

GROUNDWATER POLLUTION AND METHODS OF TREATMENT

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INTRODUCTION

Groundwater resources are among the most important sources of drinking and agricultural water in most parts of the world. Whereas several factors including urban and industrial sewage, organic materials, great use of chemical fertilizers and pesticides on farms, waste leachate, and Methyl Tertiary-Butyl Ether (MTBE) can reduce the quality of these resources, developing acceptable environmental solutions to purify groundwater resources is indispensable. Therefore, various groundwater treatment methods have been proposed.

MATERIALS AND METHODS

Reverse Osmosis System is a relatively costly method that yields purified water by passing polluted water through a membrane under an applied pressure. In chemical precipitation, a cost-effective method for purifying very heavy water, chemicals are added to water and the contaminants are settled as sediments. On the other hand, ion exchange, i.e. the exchange of ions in the structure of an electrolyte with those in the solution, is more applicable at industrial scale. Air stripping, a technique to treat large volumes of water with high concentrations of MTBE, involves the injection of air and extraction of volatile components from the aquifer. Phytoremediation of polluted groundwater with plants such as willow, hay, straw, Typha, and blue lavender and etc., during the absorption process is used. Adsorption is a process where a solid is used for removing a soluble substance from the water. In this process active carbon is the solid. Activated carbon is produced specifically so as to achieve a very big internal surface. This method is suitable for low concentrations of MTBE and also as a supplement to other techniques.

RESULTS AND DISCUSSION

Research has showed further studies on the exact sources of groundwater pollution are necessary. Despite the availability of useful water purification methods, the best strategies are still compliance with environmental issues (Habibi and et al., 2004), management accompanied by scientific and practical control of chemical fertilizers application, increased use of environment-friendly chemical fertilizers, constant monitoring of groundwater nitrate concentration, and informing the farmers about the effects of overuse of fertilizers on groundwater pollution (Gheisari and et al., 2007). It is thus recommended to execute a waste management master plan according to the waste management law, locate landfills, emphasize on the proper management of waste leachate (Rezaie and et al., 2010), and control and prevent the permeation of toxic materials into groundwater resources.

Keywords: Groundwater, pollution, methods of treatment

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