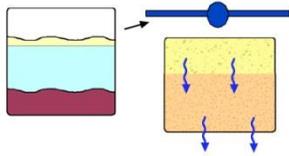


**Firm:** Non-proprietary system  
**System:** Nitrogen Removing Biofilter; Layer Cake; Soil-based Treatment without a Liner

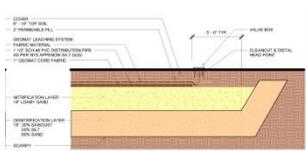
**Category:**



**SHALLOW DRAINFIELD over  
A LAYER of SAND over a  
SAND/SAWDUST MIXTURE**

**Process:** Wastewater exiting a septic tank enters a dosing tank, from which it is intermittently sent to a shallow dispersal system, usually a GeoMat™, a drip dispersal system, or a shallow narrow drainfield. Below this a 12” – 18” layer of loamy sand provides an aerobic environment supporting nitrification. Some denitrification occurs in this layer due to moisture/bacteria adhesion to the particles. Due to the shallow configuration, microorganisms in the root zone help process the wastewater, while plants provide additional uptake of nutrients. Beneath this, another layer composed of 20% silt, 20% sawdust and 80% sand promotes denitrification. The wastewater is recharged directly to native soil beneath this layer.

**System:** A two-chamber septic tank with a filter on the outflow is required ahead of the system. A dosing tank with pump, shallow distribution system, and sawdust/sand layers comprise the system, which replace the dispersal field or leaching pits of a standard installation.



**Credit: Peconic Green Growth**

**Flow Range:** Adaptable to any size.

**Tests:** The configuration has been tested at the MASSTC and will be tested as part of the experimental portion of the Suffolk County Pilot 2. The NYS Center for Clean Water Technology at Stony Brook University will be conducting the testing.

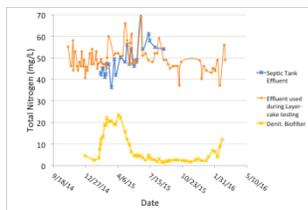
**Cost:** \$10,000, septic tank not included

**Energy:** Pump: 11.2 KWh/month at an estimated cost of \$5+/mon.

**Tanks:** Concrete, plastic or fiberglass (if separate dosing tank is used), locally sourced



Courtesy: MASSTC



Test results at MASSTC

**Footprint:** At a loading rate of 0.5 – 0.7 gallons/day/SF, a typical home would need roughly 600 SF. The dosing chamber can either be incorporated in a two-chambered septic tank, or be a separate tank.

**Life Cycle:** Pump, 3-7 years (Cost: \$300)

**Warranty:** None

**Venting:** None

**Depth:** 3-4 feet **Maintenance:** Annually, (\$200), pump-outs as required.

**Notes:** Of issue is the longevity of the carbon source (sawdust). Academic analyses indicate that it could last over 30 years, but due to the alternating wet and dry states, the life of the media may be less predictable than media in a constantly anoxic environment. The mixing of sawdust in both layers could help denitrification, as temporary anoxic conditions exist in the top layer as well.

**Installations:** MASSTC and Suffolk County Pilot 2

**Treatment:** Expected levels of denitrification are 85-95%. A study of the impacts of shallow distribution conducted by MASSTC has shown that contaminants of emerging concern, such as pharmaceuticals and personal care products, are treated to levels far surpassing those processed at sewage treatment plants when using shallow distribution methods.

**Advantages:**

- Treats to the highest levels achievable
- Treats contaminants of emerging concern
- Relatively low cost
- Energy use is low (one pump is considered to be a *passive* system)
- Replaces irrigation and use of fertilizer

**Disadvantages:**

- Area should be protected from root intrusion and vehicular loading
- Once installed, is not easy to repair the field itself
- Large footprint
- Life of media is uncertain