1. General Information:

Note that the wetland follows a septic tank and discharges to an absorption field. This is a schematic of a constructed wetland or Bio-Enhanced Treatment System (BETS). The wetland cell size fluctuates from 27’X13’ (351 ft²) for 2-bedroom home, 33’X16’ (528 ft²) for 3-bedroom home, and 38’X19’ (722 ft²) for 4-bedroom home; **HOWEVER**, the size of the disposal/absorption field (trenches) can be reduced from 33 to 50% (according to the soil profile) in comparison with a conventional septic system. The wetland depth is only 24 inches (2 feet) and the maintenance is minimal (removing dead vegetation, pulling out undesirable plant species and cleaning the septic tank but it is same than a conventional septic system).
PLANTS TREAT WASTEWATER MORE EFFICIENTLY MORE EFFECTIVELY AND MORE ECONOMICALLY than any other method of sewage treatment available to the homeowner.

The LaGrange County Health Dept. has Indiana State Department of Health approval to install a system called a Subsurface Wetland Treatment System which takes advantage of nature’s super water purification system---PLANTS. These systems were first installed in Lagrange County going on ten (10) years ago and have functioned remarkably well with no problems reported by the owners. The State of Indiana has since approved more of these systems across the state. As compared to a septic tank and absorption field system which discharges 100% of the contaminated sewage effluent into the ground, the wetland system in the county have been removing up to 99.9% of the fecal bacteria (E. coli) and 80-100% of the other contaminates BEFORE the water is discharged into the ground.

This is in direct contrast to septic systems, which do not provide sufficient treatment. Consider these facts concerning septic systems: 1) They are the largest contributor (63%) of waterborne disease caused by the consumption of untreated water in the USA (EPA). 2) Failure rates of septic systems in Indiana may be as high as 70% (reported by Purdue University, 1997). 3) Septic in Lake Developments in Lagrange County are the largest contributor to pollution of county lakes. It is recommended that swimming be limited to undeveloped areas or at least 500 feet from shore on lakes using septic for sewage treatment. Why should we install such a system when better systems are available?

The wetland system is easy to construct and is in the same cost range as a conventional septic system. In fact, the first home wetland system was installed by homeowner. When the system is fully operational, you can walk across it without getting your feet wet because the wastewater is treated below the surface. The systems also add to the landscaping of your yard and can be planted with flowering plants, which bloom all summer.

CHECK IT OUT BEFORE YOU DIG
Comparison of Effluents from Septic Tank (Sewage) Vs Constructed Wetland

<table>
<thead>
<tr>
<th>Water Quality Variables</th>
<th>Septic (Sewage)</th>
<th>Wetland Gravity</th>
<th>Wetland Recirculating</th>
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<tr>
<td>BOD</td>
<td>20</td>
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<tr>
<td>TSS</td>
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<tr>
<td>Total-N</td>
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<td>TKN</td>
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<tr>
<td>NH4-N</td>
<td>26</td>
<td>7</td>
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</tbody>
</table>

BOD: Oxygen Demand for decomposition of organic material. TSS: Particulate material suspended on sewage. TKN, Total-N, NH4-N: Different chemical forms of Nitrogen. Constructed wetlands can remove up to 99.9% of the fecal bacteria (E. coli).

Wetland Schematic

Figure 1

Each component of the schematic information for a gravity flow constructed wetland will be explained as follows: Septic tank and outlet filter; constructed wetland with cleanouts; level adjust sump for control water level in the wetland and disposal field which could be conventional leach field, mound sand; drip irrigation; pressure/dosing leach field; etc. Pictures are included to get a better idea about the wetland system.
A WETLAND SYSTEM NEEDS AN OUTLET FILTER IN THE SEPTIC TANK.
Wetland cell using an infiltrator™ chamber as an inlet manifold and 4” PVC pipe as an outlet manifold with clean-outs.

**INLET INFILTRATOR CHAMBER**

**OUTLET 4” PVC**
Cross Section

Figure 6

Image is courtesy of Southwest Wetlands Group (modified)

Cleanouts
Figure 9

Wetland Cleanout

In-Line Cleanout

Two-Way Cleanout
Sump basin using 24” drain tile or 50 gallons barrel.

Sump basin cap using a plastic (left) or concrete (right).
Sump basin showing adjustment for liquid level
This is a sample of wetland site plan drawing required to issue the septic permit. The absorption field has been reduced 50% in comparison with conventional system.

- Lester Yoder
- TWP Eden
- 1000 gal tank
- 16' x 33' cell area
- 450 sq ft of leach area
- Maximum leach depth 10''

- Excavator's Company
- Owner's Address