

Biotreatment of oil refinery sludge

Antonios Mountouris^{a*}, Dimitrios Leventos^a, Dimitrios Papadimos^b,
Christoforos Antotsios^b, Stelios Papadopoulos^c, Christos Vatseris^c, Henning Wallner^d,
Anastasios Kiroplastis^b, Nikolaos Karnavos^a

^a*Environmental Management Department, Health, Safety and Environment Corporate Directorate, Hellenic Petroleum S.A., 8A Chimarras Street, 15125 Maroussi, Greece
Tel. +30 210 6302558; Fax +30 210 6302564; email: amountouris@helpe.gr*

^b*Health, Safety, Environmental Protection and Quality Assurance Directorate, HELPE Thessaloniki Refinery, 54110 Thessaloniki, Greece*

^c*INTERGEO Environmental Technology Ltd., Industrial Area of Thermi, 570 01 Thessaloniki, Greece*

^d*INTERGEO Umwelttechnologie & Abfallwirtschaft., Robinigsreasse 93, 5020 Salzburg, Austria*

Received 20 January 2010; Accepted in revised form 12 January 2011

ABSTRACT

Utilization of waste materials generated in different industries is important from the points of ecology, economics and conservation of non-renewable resources. One of the main waste materials in petroleum industry is oil sludge, which is produced by the treatment of wastewater, from various refining and tank cleaning processes. Biotreatment or otherwise biodegradation by natural populations of microorganisms is one of the primary mechanisms by which petroleum and other hydrocarbon pollutants can be eliminated from the environment. The biotreatment technology by biopiles, which is applied in Thessaloniki Refinery area of Hellenic Petroleum S.A., for the case of the solid residual material (SRM) (dewatered oil sludge) derived from oil refinery sludge, is presented in this study. Experimental results presented herein demonstrate the fact that the biotreatment method of biopiles in the case of solid residual material stemming from oil refinery sludge can achieve high biodegradation efficiencies for organic substances and low leaching levels for heavy metals. Conclusively, Thessaloniki refinery's biotreatment unit is proven to be one effective and environmentally sustainable treatment option for the oil refinery sludge and its solid residual material, saving valuable natural resources, i.e. non impacted natural soil, which can be used mainly in earthworks or as cover material in landfill sites.

Keywords: Oil sludge; Refinery; Biodegradation; Biopiles; Leaching

* Corresponding author.