Phosphorus and E.Coli Removal from Wastewater Using Hybrid Steel Slag and Plant Charcoal Filters

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Treating wastewater poses an environmental concern because the use of disinfecting chemicals such as chlorine can be detrimental to aquatic systems. This study aims to create an alternative, low-cost wastewater treatment system that reduces pH, dissolved reactive phosphorus (DRP), and E. coli. Burlington primary effluent was collected weekly and spiked to approximately 10 ppm phosphorus. Two small-scale containers were then created using blast oxygen furnace (BOF) steel slag, a byproduct of steel making, that would reduce DRP and E. coli, but with the cost of producing a high pH. In order to reduce pH levels, an additional filter was added onto each of the slag filters. Filter 1 used a combination of a water lettuce plant *(Pistia stratiotes)*, and mesquite plant charcoal. Filter 2 used only mesquite plant charcoal. This ongoing study has shown that steel slag has the ability to reduce E. coli and DRP, and that the combination of vegetation and plant charcoal can reduce the pH. Filters such as these can be used as a pre-treatment for wastewater plants or as an alternative to a septic system.