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CHARACTERIZATION OF LEACHATE PLUMES AT TWO WASTE DISPOSAL SITES, SELANGOR

Abdul Rahim Samsudin, Bahaa-eldin Elwali A.Rahim
& Wan Zuhairi Wan Yaacob
Geology Program, School of Environment & Natural Resources Sciences,
Faculty of Science & Technology,
Universiti Kebangsaan Malaysia, Bangi, Selangor D.E.

ABSTRACT

This paper discusses the results of two-dimensional (2D) direct current resistivity imaging surveys, which were conducted to identify and delineate the extent of contaminated land and leachate plumes as well as to assess the capability of the 2D resistivity as a pre-characterization tool for tracing the properties of disposed waste and

its severity underneath a capped landfill sites. These studies were confined to two different municipal waste disposal sites, namely Ampar Tenang open-tipping site and Bukit Kemuning capped landfill. A total of eleven 2D- resistivity survey lines were carried out. Depending on site specification, these lines were distributed as 2 and 9 lines among Bukit Kemuning and Ampar Tenang sites respectively. In this study, the 2D resistivity imaging was carried out using SAS1000 & SAS4000 resistivity meters and ABEM LUND automatic electrode selector system. The objectives of the study were successfully achieved in delineating the locations of the contaminated subsoil and groundwater in terms of leachate plumes. Generally the results of measured resistivity values obtained from the two sites, define the contaminated leachate plumes as electrically conductive anomalies of relatively low resistivity value of less than 10 ohm-m. In addition, the observed resistivity values of 2D image profile, which were measured at the top of an excavated part of Bukit Kemuning landfill, were found to be in a good coincidence with the actual profile as regards to characteristics, degree of decomposition, depth and thickness of the disposed wastes, as well as thicknesses of both cap, and liner of the landfill, besides some other information about the past landfill operations on the site. This in turn, can proof the efficiency of using 2D direct current resistivity technique in waste disposal site investigations.