IN-SEWER PROCESSES: ESTABLISHING NITRATE UTILIZATION RATE IN BULK WATER UNDER ANOXIC CONDITION WITH HIGH INITIAL NITRATE CONCENTRATION

BY

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I hereby declare that this report has not been submitted, either in the same or different form, to this or any other university for a degree and except where reference is made to the work of others, it is believed to be original.

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ABSTRACT

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Sewer network act as reactors where microbial changes occur. The transport time of wastewater in sewers will affect the quality of wastewater arriving at a wastewater treatment plant. The presence of the different phases in the sewer pipe, such as the sewer atmosphere, bulkwater, biofilm and sediments, subjected to different conditions such as aerobic, anoxic and anaerobic makes the study of in-sewer processes both interesting and challenging.

The main objective of this project is to study microbial transformations under anoxic conditions particularly to establish the denitrification rates in bulkwater phase of municipal wastewater. Since anoxic conditions do not normally exist in sewer, sodium nitrate is added to the sample to induce the anoxic condition. Tests were conducted on 7 different wastewater samples take from the wastewater treatment plant (WWTP) at Section 23, Shah Alam and WWTP located at Jalan Ilmu, UiTM, Shah Alam. Tests were performed using batch reactors to measure denitrification rate under conditions of excess electron donor and electron acceptor.

Nitrate and nitrite concentration in the samples were determined by ion chromatography using 790 COM respectively.

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