

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

**January to March 2020**

**Statistical Summary of the First 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 first quarter of 2020. It is the twenty-fifth report published in the form of a quarterly report and the twenty-second 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.º665 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

Owing to the rebuilding of a station resulted from a relocation for the Modiesha monitoring station in Guangzhou, the station was temporarily suspended from 31 March 2020.

The overall operation of the Network was smooth in the first quarter of 2020. The average data capture rate of hourly air pollutant monitoring data measured at all monitoring stations was 97.1% in the first 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 January to March 2020. 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	January 2020		February 2020		March 2020	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	5	19	5	15	5	13
Modiesha (Guangzhou)	8	25	8	23	8	24
Nansha-HKUST (Guangzhou)	5	19	5	17	5	21
Tianhu (Guangzhou)	1	24	1	7	1	15
Zhudong (Guangzhou)	6	20	5	15	6	19
Tongxinling (Shenzhen)	5	8	5	7	4	8
Jinjuzui (Foshan)	3	16	3	23	3	18
Huijingcheng (Foshan)	4	22	6	18	5	20
Tangjia (Zhuhai)	1	20	1	15	1	12
Donghu (Jiangmen)	4	27	4	25	4	21
Duanfen (Jiangmen)	4	16	4	11	4	15
Huaguoshan (Jiangmen)	1	49	1	12	2	36
Chengzhong (Zhaoqing)	1	44	2	13	4	28
Xiapu (Huizhou)	5	15	4	15	5	16
Xijiao (Huizhou)	1	44	1	21	1	25
Jinguowan (Huizhou)	6	20	7	16	8	14
Zimaling (Zhongshan)	3	15	2	11	3	12
Nanchengyuanling (Dongguan)	6	24	6	17	6	18
Tap Mun (Hong Kong)	5	9	0	9	0	10
Tsuen Wan (Hong Kong)	0	12	4	12	4	13
Yuen Long (Hong Kong)	2	9	2	9	2	20
Tung Chung (Hong Kong)	2	14	2	14	4	10
Taipa Grande (Macao)	1	9	1	10	1	6

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	January 2020		February 2020		March 2020	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	6	10	5	8	6	8
Modiesha (Guangzhou)	9	14	9	12	9	13
Nansha-HKUST (Guangzhou)	6	13	6	9	6	8
Tianhu (Guangzhou)	2	7	1	4	1	4
Zhudong (Guangzhou)	6	12	6	9	6	13
Tongxinling (Shenzhen)	5	6	5	6	5	6
Jinjuzui (Foshan)	4	9	3	6	4	7
Huijingcheng (Foshan)	7	14	7	12	7	13
Tangjia (Zhuhai)	3	10	3	8	4	8
Donghu (Jiangmen)	4	10	4	8	5	10
Duanfen (Jiangmen)	5	9	5	7	5	9
Huaguoshan (Jiangmen)	2	17	2	5	2	11
Chengzhong (Zhaoqing)	2	18	3	9	5	15
Xiapu (Huizhou)	6	10	5	9	5	9
Xijiao (Huizhou)	1	24	1	7	1	6
Jinguowan (Huizhou)	7	10	8	11	8	10
Zimaling (Zhongshan)	4	9	3	6	4	8
Nanchengyuanling (Dongguan)	6	16	6	9	6	11
Tap Mun (Hong Kong)	6	9	2	8	1	8
Tsuen Wan (Hong Kong)	0	6	4	7	4	7
Yuen Long (Hong Kong)	3	6	3	6	3	8
Tung Chung (Hong Kong)	4	8	4	8	5	7
Taipa Grande (Macao)	1	4	1	4	2	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	January 2020	February 2020	March 2020
Luhu (Guangzhou)	7	6	7
Modiesha (Guangzhou)	11	10	10
Nansha-HKUST (Guangzhou)	8	7	7
Tianhu (Guangzhou)	3	2	3
Zhudong (Guangzhou)	8	7	8
Tongxinling (Shenzhen)	5	5	6
Jinjuzui (Foshan)	6	4	5
Huijingcheng (Foshan)	9	9	11
Tangjia (Zhuhai)	6	5	6
Donghu (Jiangmen)	7	6	6
Duanfen (Jiangmen)	6	6	6
Huaguoshan (Jiangmen)	6	3	5
Chengzhong (Zhaoqing)	7	4	10
Xiapu (Huizhou)	8	7	7
Xijiao (Huizhou)	5	3*	3*
Jinguowan (Huizhou)	8	8	9
Zimaling (Zhongshan)	6	5	5
Nanchengyuanling (Dongguan)	9	7	8
Tap Mun (Hong Kong)	7	6	5
Tsuen Wan (Hong Kong)	4	5	5
Yuen Long (Hong Kong)	5	4	4
Tung Chung (Hong Kong)	5	5	6
Taipa Grande (Macao)	3	2	2

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 NO<sub>2</sub>**

Monitoring Station	January 2020		February 2020		March 2020	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	4	204	5	111	10	101
Modiesha (Guangzhou)	5	173	5	109	8	103
Nansha-HKUST (Guangzhou)	5	106	5	98	5	101
Tianhu (Guangzhou)	4	79	4	46	4	43
Zhudong (Guangzhou)	5	111	5	66	7	88
Tongxinling (Shenzhen)	3	77	3	49	2	58
Jinjuzui (Foshan)	5	140	5	94	7	87
Huijingcheng (Foshan)	2	180	3	105	9	89
Tangjia (Zhuhai)	6	183	6	78	10	110
Donghu (Jiangmen)	5	110	7	52	5	70
Duanfen (Jiangmen)	1	52	1	26	1	41
Huaguoshan (Jiangmen)	7	107	5	43	5	84
Chengzhong (Zhaoqing)	5	198	1	70	6	100
Xiapu (Huizhou)	5	110	4	72	6	58
Xijiao (Huizhou)	1	24	1	18	3	25
Jinguowan (Huizhou)	1	58	1	25	2	37
Zimaling (Zhongshan)	1	83	1	67	1	63
Nanchengyuanling (Dongguan)	3	139	4	68	8	86
Tap Mun (Hong Kong)	2	42	2	23	3	48
Tsuen Wan (Hong Kong)	5	156	5	128	7	111
Yuen Long (Hong Kong)	6	136	5	104	6	96
Tung Chung (Hong Kong)	3	125	0	153	2	89
Taipa Grande (Macao)	6	93	6	57	5	67

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	January 2020		February 2020		March 2020	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	7	122	8	56	18	64
Modiesha (Guangzhou)	9	87	9	52	17	67
Nansha-HKUST (Guangzhou)	8	61	8	48	12	59
Tianhu (Guangzhou)	6	43	5	18	7	18
Zhudong (Guangzhou)	10	64	8	32	13	54
Tongxinling (Shenzhen)	6	48	5	23	5	31
Jinjuzui (Foshan)	10	92	7	44	19	66
Huijingcheng (Foshan)	11	113	7	63	17	67
Tangjia (Zhuhai)	9	51	10	36	18	60
Donghu (Jiangmen)	7	73	10	31	14	52
Duanfen (Jiangmen)	4	30	3	16	6	25
Huaguoshan (Jiangmen)	11	75	9	27	13	52
Chengzhong (Zhaoqing)	8	92	7	37	12	67
Xiapu (Huizhou)	6	46	5	22	10	27
Xijiao (Huizhou)	2	14	4	11	5	15
Jinguowan (Huizhou)	1	27	1	11	7	22
Zimaling (Zhongshan)	4	52	4	23	5	39
Nanchengyuanling (Dongguan)	5	73	6	35	14	47
Tap Mun (Hong Kong)	3	15	4	10	6	19
Tsuen Wan (Hong Kong)	16	78	19	65	19	77
Yuen Long (Hong Kong)	17	74	15	52	16	53
Tung Chung (Hong Kong)	14	71	6	68	9	54
Taipa Grande (Macao)	13	53	10	32	13	52

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	January 2020	February 2020	March 2020
Luhu (Guangzhou)	42	29	37
Modiesha (Guangzhou)	42	29	41
Nansha-HKUST (Guangzhou)	34	24	35
Tianhu (Guangzhou)	15	9	12
Zhudong (Guangzhou)	30	19	32
Tongxinling (Shenzhen)	19	11	15
Jinjuzui (Foshan)	41	23	33
Huijingcheng (Foshan)	44	28	38
Tangjia (Zhuhai)	29	22	32
Donghu (Jiangmen)	32	18	25
Duanfen (Jiangmen)	14	8	12
Huaguoshan (Jiangmen)	32	19	26
Chengzhong (Zhaoqing)	36	20	31
Xiapu (Huizhou)	23	13	18
Xijiao (Huizhou)	8	6*	10*
Jinguowan (Huizhou)	13	6	12
Zimaling (Zhongshan)	24	13	18
Nanchengyuanling (Dongguan)	32	18	28
Tap Mun (Hong Kong)	9	6	10
Tsuen Wan (Hong Kong)	46	37	38
Yuen Long (Hong Kong)	46	36	33
Tung Chung (Hong Kong)	37	30	29
Taipa Grande (Macao)	34	22	25

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 O<sub>3</sub>**

Monitoring Station	January 2020		February 2020		March 2020	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	2	219	3	178	3	156
Modiesha (Guangzhou)	2	225	2	186	2	151
Nansha-HKUST (Guangzhou)	2	397	1	217	1	160
Tianhu (Guangzhou)	10	183	6	171	10	171
Zhudong (Guangzhou)	6	253	6	177	6	165
Tongxinling (Shenzhen)	5	132	6	146	5	129
Jinjuzui (Foshan)	9	221	7	160	7	156
Huijingcheng (Foshan)	4	243	3	184	3	162
Tangjia (Zhuhai)	7	170	7	195	11	166
Donghu (Jiangmen)	1	229	2	196	1	171
Duanfen (Jiangmen)	3	167	6	170	3	170
Huaguoshan (Jiangmen)	3	191	5	156	3	144
Chengzhong (Zhaoqing)	6	252	6	155	5	121
Xiapu (Huizhou)	3	182	10	127	3	195
Xijiao (Huizhou)	2	137	2	147	2	167
Jinguowan (Huizhou)	1	241	4	133	3	215
Zimaling (Zhongshan)	3	198	4	236	3	166
Nanchengyuanling (Dongguan)	1	248	1	217	1	207
Tap Mun (Hong Kong)	3	139	4	146	2	160
Tsuen Wan (Hong Kong)	0	105	1	108	1	128
Yuen Long (Hong Kong)	1	120	1	138	1	130
Tung Chung (Hong Kong)	1	109	0	200	0	165
Taipa Grande (Macao)	8	143	9	219	8	164

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	January 2020			February 2020			March 2020		
	Min	Max	90 <sup>th</sup> per	Min	Max	90 <sup>th</sup> per	Min	Max	90 <sup>th</sup> per
Luhu (Guangzhou)	21	168	106	28	141	119	7	123	109
Modiesha (Guangzhou)	30	163	112	27	161	122	21	127	111
Nansha-HKUST (Guangzhou)	30	267	144	38	189	134	4	121	111
Tianhu (Guangzhou)	27	166	128	41	148	127	28	150	124
Zhudong (Guangzhou)	23	203	113	22	150	133	12	128	111
Tongxinling (Shenzhen)	41	117	109	50	124	105	25	124	110
Jinjuzui (Foshan)	27	172	106	34	139	113	10	137	106
Huijingcheng (Foshan)	19	187	117	29	155	133	6	129	120
Tangjia (Zhuhai)	29	126	109	43	165	108	20	140	111
Donghu (Jiangmen)	20	186	124	24	169	117	5	137	127
Duanfen (Jiangmen)	35	125	112	31	158	102	5	140	119
Huaguoshan (Jiangmen)	21	155	104	22	137	103	6	116	102
Chengzhong (Zhaoqing)	32	204	98	30	130	124	11	100	88
Xiapu (Huizhou)	41	122	107	41	111	101	12	130	119
Xijiao (Huizhou)	22	111	92	32	107	97	15	143	113
Jinguowan (Huizhou)	40	153	122	35	116	102	27	131	127
Zimaling (Zhongshan)	27	147	129	43	196	113	4	140	123
Nanchengyuanling (Dongguan)	34	221	129	41	173	139	50	149	139
Tap Mun (Hong Kong)	46	131	125	53	130	119	52	153	126
Tsuen Wan (Hong Kong)	35	89	80	15	98	88	12	113	101
Yuen Long (Hong Kong)	30	89	83	17	114	89	16	117	99
Tung Chung (Hong Kong)	23	101	88	22	136	98	22	126	113
Taipa Grande (Macao)	30	116	106	45	162	107	10	142	120

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	January 2020	February 2020	March 2020
Luhu (Guangzhou)	41	45	39
Modiesha (Guangzhou)	44	52	41
Nansha-HKUST (Guangzhou)	66	64	45
Tianhu (Guangzhou)	72	72	66
Zhudong (Guangzhou)	44	49	40
Tongxinling (Shenzhen)	67	65	64
Jinjuzui (Foshan)	52	57	50
Huijingcheng (Foshan)	47	53	44
Tangjia (Zhuhai)	62	62	63
Donghu (Jiangmen)	53	54	50
Duanfen (Jiangmen)	60	57	57
Huaguoshan (Jiangmen)	46	48	40
Chengzhong (Zhaoqing)	46	51	40
Xiapu (Huizhou)	60	60	60
Xijiao (Huizhou)	36	39*	49*
Jinguowan (Huizhou)	62	58	62
Zimaling (Zhongshan)	55	58	57
Nanchengyuanling (Dongguan)	60	64	61
Tap Mun (Hong Kong)	80	75	76
Tsuen Wan (Hong Kong)	45	46	46
Yuen Long (Hong Kong)	44	42	47
Tung Chung (Hong Kong)	43	48	55
Taipa Grande (Macao)	62	66	62

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	January 2020		February 2020		March 2020	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	0.4	1.8	0.4	1.5	0.5	1.5
Modiesha (Guangzhou)	0.4	1.7	0.3	1.0	0.3	1.3
Nansha-HKUST (Guangzhou)	0.0	1.8	0.1	1.0	0.1	1.2
Tianhu (Guangzhou)	0.4	1.3	0.4	1.5	0.5	1.4
Zhudong (Guangzhou)	0.5	2.0	0.0	1.5	0.5	1.1
Tongxinling (Shenzhen)	0.5	1.3	0.4	0.9	0.4	1.1
Jinjuzui (Foshan)	0.4	1.5	0.3	1.1	0.4	1.1
Huijingcheng (Foshan)	0.2	2.3	0.1	1.2	0.2	1.1
Tangjia (Zhuhai)	0.2	1.3	0.2	0.9	0.4	1.1
Donghu (Jiangmen)	0.5	3.0	0.3	1.7	0.5	1.5
Duanfen (Jiangmen)	0.3	1.8	0.3	1.1	0.4	1.2
Huaguoshan (Jiangmen)	0.3	2.0	0.0	1.3	0.0	1.1
Chengzhong (Zhaoqing)	0.1	1.8	0.3	0.9	0.4	1.9
Xiapu (Huizhou)	0.5	1.4	0.4	1.1	0.4	1.0
Xijiao (Huizhou)	0.4	1.1	0.2	0.8	0.2	0.8
Jinguowan (Huizhou)	0.4	1.2	0.2	0.7	0.2	1.1
Zimaling (Zhongshan)	0.3	1.6	0.1	1.0	0.2	0.9
Nanchengyuanling (Dongguan)	0.3	1.4	0.2	1.0	0.3	1.1
Tap Mun (Hong Kong)	0.5	1.2	0.2	1.1	0.3	0.9
Tsuen Wan (Hong Kong)	0.4	1.4	0.4	1.1	0.4	1.2
Yuen Long (Hong Kong)	0.4	1.5	0.2	1.1	0.3	1.0
Tung Chung (Hong Kong)	0.3	1.3	0.2	0.9	0.2	1.0
Taipa Grande (Macao)	0.3	1.3	0.3	0.9	0.4	1.2

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	January 2020			February 2020			March 2020		
	Min	Max	95 <sup>th</sup> per	Min	Max	95 <sup>th</sup> per	Min	Max	95 <sup>th</sup> per
Luhu (Guangzhou)	0.5	1.3	1.2	0.4	0.9	0.9	0.6	1.0	0.9
Modiesha (Guangzhou)	0.5	1.3	1.2	0.5	0.8	0.8	0.5	0.9	0.9
Nansha-HKUST (Guangzhou)	0.2	0.9	0.8	0.1	0.4	0.4	0.1	0.7	0.7
Tianhu (Guangzhou)	0.6	1.3	1.1	0.4	1.1	0.9	0.6	1.0	1.0
Zhudong (Guangzhou)	0.6	1.2	1.2	0.3	0.9	0.8	0.6	1.0	0.9
Tongxinling (Shenzhen)	0.5	1.1	1.0	0.5	0.9	0.8	0.4	0.8	0.8
Jinjuzui (Foshan)	0.5	1.2	1.1	0.4	0.8	0.7	0.4	0.8	0.8
Huijingcheng (Foshan)	0.3	1.1	1.1	0.2	0.9	0.7	0.4	0.8	0.8
Tangjia (Zhuhai)	0.4	1.1	1.1	0.3	0.7	0.6	0.4	0.8	0.8
Donghu (Jiangmen)	0.7	1.2	1.2	0.5	0.9	0.8	0.5	1.0	0.9
Duanfen (Jiangmen)	0.5	1.2	1.2	0.4	0.7	0.7	0.4	0.9	0.8
Huaguoshan (Jiangmen)	0.5	1.3	1.1	0.2	1.1	1.0	0.2	0.9	0.9
Chengzhong (Zhaoqing)	0.5	1.2	1.2	0.4	0.8	0.8	0.5	1.3	1.1
Xiapu (Huizhou)	0.6	1.0	1.0	0.4	0.7	0.7	0.5	0.8	0.7
Xijiao (Huizhou)	0.5	1.0	0.9	0.3	0.7	0.6	0.3	0.5	0.5
Jinguowan (Huizhou)	0.6	1.1	1.0	0.3	0.6	0.6	0.3	1.0	0.8
Zimaling (Zhongshan)	0.4	1.3	1.2	0.2	0.8	0.8	0.3	0.7	0.7
Nanchengyuanling (Dongguan)	0.4	1.1	1.1	0.3	0.8	0.8	0.3	0.7	0.7
Tap Mun (Hong Kong)	0.6	1.2	1.1	0.3	0.9	0.8	0.3	0.6	0.6
Tsuen Wan (Hong Kong)	0.6	1.2	1.0	0.5	0.8	0.8	0.5	0.9	0.8
Yuen Long (Hong Kong)	0.5	1.2	1.1	0.3	0.9	0.9	0.4	0.9	0.8
Tung Chung (Hong Kong)	0.4	1.1	1.0	0.3	0.8	0.7	0.3	0.7	0.7
Taipa Grande (Macao)	0.4	1.2	1.1	0.4	0.8	0.8	0.5	0.9	0.8

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	January 2020	February 2020	March 2020
Luhu (Guangzhou)	0.9	0.7	0.8
Modiesha (Guangzhou)	0.9	0.6	0.7
Nansha-HKUST (Guangzhou)	0.5	0.3	0.5
Tianhu (Guangzhou)	0.9	0.7	0.9
Zhudong (Guangzhou)	1.0	0.7	0.7
Tongxinling (Shenzhen)	0.8	0.7	0.7
Jinjuzui (Foshan)	0.8	0.5	0.6
Huijingcheng (Foshan)	0.7	0.5	0.6
Tangjia (Zhuhai)	0.7	0.5	0.6
Donghu (Jiangmen)	0.9	0.7	0.7
Duanfen (Jiangmen)	0.8	0.6	0.6
Huaguoshan (Jiangmen)	0.8	0.6*	0.6
Chengzhong (Zhaoqing)	0.9	0.6	0.8
Xiapu (Huizhou)	0.8	0.6	0.6
Xijiao (Huizhou)	0.7	0.5*	0.4*
Jinguowan (Huizhou)	0.8	0.4	0.5
Zimaling (Zhongshan)	0.8	0.6	0.5
Nanchengyuanling (Dongguan)	0.8	0.6	0.5
Tap Mun (Hong Kong)	0.9	0.7	0.5
Tsuen Wan (Hong Kong)	0.8	0.7	0.7
Yuen Long (Hong Kong)	0.8	0.7	0.6
Tung Chung (Hong Kong)	0.7	0.5	0.5
Taipa Grande (Macao)	0.7	0.6	0.6

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

\* 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<sub>10</sub>**

Monitoring Station	January 2020		February 2020		March 2020	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	9	123	5	53	8	67
Modiesha (Guangzhou)	9	106	8	53	12	76
Nansha-HKUST (Guangzhou)	10	82	6	48	16	54
Tianhu (Guangzhou)	6	63	5	51	4	61
Zhudong (Guangzhou)	8	139	6	67	12	79
Tongxinling (Shenzhen)	12	73	6	54	15	60
Jinjuzui (Foshan)	11	72	6	51	12	51
Huijingcheng (Foshan)	8	109	12	59	12	57
Tangjia (Zhuhai)	10	62	5	50	17	54
Donghu (Jiangmen)	9	117	6	100	20	89
Duanfen (Jiangmen)	11	75	9	61	11	53
Huaguoshan (Jiangmen)	12	159	7	91	18	94
Chengzhong (Zhaoqing)	4	120	3	55	4	98
Xiapu (Huizhou)	7	79	6	54	9	61
Xijiao (Huizhou)	5	55	10	40	8	51
Jinguowan (Huizhou)	6	47	5	43	10	49
Zimaling (Zhongshan)	10	62	3	56	14	54
Nanchengyuanling (Dongguan)	7	106	4	54	12	66
Tap Mun (Hong Kong)	8	45	9	58	16	56
Tsuen Wan (Hong Kong)	8	45	8	54	10	43
Yuen Long (Hong Kong)	10	55	9	52	10	57
Tung Chung (Hong Kong)	10	46	10	59	6	35
Taipa Grande (Macao)	11	58	8	47	9	47

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	January 2020	February 2020	March 2020
Luhu (Guangzhou)	47	31	36
Modiesha (Guangzhou)	48	33	45
Nansha-HKUST (Guangzhou)	39	27	32
Tianhu (Guangzhou)	30	26	27
Zhudong (Guangzhou)	52	36	43
Tongxinling (Shenzhen)	45	30	37
Jinjuzui (Foshan)	38	26	31
Huijingcheng (Foshan)	43	32	36
Tangjia (Zhuhai)	39	29	31
Donghu (Jiangmen)	53	38	44
Duanfen (Jiangmen)	49	35	29
Huaguoshan (Jiangmen)	66	44	45
Chengzhong (Zhaoqing)	49	30	39
Xiapu (Huizhou)	44	28	35
Xijiao (Huizhou)	33	25*	28*
Jinguowan (Huizhou)	30	22	29
Zimaling (Zhongshan)	39	27	30
Nanchengyuanling (Dongguan)	44	31	36
Tap Mun (Hong Kong)	30	27	30
Tsuen Wan (Hong Kong)	28	25	25
Yuen Long (Hong Kong)	34	29	32
Tung Chung (Hong Kong)	29	23	21
Taipa Grande (Macao)	35	26	28

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<sub>2.5</sub>**

Monitoring Station	January 2020		February 2020		March 2020	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	7	64	3	45	5	34
Modiesha (Guangzhou)	4	45	3	36	8	33
Nansha-HKUST (Guangzhou)	8	68	8	39	11	39
Tianhu (Guangzhou)	10	40	3	46	4	36
Zhudong (Guangzhou)	11	97	7	52	10	50
Tongxinling (Shenzhen)	5	47	7	35	8	35
Jinjuzui (Foshan)	8	50	8	42	9	32
Huijingcheng (Foshan)	8	74	7	46	11	38
Tangjia (Zhuhai)	8	44	2	40	8	35
Donghu (Jiangmen)	4	47	1	48	9	40
Duanfen (Jiangmen)	6	42	5	55	6	42
Huaguoshan (Jiangmen)	8	116	2	69	11	58
Chengzhong (Zhaoqing)	2	68	2	45	3	53
Xiapu (Huizhou)	5	58	4	40	7	36
Xijiao (Huizhou)	5	39	9	33	7	33
Jinguowan (Huizhou)	6	36	4	30	7	32
Zimaling (Zhongshan)	3	34	2	37	10	28
Nanchengyuanling (Dongguan)	4	84	2	58	7	50
Tap Mun (Hong Kong)	5	28	5	24	7	26
Tsuen Wan (Hong Kong)	7	33	6	37	7	31
Yuen Long (Hong Kong)	6	34	5	26	6	28
Tung Chung (Hong Kong)	8	33	6	39	5	24
Taipa Grande (Macao)	2	29	2	22	4	29

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	January 2020	February 2020	March 2020
Luhu (Guangzhou)	27	22	19
Modiesha (Guangzhou)	22	19	20
Nansha-HKUST (Guangzhou)	25	20	21
Tianhu (Guangzhou)	23	22	19
Zhudong (Guangzhou)	34	28	28
Tongxinling (Shenzhen)	29	21	22
Jinjuzui (Foshan)	25	20	19
Huijingcheng (Foshan)	29	24	23
Tangjia (Zhuhai)	28	21	21
Donghu (Jiangmen)	26	23	20
Duanfen (Jiangmen)	25	21	15
Huaguoshan (Jiangmen)	40	30	27
Chengzhong (Zhaoqing)	29	21	21
Xiapu (Huizhou)	30	21	21
Xijiao (Huizhou)	24	20*	20*
Jinguowan (Huizhou)	22	17	18
Zimaling (Zhongshan)	22	18	16
Nanchengyuanling (Dongguan)	30	25	22
Tap Mun (Hong Kong)	18	15	17
Tsuen Wan (Hong Kong)	20	17	16
Yuen Long (Hong Kong)	20	16	16
Tung Chung (Hong Kong)	19	15	13
Taipa Grande (Macao)	18	12	14

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 <sup>(3)</sup> (Huizhou)	Zhangbei Yaowei She Nationality Primary School, Henghe Town	Rural	44m	10m	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

Remarks:

- (1) Wanqingsha station was renamed as Nansha-HKUST station in the 1<sup>st</sup> quarter of 2019.
- (2) Liyuan station was renamed as Tongxinling station in the 1<sup>st</sup> quarter of 2019.
- (3) Xijiao station was relocated to Zhangbei Yaowei She Nationality Primary School, Henghe Town, Boluo County, in the 4<sup>th</sup> quarter of 2019. The distance of the old and new sites is about 200 metres.

## 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