

## **VOLATILE CONTAMINANT TRANSPORT AND FATE IN THE VADOSE ZONE: MODELING OF MULTICOMPONENT MIXTURES**

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### **ABSTRACT**

Important processes affecting the volatile compound transport in the vadose zone include gas diffusion and biodegradation. A number of literature models is reviewed here in terms of their applicability to simulate specific contaminant transport and attenuation processes. Most of the public domain codes can only deal with either a single component or a limited number of components (typically 5 to 7) hence confined to the direct modeling of oversimplified pollutant cases. Data from a large-scale lysimeter experiment were used here to validate a 2-D code that is capable of considering up to 7 compounds, and takes into account volatilization, diffusion, sorption and biodegradation. The contaminant is artificially mixed kerosene consisting of 14 organic species which are classified into different groups on the basis of similar properties. It was found that our simulation results compared satisfactorily with the lysimeter experiment data. The impact on the model results of the grouping criteria (i.e., solubilities, vapor pressures, etc.) is also evaluated.