Environmental Engineering and Management Journal xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
http://www.eemj.icpm.tuiasi.ro/; http://www.eemj.eu

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ENVIRONMENTAL ASPECTS IN SELECTING OPTIMUM VARIANT OF SEWAGE SLUDGE MANAGEMENT

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Abstract

Sewage sludge management is a current problem worldwide because of its increasing quantities and the presence of contaminants. Its sustainable handling should be socially acceptable, cost-effective method that meets requirements of the efficient recycling of resources and ensures that harmful substances are not transferred to humans or the environment. This paper provides an overview of the most used procedures of sludge treatment and disposal in relation to the basic environmental impacts: the content of heavy metals and pathogenic microorganisms when it is used in agriculture and harmful gases when thermal treatment procedures are opted. LCA is a holistic methodology allowing for the analysis of environmental impacts of different sludge treatment and disposal/use options. The use of sludge in agriculture implies the quality classification of sludge, depending on which the limits of application are determined, differing significantly between countries. Thermal treatment technologies are environmentally risky regarding negative impact on the air, and thus on human health. Higher combustion temperatures and more advanced flue gas treatments guarantee better results. Gasification is a process with higher temperatures where emissions of harmful gases are lower compared to other thermal treatment processes. Energy recovery can significantly reduce both environmental and economic burdens. There is an ongoing development of new methods for the agriculture use of sludge and its thermal treatment whose application is expected in the future resulting in updated limit values of heavy metals and pathogens content in sludge, as well as limit emissions of pollutants into the air when thermal treatment is opted.

Key words: heavy metals, LCA, pathogens, sewage sludge, thermal treatment

Received: January, 2021; Revised final: September, 2021; Accepted: December, 2021

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