(ABSTRACT TEMPLATE)

Full scale application of in situ aerobic stabilization of old landfills

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(N.B: do not use the preposition “and” between the names of authors, and avoid use of titles, like Ing., Prof., before names. If all authors share the same affiliation, the superscript number is not needed.)

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The landfill of Modena, in Central Italy, will be crossed by the new high velocity railway line, between Milan and Bologna. Waste will be completely removed from a part of the landfill and a trench for the train line will be built. During excavation works in the landfill body several problems may arise, mainly caused by biogas emissions and by the presence of a 4 m thick layer of leachate saturated waste at the bottom of the landfill. In order to facilitate excavation works and further disposal of the material extracted, suitable measures were defined. Among others, the aerobic in situ stabilisation of the area will take place before the start of the excavation works. This will ensure an increased biological stabilisation of deposited waste and safer conditions during excavation, as the formation of biogas will be prevented.

The results of the preliminary tests carried out on the landfill and at lab scale were presented at Sardinia 2001 symposium and proved that the in-situ aerobic stabilization of the landfill is feasible.

The full scale in-situ aeration plant has been built and comprises 12 air injection wells, 16 gas extractions wells and 13 monitoring wells, as well as two biofilters for biogas treatment and a leachate extraction system. Leachate recirculation is possible in an area of the installation and tests will be performed for the evaluation of the influence of aerobic condition on the variation of leachate characteristics. Two control units enable the continuous monitoring of flow rates and of extracted gas composition. All data are displayed and recorded by means of proper software and the control is possible from remote station at the University of Padova. The monitoring of gas composition will be carried out in the extraction as well as in the monitoring wells. Samples of leachate will be periodically extracted and analysed. Waste samples will be drilled after the first months of aeration and analysed for the determination of the main stability indexes (respiration index, biogas production in fermentation test, BOD5/COD ratio in leaching test eluates, black index) and the results will be evaluated in combination with the ones obtained for waste samples collected before the start of the aeration.

The detailed description of the plant will be given, as well as the results of the first months of plant operation.

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