

## **MIGRATION OF LANDFILL GAS: A NUMERICAL MODEL**

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### **ABSTRACT**

A numerical model to simulate the migration of carbon dioxide (CO<sub>2</sub>) and methane (CH<sub>4</sub>) through unsaturated soils is presented. The governing system of fully coupled non-linear partial differential equations of the model was derived from a mechanistic approach. Using the finite element method (FEM) and employing the Galekin discretisation technique a fully implicit algorithm was developed for the numerical solution. The model treats the migration of liquid, heat, dry air, carbon dioxide and methane gases as five-independent system variables of pore water pressure, temperature, pore air pressure and molar concentration of carbon dioxide (CO<sub>2</sub>) and methane (CH<sub>4</sub>). A case study taken from literature verifies the performance and capability of the numerical the model.