

## Quantifying *Escherichia coli* in household wastewater in Kuching, Sarawak

Ling, T.Y., L. Nyanti and T.F. Siew

Faculty of Resource Science & Technology  
Universiti Malaysia Sarawak  
94300 Kota Samarahan, Sarawak, Malaysia  
(tyling@frst.unimas.my)

### Abstract

Fecal pollution of surface water is a potential health hazard due to potential pathogens. This study aimed at quantifying an indicator bacteria, namely, *Escherichia coli*'s loading from households of five residential areas into tributaries of Sg. Sarawak and also Sg. Kuap. Sampling of household wastewater was conducted for a duration of two months during dry season. Household survey was conducted to gather information on water consumption and demographic data. Results of this study indicated that water consumption ranged from 180 l/c/d to 371 l/c/d, wastewater flow ranged from 47.0 to 92.9 l/c/d. Mean temperature ranged from 28.0 to 29.5°C. Dissolved oxygen ranged from 1.96 to 3.40 mg/l. There is high variation in *E. coli* concentrations sampled during low, medium and high flow. Mean *E. coli* concentration increases as the age of the residence increases with the 20 years old residence discharging *E. coli* concentration 13 times higher than that of less than a year old residence. However, in all housing areas, *E. coli* concentrations were in the order of  $10^6$  cfu/100mL. Loadings from different housing areas ranged from  $9.10 \times 10^8$  to  $5.76 \times 10^9$  cfu/c/d. With a population of 44,500 from the housing areas where the study was conducted, it is estimated that a total of  $1.64 \times 10^{14}$  cfu of *E. coli* is discharged from the residential areas daily. To reduce the *E. coli* loadings into surface water around Kuching town, it is recommended that wastewater from septic tanks be channeled to central waste stabilization ponds.

Key Words: *E. coli*, sewage, pollution, water quality

### Introduction

Water contamination by sewage is a health hazard due to potential pathogens. It is more serious in urban areas of developing countries. Health effects criteria signify that swimming in marine waters of as few as 10 *E. coli*/100ml is risky (Vasconcelos & Anthony 1985).

Household wastewater consists of as black water (urine and faeces) and grey water from kitchen, bathroom, and washing machine. According to Tchobanoglous & Burton (1991), each person discharges 100-400 billion coliform organisms per day, in addition to other kinds of bacteria. *E. coli* is one of the coliform bacteria commonly found in the intestinal tract of warm-blooded animals. It is more representative of faecal contamination than other coliforms. Most studies of domestic wastewater focused on