



## Assessment of potential pollution of an unconfined aquifer in Abidjan by hydrocarbons

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The study on the aquifer of the Continental Terminal is carried out in the Abidjan District, located on the coastal sedimentary basin in southern Côte d'Ivoire (West Africa). This unconfined aquifer of the city of Abidjan of Mio-Pliocene age is called "Abidjan groundwater" Jourda (1987). The water quality of this aquifer is facing with diverse sources of anthropogenic pollution such as scattered deposits of solid and liquid wastes of all kinds. Indeed, the inadequacy of sanitation and drinking water supply systems increase the pollution risk of the Abidjan's groundwater (SODECI, 2015). Besides, the proliferation of petrol stations (Soro, 2015), including potential tank breaking, needs to be considered in the event of an accident, which poses a real threat to groundwater given the complex hydrogeological structure of the region Yacoub (1999). In order to ensure the effective protection and management of the Abidjan water table, this work proposes to evaluate the risk of contamination of groundwater in the Abidjan aquifer by hydrocarbons such as benzene for the purpose of the implementation of protective measures. To achieve this objective, a model of underground flow and contaminant transfer was designed from the hydrodynamic data synthesis of the Abidjan aquifer using the FEFLOW software. The predictive simulation of underground flow coupled with the transport of dissolved benzene deposited on the soil surface at the N'Dotré and Anador station was implemented. Dissolved benzene initial concentrations are 43.12 and 14.17 mg/l for the two sites respectively. The results revealed that a borehole named ZE11 is polluted after 44 years and 2 months because the threshold concentration of 0.001 mg/l is reached. A maximum concentration of 0.011 mg/l is reached at this drilling at 47 years and 2 months. In this zone 5 other boreholes are threatened by pollution because dissolved benzene has been detected. At an average distance of 2 km from the N'Dotré service station, 8 boreholes are also threatened by pollution, dissolved benzene has been detected. Special attention should be paid to the N'Dotré and Anador sites in the event of a disaster or major accident, especially since this water table is the only source of drinking water supply in the District of Abidjan.

### References

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