Air Pollution from Vehicular Emission in Industrial Areas: Towards Sustainable Road Transport Management

Azliyana Azhari[a] (P69639), Ahmad Fariz Mohamed[a], Mohd Talib latif[a,b] and Matthias Ketzel[c]

[a]Institute for Environment and Development (LESTARI), Universiti Kebangsaan Malaysia, 43600 Bangi, Selangor, Malaysia
[b]School of Environmental and Natural Resource Sciences, Faculty of Science and Technology, Universiti Kebangsaan Malaysia, 43600 Bangi, Selangor, Malaysia
[c]Department of Environmental Science, Aarhus University, Roskilde, Denmark

Email: azliyana.azhari@gmail.com

Problem Statement: Road traffic network has grown in order to accommodate the demands of urbanization and industrialization. Despite the contributions, road traffic has become one of the major source of air pollutants in industrial area. **Objective:** This study aims to understand the relationship of the composition of major air pollutants and the road traffic volume in an industrial environment and suggest a strategy to reduce air pollution from traffic flow within the industrial area. **Methodology:** This study monitors the concentration of sulphur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), ozone (O_3) and particulate matter with diameters less than 10 µm (PM_{10}) on site in Shah Alam industrial area from 9th September to 24th October 2014, comparing a working day to a non-working day. Two sampling stations were selected and samples were taken at two points, 1 m and 100 m from the roadside. A long term air quality data monitoring from a nearest Department of Environment's monitoring station of the year 2014 was also analysed. OML-Highway model was used to calculate the real-world concentration of PM_{10} pollutants from traffic emission. **Results:** The level of pollutants detected at the sampling area is significantly higher on a working day compared to a non-working day ($p \leq 0.05$) for PM_{10}, CO and SO_2 at station 1 (1m). The long term monitoring analysis also shows that the diurnal pattern of PM_{10}, CO and NO_2 are closely related to the road traffic rush hour. The OML-Highway modelling shows that the mean concentration of PM_{10}, CO, NO_2 and O_3 are ranging at 56.4-80.2 µg/m^3, 997.8 – 1684 µg/m^3, 63.5 – 88.7 µg/m^3, and 7.16 – 28.1 µg/m^3 respectively. OML-highway modelled the dispersion of pollutant to be higher at receptor points closer to the roadside compared to the receptor points 100 m away from the roadside except for O_3. **Conclusion:** The result demonstrates that vehicular emission is closely related to the concentration of air pollutants in an industrial area. A sustainable road traffic management is needed to control the air pollution impact from road traffic emission as to establish a better environment for the urban population and enhance livability as the urban and industrial area is closely knitted.