UNIVERSITI TEKNOLOGI MARA

EXPOSURE CONCENTRATION OF HEAVY METALS IN INDOOR AIR OF FELDA BUKIT GOH'S RESIDENTIAL AREA

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(Hons.)

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DECLARATION BY STUDENT

Project entitled "Exposure Concentration of Heavy Metals in Indoor Air of Felda Bukit Goh's Residential Area" is a presentation of my original research work. Whenever contributions of others are involved, every effort is made to indicate this clearly, with due reference to literature, and acknowledgement of collaborative research and discussions. The project was done under the guidance of Project Supervisor, Mr. Megat Azman Bin Megat Mokhtar. It has been submitted to the Faculty of Health Sciences in partial fulfilment of the requirement for the Degree of Bachelor in Environmental Health and Safety (Hons).

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In the name of Allah, The Most Gracious, The Most Merciful.

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ABSTRACT

Bauxite mining activity emits Heavy Metals (HMs) to the ambient air and may subsequently implicate the indoor air of residential area in Felda Bukit Goh, Kuantan, thus raising concern of HMs poisoning from exposure through inhalation. Study was performed to measure the concentration of HMs Al, Cd, Fe, Pb and Zn in indoor air of 25 selected houses in proximity to bauxite mining sites (Sample Location 1) and another 25 selected houses farther from bauxite mining sites (Sample Location 2). Next is to compare between the two areas and lastly to assess the potential health risk effects from exposure through inhalation by estimating health risk assessment. A total of fifty samples of indoor air inside residential houses in Felda Bukit Goh were collected by using air sampling pumps, were digested appropriately and analyzed by AAS for five elements. All five elements were detected in the indoor air of the houses at both Sample Location 1 and 2 with the variation order Fe > Al > Zn > Pb > Cd and Fe > Pb > Al > Zn > Cd respectively, and with mean concentration ranging from 0.0043 to 0.0259 mg/m^3 and from 0.0038 to 0.0149 mg/m^3 respectively. The *p-value* for all HMs except for Cd are lesser than 0.05, signifying that there is significant difference of most HMs concentration between the two areas, and Sample Location 1 is generally higher in concentration. The non-carcinogenic health risk of HMs was estimated by hazard quotient (HQ) and hazard index (HI) and the results showed that the HI value for both areas exceed the safe limit (HI>1), indicating non-carcinogenic health effects exist in present condition. Whereas, the carcinogenic health risk of HMs was estimated by cancer risk (CR) and the result showed that Cd is also above the threshold value, thus the carcinogenic health effects exist and likely to be of threat. Both non-carcinogenic and carcinogenic negative health effects are currently present at both areas in Felda Bukit Goh and may pose health deterioration to the locals through chronic inhalation exposure. Lemly (1996) characterized HI for Sample Location 1 to be high while Sample Location 2 to be moderate in terms of non-carcinogenic health implications.

Keywords: *Heavy metals, Health risk assessment, Indoor air, Air sampling pump*