Sustainable Approach to Wastewater Management in the Federal University of Technology, Akure, Nigeria

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Abstract

Proper disposal of wastewater still remains a major concern in developing countries. As population grows and urbanization increases, more wastewater is generated and there is great awareness on the health and environmental implication of poorly disposed wastewater. This research work develops a sustainable approach to wastewater disposal in the Federal University of Technology, Akure. The existing wastewater disposal system in use in the study area is the septic tank - soakaway system for individual buildings. This approach presents serious problems due to the choice of inappropriate technology, improper siting of infrastructure, lack of adherence to correct design concepts and lack of proper maintenance.Wastewater samples were collected and their properties determined through laboratory tests to ascertain the concentrations of significant physical, chemical and bacteriological constituents for the selection of appropriate wastewater treatment processes. The total estimate of the wastewater generated from various locations was 2.075 million liters per day based on the population of approximately 26,131.Taking into consideration the available pipe sizes in the market a pipe size of 100 mm was found to be suitable for wastewater conveyance from the office and residential areas based on the contributory population. The proposed wastewater treatment plant (three anaerobic ponds of 57.42 m x19.14 m x5 m connected in series) is to be sited at the lowest topographical level which is of suitable distance from the office and residential areas. Implementing this wastewater management approach in the university will mitigate the negative effect of septic tank - soakaway system and present an environmentally sustainable wastewater management approach.

Keywords: Wastewater, disposal methods, septic tank, soakaway and anaerobic pond

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