

Characteristics of leachate from selected MSW landfills and relationships with river water chemistry.

Abstract

Leachate from three different landfills was characterized and its relationship with river water chemistry was evaluated to gain information for further improvement of current leachate management. The leachate from both active uncontrolled and closed controlled landfills was in methanogenic phase, while active controlled landfill was in acidic phase. There could be a relationship between leachate from uncontrolled landfill and river water chemistry, mainly as NH₃-N, TOC and Fe. Whereas treatment of organic NH₃-N and metals such as Fe, Mn, Cu, Cd and Cr was necessary as leachate in active controlled landfill high in organics, ammonia and pyrite oxidation was expected in the nearby stream. In addition denitrification of leachate might be required at closed controlled landfill. Management of landfill leachate is considered complicated and challenging due to the variation in its composition and the environmental problems associated with the pollutants produced. This variation is often attributed to the age of the landfill, amount and type of waste disposed, biological decomposition of waste, solubilization of soluble salts in waste, climate and moisture content in waste itself (Tchobanogolous et al., 1993). Moreover, leachate in Malaysia is highly heterogeneous due to the fact that wastes are not separated at source. Thus, leachate characteristics could be specific for each landfill and its information is very important in determining a suitable treatment method. Unfortunately, this basic information is still scarce in the country as monitoring of leachate characteristics are expensive and time-consuming.

Keyword: Leachate; Landfill; Solid waste; Leachate pollution; Leachate management; Methanogenic phase; Environmental problems; Biological decomposition; Leachate characteristics; Anaerobic consumption; Metal concentrations; Leachate treatment.