

**UNIVERSITI TEKNOLOGI MARA**

**ENVIRONMENTAL IMPACT ASSESSMENT ON  
SOLID WASTE MANAGEMENT AT SEPANG  
MUNICIPALITY**

**NUR SAJIDAH BINTI MOHAMAD SIRAT**

**Thesis is submitted in fulfillment of the requirements for the Bachelor  
Degree of Environmental Health and Safety (Honours)**

**FACULTY OF HEALTH SCIENCES**

**MAY 2010**

## DECLARATION

This thesis (Environmental Impact Assessment on Solid Waste Management at Sepang Municipality) 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 thesis has not been accepted for any degree program and is not concurrently submitted in candidature of any other degree program. The work was done under the guidance of Environmental Health and Safety Lecturer, Mr. K. Subramaniam at the Universiti of Teknologi Mara (UiTM).



**(Nur Sajidah Binti Mohamad Sirat)**

BSc. Environmental Health and Safety (Honours)

Date: 26/5/10

In my capacity as supervisor of the candidate's thesis, I certify that the above statements are true to the best of my knowledge.



**(Mr. K. Subramaniam)**

Lecturer,

Environmental Health and Safety Department

Faculty of Health Sciences,

UiTM Puncak Alam

Date: 26/5/2010.

# TABLE OF CONTENTS

<b>TITLE PAGE</b>	
<b>ACKNOWLEDGEMENTS</b>	<b>ii</b>
<b>TABLE OF CONTENTS</b>	<b>iii</b>
<b>LIST OF TABLES</b>	<b>v</b>
<b>LIST OF FIGURES</b>	<b>vii</b>
<b>LIST OF ABBREVIATIONS</b>	<b>viii</b>
<b>LIST OF PLATES</b>	<b>ix</b>
<b>ABSTRACT</b>	<b>x</b>
<b>CHAPTER ONE: INTRODUCTION</b>	
1.1 Background	1
1.2 Problem Statement	1
1.3 Justification	2
1.4 Objectives	3
1.5 Hypothesis	4
1.6 Study Variables	5
1.7 Conceptual Operational & Definitions	5
1.8 Conceptual Framework	9

# ENVIRONMENTAL IMPACT ASSESSMENT ON SOLID WASTE MANAGEMENT AT SEPANG MUNICIPALITY

NUR SAJIDAH MOHAMAD SIRAT

## ABSTRACT

**Introduction:** This study was conducted at Ampar Tenang Landfill for identification of environmental impact from solid waste management. The main objective is to assess the environmental impacts and arising health effects from solid waste management at the Ampar Tenang Landfill in Sepang. The study was divided into five different studies, there are environmental study (leachate and water quality study, air (odour) quality study, biological (includes pests) study, toxicity study and community study. For respondents, there were divided into a study (exposed) group (n=30) and control (unexposed) group (n=30). They were selected based on inclusive criteria; Ability to commit this study, ability to read, write and age more than 18 years old.

**Methodology:** It is a cross sectional study design with an exposed (study) respondents who were selected by simple random sampling and matching for unexposed (control) group. HACH 2800 was used for screening the leachate and water quality before using AAS for measured the results. For odour intensity, it was measured by using the standard checklist provided by The German standard Olfactometry Determination of Odour Intensity VDI 3882 Part 1 (VDI,1992) while toxicity test was used the guidelines (WET method) provided by USEPA. The questionnaires were used to obtain the socio-demography data among respondents.

**Results:** The results for physical hazards showed no significance difference ( $p > 0.05$ ) when compared with leachate (n=30) and river water (n=30) where temperature, ( $p > 0.053$ ), suspended solids, ( $p > 0.132$ ) and pH, ( $p > 0.640$ ), while chemical hazards in leachate and river water, eight (4) out of fourteen (14) chemical tested have significance value ( $p < 0.05$ ) for example COD, ( $p < 0.028$ ), mercury, ( $p < 0.020$ ), cadmium, ( $p < 0.004$ ), lead, ( $p < 0.010$ ), manganese, ( $p < 0.001$ ), nickel, ( $p < 0.010$ ), iron, ( $p < 0.002$ ), and sulphide, ( $p < 0.001$ ) while others (n=6) have no significance difference ( $p > 0.05$ ) like Chromium hexavalent, ( $p > 0.313$ ), chromium trivalent, ( $p > 0.078$ ), arsenic, ( $p > 0.165$ ), cyanide, ( $p > 0.231$ ), copper ( $p > 0.533$ ) and zinc ( $p > 0.476$ ). For biological hazards, there was significant different ( $p < 0.001$ ) when compared the leachate and river water for example BOD, ( $p < 0.001$ ). Cross tabulation test on odour intensity between the distance revealed a significant difference ( $p < 0.001$ ) where ( $X^2 = 30.00$ ,  $p < 0.001$ ). Biological indicator results showed, there were presence density of flies was higher than recommended fly index. When doing the association of flies density by the distance (near landfill and outside landfill), it showed the significance different where ( $X^2 = 6.358$ ,  $p < 0.001$ ). Rat presence (*Rattus r. diardii*) (n=7) at Ampar Tenang Landfills showed there was higher than recommended index (n<1). By comparing the fleas found *Xenopsylla cheopis*, the result was higher than recommended fleas index (n<1). Toxicity testing was used to identify the LC50 for leachate and river water, but the results revealed that the toxicity in the leachate and river water relatively higher with the increasing

of the percent of concentration (%). The maximum killing time for leachate only 45 min for 100% concentration while the river water only 3 days for 100% concentrations to kill the indicator (*Leptobarbus hoevenii species*). Association of environmental health risk with the study variables with the health diseases were showed significance difference ( $p < 0.001$ ) where used of river water by disease ( $X^2 = 15.78$ ,  $p < 0.001$ ), odour present by disease ( $X^2 = 15.747$ ,  $p < 0.001$ ), odour present by respondent exposure ( $X^2 = 52.50$ ,  $p < 0.001$ ), pest presence by disease ( $X^2 = 13.017$ ,  $p < 0.001$ ) and lastly respondent exposure by disease ( $X^2 = 22.259$ ,  $p < 0.001$ ).

**Conclusion:** The prediction made from this study would be there were poor management from responsible operators that causes the environmental impact to community surrounding and ecosystem.

**Keywords:** environmental impact, water study, air study, biological study, toxicity testing, environmental health risks