The Utah WaTCH

Wastewater **T**raining **C**enter **H**appenings

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Intermountain States On-Site Wastewater Treatment Forum

On July 27-28, 1999, the Utah On-Site Wastewater Treatment Training Center and the Huntsman Environmental Research Center of Utah State University will host the *Intermountain States On-Site Wastewater Treatment Forum* at the Utah State University campus in Logan, Utah. The goal of this meeting is to bring together interested parties from Utah, Nevada, Arizona, New Mexico, Colorado, Wyoming, Montana, and Idaho for a two-day forum to address on-site wastewater treatment issues within this region. The focus will be on 1) identification of needs with respect to regulatory, outreach, research, and educational issues, and 2) establishment of a communication network among interested parties.

There will be presentations made by representatives from the following on-site wastewater agencies and organizations:

- Michael Hoover, a soil science professor from North Carolina State University and the Director of the Training Center for Land-Based Technology and Watershed Protection, will be the keynote speaker. The Center is a national training facility for the demonstration and training of advanced and conventional land-based waste treatment technologies, including on-site wastewater treatment system demonstration and septic system research.
- Richard Phalunas will represent the National Environmental Training Center for Small Communities ((NETCSC) and the National Small Flows Clearinghouse (NSFC). NETCSC is a nonprofit organization funded by the U.S. Environmental Protection Agency that helps environmental trainers improve the quality of drinking water, wastewater, and solid waste services in small communities. NSFC is a nonprofit organization, established in 1977 under the federal Clean Water Act, that serves America's small communities as a national source of information and technical assistance about "small flows" wastewater technologies - those systems, ranging from individual septic systems to small sewage treatment plants, that have fewer than one million gallons of wastewater flowing through them per day.

(Continued on page 2)

Each of these organizations are in a position to be of support to those with various on-site wastewater needs. Their supportive roles will be presented with emphasis on our particular western needs.

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- George Loomis will represent the Consortium of Institutes for Decentralized Wastewater Treatment. The Consortium, composed of educational institutions and private sector practitioners, was proposed and initiated by the Coalition for Alternative Wastewater Treatment, a citizen-based group, to encourage and advance research and education about decentralized wastewater treatment.
- Ted Loudon, a soil science professor at Michigan State University and the Director of the Michigan Onsite Wastewater Training Center, will represent the National Onsite Wastewater Recycling Association (NOWRA). NOWRA was established in 1991 as a national professional organization to advance and promote the on-site wastewater industry, serve all aspects of the industry, and represent professionals engaged in siting, design, construction, and maintenance of on-site wastewater systems.
- David Lenning, the Director of the Washington State On-Site Wastewater Training Center, will represent that training center. The Center was formed by the Washington On-Site Sewage Association to offer training in various aspects of on-site sewage systems pertinent to Washington.

Each of these organizations are in a position to be of support to those with various on-site wastewater needs. Their supportive roles will be presented with emphasis on our particular western needs.

Representatives from each of the eight states will present their states' status of programs, needs, resources, etc., in the areas of regulatory issues and policies, outreach activities, research needs and opportunities, and educational programs. Specific items to be addressed and discussed include the following:

a. Regulatory Issues and Policies

This topic will include how a state administers, regulates, and changes its regulations; the current status of regulation revisions; relationship of state to local regulators; current allowed technologies; current database of treatment systems; identification of needs.

b. Outreach Activities

This topic will include the status of formal training centers; status of certification or required training; relationship with state Extension programs; general means of outreach training in a state; status of distance learning methods; identification of needs.

c. Research Needs and Opportunities

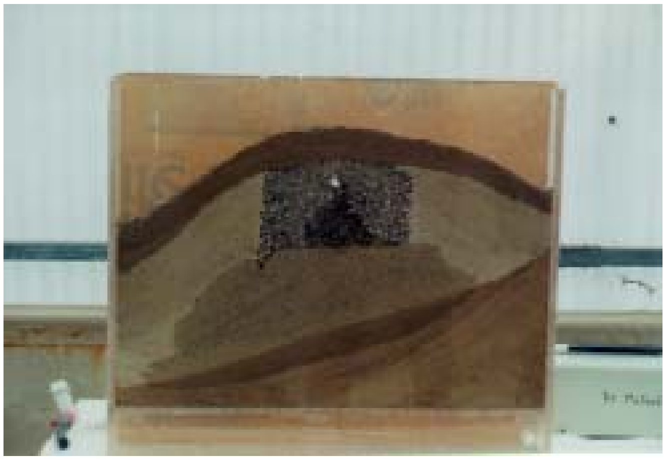
This topic will include discussion of technologies under current active formal research or informal experimentation; specific problems needing research; identification of needs.

d. Education Programs

This topic will include educational efforts or programs at formal levels of education (K-12, college, vo-tech); whether any federal Clean Water Act, Section 319 (non-point source pollution program) funding is being used for educational programs; identification of needs.

Registration cost for the Forum is $100, which includes three meals. Registration forms have been sent to the Department of Environmental Quality or Department of Health and to the Water Resources Research Institute in each state for further distribution. Forms are also being sent directly to the local health departments in each state.

To obtain a registration form or for further information, please contact Steve Iverson at (435) 797-3159 or <siverson@cc.usu.edu> or visit our website at <http://www.engineering.usu.edu/uwrl/training/forum/forum.html>.



Sloped, Non-Plowed Mound Model. (Constructed by USU Senior Design Team).

Project Funded on Source Water Protection and On-Site Wastewater Treatment Systems

The United States Geological Survey (USGS), through its 104 program, recently funded a project on source water protection and on-site wastewater management with the Utah Center for Water Resources Research at the Utah Water Research Laboratory (UWRL) at Utah State University (USU). The U.S. Environmental Protection Agency, as mandated by the Safe Drinking Water Act Amendments of 1996 (Public Law 104-182), requires through the Source Water Assessment Program that each state delineate source water protection areas and then inventory significant contaminant sources within those drinking water protection areas.

Diffuse sources of contamination present a challenge to source water protection management. Nonpoint source pollution has been identified by the U.S. Environmental Protection Agency (U.S. EPA) as the nation's largest water quality problem and has been a major focus of water quality management in Utah. Control of traditional nonpoint sources of pollution (e.g., runoff water and infiltration water contaminated with nitrates, other nutrients, and pesticides from agricultural operations, construction site runoff, highway runoff, and urban stormwater and infiltration water) has been a priority for both public and private water quality managers in Utah. However, less has been done in inventorying and managing on-site wastewater treatment systems as relatively diffuse sources of contaminants to ground water and to surface water. The number and distribution (density) of these systems in watersheds supplying drinking water is critical to source water protection. With few exceptions, there is little information available about on-site wastewater treatment systems in Utah watersheds. The Utah Division of Water Quality personnel are concerned about this possible source of contaminants and suggested that a systematic approach to management of these sources is needed in Utah. They suggested that a database inventory of on-site wastewater treatment systems in the state would be an important first step in a management approach. Information about relatively recent installations of these systems has been collected by local health departments but is not available to environmental managers in formats that are readily usable, (for example, geographical information source (GIS) maps). Records may not even exist for many older systems. Appropriate source water protection management requires information about these on-site wastewater systems, including their location, size, and functionality.

Therefore, in this project, a database system will be developed to capture on-site wastewater treatment information in a GIS-compatible format, making it readily usable and easy to interpret by environmental managers. Commercially available on-site wastewater treatment management software will be evaluated for cost-effective use in Utah. Special attention will be paid to evaluation of the use of these database programs in source water assessments and to the potential to interface this information with contaminant fate and transport models.

Dr. Darwin Sorensen of the UWRL is serving as project manager. More information on the project can be obtained from him at (435) 797-3207 or by email at <dsore@cc.usu.edu>.

If you would like to be added to our mailing list, please contact:

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Senior Design Team Develops Educational Tools for the Training Center

The 1998-1999 Senior Design Team consisting of five undergraduate students majoring in environmental engineering at Utah State University, designed and built several models to illustrate construction requirements of the mound system, which is an alternative on-site system that is being used in several areas in Utah. The students prepared the models as part of their Senior Design Project. The Senior Design Project within the College of Engineering is a yearlong academic course in which students work in teams to obtain hands-on experience with regard to three elements of engineering practice: (1) designing; (2) building; and (3) testing an applied engineering system.

The physical models consist of a table-top mound system that includes a profile that demonstrates the layering of materials in the construction of a mound. In addition, three plexiglass tabletop box models were constructed to demonstrate water flow through a typical mound. These models are used to illustrate the importance of plowing on water flow. The preparation of the interface between the mound sand fill material and the natural soil surface is critical to movement of treated wastewater into underlying soil. The interface must be gradual and diffuse to ensure that water moves into the soil and does not flow down the interface and cause failure at the toe of the mound. Such an interface is prepared by mixing the sand fill material with the underlying soil by plowing. The models include:

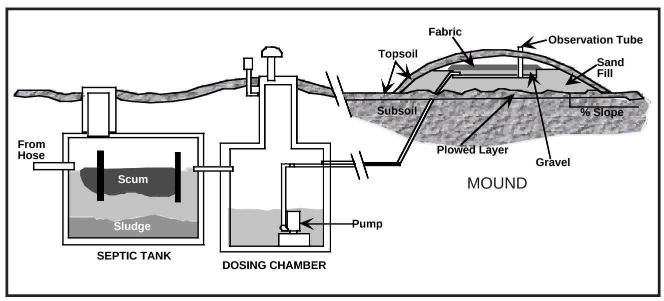
1. **Non-sloped, plowed**
   This model demonstrates the ease of water flow from the mound fill material into the underlying natural soil in a system built on level ground and with plowing of the fill/soil interface.

2. **Sloped, plowed**
   As with Model No. 1, even when the mound system is built on a sloping site, proper preparation of the fill/soil interface will ensure infiltration of the treated wastewater into the underlying soil.

3. **Sloped, non-plowed**
   This model, in which the mound fill and the natural underlying soil are not mixed, demonstrates the flow of water along the sloping and abrupt fill/soil interface, illustrating the potential for surfacing of the treated wastewater at the toe of the mound.

In addition, the computer model of a pressurized distribution system developed by last year's Senior Design Team was modified to make it more user-friendly and to provide a more useful output for designers of mound systems. The program is used to calculate the required number, size, and spacing of orifices in the pipes so that uniform distribution of wastewater effluent is maintained throughout the piping system.

The members of the Environmental Engineering Senior Design Team included: David Norman (Group Leader), Lance Allen, Shannon Johnson, Jeff Miner, and Ryan Roberts.



Mound System.

Table-Top Mound Model.

Movement and Survival of Pathogenic Bacteria and Viruses in Soils[1]

Household and commercial wastewaters disposed of through septic tank systems may contain disease-causing (pathogenic) viruses, bacteria, and parasites. Large numbers of these pathogens can pass through the septic tank and enter the soil environment through the drainfield, which is designed to distribute, dispose of, and further treat the partially treated septic tank effluent. In a system that is properly sited and designed, physical, chemical and biological processes of the soil will reduce concentrations of these pathogens to safe levels. However, if proper design and siting procedures are not followed, pathogens may be transported to ground or surface waters. People may be exposed to these pathogens if they drink contaminated ground water, ingest water while bathing or swimming in contaminated surface water, or if they eat foods contaminated from contact with the ground or surface water. People who ingest these pathogens are at risk of illness and, in some cases, death. A 1985 review of ground water contamination from septic tanks[2] reported that pathogens in ground water have accounted for the majority of waterborne illness in the United States, with most of the illness related to virus infections. For example, *Salmonella typhi*, the bacteria that causes typhoid fever, was found in the well of a family in which five persons got typhoid fever. A dye tracer study indicated that the well was receiving water from a septic tank system more than 200 feet away from the well. It took only 36 hours for the dye from the septic tank system to appear in the contaminated well.[3]

The movement of disease-causing bacteria in soil depends on a number of factors. Bacteria are large enough that physical filtering and removal in the soil pores can retard their movement. Soil particle sizes, which determine soil texture, and soil pore sizes that are associated with different soil textures are important. The more clay a soil has (i.e., the finer its texture and the smaller the pores), the more effective it is in retarding bacterial movement. The surfaces of bacterial cells usually carry a net negative electrical charge that affects their adsorption to soil particles, many of which are also negatively charged. Since negative charges repel negative charges, positively charged ions (cations) are needed to bridge between the cell and the negatively charged clay surfaces so that adsorption may occur. Therefore, the presence of cations in the soil solution is necessary in keeping bacteria attached to the soil. Lower pH (higher concentrations of H^+ ion) can also help retard the movement of bacteria in soil. High concentrations of dissolved organic matter, similar to levels found in septic tank effluents, tend to interfere with bacteria binding to soil and may enhance bacterial movement.

Water moving through the soil provides the transport medium and force for bacterial movement. Bacteria move through soils that are saturated with water more than they move through unsaturated soils, so it is important to prevent soil below the drainfield from becoming saturated. The more water that moves through the soil per unit time (i.e., high percolation rate), the farther pathogenic bacteria are likely to move. In addition, heavy rainfall may move bacteria relatively rapidly through soil because it dilutes cation concentrations. The rate of movement of bacteria through soil is affected by the interaction or balance among the factors discussed above. Sandy or gravelly soils may contain very little clay, have relatively low cation concentrations, and have high percolation rates. If the sand or gravel includes limestone, the pH of the soil solution may be relatively high. Disposal of septic tank effluents on these soils carries a relatively high risk of contaminating ground water and of exposing people to pathogenic bacteria.

During the time that bacteria are held on soil particles or are moving through a soil, they are subject to

In a system that is properly sited and designed, physical, chemical and biological processes of the soil will reduce concentrations of these pathogens to safe levels. However, if proper design and siting procedures are not followed, pathogens may be transported to ground or surface waters.

conditions that may destroy them or make them non-infective. Temperature, moisture, soil organic matter concentration, and the concentration of predatory microorganisms have the greatest influence on their survival. Lower temperatures allow bacteria to survive longer. This means that survival during winter is longer in near-surface soils where temperatures change with the season. Moist conditions also improve survival. Bacteria survive better in finer-textured soils with better water holding capacity. Higher amounts of organic matter also increase bacterial survival in soil. Grazing protozoans can consume large amounts of bacteria, including pathogens, in soil. Bacteria that are parasitic on other bacteria, the production of antagonistic compounds (e.g., antibiotics) by bacteria and fungi, and attack by viruses may also be important in the demise of bacterial pathogens in the soil environment. The biological "clogging mat" or crust that forms at the soil/wastewater distribution system interface can be important in retaining bacteria both by enhancing physical filtration and by providing a habitat for grazing and predatory organisms.

Virus movement in soil is controlled by nearly all of the same factors that control the movement of bacteria. Of these, soil texture is probably the most important, i.e., clay soils retain viruses better than sandy soils. The flow rate of water through the soil is at least as important in virus transport as it is in bacterial transport. However, there are many kinds of disease-causing viruses with different characteristics that affect their movement through the soil and retention of their disease-causing potential. For example, poliovirus 1 (an enterovirus) readily absorbs to soil but echovirus 1 has a low adsorption capacity. These variations make it difficult to generalize about virus movement in soil with confidence. Soils with very high organic matter content (e.g., muck soils) or with high concentrations of dissolved organic matter do not retain viruses well. However, the viruses in septic tank effluent may be associated with larger organic wastes particles; if these particles are filtered out of the soil solution, the movement of the associated virus is also retarded. Viruses do not adsorb well in soils with low ionic strength solutions (a condition commonly associated with sandy soils), and heavy rain fall can accelerate the movement of viruses in soils.

As with bacteria, virus "survival" or retention of infectivity in soil depends mostly on the temperature and moisture of the soil. Colder temperatures and higher soil moisture levels enhance virus persistence. Viruses in soil may be destroyed by the activity of microorganisms. Grazing protozoans may consume them, and the extracellular enzymes of bacteria and fungi may degrade them.

As public health managers, land developers, and home and business owners consider on-site wastewater treatment and disposal options, there is nothing more important than considering the properties of the site and soil environment that influence the transport and fate of pathogenic bacteria and viruses. If they are ignored or compromised, serious health risks may arise. Important facts to remember are:

- The absorption field should be located in fine- to medium-textured soils.
- Saturated conditions in the soils below the absorption field must be prevented because pathogens move faster in saturated soils.
- The thickness of the unsaturated soil above the ground water and below the infiltration system should be as large as possible and never less than allowed by regulations.
- Isolation distances between on-site system components and landscape features of concern (e.g., surface waters, wells, cut and natural slopes, drainage ditches, property lines, etc.) must be maintained.

[1]Bitton, G. (1999). *Wastewater microbiology*. Second Edition. Wiley-Liss, New York, NY. pp. 435-442.

[2]Yates, M.V. (1985). Septic tank density and ground-water contamination. *Groundwater,* 23(5):586-591.

[3]Craun, G.F. (1979). Waterborne disease—Status report emphasizing outbreaks in ground-water systems. *Groundwater,* 17:183-191.

Regulatory Spotlight—Use of Gravel in an Absorption System

Utah Administrative Code R317-507. Absorption Systems

R317-507-3.5

> The stone or "gravel" fill used in absorption field trenches shall consist of crushed stone, gravel, or similar material, ranging from 3/4 to 2 1/2 inches in diameter. It shall be free from fines, dust, sand, or organic materials and shall be durable, and resistant to slaking and dissolution. It shall extend the full width of the trench, shall be not less than 6 inches deep beneath the bottom of the distribution pipes, and shall completely encase and extend at least 2 inches about the top of the distribution pipe.

Gravel, also referred to as aggregate, is an important part of an onsite wastewater distribution system. Gravel is used to:

1. Allow storage of peak wastewater flows in trench voids and pores;
2. Dissipate energy from incoming wastewater that might erode the infiltrative surface of the soil;
3. Support the distribution pipe; and
4. Support the sidewalls of the soil excavation, preventing its collapse.

However, improper selection of an appropriate gravel and improper placement of the gravel in the absorption trench or bed may have adverse effects on wastewater infiltration into the natural underlying soil.

Utah regulations specify a size range of 3/4 to 2 1/2 inches in diameter. However, the use of smaller sizes of gravel (within the specified range) is preferred to reduce masking of the soil infiltrative surface by the gravel. The gravel should also be durable and not susceptible to dissolving or slaking (i.e., crumbling) in the applied wastewater. Gravel of improper hardness or type can be abraded during handling and placement, creating a source of fines. Certain types of gravel may react with wastewater components and may dissolve over time. Durability and hardness can be tested using the Moh scale of hardness. The gravel should have a Moh hardness rating of at least 3, which means that the gravel can scratch a copper penny without leaving a residue. Although crushed rock can be used, crushed limestone should not be used, unless it is dolomitic.

Also of concern in the selection of an appropriate gravel is its cleanliness. Utah regulations require that the gravel "shall be free from fines, dust, sand, or organic materials." When gravel containing fines is used in an absorption field, the fines may wash off the gravel and clog the infiltrative surface of the soil. At the present time, Utah regulations do not define a maximum amount of fines that are allowed, nor do they address whether washing of the gravel should be required.

In 1998 the Utah Department of Environmental Quality (DEQ) conducted a survey of twelve states to determine their specifications for gravel cleanliness. All twelve states required that "clean" gravel be used in soil absorption systems. However, only Florida had a defined percent maximum of fines in its regulations (maximum fines allowed is 3.75% by weight through a #200 sieve), while several states were considering rewriting their rules to include a definition of maximum amount of fines allowable. North Carolina required that gravel be tested by sticking a hand into the gravel and checking to see if the hand comes out clean. Two states, Arizona and North Carolina, required that gravel be washed prior to use. Most of the problems identified that were associated with "dirty" gravel were attributed to suppliers. Suppliers were reluctant to wash gravel to meet required specifications due to the added expense of washing. In Mississippi, there was such a demand for gravel that suppliers were unwilling to wash gravel because they knew they could sell it to someone else who did not require clean gravel.

To eliminate problems with interpreting what "clean" gravel is, the Utah DEQ has proposed as part of its regulatory revisions a definition of the maximum amount of fines that will be allowed. These specifications were developed by (and have already been adopted by) the Wasatch City-County Health

Department. The amount of fines are defined by the amount passing by weight through a # 10 sieve. The requirements are:

U.S. Standard Sieve Size	Specifications (% Passing, by Weight)
#10	0-2

During construction of the absorption field, gravel poured into the trench or bed may compact the soil infiltrative surface. The degree of compaction will be dependent on soil type and soil moisture, with finer-textured soils and wetter soils being more susceptible to damage. Placement techniques may also affect compaction. The gravel should be laid in from the sides (avoid driving on the soil infiltrative surface) by a backhoe or front-end loader rather than dumped from a truck.

Utah regulations require a minimum of 6 inches of gravel below the distribution pipe; however, 8 inches is recommended. A greater depth increases the sidewall area available for wastewater infiltration and increases the hydraulic head on the infiltrative surface, which may increase the rate of wastewater infiltration into the soil.

Systems that do not use gravel (gravelless systems) may avoid some of the concerns that are associated with the use of gravel, including the presence of fines in the gravel and the potential for masking the soil infiltrative surface by blocking the surface with the gravel. In Utah the only type of gravelless system presently approved for use is the chamber system. Chambers are usually constructed of plastic, with a large internal void space. They are typically 2 to 3 feet in width and several feet in length, depending on the manufacturer and the construction material. The chambers are placed end-to-end in the bottom of a trench and backfilled with natural soil. Utah regulations require that the total length of chambers equal or exceed the length required for the installation of a 36-inch wide gravel trench. Guidance for the use of chamber systems is given in R317-507-3.11 of the *Utah Administrative Code for Individual Wastewater Disposal Systems.*

On-Site Wastewater Treatment Information Available on the Internet

In this issue we are featuring two Internet sites that provide information on on-site wastewater management. Additional sites can be found by using a search engine such as Yahoo! or Excite or by browsing through sites and following their associated links.

We do not endorse any sites and would like to remind readers that information on Internet sites is not guaranteed to be accurate. In addition, site addresses often change, so the accuracy of the information listed below may also change.

http://danpatch.ecn.purdue.edu/~epados/septics/septic.htm

This site was developed by the On-Site Wastewater Disposal Project in the Department of Agricultural and Biological Engineering at Purdue University in West Lafayette, Indiana. It contains a link to a newsletter, *On-Site*, which provides general educational information relating to on-site systems. It also provides full text articles and project reports developed by the On-Site Wastewater Disposal Project as well as many developed by other university extension services across the country. It provides links to two educational tutorials, *Management of Decentralized, On-Site Systems for Treatment of Domestic Wastes,* and *Principles* and *Design of On-Site Waste Treatment With Septic Systems*, as well as to many other sources of information on on-site systems.

http://towtrc.tamu.edu/

This is a site maintained by the Texas On-site Wastewater Treatment Research Council. The Council, created in 1987 by the Texas State Legislature, oversees a research and technology transfer program that is used to develop innovative, site-specific solutions to on-site wastewater management problems. Information provided at this site includes research project updates, a quarterly newsletter, *Texas On-Site Insights*, training center news and schedules, *SepticTalk*, an interactive Internet-based discussion group and information service, and extensive links to other information sources.

Calendar of Events

June 16, 1999
Utah Wastewater Disposal Technical Review Committee Meeting, Room 336, Cannon Health Building, 288 North 1460 West, Salt Lake City, UT. Dwight Hill at (801) 370-8771

July 6-8, 1999
Onsite Wastewater Systems Conference, National Environmental Health Association. Nashville, TN. (303) 756-9090 or [www.neha.org].

July 27-28, 1999
Intermountain States On-Site Wastewater Treatment Forum. Utah State University, Logan, UT. Steve Iverson at (435) 797-3159 or [www.engineering.usu.edu/uwrl/training/forum/forum.html]

August 10, 1999
Utah Wastewater Disposal Technical Review Committee Meeting. Bear River Health Department, 655 East 1300 North, Logan, UT. Dwight Hill at (801) 370-8771.

September 20-21, 1999
Northwest On-Site Wastewater Treatment Short Course and Equipment Exhibition, University of Washington and Washington State Department of Health. University of Washington, Seattle, WA. Engineering Professional Programs at (206) 543-5539 or email at <uw-epp@engr.washington.edu>.

September 29 - October 1, 1999
Utah Environmental Health Association Fall Conference. Sherwood Hills, Highway 89-91, Logan, UT. Bill Emminger at (801) 538-6755.

October 12, 1999
Utah Wastewater Disposal Technical Review Committee Meeting. Southeastern Utah District Health Department, 28 South 1st East, Price, UT. Dwight Hill at (801) 370-8771.

October 19-21, 1999
16th Annual On-Site Wastewater Treatment Conference. Raleigh, NC. Joni Tanner at (919) 513-1678 or e-mail at <joni_tanner@ncsu.edu>

October 31 - November 4, 1999
American Society of Agronomy/Crop Science Society of America/Soil Science Society of America 1999 Annual Meetings. Salt Lake City, UT. David Kral at (606) 272-8080 or [www.asa-cssa-sssa.org/olr99/].

November 3-6, 1999
8th Annual National Onsite Wastewater Recycling Association (NOWRA) Conference & Exhibit. Jekyll Island, GA. (800) 966-2942 or [www.nowra.org].

December 14, 1999
Utah Wastewater Disposal Technical Review Committee Meeting. Davis County Health Department, 50 East State Street, Farmington, UT. Dwight Hill at (801) 370-8771.

February 16-17, 2000
Third Southwest On-Site Wastewater Conference & Exhibit. Laughlin, NV. Dan Smith at (520) 226-2713.

DEQ appoints Gennaro Dicataldo as On-Site Wastewater Engineer

The Division of Water Quality of the Utah Department of Environmental Quality recently appointed Gennaro Dicataldo as an environmental engineer to work in the on-site wastewater treatment program. He replaces Mr. Richard Jex, who is now with the Wasatch City/County Health Department.

Mr. Dicataldo is presently completing an M.S. Degree in Civil Engineering, with an emphasis on environmental engineering, at Brigham Young University (BYU). Prior to obtaining his B.S degree in Civil Engineering at BYU in 1997, Mr. Dicataldo received an associate degree in 1986 in Civil Engineering from the Istituto Technico per Geometri in Bari, Italy. His prior work experience includes internships with the Consiglio Nazionale delle Recerche (National Council of Research) in Italy and with the Utah Department of Transportation.

Gennaro and his wife Milano are the parents of one-year old twins, Emily and Matthew.

Manager’s Corner—Viewpoint

In January we passed the one-year anniversary of the establishment of the Utah On-Site Wastewater Treatment Training Center, and we would like to express our gratitude to so many whose efforts have helped us. Regulators at both the local and state levels have contributed tremendous support to the organization and operation of the Center. Without the financial and administrative support of the State of Utah Department of Environmental Quality and the Utah Water Research Laboratory and the College of Engineering of Utah State University, we couldn’t have even begun this effort. Although our past year’s efforts have focused primarily on training of health department personnel, we have been gratified by the encouragement and interest that we have received from private sector practitioners as well. We also appreciate the support and sharing of knowledge that we have received from national on-site professional organizations and from other on-site training centers.

Thank you one and all for your support. We will do our best in the coming year to continue to serve you.

Steven Iverson
Manager

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