

## How Is Sewage Treated?

In the typical system, raw sewage is collected by the plumbing in the home and delivered to the septic tank. There the light solids float to the top, forming a scum layer, and the heavy solids sink to the bottom, forming sludge.

In the tank, organic solids such as food particles and human waste are decomposed by millions of naturally occurring bacteria. The septic tank delivers the partially treated liquids, or effluent, to the soil treatment area. Effluent contains pathogens (disease-causing organisms), nutrients, and some fine solids. A thin layer of fine solids, dead bacteria, and soil bacteria, called a biomat, forms naturally where the effluent enters the soil. The biomat restricts the flow sufficiently to keep the soil beneath unsaturated.

The unsaturated soil contains oxygen which allows aerobic bacteria to live and destroy pathogens. These air spaces also force nutrients such as phosphorus and sodium to come in direct contact with soil particles to which they become attached. A portion of the nitrogen passes through into the groundwater. After passing through the unsaturated soil, the now harmless water evaporates into the air or returns to the soil and groundwater system. In regular septic tanks, the bacteria are anaerobic, that is, they live without air in the liquid. In aerobic tanks, the bacteria are aerobic and require air to live.

Failure to treat effluent can result in the discharging of sewage into a drainfield, a body of water or gravelly soil with no filtration capacity. This can easily result in groundwater or surface water pollution. This method of failure is more difficult to detect, hard to understand and harder to accept for landowners since it is often not readily seen. In Shoreland areas, a system with less than 3 feet of vertical separation from the bottom of the drainfield to the seasonally saturated soils is NOT properly treating the sewage and is considered non-conforming.

If the bottom of a septic systems drainfield is at or near the highest level of the periodically saturated zone in the soil, there will be a 'less aerobic' condition in the soil. This situation reduces the treatment effectiveness and increases risk of contamination. Also, being at or near the periodically saturated zone allows pathogens to move quickly through the soil without being adsorbed or filtered, thus polluting the shallow ground water. The shallow ground water can then infiltrate into deeper aquifers, contaminating wells or discharging into lakes and streams, where the public can come into contact with disease-causing organisms. Also, phosphorous is a very mobile byproduct released into the soil from "bad" septic systems. If the septic system is not properly located or treating the sewage it can cause algae blooms in higher concentrations once it enters a lake.

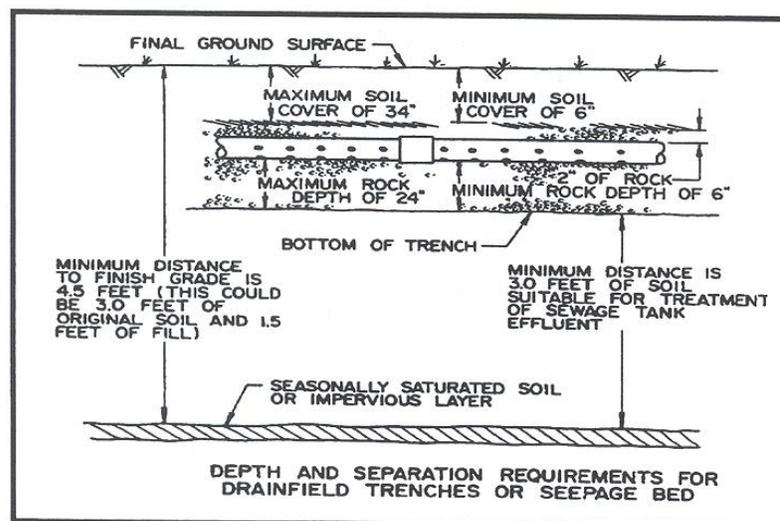


Figure H-1