

**QUALITY OF WASTE WATER EFFLUENT FROM WASTE
WATER TREATMENT PLANT UITM PULAU PINANG USING
SAND FILTRATION**

By

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ABSTRACT

In this study, wastewater effluent from UiTM Pulau Pinang wastewater treatment plant is taken as the first sample (initial reading) and effluent that is pass a sand filtration process as a second sample (final reading). The entire sample taken was evaluated and tested using experiment method in UiTM Pulau Pinang Environmental Laboratory to test the parameter. The result is compared to WHO, INTERIM and EQA (A and B) standard.

A small model of sand filter was constructed with sand and gravel as a filter media. It is open sand filter where the sand filter surface is open to the atmosphere Sieve analysis was carrying out to evaluate the media. The effluent passes with vertical movement to downward using gravity force or gravity flow.

Sand filtration can improve wastewater quality such as to reduce pollutants in wastewater. The sand filtration effluent can use for domestic purposes such as cleaning and watering plant, in fact to reduce water consumption.

Properly designed and functioning sand filters can provide for enhanced BOD₅, COD, SS removal, color reduction, and heavy metal of wastewater effluent. In this study sand filtration can remove suspended solid, BOD₅, COD, color, ammonia, chromium and zinc, but sand filter is very effective in suspended solid removal and can achieved until 100 percent removal compared to other parameter. It is also can adjust pH values. This study shows that the sand filter improves the wastewater effluent into a better quality water confirm to the WHO Drinking Standard Guidelines, EQA (1979) and the Interim National River Water quality standard for Malaysia (within class 1 and IIA) which makes its suitable for a variety of non potable uses.

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CHAPTER 1

INTRODUCTION

1.1 Background

Sand filtration is a relatively an old technology. It has been used extensively for onsite and small community applications for treating both water and wastewater, with numerous installations. Sand filtration can be used to treat septic tank effluent or effluent from other types of pretreatment processes such as aerobic tanks.

Sand filters treat wastewater using naturally occurring physical, biological and chemical processes. They are one of the best options for additional onsite treatment where septic tank or soil absorption systems have failed or are restricted due to high groundwater, shallow bedrock, poor soils, or other site condition. Sand filters have also been used where centralized treatment is unavailable or too expensive for homes, businesses, institutions and small residential communities. (www.danpatch.ecn.purdue)

Sand filtration on the other hand is a model developed in India and Malaysia, to treat rainwater from rainwater harvesting. It is developed to conserve water and to minimize water consumption from the water supply treatment plant. The sand filtration is design to filter the rainwater until it can be use for drinking purpose. Sand filtration is also use in most water treatment plant in Malaysia. In this research, sand filtration is used to filter the effluent from wastewater treatment plant so that the quality of the effluent can be improved.