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MUNICIPAL SOLID WASTE MANAGEMENT AND TREATMENT OF EFFLUENTS RESULTING FROM THEIR LANDFILLING

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Abstract

EU policy on waste management stresses the importance of an integrated approach to waste management, which includes construction of waste disposal facilities with prevention of waste generation and recycling, in line with management hierarchy: prevention of waste and its negative impacts; recovery of waste through recycling, reuse, safe final disposal of waste where there is no possibility of recovery.

This paper address the issue of municipal waste management and the impacts generated into the environment due to landfilling and the secondary pollutants resulted from the landfilling process: leachate and landfilling gas. In this context, our study examines dynamics of waste production in the world and the European Union, impact and risk induced by solid waste storage, specific pollutants in landfills, with a special focus to leachate generation and its characteristics, considering the case study of leachate occurrence in Tomeşti landfill, Iasi – Romania. Some data of the analyses of leachate composition and environmental components quality indicators (soil, surface water, and groundwater) at Tomeşti landfill are also provided. Based on experimental data an assessment of environmental impact induced by Tomeşti landfill was performed.

Some methods and processes for leachate treatment are analyzed such as: conventional leachate treatment processes (leachate transfer, biological treatment, physico-chemical processes – flotation, coagulation/flocculation, chemical precipitation, adsorption, chemical oxidation, ion exchange), and new approaches as membrane processes. Research results on reverse osmosis treatment of landfill leachate on the new Tutora landfill, Iasi, Romania are provided and discussed considering the separation efficiency.

The treatment of landfill leachate by reverse osmosis shows that this method is a feasible and effective alternative to provide good efficiency of separation.

Research in this area must continue to develop, since both municipal solid waste management, as a whole, and the treatment of landfill leachate are increasingly significant of environmental concerns, and stricter environmental requirements are permanently enforced, especially those regarding ground and surface waters.

Key words: environmental impact, landfilling, leachate reverse osmosis, waste hierarchy

Received: March 2013; *Revised final:* July, 2013; *Accepted:* July, 2013

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