

Improvement of Biological Groundwater Treatment at an Oil Distribution Depot

An oil distribution depot in Southern Europe had a problem with its existing groundwater treatment plant. Changes in legislation meant that the oil company which owned the depot had to improve the quality of groundwater that it collected from the depot site and discharged to foul sewer to meet changed discharge consents or face increasing fines. Prior to discharge the company also wished to circulate the water through the depot's fire suppression system to reduce costs. The multiple stage rotating membrane bioreactors used for water treatment at the site could not remove some of the organic additives that were being introduced into petrol and diesel (gasoil) to improve engine efficiency and reduce fuel consumption. The peak water flow was 30m³ per hour and activated carbon filtration had been tried, but was expensive and disposal of the spent carbon to landfill was not permitted under EU Directives. The problem was compounded by the fact that chemical oxidation techniques to treat organic compounds dissolved in water, including Fenton's reagent plus hydrogen peroxide, and ozone plus ultraviolet light, could only oxidise these compounds to acetic and other simple acids and not completely mineralise them.

After careful analysis of the groundwater samples that were collected before and after treatment in the existing membrane bioreactor plant, Global Advantech's engineers observed that less than 30% of the organic additives were being removed, and that it was mainly



oxygenates that are toxic to bacteria remaining. A dosing system was set to add Global Advantech's Natural Biostimulant Effluent Treatment WT952 into the groundwater flow just before the first stage membrane bioreactor in the treatment plant. The purpose of adding the WT952 was to stimulate the established bacteria in the bioreactors to breakdown the organic additive. Within two weeks analyses showed that the concentration of the organic additives at the exit of the treatment had begun to reduce. After eight weeks the additives were removed to below detectable limits.

Global Advantech's biostimulant wastewater and effluent treatment products contain natural molecules, which are proven to catalyse certain cell defence mechanisms and accelerate specific metabolic functions within micro-organisms. Their addition enables indigenous micro-organisms to utilise the hydrocarbons and otherwise toxic organic molecules as food sources, rapidly degrading them to carbon dioxide, and simple salts.

Global Advantech Limited

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