

## **Application of Arak Wastewater Treatment Plant Effluent on Agricultural Farms**

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### **Abstract**

Being located in a (semi-) arid region, Iran has been facing severe droughts in recent years complicated by the increasing urbanization. These conditions have led to a growing pressure on renewable water resources and, greater attention has been, therefore, drawn to efficient use of unconventional water resources such as urban and domestic effluents. Wastewater reuse is of great importance for the study area as a solution to overcome the growing demand for water. At the time of this study, the effluent from Arak wastewater treatment plant (WWTP) was being discharged into the Mighan desert where it is reused by downstream farmers in an unplanned manner. Concerns over public health and introduction of pollutants into soil, water, and agricultural products call for a well-planned agricultural reuse policy based on investigations of the effluent quality. The present descriptive, cross-sectional study was, therefore, conducted to determine the quality parameters of the effluent from Arak WWTP against the relevant standards and to determine its usability for irrigation. For this purpose, samples were collected from the effluent and the required tests were performed. Results revealed average values of 49.65, 23.26, and 1.93 mg/l for COD, BOD<sub>5</sub>, and DO, respectively, and 0.0564, 0.08, and 0.512 mg/L, respectively, for the heavy metals of Cadmium, copper, and lead. These values are in compliance with the limits recommended by Iran Environmental Protection Organization for wastewater reuse in agriculture. Total and fecal coliforms were, however, found to be 877.882 and 379.5588 per 100 mL and the average number of parasite eggs was 0.524 per liter, which violate the relevant standards. Based on the result obtained, the effluent seems to have no limitation for reuse in agricultural irrigation except for its total and fecal coliforms. Thus, disinfection and continuous monitoring of the effluent along with upgrading of the WWTP facility are strongly recommended for its effluent to be reusable. Over all recommendation for agricultural reuse of the effluent can be certainly made once in-depth research has been carried out.

**Keywords: Agriculture, Wastewater Treatment, Wastewater reuse.**

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