Come One, Come All! On-Site Field Day July 17th
Curious about these technologies we’ve been talking about? Want to get some design ideas?
Come to an On-Site Field Day on July 17th at the Agronomy Research Center (ARC) from 9:00 to
4:00. The ARC is located on US 52, seven miles west of West Lafayette. What are we covering?

1. Design of Sand Filters
2. Soils and On-Site Systems
3. Design of Cluster Systems
4. Design of Constructed Wetlands
5. Pump Fundamentals and Selection
6. Rule Update and General Information

Admission is free. Bring a bag lunch and join us. Contact Catherine Taylor at 765-496-3454 if you
would like to attend. See you there rain or shine!

Building a Wetland Construction in Indiana
A manual for single residence constructed wetland design in Indiana is now available. It is on our
articles.

Did you know there is a newsletter devoted to drinking and wastewater funding
opportunities for small communities?
Water Sense, published by the National Drinking Water Clearinghouse is a publication devoted to
helping small communities navigate through the funding maze. It discusses funding sources and
criteria, financing resources, regulations, cost-saving strategies, and innovative financing
mechanisms. It is geared toward funding drinking water projects, but they discuss wastewater as
well. Sign up for your free copy by calling (800) 624-8301. Newsletters are also available on the

News from ISDH
The Indiana State Department of Health has received numerous comments concerning the
proposed rule revisions for the Commercial and Residential On-Site sewage disposal programs.
The comments were both general and specific, pro and con. They were received from local
health departments (both individual and groups), IEHA, IOWPA, soil scientists, installers,
enGINEERS, builders and developers, county commissioners, and state legislators. ISDH staff is in
the process of tabulating all of the comments for review and consideration. We appreciate all of
the input during this preliminary stage of drafting the rule revision. All of the comments will be
given careful consideration by ISDH staff. A report will be made available summarizing this
information and the resulting decisions by ISDH. This report should be completed by late
summer, 1988.—Alan Dunn

On-Site is a cooperative project between county health departments,
Purdue University and the Indiana State Department of Health
Visit us on the Web at: http://www.agry.purdue.edu/agronomy/landuse/planning.htm
An Editorial by Joseph E. Yahner

Do septic systems really work? More than a thousand phone calls have asked this question. Consider the following. If you have a good site, with a reasonably good soil, a well-engineered design, competent installation, and then homeowner education and maintenance, yes, I think the chances of success are quite good. However, if links in the chain fail problems will occur.

There are about 750,000 septic systems in Indiana. But the overall performance of septic systems is generally unknown. The amount of failure (often confused with failure rate) in some areas can be as high as 70%. Effluent flows from the home to a ditch, surface water, or enters groundwater without sufficient filtration and purification. In addition to sporadic problems with new systems and a widespread lack of maintenance, there are systems from the past. For example, between 1940 and 1960, approximately 300,000 homes installed indoor plumbing. Replacements for the outhouse probably directed the effluent to a tile line or a ditch. Now these failures are part of our "legacy." If we desire to improve the environment, maintain a high standard of public health, and protect property values we must find a way to handle these legacy systems. If we don’t act positively and try something different and new, the situation will not change.

How can these systems be found? One approach to the problem is to require that, at the time of sale of a home, the system must either be shown to meet the code of December 1990 or later, or be brought up to current code. Site limitations, such as a lack of space, might be overcome with an alternative technology. This would be a point of entry into the process of rehabilitation. However, a homeowner may have a very large bill to pay. The repair cost of some systems is in the order of $5,000 - $10,000. How can we ask people to do this with any great degree of sincerity? One way is to provide low interest loans, for example up to $10,000 at 1% or 2% interest.

State revolving funds could also be used to provide help to smaller communities where there is almost no chance of repairs on individual lots. Small communities could be secure or grow. At the moment, they are often groups of homes in failure, clearly violating the law. If this is the case, then we have many communities in Indiana full of homes in which the homeowners have lost their equity. This is a staggering sum of money, and a staggering burden to put on people.

How can you sell a house to someone without telling them that the home is in violation of the law? Realtors, contractors, engineers, industry, and lending institutions all have a place in resolving this problem.

Are there any new technologies that can overcome these problems? Are there ways that we can improve effluent treatment and put it into smaller absorption fields? Are there ways we can hook groups of homes together not to a municipal plant but to a small treatment system? Innovative, alternative, or experimental technologies are not common in Indiana, but have been used in many other places in the United States and overseas. Perhaps we should start by changing the name from “experimental” to “appropriate,” as many of the technologies have been researched and/or used for 20-100 years or more. In some cases Indiana is calling technologies “experimental” that are the same vintage as the airplane. A great impact can be made on the quality of both surface and ground waters. Additionally, technologies that remove nitrogen would have a big advantage on the areas of the state with problems of nitrate contamination from on-site sewage.

A revised septic system rule is being reviewed. Ease in permitting the use of these “newer” technologies would be of great benefit to the state. There may be fear of doing this, turning something loose that contractors do not know how to install or maintain. The answer is education with which Purdue can help. If appropriate new technologies are discouraged, then only those of the past will be available and will not solve the problem. Consider a failure on a small lot. Is the answer an undersized system next to the failed one? We do it all the time.

Any on-site wastewater treatment system, whether for a single home or a cluster of homes, requires maintenance. If the revised rule approaches the problem, it can have an impact. If we make it difficult to use the appropriate technologies, and continue to keep using technologies of the past, and if we continue to ignore the necessary system maintenance, we won’t make a dent in this problem.

Subdivisions on wells and septic systems should not be the norm, but an exception. A group of homes on septic systems is not the same as individual homesites. Housing concentrations should be connected to sewer and water systems. It is important to note that this does not necessarily mean conventional sewers and treatment plants, but possibly one of the variety of less expensive alternatives. Protection of the homebuyer and public health should be paramount. What is the risk of, 20 years from now, of having another set of “legacy” problems? How large would a lot be? The septic system occupies a fairly large space on the lot. For security, room for a second system is needed. People often move out to the country not only for the countryside, but wish to add a swimming pool, a barn for a lawn tractor, and a number of other things. Putting all of these on a lot along with two septic systems, requires large lots and encourages sprawl.

The relationship between planning and on-site systems is evident. The closer we can come to a secure on-site wastewater treatment
system, be it a community system, a cluster system or a municipal system, the better we are doing for homebuyers and landowners. This has a huge impact on planning. Planning commissions are loath to say that you cannot build 10, 15, or 20 houses on septic systems because people want to live in the country with space and low taxes. Not every piece of land is suited to housing, especially on septic systems. The needs of the community are important. Decisions considering health, safety and welfare are the function of zoning and planning and should be serious business.

Are there places in the state, certain geologic materials, or soil regions with an “above normal” failure rate? The answer is yes. Examples could include soils with drainage problems, clayey areas with dense tills, and poorly drained fragipan soils. Furthermore, when considering how effluent moves and where effluent goes, we should also throw in areas with sinkholes. Places where it seems logical to use septic systems are the rapidly permeable, well drained sandy or gravelly soils susceptible to contamination. These are areas where septic systems should be used sparingly.

Another important point. If we are to establish a means to “cure” problems using community systems and more advanced technologies, there will be a need for individuals trained and capable in the area of on-site and small community waste disposal. Indiana needs more than the small number of staff available if it is to educate, advise homeowners and contractors, and introduce “appropriate” technologies. Some county health departments are well staffed and paid. Others are understaffed, are poorly paid and equipped. Good decisions require information and data, yet some health departments lack computers to keep basic records. Levels of compensation and effort should be improved in many communities because decisions on waste disposal systems should be made locally or regionally, close to where the problem lies and close to the environment in which the system will function. Success requires upgrading the capability to service these needs.

Finally, most of these ideas come down to local and state government. Individuals are needed to write, talk, discuss, and influence legislators and local officials to create the possibility for change. We should not settle for the lowest common denominator. Let’s set our sights a little higher, caring not only for today, but also for the problems inherited from the past. Let’s consider how we can improve the quality of life, the environment, and the ability of people to have security in their own homes. Leadership is needed! Repairing systems will require funding! Goals should be set! If the means to improve Indiana’s on-site conditions are to be available, local government and the state legislature should provide those means.

Joe Yahner will be retiring from Purdue University in June. We thank him for his years of dedicated service and wish him good luck on his next set of adventures.
Drainage (con’t)

deeper than the impermeable layer (fragipan, dense till, rock, etc.) If this layer is, for example, 36 inches deep then the tile spacing will have to be very close to achieve adequate drainage with the drawdown curve.

It is important to note that the drawdown curve is a static picture while water tables vary and will rise in the soil in response to rainfall. A beneficial effect of tile is the reduction in duration of the seasonal water table.

The on-site staff ran a typical wet soil from the Purdue area, Crosby, through Drainmod. Drainmod is a drainage modeling computer program by Dr. Wayne Skaggs that has been used and tested since the early 80’s. Drainmod estimated that with an impermeable layer at 48 inches, drain depth of 46 inches, and trench bottom depth of 18 inches, it took a drain spacing of 10 feet to bring the water table depth to 42 inches (2 feet below the trench bottom). In this example, the water table was lowered to 2 feet below trench bottom depth for approximately 3 months during the wettest year and 6 months for the driest year of a 20 year period. This is only one theoretical example, and septic tank effluent behaves differently from water, so the dynamics in the field are probably somewhat different. However, it is enough to raise questions about our current practices.

In short, the perimeter drain around the system needs to be significantly lower than two feet below the distribution system to provide adequate drainage. How much lower? That depends upon the soil characteristics. Do they work? They are a good idea, but should probably not be relied upon as heavily as they are.