



## **Rough walled parallel plate and random walk models to describe the scenario of contamination in Bari Industrial area (Italy)**

Nicola Pastore (1), Claudia Cherubini (2), Concetta I. Giasi (1), and Dimitra Rapti (2)

(1) Polytechnic of Bari, DICATECh, Bari, Italy (nicola.pastore.ing@gmail.com), (2) Università degli studi di Ferrara

Fluid flow and contaminant transport dynamics in fractured and karstic aquifers is an open issue. The knowledge of this phenomena and their modeling have great importance in the environmental risk assessment and in groundwater remediation system design. In the study area the various monitoring campaigns carried out have shown a contamination by Chlorinated Aliphatic Hydrocarbons which, unlike petroleum products, are denser than water and can exist as Dense Non-Aqueous Phase Liquids (DNAPLs). The presence of hot spot areas has been detected, located upstream of the groundwater flow, coherently with the state of contamination detected downstream. A rough walled parallel plate model has been implemented and calibrated on the basis of piezometric data. Using the random walk theory, the steady state distribution of hypothetical contamination with the source of contamination at the hot spot has been carried out. The simulated contaminant distribution is coherent with observed contaminated scenarios in the area.

The obtained results represent the fundamental basis for a detailed study of the contaminant propagation in correspondence of the hot spot area in order to find the best clean up strategies and optimize any anthropic intervention on the industrial site