Indiana On-Site Wastewater Industry Directory

Who can I call to build my on-site system? Where can I get septic tanks? I need a certified engineer to design my system, are any in my area? Do you have a list of product manufacturers that serve Indiana?

These are questions Purdue (and most local health departments) receives frequently. In light of this, we have decided to make an on-site industry directory. We would like to include everyone who provides on-site services or products to Indiana. The directory would be available at local health departments and sent to others upon request while supplies last. This would also be a great networking tool. If you would like to be included in our directory, please send us a postcard and with the following information: name, company, address, county you are located in, phone number, email, and products and/or services provided. The postcard should be sent to:

Carol Sikler
1146 Agricultural and Biological Engineering
Purdue University
West Lafayette, IN 47907-1146

Questions or comments can be directed to Carol (765/494-1174) or Don Jones (765/494-1178). Thank You! (Health Departments, please inform the contractors in your area about the directory.)

Missed the on-site wastewater seminar?

All is not lost. We still have a limited number of handout booklets left. These booklets, entailing the design and construction of constructed wetlands, single pass sand filters, and recirculating sand filters, are available on a first-come, first-served basis.

Need a more personal approach? Purdue will be hosting 3 regional seminars this fall and winter. The seminars will cover design of constructed wetlands and sand filters for individual residences. Seminars will be from 10:00 am-3:00 pm.

- Jan. 27, 1999, Hills Road Agri-Way, IN 47933
- Mar. 27, 1999, Times Bldg., South Bend, IN 46637
- Apr. 10, 1999, Times Bldg., South Bend, IN 46637
Performance Standards

This past year, experts from around the country have recommended nationwide standards for on-site wastewater disposal. These were developed to be used as performance standards. The following table was derived from Hoover, Sievers, and Gustafson (1998):

Table 2. Constituent Concentrations for Performance Standards

<table>
<thead>
<tr>
<th>Standard</th>
<th>BOD (mg/L)</th>
<th>TSS (mg/L)</th>
<th>PO4-P (mg/L)</th>
<th>NH4-N (mg/L)</th>
<th>NO3-N (mg/L)</th>
<th>Total Nitrogen* (% removed)</th>
<th>Fecal Coliform colony densities (no./100 mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TS1-primary treatment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TS1-unfiltered</td>
<td>300</td>
<td>300</td>
<td>15</td>
<td>80</td>
<td>NA</td>
<td>NA</td>
<td>10,000,000</td>
</tr>
<tr>
<td>TS1-filtered</td>
<td>200</td>
<td>80</td>
<td>15</td>
<td>80</td>
<td>NA</td>
<td>NA</td>
<td>10,000,000</td>
</tr>
<tr>
<td>TS2-secondary</td>
<td>30</td>
<td>30</td>
<td>15</td>
<td>10</td>
<td>NA</td>
<td>NA</td>
<td>50,000</td>
</tr>
<tr>
<td>TS3-tertiary</td>
<td>10</td>
<td>10</td>
<td>15</td>
<td>10</td>
<td>NA</td>
<td>NA</td>
<td>10,000</td>
</tr>
<tr>
<td>TS4n-nitrogen reduction</td>
<td>10</td>
<td>10</td>
<td>15</td>
<td>5</td>
<td>NA</td>
<td>50%</td>
<td>10,000</td>
</tr>
<tr>
<td>TS4p-phosphorus reduction</td>
<td>10</td>
<td>10</td>
<td>2</td>
<td>10</td>
<td>NA</td>
<td>25%</td>
<td>10,000</td>
</tr>
<tr>
<td>TS4np-nitrogen and phosphorus reduction</td>
<td>10</td>
<td>10</td>
<td>2</td>
<td>5</td>
<td>NA</td>
<td>50%</td>
<td>10,000</td>
</tr>
<tr>
<td>TS5-bodily contact disinfection</td>
<td>10</td>
<td>10</td>
<td>15</td>
<td>10</td>
<td>NA</td>
<td>25%</td>
<td>200</td>
</tr>
<tr>
<td>TS6-wastewater reuse</td>
<td>5</td>
<td>5</td>
<td>15</td>
<td>5</td>
<td>NA</td>
<td>50%</td>
<td>14</td>
</tr>
<tr>
<td>TS7-near drinking water</td>
<td>5</td>
<td>5</td>
<td>1</td>
<td>5</td>
<td>10</td>
<td>75%</td>
<td>&lt;1***</td>
</tr>
</tbody>
</table>

*Minimum % reduction of total nitrogen (as nitrate-nitrogen plus ammonia nitrogen) concentration in the raw untreated wastewater.
**Total coliform densities <<50/100 mg


Based on observations from the literature based on research in different climates, some preliminary estimates of performance expectations for several properly designed and maintained pretreatment systems treating typical residential effluent can be estimated. Please note, these estimates are "unofficial" and are limited by the author's experience.

1. Mature constructed wetlands with retention times of five days or greater can achieve TS2 goals for BOD and TSS. Fecal coliform removal is typically between TS2 and TS3. Ammonia removal is variable and may be better to evaluate constructed wetlands on a mass loading basis in addition to utilizing concentrations.

2. Single pass sand filters can consistently meet TS2 standards for TSS and TS3 standards for BOD. TS4n goals can be met for ammonia, with nitrate concentration ≤30 mg/L. Recirculating sand filters comfortably meet TS3 goals for BOD and TSS removal. Fecal coliform counts for both recirculating and single pass sand filters are usually significantly less than tertiary treatment goals. Recirculating sand
coliforms and TS4n goals for ammonia. It is important to consider that total nitrogen removal is dependent on the design, as any aerobic system will convert ammonia to nitrate. Aerobic treatment units may be the technology most sensitive to maintenance (or lack of it), however; all of these technologies require consistent maintenance to meet these goals.

Absorption field downsizing is much more difficult to determine and our confidence about the preliminary recommendations is less. A conservative estimate of general downsizing would be 35%-50% for effluent meeting TS2 standards and 50-75% for effluent of TS3 quality. This would greatly depend upon the absorption field characteristics. Soils with water movement and removal restrictions due to low saturated hydraulic conductivities and limiting layers would not be able to be downsized as much as soils capable of removing the water, unless surface and subsurface drainage is added. In other words, if the site's hydraulics are such that it has difficulty removing clean water, cleaning up the effluent will not permit significant downsizing.

News from ISDH….

One of the questions that ISDH staff deals with on a regular basis is the possible use of sewage holding tanks with “pump and haul” as a homeowner’s means of sewage disposal.

The U.S. Environmental Protection Agency, in its Design Manual, On-Site Wastewater Treatment and Disposal Systems (October, 1980), states that flows from a typical residence will be in a range of 45 to 60 gallons/capita/day (g/c/d). This same year for appropriate and legal sewage disposal if a holding tank is used.

The holding tank option is usually the option of last resort when no other sewage disposal means are available. Most citizens have no idea of the volume of wastewater generated or the total cost of using a holding tank for wastewater disposal. Our experience has been that citizens, when presented with the above facts, tend not to believe them and still desire to use a holding tank. Due to the high cost associated with holding tanks, the homeowner will soon be tempted to let the tank overflow.

It would not be appropriate, in our opinion, to approve the use of holding tanks, given the temptation to dispose of the wastewater from the tanks improperly or illegally because of economic pressures. Although this may seem harsh to the individual, we are protecting their public health and economic interests. Rather than being faced with repetitive orders to dispose of the wastewater properly and legally, the possible declaration of a residence unfit for human habitation, or the inability to sell a property which is not attractive to potential purchasers because of the cost sewage disposal, the property owner should provide an appropriately sized and designed on-site sewage disposal system or a connection to a sanitary sewer should be used.

Current ISDH rules permit the use of a temporary sewage holding tank under certain conditions. If a permit has been issued for an on-site sewage disposal system, the local health department may permit the installation and use of the septic tank as a holding tank until soil conditions permit the installation of the absorption field. If the owner has written verification from a sewer utility that sanitary sewer will be available to the property within one year, ISDH may issue approval for the use of a temporary holding tank until connection to the sewer is secured. Finally, a temporary sewage holding tank may be used to eliminate the
So, you're part of a small community that needs to find solutions to its wastewater problems...

Where do you start? Often the problem will be outlined at a town meeting. At this meeting it is important to educate the community on the problem and the reason why it needs to be fixed. Topics covered may include the current status of the problem, hazards associated with raw sewage, how a properly functioning on-site system works, maintenance or management tips, and suggestions to how the community can minimize the problem until it becomes fixed.

A very important part of that meeting is to have the community decide whether they would like to solve the problem as a community or leave it up to individual property owners. If the community does not back a community wide solution, very little can be done. An anonymous vote may be a good idea.

After the community decides to explore a community wide solution, they should select a committee to gather groundwork information. Decide upon five to ten committed and interested individuals to work on the problem. It is important that the committee is made up of a diverse group of individuals, representing different interests. If at all possible enlist your county environmental health official, a member of the planning commission, and an engineer or construction contractor to serve on the committee. The committee should begin gathering information.

Another job of the committee is to locate any past records, engineer reports, or feasibility studies. Maps, population statistics, soil data, permit records, planning documents, and budgets will also need to be collected if available. If asking local officials for planning funding assistance, a formal letter of request, a signed petition, and other documents may be required. An income survey is usually necessary. Remind respondents that the survey is confidential and urge them to be truthful. More than one community has lost their chances for funding assistance by exaggerating their income out of pride.

The committee will probably need help. Where can you get it?
1. Local extension office. Call Purdue University at 888/398-4636 (toll free) to locate the extension office in your area.
3. Indiana Rural Development Council...
4. Indiana Department of Commerce, Community Development. Another place for funding and planning assistance. – 317/232-8911.


6. Indiana Department of Environmental Management – Focus on municipal and community wide projects. Permits both conventional sewage treatment projects and alternative projects. If the end disposal goes above ground or to water, IDEM is the place to contact. Facility Construction Section, Office of Water Management, 100 North Senate Avenue, P.O. Box 6015, Indianapolis, Indiana 46206-6015. 317/232-8670.


8. Indiana Office of Utility Consumer Counselor, This state agency is charged with representing utility customers. They deal with rate cases, service territory requests, resource planning, deregulation, and legislation and rules. 100 North Senate Avenue, Room N501, Indianapolis, Indiana 46204-2275, 888/441-2494.

Next you'll need to determine a rough budget. Operation, maintenance, and accounting costs must be considered in addition to construction costs. (There are many technologies roughly equivalent in construction costs, but vastly different in operation and maintenance costs.) Your cost goals might be something like "keep monthly charge to $XX per household." You may consider working with local industries as

Now you are ready to look for a consultant. Stay tuned for the next edition of On-Site, or call the National Small Flows Clearinghouse and order Pipeline, Choose the Right Consultant for Your Wastewater Project ($0.20+shipping).

We have videos!
Our latest find is "Upgrading Wastewater for Small Communities". This 20-minute video covers a range of wastewater technologies applicable for small communities. It describes how treatments such as the trickling filter, sequencing batch reactor, sand filter, constructed wetland, overland flow, rapid infiltration and lagoons work. It also compares relative treatment efficiencies and capital and maintenance costs of each type of treatment. This video would be perfect for town meetings, planning commissions, and other places where it would be useful to explain a variety of appropriate wastewater treatment options. The video can be ordered from the National Small Flows Clearinghouse (800/624-8301) for $10.00 plus shipping. We have one copy of this in our library that can be borrowed.

To borrow a video, or for a list of videos that are available, call Carol at 765/494-1174 or email carols@purdue.edu.

Homer & Maud Homeowner