

Recirculating Media Filters
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The decentralization of wastewater treatment is a growth industry in Tennessee. Greater than 100 subdivisions and cluster developments are served by STEP systems that deliver effluent to recirculating media filters. Once renovated, the water is dispersed to the soil environment with drip irrigation. Recirculating media filters are fixed-film, non-saturated, aerobic treatment reactors. Effluent trickles down through the media where organic carbon, oxygen, and nutrients will migrate into the fixed-film. Aerobic microbes convert a portion of the organic carbon and nutrients into new cells and carbon dioxide gas. A particular advantage to recirculating media filters is that they can promote both nitrification and denitrification. These processes allow nitrogen compounds from the wastewater to be converted to nitrogen gas, and thus be removed from the effluent.

With any domestic wastewater collection system, it is expected that there will be a diurnal cycle of wastewater inflow. A properly designed recirculating media filter system will include surge storage for peak inflows. This storage allows for a fairly constant dosing of the filter media. However, it is not clear how inflow cycling affects the wastewater quality entering the treatment system. A brief study was conducted to determine how COD and TN changes during the diurnal cycle and then follow those changes through the treatment process. The results suggest that there are significant changes in COD and TN concentrations in the effluent during a 24-hour period. However, the results also suggest that there is sufficient treatment capacity in the system to provide removal of organic carbon and nitrogen.