INVESTIGATION OF SURFACE WATER ACIDIFICATION
AT SEMENYIH DAM WATER RESOURCE AREA

ANNUR AIMAN BT. BAHARUDIN

BACHELOR OF SCIENCE (Hons.) CHEMISTRY
FACULTY OF APPLIED SCIENCES
UNIVERSITI TEKNOLOGI MARA

NOVEMBER 2008
This Final Project Report entitled “Investigation of Surface Water Acidification at Semenyih Dam Water Resource Area” was submitted by Annur Aiman Bt. Baharudin, in partial fulfilment of the requirements for the Degree of Bachelor of Science (Hons.) Chemistry in the Faculty of Applied Sciences, and was approved by:

Pn. Nesamalai A/P Kantasamy
Supervisor
Faculty of Applied Sciences
Universiti Teknologi MARA

Pn. Siti Mariam Bt. Sumari
Co-supervisor
Faculty of Applied Sciences
Universiti Teknologi MARA

Dr. Famiiza B. Abd Latiff
Project Coordinator
B.Sc (Hons.) Chemistry
Universiti Teknologi MARA

Prof. Madya Badariah Bt. Abu Bakar
Head of Programme
B.Sc (Hons.) Chemistry
Faculty of Applied Sciences
Universiti Teknologi MARA

Date: 20 Nov 2020
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACKNOWLEDGEMENT</td>
<td>iii</td>
</tr>
<tr>
<td>TABLE OF CONTENTS</td>
<td>iv</td>
</tr>
<tr>
<td>LIST OF TABLES</td>
<td>vi</td>
</tr>
<tr>
<td>LIST OF FIGURES</td>
<td>vii</td>
</tr>
<tr>
<td>LIST OF ABBREVIATION</td>
<td>viii</td>
</tr>
<tr>
<td>ABSTRACT</td>
<td>x</td>
</tr>
<tr>
<td>ABSTRAK</td>
<td>xi</td>
</tr>
</tbody>
</table>

## CHAPTER 1 INTRODUCTION

1.1 Acidification
1.2 Background
1.3 Surface Water Acidification
1.4 Problem Statement
1.5 Objective of Study
1.6 Significance of Study

## CHAPTER 2 LITERATURE REVIEW

2.1 Introduction
2.2 Acidification of surface/lake water
2.3 Sources of surface water/lake acidification
2.4 Effect of surface water and acidification
2.5 Major ions in surface water
2.6 Acidification parameters
   2.6.1 pH
   2.6.2 Water temperature
   2.6.3 Electrical conductivity
   2.6.4 Alkalinity
   2.6.5 Acid Neutralizing Capacity (ANC)
CHAPTER 3 MATERIAL AND METHOD
3.1 Sampling location
3.2 Site sampling
3.3 In-situ measurement
3.4 Measurement
   3.4.1 pH value
   3.4.2 Water temperature
   3.4.3 Electrical Conductivity (EC)
   3.4.4 ANC measurement
   3.4.5 Alkalinity
3.5 Instrument for ion measurement
3.6 Equipment for sample collection
3.7 Sampling Platform
3.8 Sample Collection
3.9 Transportation and storage samples
3.10 Labeling
3.11 Physical and chemical analysis

CHAPTER 4 RESULTS AND DISCUSSION
4.1 Parameter measurement
   4.1.1 Parameter values of sampling collection
      4.1.1.1 pH values for sample collection
      4.1.1.2 Temperature values for sample collection
      4.1.1.3 Electrical conductivity (EC) values for the sample collection
      4.1.1.4 Alkalinity value for the sample collection
   4.1.2 Cations and anions
   4.2 Ion measurement
5.1 Conclusion
5.2 Recommendation

CITED REFERENCES
APPENDICES
CURRICULUM VITAE
INVESTIGATION OF SURFACE WATER ACIDIFICATION AT SEMENYIH DAM WATER RESOURCES AREA

A study was done to analyze the state of acidification of surface water at Semenyih Dam. This study was conducted for one month on July 2008. The analyzing involves eight sampling locations. Four at entrance points of the following river (Semenyih, Kesuma, Lanjut and Rephen) and four at the middle of the Semenyih Dam. The water samples were analyzed both in-situ and in the lab for the following parameter which are (temperature, electrical conductivity and pH). Measurement for alkalinity was done in the lab. The cations and anions in sample are measured by Ion Chromatograph. From the results, it was found that the average of concentration of ions from sampling are $\text{HCO}_3^-$ > $\text{Na}^+$ > $\text{Ca}^{2+}$ > $\text{SO}_4^{2-}$ > $\text{K}^+$ > $\text{Cl}^-$ > $\text{NO}_3^-$ > $\text{Mg}^{2+}$ > $\text{F}^-$ > $\text{NH}_4^+$ > $\text{Br}^-$. Semenyih Dam also has average pH values which are from 7.51 to 7.64. This average can be classified as neutral and normal for freshwater. Alkalinity readings were from 21.42 mg/L to 134.66mg/L. Alkalinity which is indicates presence of $\text{HCO}_3^-$. $\text{HCO}_3^-$ ions act as buffers, which are important because it slow the rate at which the pH changes. It is also was the important component of pH balance in water. Meanwhile, the average temperature values are around 29°C and the value of acid neutralizing capacity (ANC) is high due to the excess amount of base cations compared to amounts of anions. The result also shows that electrical conductivity value is more than 25 µS/cm. The high value of alkalinity and ANC indicate the high buffering capacity of the dam. Therefore, the Semenyih Dam is currently classified as insensitive to acidification due to the value of pH, alkalinity and ANC.