

Induced groundwater contamination by phosphogypsum land raising

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Demographic explosion, uncontrolled urbanisation and accelerated and uncontrolled generation of municipal wastes and industrial hazardous wastes are in the first range of solid waste management in developing countries. In the most of the countries in the third world, solid wastes storage continue to be uncontrolled. It's operated consists, in the most cases, by filling natural or artificial excavations or simply by land raising.

The phosphogypsum is a solid by product of phosphate fertilisers industry. It's issued from the filtration of the solution of phosphate attack by the sulphuric acid. It's mainly constituted by calcium sulphate, free phosphoric acid, a lot of heavy metals salts such as cadmium, zinc and lead. It's also highly concentrated with phosphates and fluorides.

At Sfax city, the phosphogypsum produced by two processing plants is stored, during an approximate period of 30 years, directly on the soil surface. The superficial meters of the soil at the phosphogypsum storage sites are principally composed of silt and clayey sand. This allowed the storage and rain waters to infiltrate to the superficial water table.

Chemical analysis of subsurface water and soil samples from the sites have detected fluoride, phosphate and heavy metal pollution at levels above permitted by Tunisian waste standards.