

**UNIVERSITI TEKNOLOGI MARA**

**DETERMINATION OF TRACE METAL IN  
PALM OIL PLANTATION SOIL AND  
HEALTH RISK ASSESSMENT AT PASIR  
SALAK, PERAK.**

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**Project submitted in fulfilment of the requirements  
for the degree of**

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Safety  
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## Declaration by Student

Project entitled “Determination Of Trace Metal In Palm Oil Plantation Soil and Health Risk Assessment at Pasir Salak, Perak” is a presentation of my original research work. Wherever contributions of others are involved, every effort is made to indicate this clearly, with due reference to the literature, and acknowledgement of collaborative research and discussions. The project was done under the guidance of Mr. Razi Ikhwan bin Md Rashid as Project Supervisor. It has been submitted to the Faculty of Health Sciences in Partial fulfillment of the requirement for the Degree of Bachelor in Environmental Health and Safety (Hons)

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## **Abstract**

### **Determination of Trace Metal in Palm Oil Plantation Soil and Health Risk Assessment at Pasir Salak, Perak.**

**Nabihah Syahira bt Ismail**

Anthropogenic activities continuously increase the amount of trace metal in the environment, especially in agriculture soils. The trace metal cannot be degraded, they are deposited, assimilated or incorporated in soils. This study assessed the concentration of trace metal such as Cu, Mn, and Mg in Palm Oil Plantation soils and their possible human health risk at Kampung Gajah, Pasir Salak. In these study, 100 samples collected in the palm oil plantation soils were analyzed for Magnesium, Copper and Manganese using the Atomic Absorption Spectrometry. The study design is cross-sectional study. The mean concentration of Mn, Cu, and Mg in the soil were 30.72, 20.70 and 29.84 mg/kg respectively. The concentration of trace metal in soils were compared with the Contaminated Land Management and Control Guideline, Environment Protection Act and Canadian Soil Quality Guideline. The result indicated that the concentration of Mn and Cu are exceeded the permissible limits set by the Contaminated Land Management and Control Guideline. However, copper metal lower than the standard that stated under the Environment Protection Act and Canadian Soil Quality Guideline. For Mg concentration, the result revealed is lower than the permissible limit of typical range of natural occurring metals concentration from the Contaminated Land Management and Control Guideline. However, there is no value derived for Mg and Mn element from the other standard. Generally, the concentration level of Mn and Cu are higher than that of Mg. Statistical analysis revealed that there is significance difference of mean Manganese level between the Site A and C ( $p < 0.05$ ) while no significance difference for Copper and Magnesium ( $p > 0.05$ ). The health risk assessment model revealed that there was no health risk for both worker at palm oil plantation and construction's workers with all the trace metal, since the calculation of hazard index (HI) was below than 1 ( $HI \leq 1$ ). As conclusion, this study provides important information about the concentration of Mn, Cu, and Mg in palm oil plantation exposed to environmental stress by anthropogenic activities, mainly from the application of the fertilizer.

**Keywords:** Trace Metals, Soils, Health Risk Assessment, Hazard Index, Non-Carcinogenic Risk