
TABLE OF CONTENTS

	Page
Acknowledgement	i
Table of Contents	ii
List of Tables	vi
List of Figures	vii
List of Plates	ix
List of Symbols and Abbreviations	x
List of Appendix	xii
CHAPTER ONE	
Introduction	
1.1 General Introduction	1
1.2 Water Pollution In Malaysia	3
1.3 Pollution Loading In Malaysia	6
1.4 Wastewater Treatment Plant	9
1.5 Objectives	10
CHAPTER TWO	
Literature Review	
2.1 Conventional Wastewater Treatment Process	12
2.2 New Technologies	15
2.3 Wastewater Characteristics	21
2.3.1 Heat Exchanger Wastes	22
2.3.2 Vinyl Chloride Monomer	25
2.3.3 Storm Water Runoff	26

2.4	Chemical Processes In Wastewater Treatment	28
2.5	Aeration and Biomass Activity	32
2.6	Organic and Inorganic Components of Wastewater	35
2.7	Activated Sludge Process	40
2.7.1	Sludge Dewatering	48
2.7.2	Thickening	50
2.7.3	Centrifugation	51

CHAPTER THREE

Process Description And Plant Control

3.1	Plant Location	54
3.2	Process Description	55
3.2.1	Integration Of Influent	57
3.2.2	Off-Spec Flow	59
3.2.3	Oil & Solid Separation	61
3.2.4	Equalization Process	63
3.2.5	Aeration Process	66
3.2.6	Discharge	68
3.2.7	Return Activated Sludge	69
3.2.8	Sludge Dewatering	72

CHAPTER FOUR

Material And Method

4.1	Records And Sampling	73
4.2	Plant Design Parameters	76
4.3	Method Of Analysis	79

4.3.1	pH	79
4.3.2	DO	80
4.3.3	COD	80
4.3.4	Chloride	81
4.3.5	Phosphorus	81
4.3.6	Ammonia	81
4.3.7	O & G	82
4.3.8	TSS	82
4.3.9	Influent Flow	82
4.3.10	Settling Test	83
4.3.11	BOD ₅	83

CHAPTER FIVE

Results And Discussion

5.1	Trouble Shooting	84
5.2	Plant Performance During Pre-Commissioning	85
5.2.1	pH	86
5.2.2	COD	87
5.2.3	Chloride	90
5.2.4	TSS	91
5.2.5	NH ₃ and Phosphorus	93
5.2.6	Oil & Grease	95
5.2.7	Average Flow	96
5.2.8	Off Spec Tank	97
5.2.9	Aeration Tank	99
5.2.10	Final Discharge	103

5.3	Plant Performance During Commissioning	106
5.3.1	Influent Flow	106
5.3.2	pH And Temperature	108
5.3.3	Total Suspended Solids	112
5.3.4	Oil & Grease	114
5.3.5	COD and BOD ₅	115
5.3.6	DO & MLSS In Aeration Tank	118
5.3.7	Full Standard B Analysis	121

CHAPTER SIX

Conclusions And Recommendations

6.1	Conclusions	124
6.2	Recommendations	125

REFERENCES	127
-------------------	------------