

**Guangdong-Hong Kong-Macao  
Pearl River Delta  
Regional Air Quality Monitoring Network**

**July to September 2019**

**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<sub>2.5</sub> or FSP) were added to the report in addition to those of respirable suspended particulates (PM<sub>10</sub> or RSP), sulfur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), and ozone (O<sub>3</sub>).

This report is the statistical summary of the monitoring results of the PRD Regional Air Quality Monitoring Network in the third quarter of 2019. It is the twenty-third report published in the form of a quarterly report and the twentieth report with the statistical summaries of the six pollutants (i.e. PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, NO<sub>2</sub>, O<sub>3</sub> 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<sub>2.5</sub>), 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 the 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<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, NO<sub>2</sub>, O<sub>3</sub> 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 116<sup>th</sup> 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 2019. The average data capture rate of hourly air pollutant monitoring data measured at all monitoring stations was 97.2% in the third quarter.

## 4. Statistical Results of Pollutant Concentrations

Tables 4.1a to 4.6b list the detailed statistical results of the six air pollutants (SO<sub>2</sub>, NO<sub>2</sub>, O<sub>3</sub>, CO, PM<sub>10</sub> and PM<sub>2.5</sub>) from July to September 2019. Per the amended *GB 3095-2012: Ambient Air Quality Standards*, starting from 2019, the concentrations of gaseous pollutants are calculated at a reference temperature of 298.15K and a pressure of 101.325 kPa, while the concentrations of PM<sub>10</sub> and PM<sub>2.5</sub> are measured at real-time temperature and atmospheric pressure during monitoring.

**Table 4.1a : The monthly maxima and minima of hourly averages of SO<sub>2</sub>**

Monitoring Station	July 2019		August 2019		September 2019	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	4	18	5	23	5	19
Modiesha (Guangzhou)	10	34	5	28	5	33
Nansha-HKUST (Guangzhou)	5	22	5	22	5	81
Tianhu (Guangzhou)	2	10	2	13	2	23
Zhudong (Guangzhou)	1	32	1	22	1	42
Tongxinling (Shenzhen)	5	8	5	7	4	16
Jinjuzui (Foshan)	3	24	3	22	2	39
Huijingcheng (Foshan)	5	50	5	40	5	53
Tangjia (Zhuhai)	2	16	1	19	1	30
Donghu (Jiangmen)	2	26	2	20	3	40
Duanfen (Jiangmen)	4	19	5	16	5	18
Huaguoshan (Jiangmen)	1	134	1	97	1	110
Chengzhong (Zhaoqing)	4	45	4	78	5	81
Xiapu (Huizhou)	3	25	4	23	5	37
Xijiao (Huizhou)	1	9	1	18	1	37
Jinguowan (Huizhou)	6	23	7	19	7	27
Zimaling (Zhongshan)	1	20	3	28	1	35
Nanchengyuanling (Dongguan)	3	26	2	35	4	25
Tap Mun (Hong Kong)	1	8	1	8	3	12
Tsuen Wan (Hong Kong)	5	19	6	21	6	16
Yuen Long (Hong Kong)	3	41	3	28	1	14
Tung Chung (Hong Kong)	7	26	1	17	1	23
Taipa Grande (Macao)	0	3	0	3	0	9

Remark : All concentration units are in micrograms per cubic metre (µg/m<sup>3</sup>).

**Table 4.1b : The monthly maxima and minima of daily averages of SO<sub>2</sub>**

Monitoring Station	July 2019		August 2019		September 2019	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	5	11	5	10	5	12
Modiesha (Guangzhou)	11	14	5	15	5	14
Nansha-HKUST (Guangzhou)	5	11	6	12	6	14
Tianhu (Guangzhou)	2	6	2	6	2	12
Zhudong (Guangzhou)	3	14	1	8	2	17
Tongxinling (Shenzhen)	5	6	5	6	5	10
Jinjuzui (Foshan)	4	9	3	10	3	18
Huijingcheng (Foshan)	7	20	7	21	8	27
Tangjia (Zhuhai)	5	8	2	11	2	11
Donghu (Jiangmen)	4	10	4	11	4	18
Duanfen (Jiangmen)	4	8	5	7	6	11
Huaguoshan (Jiangmen)	2	34	1	20	3	23
Chengzhong (Zhaoqing)	6	18	6	19	6	19
Xiapu (Huizhou)	4	10	5	11	7	15
Xijiao (Huizhou)	2	4	2	5	2	8
Jinguowan (Huizhou)	7	11	7	13	8	14
Zimaling (Zhongshan)	2	10	3	11	3	11
Nanchengyuanling (Dongguan)	4	11	3	11	7	13
Tap Mun (Hong Kong)	1	3	1	5	3	9
Tsuen Wan (Hong Kong)	6	11	6	11	6	12
Yuen Long (Hong Kong)	4	10	5	10	3	9
Tung Chung (Hong Kong)	7	14	2	9	2	9
Taipa Grande (Macao)	0	1	0	2	0	4

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

**Table 4.1c : The monthly averages of SO<sub>2</sub>**

Monitoring Station	July 2019	August 2019	September 2019
Luhu (Guangzhou)	7	7	8
Modiesha (Guangzhou)	12	12	8
Nansha-HKUST (Guangzhou)	7	8	10
Tianhu (Guangzhou)	3	3	6
Zhudong (Guangzhou)	6	4	10
Tongxinling (Shenzhen)	6	5	6
Jinjuzui (Foshan)	5	6	7
Huijingcheng (Foshan)	10	13	13
Tangjia (Zhuhai)	6	7	5
Donghu (Jiangmen)	5	5	9
Duanfen (Jiangmen)	5	6	8
Huaguoshan (Jiangmen)	9	8	11
Chengzhong (Zhaoqing)	9	10	11
Xiapu (Huizhou)	6	8	10
Xijiao (Huizhou)	3	3	4
Jinguowan (Huizhou)	8	8	9
Zimaling (Zhongshan)	5	6	7
Nanchengyuanling (Dongguan)	7	7	9
Tap Mun (Hong Kong)	2	3	5
Tsuen Wan (Hong Kong)	7	8	8
Yuen Long (Hong Kong)	5	7	5
Tung Chung (Hong Kong)	8	4	4
Taipa Grande (Macao)	0	1	1

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

**Table 4.2a : The monthly maxima and minima of hourly averages of NO<sub>2</sub>**

Monitoring Station	July 2019		August 2019		September 2019	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	9	95	9	119	7	148
Modiesha (Guangzhou)	8	90	7	106	6	164
Nansha-HKUST (Guangzhou)	3	113	1	99	3	147
Tianhu (Guangzhou)	4	35	4	48	3	22
Zhudong (Guangzhou)	2	63	2	52	1	95
Tongxinling (Shenzhen)	3	63	1	48	2	79
Jinjuzui (Foshan)	1	71	3	100	6	137
Huijingcheng (Foshan)	8	81	10	163	7	169
Tangjia (Zhuhai)	7	60	4	70	4	86
Donghu (Jiangmen)	4	63	5	57	6	116
Duanfen (Jiangmen)	4	32	4	24	5	50
Huaguoshan (Jiangmen)	3	46	4	47	4	91
Chengzhong (Zhaoqing)	5	76	5	127	5	136
Xiapu (Huizhou)	4	68	4	88	5	126
Xijiao (Huizhou)	1	36	1	28	2	34
Jinguowan (Huizhou)	1	64	1	57	1	50
Zimaling (Zhongshan)	1	51	1	55	2	101
Nanchengyuanling (Dongguan)	7	125	4	93	7	139
Tap Mun (Hong Kong)	0	37	0	41	0	33
Tsuen Wan (Hong Kong)	0	143	0	160	0	130
Yuen Long (Hong Kong)	1	99	3	103	5	143
Tung Chung (Hong Kong)	0	74	1	94	4	160
Taipa Grande (Macao)	0	50	0	62	0	73

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 NO<sub>2</sub>**

Monitoring Station	July 2019		August 2019		September 2019	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	14	49	21	52	21	81
Modiesha (Guangzhou)	16	52	19	58	17	68
Nansha-HKUST (Guangzhou)	10	43	14	39	12	61
Tianhu (Guangzhou)	5	18	4	17	5	13
Zhudong (Guangzhou)	12	36	7	28	8	43
Tongxinling (Shenzhen)	7	41	5	30	5	32
Jinjuzui (Foshan)	4	42	12	50	15	80
Huijingcheng (Foshan)	17	58	21	63	18	87
Tangjia (Zhuhai)	10	31	12	37	8	27
Donghu (Jiangmen)	9	31	9	31	10	58
Duanfen (Jiangmen)	5	16	6	16	8	21
Huaguoshan (Jiangmen)	5	23	7	28	10	51
Chengzhong (Zhaoqing)	10	39	18	48	13	62
Xiapu (Huizhou)	10	33	11	31	11	44
Xijiao (Huizhou)	4	18	3	16	4	12
Jinguowan (Huizhou)	4	29	3	27	5	21
Zimaling (Zhongshan)	3	24	3	26	9	53
Nanchengyuanling (Dongguan)	13	65	18	54	18	54
Tap Mun (Hong Kong)	1	21	2	22	2	14
Tsuen Wan (Hong Kong)	12	67	21	72	13	63
Yuen Long (Hong Kong)	13	66	20	71	20	85
Tung Chung (Hong Kong)	4	43	7	49	14	69
Taipa Grande (Macao)	5	23	5	27	7	41

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

**Table 4.2c : The monthly averages of NO<sub>2</sub>**

Monitoring Station	July 2019	August 2019	September 2019
Luhu (Guangzhou)	30	35	43
Modiesha (Guangzhou)	33	37	38
Nansha-HKUST (Guangzhou)	23	27	30
Tianhu (Guangzhou)	11	9	7
Zhudong (Guangzhou)	21	19	28
Tongxinling (Shenzhen)	17	17	20
Jinjuzui (Foshan)	23	28	34
Huijingcheng (Foshan)	33	39	46
Tangjia (Zhuhai)	17	19	17
Donghu (Jiangmen)	17	20	28
Duanfen (Jiangmen)	9	11	15
Huaguoshan (Jiangmen)	14	15	28
Chengzhong (Zhaoqing)	23	28	32
Xiapu (Huizhou)	21	21	21
Xijiao (Huizhou)	10	7	8
Jinguowan (Huizhou)	12	11	10
Zimaling (Zhongshan)	10	12	23
Nanchengyuanling (Dongguan)	30	34	33
Tap Mun (Hong Kong)	6	9	6
Tsuen Wan (Hong Kong)	32	36	34
Yuen Long (Hong Kong)	27	37	46
Tung Chung (Hong Kong)	16	22	32
Taipa Grande (Macao)	11	14	19

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

**Table 4.3a : The monthly maxima and minima of hourly averages of O<sub>3</sub>**

Monitoring Station	July 2019		August 2019		September 2019	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	2	245	2	269	2	296
Modiesha (Guangzhou)	8	284	6	302	6	260
Nansha-HKUST (Guangzhou)	1	305	1	345	1	365
Tianhu (Guangzhou)	13	199	13	238	29	195
Zhudong (Guangzhou)	1	241	1	237	1	239
Tongxinling (Shenzhen)	5	359	5	371	3	283
Jinjuzui (Foshan)	4	260	4	300	4	296
Huijingcheng (Foshan)	4	217	3	312	4	351
Tangjia (Zhuhai)	7	234	9	248	16	338
Donghu (Jiangmen)	1	218	1	246	1	382
Duanfen (Jiangmen)	2	110	2	150	3	249
Huaguoshan (Jiangmen)	3	199	4	247	3	306
Chengzhong (Zhaoqing)	3	224	3	256	4	243
Xiapu (Huizhou)	3	192	3	263	3	197
Xijiao (Huizhou)	2	193	3	211	2	176
Jinguowan (Huizhou)	1	240	1	224	3	210
Zimaling (Zhongshan)	3	265	3	337	3	349
Nanchengyuanling (Dongguan)	2	313	1	399	1	306
Tap Mun (Hong Kong)	5	232	7	314	13	270
Tsuen Wan (Hong Kong)	0	210	1	336	5	407
Yuen Long (Hong Kong)	5	298	0	408	0	330
Tung Chung (Hong Kong)	4	295	4	353	5	405
Taipa Grande (Macao)	1	254	0	313	0	419

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 O<sub>3</sub> (the monthly maxima, minima and the 90<sup>th</sup> percentile)**

Monitoring Station	July 2019			August 2019			September 2019		
	Min	Max	90 <sup>th</sup> per	Min	Max	90 <sup>th</sup> per	Min	Max	90 <sup>th</sup> per
Luhu (Guangzhou)	19	188	122	29	202	172	31	236	203
Modiesha (Guangzhou)	28	231	140	47	266	216	44	228	200
Nansha-HKUST (Guangzhou)	23	253	106	32	266	205	41	282	270
Tianhu (Guangzhou)	48	175	154	45	197	155	63	178	173
Zhudong (Guangzhou)	28	168	144	31	216	200	29	202	187
Tongxinling (Shenzhen)	43	301	83	42	291	197	26	252	218
Jinjuzui (Foshan)	26	223	148	37	239	220	35	248	223
Huijingcheng (Foshan)	21	184	120	31	283	205	32	295	229
Tangjia (Zhuhai)	31	189	75	35	209	179	37	277	233
Donghu (Jiangmen)	34	188	134	41	213	203	29	325	298
Duanfen (Jiangmen)	39	100	97	35	120	83	24	192	174
Huaguoshan (Jiangmen)	29	156	102	39	230	173	39	255	218
Chengzhong (Zhaoqing)	48	206	106	48	215	193	55	220	204
Xiapu (Huizhou)	25	163	133	36	207	152	32	180	170
Xijiao (Huizhou)	34	150	127	42	172	132	47	162	152
Jinguowan (Huizhou)	23	197	119	35	173	150	23	189	179
Zimaling (Zhongshan)	27	226	124	41	283	203	30	302	258
Nanchengyuanling (Dongguan)	35	247	162	49	338	259	42	252	233
Tap Mun (Hong Kong)	48	214	80	41	251	169	34	249	200
Tsuen Wan (Hong Kong)	21	155	47	10	284	162	22	291	188
Yuen Long (Hong Kong)	28	244	68	17	305	186	38	258	218
Tung Chung (Hong Kong)	35	252	66	19	292	210	28	320	230
Taipa Grande (Macao)	27	172	64	22	262	167	18	323	259

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

**Table 4.3c : The monthly averages of O<sub>3</sub>**

Monitoring Station	July 2019	August 2019	September 2019
Luhu (Guangzhou)	43	56	74
Modiesha (Guangzhou)	53	75	91
Nansha-HKUST (Guangzhou)	40	69	110
Tianhu (Guangzhou)	72	81	109
Zhudong (Guangzhou)	52	68	71
Tongxinling (Shenzhen)	48	68	98
Jinjuzui (Foshan)	49	70	96
Huijingcheng (Foshan)	47	69	96
Tangjia (Zhuhai)	43	65	103
Donghu (Jiangmen)	48	72	112
Duanfen (Jiangmen)	67	46	72
Huaguoshan (Jiangmen)	45	68	65
Chengzhong (Zhaoqing)	49	72	92
Xiapu (Huizhou)	48	62	85
Xijiao (Huizhou)	48	53	61
Jinguowan (Huizhou)	42	57	80
Zimaling (Zhongshan)	54	73	107
Nanchengyuanling (Dongguan)	63	89	106
Tap Mun (Hong Kong)	49	66	103
Tsuen Wan (Hong Kong)	28	42	75
Yuen Long (Hong Kong)	39	52	75
Tung Chung (Hong Kong)	45	59	80
Taipa Grande (Macao)	44	59	107

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

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

Monitoring Station	July 2019		August 2019		September 2019	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	0.3	1.5	0.3	1.5	0.4	1.7
Modiesha (Guangzhou)	0.4	1.2	0.3	1.2	0.3	1.5
Nansha-HKUST (Guangzhou)	0.0	0.8	0.0	0.9	0.1	1.2
Tianhu (Guangzhou)	0.5	1.0	0.3	0.9	0.4	1.1
Zhudong (Guangzhou)	0.4	1.0	0.4	1.0	0.4	1.1
Tongxinling (Shenzhen)	0.4	1.0	0.3	1.0	0.4	1.1
Jinjuzui (Foshan)	0.2	4.1	0.2	1.2	0.4	1.3
Huijingcheng (Foshan)	0.3	1.0	0.3	1.7	0.3	1.4
Tangjia (Zhuhai)	0.2	0.9	0.1	0.8	0.1	1.3
Donghu (Jiangmen)	0.3	1.6	0.3	1.5	0.4	1.6
Duanfen (Jiangmen)	0.3	0.6	0.3	0.8	0.1	1.0
Huaguoshan (Jiangmen)	0.4	1.3	0.4	1.3	0.4	1.2
Chengzhong (Zhaoqing)	0.3	1.1	0.3	1.2	0.6	1.4
Xiapu (Huizhou)	0.2	0.8	0.2	1.0	0.4	1.2
Xijiao (Huizhou)	0.4	1.0	0.2	1.0	0.3	1.4
Jinguowan (Huizhou)	0.3	0.9	0.5	1.2	0.1	0.9
Zimaling (Zhongshan)	0.1	1.5	0.0	1.0	0.2	1.2
Nanchengyuanling (Dongguan)	0.4	1.2	0.4	1.2	0.5	1.3
Tap Mun (Hong Kong)	0.1	0.6	0.2	0.8	0.3	1.0
Tsuen Wan (Hong Kong)	0.2	0.9	0.2	1.0	0.2	1.0
Yuen Long (Hong Kong)	0.3	1.1	0.3	1.1	0.2	1.3
Tung Chung (Hong Kong)	0.2	1.0	0.2	1.0	0.2	1.3
Taipa Grande (Macao)	0.1	1.8	0.2	1.6	0.4	1.3

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

**Table 4.4b : Daily averages of CO (the monthly maxima, minima and the 95<sup>th</sup> percentile)**

Monitoring Station	July 2019			August 2019			September 2019		
	Min	Max	95 <sup>th</sup> per	Min	Max	95 <sup>th</sup> per	Min	Max	95 <sup>th</sup> per
Luhu (Guangzhou)	0.4	0.9	0.8	0.4	0.9	0.9	0.4	1.0	1.0
Modiesha (Guangzhou)	0.5	0.9	0.9	0.4	1.0	0.9	0.5	1.1	1.1
Nansha-HKUST (Guangzhou)	0.0	0.6	0.6	0.0	0.6	0.6	0.2	0.7	0.7
Tianhu (Guangzhou)	0.6	0.9	0.9	0.5	0.9	0.8	0.5	0.9	0.8
Zhudong (Guangzhou)	0.5	0.7	0.7	0.5	0.8	0.8	0.6	0.9	0.9
Tongxinling (Shenzhen)	0.4	0.8	0.8	0.4	0.8	0.8	0.5	0.9	0.8
Jinjuzui (Foshan)	0.5	0.9	0.8	0.5	0.9	0.9	0.5	0.9	0.9
Huijingcheng (Foshan)	0.3	0.7	0.7	0.4	0.9	0.9	0.5	0.8	0.8
Tangjia (Zhuhai)	0.3	0.7	0.7	0.2	0.6	0.6	0.2	1.0	0.9
Donghu (Jiangmen)	0.4	1.0	0.9	0.4	1.0	0.9	0.5	1.1	1.0
Duanfen (Jiangmen)	0.3	0.5	0.5	0.3	0.8	0.6	0.2	0.6	0.6
Huaguoshan (Jiangmen)	0.5	0.8	0.8	0.6	1.1	1.0	0.5	1.1	1.0
Chengzhong (Zhaoqing)	0.3	0.9	0.8	0.4	0.9	0.9	0.6	1.1	1.0
Xiapu (Huizhou)	0.3	0.6	0.6	0.3	0.8	0.7	0.5	0.8	0.8
Xijiao (Huizhou)	0.5	0.7	0.7	0.3	0.8	0.8	0.3	0.7	0.7
Jinguowan (Huizhou)	0.4	0.7	0.6	0.5	0.9	0.9	0.2	0.7	0.6
Zimaling (Zhongshan)	0.2	1.0	1.0	0.1	0.8	0.7	0.3	0.9	0.8
Nanchengyuanling (Dongguan)	0.4	0.8	0.8	0.5	1.0	0.9	0.6	1.0	0.9
Tap Mun (Hong Kong)	0.2	0.5	0.5	0.3	0.6	0.6	0.3	0.9	0.7
Tsuen Wan (Hong Kong)	0.3	0.7	0.6	0.3	0.7	0.6	0.3	0.8	0.6
Yuen Long (Hong Kong)	0.3	1.0	0.9	0.4	0.9	0.7	0.3	1.0	0.8
Tung Chung (Hong Kong)	0.2	0.6	0.6	0.3	0.7	0.7	0.2	0.9	0.8
Taipa Grande (Macao)	0.2	0.6	0.5	0.3	1.0	0.9	0.4	1.1	1.0

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

**Table 4.4c : The monthly averages of CO**

Monitoring Station	July 2019	August 2019	September 2019
Luhu (Guangzhou)	0.7	0.7	0.8
Modiesha (Guangzhou)	0.7	0.7	0.8
Nansha-HKUST (Guangzhou)	0.3	0.3	0.4
Tianhu (Guangzhou)	0.8	0.7	0.7
Zhudong (Guangzhou)	0.6	0.7	0.7
Tongxinling (Shenzhen)	0.5	0.6	0.6
Jinjuzui (Foshan)	0.6	0.7	0.7
Huijingcheng (Foshan)	0.5	0.6	0.7
Tangjia (Zhuhai)	0.5	0.5	0.5
Donghu (Jiangmen)	0.6	0.7	0.7
Duanfen (Jiangmen)	0.4	0.5	0.4
Huaguoshan (Jiangmen)	0.6	0.8	0.8
Chengzhong (Zhaoqing)	0.6	0.7	0.9
Xiapu (Huizhou)	0.4	0.6	0.6
Xijiao (Huizhou)	0.6	0.5	0.5
Jinguowan (Huizhou)	0.5	0.7	0.5
Zimaling (Zhongshan)	0.6	0.4	0.6
Nanchengyuanling (Dongguan)	0.6	0.7	0.7
Tap Mun (Hong Kong)	0.3	0.4	0.5
Tsuen Wan (Hong Kong)	0.4	0.4	0.4
Yuen Long (Hong Kong)	0.6	0.5	0.5
Tung Chung (Hong Kong)	0.3	0.4	0.5
Taipa Grande (Macao)	0.4	0.7	0.7

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



**Table 4.5a : The monthly maxima and minima of daily averages of PM<sub>10</sub>**

Monitoring Station	July 2019		August 2019		September 2019	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	15	64	12	68	13	83
Modiesha (Guangzhou)	17	63	11	76	17	99
Nansha-HKUST (Guangzhou)	15	78	13	76	21	89
Tianhu (Guangzhou)	10	39	9	49	11	53
Zhudong (Guangzhou)	18	65	12	74	19	73
Tongxinling (Shenzhen)	10	67	10	61	13	90
Jinjuzui (Foshan)	14	52	9	62	18	80
Huijingcheng (Foshan)	16	61	14	68	16	94
Tangjia (Zhuhai)	6	62	7	67	11	83
Donghu (Jiangmen)	18	56	12	72	20	113
Duanfen (Jiangmen)	8	46	8	73	11	88
Huaguoshan (Jiangmen)	17	63	12	67	22	117
Chengzhong (Zhaoqing)	17	57	11	68	16	74
Xiapu (Huizhou)	9	59	9	65	16	99
Xijiao (Huizhou)	12	51	8	45	16	55
Jinguowan (Huizhou)	12	65	10	77	15	74
Zimaling (Zhongshan)	11	54	9	70	17	96
Nanchengyuanling (Dongguan)	16	78	11	72	19	97
Tap Mun (Hong Kong)	12	50	13	55	12	74
Tsuen Wan (Hong Kong)	8	71	9	75	8	85
Yuen Long (Hong Kong)	6	73	10	70	10	94
Tung Chung (Hong Kong)	9	68	9	71	9	80
Taipa Grande (Macao)	6	47	7	63	9	87

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

**Table 4.5b : The monthly averages of PM<sub>10</sub>**

Monitoring Station	July 2019	August 2019	September 2019
Luhu (Guangzhou)	32	37	48
Modiesha (Guangzhou)	37	45	54
Nansha-HKUST (Guangzhou)	33	39	46
Tianhu (Guangzhou)	26	26	34
Zhudong (Guangzhou)	35	40	49
Tongxinling (Shenzhen)	25	28	43
Jinjuzui (Foshan)	27	32	42
Huijingcheng (Foshan)	33	39	50
Tangjia (Zhuhai)	25	26	39
Donghu (Jiangmen)	32	36	53
Duanfen (Jiangmen)	25	26	39
Huaguoshan (Jiangmen)	32	37	55
Chengzhong (Zhaoqing)	33	39	47
Xiapu (Huizhou)	32	35	45
Xijiao (Huizhou)	28	27	36
Jinguowan (Huizhou)	32	34	40
Zimaling (Zhongshan)	25	28	46
Nanchengyuanling (Dongguan)	34	40	49
Tap Mun (Hong Kong)	24	26	34
Tsuen Wan (Hong Kong)	21	23	31
Yuen Long (Hong Kong)	23	26	39
Tung Chung (Hong Kong)	21	24	28
Taipa Grande (Macao)	19	21	34

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

**Table 4.6a : The monthly maxima and minima of daily averages of PM<sub>2.5</sub>**

Monitoring Station	July 2019		August 2019		September 2019	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	7	40	5	47	5	52
Modiesha (Guangzhou)	8	37	3	40	5	53
Nansha-HKUST (Guangzhou)	6	44	7	41	10	56
Tianhu (Guangzhou)	6	28	6	36	7	42
Zhudong (Guangzhou)	15	48	11	57	12	58
Tongxinling (Shenzhen)	5	50	5	44	9	70
Jinjuzui (Foshan)	7	35	6	42	10	54
Huijingcheng (Foshan)	10	40	9	51	10	60
Tangjia (Zhuhai)	3	42	4	50	6	66
Donghu (Jiangmen)	6	34	4	49	9	62
Duanfen (Jiangmen)	2	23	2	57	5	43
Huaguoshan (Jiangmen)	7	38	5	52	11	69
Chengzhong (Zhaoqing)	9	33	6	43	7	40
Xiapu (Huizhou)	6	33	5	39	8	57
Xijiao (Huizhou)	7	32	6	37	10	44
Jinguowan (Huizhou)	6	38	4	41	7	52
Zimaling (Zhongshan)	6	37	3	48	11	62
Nanchengyuanling (Dongguan)	7	38	7	38	7	54
Tap Mun (Hong Kong)	4	34	4	38	5	53
Tsuen Wan (Hong Kong)	5	50	4	56	5	63
Yuen Long (Hong Kong)	5	47	6	46	8	59
Tung Chung (Hong Kong)	4	46	5	48	5	63
Taipa Grande (Macao)	2	33	1	46	2	55

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

**Table 4.6b : The monthly averages of PM<sub>2.5</sub>**

Monitoring Station	July 2019	August 2019	September 2019
Luhu (Guangzhou)	18	23	28
Modiesha (Guangzhou)	18	20	25
Nansha-HKUST (Guangzhou)	14*	20	27
Tianhu (Guangzhou)	18	19	24
Zhudong (Guangzhou)	25	31	34
Tongxinling (Shenzhen)	15	18	28
Jinjuzui (Foshan)	16	21	27
Huijingcheng (Foshan)	21	27	33
Tangjia (Zhuhai)	14	17	27
Donghu (Jiangmen)	16	20	30
Duanfen (Jiangmen)	9	15*	17
Huaguoshan (Jiangmen)	17	23	35
Chengzhong (Zhaoqing)	17	23	27
Xiapu (Huizhou)	15	19	24
Xijiao (Huizhou)	18	20	27
Jinguowan (Huizhou)	15	17	23
Zimaling (Zhongshan)	13	17	27
Nanchengyuanling (Dongguan)	15	21	26
Tap Mun (Hong Kong)	12	15	18
Tsuen Wan (Hong Kong)	12	15	20
Yuen Long (Hong Kong)	14	16	23
Tung Chung (Hong Kong)	12	15	21
Taipa Grande (Macao)	9	11	19

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
Nansha-HKUST <sup>(1)</sup> (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
Tongxinling <sup>(2)</sup> (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

Remarks:

<sup>(1)</sup> Nansha HKUST Station was originally named as Wanqingsha prior to 2019.

<sup>(2)</sup> Tongxinling Station was originally named as Liyuan prior to 2019.

## Annex B : Measurement Methods of Air Pollutant Concentration

Pollutants	Measuring Principles
Sulphur dioxide (SO <sub>2</sub> )	UV fluorescence / Differential Optical Absorption Spectroscopy
Nitrogen dioxide (NO <sub>2</sub> )	Chemiluminescence / Differential Optical Absorption Spectroscopy
Ozone (O <sub>3</sub> )	UV absorption / Differential Optical Absorption Spectroscopy
Respirable suspended particulates (PM <sub>10</sub> )	Oscillating microbalance (TEOM) / Beta particulate monitor
Fine suspended particulates (PM <sub>2.5</sub> )	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