Manufactures will be encouraged to use this site to monitor the performance of there products.

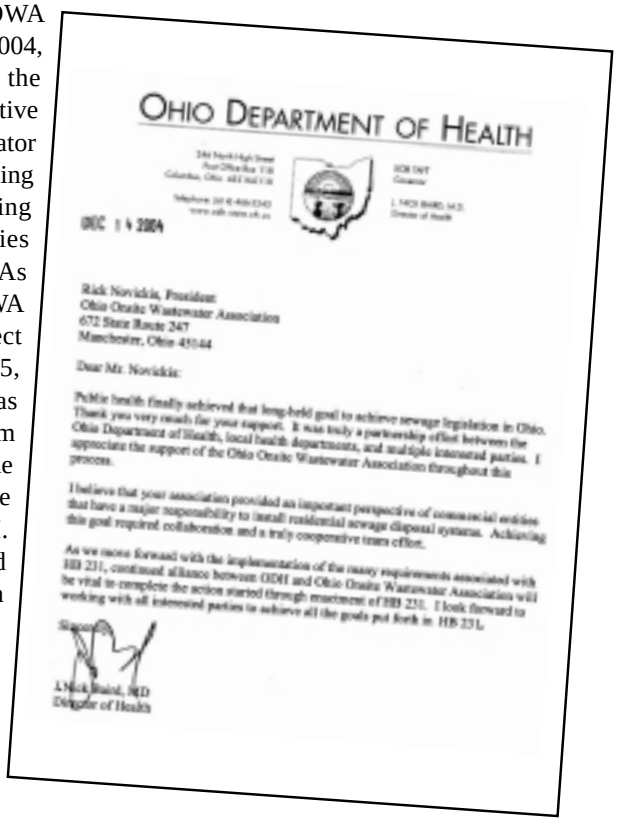
Persons who are interested in assisting with this project are encouraged to contact any IOWWA Board member or Doug Bird with the Bremer County Health Department at 319-352-0332 or email lbird@co.bremer.ia.us

Ohio

Ohio Onsite Wastewater Association

The Ohio Onsite Wastewater Association (OOWA) held its sixth annual convention in January 2005 including the third year of focused contractor training through the pilot OOWA Installer Qualification Program. The conference was a time for celebration of the passage of onsite sewage legislation (HB 231) in Ohio. OOWA received a letter of recognition from the director of the Ohio Department of Health (ODH) for the association's partnership efforts with ODH, local health departments, and multiple interested parties. Rick Novickis, as OOWA President in 2003 and 2004, worked closely with the bill's sponsor, Representative Tom Niehaus (now Senator Tom Niehaus), in working out language concerning installer responsibilities and competencies. As Rick has passed the OOWA gavel to President-Elect Jim Whitcraft in 2005, he now serves as the NOWRA Program Committee Chair for the NOWRA Conference to be held in Cleveland OH. OOWA is looking forward to hosting NOWRA in October 2005!

incoming OOWA President Jim Whitcraft and Past-president Rick Novickis.



OHIO DEPARTMENT OF HEALTH

DEC 1 4 2004

Rick Novickis, President
Ohio Onsite Wastewater Association
672 State Route 247
Manchester, Ohio 45144

Dear Mr. Novickis:

Public health finally achieved that long-held goal to achieve sewage legislation in Ohio. Thank you very much for your support. It was truly a partnership effort between the Ohio Department of Health, local health departments, and multiple interested parties. I appreciate the support of the Ohio Onsite Wastewater Association throughout this process.

I believe that your association provided an important perspective of commercial entities that have a major responsibility to install residential sewage disposal systems. Achieving this goal required collaboration and a truly cooperative team effort.

As we move forward with the implementation of the many requirements associated with HB 231, continued alliance between ODH and Ohio Onsite Wastewater Association will be vital to complete the action started through enactment of HB 231. I look forward to working with all interested parties to achieve all the goals put forth in HB 231.

Sincerely,

J. Nick Baird, MD
Director of Health

Virginia

WHY VOWRA? WHY NOWRA? *WHY NOW?*

by: Mike Lynn, VOWRA President

What a great time to be president of this organization! I've got a thirteen-year-old son and his two sweet younger sisters and, of course don't forget their beautiful mother who needs time, too. Business is booming and none of us in the Onsite Industry can keep up. I've got plenty of time.

Ha!

On top of that, VOWRA is trying to review legislation and regulations, improve communication and keep us all out of court. (Yes, I've been there, I know. You don't want to go).

All aside, what you as VOWRA members, do have is probably the most dedicated Board of Directors I've ever worked with. In early January, we locked ourselves in a hotel conference room in Charlottesville for two days to strategically look at our strengths, weaknesses, opportunities and obstacles. Under the direction of NOWRA's executive director, Linda Hanifin-Bonner, we determined that you, the members of VOWRA are our number one strength. The onsite industry in Virginia is strong and full of great soil scientists, AOSEs, designers, engineers, regulators and manufacturers. Taking a look at our weaknesses was a little tougher. Especially when we looked at our lack of a strategic plan, lack of an annual budget and most importantly the fact that we had no defined short- or long-term goals.

There was no one to blame other than ourselves. We have not provided you with the leadership and opportunities you deserve and for that we sincerely apologize. Chuck Jackson led us for the past two-years and has brought us back from life support to a living, breathing and thinking organization with structure and good communication. Board meetings have been made easier through e-mail and conference calls and in the past two years we have had three successful conferences and trained more than 100 people for the NSF written and practical exams. Virginia has more NSF certified inspectors than any state in the U.S.

The first decision we had to make on your behalf was whether we were simply going to remain a conference organization or whether we were going to lead the Onsite Industry in Virginia.

We have decided to lead!

While the Virginia Department of Health plays a paramount role in regulating the Onsite Industry via the legislative authority granted them, there are multitudes of ways that VOWRA can provide support to every onsite stakeholder in Virginia including VDH.

Is it possible that VOWRA could be the primary trainer for VDH staff and the private sector? Could VOWRA be the

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one to propose legislative changes and build consensus among the builders' association, realtors, counties, planners and others who might oppose changes to the way the onsite functions just because they are not informed? Could VOWRA start a voluntary registered installer credential program that leads to State Certification?

WHY VOWRA?

1. VOWRA is the only organization in Virginia that equally represents the interests of all stakeholders in the Onsite Wastewater Industry, which includes regulators.
2. VOWRA's Board of directors is committed to leading the Onsite Industry in Virginia. To accomplish these goals, we need not only your ideas, but donations of your time and talents and financial resources.
3. VOWRA's Board has set three priorities for 2005.
   a. To establish a plan and begin to create a VOWRA Onsite training program and training center in Virginia.
   b. To establish a plan and begin training for a VOWRA Registered Onsite Wastewater System Installer Credential, leading to a state requirement for installer certification.
   c. Create a short and long term communication plan to enhance communication between members and all onsite stakeholders maximizing the benefits of e-mail, snail mail, meetings and the web.

WHY NOWRA?

1. NOWRA is a national organization developing materials to support the Onsite Industry nationwide. These materials include the National Model Performance Code, Operations & Maintenance Provider and Certified Onsite Installers.
2. NOWRA has a new board of directors in place committed to making NOWRA and onsite, household terms across the Nation, promoting decentralized and individual onsite systems as the preferred method of wastewater disposal.
3. NOWRA's new board is also committed to re-focusing on State Groups by developing and assisting with grass roots legislative efforts and providing a large support network for State Leaders.

Why Now?

1. Most simply put, VOWRA NEEDS YOU and I personally promise that VOWRA is worth your time.
2. The truth in any business plan is enacting it and seeing it through. Without you, our greatest asset, VOWRA will not be able to meet the priorities set for 2005.
3. We need your help on committees, planning conferences, gathering vendors, reviewing regulations, the AOSE advisory committee and identifying speakers and training needs across the State.

There are so many opportunities to help our industry grow and come together. I hope that by offering just a little time, we can start build consensus among all of those with an interest in Onsite Wastewater Disposal and Recycling in Virginia.

I sincerely hope you will visit our website: http://nowra.vowra.org or call me personally on my cell (703) 856-8637.

Mike

2005 Virginia Sewage Summitt Success

In March 2005, the Virginia Department of Health in cooperation with the Virginia Onsite Wastewater Recycling Association sponsored Advanced Onsite Training in Richmond. Topics covered during the day sessions included – Wastewater Microbiology and Nutrient Issues, Septic Tank Effluent for Onsite Systems, Alternatives to Septic Tank Effluent for Onsite Systems, Onsite Dispersal of Secondary or Better Quality Effluent, and Management and Public Policy Issues. Topics covered during the evening sessions included – Site Evaluation, Management, and Technology. About 400 people registered for the event, about half from VDH.

Canaan Valley Institute (CVI) organized a successful event on March 2005 (Tuesday March 29 afternoon, Wednesday March 30 all day, Thursday March 31 till 3 PM). Topics covered during the event the program included – Opening Session on Challenges and Solutions, Case Study; Afternoon Session on Technologies, Management, Finances, and Community Process; Case Study; State Regulatory Interactive Panel Discussion; and Overall Panel Discussion at the end. Focus of this event will be on How to boost confidence in Managed Decentralized Systems (MDS). Field

tour to Explore Park may be in the afternoon of the first day (Tuesday March 29th). VOWRA spring training for 2005 will be part of this event.

VDH Advanced Onsite Training in March 2006 will be the logical extension of the training programs in Virginia. Planning for this training began with a conference call on January 27, 2005. The focus will be on training for neighborhood community wastewater systems and will emphasize the obstacles and opportunities from cradle to grave. Topics will include planning, public policy, design, installation, operation and maintenance. Preliminary conference dates have been set for March 22, 23 & 24, 2006 with backup dates of March 15, 16 & 17 in Richmond, contingent on hotel availability. VDH has included VOWRA, CVI, DEQ and NVPDC on the committee with representation from sanitation authorities and other local utilities. Technical training will be geared towards AOSEs, EHSs and PEs. Training on legislative needs, public policies and wastewater planning will be geared towards elected public officials, utility managers and local planners.

Look for announcements of other VOWRA training sessions in May (VA Beach area) and October (Charlottesville area) here and on our web site (http://vowra.nowra.org). Topics will include NSF wastewater system written tests and practical examination training, AOSE/PE training on soils and advanced system design and installer training in anticipation of ***The VOWRA Registered Installer Credential***.

The next planning conference call for the 2006 VDH conference is set up for Monday March 7, 2005. Those with topics of interest for training or those who know of conflicts with the dates should contact Mike Lynn before March 7 @ (703) 856-8637 or mikel@sesonsite.com.

VOWRA's Spring Workshop

May 14-19

VOWRA will be having a spring workshop at the Holiday Inn Surfside, Virginia Beach on May 17-19. Course offerings include Dr. Jim Converse's A-Z course, which is applicable to anyone wanting to sit for the NSF Water / Wastewater Inspection exam or for contractors wanting to become eligible for VOWRA's Volunteer Contractor's Certification program.Tentatively scheduled is a one-day soils emphasized program that's co-sponsored by the Virginia Association of Professional Soil Scientists. Topics may include onsite system inspections and sizing criteria for mini-mound systems. For more information, call Chuck Jackson at 540 436-9130 or email soilonsite@yahoo.com.

Washington

News from the Northwest and The Washington Onsite Sewage Association

WOSSA 9th Annual State Conference largest ever!

At the end of January, WOSSA hosted its 9th Annual State Conference. With over 300 people attending, we enjoyed the largest conference participation ever. 40 Exhibitors and Manufacturers were present, representing the best and newest in the industry. We especially thank them for their support and contributions to our organization and the promotion of the industry in Washington.

One of the significant things coming out of our conference this year allowed WOSSA to establish a Scholarship Fund……An idea conceived and taken on by JR Inman, the current President of WOSSA was successful with the establishment of a scholarship fund totaling over $38,000.

$10,000 cash was donated toward the scholarship fund through efforts led by Ken Moody of Environmental Earth Systems. Ken organized a number of member companies to donate time and materials to an installation that was

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donated as seed money to the fund.

It is with our thanks and gratitude we recognize the following companies:

- Ken Moody – Environmental Earth Systems and distributors
- Curtis Johnson – Bravo Enterprise
- Bob Cazabon – Rob-Mar Enterprise
- Randy Jackson – R&J Trends
- Don Malkowski- Alternative Septic
- Dan Wallace – J&D Wallace
- Dean Bannister – Bannister Septic
- Ken Moody - UV The Disinfector
- Raymond Peat - Bio-Microbics
- Cuz Concrete – Tanks donated
- HB Jaeger Co – Herb Braicks: Jim Rose- Pipe and fittings
- Zoeller Pump Inc.- Jeff Woodard – Pumps & Fittings

Members in good standing of the Associations' immediate family are eligible to apply for $500.00 and $1,000 grants to be awarded in 2005. Corporate/Group members of WOSSA allow for all of the group members immediate family to be eligible for application of these educational scholarships. For more information please go the home page of WOSSA at: wossa.org

News from Washington: *State Legislative Action*

WOSSA has recently been involved in offering comment and suggested changes to a Washington state legislative bill being proposed by the " Friends of Puget Sound" regarding the low DO levels experienced in the lower Hood Canal.

This critical and essential waterway is one of our state treasures and a hub of activity for tourism and economic activities including agriculture, forestry, and shellfish, commercial and recreational fishing and a variety of other activities.

A recent report published to the Puget Sound Action Team on the general health of this state waterway indicated gains in many areas as well as opportunities for improvement in others. Low Dissolved Oxygen in relation to Nitrogen contamination from various activities above, have led to a general degradation of the Lower Hood Canal to critical levels.

The proposed legislation in the State House and the companion bill in the State Senate outline the focus of the legislation and articulate potential non-source points of pollution and mitigation options that focus on poorly functioning and failing onsite systems on or near the water way. WOSSA opposed the legislation as it was initially introduced due to certain language and focus of the proposed solutions. One key objection was that the proposed legislation reiterated much of what was in existing rule and further did little to mandate funding to support the legislated changes and another being the narrow focus of the bill of Onsite systems being described as "significant" and "major" contributors to the issue with too little research to support the conclusions. Further, WOSSA felt this put an undue and unfunded burden onto the local regulatory agencies to resolve.

Working cooperatively various state organizations such as the Builders Association, AGC, State Association of Counties, the Washington State Realtors Association, we were able to recommend significant language changes to the proposed legislation before it came out of committee to the floor. WOSSA supports the basic concept in the proposed legislation of identification; repair and continued monitoring of the performance of these non-point sources and the ability of our industry knowledge and skills to support the local regulatory issues and need for timely correction of the problems these systems contribute.

We continue to monitor the house bill and its companion bill in the Senate as it now moves through to the appropriations committees and to the floor for vote and will continue to review proposed changes and modifications as it moves through the legislative process.

Lawmakers want to crack down on broken septic tanks

New legislation would toughen rules on inspections, ease marine pollution

By ROBERT McCLURE

SEATTLE POST-INTELLIGENCER REPORTER

Spurred by scenes of dead fish floating in Hood Canal and reports of Puget Sound shellfish beds closed by pollution, the Legislature is considering cracking down on broken septic tanks

Legislation being rewritten this week calls for a system to ensure that septic tanks are inspected, maintained and repaired. It would apply near Puget Sound-area marine waters closed to shellfishing because of pollution, or where water-quality violations are serious enough to trigger a cleanup.

Donald McDonald of Seattle holds a light for Leon Borst, left, and Thad Bamford of AAA Septic and Pumping as they clean and inspect a decades-old septic system at his home on the Hood Canal near Tahuya.

Supporters say the action is long overdue and necessary to beef up rules proposed by the Washington Health Department. The septic-tank industry says the legislation (HB1458 and SB5431) is overkill.

"The intent of this bill is actually very good. Our industry supports the intent," said J.R. Inman, president of the Washington On-Site Sewage Association. "Our struggle with it is ... if they would fund the existing laws, the existing statutes, and enforce them properly, we wouldn't be here now creating new legislation."

Dondald McDonald of Seattle holds a light for Leon borst, left, and Thad Bamford of AAA Septic and Plumbing as they clean and inspect a decades-old septic system at his home on the Hood Canal near Tahuya.

Bruce Wishart, lobbyist for the environmental group People for Puget Sound, said he remembers arguing about the same topic in the late 1980s. Since then, the problem has gotten worse.

"We know this is a problem out there across the Sound. The problems are growing," Wishart said. "There is no systematic way of evaluating septics, and we have not taken the next step in that area."

At least some of the problem can be attributed to the conversion of homes built as summer cabins in the 1950s, '60s and '70s into full-time residences, with use of the home and the septic tank much higher now than envisioned.

"We're finding there are significant failure rates and in many cases systems are just not being maintained properly," Wishart said.

Details of the legislation remain to be worked out, but the state, shellfish growers, environmentalists, septic-tank installers and others are working on a plan that will instruct county health departments to regulate the septic tanks. Not every county will have to crack down, only those with demonstrated problems from septic tanks, supporters say.

Officials don't even know where many of the septic tanks are. Septics installed before 1975 generally were not required to be registered, officials said,

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and are thought to account for a large proportion of the pollution problem. They're old, underground and in many cases forgotten.

Gov. Christine Gregoire has signaled support for the legislation, backers say. Last year Gov. Gary Locke called beefing up the rules "critical."

Some 30,000 acres of shellfish beds are off-limits to harvesting and the number in danger of being closed doubled in the past two years.

"What the environmental community is trying to do, and we support it, is raise the bar for areas where we have sensitive shorelines," said Bill Dewey, spokesman for Taylor Shellfish Co. and chairman of the government relations committee of the Pacific Coast Shellfish Growers Association.

The current legislation would apply only to the Puget Sound region, including Hood Canal. Shellfish growers would like it applied to areas of southwest Washington. They also want a more concerted effort to track down unregistered septic tanks.

As land that can be developed has grown scarcer in many areas around the Sound, some septic tanks have been installed in areas where the soil or drainage conditions are not ideal for a septic tank. In that case, advanced septic systems are often installed -- which is a good thing and a bad thing.

"It's like anything, like with your cars -- when you have electric windows, you have motors that can go out. The more advanced the (septic) systems, the more moving parts you have that can go wrong," said Janice Adair, assistant secretary for environmental health at the Health Department. (Editor's Note: Ms. Adair's name was misspelled in the original version of this story.)

Adair said she agrees with environmentalists about the need for a program because "we see more and more development go into areas without ideal soils" for septics.

Rules already require that septic tanks be inspected every three years, but all concerned acknowledge that homeowners are often unaware of this requirement.

Adair and others pointed out that even properly functioning septic systems emit nutrients such as nitrogen, which helps fuel pollution problems. However, properly functioning septic tanks may emit less, and are much more effective at controlling disease-causing organisms responsible for shellfish bed closures.

In many cases, all that's required to keep a septic tank functioning properly is regular pump-outs, Adair said.

Among those working on the legislation are the Association of Washington Business and the Washington State Dairy Federation, whose members have faced their own pollution crackdowns in recent years.

P-I reporter Robert McClure can be reached at 206-448-8092 or robertmcclure@seattlepi.com

Pentair Acquires Delta Environmental Products to Complement Existing Business

GOLDEN VALLEY, Minn., Feb. 23 /PRNewswire-FirstCall/ -- Pentair (NYSE: PNR) today announced that it has acquired the assets of Delta Environmental Products, Inc., a privately held company, to complement existing businesses in its Water Group. Delta will become part of Pentair's leading water and wastewater business, which serves residential, commercial and municipal markets. Pentair anticipates the acquisition will be accretive to earnings within the first 12 months of ownership.

Delta offers a full range of wastewater treatment products for the residential and commercial onsite treatment markets. Pentair's existing pump businesses manufacture products ranging from light-duty household utility pumps to massive, high-flow turbine pumps designed for municipal water applications.

"Delta's product lines -- including its aerobic treatment units ("ATU"), and recently introduced fixed film technology -- present an attractive growth opportunity for the pump business as onsite treatment becomes more common," said Richard Cathcart, Pentair vice chairman and president of the Water Group. "The market for safe, effective onsite wastewater disposal is growing rapidly, as more than 25% of new housing starts use onsite treatment methods." The acquisition will leverage Pentair's and Delta's existing distribution networks to provide customers with market-leading solutions.

Founded in 1985, Delta is a respected leader in wastewater systems research, development and manufacturing. The company is based in Denham Springs, Louisiana and employs approximately 45 people. Delta recorded 2004 sales of about $12 million.

Most Advanced, Quickest to Install Chamber in the Onsite Industry Is Now Available From Infiltrator® Systems

Old Saybrook, Conn. (January 2005)—The next generation of chamber technology is now available from Infiltrator Systems, Inc. The Quick4™ Standard and the Quick4™ Equalizer® 36 Chambers are the quickest to install leaching chambers available to the onsite wastewater industry today. Both models offer optimal installation flexibility, contouring capability, and multiple piping options that represent a dramatic evolution in the advancement of the onsite industry. They are ideal for curved and straight systems and for all leachfield applications.

Infiltrator Systems' long-term expertise in onsite wastewater technology and systems has allowed for the combination of design and performance features in the Quick4 Standard and Quick4 Equalizer 36 chambers that until now have not been available in one product.

- The Contour Swivel Connection™ provides optimal contouring capability. This built in feature provides a 10- to15-degree right or left turning capability. It allows the Quick4 Chamber System to easily follow contours or form an "S" curve, and to avoid obstacles during installation without additional parts or accessories.
- The shorter four-foot length of both models provides greater design and installation flexibility and their compact nesting provides more trench length in single truckload.
- The MultiPort™ End Cap design has molded-in inlets/outlets that allow piping to enter or exit the system from various directions. The location of the ports allows multiple trench designs, eliminates pipefittings, and makes looping ends easy. The molded-in, tear out tabs are part of the inlet and outlet ports and provide a tight fit to the pipe. Additionally, the end cap can be used on either end of the chamber or trench.

- Exceptional structural strength is another feature of the Quick4 Standard and Quick4 Equalizer 36 Chambers. Structural tests, as certified by independent professional engineers, show that Quick4 Chambers withstand 16,000 lb/axle with only 6 inches of cover.

The Quick4 Standard and Quick4 Equalizer 36 Chambers are the latest in the extensive line of plastic leaching chambers created and manufactured by Infiltrator Systems, Inc. of Old Saybrook, Connecticut. Infiltrator Systems is the world leader in providing innovative technology and solutions to solve onsite wastewater challenges today and in the future. Infiltrator is the original and most specified leachfield chamber in the onsite industry and is approved in all 50 states, 46 states with up to a 50 percent smaller absorption area than gravel trenches. One in four leachfield systems in the United States is an Infiltrator Chamber System.

For more information about chamber solutions from Infiltrator Systems or to find out about product training, demonstrations and instructional seminars visit our Website at www.infiltratorsystems.com or call 1-800-221-4436. Installation, educational, and technical material is also available for download.

2005 Western Onsite Wastewater Exhibition & Conference

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May 23 & 24, 2005

with Training and Workshops on May 25 & 26

Keynote Address: **"The Future of Onsite Wastewater Treatment"**

"Dr. T", George Tchobanoglous, Ph.D., P.E., Professor Emeritus

Department of Civil and Environmental Engineering

University of California, Davis

For more information, contact Cliff Trammel with COWA at707/579-4882 or visit www.cowa.org

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