Remediation of Contaminated Water, Year Two

Hauschulz, Hannah

The purpose of this experiment is to determine if bone char can successfully remediate water contaminated with arsenic, cadmium, copper, zinc, or a combination thereof. If bone char effectively decreases contaminant levels, then further testing includes combining bone char and Chlamydomonas reinhardtii to determine if a synergistic remediation rate is possible. I hypothesized bone char will aide in remediation of contaminated Berkeley Pit water by reducing the levels of the four metals in the water. Prior to experimentation, I cultured algae and obtained bone char, arsenic, cadmium, zinc, copper, and Berkeley Pit sample water. I made dilutions of each contaminant and initial contaminant level tests were performed. I then added bone char to the dilutions. On the 5th, 10th, and 15th day of experimentation I again obtained contaminant levels. The second set of tests used the same contaminants, but included algae with the bone char. Initial cell counts of the algae were performed. Contamination levels were reassessed twice and final cell counts taken. T-Tests were used for statistical analysis. Measurements indicated that all the chemical levels decreased over time. However, in each group, except the controls, the algae cells decreased also. Few of the analysis showed a significant difference in contaminant levels when being treated with both algae and bone char. Based on my results, I accepted my hypothesis. Bone char can act as a remediation agent in contaminated Berkeley Pit water by reducing levels of selected heavy metals.

Awards Won: