

Guangdong-Hong Kong-Macao
Pearl River Delta
Regional Air Quality Monitoring Network
July to September 2018
Statistical Summary of the Third Quarter
Monitoring Results

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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 (PM₁₀ or RSP), sulphur dioxide (SO₂), nitrogen dioxide (NO₂), and ozone (O₃).

This report is the statistical summary of the monitoring results of the PRD Regional Air Quality Monitoring Network in the third quarter of 2018. It is the nineteenth report published in the form of a quarterly report and the sixteenth report with the statistical summaries of the six pollutants (i.e. PM₁₀, PM_{2.5}, SO₂, NO₂, O₃ 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 Macao 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 PM₁₀, PM_{2.5}, SO₂, NO₂, O₃ 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 to 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 third quarter of 2018, except Tap Mun and Jinguowan stations had a lower data capture rate in September owing to the influence of Typhoon Mangkhut. The average data capture rate of hourly air pollutant monitoring data measured at all monitoring stations was 95.0% in the third 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 (SO₂, NO₂, O₃, CO, PM₁₀ and PM_{2.5}) from July to September 2018.

Table 4.1a : The monthly maxima and minima of hourly averages of SO₂

Monitoring Station	July 2018		August 2018		September 2018	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	5	17	5	20	5	20
Modiesha (Guangzhou)	6	22	7	31	9	29
Wanqingsha (Guangzhou)	9	57	9	31	9	41
Tianhu (Guangzhou)	7	18	3	31	3	19
Zhudong (Guangzhou)	0	40	0	36	5	71
Liyuan (Shenzhen)	5	11	5	14	5	12
Jinjuzui (Foshan)	4	46	3	20	3	75
Huijingcheng (Foshan)	2	46	1	58	3	44
Tangjia (Zhuhai)	1	38	1	35	1	18
Donghu (Jiangmen)	2	29	2	27	2	28
Duanfen (Jiangmen)	5	22	5	22	5	23
Huaguoshan (Jiangmen)	9	61	1	51	2	51
Chengzhong (Zhaoqing)	4	115	5	102	4	64
Xiapu (Huizhou)	4	27	4	28	5	26
Xijiao (Huizhou)	1	17	1	11	0	10
Jinguowan (Huizhou)	4	48	0	12	4	16
Zimaling (Zhongshan)	4	19	1	22	1	20
Nanchengyuanling (Dongguan)	5	35	4	51	5	34
Tap Mun (Hong Kong)	5	12	5	15	6	22
Tsuen Wan (Hong Kong)	4	26	4	32	4	41
Yuen Long (Hong Kong)	6	29	5	32	5	40
Tung Chung (Hong Kong)	4	27	5	30	6	26
Taipa Grande (Macao)	0	11	0	9	0	16

Remark : All concentration units are in micrograms per cubic metre (µg/m³).

Table 4.1b : The monthly maxima and minima of daily averages of SO₂

Monitoring Station	July 2018		August 2018		September 2018	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	6	10	7	11	7	11
Modiesha (Guangzhou)	7	13	9	15	11	19
Wanqingsha (Guangzhou)	9	19	10	20	10	23
Tianhu (Guangzhou)	7	12	3	11	3	10
Zhudong (Guangzhou)	2	17	3	16	6	24
Liyuan (Shenzhen)	6	9	7	8	5	9
Jinjuzui (Foshan)	6	13	4	11	4	19
Huijingcheng (Foshan)	5	16	3	22	6	21
Tangjia (Zhuhai)	1	12	2	7	2	6
Donghu (Jiangmen)	3	11	4	12	3	12
Duanfen (Jiangmen)	5	10	5	13	6	14
Huaguoshan (Jiangmen)	9	23	2	17	4	16
Chengzhong (Zhaoqing)	9	36	7	21	6	20
Xiapu (Huizhou)	5	13	6	11	5	12
Xijiao (Huizhou)	2	14	2	4	0	5
Jinguowan (Huizhou)	4	9	3	8	4	9
Zimaling (Zhongshan)	4	8	1	9	1	10
Nanchengyuanling (Dongguan)	7	15	6	20	6	16
Tap Mun (Hong Kong)	6	8	6	11	6	11
Tsuen Wan (Hong Kong)	4	11	4	16	4	16
Yuen Long (Hong Kong)	6	11	6	15	6	15
Tung Chung (Hong Kong)	5	11	6	13	7	14
Taipa Grande (Macao)	0	2	0	5	0	7

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

Table 4.1c : The monthly averages of SO₂

Monitoring Station	July 2018	August 2018	September 2018
Luhu (Guangzhou)	8	8	8
Modiesha (Guangzhou)	11	12	14
Wanqingsha (Guangzhou)	13	13	15
Tianhu (Guangzhou)	9	6	6
Zhudong (Guangzhou)	8	9	14
Liyuan (Shenzhen)	7	7	7
Jinjuzui (Foshan)	9	7	7
Huijingcheng (Foshan)	8	10	13*
Tangjia (Zhuhai)	4	4	4
Donghu (Jiangmen)	6	7	6
Duanfen (Jiangmen)	7	8	10
Huaguoshan (Jiangmen)	13	7	9
Chengzhong (Zhaoqing)	15	12	11
Xiapu (Huizhou)	8	8	9
Xijiao (Huizhou)	8	3	3
Jinguowan (Huizhou)	6	7	7*
Zimaling (Zhongshan)	6	5	5
Nanchengyuanling (Dongguan)	10	11	11
Tap Mun (Hong Kong)	7	7	8*
Tsuen Wan (Hong Kong)	7	8	9
Yuen Long (Hong Kong)	8	8	9
Tung Chung (Hong Kong)	7	8	10
Taipa Grande (Macao)	0	1	3

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

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

Table 4.2a : The monthly maxima and minima of hourly averages of NO₂

Monitoring Station	July 2018		August 2018		September 2018	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	10	95	11	118	4	155
Modiesha (Guangzhou)	12	103	8	138	5	130
Wanqingsha (Guangzhou)	0	87	1	99	0	142
Tianhu (Guangzhou)	2	47	4	38	3	40
Zhudong (Guangzhou)	3	85	4	93	3	83
Liyuan (Shenzhen)	5	74	5	72	4	105
Jinjuzui (Foshan)	0	86	6	100	0	114
Huijingcheng (Foshan)	7	99	6	85	4	104
Tangjia (Zhuhai)	1	71	1	76	1	76
Donghu (Jiangmen)	3	70	4	86	1	77
Duanfen (Jiangmen)	1	29	1	28	1	37
Huaguoshan (Jiangmen)	0	60	0	71	0	87
Chengzhong (Zhaoqing)	6	121	7	88	3	121
Xiapu (Huizhou)	7	51	5	75	1	80
Xijiao (Huizhou)	3	43	3	32	3	33
Jinguowan (Huizhou)	0	47	1	57	2	69
Zimaling (Zhongshan)	1	49	1	84	1	82
Nanchengyuanling (Dongguan)	7	111	7	103	1	110
Tap Mun (Hong Kong)	2	32	2	43	1	50
Tsuen Wan (Hong Kong)	1	72	3	209	0	132
Yuen Long (Hong Kong)	5	81	7	128	4	131
Tung Chung (Hong Kong)	0	66	5	101	0	124
Taipa Grande (Macao)	0	51	0	100	0	80

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

Table 4.2b : The monthly maxima and minima of daily averages of NO₂

Monitoring Station	July 2018		August 2018		September 2018	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	22	59	23	58	9	78
Modiesha (Guangzhou)	23	49	24	84	11	74
Wanqingsha (Guangzhou)	9	41	10	49	10	45
Tianhu (Guangzhou)	3	23	6	18	4	19
Zhudong (Guangzhou)	17	37	17	40	15	37
Liyuan (Shenzhen)	9	29	11	46	7	54
Jinjuzui (Foshan)	7	37	20	62	4	51
Huijingcheng (Foshan)	19	63	16	50	19	45
Tangjia (Zhuhai)	2	32	3	33	4	29
Donghu (Jiangmen)	10	33	11	40	6	44
Duanfen (Jiangmen)	3	14	3	16	4	23
Huaguoshan (Jiangmen)	4	28	8	33	9	40
Chengzhong (Zhaoqing)	14	53	22	43	11	47
Xiapu (Huizhou)	12	36	12	34	3	35
Xijiao (Huizhou)	6	21	8	19	7	20
Jinguowan (Huizhou)	8	27	10	28	8	28
Zimaling (Zhongshan)	2	22	3	31	5	36
Nanchengyuanling (Dongguan)	15	48	21	62	4	48
Tap Mun (Hong Kong)	3	17	4	22	5	20
Tsuen Wan (Hong Kong)	13	44	20	92	7	71
Yuen Long (Hong Kong)	18	43	22	74	27	77
Tung Chung (Hong Kong)	8	49	10	57	12	77
Taipa Grande (Macao)	2	24	3	42	4	52

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

Table 4.2c : The monthly averages of NO₂

Monitoring Station	July 2018	August 2018	September 2018
Luhu (Guangzhou)	36	44	44
Modiesha (Guangzhou)	35	49	45
Wanqingsha (Guangzhou)	23	27	29
Tianhu (Guangzhou)	10	10	9
Zhudong (Guangzhou)	26	27	25
Liyuan (Shenzhen)	18	25	27
Jinjuzui (Foshan)	19	30	32
Huijingcheng (Foshan)	34	29	31
Tangjia (Zhuhai)	12	15	16
Donghu (Jiangmen)	19	25	22
Duanfen (Jiangmen)	6	7	11
Huaguoshan (Jiangmen)	15	19	20
Chengzhong (Zhaoqing)	31	32	29
Xiapu (Huizhou)	22	21	21
Xijiao (Huizhou)	12	12	12
Jinguowan (Huizhou)	14	17	16*
Zimaling (Zhongshan)	11	14	15
Nanchengyuanling (Dongguan)	28	37	30
Tap Mun (Hong Kong)	7	10	12*
Tsuen Wan (Hong Kong)	29	46	43
Yuen Long (Hong Kong)	29	44	48
Tung Chung (Hong Kong)	19	31	40
Taipa Grande (Macao)	9	20	20

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

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

Table 4.3a : The monthly maxima and minima of hourly averages of O₃

Monitoring Station	July 2018		August 2018		September 2018	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	2	236	2	266	2	254
Modiesha (Guangzhou)	0	263	6	299	7	302
Wanqingsha (Guangzhou)	5	264	5	343	5	433
Tianhu (Guangzhou)	7	238	10	194	9	242
Zhudong (Guangzhou)	4	286	5	274	4	229
Liyuan (Shenzhen)	5	267	4	371	4	275
Jinjuzui (Foshan)	7	316	4	326	4	309
Huijingcheng (Foshan)	5	265	2	277	3	285
Tangjia (Zhuhai)	1	260	4	345	2	282
Donghu (Jiangmen)	1	295	1	345	1	289
Duanfen (Jiangmen)	2	227	2	197	5	228
Huaguoshan (Jiangmen)	3	267	3	254	3	214
Chengzhong (Zhaoqing)	4	242	2	273	3	256
Xiapu (Huizhou)	4	285	7	233	4	236
Xijiao (Huizhou)	2	273	2	237	2	290
Jinguowan (Huizhou)	2	293	2	294	2	255
Zimaling (Zhongshan)	4	262	2	353	4	244
Nanchengyuanling (Dongguan)	2	308	2	269	2	251
Tap Mun (Hong Kong)	4	143	6	365	3	200
Tsuen Wan (Hong Kong)	1	84	0	331	0	262
Yuen Long (Hong Kong)	2	230	3	379	1	243
Tung Chung (Hong Kong)	2	194	1	337	2	283
Taipa Grande (Macao)	2	201	0	295	0	273

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

Table 4.3b : Daily maximum 8-hour averages of O₃ (the monthly maxima, minima and the 90th percentile)

Monitoring Station	July 2018			August 2018			September 2018		
	Min	Max	90 th per	Min	Max	90 th per	Min	Max	90 th per
Luhu (Guangzhou)	19	175	122	23	174	145	15	184	158
Modiesha (Guangzhou)	28	225	151	24	219	179	26	205	188
Wanqingsha (Guangzhou)	37	190	119	47	275	219	5	264	206
Tianhu (Guangzhou)	38	180	133	53	160	134	55	220	146
Zhudong (Guangzhou)	43	183	164	45	233	169	58	204	179
Liyuan (Shenzhen)	37	182	91	35	277	210	20	189	170
Jinjuzui (Foshan)	30	240	199	37	252	204	46	227	195
Huijingcheng (Foshan)	20	195	162	25	230	170	21	201	182
Tangjia (Zhuhai)	29	212	92	49	291	232	34	235	199
Donghu (Jiangmen)	30	230	174	41	316	231	33	226	207
Duanfen (Jiangmen)	38	197	73	47	179	145	41	198	191
Huaguoshan (Jiangmen)	28	214	125	31	206	181	36	184	160
Chengzhong (Zhaoqing)	33	200	185	36	235	167	38	189	156
Xiapu (Huizhou)	41	254	150	37	178	134	38	212	169
Xijiao (Huizhou)	37	191	163	42	177	146	60	242	180
Jinguowan (Huizhou)	35	251	111	23	217	146	27	210	174
Zimaling (Zhongshan)	29	228	137	42	300	241	31	216	188
Nanchengyuanling (Dongguan)	48	269	130	52	216	158	36	205	170
Tap Mun (Hong Kong)	44	120	73	48	277	179	35	181	162
Tsuen Wan (Hong Kong)	18	62	47	13	244	185	4	181	139
Yuen Long (Hong Kong)	23	134	68	26	267	184	11	175	154
Tung Chung (Hong Kong)	34	124	71	18	238	222	21	218	164
Taipa Grande (Macao)	30	73	65	38	236	179	30	241	187

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

Table 4.3c : The monthly averages of O₃

Monitoring Station	July 2018	August 2018	September 2018
Luhu (Guangzhou)	41	47	56
Modiesha (Guangzhou)	46	60	71
Wanqingsha (Guangzhou)	46	72	68
Tianhu (Guangzhou)	61	72	84
Zhudong (Guangzhou)	58	67	73
Liyuan (Shenzhen)	42	62	65
Jinjuzui (Foshan)	55	72	73
Huijingcheng (Foshan)	50	59	72
Tangjia (Zhuhai)	46	74	71
Donghu (Jiangmen)	46	69	70
Duanfen (Jiangmen)	42	59	67
Huaguoshan (Jiangmen)	41	56	58
Chengzhong (Zhaoqing)	54	61	66
Xiapu (Huizhou)	52	64	72
Xijiao (Huizhou)	48	57	72
Jinguowan (Huizhou)	40	47	67*
Zimaling (Zhongshan)	49	73	67
Nanchengyuanling (Dongguan)	48	65	61
Tap Mun (Hong Kong)	45	70	76*
Tsuen Wan (Hong Kong)	25	42	46
Yuen Long (Hong Kong)	29	49	50
Tung Chung (Hong Kong)	41	57	53
Taipa Grande (Macao)	37	64	66

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

* 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	July 2018		August 2018		September 2018	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	0.4	1.4	0.4	2.6	0.5	1.7
Modiesha (Guangzhou)	0.0	0.9	0.2	1.3	0.3	1.5
Wanqingsha (Guangzhou)	0.2	1.4	0.0	1.3	0.2	1.2
Tianhu (Guangzhou)	0.0	0.9	0.4	1.3	0.3	0.9
Zhudong (Guangzhou)	0.1	0.9	0.1	1.2	0.3	0.9
Liyuan (Shenzhen)	0.4	0.9	0.4	1.2	0.4	1.1
Jinjuzui (Foshan)	0.4	1.5	0.2	1.2	0.4	1.6
Huijingcheng (Foshan)	0.3	1.0	0.3	1.3	0.3	1.3
Tangjia (Zhuhai)	0.3	0.8	0.4	1.2	0.3	1.0
Donghu (Jiangmen)	0.4	1.5	0.4	1.8	0.3	1.6
Duanfen (Jiangmen)	0.2	1.0	0.1	0.8	0.2	0.8
Huaguoshan (Jiangmen)	0.0	1.0	0.1	1.2	0.0	1.4
Chengzhong (Zhaoqing)	0.5	1.6	0.4	1.6	0.4	1.4
Xiapu (Huizhou)	0.4	1.0	0.3	1.1	0.3	0.9
Xijiao (Huizhou)	0.0	1.0	0.0	0.9	0.3	0.9
Jinguowan (Huizhou)	0.1	0.9	0.1	1.0	0.3	0.8
Zimaling (Zhongshan)	0.1	0.9	0.3	1.6	0.2	1.4
Nanchengyuanling (Dongguan)	0.3	1.5	0.4	1.3	0.0	1.0
Tap Mun (Hong Kong)	0.2	0.6	0.3	1.0	0.3	0.8
Tsuen Wan (Hong Kong)	0.2	0.9	0.2	1.1	0.1	1.4
Yuen Long (Hong Kong)	0.3	1.0	0.3	1.2	0.3	1.3
Tung Chung (Hong Kong)	0.2	0.5	0.3	1.1	0.2	1.1
Taipa Grande (Macao)	0.0	0.8	0.2	1.6	0.4	1.5

Remark : All concentration units are in milligrams per cubic metre (mg/m³).

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

Monitoring Station	July 2018			August 2018			September 2018		
	Min	Max	95 th per	Min	Max	95 th per	Min	Max	95 th per
Luhu (Guangzhou)	0.4	0.9	0.9	0.6	1.1	1.1	0.6	1.2	1.1
Modiesha (Guangzhou)	0.2	0.6	0.6	0.4	1.1	1.0	0.3	1.1	1.1
Wanqingsha (Guangzhou)	0.3	1.0	0.8	0.3	0.9	0.9	0.5	0.8	0.8
Tianhu (Guangzhou)	0.4	0.8	0.7	0.5	1.2	1.1	0.4	0.9	0.9
Zhudong (Guangzhou)	0.3	0.6	0.6	0.2	0.8	0.8	0.4	0.7	0.7
Liyuan (Shenzhen)	0.4	0.7	0.7	0.5	0.9	0.9	0.4	0.8	0.8
Jinjuzui (Foshan)	0.4	0.8	0.8	0.4	0.9	0.9	0.5	1.0	0.9
Huijingcheng (Foshan)	0.4	0.7	0.7	0.4	1.0	1.0	0.5	0.9	0.9
Tangjia (Zhuhai)	0.4	0.6	0.5	0.4	0.9	0.8	0.4	0.8	0.7
Donghu (Jiangmen)	0.6	0.9	0.9	0.6	1.1	1.0	0.4	1.0	0.9
Duanfen (Jiangmen)	0.2	0.4	0.3	0.2	0.7	0.6	0.2	0.7	0.7
Huaguoshan (Jiangmen)	0.3	0.7	0.7	0.5	0.9	0.9	0.5	0.8	0.8
Chengzhong (Zhaoqing)	0.7	1.1	1.1	0.6	1.1	1.1	0.6	0.9	0.9
Xiapu (Huizhou)	0.5	0.9	0.9	0.4	0.9	0.9	0.4	0.7	0.7
Xijiao (Huizhou)	0.2	0.8	0.7	0.1	0.8	0.7	0.4	0.7	0.6
Jinguowan (Huizhou)	0.2	0.6	0.6	0.2	0.8	0.8	0.4	0.7	0.6
Zimaling (Zhongshan)	0.2	0.7	0.6	0.5	1.3	1.2	0.3	1.1	1.0
Nanchengyuanling (Dongguan)	0.4	1.1	0.9	0.5	1.2	1.1	0.3	0.7	0.7
Tap Mun (Hong Kong)	0.3	0.6	0.6	0.3	0.8	0.8	0.3	0.7	0.6
Tsuen Wan (Hong Kong)	0.3	0.7	0.7	0.3	0.8	0.8	0.2	0.8	0.6
Yuen Long (Hong Kong)	0.4	0.8	0.8	0.4	1.0	1.0	0.4	1.0	0.9
Tung Chung (Hong Kong)	0.3	0.4	0.4	0.3	0.9	0.9	0.3	0.8	0.7
Taipa Grande (Macao)	0.1	0.7	0.7	0.5	1.1	1.1	0.5	1.1	1.0

Remark : All concentration units are in milligrams per cubic metre (mg/m³).

Table 4.4c : The monthly averages of CO

Monitoring Station	July 2018	August 2018	September 2018
Luhu (Guangzhou)	0.7	0.9	0.9
Modiesha (Guangzhou)	0.3	0.7	0.7
Wanqingsha (Guangzhou)	0.5	0.6	0.6
Tianhu (Guangzhou)	0.6	0.8	0.7
Zhudong (Guangzhou)	0.5	0.5	0.6
Liyuan (Shenzhen)	0.5	0.7	0.6
Jinjuzui (Foshan)	0.6	0.6	0.8
Huijingcheng (Foshan)	0.5	0.7	0.7
Tangjia (Zhuhai)	0.5	0.6	0.5
Donghu (Jiangmen)	0.7	0.8	0.7
Duanfen (Jiangmen)	0.3	0.4	0.4
Huaguoshan (Jiangmen)	0.5	0.7	0.6
Chengzhong (Zhaoqing)	0.9	0.9	0.8
Xiapu (Huizhou)	0.7	0.6	0.6
Xijiao (Huizhou)	0.5	0.4	0.5
Jinguowan (Huizhou)	0.4	0.5	0.5*
Zimaling (Zhongshan)	0.5	0.8	0.7
Nanchengyuanling (Dongguan)	0.7	0.8	0.5
Tap Mun (Hong Kong)	0.4	0.5	0.5*
Tsuen Wan (Hong Kong)	0.5	0.6	0.4
Yuen Long (Hong Kong)	0.6	0.7	0.6
Tung Chung (Hong Kong)	0.3	0.5	0.5
Taipa Grande (Macao)	0.4	0.8	0.7

Remark : All concentration units are in milligrams per cubic metre (mg/m³).

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

Table 4.5a : The monthly maxima and minima of daily averages of PM₁₀

Monitoring Station	July 2018		August 2018		September 2018	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	21	53	19	64	25	78
Modiesha (Guangzhou)	25	67	19	76	23	79
Wanqingsha (Guangzhou)	15	44	11	61	19	71
Tianhu (Guangzhou)	13	62	10	58	17	69
Zhudong (Guangzhou)	22	75	19	76	32	82
Liyuan (Shenzhen)	11	42	13	68	17	65
Jinjuzui (Foshan)	14	46	17	62	18	58
Huijingcheng (Foshan)	19	49	24	77	32	75
Tangjia (Zhuhai)	12	44	11	77	16	70
Donghu (Jiangmen)	17	61	23	79	25	74
Duanfen (Jiangmen)	5	46	6	42	14	70
Huaguoshan (Jiangmen)	16	54	16	67	22	79
Chengzhong (Zhaoqing)	19	70	18	71	13	74
Xiapu (Huizhou)	16	64	14	68	13	57
Xijiao (Huizhou)	17	53	11	49	23	73
Jinguowan (Huizhou)	11	59	10	69	21	61
Zimaling (Zhongshan)	10	45	9	75	15	66
Nanchengyuanling (Dongguan)	21	60	20	72	18	60
Tap Mun (Hong Kong)	10	33	11	67	15	56
Tsuen Wan (Hong Kong)	3	23	6	74	11	52
Yuen Long (Hong Kong)	8	25	8	71	16	62
Tung Chung (Hong Kong)	5	24	5	58	9	60
Taipa Grande (Macao)	7	36	7	68	10	85

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

Table 4.5b : The monthly averages of PM₁₀

Monitoring Station	July 2018	August 2018	September 2018
Luhu (Guangzhou)	33	41	47
Modiesha (Guangzhou)	40*	45	49*
Wanqingsha (Guangzhou)	25	31	39
Tianhu (Guangzhou)	30	33	37
Zhudong (Guangzhou)	45	46	54
Liyuan (Shenzhen)	23	29	38
Jinjuzui (Foshan)	28	36	40
Huijingcheng (Foshan)	32	42	50
Tangjia (Zhuhai)	22	32	36
Donghu (Jiangmen)	35	45	44
Duanfen (Jiangmen)	20	22	33
Huaguoshan (Jiangmen)	30	38	52
Chengzhong (Zhaoqing)	43	43	42
Xiapu (Huizhou)	35	34	38
Xijiao (Huizhou)	32	31	40
Jinguowan (Huizhou)	28	29	40*
Zimaling (Zhongshan)	23	33	36
Nanchengyuanling (Dongguan)	37	43	42
Tap Mun (Hong Kong)	22	23	32*
Tsuen Wan (Hong Kong)	14	24	30
Yuen Long (Hong Kong)	16	25	35
Tung Chung (Hong Kong)	14	20	28
Taipa Grande (Macao)	20	28	34

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

* 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	July 2018		August 2018		September 2018	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	11	33	11	42	14	57
Modiesha (Guangzhou)	10	39	11	53	9	47
Wanqingsha (Guangzhou)	9	25	9	43	10	42
Tianhu (Guangzhou)	6	39	6	38	10	46
Zhudong (Guangzhou)	10	43	10	48	18	50
Liyuan (Shenzhen)	5	27	4	54	6	53
Jinjuzui (Foshan)	8	29	9	43	10	37
Huijingcheng (Foshan)	11	34	14	55	21	49
Tangjia (Zhuhai)	3	27	5	54	6	39
Donghu (Jiangmen)	9	28	8	51	10	40
Duanfen (Jiangmen)	1	24	2	28	7	42
Huaguoshan (Jiangmen)	4	35	12	49	14	58
Chengzhong (Zhaoqing)	14	40	12	44	12	45
Xiapu (Huizhou)	8	33	9	42	8	36
Xijiao (Huizhou)	9	37	7	31	12	54
Jinguowan (Huizhou)	7	36	6	42	12	40
Zimaling (Zhongshan)	5	29	4	55	6	40
Nanchengyuanling (Dongguan)	11	35	14	42	8	39
Tap Mun (Hong Kong)	4	15	3	51	8	29
Tsuen Wan (Hong Kong)	2	12	5	58	6	41
Yuen Long (Hong Kong)	3	15	6	48	10	34
Tung Chung (Hong Kong)	2	13	3	41	4	35
Taipa Grande (Macao)	1	16	2	42	2	47

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

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

Monitoring Station	July 2018	August 2018	September 2018
Luhu (Guangzhou)	19	27	31
Modiesha (Guangzhou)	19*	27	30*
Wanqingsha (Guangzhou)	14	21	25
Tianhu (Guangzhou)	16	20	24
Zhudong (Guangzhou)	25	28	33
Liyuan (Shenzhen)	14	21	27
Jinjuzui (Foshan)	15	22	25
Huijingcheng (Foshan)	20	28	33
Tangjia (Zhuhai)	10	18	21
Donghu (Jiangmen)	16	25	25
Duanfen (Jiangmen)	8	13	19
Huaguoshan (Jiangmen)	17	28	34
Chengzhong (Zhaoqing)	24	27	27
Xiapu (Huizhou)	17	19	23
Xijiao (Huizhou)	18	20	28
Jinguowan (Huizhou)	16	18	27*
Zimaling (Zhongshan)	12	22	22
Nanchengyuanling (Dongguan)	19	25	26
Tap Mun (Hong Kong)	10	14	18*
Tsuen Wan (Hong Kong)	7	18	21
Yuen Long (Hong Kong)	8	17	21
Tung Chung (Hong Kong)	6	12	16
Taipa Grande (Macao)	6	14	17

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

* 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
Nanchengyuanling (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