# 2. AIR QUALITY IMPACT

## 2.1 Legislation, Policies, Plans, Standards, and Criteria

**2.1.1** The air quality impact assessment criteria make reference to the Hong Kong Planning Standards and Guidelines (HKPSG), the *Air Pollution Control Ordinance* (APCO) (Cap.311), and Annex 4 of the *Technical Memorandum on Environmental Impact Assessment Process* (EIAO-TM).

**2.1.2** The *APCO* (Cap.311) provides powers for controlling air pollutants from a variety of stationary and mobile sources and encompasses a number of Air Quality Objectives (AQOs). Currently AQOs stipulate concentrations for a range of pollutants, of which sulphur dioxide ($SO_2$), nitrogen dioxide ($NO_2$), respirable suspended particulates (RSP) and total suspended particulates (TSP) are relevant to this assessment. The AQOs are listed in **Table 2.1**.

**Table 2.1 Hong Kong Air Quality Objectives**

| Parameter | Maximum Average Concentration (µg/m³)[1] | | | |
|---|---|---|---|---|
| | 1-Hour[2] | 8-Hour[3] | 24-Hour[3] | Annual[4] |
| $SO_2$ | 800 | - | 350 | 80 |
| $NO_2$ | 300 | - | 150 | 80 |
| RSP | - | - | 180 | 55 |
| TSP | 500[5] | - | 260 | 80 |

Notes:
1 Measured at 298 K and 101.325 kPa.
2 Not to be exceeded more than three times per year.
3 Not to be exceeded more than once per year.
4 Arithmetic mean.
5 Not an AQO but is a criteria for evaluating air quality impacts as stated in Annex 4 of *Technical Memorandum on Environmental Impact Assessment Process*.

**2.1.3** Air within a vehicle tunnel contaminated by tailpipe emissions would be exhausted through the vent shafts. The tunnel air quality limits stipulated in EPD's Practice Note on Control of Air Pollution in Vehicle Tunnels are presented in **Table 2.2.**

**Table 2.2 Tunnel Air Quality Criteria**

| Air Pollutant | Average Time | Maximum Concentration | |
|---|---|---|---|
| | | (mg/m³) | (ppm) |
| Carbon Monoxide | 5 minutes | 115,000 | 100 |
| Nitrogen Dioxide | 5 minutes | 1,800 | 1 |
| Sulphur Dioxide | 5 minutes | 1,000 | 0.4 |

Note: 1. All limits listed above are expressed as at reference conditions of 298K and 101.325kPA.
2. Although not directly related to the control of air pollution in vehicle tunnels, visibility is a gross indicator of the smoke concentration therein, and should be controlled to a level equivalent to an extinction coefficient of 0.005 per metre or less at any 5-minute interval.

**2.1.4** The HKPSG specify buffer distances between sources of pollution and sensitive land uses to ensure acceptable air quality at the sensitive land uses. Examples of recommended buffer distances extracted from the HKPSG for relevant source and sensitive land use combinations are given in **Table 2.3** below. The actual buffer distances required to avoid adverse air quality impacts on SEKD would be reviewed based on the findings of this assessment.

**Table 2.3 HKPSG Recommended Buffer Distances**

| Source | Sensitive Land Use | Recommended Buffer Distance |
|---|---|---|
| Multi-storey industrial buildings without chimneys | Residential areas and schools | 100m |
| Multi-storey industrial buildings without chimneys | Low-rise air-conditioned commercial and G/IC uses | 30m |
| Industrial areas / large pollution sources | Hospitals | 500m |
| Industrial areas | Sensitive uses | If any within 500m, consult EPD |
| Major industrial areas | High-rise buildings | >200m |
| Industrial chimneys | Active recreation open spaces | 10-200m, depending on difference in height |
| Industrial chimneys | Passive recreation open spaces | 5-200m, depending on difference in height |
| Odour sources | Sensitive uses | 200m |
| Construction and earth moving activities | Active recreation open spaces | 50m |
| Construction and earth moving activities | Passive recreation open spaces | No buffer distance |
| Dusty uses | Other uses | 100m |
| Trunk road and primary distributor | Active recreation open spaces | 20m |
| Trunk road and primary distributor | Passive recreation open spaces | 3-20m |
| Trunk road and primary distributor | Amenity areas | No buffer distance |
| District distributor | Active recreation open spaces | 10m |
| District distributor | Passive recreation open spaces | No buffer distance |
| Local distributor | Active recreation open spaces | 5m |
| Local distributor | Passive recreation open spaces | No buffer distance |

**2.1.5** For construction dust, Annex 4 of *EIAO-TM* specifies a TSP limit in air over a 1-hour period of 500 $\mu g/m^3$. The maximum acceptable TSP concentration averaged over a 24-hour period is 260 $\mu g/m^3$, as defined in the AQOs.

**2.1.6** The *Air Pollution Control (Construction Dust) Regulation* specifies processes that require special control. Contractors and site agents are required to inform EPD and adopt dust reduction measures while carrying out "Notifiable Works" as defined under the regulation. These works include:

- Site formation;
- Reclamation;
- Demolition of a building;
- Work carried out in any part of a tunnel that is within 100m of any exit to the open air;
- Construction of the foundation of a building;
- Construction of the superstructure of a building; or
- Road construction work.

**2.1.7** Amendment to the *APCO* (1993) has included objectionable odour as an air pollutant, but with no quantitative criteria. The *EIAO-TM* stipulates an odour nuisance limit of 5 odour units (OU) based on an averaging time of 5 seconds. An OU is defined as the dilution factor required for samples of odorous gases to be diluted with clean odour-free air to the detection threshold.

## 2.2 Description of the Environment

**2.2.1** Existing air quality in the vicinity of the study area is influenced by emissions from the following sources:

- Kai Tak International Airport (before its closure in mid 1998);
- Road network within and around the study area;
- Industrial areas around the study area namely Kwun Tong, Kowloon Bay, San Po Kong, To Kwa Wan, and Hung Hom;
- Construction activities within and around the study area; and
- Potential odour emissions from Kai Tak Approach Channel and Kwun Tong Typhoon Shelter.