



KEMENTERIAN TENAGA, TEKNOLOGI,
SAINS, PERUBAHAN IKLIM & ALAM SEKITAR
MINISTRY OF ENERGY, TECHNOLOGY, SCIENCE, CLIMATE CHANGE & ENVIRONMENT



INDUSTRIAL EFFLUENT ON ENVIRONMENT

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TABLE OF CONTENT

No	Content	Page
1	Introduction	1
2	Sources of Waste Effluents	2
3	Impact of Waste Effluents	3
4	Environment Quality Act 1974	3
5	Treatment of Industrial Effluent	5
6	References	6

Introduction

Developments of countries and industrial nowadays can lead to pollution and produce waste which affects the environment and nature system. Environmental pollution is occurring when environment cannot process and neutralize harmful by product from the industrial effluents (Foi & B, 2016). Water pollutions are the most environmental problem occurred in Malaysia. This pollution especially can cause the deficiency of aquatic ecosystem while air pollution will disrupt the respiratory system of human. Although the water was contaminated with unknown contaminants from the industrial waste it is difficult to trace the contaminants. Industrial effluents are one of the sources of water pollution. According to Regulation 2 of Environmental Quality Act 1974 (EQA), industrial effluent is any waste in the form of liquid or wastewater generated from manufacturing process including the treatment of water for water supply or any activity occurring at any industrial premises.



Figure 1 Effluent

In addition, industrial premises need to notify through prior written notification as in Regulation 4 of EQA to director general of Department of Environment (DOE) before the premise start the work or construction and upgrading. Industrial effluents are hazardous waste contained with chemicals which are toxic, ignitable, corrosive or reactive. The effluents can be categorized as solid, liquid and gases held in containers. When the industrial improperly managed the waste, it will be discharged into the river and flow to the water systems. There are several of microorganisms in the effluents. However, a great number of microorganisms are considered as critical factors in contributing to numerous water-borne diseases outbreak (Okereke et al., 2016).

Furthermore, the main pollutant in Malaysia is Biochemical Oxygen Demand (BOD), Ammoniacal Nitrogen (NH₃-N) and suspended solid (SS). High BOD when the oxygen in the water is being consumed by the bacteria from untreated or partially treated sewage. The sources of NH₃-N are from the domestic sewage or organic waste while SS is from the earthquake and land clearing activities (Huang et al., 2015). Therefore, water quality index (WQI) method is used by DOE for the continuous assessment and monitoring the quality of the water. WQI is to evaluate the status of the river water quality.

Sources of Effluent Waste

No	Type of Waste	Type of Plant
1	High Suspended Solid	Steel Industries, Pulp and Paper Mills
2	Colored	Textiles dye houses
3	High Acid	Chemical plant, Iron and Steel plant
4	High Temperature	Bottle washing plants, Power plants

Impact of Effluents Waste

Impact of effluents waste on environment is not limited to the water. It also can affect the soil, air and human. The quality of water become worst because of untreated waste is discharged to the inland water from the processing industries which make the physical change to the water which resulting greasy oily nature and discoloration. The air can be polluted by the smell of the chemicals from the water pollution which can affect human respiratory system and neurological disease. Furthermore, industrial plants with unsystematic of managing the effluents waste from their processing machines can affect the properties of the soils. It leads to increasing the salinity of soils, formation of sludge on the soils and the soil will become more acidic.

Environment Quality Act 1974

No	Section	Arrangement of Section
1	17(2)	Different fees may be prescribed according to anyone or more of the factors- (a) The class of premises; (b) The location of the such premises; (c) The quantity of wastes discharged; (d) The pollutant or class of pollutants discharged; (e) The existing level of pollution.
2	17(3)	Where upon inspection it is ascertained that the pollutants or class of pollutants discharged, emitted or deposited is different from or the quantity of wastes discharged, emitted or deposited is greater than, that declared by the occupier in his application for or renewal of license, the Director General may recover such fees as would have been payable in respect of that pollutant or class of pollutant or extra quantity of discharge, emission or deposit.
3	21	The Minister, after consultation with the Council, may specify the acceptable conditions for the emission, discharge or deposit of

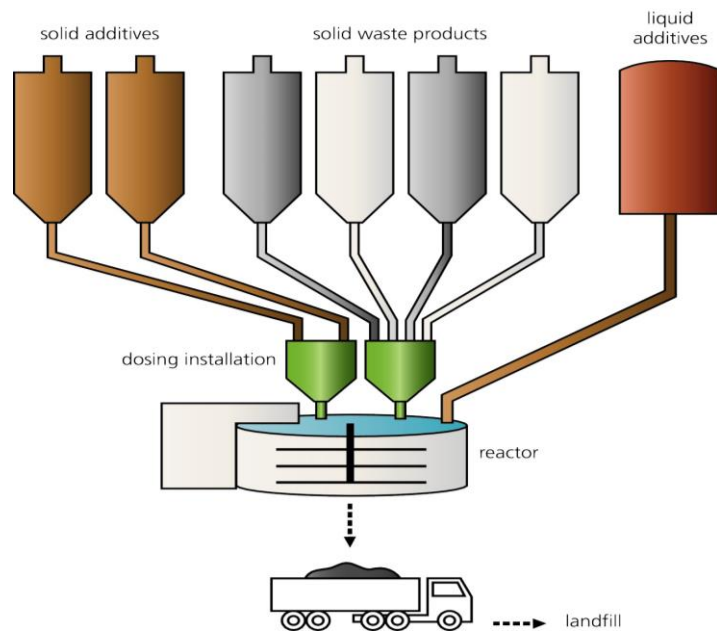
		wastes or the emission of noise into any area, segment or element of the environment and may set aside any area, segment or element of the environment within which the emission, discharge or deposit is prohibited or restricted.
4	25(1)	No person shall, unless licensed, emit, discharge or deposit any wastes into any inland waters in contravention of the acceptable conditions specified under section 21.
5	25(2)	<p>Without limiting the generality of the subsection (1), a person shall be deemed to emit, discharge or deposit wastes into inland waters if-</p> <ul style="list-style-type: none"> (a) he places any wastes in or any waters or in a place where it may gain access to any waters; (b) he places any waste in a position where it falls, descends, drains, evaporates, is washed, is blown or percolates or is likely to fall, descend, drain, evaporate or be washed, be blown, or percolated into any waters, or knowingly or through his negligence, whether directly or indirectly, causes or permits any wastes to be placed in such a position or (c) he causes the temperature of the receiving waters to be raised or lowered by more than the prescribed limits.
6	25(3)	Any person who contravenes subsection (1) shall be guilty of an offence and shall be liable to a fine not exceeding te thousand ringgit or to imprisonment for a period not exceeding two years or to both and to a further fine not exceeding one thousand ringgit a day for every day that the offence is continued after a notice by the Director General requiring him to cease the act specified therein has been served upon him.

Treatment of Industrial Effluent

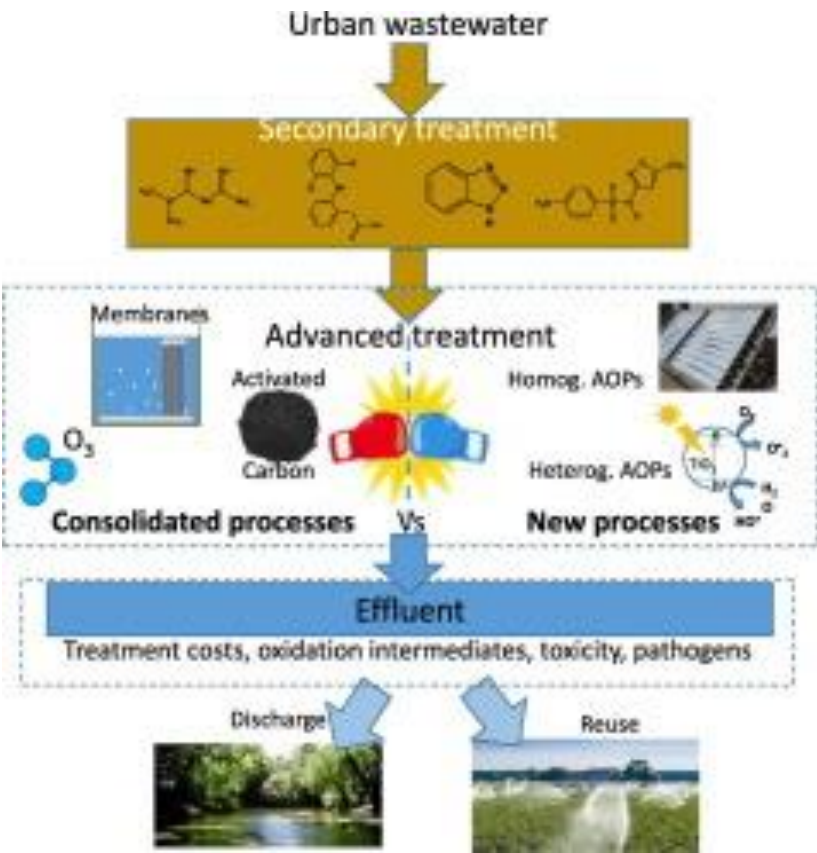
Biological Wastewater Treatment



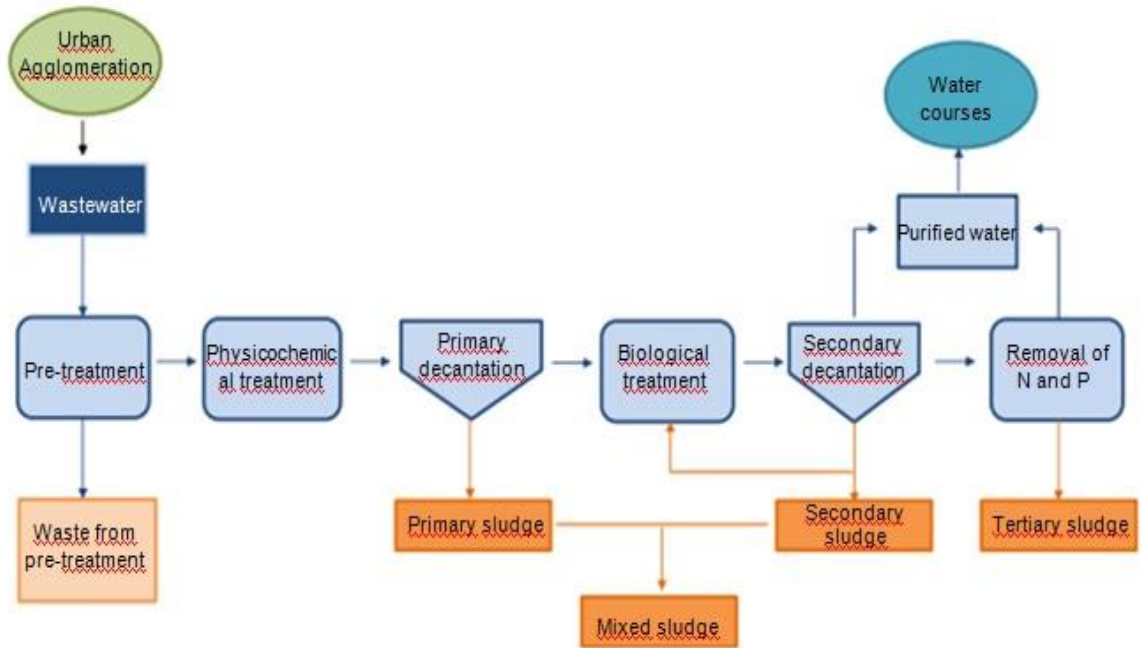
Physico-Chemical Treatment Process



Advanced Treatment Process



Treatment of Sludge



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