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*The Water, the Waste and the Wetland*

The purpose of this investigation was to determine if the wetland filtering process improves contaminated water quality, and, if so, do soil amendments enhance filtering success. Two hypotheses were required for this experiment. The first was that if contaminated water is filtered through a wetland, then the water quality will improve because wetlands are nature's filter. The second part was that if soil amendments are included in a wetland then they will improve contaminated water quality, because biochar reduces nutrient leaching and calcium oxide will lower heavy metal content and neutralize pH.

This experiment involved constructing nine different wetlands, three for each water type. Different contaminated waters were then run through their corresponding wetlands. The filtered water was collected and tested each week.

The data collected partially supported the original hypothesis. Filtration enhanced the contaminated water quality in areas such as pH (3.01 to 4.07; mine tailing water and 7.95 to 7.79; agricultural water) and iron (.1 mg/L to .07mg/L; mine tailing water) after filtration. Biochar enhances filtration in most areas, only harming total alkalinity (10 mg/L to 25 mg/L; mine tailing water) and pH (7.79 to 8.09; agricultural water). Calcium oxide only improved pH (4.07 to 4.87) and phosphate (116.67microgrms/L: 100microgrms/L) in mine tailings water, and nitrite nitrogen (.73mg/L:.1mg/L) and total alkalinity (240mg/L: 160mg/L) in agricultural water.

These findings led me to the conclusion that if contaminated water is filtered through a wetland then its quality improves and that biochar improves filtration in all areas of water quality.