

Mass balance and dissolved metal loads in the Mamut copper Mine temporary settling pond

ABSTRACT

Mining activities which involve certain sulphide bearing minerals generally produce acid mine drainage. The understanding of the characteristics of dissolved metals before they are discharged into streams is important for environmental management. This study focuses on a small water reservoir in the former Mamut Copper Mine, known locally as the Temporary Settling Pond (TSP). The main objective of this study is to estimate the mass balance and load of dissolved metals in the acid mine drainage (from the mine pit to the TSP). Water sampling and discharge measurements were done during baseflow and high flows using water level sensors and dataloggers. The analysis of dissolved elements in water samples was done using ICP-OES, while sulphate was analysed using a 'HACH' spectrometer kit. Through the mass balance method, Fe had the highest removal rate followed by Cu, Al, Zn and Mn. The highest dissolved metal load discharged from the TSP was Al followed by Mn, Cu, Zn and Fe..