

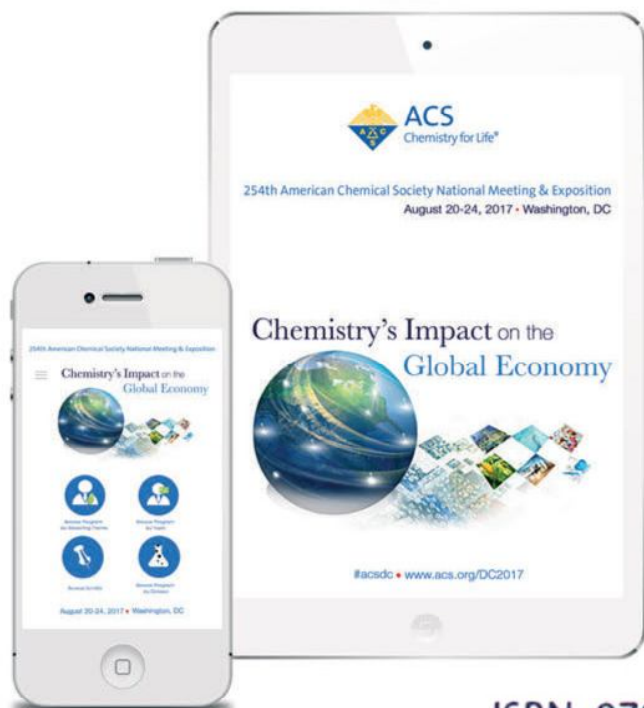


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## 449 - Bioremediation in exploitation of oil and green chemistry

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### **i** Abstract

Oil industry is the largest or potentially the largest source of pollutants for all ecospheres. This applies to all segments, from exploitation to processing, transportation, storage and use of fuel and raw materials for petrochemical industry.

Exploitation produces spent drilling fluid which is being collected and transported to landfills where it is treated. In the past it was deposited below the borehole, into mud pits, so there are many of them all over the world now as historical pollutants. In Serbia, too, at this moment there are about a hundred of them untreated, in oil fields.

Spent drilling fluid is a very complex waste including oil (in average approx. 40 g/kg dry matter).

Consortia of zymogenous microorganisms isolated from mud pits have proven to be highly active in the degradation of crude oil, i.e. total petroleum hydrocarbons (TPH). The bioremediation procedure that we apply, that is explained in the presentation on one example, starts with the adjustment of pH, biostimulation (adjustment of the special ratio COrg:N:P), homogenisation and bioaugmentation by microbial consortia biomass. Aeration is achieved with mixing use of construction machinery. The process lasts up to 6 months during which TPH is reduced from the initial about 40 to approximately 1.5 g/kg DM, with the increase in the concentration of humic substances, which means that soilification (man-made-soil) is being created. Land obtained in such a way used for the cultivation of corn and soy as industrial crops.

The fundamental postulates of the green chemistry are the reduction of the: level of pollution, quantities of waste, total material, environmental risks, energy and costs, and all that is being observed in the biotechnology that we have developed and applied in tens of mud pits, having the volume of cc. 1000 m<sup>3</sup> (1500 t), on average.

**Time** Wednesday, August 23, 2017 6:00 PM

**Session** ENVR: Green Chemistry & the Environment: EVE session (6:00 PM - 8:00 PM)

**Location** Walter E. Washington Convention Center

**Room** Hall D

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