

STUDIES OF THE BERKELEY PIT-LAKE SYSTEM AT MONTANA TECH

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The Berkeley Pit-Lake System, the largest Superfund site in the United States, is an open-pit copper mine which operated from 1955 to 1982. When operations ceased acidic water began to infiltrate the open pit at a rate of 12 million liters per day. Since 1984, various studies have been conducted on the water and its chemical interactions with the surrounding pit walls. New research at Montana Tech includes organic carbon influence, thallium concentrations, and investigation of the microorganisms in the pit. Organic carbon trace metal interactions in the pit water and sediments are being investigated. The main objectives are to isolate, identify and model organic carbon, focusing on its interaction with trace metals in the sediment and water. Microorganisms indigenous to the Berkeley Pit are being identified and characterized. Six species of algae have been isolated and identified. Minimum nutrient requirements and bioremediative potential will be determined from results of controlled laboratory experiments. Preliminary results show significant metal uptake by one of the algal species. Thallium, an element present in most mine wastewater, surpasses the toxicity of mercury in humans. Total world mobilization of thallium exceeds 2,000,000 kg/yr, in contrast to the U.S. EPA's drinking water regulation for Maximum Contaminant Level of 2ppb. Thallium contamination in the pit water and sediment will be determined.