Guangdong-Hong Kong-Macao

Pearl River Delta

Regional Air Quality Monitoring Network

October to December 2018

Statistical Summary of the Fourth Quarter Monitoring Results

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Approved by	**:**	**Quality Management Committee of Guangdong-Hong Kong-Macao Pearl River Delta Regional Air Quality Monitoring Network**
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1. Foreword

Since the Pearl River Delta (PRD) Regional Air Quality Monitoring Network came into operation on 30 November 2005, the PRD Regional Air Quality Index (RAQI) was reported to the public on a daily basis. Starting from 2006, half-yearly and annual air quality monitoring reports were also published every year. The network was subsequently enhanced and expanded in September 2014 and renamed to "Guangdong-Hong Kong-Macao Pearl River Delta Regional Air Quality Monitoring Network" (the "Network").

To cope with the enhancement of the network, the update of the national ambient air quality standards as well as the need for improving the reporting frequency of monitoring results, starting from 2014, the real-time hourly monitoring data was reported on a new internet platform to replace the daily RAQI, the half-yearly report was also replaced by a quarterly report while the annual air quality monitoring report was maintained. The quarterly report is a brief statistical summary of the regional air quality monitoring results in a quarter. The annual report, in addition to the reporting of the monitoring data, provides a more detailed analysis and comparison of the air quality in the year. From the fourth quarter of 2014, the statistical results of carbon monoxide (CO) and fine suspended particulates ($PM_{2.5}$ or FSP) were added to the report in addition to those of respirable suspended particulates (PM_{10} or RSP), sulphur dioxide (SO_2), nitrogen dioxide (NO_2), and ozone (O_3).

This report is the statistical summary of the monitoring results of the PRD Regional Air Quality Monitoring Network in the fourth quarter of 2018. It is the twentieth report published in the form of a quarterly report and the seventeenth report with the statistical summaries of the six pollutants (i.e. PM_{10}, $PM_{2.5}$, SO_2, NO_2, O_3 and CO).

2. Introduction to Guangdong-Hong Kong-Macao Pearl River Delta Regional Air Quality Monitoring Network

The PRD Regional Air Quality Monitoring Network was jointly established by the Guangdong Provincial Environmental Monitoring Centre (GDEMC) and the Environmental Protection Department of the Hong Kong Special Administrative Region (HKEPD) from 2003 to 2005, and commenced its operation to report the Regional Air Quality Index (RAQI) on 30 November 2005.

With the growing concerns of air pollution control and economic development of the region, the GDEMC and HKEPD had worked in collaboration with the environmental protection cum meteorological authorities of Macao to enhance the network by extending the coverage of monitoring area to Guangdong, Hong Kong and Macao in September 2014. The enhancements included the addition of monitoring stations from 16 to 23 to further improve the spatial distribution and the inclusion of two new monitoring parameters, i.e. carbon monoxide (CO) and fine suspended particulates ($PM_{2.5}$), to enrich the air quality monitoring information. At the same time, the network was renamed to "Guangdong-Hong Kong-Macao Pearl River Delta Regional Air Quality Monitoring Network" (the "Network") while the "Quality Management Committee of Guangdong-Hong Kong-Macao Pearl River Delta Regional Air Quality Monitoring Network", which was jointly established by the GDEMC, HKEPD, Environmental Protection Bureau of Macau SARG and Meteorological and Geophysical Bureau of Macao SARG, was responsible for quality management of the Network and dissemination of information.

The Network comprises 23 automatic air quality monitoring stations (see Figure 2.1) across the PRD region. Ten city stations are operated either by the Environmental Monitoring Centres of the individual cities in Guangdong or the operation-cum-maintenance agencies commissioned by the State. Eight regional stations are operated by the GDEMC, the four stations located in Hong Kong are managed by the HKEPD and the remaining one in Macao is operated by Meteorological and Geophysical Bureau of Macao SARG.

All stations are installed with monitoring equipment to measure the ambient concentrations of PM_{10}, $PM_{2.5}$, SO_2, NO_2, O_3 and CO.

Annexes A and B show the site information of the monitoring stations in the Network and the methods used for measuring air pollutant concentrations respectively.

Figure 2.1：Spatial Distribution of Monitoring Stations in the Network

Remark: For the boundary of the administrative division of the Macao Special Administrative Region, according the Decree n. ℅665 of the State Council of the People's Republic of China, "the map of the administrative division of the Macao Special Administrative Region" was approved at the 116th Executive Meeting of the State Council on 16 December 2015.

3. Operation of the Network

The overall operation of the Network was smooth in the fourth quarter of 2018. The average data capture rate of hourly air pollutant monitoring data measured at all monitoring stations was 97.2% in the fourth quarter.

4. Statistical Results of Pollutant Concentrations

Tables 4.1a to 4.6b list the detailed statistical results of the ambient concentrations of the six air pollutants (SO_2, NO_2, O_3, CO, PM_{10} and $PM_{2.5}$) from October to December 2018.

Table 4.1a：The monthly maxima and minima of hourly averages of SO_2

Monitoring Station	October 2018		November 2018		December 2018	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	5	25	3	14	4	17
Modiesha (Guangzhou)	11	35	0	28	7	29
Wanqingsha (Guangzhou)	9	120	9	45	10	40
Tianhu (Guangzhou)	2	39	2	17	2	17
Zhudong (Guangzhou)	5	70	4	52	3	33
Liyuan (Shenzhen)	5	15	7	14	7	11
Jinjuzui (Foshan)	3	32	3	23	3	29
Huijingcheng (Foshan)	2	52	3	50	0	37
Tangjia (Zhuhai)	1	47	1	44	2	27
Donghu (Jiangmen)	3	44	4	38	3	32
Duanfen (Jiangmen)	7	33	7	34	5	28
Huaguoshan (Jiangmen)	3	58	2	64	2	69
Chengzhong (Zhaoqing)	7	110	7	123	3	163
Xiapu (Huizhou)	7	37	8	33	8	26
Xijiao (Huizhou)	1	25	1	29	1	24
Jinguowan (Huizhou)	3	58	1	14	0	24
Zimaling (Zhongshan)	4	28	5	33	1	31
Nanchengyuanling (Dongguan)	7	45	7	38	1	32
Tap Mun (Hong Kong)	7	21	7	17	2	17
Tsuen Wan (Hong Kong)	5	35	5	43	6	36
Yuen Long (Hong Kong)	4	23	4	24	5	35
Tung Chung (Hong Kong)	8	43	7	34	9	49
Taipa Grande (Macao)	1	15	1	15	2	28

Remark : All concentration units are in micrograms per cubic metre ($\mu g/m^3$).

Table 4.1b：The monthly maxima and minima of daily averages of SO_2

Monitoring Station	October 2018		November 2018		December 2018	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	7	14	4	11	5	9
Modiesha (Guangzhou)	12	19	4	18	8	18
Wanqingsha (Guangzhou)	11	29	12	24	12	24
Tianhu (Guangzhou)	3	14	2	12	3	9
Zhudong (Guangzhou)	9	32	8	21	6	18
Liyuan (Shenzhen)	7	12	7	11	7	9
Jinjuzui (Foshan)	4	14	4	15	4	14
Huijingcheng (Foshan)	3	26	6	25	2	22
Tangjia (Zhuhai)	3	12	3	10	6	17
Donghu (Jiangmen)	5	21	6	18	4	16
Duanfen (Jiangmen)	7	18	7	17	8	17
Huaguoshan (Jiangmen)	5	24	8	20	4	20
Chengzhong (Zhaoqing)	8	33	8	41	4	31
Xiapu (Huizhou)	8	18	10	16	9	15
Xijiao (Huizhou)	2	9	3	10	2	8
Jinguowan (Huizhou)	5	12	4	11	3	9
Zimaling (Zhongshan)	5	17	7	18	2	10
Nanchengyuanling (Dongguan)	8	21	9	22	3	17
Tap Mun (Hong Kong)	7	15	7	12	3	11
Tsuen Wan (Hong Kong)	5	13	5	14	6	15
Yuen Long (Hong Kong)	4	12	4	11	6	10
Tung Chung (Hong Kong)	9	20	9	19	10	19
Taipa Grande (Macao)	3	9	2	9	4	11

Remark : All concentration units are in micrograms per cubic metre ($\mu g/m^3$).

Table 4.1c ：The monthly averages of SO_2

Monitoring Station	October 2018	November 2018	December 2018
Luhu (Guangzhou)	10	7	7
Modiesha (Guangzhou)	16	12	12
Wanqingsha (Guangzhou)	18	18	17
Tianhu (Guangzhou)	7	5	5
Zhudong (Guangzhou)	21	15	12
Liyuan (Shenzhen)	8	8	8
Jinjuzui (Foshan)	9	9	7
Huijingcheng (Foshan)	13	13	11
Tangjia (Zhuhai)	7	7	12
Donghu (Jiangmen)	11	10	9
Duanfen (Jiangmen)	13	12	11
Huaguoshan (Jiangmen)	14	14	11
Chengzhong (Zhaoqing)	17	18	11
Xiapu (Huizhou)	12	12	12
Xijiao (Huizhou)	5	6	5
Jinguowan (Huizhou)	8	7	6*
Zimaling (Zhongshan)	10	11	6
Nanchengyuanling (Dongguan)	13	13	8
Tap Mun (Hong Kong)	9	8	7
Tsuen Wan (Hong Kong)	8	8	8
Yuen Long (Hong Kong)	8	7	8
Tung Chung (Hong Kong)	11	11	12
Taipa Grande (Macao)	6	5	7

Remark : All concentration units are in micrograms per cubic metre ($\mu g/m^3$).

* The capture rate of validated daily data per month is below 85%.

Table 4.2a：The monthly maxima and minima of hourly averages of NO_2

Monitoring Station	October 2018		November 2018		December 2018	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	14	170	17	140	15	175
Modiesha (Guangzhou)	16	136	12	188	17	168
Wanqingsha (Guangzhou)	3	212	11	176	15	139
Tianhu (Guangzhou)	2	51	2	57	5	64
Zhudong (Guangzhou)	9	117	7	84	12	171
Liyuan (Shenzhen)	7	122	5	98	5	123
Jinjuzui (Foshan)	9	131	9	145	13	126
Huijingcheng (Foshan)	9	118	10	135	10	140
Tangjia (Zhuhai)	1	126	1	142	3	127
Donghu (Jiangmen)	7	129	15	148	11	139
Duanfen (Jiangmen)	2	58	0	103	3	92
Huaguoshan (Jiangmen)	4	110	5	124	4	204
Chengzhong (Zhaoqing)	14	141	13	148	16	202
Xiapu (Huizhou)	13	129	10	106	10	119
Xijiao (Huizhou)	5	37	5	49	5	58
Jinguowan (Huizhou)	5	78	5	45	5	72
Zimaling (Zhongshan)	1	127	9	186	2	110
Nanchengyuanling (Dongguan)	11	143	14	140	14	180
Tap Mun (Hong Kong)	3	45	4	49	5	77
Tsuen Wan (Hong Kong)	3	132	9	185	14	196
Yuen Long (Hong Kong)	7	161	8	163	13	199
Tung Chung (Hong Kong)	5	175	6	165	6	153
Taipa Grande (Macao)	4	98	7	130	0	131

Remark : All concentration units are in micrograms per cubic metre ($\mu g/m^3$).

Table 4.2b：The monthly maxima and minima of daily averages of NO_2

Monitoring Station	October 2018		November 2018		December 2018	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	29	83	33	87	24	117
Modiesha (Guangzhou)	36	87	31	90	26	117
Wanqingsha (Guangzhou)	13	94	29	76	19	88
Tianhu (Guangzhou)	5	23	6	22	7	28
Zhudong (Guangzhou)	25	56	22	55	19	110
Liyuan (Shenzhen)	11	68	9	50	12	73
Jinjuzui (Foshan)	22	69	23	87	22	78
Huijingcheng (Foshan)	20	60	24	72	17	90
Tangjia (Zhuhai)	7	60	21	58	22	69
Donghu (Jiangmen)	20	74	29	97	30	76
Duanfen (Jiangmen)	7	36	9	58	9	57
Huaguoshan (Jiangmen)	20	70	25	70	25	85
Chengzhong (Zhaoqing)	22	72	18	105	23	133
Xiapu (Huizhou)	19	51	16	48	14	51
Xijiao (Huizhou)	9	18	10	20	10	23
Jinguowan (Huizhou)	12	27	11	26	12	27
Zimaling (Zhongshan)	7	69	21	74	22	71
Nanchengyuanling (Dongguan)	19	59	23	74	24	83
Tap Mun (Hong Kong)	6	19	7	22	9	27
Tsuen Wan (Hong Kong)	32	73	32	96	37	90
Yuen Long (Hong Kong)	24	86	30	90	32	90
Tung Chung (Hong Kong)	16	78	18	81	27	85
Taipa Grande (Macao)	17	62	14	77	24	76

Remark : All concentration units are in micrograms per cubic metre ($\mu g/m^3$).

Table 4.2c：The monthly averages of NO_2

Monitoring Station	October 2018	November 2018	December 2018
Luhu (Guangzhou)	51	55	49
Modiesha (Guangzhou)	54	59	49
Wanqingsha (Guangzhou)	36	51	46
Tianhu (Guangzhou)	10	11	12
Zhudong (Guangzhou)	37	36	37
Liyuan (Shenzhen)	27	26	34
Jinjuzui (Foshan)	44	53	43
Huijingcheng (Foshan)	38	46	37
Tangjia (Zhuhai)	27	36	42
Donghu (Jiangmen)	44	56	46
Duanfen (Jiangmen)	21	27	28
Huaguoshan (Jiangmen)	38	46	40
Chengzhong (Zhaoqing)	45	54	48
Xiapu (Huizhou)	29	31	29
Xijiao (Huizhou)	14	15	15
Jinguowan (Huizhou)	17	18	20*
Zimaling (Zhongshan)	34	43	40
Nanchengyuanling (Dongguan)	37	45	42
Tap Mun (Hong Kong)	11	12	17
Tsuen Wan (Hong Kong)	49	49	55
Yuen Long (Hong Kong)	53	51	55
Tung Chung (Hong Kong)	43	39	48
Taipa Grande (Macao)	37	45	40

Remark : All concentration units are in micrograms per cubic metre ($\mu g/m^3$).

* The capture rate of validated daily data per month is below 85%.

Table 4.3a：The monthly maxima and minima of hourly averages of O_3

Monitoring Station	October 2018		November 2018		December 2018	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	3	250	2	221	2	182
Modiesha (Guangzhou)	2	293	2	229	1	177
Wanqingsha (Guangzhou)	5	306	4	306	4	216
Tianhu (Guangzhou)	4	175	4	207	9	179
Zhudong (Guangzhou)	2	271	0	207	0	172
Liyuan (Shenzhen)	5	255	5	222	5	195
Jinjuzui (Foshan)	3	289	4	299	4	204
Huijingcheng (Foshan)	0	286	1	252	0	177
Tangjia (Zhuhai)	2	282	1	312	3	263
Donghu (Jiangmen)	1	312	1	323	1	251
Duanfen (Jiangmen)	3	275	3	213	3	126
Huaguoshan (Jiangmen)	3	272	2	206	3	180
Chengzhong (Zhaoqing)	3	250	1	229	1	200
Xiapu (Huizhou)	5	207	4	205	3	163
Xijiao (Huizhou)	3	193	2	177	3	179
Jinguowan (Huizhou)	7	222	2	230	3	221
Zimaling (Zhongshan)	4	289	4	246	4	205
Nanchengyuanling (Dongguan)	2	243	1	203	1	175
Tap Mun (Hong Kong)	11	269	14	224	3	164
Tsuen Wan (Hong Kong)	3	251	1	137	1	128
Yuen Long (Hong Kong)	0	238	0	235	0	190
Tung Chung (Hong Kong)	1	287	1	289	1	188
Taipa Grande (Macao)	0	295	0	275	0	176

Remark : All concentration units are in micrograms per cubic metre ($\mu g/m^3$).

Table 4.3b：Daily maximum 8-hour averages of O_3 (the monthly maxima, minima and the 90th percentile)

Monitoring Station	October 2018			November 2018			December 2018		
	Min	Max	90th per	Min	Max	90th per	Min	Max	90th per
Luhu (Guangzhou)	28	200	188	5	162	135	10	120	100
Modiesha (Guangzhou)	24	246	201	5	172	151	10	116	104
Wanqingsha (Guangzhou)	36	262	230	14	211	206	11	146	126
Tianhu (Guangzhou)	8	164	154	27	128	121	25	156	103
Zhudong (Guangzhou)	20	235	194	5	163	146	7	123	108
Liyuan (Shenzhen)	32	205	192	37	169	130	11	144	118
Jinjuzui (Foshan)	33	244	206	8	227	173	11	136	118
Huijingcheng (Foshan)	28	245	212	4	188	154	4	123	100
Tangjia (Zhuhai)	42	261	233	11	231	152	40	209	152
Donghu (Jiangmen)	32	280	238	8	274	190	6	176	119
Duanfen (Jiangmen)	34	236	217	18	158	132	13	97	82
Huaguoshan (Jiangmen)	24	246	200	6	170	155	6	127	91
Chengzhong (Zhaoqing)	30	222	214	14	194	163	13	142	114
Xiapu (Huizhou)	48	182	175	29	146	129	14	125	93
Xijiao (Huizhou)	54	185	178	27	138	118	18	139	108
Jinguowan (Huizhou)	42	192	179	27	170	133	13	188	139
Zimaling (Zhongshan)	18	254	218	7	197	164	9	147	102
Nanchengyuanling (Dongguan)	28	208	171	8	158	133	9	141	112
Tap Mun (Hong Kong)	47	208	198	62	181	147	18	156	135
Tsuen Wan (Hong Kong)	25	198	156	36	113	94	8	108	92
Yuen Long (Hong Kong)	17	207	178	27	167	108	12	115	90
Tung Chung (Hong Kong)	13	202	188	14	140	113	4	121	102
Taipa Grande (Macao)	29	271	226	31	182	131	5	118	110

Remark : All concentration units are in micrograms per cubic metre ($\mu g/m^3$).

Table 4.3c：The monthly averages of O_3

Monitoring Station	October 2018	November 2018	December 2018
Luhu (Guangzhou)	65	39	26
Modiesha (Guangzhou)	79	44	26
Wanqingsha (Guangzhou)	95	63	35
Tianhu (Guangzhou)	78	67	55
Zhudong (Guangzhou)	67	42	24
Liyuan (Shenzhen)	97	71	43
Jinjuzui (Foshan)	83	54	31
Huijingcheng (Foshan)	71	38	22
Tangjia (Zhuhai)	104	62	64
Donghu (Jiangmen)	89	56	32
Duanfen (Jiangmen)	90	56	39
Huaguoshan (Jiangmen)	71	43	25
Chengzhong (Zhaoqing)	78	50	31
Xiapu (Huizhou)	99	65	38
Xijiao (Huizhou)	71	52	39
Jinguowan (Huizhou)	93	64	67*
Zimaling (Zhongshan)	85	56	31
Nanchengyuanling (Dongguan)	76	48	31
Tap Mun (Hong Kong)	120	88	57
Tsuen Wan (Hong Kong)	88	57	34
Yuen Long (Hong Kong)	73	49	31
Tung Chung (Hong Kong)	79	56	29
Taipa Grande (Macao)	110	67	34

Remark : All concentration units are in micrograms per cubic metre ($\mu g/m^3$).

* The capture rate of validated daily data per month is below 85%.

Table 4.4a：The monthly maxima and minima of hourly averages of CO

Monitoring Station	October 2018		November 2018		December 2018	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	0.5	1.8	0.3	1.4	0.3	1.8
Modiesha (Guangzhou)	0.4	1.5	0.3	1.7	0.4	1.7
Wanqingsha (Guangzhou)	0.2	2.3	0.5	1.4	0.4	1.5
Tianhu (Guangzhou)	0.2	1.2	0.1	1.2	0.4	1.5
Zhudong (Guangzhou)	0.3	1.2	0.3	1.2	0.3	1.4
Liyuan (Shenzhen)	0.4	1.3	0.4	1.6	0.4	1.7
Jinjuzui (Foshan)	0.5	1.7	0.5	2.3	0.5	1.9
Huijingcheng (Foshan)	0.4	1.5	0.5	2.2	0.5	3.1
Tangjia (Zhuhai)	0.3	1.2	0.3	1.4	0.5	1.8
Donghu (Jiangmen)	0.5	2.0	0.5	3.1	0.5	3.1
Duanfen (Jiangmen)	0.2	1.0	0.1	1.3	0.3	1.4
Huaguoshan (Jiangmen)	0.0	1.4	0.1	1.6	0.3	1.4
Chengzhong (Zhaoqing)	0.5	2.0	0.5	2.1	0.6	2.3
Xiapu (Huizhou)	0.4	1.1	0.4	1.5	0.4	1.8
Xijiao (Huizhou)	0.3	1.6	0.3	1.2	0.3	1.7
Jinguowan (Huizhou)	0.4	1.0	0.4	1.1	0.2	1.4
Zimaling (Zhongshan)	0.1	1.2	0.2	1.7	0.2	2.1
Nanchengyuanling (Dongguan)	0.5	1.4	0.6	1.8	0.4	1.6
Tap Mun (Hong Kong)	0.2	0.8	0.2	0.8	0.2	1.0
Tsuen Wan (Hong Kong)	0.3	1.2	0.3	1.2	0.3	1.3
Yuen Long (Hong Kong)	0.4	1.4	0.4	1.4	0.4	1.8
Tung Chung (Hong Kong)	0.2	1.2	0.2	1.3	0.4	1.4
Taipa Grande (Macao)	0.4	1.4	0.4	1.4	0.4	5.3

Remark : All concentration units are in milligrams per cubic metre (mg/m^3).

Table 4.4b：Daily averages of CO (the monthly maxima, minima and the 95th percentile)

Monitoring Station	October 2018			November 2018			December 2018		
	Min	Max	95th per	Min	Max	95th per	Min	Max	95th per
Luhu (Guangzhou)	0.6	1.4	1.3	0.4	1.1	1.0	0.6	1.3	1.3
Modiesha (Guangzhou)	0.5	1.1	1.0	0.6	1.3	1.1	0.6	1.1	1.1
Wanqingsha (Guangzhou)	0.3	1.1	1.0	0.5	1.1	1.1	0.5	1.1	1.1
Tianhu (Guangzhou)	0.4	0.9	0.9	0.5	1.0	1.0	0.5	1.0	1.0
Zhudong (Guangzhou)	0.4	0.9	0.9	0.4	0.9	0.9	0.5	1.2	1.1
Liyuan (Shenzhen)	0.5	0.9	0.9	0.5	1.0	0.9	0.6	1.2	1.2
Jinjuzui (Foshan)	0.6	1.2	1.1	0.5	1.5	1.4	0.7	1.4	1.3
Huijingcheng (Foshan)	0.5	1.1	1.0	0.6	1.4	1.3	0.6	1.6	1.3
Tangjia (Zhuhai)	0.4	1.1	1.1	0.4	1.1	1.0	0.5	1.3	1.3
Donghu (Jiangmen)	0.6	1.3	1.1	0.7	1.7	1.4	0.7	1.3	1.3
Duanfen (Jiangmen)	0.3	0.8	0.8	0.5	1.0	1.0	0.5	1.2	1.1
Huaguoshan (Jiangmen)	0.5	1.1	0.9	0.6	1.2	1.2	0.7	1.2	1.2
Chengzhong (Zhaoqing)	0.7	1.4	1.3	0.8	1.4	1.4	0.8	1.6	1.4
Xiapu (Huizhou)	0.5	0.8	0.8	0.5	1.2	1.1	0.6	1.0	1.0
Xijiao (Huizhou)	0.4	0.9	0.8	0.5	0.7	0.7	0.5	0.9	0.9
Jinguowan (Huizhou)	0.5	0.9	0.8	0.5	1.0	0.9	0.6	0.9	0.9
Zimaling (Zhongshan)	0.2	0.9	0.8	0.3	1.0	0.9	0.4	1.5	1.4
Nanchengyuanling (Dongguan)	0.7	1.1	1.1	0.7	1.4	1.2	0.8	1.4	1.3
Tap Mun (Hong Kong)	0.2	0.7	0.7	0.2	0.6	0.6	0.3	0.8	0.8
Tsuen Wan (Hong Kong)	0.4	0.9	0.9	0.5	0.9	0.8	0.5	1.1	1.0
Yuen Long (Hong Kong)	0.5	1.0	1.0	0.6	1.1	1.1	0.6	1.4	1.4
Tung Chung (Hong Kong)	0.3	0.9	0.8	0.3	1.0	0.9	0.5	1.2	1.2
Taipa Grande (Macao)	0.5	1.2	1.1	0.5	1.1	1.1	0.5	1.1	1.1

Remark : All concentration units are in milligrams per cubic metre (mg/m^3).

Table 4.4c：The monthly averages of CO

Monitoring Station	October 2018	November 2018	December 2018
Luhu (Guangzhou)	0.9	0.8	0.9
Modiesha (Guangzhou)	0.8	0.9	0.9
Wanqingsha (Guangzhou)	0.7	0.9	0.8
Tianhu (Guangzhou)	0.7	0.7	0.7
Zhudong (Guangzhou)	0.7	0.6	0.8
Liyuan (Shenzhen)	0.7	0.7	0.9
Jinjuzui (Foshan)	0.9	1.0	1.0
Huijingcheng (Foshan)	0.8	1.0	1.0
Tangjia (Zhuhai)	0.7	0.7	0.9
Donghu (Jiangmen)	0.9	1.1	1.0
Duanfen (Jiangmen)	0.6	0.7	0.8
Huaguoshan (Jiangmen)	0.8	0.9	0.9
Chengzhong (Zhaoqing)	0.9	1.1	1.0
Xiapu (Huizhou)	0.6	0.8	0.8
Xijiao (Huizhou)	0.6	0.6	0.7
Jinguowan (Huizhou)	0.7	0.7	0.7*
Zimaling (Zhongshan)	0.6	0.6	1.0
Nanchengyuanling (Dongguan)	0.9	1.0	0.9
Tap Mun (Hong Kong)	0.4	0.4	0.6
Tsuen Wan (Hong Kong)	0.7	0.6	0.8
Yuen Long (Hong Kong)	0.7	0.9	0.9
Tung Chung (Hong Kong)	0.6	0.6	0.9
Taipa Grande (Macao)	0.7	0.8	0.8

Remark : All concentration units are in milligrams per cubic metre (mg/m^3).

* The capture rate of validated daily data per month is below 85%.

Table 4.5a：The monthly maxima and minima of daily averages of PM_{10}

Monitoring Station	October 2018		November 2018		December 2018	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	19	96	22	87	7	102
Modiesha (Guangzhou)	19	104	24	128	14	117
Wanqingsha (Guangzhou)	25	83	34	92	24	79
Tianhu (Guangzhou)	13	81	7	64	9	76
Zhudong (Guangzhou)	23	122	29	125	21	168
Liyuan (Shenzhen)	29	87	23	80	28	85
Jinjuzui (Foshan)	22	81	26	94	14	94
Huijingcheng (Foshan)	24	115	27	118	17	124
Tangjia (Zhuhai)	28	82	32	83	34	100
Donghu (Jiangmen)	32	106	41	178	24	110
Duanfen (Jiangmen)	20	88	17	79	24	78
Huaguoshan (Jiangmen)	37	111	37	151	30	145
Chengzhong (Zhaoqing)	15	111	20	131	9	208
Xiapu (Huizhou)	20	72	20	76	15	83
Xijiao (Huizhou)	11	58	21	50	14	65
Jinguowan (Huizhou)	17	79	14	65	12	66
Zimaling (Zhongshan)	28	75	33	107	21	90
Nanchengyuanling (Dongguan)	22	97	26	110	14	105
Tap Mun (Hong Kong)	14	62	12	56	15	53
Tsuen Wan (Hong Kong)	13	70	12	65	13	52
Yuen Long (Hong Kong)	23	72	23	80	21	56
Tung Chung (Hong Kong)	16	73	12	80	18	68
Taipa Grande (Macao)	18	75	25	93	29	88

Remark : All concentration units are in micrograms per cubic metre ($\mu g/m^3$).

Table 4.5b：The monthly averages of PM_{10}

Monitoring Station	October 2018	November 2018	December 2018
Luhu (Guangzhou)	54	55	48
Modiesha (Guangzhou)	64	69	53
Wanqingsha (Guangzhou)	57	62	50
Tianhu (Guangzhou)	44	39	33
Zhudong (Guangzhou)	65	63	56
Liyuan (Shenzhen)	54	49	51
Jinjuzui (Foshan)	53	58	49
Huijingcheng (Foshan)	59	69*	55
Tangjia (Zhuhai)	58	57	55
Donghu (Jiangmen)	71	85	62
Duanfen (Jiangmen)	58	51	46
Huaguoshan (Jiangmen)	76	91	68
Chengzhong (Zhaoqing)	61	67	55
Xiapu (Huizhou)	53	51	45
Xijiao (Huizhou)	41	38	34
Jinguowan (Huizhou)	50	42	39*
Zimaling (Zhongshan)	57	60	49
Nanchengyuanling (Dongguan)	61	63	50
Tap Mun (Hong Kong)	41	32	31
Tsuen Wan (Hong Kong)	39	34	30
Yuen Long (Hong Kong)	53	46	40
Tung Chung (Hong Kong)	44	39	42
Taipa Grande (Macao)	53	52	53

Remark : All concentration units are in micrograms per cubic metre ($\mu g/m^3$).

* The capture rate of validated daily data per month is below 85%.

Table 4.6a：The monthly maxima and minima of daily averages of $PM_{2.5}$

Monitoring Station	October 2018		November 2018		December 2018	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	13	76	13	62	10	73
Modiesha (Guangzhou)	12	62	10	63	4	56
Wanqingsha (Guangzhou)	18	53	21	60	15	46
Tianhu (Guangzhou)	9	54	4	41	6	39
Zhudong (Guangzhou)	16	81	18	71	16	82
Liyuan (Shenzhen)	19	68	17	62	14	50
Jinjuzui (Foshan)	14	51	15	54	9	46
Huijingcheng (Foshan)	19	80	19	85	9	76
Tangjia (Zhuhai)	14	71	17	71	10	60
Donghu (Jiangmen)	14	71	17	71	10	60
Duanfen (Jiangmen)	9	51	10	50	15	47
Huaguoshan (Jiangmen)	25	78	24	89	19	94
Chengzhong (Zhaoqing)	11	76	16	101	8	154
Xiapu (Huizhou)	16	52	15	51	9	50
Xijiao (Huizhou)	8	47	14	37	11	52
Jinguowan (Huizhou)	12	50	7	46	8	38
Zimaling (Zhongshan)	19	59	12	59	10	50
Nanchengyuanling (Dongguan)	17	61	18	75	12	72
Tap Mun (Hong Kong)	9	32	7	25	8	30
Tsuen Wan (Hong Kong)	10	50	10	45	11	41
Yuen Long (Hong Kong)	13	46	11	39	12	36
Tung Chung (Hong Kong)	11	51	9	50	12	48
Taipa Grande (Macao)	12	45	12	55	11	52

Remark : All concentration units are in micrograms per cubic metre ($\mu g/m^3$).

Table 4.6b：The monthly averages of $PM_{2.5}$

Monitoring Station	October 2018	November 2018	December 2018
Luhu (Guangzhou)	37	40	33
Modiesha (Guangzhou)	36	36	26
Wanqingsha (Guangzhou)	35	38	29
Tianhu (Guangzhou)	27	25	22
Zhudong (Guangzhou)	40	40	36
Liyuan (Shenzhen)	34	33	30
Jinjuzui (Foshan)	32	34	27
Huijingcheng (Foshan)	39	46	37
Tangjia (Zhuhai)	38	44	33
Donghu (Jiangmen)	38	44	33
Duanfen (Jiangmen)	31	30	25
Huaguoshan (Jiangmen)	50	57	42
Chengzhong (Zhaoqing)	40	52	44
Xiapu (Huizhou)	32	33	29
Xijiao (Huizhou)	29	28	26
Jinguowan (Huizhou)	30	27	26*
Zimaling (Zhongshan)	34	35	28
Nanchengyuanling (Dongguan)	38	43	35
Tap Mun (Hong Kong)	21	18	17
Tsuen Wan (Hong Kong)	25	24	21
Yuen Long (Hong Kong)	26	22	22
Tung Chung (Hong Kong)	24	22	24
Taipa Grande (Macao)	27	27	25

Remark : All concentration units are in micrograms per cubic metre ($\mu g/m^3$).

* The capture rate of validated daily data per month is below 85%.

Annex A：Site Information of Monitoring Stations

Monitoring Stations	Address	Area Type	Sampling Height (Above P.D.)	Above Ground	Date Commenced Operation
Luhu (Guangzhou)	Jufong Garden of Luhu Park (Big yard, No. 11 Luhu Park)	City	30m	9m	1993
Modiesha (Guangzhou)	Modiesha Street, Haizhu District	City	95m	45m	Dec 2011
Wanqingsha (Guangzhou)	HKUST Fok Ying Tung Research Institute, Nansha	Mixed educational/ commercial and residential/industrial	54m	28m	Oct 2004
Tianhu (Guangzhou)	Tianhu Park, Conghua	Background : rural	251m	13m	Oct 2004
Zhudong (Guangzhou)	Zhudong Village Committee, Chini Town, Huadu District	Rural	19m	10m	Dec 2011
Liyuan (Shenzhen)	Shennan Zhong Road, Futian District	City	38m	12m	Sep 1997
Jinjuzui (Foshan)	Foshan City Communist Party School, Jinjuzui, Shunde District	Tourist and cultural /educational	27m	17m	Oct 1999
Huijingcheng (Foshan)	No. 127, Fenjiang Nan Road, Chancheng District	Urban: mixed residential/commercial/ industrial	24m	14m	Feb 2000
Tangjia (Zhuhai)	Qiao Island Mangrove Monitoring Station, Tangjia Town	Mixed educational/ commercial and residential/industrial	13m	13m	Jan 2010
Donghu (Jiangmen)	Donghu Park, Jiangmen	City	17.5m	5m	Nov 2001
Duanfen (Jiangmen)	Duanfen Middle School, Taishan	Rural	15m	12m	Dec 2011
Huaguoshan (Jiangmen)	Huaguoshan, Taoyuan, Heshan	Rural	25m	15m	Feb 2012
Chengzhong (Zhaoqing)	No. 63, Zhengdong Road, Duanzhou District	Urban: mixed residential/commercial	38m	16m	Jun 2001
Xiapu (Huizhou)	No. 4 Xiabuhengjiang Road No. 3, Huicheng District	Urban: commercial	49m	20m	Dec 1999
Xijiao (Huizhou)	Xijiao Village Committee, Boluo County	Rural	39m	12m	Dec 2011
Jinguowan (Huizhou)	Jinguowan Ecological Farm, Huizhou	Residential	77m	8m	Oct 2004

Monitoring Stations	Address	Area Type	Sampling Height (Above P.D.)	Above Ground	Date Commenced Operation
Zimaling (Zhongshan)	Zimaling Park, Zhongshan	Mixed residential/ commercial	45 m	7m	Aug 2002
Nancheng-yuanling (Dongguan)	Nanchengyuanling Community, Dongguan	Mixed residential/ commercial/industrial	33 m	18m	Sep 2010
Tap Mun (Hong Kong)	Tap Mun Police Station	Background: rural	26m	11m	Apr 1998
Tsuen Wan (Hong Kong)	60 Tai Ho Road, Tsuen Wan	Urban: mixed residential/commercial/ industrial	21m	17m	Aug 1988
Yuen Long (Hong Kong)	Yuen Long District Office, 269 Castle Peak Road, Yuen Long	New Town: residential	31m	25m	Jul 1995
Tung Chung (Hong Kong)	6 Fu Tung Street, Tung Chung	New Town: residential	34.5m	27.5m	Apr 1999
Taipa Grande (Macao)	Rampa do Observatorio, Taipa Grande	Rural	120m	10m	Mar 1999

Annex B：Measurement Methods of Air Pollutant Concentration

Pollutants	Measuring Principles
Sulphur dioxide (SO_2)	UV fluorescence / Differential Optical Absorption Spectroscopy
Nitrogen dioxide (NO_2)	Chemiluminescence / Differential Optical Absorption Spectroscopy
Ozone (O_3)	UV absorption / Differential Optical Absorption Spectroscopy
Respirable suspended particulates (PM_{10})	Oscillating microbalance (TEOM) / Beta particulate monitor
Fine suspended particulates ($PM_{2.5}$)	Oscillating microbalance (TEOM) / Beta particulate monitor / Hybrid nephelometric / radiometric particulate mass monitor
Carbon monoxide (CO)	Gas filter correlation infrared absorption method / Non-dispersive infrared absorption method