AIR QUALITY
IN HONG KONG 2007

Air Science Group

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Environmental Protection Department

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The Government of the Hong Kong
Special Administrative Region

A report on the results from the Air Quality Monitoring Network (AQMN) (2007)

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Security Classification	:	Unrestricted

Summary

This report summarises the 2007 air quality monitoring data collected by the Environmental Protection Department's monitoring network.

As a result of the enhanced vehicle emission control programme implemented by the Government since 2000, concentrations of respirable suspended particulates, nitrogen oxides and sulphur dioxide at roadside have been dropping gradually over the past few years.

Concentrations of ozone have been on a slow rising trend since 1990, reflecting a deterioration in regional air quality. On this front, the Hong Kong Special Administrative Region Government and the Guangdong Provisional Government are implementing a Regional Air Quality Management Plan to improve air quality in the Pearl River Delta Region.

As in previous years, concentrations of sulphur dioxide, carbon monoxide and lead remained at levels well below their respective Air Quality Objectives limits in 2007.

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1. Introduction

The Environmental Protection Department (EPD) operates a network of 14 air quality monitoring stations for measuring concentrations of major air pollutants. It consists of 11 general stations for monitoring ambient air quality and 3 roadside stations for measuring street level air quality. Details of these monitoring stations are shown in Table B1 of Appendix B.

Additional monitoring facilities specifically designed for collecting Toxic Air Pollutants (TAPs) samples have been installed at the Tsuen Wan and Central/Western monitoring stations since 1997.

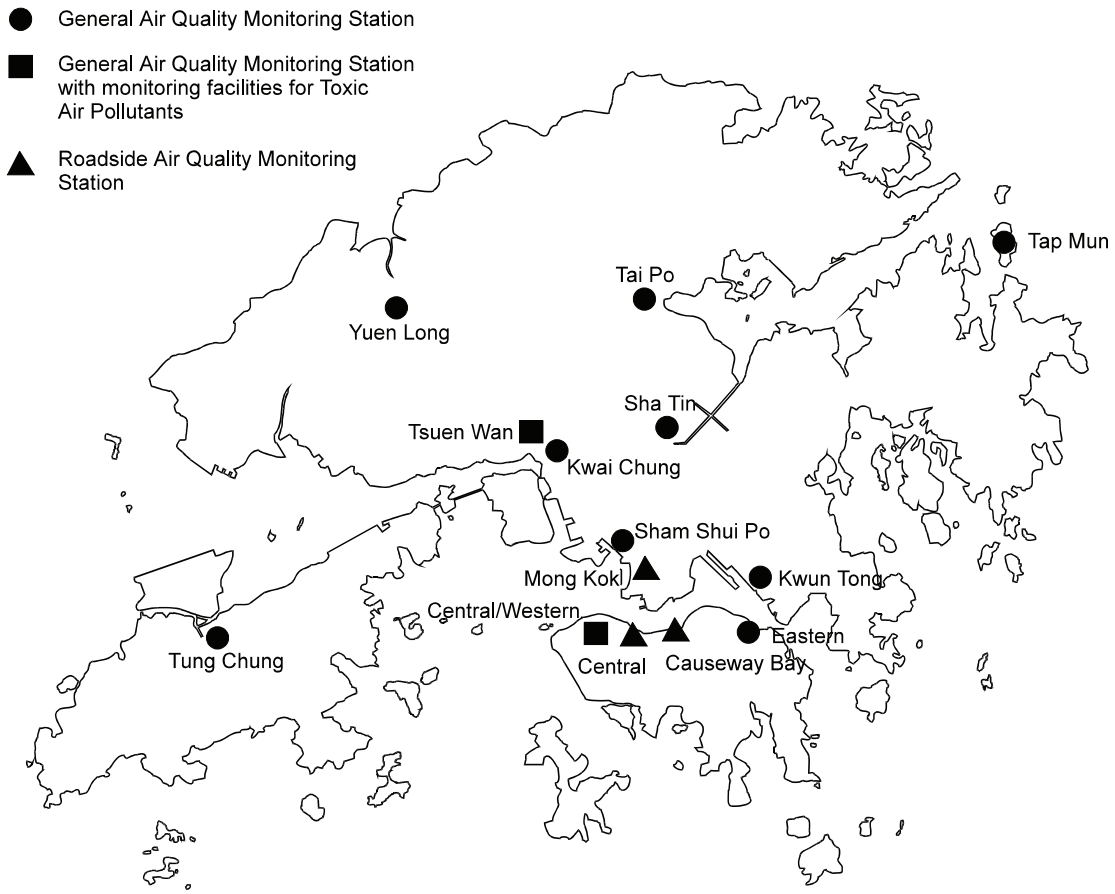


Figure 1: Location of EPD's Air Quality Monitoring Stations (2007)

Apart from EPD's network, the Hongkong Electric Co. Ltd. (HEC) and the CLP Power Hong Kong Limited (CLP) also operate a number of monitoring stations to assess the ambient levels of sulphur dioxide and nitrogen dioxide in the vicinity of their power generating stations. The locations of these monitoring stations and the relevant monitoring results in 2007 are at Appendix D.

2. Gaseous Pollutants

2.1 Sulphur Dioxide (SO_2)

Sulphur dioxide (SO_2) is formed primarily from combustion of sulphur-containing fossil fuels. In Hong Kong, power stations are the major sources of SO_2, followed by marine vessels, fuel combustion and motor vehicles.

Exposure to high levels of SO_2 may cause impairment of respiratory function and aggravate existing respiratory and cardiac illnesses. Prolonged exposure at lower levels may also increase the risk of developing chronic respiratory diseases.

Figure 2a: Sulphur Dioxide Monitoring 2007
(1-Hour Average Statistics)

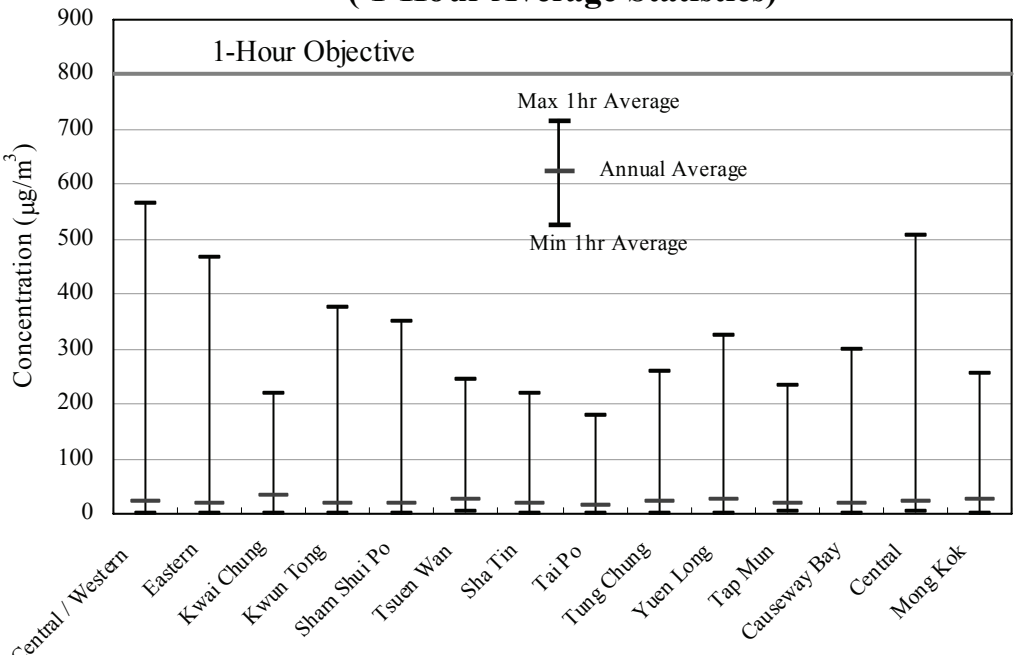


Figure 2b: Sulphur Dioxide Monitoring 2007
(24-Hour Average Statistics)

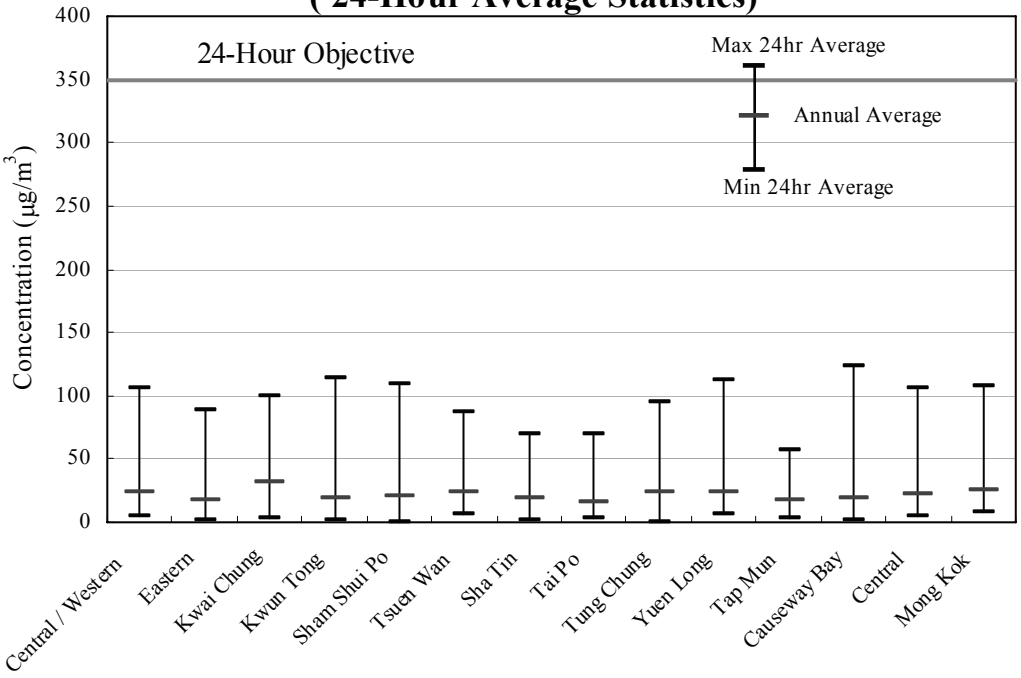
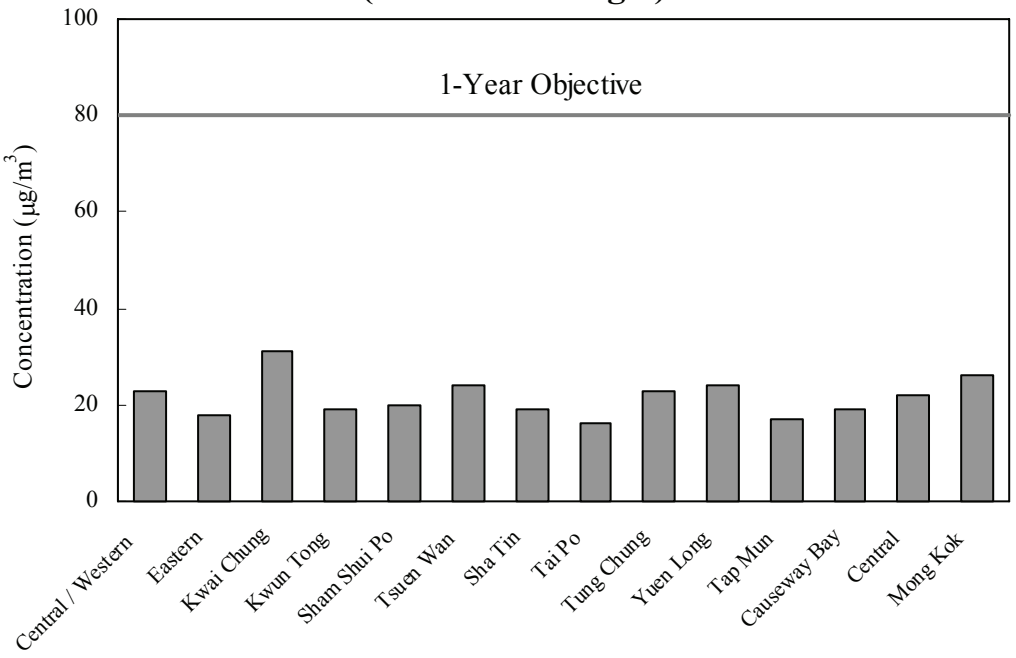


Figure 2c: Sulphur Dioxide Monitoring 2007
(Annual Average)



Sulphur dioxide was continuously measured at all the 14 monitoring stations during 2007. As in previous years, SO_2 concentrations remained at very low levels throughout the territory in 2007. All of the 14 monitoring stations complied with the relevant short and long term Hong Kong Air Quality Objectives[1] (AQOs) for SO_2. The highest 1-hour average (566 μg/m^3) was recorded at the Central/Western station while the Causeway Bay station had the highest 24-hour average (124 μg/m^3) in the year. As for the annual average, the Kwai Chung station recorded the highest value (31 μg/m^3) in the year. All these readings were well below their respective AQO limits.

2.2 Nitrogen Oxides (NO_x) and Nitrogen Dioxide (NO_2)

The various chemical species of the oxides of nitrogen are collectively termed as nitrogen oxides. From an air pollution standpoint, the most important nitrogen oxides in the atmosphere are nitric oxide (NO) and nitrogen dioxide (NO_2). These two gases, which are often mentioned jointly in the air pollution literature as NO_x, usually enter the atmosphere as a result of combustion processes. Emissions from power stations and motor vehicles are the two major sources of NO_x in Hong Kong. NO_x emissions from motor vehicles have great impact on roadside air quality.

Nitrogen dioxide (NO_2) is mainly formed from oxidation of nitric oxide (NO) emitted from fuel combustion. Long-term exposure to NO_2 can lower a person's resistance to respiratory infections and aggravate existing chronic respiratory diseases.

Nitrogen dioxide was continuously measured at all the 14 monitoring stations during 2007. In 2007, the highest 1-hour average (369 μg/m^3) and the highest 24-hour average (201 μg/m^3) were recorded at the Central and Mong Kok roadside stations, respectively. Among all 14 stations, only the 3 roadside stations at Causeway Bay, Central and Mong Kok violated the 1-hour AQO (i.e., with the 1-hour AQO limit exceeded more than three times in the year) and the 24-hour AQO (i.e., with the 24-hour AQO limit exceeded more than once in the year) for NO_2.

[1] The Hong Kong Air Quality Objectives can be found in Appendix A.

As in previous year, all general stations complied with the annual AQO for NO_2 in 2007 while non-compliance was still observed at the 3 roadside stations, with the Mong Kok station recorded the highest annual average (101 μg/m^3) in the year.

Figure 3a: Nitrogen Dioxide Monitoring 2007
(1-Hour Average Statistics)

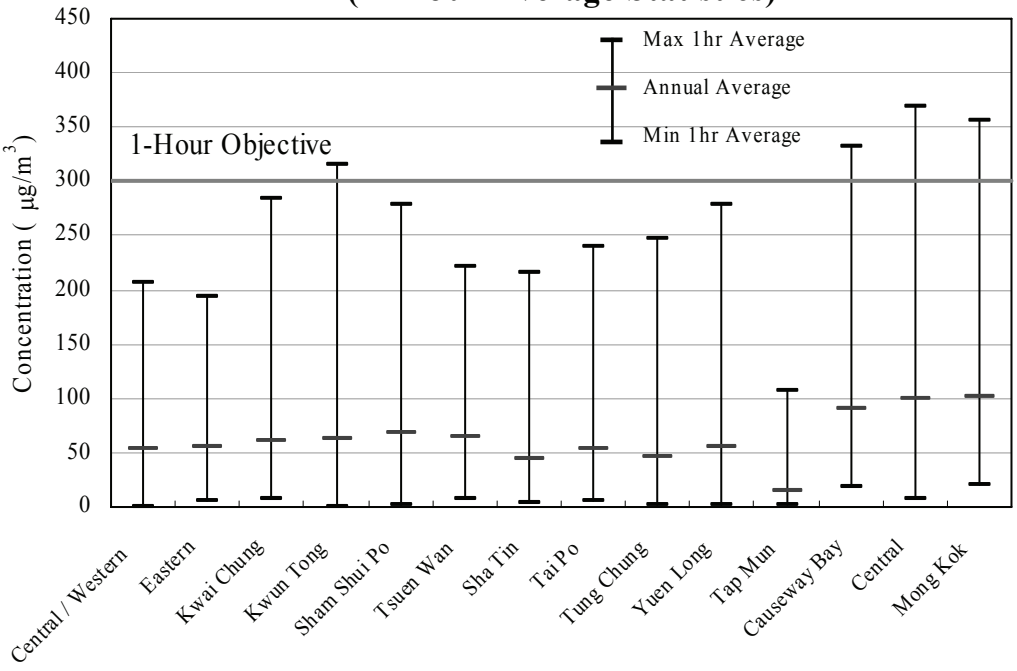


Figure 3b: Nitrogen Dioxide Monitoring 2007
(24-Hour Average Statistics)

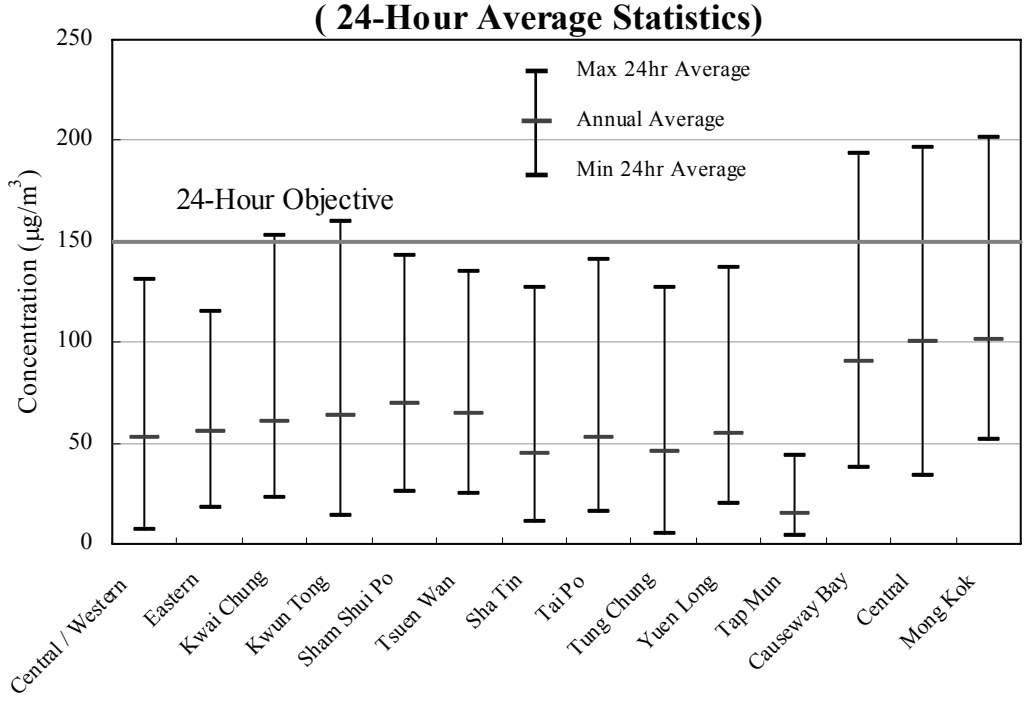
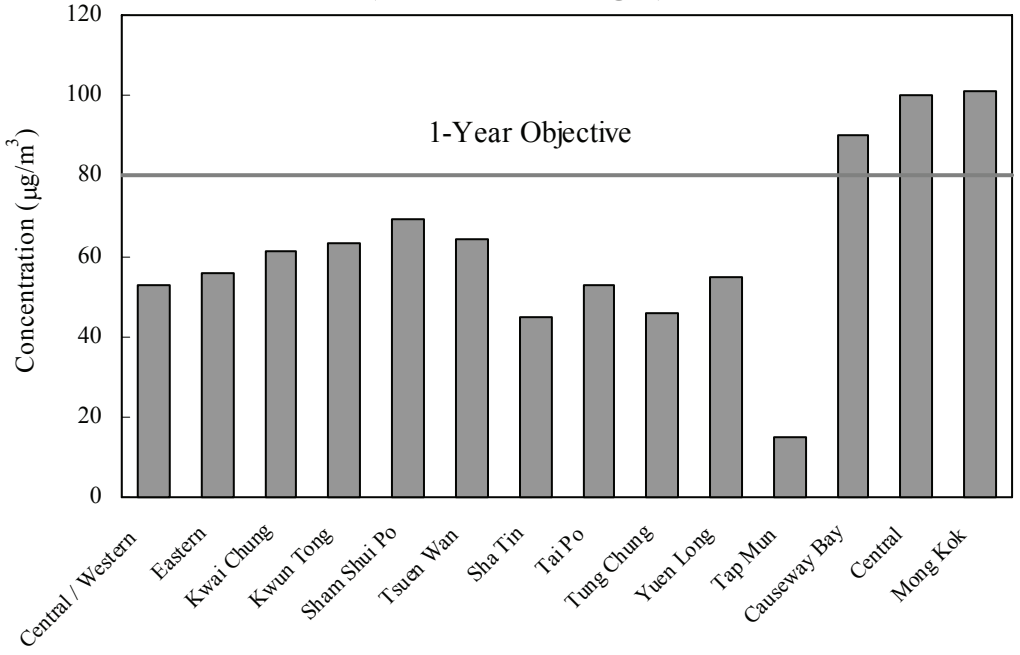


Figure 3c: Nitrogen Dioxide Monitoring 2007
(Annual Average)



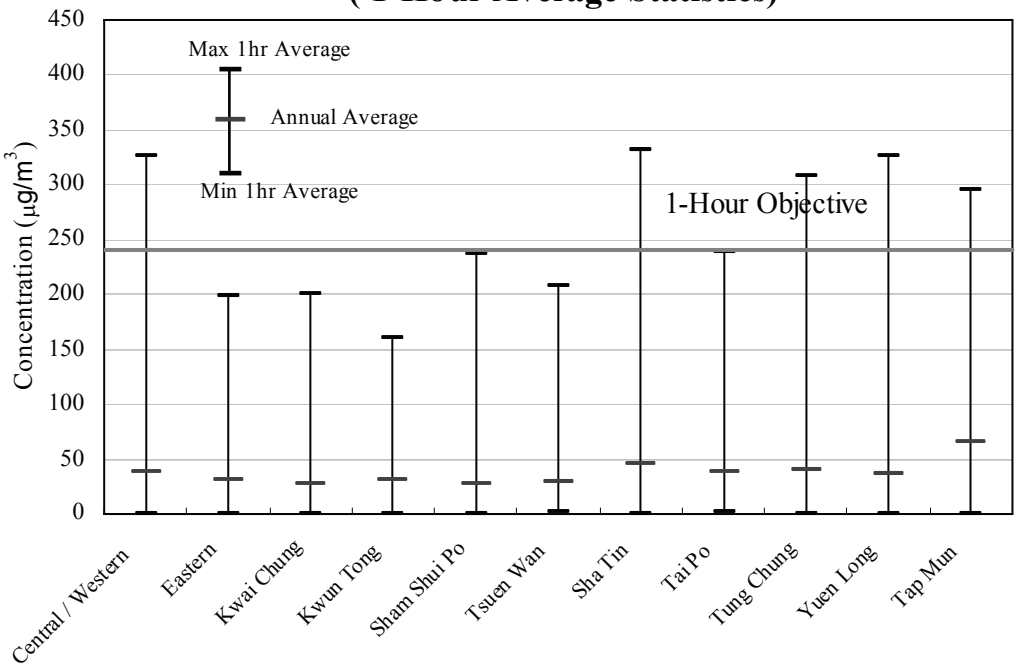
2.3 Ozone (O_3)

Ozone (O_3), a major constituent of photochemical smog, is formed by a series of complicated photochemical reactions of oxygen, nitrogen oxides and volatile organic compounds in the presence of sunlight and warm temperature. Being a strong oxidant, ozone can cause irritation to the eye, nose and throat even at low concentrations. At elevated levels, it can increase a person's susceptibility to respiratory infections and aggravate pre-existing respiratory illnesses such as asthma.

Among the 11 general stations with ozone measurement, five of them violated the 1-hour AQO in 2007. The highest 1-hour average (331 μg/m^3) was recorded at the Sha Tin station, followed closely by the Central/Western and Yuen Long stations (both at 327 μg/m^3).

In Hong Kong, elevated ozone incidents are mostly associated with very hot, fine and calm weather conditions in the region which favour the photochemical formation and accumulation of ozone. Such weather conditions mostly occur in summer and autumn, especially when Hong Kong and the Pearl River Delta Region is under the influence of subsiding air induced by a tropical cyclone located in the Western Pacific Ocean near Taiwan.

Figure 4a: Ozone Monitoring 2007
(1-Hour Average Statistics)



2.4 Carbon Monoxide (CO)

Carbon monoxide (CO) comes mainly from vehicular emissions although a small amount of which may also come from incomplete combustion of fuels from factories and power stations. When it enters the bloodstream, CO can reduce oxygen delivery to the body's organs and tissues. Typical symptoms of CO poisoning include shortness of breath, chest pain, headaches, and loss of co-ordination. The health threat from CO is more severe for those who suffer from heart disease.

Carbon monoxide was continuously monitored at 7 stations including 4 general stations and 3 roadside stations during 2007. Similar to previous years, both the ambient and roadside CO concentrations remained at a very low level throughout the year. All the 7 monitoring stations complied with the 1-hour and 8-hour AQOs for CO. In 2007, the highest 1-hour average (4600 $\mu g/m^3$) and the highest 8-hour average (3514 $\mu g/m^3$) were recorded at the Mong Kok and Tung Chung stations, respectively; these values were around 15% and 35% of the respective AQO limits.

Figure 5a: Carbon Monoxide Monitoring 2007
(1-Hour Average Statistics)

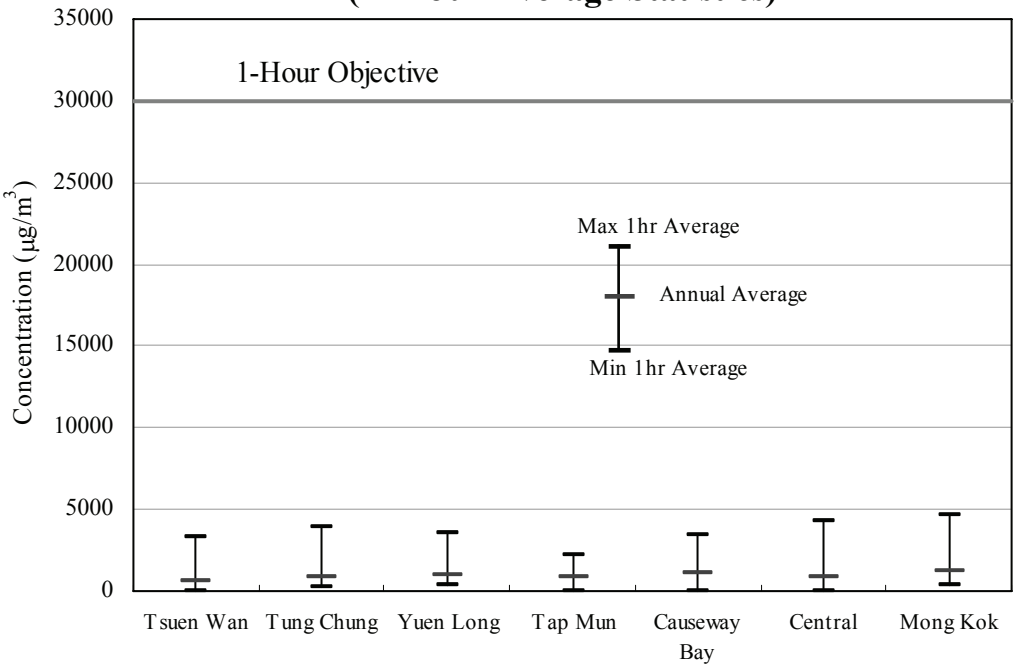
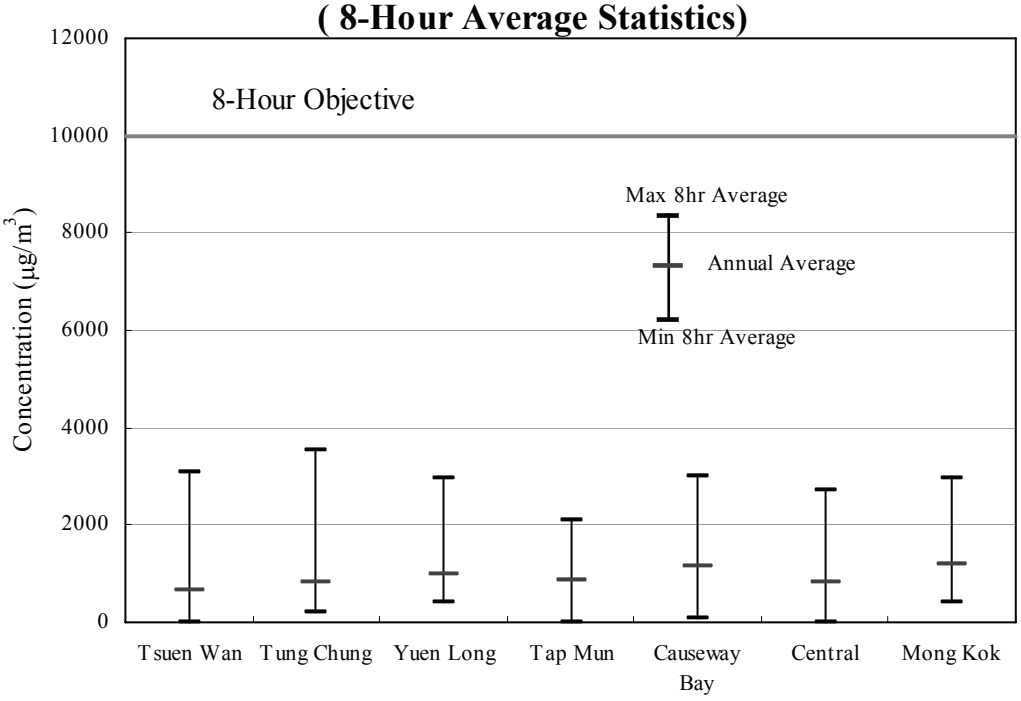


Figure 5b: Carbon Monoxide Monitoring 2007
(8-Hour Average Statistics)



3. Suspended Particulates

3.1 Total Suspended Particulates (TSP)

Total suspended particulates (TSP) are small airborne particulates such as dust, fume and smoke with diameters less than 100 micrometres. Major sources of TSP include power stations, construction activities and vehicle exhausts. TSP can be broadly divided into two major types. Suspended particulates with a nominal aerodynamic diameter of 10 micrometres or less are called respirable suspended particulates (RSP), or PM10 for short, and are usually of much greater health concern (see Section 3.2 below). On the other hand, suspended particulates that are larger than 10 micrometres in diameter mainly cause soiling and dust nuisance.

TSP measurement was conducted by sampling using High-volume samplers at 9 general stations and 1 roadside station during 2007.

The Yuen Long station was the only station failing to comply with the 24-hour AQO for TSP in 2007. It also recorded the highest 24-hour average (304 μg/m^3) in the year. Exceedance of the annual AQO for TSP (80 μg/m^3) was observed at the Mong Kok roadside station and 3 other general stations. As in the previous years, the highest annual average (115 μg/m^3) was recorded at the Mong Kok roadside station.

Figure 6a: TSP Monitoring 2007
(24-Hour Average Statistics)

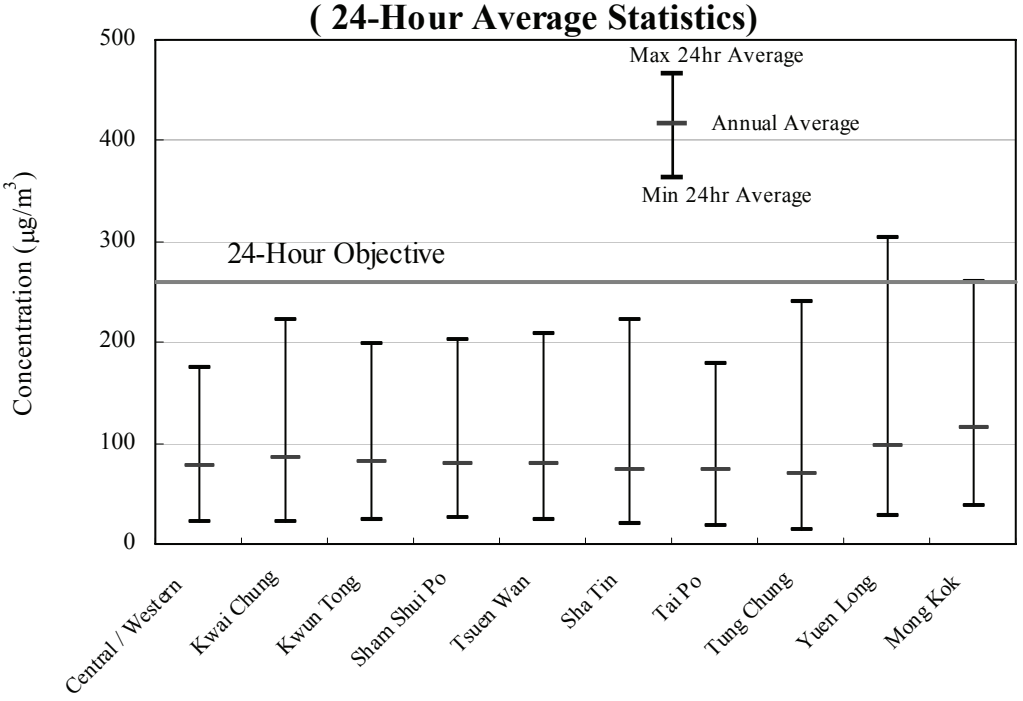
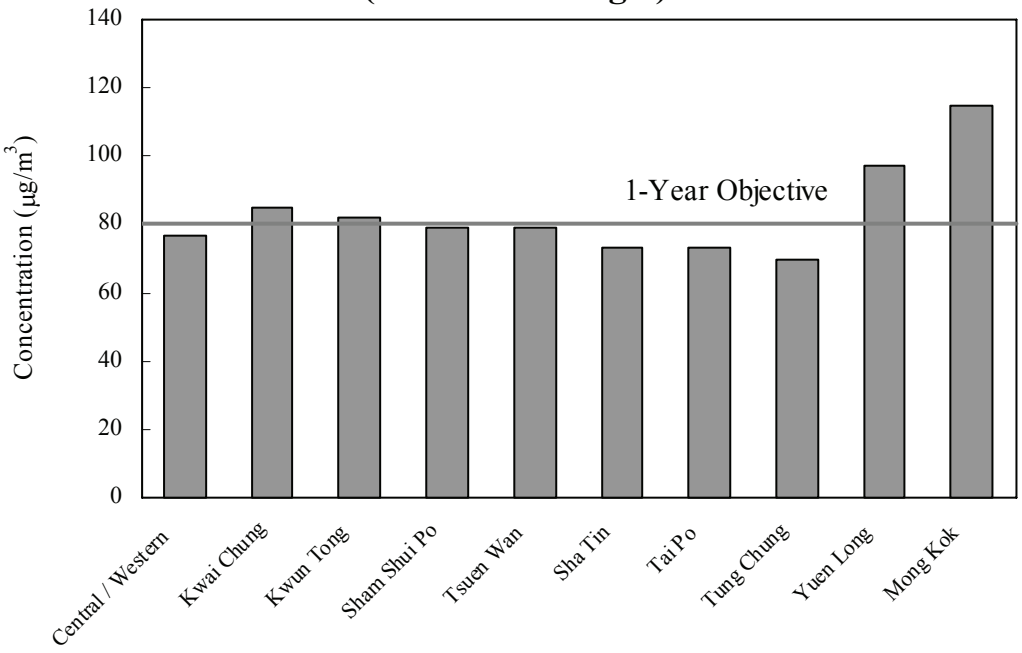


Figure 6b: TSP Monitoring 2007
(Annual Average)



3.2 Respirable Suspended Particulates (RSP)

Respirable suspended particulates (RSP) refer to those suspended particulates with nominal aerodynamic diameters of 10 micrometres or less. Combustion sources, in particular diesel vehicle exhaust and emissions from power plants, are the major sources of RSP in Hong Kong. Besides, RSP can be formed by atmospheric oxidation of sulphur dioxide and nitrogen oxides. Although to a lesser extent, crustal derived dust and marine aerosols are also sources of RSP.

RSP at high levels may cause chronic and acute effects on human health, particularly the pulmonary function, as they can penetrate deep into the lungs and cause respiratory problems. These effects are enhanced if high RSP levels are associated with higher levels of other pollutants, such as SO_2. The smaller particulates in RSP have a major impact on visibility.

RSP was continuously measured at all 14 monitoring stations during 2007. Most of these stations were also equipped with high-volume sampler to collect particulate samples for chemical analysis.

Among all 14 stations, the Causeway Bay, Tung Chung and Yuen Long stations failed to comply with the 24-hour AQO for RSP in 2007. Similar to last year, exceedances of the annual AQO limit for RSP (55 $\mu g/m^3$) were observed at the 3 roadside stations and 4 other general stations. In 2007, the highest annual average (85 $\mu g/m^3$) was measured at the Causeway Bay roadside station while Yuen Long station recorded the highest 24-hour average (207 $\mu g/m^3$).

Figure 7a: RSP Monitoring 2007
(24-Hour Average Statistics)

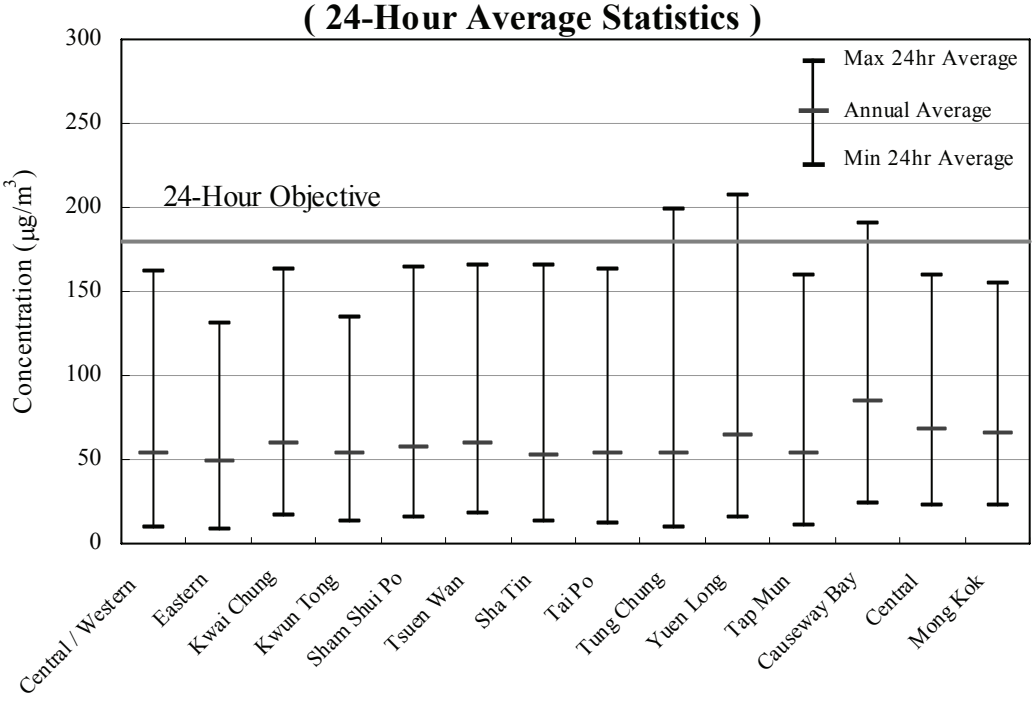
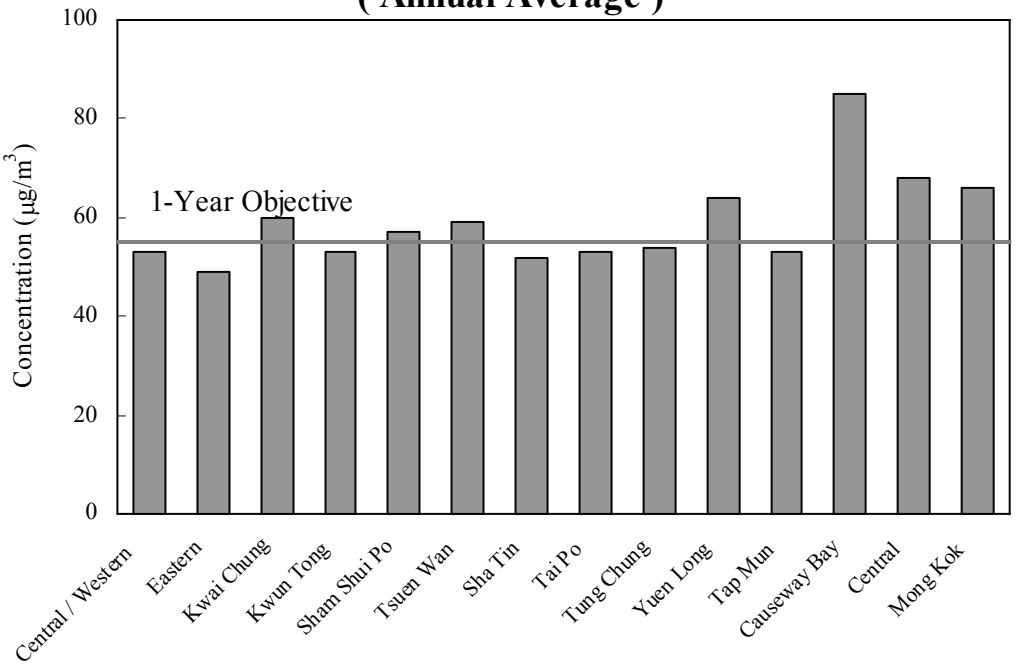


Figure 7b: RSP Monitoring 2007
(Annual Average)



3.3 Lead (Pb)

Lead is the only one criteria pollutant included in the AQO that is also a toxic air pollutant. In Hong Kong, the sale and supply of leaded petrol, which is a known major source of lead, was banned from 1 April 1999. As in previous years, the ambient lead concentrations continued to linger at very low levels during 2007. The overall 3-month averages, ranging from 9 ng/m^3 (Central/Western) to 180 ng/m^3 (Yuen Long), were well below the AQO limit of 1,500 ng/m^3.

4. Toxic Air Pollutants (TAPs)

Two groups of toxic air pollutants (TAPs), viz. heavy metals and organic substances, were regularly monitored at the Central/Western and Tsuen Wan stations since mid 1997. Among the various TAPs monitored in 2007, 8 of them are considered more important in terms of their health impacts and their annual averages are summarised in Table C8. Detailed description of the TAPs monitoring operation is given in Appendix B4. The monitoring data collected so far indicate that the levels of toxic air pollutants in Hong Kong are comparable to those observed in other major cities.

5. Variation of Air Pollution Levels over Time

The concentrations of air pollutants in the atmosphere can change over a day, over the months of a year and in the period of several years.

5.1 Over a Day

The concentrations of most air pollutants generally follow the diurnal pattern of human activities and traffic. For instance, higher levels of NO_2 and RSP are usually observed in the morning and the evening rush hours when there are more traffic and human activities. Likewise, the lowest concentrations often occur from midnight to dawn when the traffic is at its minimum. To no surprise, this type of traffic induced diurnal pattern is much more distinct for pollutant levels at roadside.

Figure 8: 2007 Diurnal variations of NO_2

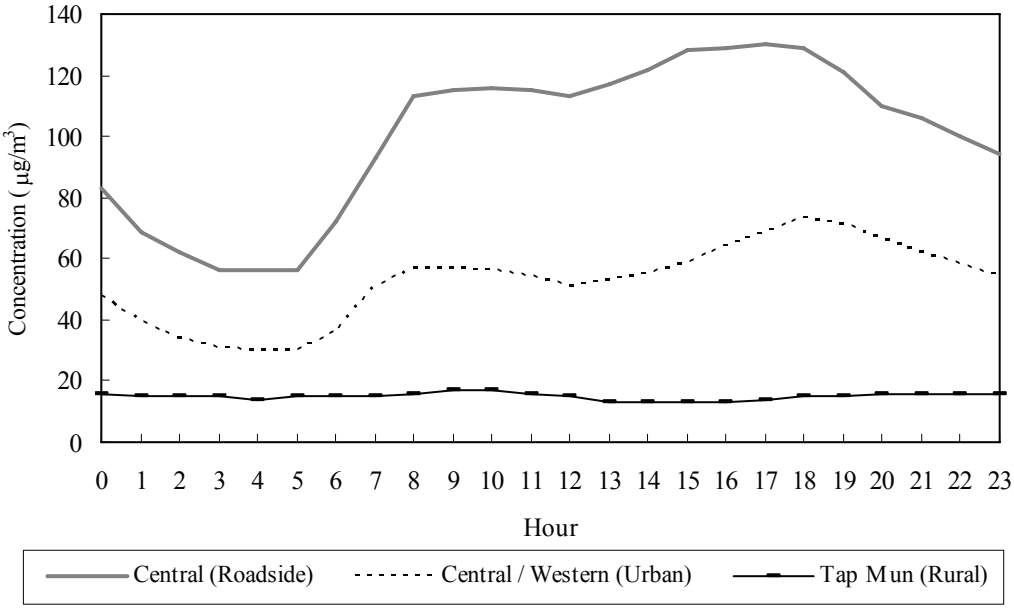
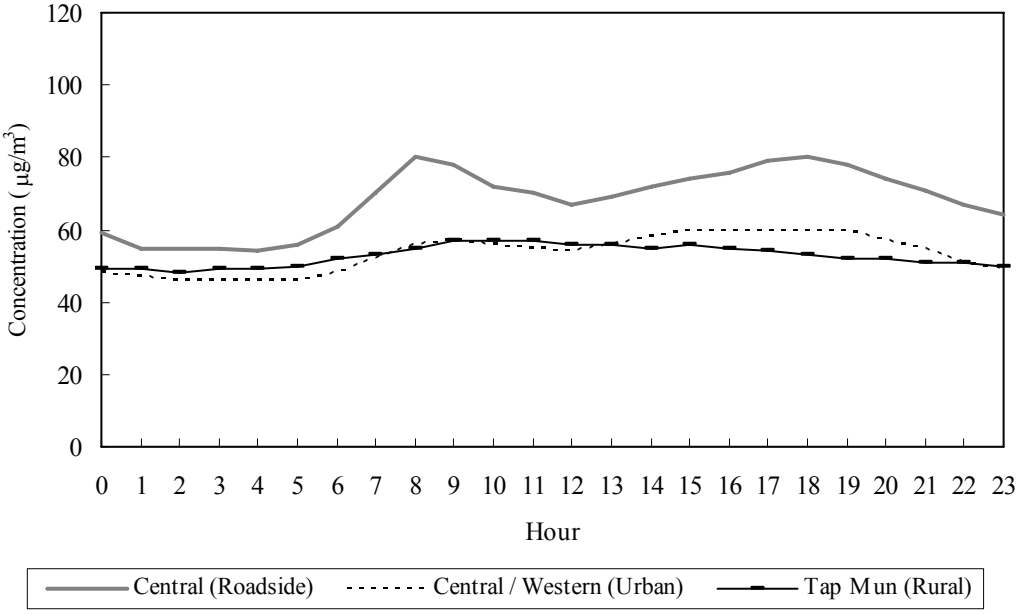
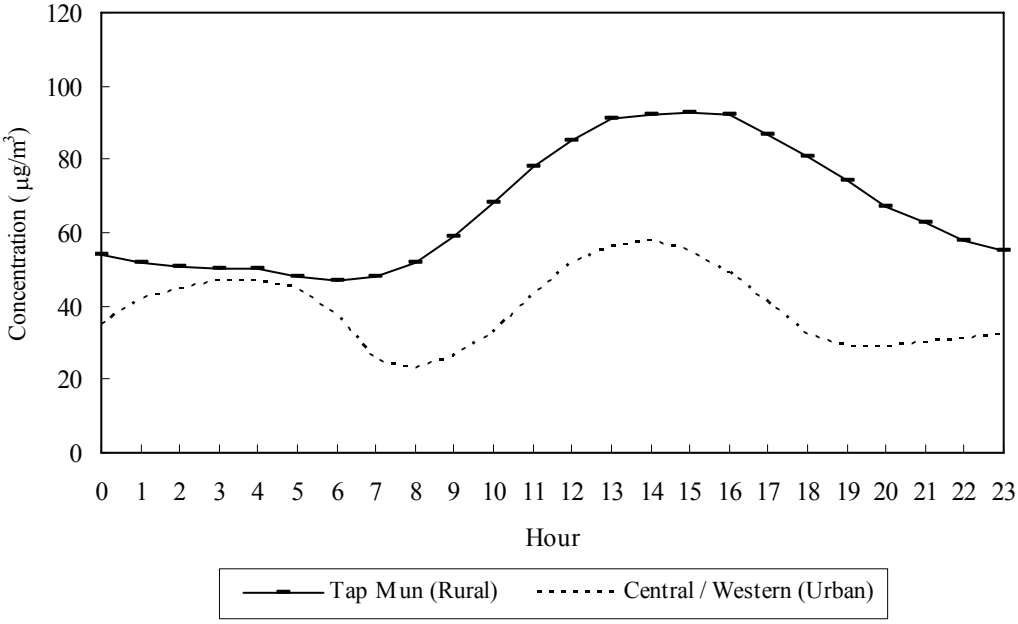


Figure 9: 2007 Diurnal variations of RSP



The diurnal pattern of ozone is different from that of NO_2 and RSP. Ozone is formed by photochemical reactions of its precursor pollutants such as NOx and volatile organic compounds (VOCs) under sunlight. Outside urban centres the ambient ozone levels start to build up before noon and peak in the afternoon, when precursor pollutants are accumulated and sunlight is strong. In urban areas, the lowest ozone concentrations are often observed during the rush hours. This is because a large amount of nitric oxide from the rush-hour traffic acts as an efficient scavenger of ozone, and sunlight is not strong enough for photochemical reactions to take place.

Figure 10: 2007 Diurnal variations of O_3



5.2 Over a Year

Concentrations of NO_2, RSP and O_3 are substantially lower in summer months (June to August) due to a number of reasons. The higher temperatures in summer months induce larger mixing heights, which favours the dispersion of pollutants. The rains in summer help to wash out pollutants more frequently. The south-westerly monsoon in summer also helps to replenish the region with cleaner oceanic air.

Figure 11: Monthly variations of NO_2 and RSP at Central / Western in 2007

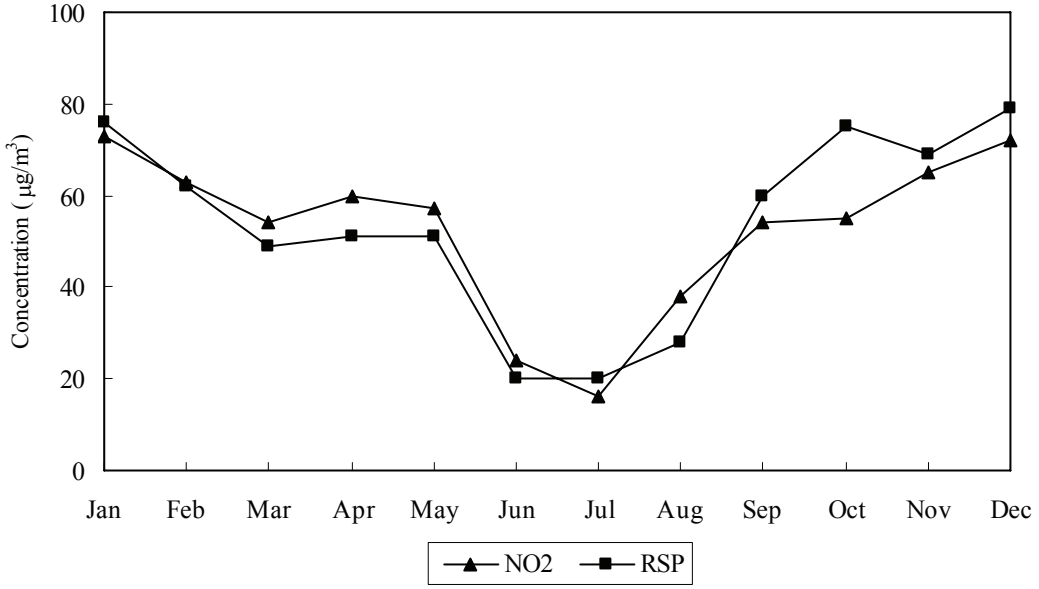
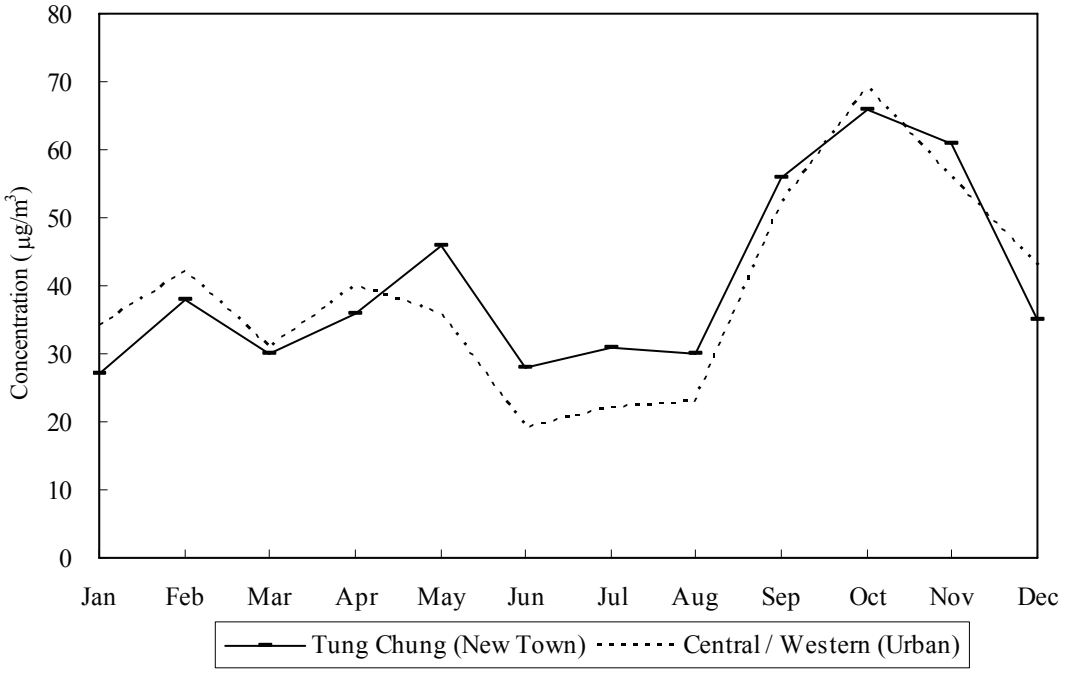


Figure 12: Monthly variations of O_3 in 2007



5.3 Long Term Trends

The long-term trends for the air pollutants presented in this section are based on their annual average concentrations recorded from the relevant air quality monitoring stations categorised into 4 groups of land use types, namely Urban, New Town, Rural and Roadside as defined in Table 1 below.

Table 1: Classification of Air Monitoring Stations by Land Use Types

Land Use Type	Land Use Characteristics	Air Monitoring Stations
Urban	Densely populated residential areas mixed with some commercial and/or industrial areas	Central/Western, Eastern, Kwai Chung, Kwun Tong, Sham Shui Po and Tsuen Wan
New Town	Mainly residential areas	Sha Tin, Tai Po, Tung Chung and Yuen Long
Rural	Rural areas	Tap Mun (background station)
Roadside[2]	Urban roadside in mixed residential/ commercial area with heavy traffic and surrounded by many tall buildings	Causeway Bay and Central

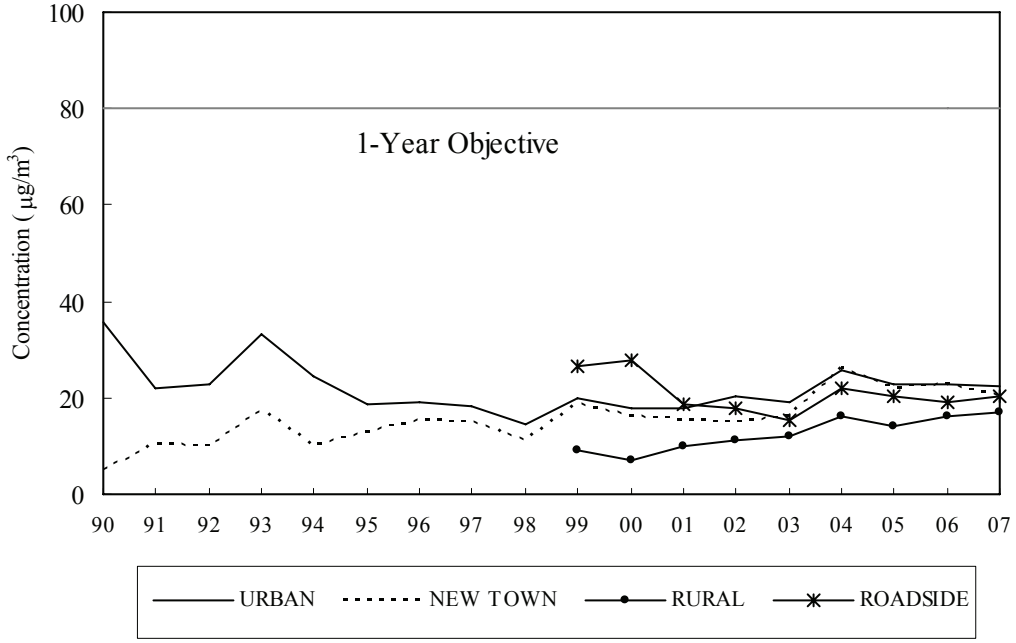
5.3.1 Sulphur Dioxide (SO_2)

Since the implementation of the Air Pollution Control (Fuel Restriction) Regulations in 1990 for restricting sulphur content of industrial fuels and the Air Pollution Control (Motor Vehicle Fuel) Regulations in 1995 for controlling motor vehicle fuel quality, SO_2 concentrations in Hong Kong have remained at levels well below the annual AQO limit of 80 $\mu g/m^3$.

As a result of the introduction of ultra low sulphur diesel for vehicle fleet in late 2000, the average SO_2 concentration at roadside in 2007 (21 $\mu g/m^3$) dropped by 22% as compared with the 1999 value (27 $\mu g/m^3$).

[2] The current Mong Kok roadside station, commissioned in 2001, is not included in the trend analysis due to its relatively short history of measurement as compared with other 2 roadside stations, viz. Causeway Bay and Central stations.

Figure 13: SO_2 long term trend

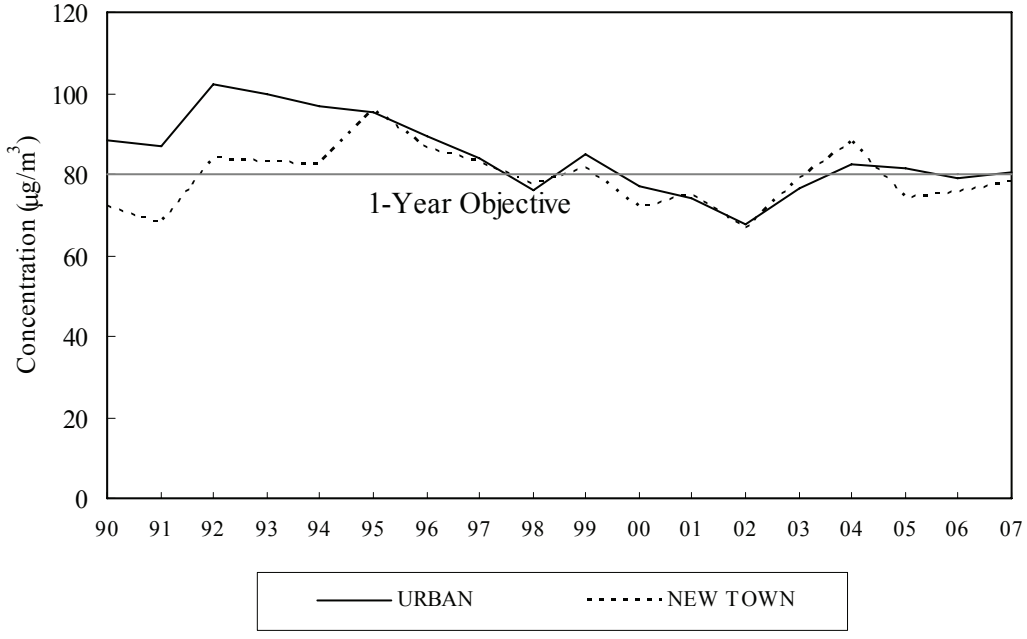


5.3.2 Total Suspended Particulates (TSP)

The TSP concentrations in the territory exhibited primarily declining trends from 1995 to 2002 but rebounded afterwards.

The moderate rising trends of the TSP concentrations in the territory since 2002 were mainly due to the increase in the regional background levels of TSP.

Figure 14: TSP long term trend

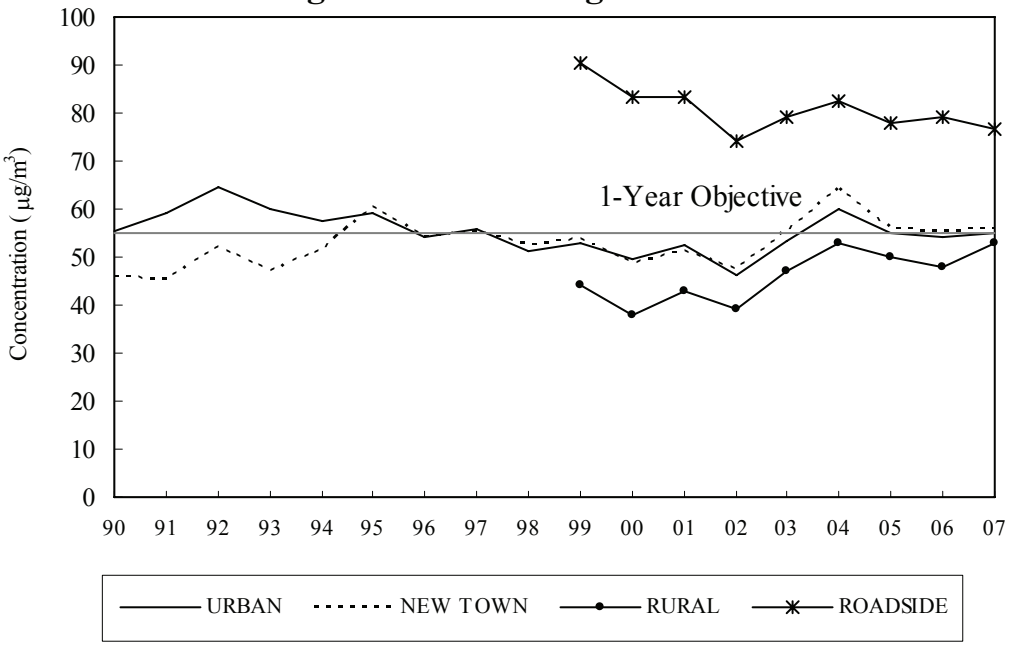


5.3.3 Respirable Suspended Particulates (RSP)

The concentrations of RSP in the territory showed a primarily downward trend between 1995 and 2002, followed by a rebound that peaked in 2004. The RSP concentrations then dropped and stablised at a level close to the annual AQO limit. Similar to TSP, the gentle rising trend of RSP in the territory since 2002 was mainly caused by the increase in its regional background levels.

In Hong Kong, high level of roadside RSP, caused mainly by the exhaust emissions of diesel vehicles, has long been a major air pollution concern. As a result of the implementation of various vehicle emission control measures in recent years, the annual average of RSP concentration at roadside in 2007 had reduced by 15% when compared with the 1999 value.

Figure 15: RSP long term trend



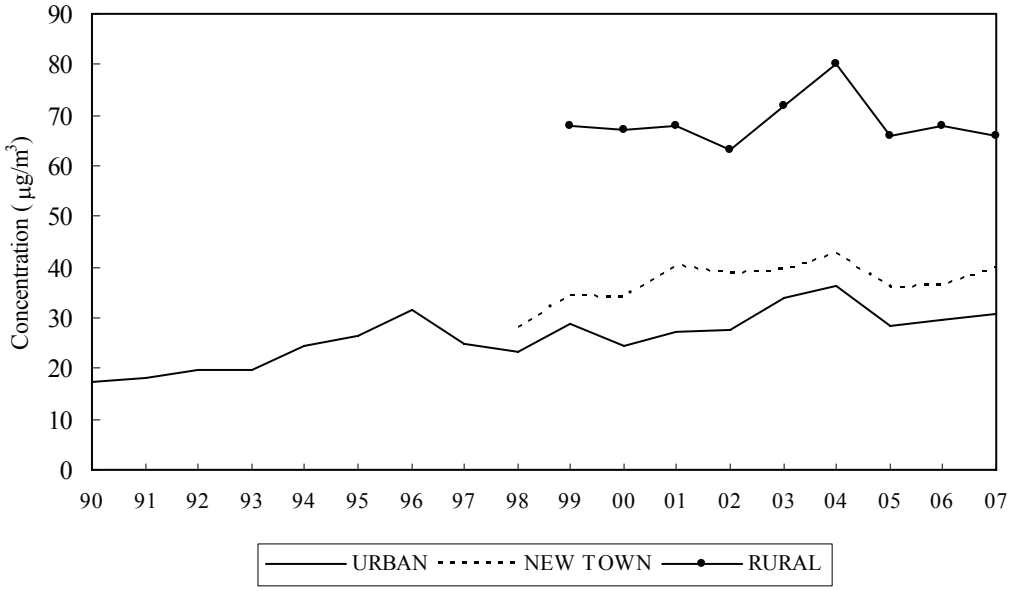
5.3.4 Ozone (O_3)

The ozone concentrations in the territory have shown a moderate upward trend since 1990.

Ozone is a regional air pollution issue. The rising trend of ozone generally reflects deterioration in air quality on a regional scale over the past years. The Hong Kong Special Administrative Region Government and Guangdong Provincial Government are implementing a regional air quality management plan to improve air quality in the Pearl River Delta region.

As nitric oxide emissions from motor vehicles can react with and remove ozone in the air, areas with heavy traffic normally have lower ozone levels than areas with light traffic. Hence, Tap Mun rural station has steadily recorded more than twice the ozone levels measured in urban areas since 1999.

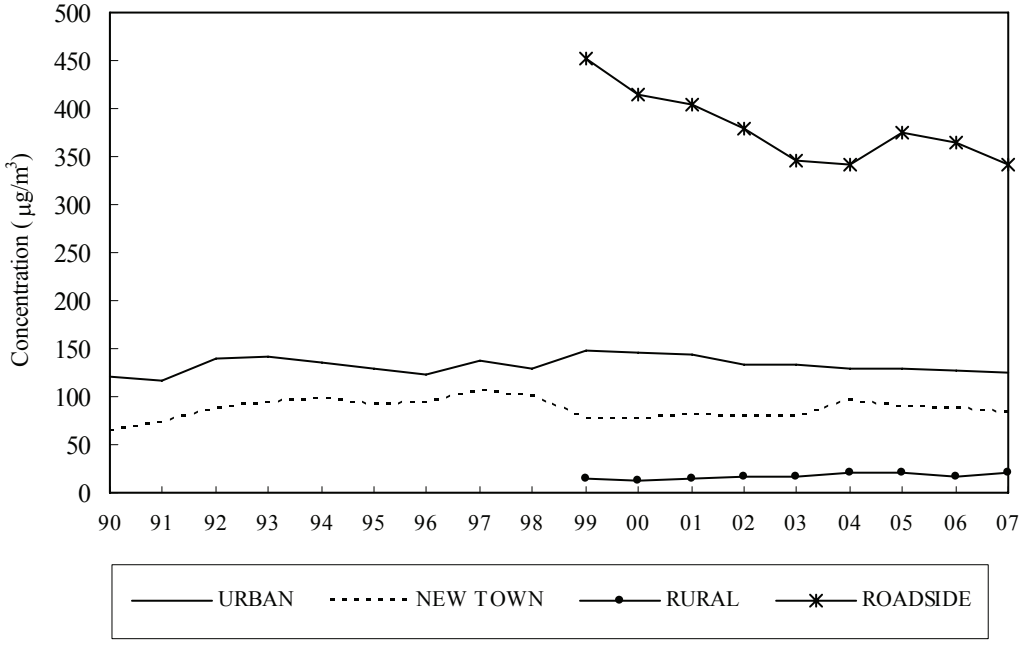
Figure 16: O_3 long term trend



5.3.5 Nitrogen Oxides (NO_x) and Nitrogen Dioxide (NO_2)

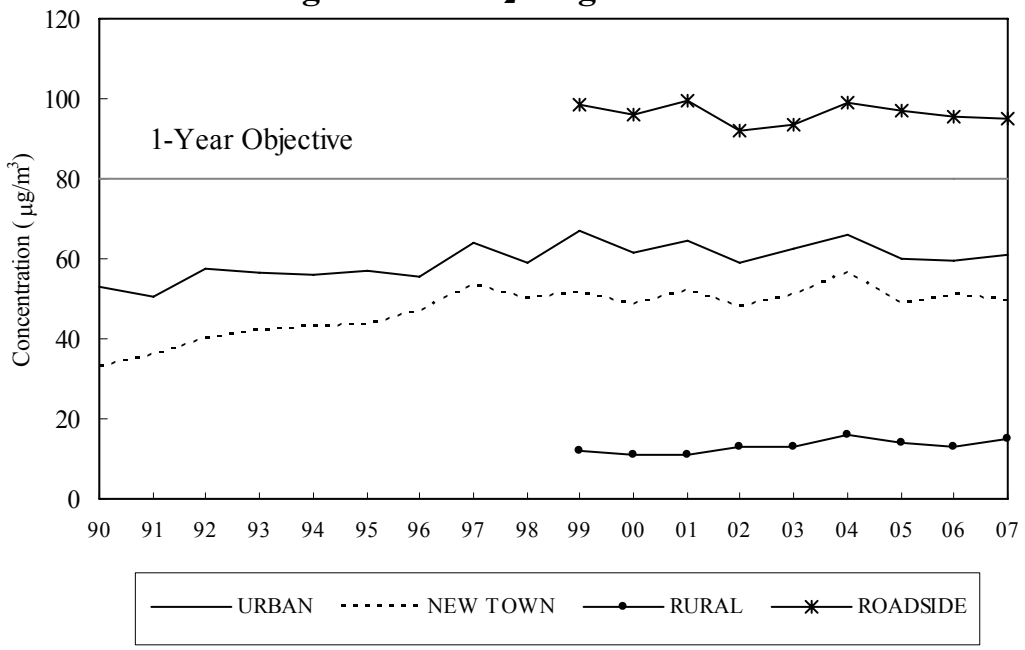
The annual average of NO_x in urban areas has remained quite constant over the past decade. During the same period, the roadside NO_x concentration has generally shown a decreasing trend, reflecting the successful reduction of vehicular NOx emission as a result of vehicle emission control measures implemented in the past few years. The roadside NOx concentration in 2007 was 24% lower than its 1999 value.

Figure 17: NOx long term trend



NO_2 is mainly formed from the oxidation of nitric oxide, a major component of NO_x. The oxidation can be promoted by the presence of more ozone and VOCs in the ambient air. Since 1990, the NO_2 levels in the territory have exhibited slow rising trends similar to those of ozone.

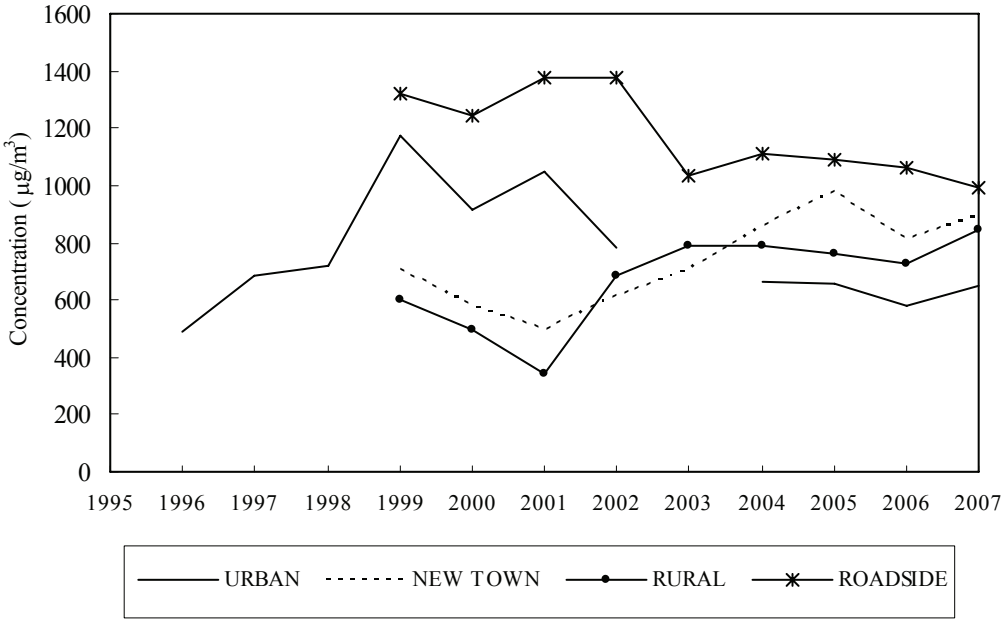
Figure 18: NO_2 long term trend



5.3.6 Carbon Monoxide (CO)

The concentrations of CO in Hong Kong remained at very low levels in the past several years. Even at the roadside close to the vehicular emission sources, the CO levels were well within the 1-hour AQO (30,000 μg/m^3) and 8-hour AQO (10,000 μg/m^3) levels.

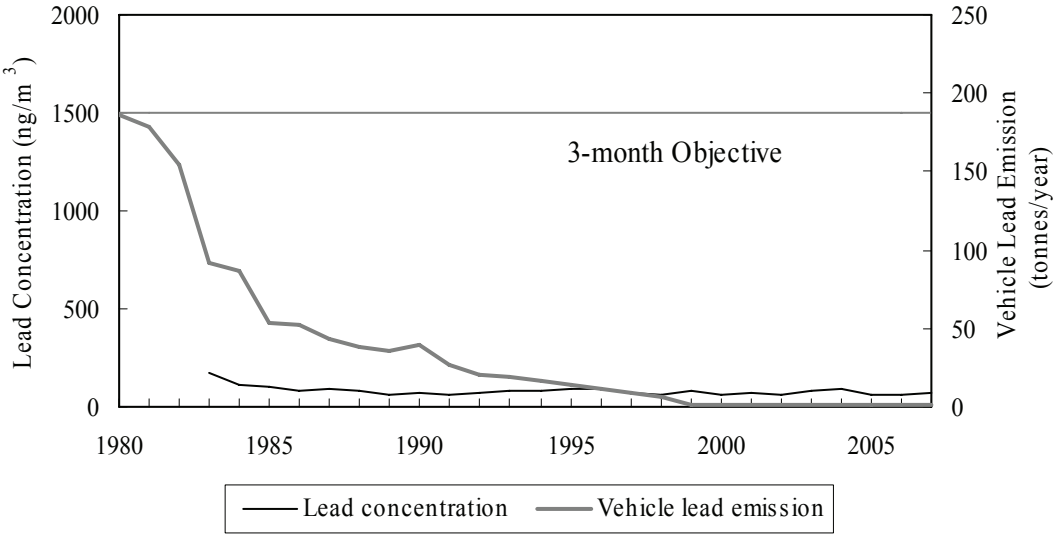
Figure 19: CO long term trend



5.3.7 Lead (Pb)

The ambient lead concentrations have been lingering at very low levels since the oil companies took voluntary action in reducing the lead content of petrol in the early eighties. Lead emissions from motor vehicles were further reduced as a result of the introduction of unleaded petrol in April 1992 and completely eliminated when the sale and supply of leaded petrol was banned in April 1999.

Figure 20 : Vehicle lead emission and lead concentration



Appendix A

Air Quality Objectives and their Compliance Status

Established in 1987, the Hong Kong Air Quality Objectives (AQO) for seven major air pollutants were set at levels to protect public health. The compliance status of the AQO has been used as the indicator of air quality in different districts in Hong Kong.

Table A1: Hong Kong Air Quality Objectives (AQO)

Concentration in micrograms per cubic metre [1]

Pollutant	Averaging Time				
	1 hour[2]	**8 hours[3]**	**24 hours[3]**	**3 months[4]**	**1 year[4]**
Sulphur dioxide (SO_2)	800		350		80
Total suspended particulates (TSP)			260		80
Respirable suspended particulates (RSP) [5]			180		55
Nitrogen dioxide (NO_2)	300		150		80
Carbon monoxide (CO)	30000	10000			
Photochemical oxidants (as ozone (O_3) [6])	240				
Lead (Pb)				1.5	

[1] Measured at 298K (25°C) and 101.325 kPa (one atmosphere).
[2] Not to be exceeded more than three times per year.
[3] Not to be exceeded more than once per year.
[4] Arithmetic means.
[5] Respirable suspended particulates mean suspended particulates in air with a nominal aerodynamic diameter of 10 micrometres or smaller.
[6] Photochemical oxidants are determined by measurement of ozone only.

Table A2: Percentage Time in compliance with Short-Term Air Quality Objectives in 2007

Station		O_3	NO_2		TSP	RSP	SO_2		CO	
		1-hr	**1-hr**	**24-hr**	**24-hr**	**24-hr**	**1-hr**	**24-hr**	**1-hr**	**8-hr**
General Station	Central/Western	99.94	100	100	100	100	100	100	--	--
	Eastern	100	100	100	--	100	100	100	--	--
	Kwai Chung	100	100	99.73	100	100	100	100	--	--
	Kwun Tong	100	99.98	99.72	100	100	100	100	--	--
	Sham Shui Po	100	100	100	100	100	100	100	--	--
	Tsuen Wan	100	100	100	100	100	100	100	100	100
	Sha Tin	99.88	100	100	100	100	100	100	--	--
	Tai Po	100	100	100	100	100	100	100	--	--
	Tung Chung	99.87	100	100	100	99.41	100	100	100	100
	Yuen Long	99.86	100	100	98.39	99.18	100	100	100	100
	Tap Mun	99.83	100	100	--	100	100	100	100	100
Roadside Station	Causeway Bay	--	99.93	95.84	--	99.44	100	100	100	100
	Central	--	99.90	91.69	--	100	100	100	100	100
	Mong Kok	--	99.91	95.04	100	100	100	100	100	100

Notes: "--" *Not measured*

Compliance with the short-term AQO

Table A2 shows the percentage time of compliance with the short-term AQO (i.e. 1-hour and 24-hour AQO) recorded at each of the monitoring stations in 2007. For NO_2, the compliance percentages of the 24-hour AQO were above 99% for general stations and between 91 to 96% for roadside stations; its 1-hour AQO compliance rates were above 99% at all stations. Regarding RSP, the compliance percentages for its 24-hour AQO were above 99% at all stations. The compliance levels of 1-hour AQO for O_3 were also over 99% at all monitoring stations. For TSP, the compliance percentage of its 24-hr AQO was between 98% and 100% at various stations. As in previous years, all monitoring stations achieved full compliance with the short-term AQO for SO_2 and CO in 2007.

Compliance with the long-term AQO

Table A3 shows the compliance status of the long-term (annual) AQO for all 14 monitoring stations in 2007. Similar to previous years, all monitoring stations achieved full compliance with the long-term AQO for SO_2 and lead in 2007. Compliance with the annual AQO for NO_2 was recorded at 11 out of 14 stations, same as 2006. The compliance rates for RSP and TSP in 2007 were also same as in 2006. For RSP, half of the 14 stations complied with the annual AQO while there were 6 out of 10 stations for TSP.

Table A3: Compliance Status of Long-Term (Annual) Air Quality Objectives in 2007

Station		NO_2	TSP	RSP	SO_2	Lead
		1-year	1-year	1-year	1-year	3-months
General Station	Central/Western	✓	✓	✓	✓	✓
	Eastern	✓	--	✓	✓	--
	Kwai Chung	✓	×	×	✓	✓
	Kwun Tong	✓	×	✓	✓	✓
	Sham Shui Po	✓	✓	×	✓	--
	Tsuen Wan	✓	✓	×	✓	✓
	Sha Tin	✓	✓	✓	✓	--
	Tai Po	✓	✓	✓	✓	--
	Tung Chung	✓	✓	✓	✓	✓
	Yuen Long	✓	×	×	✓	✓
	Tap Mun	✓	--	✓	✓	--
Roadside Station	Causeway Bay	×	--	×	✓	--
	Central	×	--	×	✓	--
	Mong Kok	×	×	×	✓	✓

Notes: "✓" *Complied with the AQO* "×" *Violated the AQO* "--" *Not measured*

Appendix B

Air Quality Monitoring Operation

B.1 Network Operation

The air quality monitoring network of 14 monitoring stations is operated by the Air Science Group of the Environmental Protection Department. The measurement of ambient concentrations of total suspended particulates (TSP), respirable suspended particulates (RSP), sulphur dioxide (SO_2), nitrogen dioxide (NO_2), ozone (O_3) and carbon monoxide (CO) have been accredited by the Hong Kong Laboratory Accreditation Scheme (HOKLAS) since August 1995.

In order to provide good representation of the air quality in areas of high population density, the locations of the 14 monitoring stations were carefully chosen by referencing to the United States Environmental Protection Agency's (USEPA) guidelines with practical consideration of the unique congested high-rise development of Hong Kong.

The details for the parameters monitored at each monitoring station and a list of equipment employed for measuring the air pollutants are summarised in Tables B2 and B3 respectively. In general, the concentration of gaseous pollutants and RSP are determined continuously by automatic analysers. Manually operated high volume samplers using the gravimetric methods are also used regularly to measure the TSP and RSP. In addition, meteorological parameters, including temperature and solar radiation, wind speed and direction, are also recorded continuously at each station as appropriate.

Wet and dry deposition samples are collected at 3 stations: Central/Western, Kwun Tong and Yuen Long. The parameters measured for all wet and dry samples include: pH, Na^+, K^+, NH_4^+, NO_3^-, SO_4^{2-}, Cl^-, F^-, Ca^{2+}, Mg^{2+}, formate and acetate in the filtrate.

B.2 Data Processing and Dissemination

At each monitoring station, signals from the continuous analysers and the meteorological instruments are first stored in a data logger and then sent back to the Data Processing Unit of the Air Science Group via dedicated telephone lines for further processing. After careful checking and validation, the monitoring data are disseminated to the public in the following manner:-

- Monthly release of the monitoring data recorded at the Mong Kok, Kwai Chung and Central/Western stations (up to June 1998)
- Monthly release of the Air Pollution Index (API) summary for all monitoring stations (since July 1998)
- Daily API reporting and forecast for three categories of land-use areas, viz., urban, industrial, and new development (from 6 June 1995 to 14 June 1998)
- Daily API reporting and forecast for individual station (from 15 June 1998 to 30 June 1999)
- Hourly API reporting for individual station (since 1 July 1999)
- Reporting of monitoring data in the annual reports "*Air Quality in Hong Kong"* and "*Environment Hong Kong"*
- Ad hoc provision of air quality data to the public, academics and environmental consultants upon request for the purposes of research and air quality assessment

- Establishment of the Environmental Protection Interactive Centre (EPIC) for the public to download air quality monitoring data (since March 2004)
  (http://www.epd.gov.hk/epd/epic/english/epichome.html)

The reporting and forecast of API will help the public (particularly susceptible groups such as the elderly, children and people with heart or respiratory illness) to decide on taking precautionary measures when necessary. The monitoring results are also regularly used to assist the formulation of air quality management plans and the evaluation on the effectiveness of the current air pollution control programmes.

B.3 Quality Control and Assurance

A quality policy is adopted to ensure that ambient air quality monitoring results from the monitoring stations attain a high degree of accuracy and precision. A quality system has been established in accordance with the HOKLAS criteria.

The accuracy of the monitoring network is assessed by performance audits. Similar to overseas standards, control limits of ±15% and ±10% are adopted for the gaseous pollutants and particulates respectively. In 2007, 459 audit checks were carried out on the stations' analysers and samplers. As shown in Figure B1 and based on the 95% probability limits, the accuracy of the network was within the specified control limits.

The precision, a measure of the repeatability, of the measurements is checked in accordance with EPD's quality manuals. In 2007, 2003 precision checks were carried out on the analysers and samplers. As shown in Figure B2 and based on the 95% probability limits, the precision of the network varied between -8.1 % and 7.3 %, which was again within target limits.

In addition to the above operation, a system audit to review the quality assurance activities is carried out on an annual basis on the monitoring network. A report outlining the deficiencies and corrective actions is compiled at the end of the audit.

B.4 Toxic Air Pollutants Monitoring Operation

The Air Science Group has installed in July 1997 additional monitoring facilities at the Tsuen Wan and Central/Western stations to measure regularly the levels of Toxic Air Pollutants (TAPs) in Hong Kong. The TAPs being monitored can be broadly classified as volatile organic compounds (e.g. benzene, perchloroethylene and 1,3-butadiene), dioxins and furans (e.g. 2,3,7,8-TCDF and 2,3,7,8-TCDD), carbonyl compounds (e.g. formaldehyde), polycyclic aromatic hydrocarbons (e.g. benzo(a)pyrene), and hexavalent chromium. Five distinct methods were used to analyse the collected samples for target TAPs (please refer to Table B4 for details). All these methods have stringent QA/QC criteria to ensure the data quality. Sampling media used include stainless steel canisters, Sep-Pak cartridges, polyurethane foams and bicarbonate impregnated filters. TAP samples are analysed by the Government Laboratory.

Table B1. Fixed Network Monitoring Stations: Site Information

Monitoring Station	Address	Area Type	Sampling Height (Above P.D.H.K.)	Above Ground	Date Start Operation
Central/Western (Upper Level Police Station)	1 High Street, Sai Ying Pun	Urban : Mixed residential/commercial	78m	18m (4 floors)	Nov 83
Eastern (Sai Wan Ho Fire Station)	20 Wai Hang Street, Sai Wan Ho	Urban : Residential	28m	15m (4 floors)	Jan 99
Kwai Chung (Kwai Chung Police Station)	999 Kwai Chung Road, Kwai Chung	Urban : Mixed residential/ commercial/industrial	19m	13m (2 floors)	Jan 99
Kwun Tong (City District Office)	6 Tung Yan Street, Kwun Tong	Urban : Mixed residential/ commercial/industrial	34m	25m (6 floors)	Jul 83
Sham Shui Po (Police Station)	37A Yen Chow Street, Sham Shui Po	Urban : Mixed residential/commercial	21m	17m (4 floors)	Jul 84
Tsuen Wan (Princess Alexandra Community Centre)	60 Tai Ho Road, Tsuen Wan	Urban : Mixed residential/ commercial/industrial	21m	17m (4 floors)	Aug 88
Sha Tin (Sha Tin Govt. Secondary School)	11-17 Man Lai Road, Tai Wai, Sha Tin	New Town : Residential	31m	25m (6 floors)	Jul 91
Tai Po (Tai Po Govt. Office Bldg.)	1 Ting Kok Road, Tai Po	New Town : Residential	31m	25m (6 floors)	Feb 90
Tung Chung (Tung Chung Health Centre)	6 Fu Tung Street, Tung Chung	New Town : Residential	34.5m	27.5m (4 floors)	Apr 99
Yuen Long (Yuen Long District Branch Offices Bldg.)	269 Castle Peak Road Yuen Long	New Town : Residential	31m	25m (6 floors)	July 95
Tap Mun (Tap Mun Police Station)	Tap Mun	Background : Rural	26m	11m (3 floors)	Apr 98
Causeway Bay	1 Yee Woo Street, Causeway Bay	Urban Roadside : Busy commercial/residential area surrounded by many tall buildings	6.5m	3m	Jan 98
Central	Junction of Des Voeux Road Central and Chater Road, Central	Urban Roadside : Busy commercial/financial area surrounded by many tall buildings	8.5m	4.5m	Oct 98
Mong Kok	Junction of Nathan Road and Lai Chi Kok Road	Urban Roadside : Busy commercial/residential area surrounded by many tall buildings	8.5m	3m	Jan 01

Note: P.D. = Principal Datum

Table B2. Summary of the Parameters Monitored in the Network (2007)

	PARAMETERS									
STATIONS	SO_2	NO_x	NO	NO_2	CO	O_3	RSP		TSP	MET[3]
							Cont [1]	Hi-Vol [2]		
Central/Western	✓	✓	✓	✓		✓	✓	✓	✓	✓
Eastern	✓			✓		✓	✓			✓
Kwai Chung	✓	✓	✓	✓		✓	✓		✓	✓
Kwun Tong	✓	✓	✓	✓		✓	✓	✓	✓	✓
Sham Shui Po	✓	✓	✓	✓		✓	✓	✓	✓	✓
Tsuen Wan	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Sha Tin	✓	✓	✓	✓		✓	✓		✓	✓
Tai Po	✓			✓		✓	✓		✓	✓
Tung Chung	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Yuen Long	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Tap Mun	✓	✓	✓	✓	✓	✓	✓			
Causeway Bay	✓	✓	✓	✓	✓		✓			
Central	✓	✓	✓	✓	✓		✓			
Mong Kok	✓	✓	✓	✓	✓		✓	✓	✓	✓

Note:
[1] "Cont" denotes continuous monitoring.
[2] "Hi-Vol" denotes high-volume sampling.
[3] "MET" denotes meteorological parameters such as temperature, wind speed, wind direction, etc.

Table B3 List of Equipment Used in Measuring Air Pollutant Concentration

Pollutants	**Measurement Principle**	**Commercial Instrument**
SO_2	UV fluorescence	TECO 43A API 100E
NO, NO_2, NO_x	Chemiluminescence	API 200A
O_3	UV absorption	API 400, API 400A
SO_2, NO_2, O_3	Differential Optical Absorption Spectroscopy	Opsis AR 500 System
CO	Non-dispersive infra-red absorption with gas filter correlation	TECO 48C, API 300
TSP	Gravimetric	General Metals 2310
RSP	a) Gravimetric b) Oscillating microbalance	Graseby Andersen PM10 R&P TEOM Series 1400a-AB-PM10

Table B4 Sampling and Analysis Methods Used in Measuring Toxic Air Pollutants

Toxic Air Pollutants	Sampling and Analysis method	Sampling Instrument	Sampling Media	Sampling Schedule	Sampling Period
Benzene	USEPA Method TO-14A	Xontech 910A / RM 910A	Canister	Twice per month	24 hours
Perchloroethylene	USEPA Method TO-14A	Xontech 910A / RM 910A	Canister	Twice per month	24 hours
1,3-Butadiene	USEPA Method TO-14A	Xontech 910A / RM 910A	Canister	Twice per month	24 hours
Formaldehyde	USEPA Method TO-11A	Xontech 925 / RM 925	DNPH coated silica gel cartridge	Once per month	24 hours
Benzo(a)pyrene	USEPA Method TO-13	Graseby GPS1 / Tisch TE-1000	Quartz fibre filter and polyurethane foam with XAD-2 resin	Once per month	24 hours
Dioxin	USEPA Method TO-9A	Graseby GPS1 / Tisch TE-1000	Quartz fibre filter and polyurethane foam	Once per month	24 hours
Hexavalent Chromium	CARB SOP MLD 039	Xontech 920	Bicarbonate Impregnated Filter	Once per month	24 hours

Figure B1: Accuracy of Air Quality Monitoring Network, 2007

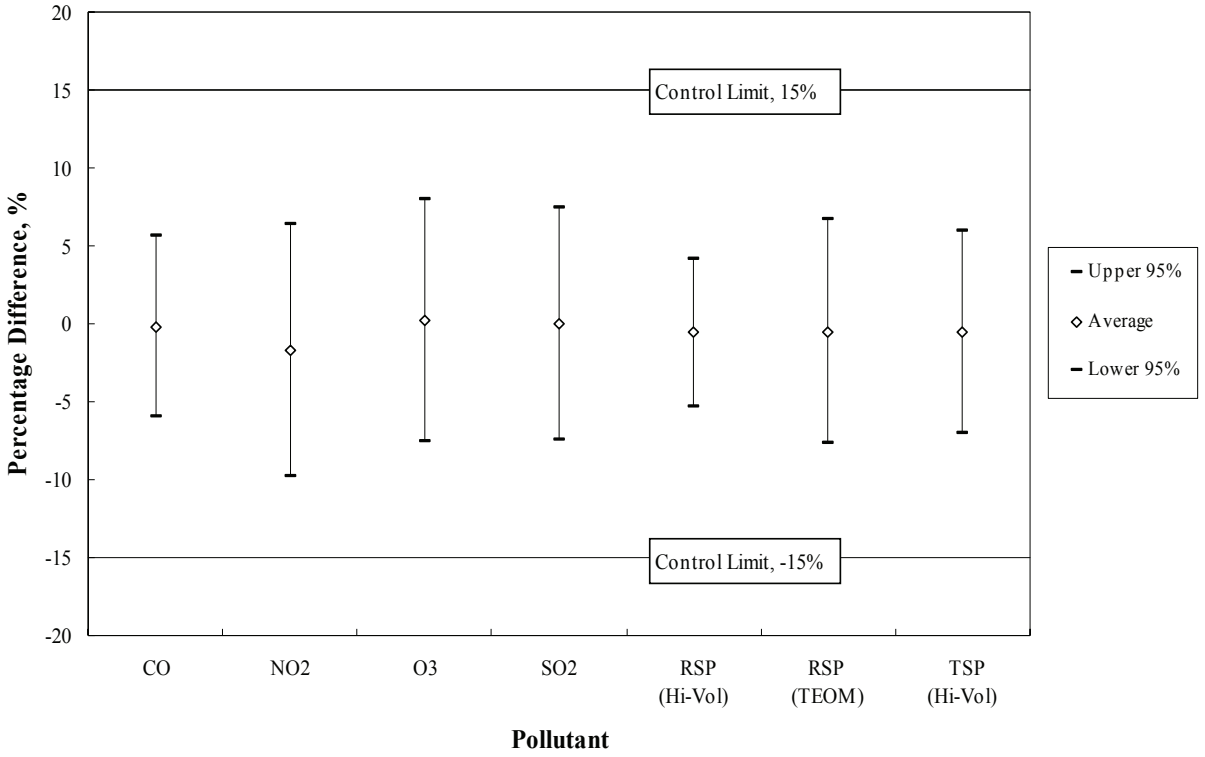
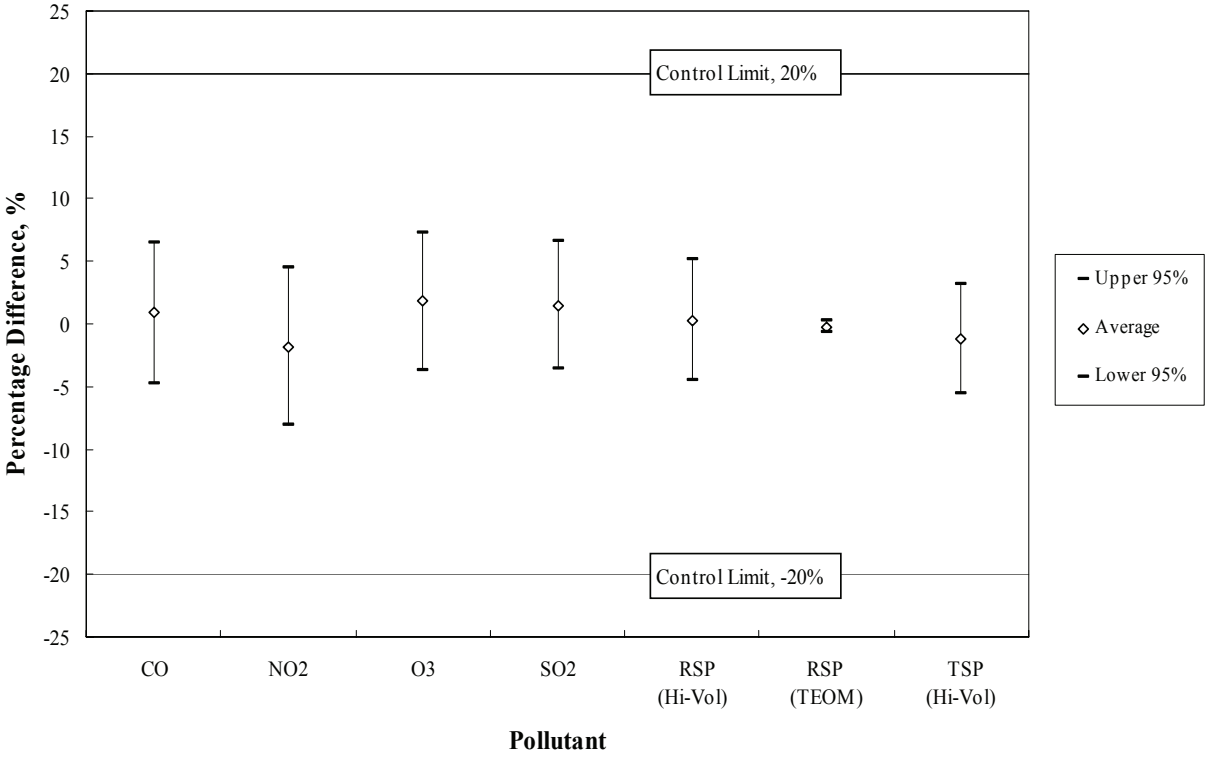


Figure B2: Precision of Air Quality Monitoring Network, 2007



Note: The Control Limits for RSP and TSP are ±10% for both Accuracy and Precision.

Appendix C

Tables of Air Quality Data

Table No.	Title
C1.	The highest 4 hourly pollutant concentrations measured in 2007
C2.	The highest 2 daily pollutant concentrations measured in 2007
C3.	2007 Monthly and annual averages of gaseous pollutants
C4.	2007 Monthly and annual averages of particulate pollutants
C5.	2007 Hourly Statistics of major air pollutants
C6.	2007 Total wet and dry deposition
C7.	2007 Diurnal variations of air pollutant
C8.	2007 Ambient levels of toxic air pollutants

TABLE C1: THE HIGHEST 4 HOURLY POLLUTANT CONCENTRATIONS MEASURED IN 2007

Pollutant: Sulphur Dioxide *
(1-hour AQO = 800)

Station	1st High	2nd High	3rd High	4th High
Central / Western	566	552	479	311
Eastern	466	269	248	235
Kwai Chung	219	205	201	199
Kwun Tong	375	281	276	261
Sham Shui Po	348	312	273	231
Tsuen Wan	245	237	210	206
Sha Tin	219	187	169	158
Tai Po	179	178	168	157
Tung Chung	259	254	216	208
Yuen Long	326	321	316	258
Tap Mun	235	206	204	181
Causeway Bay	300	221	221	212
Central	507	468	435	380
Mong Kok	255	229	212	204

Pollutant: Nitrogen Oxides

Station	1st High	2nd High	3rd High	4th High
Central / Western	779	704	686	664
Kwai Chung	665	659	647	639
Kwun Tong	938	776	771	769
Sham Shui Po	800	795	786	782
Tsuen Wan	595	570	559	536
Sha Tin	677	569	562	554
Tung Chung	414	405	404	382
Yuen Long	597	595	590	578
Tap Mun	229	189	183	171
Causeway Bay	1434	1337	1292	1283
Central	1584	1572	1504	1462
Mong Kok	1451	1306	1200	1197

Pollutant: Nitric Oxide

Station	1st High	2nd High	3rd High	4th High
Central / Western	380	374	356	323
Kwai Chung	370	357	349	340
Kwun Tong	523	430	418	373
Sham Shui Po	434	430	427	426
Tsuen Wan	330	287	285	283
Sha Tin	360	305	290	288
Tung Chung	208	188	182	175
Yuen Long	311	303	303	297
Tap Mun	86	73	72	62
Causeway Bay	755	748	716	710
Central	902	891	889	838
Mong Kok	799	712	641	635

Note: 1. All concentration units are in micrograms per cubic metre.
2. Shaded 1-hour averages are above their respective AQO.
3. Only the asterisked pollutants have hourly AQO.

Pollutant: Nitrogen Dioxide *
(1-hour AQO = 300)

Station	1st High	2nd High	3rd High	4th High
Central / Western	207	199	199	198
Eastern	194	192	191	186
Kwai Chung	284	283	279	261
Kwun Tong	316	309	273	270
Sham Shui Po	279	252	251	250
Tsuen Wan	221	221	220	215
Sha Tin	216	205	199	198
Tai Po	239	238	222	212
Tung Chung	248	231	209	208
Yuen Long	279	275	252	227
Tap Mun	107	107	101	100
Causeway Bay	332	321	314	309
Central	369	328	324	322
Mong Kok	356	333	330	315

Pollutant: Carbon Monoxide *
(1-hour AQO = 30000)

Station	1st High	2nd High	3rd High	4th High
Tsuen Wan	3360	3350	3230	3140
Tung Chung	3920	3810	3670	3600
Yuen Long	3540	3380	3170	3130
Tap Mun	2210	2200	2160	2160
Causeway Bay	3450	3450	3340	3340
Central	4260	3220	3110	2990
Mong Kok	4600	3790	3560	3450

Pollutant: Ozone *
(1-hour AQO = 240)

Station	1st High	2nd High	3rd High	4th High
Central / Western	327	298	274	268
Eastern	198	171	164	163
Kwai Chung	201	194	191	184
Kwun Tong	161	158	147	144
Sham Shui Po	237	224	223	217
Tsuen Wan	207	201	199	198
Sha Tin	331	292	290	273
Tai Po	239	214	211	207
Tung Chung	308	297	291	277
Yuen Long	327	302	300	284
Tap Mun	296	283	277	274

Pollutant: Respirable Suspended Particulates

Station	1st High	2nd High	3rd High	4th High
Central / Western	268	268	263	259
Eastern	237	224	216	190
Kwai Chung	305	294	291	287
Kwun Tong	273	258	256	243
Sham Shui Po	292	275	267	259
Tsuen Wan	302	302	295	285
Sha Tin	355	287	255	228
Tai Po	411	339	312	283
Tung Chung	314	292	284	276
Yuen Long	341	333	318	316
Tap Mun	215	212	212	207
Causeway Bay	282	276	276	269
Central	288	283	279	276
Mong Kok	305	286	285	278

TABLE C2: THE HIGHEST 2 DAILY POLLUTANT CONCENTRATIONS MEASURED IN 2007

Pollutant: Sulphur Dioxide *
(24-hour AQO = 350)

Station	1st High	2nd High
Central / Western	106	94
Eastern	89	81
Kwai Chung	99	88
Kwun Tong	114	85
Sham Shui Po	109	99
Tsuen Wan	87	86
Sha Tin	70	69
Tai Po	70	64
Tung Chung	95	85
Yuen Long	112	97
Tap Mun	57	53
Causeway Bay	124	80
Central	106	94
Mong Kok	107	93

Pollutant: Nitrogen Dioxide *
(24-hour AQO = 150)

Station	1st High	2nd High
Central / Western	131	127
Eastern	115	110
Kwai Chung	153	137
Kwun Tong	160	137
Sham Shui Po	143	142
Tsuen Wan	135	126
Sha Tin	127	109
Tai Po	141	116
Tung Chung	127	113
Yuen Long	137	126
Tap Mun	44	43
Causeway Bay	193	179
Central	196	193
Mong Kok	201	185

Pollutant: Respirable Suspended Particulates *
(24-hour AQO = 180)

Station	1st High	2nd High
Central / Western	162	159
Eastern	131	129
Kwai Chung	163	161
Kwun Tong	134	134
Sham Shui Po	164	145
Tsuen Wan	165	159
Sha Tin	165	158
Tai Po	163	163
Tung Chung	199	198
Yuen Long	207	194
Tap Mun	159	156
Causeway Bay	190	183
Central	159	158
Mong Kok	155	154

Pollutant: Nitrogen Oxides

Station	1st High	2nd High
Central / Western	283	270
Kwai Chung	381	353
Kwun Tong	304	300
Sham Shui Po	353	317
Tsuen Wan	253	246
Sha Tin	277	265
Tung Chung	210	172
Yuen Long	288	281
Tap Mun	86	65
Causeway Bay	716	687
Central	740	665
Mong Kok	701	545

Pollutant: Nitric Oxide

Station	1st High	2nd High
Central / Western	127	106
Kwai Chung	182	180
Kwun Tong	136	127
Sham Shui Po	142	138
Tsuen Wan	106	106
Sha Tin	114	106
Tung Chung	64	64
Yuen Long	110	101
Tap Mun	29	22
Causeway Bay	356	355
Central	388	316
Mong Kok	343	254

Pollutant: Total Suspended Particulates *
(24-hour AQO = 260)

Station	1st High	2nd High
Central / Western	175	169
Kwai Chung	223	198
Kwun Tong	198	185
Sham Shui Po	203	173
Tsuen Wan	208	176
Sha Tin	223	153
Tai Po	178	174
Tung Chung	240	201
Yuen Long	304	249
Mong Kok	259	199

Pollutant: Ozone

Station	1st High	2nd High
Central / Western	120	112
Eastern	84	82
Kwai Chung	103	94
Kwun Tong	93	87
Sham Shui Po	87	87
Tsuen Wan	92	88
Sha Tin	127	112
Tai Po	101	91
Tung Chung	117	106
Yuen Long	119	108
Tap Mun	154	152

Pollutant: Carbon Monoxide *
(8-hour AQO = 10000)

Station	1st High	2nd High
Tsuen Wan	3068	3068
Tung Chung	3514	3480
Yuen Long	2975	2963
Tap Mun	2090	2079
Causeway Bay	2993	2964
Central	2703	2674
Mong Kok	2948	2890

Note: 1. *All concentration units are in micrograms per cubic metre.*
2. *Values for Carbon Monoxide are 8-hour averages.*
3. *Shaded 24-hour averages are above their respective AQO.*
4. *Only the asterisked pollutants have either 8-hour or 24-hour AQO.*

TABLE C3: 2007 MONTHLY AND ANNUAL AVERAGES OF GASEOUS POLLUTANTS

Pollutant: Sulphur Dioxide (Annual AQO = 80)

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Central / Western	28	18	16	25	27	18	15	28	29	26	22	28	23
Eastern	21	15	13	18	22	14	15	21	17	20	17	18	18
Kwai Chung	28	23	26	31	40	43	40	36	27	25	23	24	31
Kwun Tong	21	13	12	17	20	20	23	26	20	22	17	13	19
Sham Shui Po	21	17	14	20	26	21	15	26	22	24	16	18	20
Tsuen Wan	28	21	20	21	31	24	19	24	22	25	22	28	24
Sha Tin	22 *	15	12	19	22	19	19	18	20	22	19	18	19
Tai Po	25	15	13	17	18	11	9	16	14	17	16	20	16
Tung Chung	41	17	13	19	20	17	14	24	28	32	23	27	23
Yuen Long	36	21	20	21	19	18	16	26	25	31	24	28	24
Tap Mun	28	13	12	15	14	9	8	15	15	24	24	24	17
Causeway Bay	29	14	22	23	15	10	16	23	19	18	15	18	19
Central	26	18	16	22	23	19	20	25	27	21	21	26	22
Mong Kok	34	23	19	24	30	23	19	26	27	30	26	26	26

Pollutant: Nitrogen Oxides

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Central / Western	110	101	92	97	98	60	36	76	80	68	82	109	84
Kwai Chung	154	167	156	170	192	222	167	171	137	118	129	155	162
Kwun Tong	147	138	135	144	140	145	117	142	110	111	113	143	132
Sham Shui Po	152	158	141	134	144	113	87	123	109	108	109	149	127
Tsuen Wan	134	133	133	122	131	119	91	113	95	92	99	132	116
Sha Tin	152 *	100	65	76	84	78	53	74	65	59	69	99	76
Tung Chung	110	79	70	75	61	43	31	58	71	65	77	110	71
Yuen Long	126	123	108	110	104	97	81	97	85	85	100	135	104
Tap Mun	25	16	18	20	20	20	18	27	14	16	19	22	20
Causeway Bay	467	320	306	304	323	316	347	388	311	280	320	414	341
Central	412	353	345	346	348	328	303	353	335	275	350	374	343
Mong Kok	364	340	316	325	345	320	289	315	318	328	306	327	324

Pollutant: Nitric Oxide

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Central / Western	24	25	25	24	27	23	13	25	17	9	11	24	21
Kwai Chung	58	68	67	69	85	115	85	76	45	32	38	51	66
Kwun Tong	48	44	48	48	49	62	50	57	34	27	29	45	45
Sham Shui Po	44	50	47	38	49	44	32	45	27	22	22	41	38
Tsuen Wan	36	40	45	34	42	48	35	41	21	15	19	35	34
Sha Tin	52 *	32	15	17	25	27	16	24	14	8	12	29	20
Tung Chung	25	19	18	16	13	14	11	18	14	10	13	27	16
Yuen Long	42	46	35	31	33	40	33	35	20	15	21	38	32
Tap Mun	2	2	2	2	4	6	4	7	1	1	1	2	3
Causeway Bay	228	148	150	141	156	170	187	204	141	115	137	191	164
Central	187	159	164	156	163	173	157	179	149	109	150	164	159
Mong Kok	162	149	147	144	157	164	148	156	135	133	121	136	146

Pollutant: Nitrogen Dioxide (Annual AQO = 80)

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Central / Western	73	63	54	60	57	24	16	38	54	55	65	72	53
Eastern	70	68	58	63	60	35	30	44	55	57	63	70	56
Kwai Chung	66	64	54	64	63	45	37	54	69	70	72	77	61
Kwun Tong	73	71	61	71	65	50	40	55	59	70	68	74	63
Sham Shui Po	85	82	70	77	69	46	38	54	68	75	76	86	69
Tsuen Wan	79	72	64	70	67	46	38	50	62	68	70	79	64
Sha Tin	72 *	51	42	50	46	36	29	38	44	46	50	55	45
Tai Po	74	61	52	65	56	38	32	40	48	52	60	58	53
Tung Chung	72	50	43	51	41	21	15	30	50	50	58	70	46
Yuen Long	61	53	54	63	54	36	31	42	54	63	68	77	55
Tap Mun	21	13	14	16	14	12	11	17	12	14	16	19	15
Causeway Bay	118	93	77	89	85	57	61	76	95	104	111	121	90
Central	125	110	94	108	98	63	64	79	106	108	120	124	100
Mong Kok	116	112	92	104	105	70	63	77	111	125	121	119	101

Pollutant: Carbon Monoxide

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Tsuen Wan	890	970	830	760	550	330	290	760	340	420	850	830	651
Tung Chung	1430	1140	1010	590	500	530	790	710	580	670	680	1200	819
Yuen Long	1350	990	880	880	790	680	650	770	1010	1030	1130	1470	969
Tap Mun	1050	940	860	860	740	550	460	670	1010	840	1070	1130	847
Causeway Bay	1600	1100	920	930	790	900	1090	1200	1170	1030	1370	1740	1153
Central	1230	1050	1190	1120	750	530	490	680	690	630	680	920	829
Mong Kok	1330	1040	1140	1120	1290	1160	710	930	1340	1230	1350	1790	1204

Pollutant: Ozone

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Central / Western	34	42	31	40	36	19	22	23	52	69	56	43	39
Eastern	33	32	23	32	30	12	12	16	39	50	52	43	31
Kwai Chung	25	27	20	23	18	12	12	17	42	53	47	37	28
Kwun Tong	29	35	26	33	32	10	11	14	43	52	50	37	31
Sham Shui Po	24	25	17	30	26	10	11	14	42	50	44	28	27
Tsuen Wan	25	28	23	32	28	10	11	15	44	52	48	32	29
Sha Tin	41 *	48	40	46	46	15	19	25	62	75	67	53	45
Tai Po	39	39	33	36	37	18	22	26	52	61	53	44	38
Tung Chung	27	38	30	36	46	28	31	30	56	66	61	35	40
Yuen Long	28	31	22	32	39	18	22	27	61	71	54	32	36
Tap Mun	66	79	59	70	71	29	31	41	80	100	91	79	66

Notes:

1. All units are in micrograms per cubic metre.

2. Asterisked values are below their respective minimum data requirement of 66% for number of data within the period.

3. Shaded monthly averages are below the minimum data requirements for number of data within a quarter.

4. Shaded annual averages are above their respective AQO.

TABLE C4: 2007 MONTHLY AND ANNUAL AVERAGES OF PARTICULATE POLLUTANTS

Pollutant: Total Suspended Particulates (Annual AQO = 80)

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Central / Western	132	85	70	84	60	29	33	38	85	105	96	111	77
Kwai Chung	134	84	69	73	73	49	49	64	96	136	112	99	85
Kwun Tong	100	87	85	64	76	33	41	52	83	114	92	144	82
Sham Shui Po	124	89	68	90	65	37	43	43	84	102	99	117	79
Tsuen Wan	119	89	80	62	65	43	37	62	84	95	104	112	79
Sha Tin	122	81	60	59	66	31	39	33	78	85	120	109	73
Tai Po	113	90	58	70	66	27	32	42	68	102	115	99	73
Tung Chung	111	70	84	58	50	29	26	28	89	82	95	120	70
Yuen Long	165	98	89	78	59	42	36	79	70	137	145	165	97
Mong Kok	176	137	120	110	96	62	71	65	114	118	153	148	115

Pollutant: Respirable Suspended Particulates (Annual AQO = 55)

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Central / Western	76	62	49	51	51	20	20	28	60	75	69	79	53
Eastern	67	58	45	49	47	18	20	26	52	68	64	72	49
Kwai Chung	81	63	51	58	59	39	37	41	66	75 *	76 *	81	60
Kwun Tong	71	60	48	55	52	25	26	32	56	70	67	74	53
Sham Shui Po	77	66	50	55	53	26	27	36	62	80	75	83	57
Tsuen Wan	81	62	51	56	56	31	32	38	65	81	76	85	59
Sha Tin	100 *	59	44	52	49	24	24	31	58	72	71	80	52
Tai Po	76	57	45	50	48	22	24	31	58	75	74	79	53
Tung Chung	90	58	47	52	48	20	21	16	34 *	84	78	91	54
Yuen Long	99	63	52	58	52	25	26	36	69	89	91	104	64
Tap Mun	71	55	42	49	50	20	21	31	59	81	77	82	53
Causeway Bay	96	94	81	78	88	46	50	71	97	104	104	109	85
Central	89	77	64	66	66	40	40	49	76	86	80	85	68
Mong Kok	84	73	61	65	64	36	37	48	73	86	78	87	66

Notes:

1. All units are in micrograms per cubic metre.

2. Asterisked values are below their respective minimum data requirement of 66% for number of data within the period.

3. Shaded monthly averages are below the minimum data requirements for number of data within a quater.

4. Shaded annual averages are above their respective AQO.

TABLE C5: 2007 HOURLY STATISTICS OF MAJOR AIR POLLUTANTS

Pollutant: Sulphur Dioxide

Station	No. of hours	Data capture rate %	<----------Percentiles---------->								Geometric mean	Arithmetic mean	Highest 1 hour	Highest 24 hour
			10	25	50	75	90	95	98	99				
Central / Western	8619	98.4	6	8	14	26	51	75	113	142	16	23	566	106
Eastern	8573	97.9	6	8	12	19	30	45	81	110	13	18	466	89
Kwai Chung	8612	98.3	8	11	19	40	71	89	118	139	22	31	219	99
Kwun Tong	8544	97.5	5	8	12	20	36	58	95	118	13	19	375	114
Sham Shui Po	8651	98.8	4	7	12	21	45	76	111	139	13	20	348	109
Tsuen Wan	8625	98.5	8	11	17	29	47	65	91	119	18	24	245	87
Sha Tin	8090	92.4	6	8	13	23	37	50	70	89	14	19	219	70
Tai Po	8486	96.9	4	7	12	19	31	43	63	80	12	16	179	70
Tung Chung	8533	97.4	7	11	16	26	44	64	96	121	17	23	259	95
Yuen Long	8584	98.0	8	11	18	28	41	58	90	122	19	24	326	112
Tap Mun	8439	96.3	6	8	13	21	33	41	53	72	13	17	235	57
Causeway Bay	8530	97.4	4	7	12	23	37	54	87	105	13	19	300	124
Central	8601	98.2	6	8	14	25	45	66	97	120	15	22	507	106
Mong Kok	8549	97.6	12	15	20	28	44	63	95	119	22	26	255	107

Pollutant: Nitrogen Oxides

Station	No. of hours	Data capture rate %	<----------Percentiles---------->								Geometric mean	Arithmetic mean	Highest 1 hour	Highest 24 hour
			10	25	50	75	90	95	98	99				
Central / Western	8572	97.9	22	38	66	106	164	216	298	364	62	84	779	283
Kwai Chung	8610	98.3	59	94	145	210	282	336	403	461	137	162	665	381
Kwun Tong	8489	96.9	46	79	118	166	229	275	351	412	111	132	938	304
Sham Shui Po	8648	98.7	42	78	115	156	211	264	364	448	106	127	800	353
Tsuen Wan	8581	98.0	39	75	104	142	199	242	311	371	98	116	595	253
Sha Tin	8090	92.4	20	31	52	92	162	223	317	367	55	76	677	277
Tung Chung	8546	97.6	17	30	55	99	149	181	219	246	53	71	414	210
Yuen Long	8579	97.9	45	61	89	127	180	220	294	359	89	104	597	288
Tap Mun	8439	96.3	8	10	15	24	35	46	64	80	16	20	229	86
Causeway Bay	8492	96.9	138	210	310	442	578	679	799	910	296	341	1434	716
Central	8580	97.9	119	189	312	457	615	713	838	928	286	343	1584	740
Mong Kok	8588	98.0	148	239	326	400	475	528	600	664	297	324	1451	701

Pollutant: Nitric Oxide

Station	No. of hours	Data capture rate %	<----------Percentiles---------->								Geometric mean	Arithmetic mean	Highest 1 hour	Highest 24 hour
			10	25	50	75	90	95	98	99				
Central / Western	8572	97.9	1	3	9	23	52	83	131	165	9	21	380	127
Kwai Chung	8610	98.3	12	26	52	95	137	165	207	234	46	66	370	182
Kwun Tong	8489	96.9	7	18	34	59	96	122	165	198	30	45	523	136
Sham Shui Po	8648	98.7	3	15	30	48	77	104	162	227	26	38	434	142
Tsuen Wan	8581	98.0	3	11	25	46	73	99	142	175	21	34	330	106
Sha Tin	8090	92.4	1	2	7	22	59	94	138	164	8	20	360	114
Tung Chung	8546	97.6	1	4	7	20	45	62	83	99	10	16	208	64
Yuen Long	8579	97.9	5	10	22	42	71	95	135	161	21	32	311	110
Tap Mun	8439	96.3	1	1	2	3	6	9	14	21	2	3	86	29
Causeway Bay	8492	96.9	49	84	144	223	303	359	429	483	131	164	755	356
Central	8580	97.9	38	75	135	223	308	367	446	497	120	159	902	388
Mong Kok	8588	98.0	55	98	145	187	229	260	302	341	128	146	799	343

Pollutant: Nitrogen Dioxide

Station	No. of hours	Data capture rate %	<----------Percentiles---------->								Geometric mean	Arithmetic mean	Highest 1 hour	Highest 24 hour
			10	25	50	75	90	95	98	99				
Central / Western	8572	97.9	15	27	49	71	97	115	140	157	41	53	207	131
Eastern	8578	97.9	24	36	54	71	89	103	121	135	50	56	194	115
Kwai Chung	8610	98.3	31	40	55	73	99	120	149	167	55	61	284	153
Kwun Tong	8489	96.9	30	42	59	78	101	116	140	161	57	63	316	160
Sham Shui Po	8648	98.7	32	42	63	88	111	129	154	169	61	69	279	143
Tsuen Wan	8581	98.0	30	42	58	79	105	122	147	163	57	64	221	135
Sha Tin	8090	92.4	17	26	38	55	82	102	127	144	38	45	216	127
Tai Po	8489	96.9	25	34	47	66	88	105	125	139	47	53	239	141
Tung Chung	8546	97.6	11	21	39	63	90	108	131	146	35	46	248	127
Yuen Long	8579	97.9	26	35	49	69	90	107	127	144	49	55	279	137
Tap Mun	8439	96.3	5	7	12	19	29	37	49	58	12	15	107	44
Causeway Bay	8492	96.9	48	63	84	111	139	161	187	216	83	90	332	193
Central	8580	97.9	46	64	92	128	163	187	220	242	89	100	369	196
Mong Kok	8588	98.0	53	70	93	129	158	177	200	218	93	101	356	201

Pollutant: Carbon Monoxide

Station	No. of hours	Data capture rate %	<----------Percentiles---------->								Geometric mean	Arithmetic mean	Highest 1 hour	Highest 8 hour
			10	25	50	75	90	95	98	99				
Tsuen Wan	8625	98.5	180	350	630	890	1140	1320	1550	1680	539	651	3360	3068
Tung Chung	8541	97.5	350	480	740	1060	1400	1630	1930	2120	716	819	3920	3514
Yuen Long	8587	98.0	560	670	870	1180	1520	1750	1990	2180	898	969	3540	2975
Tap Mun	8372	95.6	380	560	790	1120	1370	1490	1600	1710	764	847	2210	2090
Causeway Bay	8209	93.7	580	800	1150	1380	1840	2070	2300	2530	1054	1153	3450	2993
Central	8371	95.6	230	460	800	1150	1490	1730	1960	2070	702	829	4260	2703
Mong Kok	8551	97.6	690	920	1150	1380	1730	1840	2180	2300	1140	1204	4600	2948

Pollutant: Ozone

Station	No. of hours	Data capture rate %	<----------Percentiles---------->								Geometric mean	Arithmetic mean	Highest 1 hour	Highest 24 hour
			10	25	50	75	90	95	98	99				
Central / Western	8554	97.6	5	13	30	58	86	100	118	135	25	39	327	120
Eastern	8564	97.8	5	10	26	47	65	74	86	97	21	31	198	84
Kwai Chung	8561	97.7	7	11	19	40	62	76	92	104	20	28	201	103
Kwun Tong	8495	97.0	4	9	24	49	69	81	95	105	20	31	161	93
Sham Shui Po	8602	98.2	3	6	18	39	63	79	98	114	16	27	237	87
Tsuen Wan	8579	97.9	5	8	19	42	67	81	101	116	19	29	207	92
Sha Tin	8051	91.9	2	8	33	73	106	125	148	163	23	45	331	127
Tai Po	8488	96.9	9	14	29	57	83	97	116	128	27	38	239	101
Tung Chung	8512	97.2	5	15	32	55	85	106	139	177	26	40	308	117
Yuen Long	8421	96.1	5	10	24	50	84	110	145	176	22	36	327	119
Tap Mun	8364	95.5	16	34	60	95	123	140	158	173	50	66	296	154

Pollutant: Respirable Suspended Particulates (Continuous monitoring)

Station	No. of hours	Data capture rate %	<----------Percentiles---------->								Geometric mean	Arithmetic mean	Highest 1 hour	Highest 24 hour
			10	25	50	75	90	95	98	99				
Central / Western	8534	97.4	15	25	46	74	101	119	146	165	42	53	268	162
Eastern	8667	98.9	14	23	43	69	92	108	126	140	39	49	237	131
Kwai Chung	7983	91.1	25	36	51	76	106	127	152	170	51	60	305	163
Kwun Tong	8553	97.6	18	29	46	71	96	112	133	148	44	53	273	134
Sham Shui Po	8618	98.4	20	30	50	77	104	122	148	164	48	57	292	164
Tsuen Wan	8504	97.1	24	34	51	78	105	126	155	172	51	59	302	165
Sha Tin	8107	92.5	18	26	44	71	97	117	143	158	43	52	355	165
Tai Po	8594	98.1	17	26	45	73	99	118	143	157	43	53	411	163
Tung Chung	8067	92.1	14	22	43	75	107	131	165	195	41	54	314	199
Yuen Long	8581	98.0	20	30	54	87	123	146	176	198	51	64	341	207
Tap Mun	8298	94.7	17	25	45	73	99	117	140	155	43	53	215	159
Causeway Bay	8416	96.1	37	57	82	108	135	153	176	194	75	85	282	190
Central	8480	96.8	30	42	61	87	115	134	160	178	60	68	288	159
Mong Kok	8565	97.8	27	40	60	86	112	129	154	174	57	66	305	155

Note: *1. All concentration units are in micrograms per cubic metre.*

2. Annual averages calculated from less than 8 representative months are not published.

TABLE C6: 2007 TOTAL WET AND DRY DEPOSITION

(a) WET DEPOSITION

	Monitoring Station	Central / Western	Kwun Tong	Yuen Long
	WET DEPOSITION (TON/HA)	16624	18843	17235
	WEIGHTED MEAN pH (based on volume-weighted mean hydrogen ion concentrations ($[H^+]$)	4.57	4.66	4.48
	WEIGHTED MEAN pH (based on volume-weighted mean pH)	4.83	4.98	4.74
	NO. OF SAMPLES	91	95	91
Filtrate (Kg/Ha)	**NH_4^+**	4.87	5.61	8.04
	NO_3^-	16.10	15.60	24.30
	$SO_4^=$	28.06	28.96	34.26
	Cl^-	22.30	21.17	9.51
	F-	0.45	0.49	0.53
	Na^+	11.90	11.76	5.50
	K^+	4.24	4.69	4.26
	Formate	3.63	3.99	3.37
	Acetate	3.04	3.35	3.36
	Ca^{++}	3.84	4.26	4.44
	Mg^{++}	1.51	1.55	0.76

(b) DRY DEPOSITION

	Monitoring Station	Central / Western	Kwun Tong	Yuen Long
	NO. OF SAMPLES	27	27	27
Filtrate (Kg/Ha)	**NH_4^+**	0.81	0.60	0.41
	NO_3^-	12.88	11.49	9.24
	$SO_4^=$	13.67	10.48	9.88
	Cl^-	15.68	10.56	5.62
	F-	0.197	0.171	0.238
	Na^+	10.18	6.15	3.03
	K^+	1.03	0.71	0.66
	Formate	0.17	0.17	0.17
	Acetate	0.17	0.17	0.17
	Ca^{++}	7.80	7.52	7.36
	Mg^{++}	1.42	0.93	0.61

** Note: The weighted mean pH is calculated from the pH values measured by the Government Laboratory.*

TABLE C7: 2007 DIURNAL VARIATIONS OF AIR POLLUTANTS

Pollutant: Sulphur Dioxide

Station	Hr00	Hr01	Hr02	Hr03	Hr04	Hr05	Hr06	Hr07	Hr08	Hr09	Hr10	Hr11	Hr12	Hr13	Hr14	Hr15	Hr16	Hr17	Hr18	Hr19	Hr20	Hr21	Hr22	Hr23
Central / Western	20	19	18	19	18	18	19	23	27	27	27	26	25	27	27	27	27	28	27	26	24	23	21	20
Eastern	15	16	15	15	15	15	16	19	20	20	19	20	19	18	19	17	18	18	19	18	20	20	17	16
Kwai Chung	29	28	28	28	26	24	24	26	29	32	31	32	32	34	35	36	36	37	36	34	31	29	28	28
Kwun Tong	16	15	15	16	14	15	16	17	20	21	21	21	20	22	23	22	23	23	22	20	18	17	17	16
Sham Shui Po	18	18	18	19	18	17	19	20	20	22	22	22	20	20	21	22	22	21	21	22	20	20	20	19
Tsuen Wan	19	19	20	20	19	19	18	21	25	27	28	28	29	28	30	30	28	28	27	26	23	22	21	21
Sha Tin	16	16	16	17	16	15	16	17	20	21	22	22	20	19	21	21	21	21	20	19	18	18	17	16
Tai Po	14	14	13	13	12	12	13	15	18	20	19	18	19	18	18	18	19	18	17	17	16	15	14	13
Tung Chung	19	18	18	19	18	18	18	20	24	27	28	28	29	29	29	28	27	26	23	22	22	21	21	20
Yuen Long	20	19	19	20	19	19	19	21	26	28	27	27	28	29	28	28	29	28	26	24	23	23	22	21
Tap Mun	15	15	15	16	15	15	15	17	19	21	23	23	23	19	18	18	17	16	15	15	15	15	15	15
Causeway Bay	15	15	15	14	14	14	16	20	25	26	24	21	19	21	22	22	21	20	19	18	17	16	16	16
Central	15	16	16	17	15	15	17	22	29	28	28	27	24	24	24	25	28	29	27	23	22	21	18	17
Mong Kok	22	22	22	22	21	21	23	25	28	30	30	29	28	29	28	28	29	30	28	26	25	25	25	23

Pollutant: Nitrogen Oxides

Station	Hr00	Hr01	Hr02	Hr03	Hr04	Hr05	Hr06	Hr07	Hr08	Hr09	Hr10	Hr11	Hr12	Hr13	Hr14	Hr15	Hr16	Hr17	Hr18	Hr19	Hr20	Hr21	Hr22	Hr23
Central / Western	78	62	52	47	46	45	55	95	118	114	103	89	79	81	80	84	90	97	108	109	103	99	92	89
Kwai Chung	141	114	102	90	88	95	132	180	209	210	187	170	164	164	176	184	193	202	215	202	175	164	162	156
Kwun Tong	121	84	71	62	59	68	124	170	187	174	152	136	129	131	138	140	154	172	177	163	144	138	140	139
Sham Shui Po	115	84	72	64	60	67	113	151	168	162	141	129	124	126	131	137	148	159	166	163	150	148	141	135
Tsuen Wan	103	70	61	50	49	56	95	133	158	154	136	125	120	119	124	129	135	147	160	151	132	128	124	121
Sha Tin	97	76	66	60	56	59	83	102	103	86	68	58	50	50	53	56	61	72	82	92	94	100	103	101
Tung Chung	76	59	49	44	43	54	71	83	85	77	74	73	72	70	69	68	70	74	83	85	83	80	80	80
Yuen Long	114	98	85	70	67	72	105	133	125	108	93	87	83	82	84	90	102	114	127	136	132	128	131	128
Tap Mun	20	19	19	19	18	19	20	21	23	24	24	22	20	17	17	17	16	18	18	18	19	20	20	20
Causeway Bay	291	227	205	183	170	171	259	401	461	455	428	397	373	374	364	365	366	379	391	402	384	398	398	354
Central	272	203	175	152	149	150	235	372	527	497	440	396	361	357	365	395	400	432	459	429	398	379	363	343
Mong Kok	303	213	194	165	153	153	252	341	388	395	353	336	333	353	373	383	406	430	453	386	342	358	372	359

Pollutant: Nitric Oxide

Station	Hr00	Hr01	Hr02	Hr03	Hr04	Hr05	Hr06	Hr07	Hr08	Hr09	Hr10	Hr11	Hr12	Hr13	Hr14	Hr15	Hr16	Hr17	Hr18	Hr19	Hr20	Hr21	Hr22	Hr23
Central / Western	19	15	12	11	11	10	12	29	40	37	31	23	19	18	16	16	17	18	23	25	24	24	23	22
Kwai Chung	58	45	40	35	34	37	56	81	96	96	81	70	64	62	66	69	73	78	87	82	69	65	66	64
Kwun Tong	41	25	20	16	16	19	45	69	78	71	58	48	42	42	43	43	48	56	59	54	46	45	48	48
Sham Shui Po	34	22	18	15	14	17	36	55	64	61	48	40	36	35	35	36	40	44	48	48	44	45	43	41
Tsuen Wan	30	16	14	10	10	13	29	48	61	58	46	40	35	32	32	33	35	40	47	45	37	37	37	37
Sha Tin	32	22	18	16	15	16	27	37	36	26	18	13	10	10	10	10	10	12	16	22	24	29	32	32
Tung Chung	20	14	10	9	8	13	21	27	26	21	18	17	15	13	12	11	10	11	15	18	19	19	21	22
Yuen Long	40	33	27	21	20	22	39	53	46	37	29	24	21	20	20	20	24	29	35	41	41	41	45	45
Tap Mun	3	3	3	3	3	3	3	4	5	5	5	4	3	3	3	2	2	2	2	2	2	2	3	3
Causeway Bay	139	103	92	82	75	75	124	205	238	232	216	194	178	177	167	167	169	177	186	194	185	197	198	174
Central	124	88	74	62	61	62	107	183	271	250	212	184	162	157	159	175	177	198	216	202	189	179	172	163
Mong Kok	138	91	82	67	61	61	114	165	190	190	163	149	143	152	160	165	179	194	209	174	152	163	174	169

Pollutant: Nitrogen Dioxide

Station	Hr00	Hr01	Hr02	Hr03	Hr04	Hr05	Hr06	Hr07	Hr08	Hr09	Hr10	Hr11	Hr12	Hr13	Hr14	Hr15	Hr16	Hr17	Hr18	Hr19	Hr20	Hr21	Hr22	Hr23
Central / Western	48	39	34	31	30	30	36	51	57	57	56	54	51	53	55	59	64	69	73	71	67	62	58	54
Eastern	53	45	37	34	33	36	49	60	61	59	57	56	55	56	59	64	70	72	72	70	67	64	60	58
Kwai Chung	53	45	41	37	36	38	47	57	62	64	64	63	66	68	75	78	82	83	82	77	69	64	61	58
Kwun Tong	58	46	40	37	35	39	56	65	67	65	64	63	64	68	72	74	80	85	86	80	73	69	67	65
Sham Shui Po	63	50	44	41	39	42	58	66	70	69	67	67	69	73	77	81	87	91	93	90	83	79	75	71
Tsuen Wan	58	46	41	35	33	37	51	60	65	66	65	65	67	70	75	78	82	86	88	83	75	71	68	65
Sha Tin	48	42	39	35	33	34	42	46	48	45	41	38	34	35	38	41	46	53	57	58	57	56	55	52
Tai Po	55	48	43	40	38	40	49	56	56	50	45	42	42	43	45	48	56	66	74	74	69	64	62	60
Tung Chung	45	38	33	31	30	34	38	42	45	45	46	48	49	51	51	52	55	57	60	58	54	51	48	47
Yuen Long	53	48	43	39	37	39	46	52	54	52	50	50	50	52	54	59	65	71	74	74	69	65	62	58
Tap Mun	16	15	15	15	14	15	15	15	16	17	17	16	15	13	13	13	13	14	15	15	16	16	16	16
Causeway Bay	79	69	64	58	56	56	69	88	97	100	98	101	101	105	108	109	109	109	108	105	101	98	97	89
Central	83	69	62	56	56	56	72	93	113	115	116	115	113	117	122	128	129	130	129	121	110	106	100	94
Mong Kok	91	74	69	63	61	61	78	90	98	104	104	108	113	120	128	131	132	133	133	120	110	108	106	101

Pollutant: Carbon Monoxide

Station	Hr00	Hr01	Hr02	Hr03	Hr04	Hr05	Hr06	Hr07	Hr08	Hr09	Hr10	Hr11	Hr12	Hr13	Hr14	Hr15	Hr16	Hr17	Hr18	Hr19	Hr20	Hr21	Hr22	Hr23
Tsuen Wan	630	580	550	520	530	550	620	690	720	700	670	630	630	630	640	630	650	680	740	760	740	740	720	680
Tung Chung	790	780	780	780	780	800	810	830	830	830	840	840	840	850	840	840	830	830	830	830	830	820	810	810
Yuen Long	990	950	930	890	870	880	950	1050	1040	1000	950	920	900	910	900	910	920	960	1010	1060	1070	1050	1070	1040
Tap Mun	830	830	840	840	840	850	870	890	890	890	880	880	870	850	840	830	830	820	820	820	820	820	830	830
Causeway Bay	1280	1360	1320	1220	1130	1040	950	940	1030	1110	1160	1160	1150	1160	1110	1110	1090	1100	1170	1230	1260	1270	1210	1150
Central	820	690	600	560	550	530	590	700	860	960	970	890	850	920	900	900	860	930	1000	960	1030	1010	910	880
Mong Kok	1210	1290	1240	1110	1140	1130	1080	1100	1170	1200	1160	1160	1180	1200	1220	1240	1250	1260	1330	1310	1280	1260	1220	1170

Pollutant: Ozone

Station	Hr00	Hr01	Hr02	Hr03	Hr04	Hr05	Hr06	Hr07	Hr08	Hr09	Hr10	Hr11	Hr12	Hr13	Hr14	Hr15	Hr16	Hr17	Hr18	Hr19	Hr20	Hr21	Hr22	Hr23
Central / Western	35	42	45	47	47	45	37	25	23	26	33	43	52	56	58	55	49	41	32	29	29	30	31	32
Eastern	27	32	35	36	36	33	24	18	18	22	28	35	41	44	44	44	38	33	30	28	26	25	26	26
Kwai Chung	26	32	33	35	34	32	24	18	18	20	26	32	37	39	36	34	29	25	21	21	23	23	23	24
Kwun Tong	27	35	38	40	40	35	23	17	18	23	30	36	42	45	43	42	36	29	24	24	27	26	25	25
Sham Shui Po	22	31	34	36	37	33	20	15	15	20	27	34	39	41	41	38	31	23	17	16	18	18	17	18
Tsuen Wan	22	32	35	38	37	34	22	17	18	22	29	36	41	44	43	41	36	28	20	19	21	21	20	20
Sha Tin	32	34	36	37	37	34	27	26	29	38	50	63	73	77	76	73	66	54	45	39	36	33	31	31
Tai Po	28	30	32	33	32	30	24	23	27	36	45	55	62	66	66	63	55	44	33	30	30	30	28	27
Tung Chung	30	35	37	37	36	31	27	25	27	32	39	46	55	64	70	71	64	51	39	33	32	32	31	30
Yuen Long	23	26	28	31	31	27	22	20	23	32	44	55	68	74	73	67	53	39	28	23	23	22	22	22
Tap Mun	54	52	51	50	50	48	47	48	52	59	68	78	85	91	92	93	92	87	81	74	67	63	58	55

Pollutant: Respirable Suspended Particulates (Continuous Monitoring)

Station	Hr00	Hr01	Hr02	Hr03	Hr04	Hr05	Hr06	Hr07	Hr08	Hr09	Hr10	Hr11	Hr12	Hr13	Hr14	Hr15	Hr16	Hr17	Hr18	Hr19	Hr20	Hr21	Hr22	Hr23
Central / Western	48	47	46	46	46	46	48	52	56	57	56	55	54	56	58	60	60	60	60	60	57	55	51	49
Eastern	44	44	44	43	44	44	46	48	49	50	50	51	50	51	53	54	54	54	54	54	52	50	47	46
Kwai Chung	53	50	49	49	50	51	54	57	61	59	60	60	60	64	65	67	72	74	72	70	65	62	59	56
Kwun Tong	47	45	45	44	44	45	48	51	54	55	56	55	54	56	58	58	60	61	61	60	57	53	51	49
Sham Shui Po	52	50	49	49	48	49	51	55	56	57	57	57	56	60	62	63	66	68	69	69	64	60	57	54
Tsuen Wan	53	51	50	49	48	49	52	55	59	62	62	62	62	64	67	68	69	68	68	67	64	61	58	56
Sha Tin	50	48	47	47	47	47	48	49	50	51	52	53	51	53	55	56	57	59	58	58	56	55	53	51
Tai Po	51	49	48	47	47	47	49	53	55	55	54	55	54	55	56	55	56	56	57	59	57	55	53	52
Tung Chung	49	47	47	46	47	47	49	52	53	54	56	57	59	62	64	64	63	61	58	56	55	53	52	50
Yuen Long	59	57	56	54	54	54	57	63	72	72	70	70	69	70	69	69	67	65	65	67	66	64	63	61
Tap Mun	49	49	48	49	49	50	52	53	55	57	57	57	56	56	55	56	55	54	53	52	52	51	51	50
Causeway Bay	73	60	56	54	54	54	66	80	88	91	89	88	86	94	96	97	102	106	111	111	103	97	93	87
Central	59	55	55	55	54	56	61	70	80	78	72	70	67	69	72	74	76	79	80	78	74	71	67	64
Mong Kok	56	50	48	48	49	50	55	63	68	70	70	68	67	72	76	76	78	82	81	82	77	72	67	61

Note: All concentration units are in micrograms per cubic metre.

TABLE C8: 2007 AMBIENT LEVELS OF TOXIC AIR POLLUTANTS

Toxic Air Pollutants	Concentration Unit	Annual Averages [1]	
		Tsuen Wan	Central/Western
Heavy Metals			
Hexavalent chromium	ng/m^3	0.10	0.10
Lead [2]	ng/m^3	69	59
Organic Substances			
Benzene	$\mu g/m^3$	1.75	1.39
Benzo[a]pyrene	ng/m^3	0.37	0.27
1,3-Butadiene	$\mu g/m^3$	0.23	0.20
Formaldehyde	$\mu g/m^3$	4.61	4.85
Perchloroethylene	$\mu g/m^3$	0.69	0.83
Dioxins [3]	$pgI\text{-}TEQ/m^3$	0.083	0.072

Note:

[1] For TAP concentrations that are lower than the method detection limit (MDL), one half of the MDL is used in calculating the annual averages.

[2] For lead the reported figures are the respective 2007 annual average concentrations in the elemental analysis of total suspended particulates.

[3] The ambient level of dioxins is expressed here as toxic equivalent (I-TEQ) concentration of 2,3,7,8-Tetrachlorodibenzodioxin (TCDD) based on the International Toxic Equivalent Factors (I-TEF) of the North Atlantic Treaty Organisation (NATO/CCMS).

Appendix D

Monitoring Results of Sulphur Dioxide and Nitrogen Dioxide by HEC and CLP

Figure D1 Location of HEC's & CLP's Air Quality Monitoring Stations for Sulphur Dioxide and Nitrogen Dioxide

D.1 The Hongkong Electric Co. Ltd. (HEC)

Air Quality Monitoring Stations	Annual Mean Concentration [1]	Range of Monthly Mean Concentration [1]
Sulphur Dioxide (SO_2) [2]		
Chung Hom Kok	18	7 - 32
Victoria Road	17	11 - 25
Queen Mary Hospital	13	5 - 22
Ap Lei Chau	15	7 - 21
Cheung Chau [4]	13	2 - 22
Nitrogen Dioxide (NO_2) [2]		
Chung Hom Kok	21	10 - 33
Victoria Road	32	8 - 58
Queen Mary Hospital	27	5 - 46
Ap Lei Chau	20	9 - 37
Cheung Chau [4]	28	7 - 46

D.2 CLP Power Hong Kong Ltd. (CLP)

Air Quality Monitoring Station	Annual Mean Concentration [1]	Range of Monthly Mean Concentration [1]
Sulphur Dioxide (SO_2) [2]		
San Hui	24	14 - 44
Tin Shui Wai	13	2 - 51
Butterfly Estate	19	10 - 34
Lung Kwu Tan	9	2 - 31
Lau Fau Shan	17	3 - 39
Nitrogen Dioxide (NO_2) [3]		
San Hui	76	43 - 101
Tin Shui Wai	37	17 - 63
Butterfly Estate	45	20 - 67
Lung Kwu Tan	22	9 - 37
Lau Fau Shan	35	19 - 58

Notes:

[1] All pollutant units are in micrograms per cubic metre.

[2] There was no exceedance of AQO limit for the pollutant in 2007.

[3] Both San Hui and Tin Shui Wai stations recorded 1 count of exceedance of the 24-hr AQO limit for NO_2 in 2007. Besides, San Hui station also recorded 3 counts of exceedance of the 1-hr AQO limit.

[4] Air monitoring at the Cheung Chau station commenced in January 2007.