MSW LANDFILLS AND EUROPEAN INTEGRATION PROCESS FROM NATIONAL DIVERSITIES: A COOPERATION STRATEGY FOR A COMMON APPROACH TO ENVIRONMENTAL MONITORING (THE CASE OF KOMOTINI, GREECE).

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Italy and Greece are acknowledging EU "Landfill Directive" by different lapses of time and courses of action. Obviously, in absence of standardized protocols as concern environmental monitoring, the development of commonly accepted procedures at European level is a high-priority goal to support a widespread acceptance of this directive. In this context, Geosciences and Earth Resources Institute of Italian CNR and NCSR Demokritos in Athens came to an agreement to test chemical and isotopic analytical procedures for global environmental monitoring of municipal solid waste landfills. This work aims at verifying the pertinence of the experiences developed previously by IGG-CNR team on Italian sites (Doveri et al., 2007; Raco et al., 2007), when applied to Greek MSW landfills. A master plan looked upon two municipal solid waste management plants located near Komotini (NE Greece), only one still now cultivated, in order to take into account the different natural and human factors: as a matter of fact, geology, geography and land use, as well as national laws and regulations and the technical features of the MSW plant constitute an intricate framework.

Monitoring of the environmental impact originated by MSW landfills is based on: a) development and application of a pioneering methodology of qualitative and quantitative measurement of diffuse biogas emission from the soil into atmosphere by the accumulation chamber method and geostatistic data implementation (Raco et al., 2005); b) chemical and

isotopic $^{2}H/^{1}H$, $^{3}H/H$, $^{13}C/^{12}C$ and $^{18}O/^{16}O$ analyses in leachate, surface and deep waters in order to assess landfill impact on surrounding water bodies by verifying whether and where contaminants are escaping into the local groundwater system. When a low level of interaction between leachate and uncontaminated waters occurs, isotopes response (tritium above all) is well beyond the one of the commonly analysed chemical parameters. Moreover, water and DIC isotope compositions are a powerful tool to achieve a detailed knowledge of local hydrogeological features and biogas isotope composition trace methanogenesis and subsequent oxidation (Hackley and Liu, 1996).

The combined chemical and isotopic analyses of the fluids collected inside and surrounding the Komotini landfills give a detailed picture of biogas emission, leachate composition, local waters behaviour and a first check of the degree of environmental pollution. This is a crucial step to support a proper waste management, site monitoring as well as the assessment of the landfill environmental impact.

Keywords: Municipal Solid Wastes, EU Landfill Directive, biogas emission, atmospheric pollution, water contamination, environmental impact monitoring.