**What if we were to...**

Indiana is not the only state pondering how to handle on-site wastewater disposal systems. Many other states have found creative solutions to their problems. Part of our project involves exploring these solutions and considering how they might be applied to Indiana.

Recently the On-Site staff trekked north to Wisconsin, the friendly home of cows, large mosquitoes and innovative on-site technology. There we met with personnel from the Wisconsin State Department of Commerce, the University of Wisconsin, several county health departments, and contractors who had designed experimental systems. We were taken on an informative tour of single pass and recirculating sand filters being used to treat septic tank effluent prior to discharge to a soil absorption field by reducing its BOD and nitrogen concentrations. Low organic matter effluent reduces or eliminates organic matting, allowing increased soil loading rates and consequently smaller absorption areas. Final “polishing” of the treated effluent may be accomplished by passage through smaller amounts of soil.

In addition to discussing and touring sand filters, we received a draft copy of their proposed on-site code. Wisconsin is proposing significant changes in legislation, shifting the code from prescription to performance based standards. Any system which can be proven to consistently meet state standards will be permitted. The burden of proof rests with the contractor and homeowner. Once a system is proven in Wisconsin, that combination of technologies can become a “package,” acceptable in the state.

Another innovation in Wisconsin is the development of on-site system maintenance monitoring. Newer technologies usually require greater homeowner knowledge and regular maintenance. Wisconsin may be working with an ATM card company to develop a procedure to electronically record on-site system maintenance. When a system is pumped or provided maintenance, the on-site professional will enter that information into a central database using a touch telephone. Traditional septic tank/soil absorption systems should be cleaned and maintained at least every three years. Other technologies may require more frequent maintenance depending on the approved management plan. Counties, which are the agents for the state administered on-site wastewater program, will then be able to encourage homeowners to maintain their systems.

We can’t speculate on this policy’s potential in Indiana, but we see some substantial benefits. Homeowner awareness of their on-site systems would certainly increase. The mentality that once you install the system, you can forget about it would likely change. We should think of owning a septic system as being similar to owning a car. It is an investment with great potential for improving a person’s lifestyle. However, it needs tune-ups and regular maintenance to function properly. Automobile pollution is evaluated through vehicle emissions testing. Wisconsin is developing a first step toward ensuring that homeowners take care of their on-site systems so that pollution due to failure is minimized. One step Indiana could take is to require Realtors to provide educa-
tional information on on-site wastewater disposal to prospective homebuyers considering homes utilizing on-site systems. Evidence of the existence of a complete on-site system, in addition to information on system functioning and repairs as part of the usual disclosure process in a real estate transaction would increase public understanding, protect the homebuyer, and ultimately decrease failure, health risks, and environmental contamination. Some of this evidence is available in health department records.

For further information about the Wisconsin on-site program contact: Roman Kaminski, Wisconsin Department of Commerce, Bureau of Program Development, Division of Safety and Buildings, 2715 Post Rd., Stevens Point, WI, 54481-6456, (715) 345-5334.

A perspective on on-site wastewater disposal and hogs

Indiana is home of the hog. We are seventh in hog production in the United States. Approximately 70% of Indiana’s livestock agriculture is hogs. This has led to substantial concern about the environmental impact of the disposal of hog waste. The state has week long legislative meetings on hog waste. The general assembly debated the confined livestock feeding approval process for a significant part of the last legislature in response to water quality concerns. We plan for our hogs.

How do on-site wastewater disposal systems stack up to hogs in Indiana?

Available nitrogen is a significant concern when treating both human and animal waste. Hog manure is applied in the plant root zone and is often utilized as fertilizer, while septic system effluent is applied below the root zone. Plant uptake of nutrients is limited in a properly functioning on-site wastewater disposal system. Regulations mandate that hog manure is applied at a maximum rate of 150 lbs. available N/acre/year and assume that plants will take up significant portions of the applied nitrogen. Figure 1 estimates that septic system applications of nitrogen exceed 150 lbs. of available N/ac/yr.

Figure 2 indicates that overall more nutrients, solids, and biological material are applied to soil from hog manure than from septic tank effluent. On a gallon basis, we calculate that septic tanks are discharging approximately 32 times as much wastewater. One might interpret this to mean that on-site wastewater disposal systems are applying such large quantities of dilute wastewater to small areas that the nutrient loading is similar to that produced by hog manure applications. However, nutrients released as part of septic tank effluent are not significantly utilized by plants and therefore are available to move to surface and groundwater bodies.

On-site wastewater disposal systems might deserve some consideration, research, planning, and funding.

Graphs are based on the following assumptions:
- Indiana has 1.925 million people utilizing on-site wastewater disposal systems and markets about 5 million hogs per year
- Soil absorption fields have 3 foot wide trenches 9 feet apart (on center)
- Each person generates 45 gallons of wastewater per day (EPA, 1980)
- Septic tank effluent in this example has a BOD concentration of 200 mg/L, total N of 40 mg/L, total P of 5 mg/L, and TSS of 141 mg/L. (BOD, N, and P concentrations are medium strength effluent concentrations utilized in Canada. TSS concentration was selected from “Performance and Costs of On-Site Recirculating Sand filters” by MG Bruen and RJ Piluk as an intermediate value)
- 75% of total nitrogen is available from manure, 70% is available from wastewater (EPA, 1980)
The Residential Sewage Disposal Staff, ISDH, has received a number of inquiries about the use of the “Earthquaker” process to renovate failing on-site sewage disposal systems. For those unfamiliar with this process, it involves using equipment to inject compressed air into the soils under and around the soil absorption field. The compressed air “fractures” the soils, resulting in cracks and crevices to enhance water movement through the soils. Polystyrene beads are injected in these crevices during the process, allegedly to hold the crevices open for an extended period of time.

The companies marketing this process have claimed great successes with the renovation of failing on-site sewage disposal systems; however, we have been unable to verify the efficacy of this process as a long-term solution for failing on-site sewage disposal systems. Our attempts to work with the local companies to study and monitor this process have not been fruitful.

Issues raised concerning this process include the collapse of the crevices; the clogging of the crevices with sewage solids and the organic mat; and the potential for the creation of groundwater contamination in some soils. These are issues that must be addressed in order to consider this process for renovation of failing on-site sewage disposal systems. Until these issues have been adequately addressed, the ISDH cannot recommend the use of this process.

When a homeowner is experiencing problems with an on-site sewage disposal system, no plan for repair or replacement should be implemented until a thorough investigation of the soils and the system has been conducted. The homeowner should contact the local health department for assistance with this investigation.

This investigation should include, but may not be limited to: 1) a review of the health department files on the system; 2) a soils evaluation by a soil scientist; 3) a check of piping for blockage or collapse; 4) the examination of system components, including the septic tank, dosing tank (if applicable), and distribution box for integrity, stability, level, and groundwater infiltration; 5) a check of plumbing for leaks; 6) a check of actual water usage vs. system size; 7) a check of the perimeter drain system, if applicable.

Only after the necessary information has been collected should a plan for resolution of the problem be implemented. This plan must address the reasons for original system failure, the soil conditions at the site, and the daily wastewater flows. To arbitrarily apply any process for renovation of a failing on-site sewage disposal system without the procedure described above would be a disservice to the homeowner.

If you have any questions about this process, please contact the Residential Sewage Disposal Program staff at (317) 233-7177.

The statistics on the number of new and repair permits issued in Indiana are outdated. Please send this information for the period of June 1, 1996 - May 31, 1997 to:

Alan Dunn
Residential Sewage Disposal
Indiana State Department of Health
2 North Meridian Street
Indianapolis, IN 46204
adunn@isdh.state.in.us

On-site wastewater database completed

The database is ready! You may download a copy from: http://www.agry.purdue.edu/agronomy/landuse/septic/septic/database.htm

There are two versions, one sized for a monitor resolution of 480 by 640, and another sized for a monitor resolution of 600 by 800. If you don’t have internet access and you would like a copy, please contact us.

Homer & Maud Homeowner

“Maud, Tilly’s Toilet Tamer may smell nice but we still need to pump the septic tank.”
The Indiana State Department of Health is having regional Public Health Institutes for county health department personnel this fall. These institutes will include a short training session on the database. Dates and locations are as follows:

October 28 Michigan City
October 29 Kendallville
November 18 Jasper
November 20 Rushville
December 4 Marion

October 29 Kendallville
November 18 Jasper
December 5 Indianapolis
December 9 Scottsburg
December 11 Terra Haute
December 18 Lafayette
December 4 Marion

Visit us on the Web at:
http://www.agry.purdue.edu/agronomy/landuse/planning.htm