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Acid Tar Lagoons: Management and Recovery

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This contribution presents the issue with possibility of definitive removal of dangerous environmental burden in Slovakia – serious historical problem of two acid tar lagoons. In relation to their removal, no technology has been found so far - technologically and economically suitable, what caused problems with its management.
Locality Predajná is well known in Slovakia by its character of contrasts: it is situated in the picturesque landscape of National Park buffer zone of Nízke Tatry, on the other site it is contaminated by 229 211m3 of acid tar with its characteristics of toxicity, carcinogenicity, teratogenicity, mutagenicity and toxicity especially for animals and plants.
Acid tar in two landfills with depth of 1m in case of the first lagoon and 9,5m in case of the second lagoon is a waste product derived from operation of Petrochema Dubová - refinery and petrochemical plant whose activity was to process the crude oil through processes of sulfonation and adsorption technology for producing lubricating and special oils, synthetic detergents and special white oils for cosmetic and medical purposes.
A part of acid tar was incinerated in two incineration plats. Concentration of SO_2 in combustion gases was too high and it was not possible to decrease it under the value of 2000 mg.mn-3 [LADOMERSKÝ, J. - SAMEŠOVÁ, D.: Reduction in sulfur dioxide emissions waste gases of incineration plant. Acta facultatis ecologiae. 1999, p. 217-223]. That is why it was necessary to put them out of operation. Later, because of public opposition it was not possible to build a new incineration plat corresponding to the state of the art.
Even though actual Slovak and European legislative for protection of environment against such impacts, neither of tried methods – bio or non-biologic treatment methods - was proved as suitable for processing or for recovery in the reason of different factors admission: i.e. strong aggressivity, difficulty with handling because of its sludgy and liquid state et sim. Because of lack of geological research caused by fragile limestone bedrock under the lagoon in combination with aggressive substance in the lagoon, waste management of this contaminated site became even more complicated.
The main aim of this work is to present by analysis a new possibility of acid tarry-waste management thanks to the technique of thermal desorption as a method for acid tar processing, through which it is possible to gain only organic part; and a technology of Blowing Decomposition as a method for its consequent recovery.
Thermal desorption process is an effective separation process through which is possible to split acid tarry material into matrix (soil, sediments) and organic contaminants (PCB and POPs compounds). The process is carried out through a mobile unit which is relocatable. The work also presents a relation between volume of de-contaminated matrix and organic compounds. In order to boost the efficiency in processing of acid tar waste through thermal desorption, the work will present possibility of application of innovative technology – method of Blowing Decomposition for recovering of organic matter into technological lubricating oil.

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