Surficial hydrogeological investigations involving solid waste landfilling: A case study

Ole P. Lund
Porter & Associates, Engineers, Halifax, N.S.

Over the past two decades, landfilling has become a popular means of disposing domestic solid wastes. Factors that must be considered in evaluating potential solid waste disposal sites include: (1) available land area, (2) impact of processing and resource recovery, (3) haul distance, (4) soil conditions and topography, (5) climatological conditions, (6) surface water hydrology, (7) geologic and hydrogeologic conditions, and (9) potential ultimate uses for the completed site. Final selection of a disposal site usually is based on the results of a preliminary site survey, results of engineering design and cost studies and an environmental impact assessment.

Aside from the socio-economic factors in site selection, the geologic and hydrogeologic settings ultimately determine the location. The surficial geologic material must be workable and of the type not to result in the contamination of surface and groundwaters from placement of a landfill.

Thickness, lateral extent, topography, slope permeability, density, water table levels, underlying geologic material, direction and rates of movement of the shallow groundwater flow system are important considerations.

To illustrate the importance of surficial geologic investigations, a solid waste disposal case study will be used. Methodology and findings will be described. These will be related to the overall design of a landfill at this particular site.