

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

**January to March 2017**

**Statistical Summary of the First Quarter  
Monitoring Results**

**Report Number : PRDAIR-2017-1**

**Report Prepared by : Guangdong Provincial Environmental  
Monitoring Centre  
Environmental Protection Department,  
Hong Kong SARG  
Environmental Protection Bureau,  
Macao SARG  
Meteorological and Geophysical Bureau,  
Macao SARG**

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

**Security Classification : Unrestricted**

# Contents

	<u>Page</u>
1. Foreword	3
2. Introduction to Guangdong-Hong Kong-Macao Pearl River Delta Regional Air Quality Monitoring Network	3
3. Operation of the Network	4
4. Statistical Results of Pollutant Concentrations	4
Annex A : Site Information of Monitoring Stations	21
Annex B : Measurement Methods of Air Pollutant Concentration	22

## List of Tables

	<u>Page</u>
Table 4.1a : The monthly maxima and minima of hourly averages of SO <sub>2</sub>	5
Table 4.1b : The monthly maxima and minima of daily averages of SO <sub>2</sub>	6
Table 4.1c : The monthly averages of SO <sub>2</sub>	7
Table 4.2a : The monthly maxima and minima of hourly averages of NO <sub>2</sub>	8
Table 4.2b : The monthly maxima and minima of daily averages of NO <sub>2</sub>	9
Table 4.2c : The monthly averages of NO <sub>2</sub>	10
Table 4.3a : The monthly maxima and minima of hourly averages of O <sub>3</sub>	11
Table 4.3b : Daily maximum 8-hour averages of O <sub>3</sub> (the monthly maxima, minima and the 90 <sup>th</sup> percentile)	12
Table 4.3c : The monthly averages of O <sub>3</sub>	13
Table 4.4a : The monthly maxima and minima of hourly averages of CO	14
Table 4.4b : Daily averages of CO (the monthly maxima, minima and the 95 <sup>th</sup> percentile)	15
Table 4.4c : The monthly averages of CO	16
Table 4.5a : The monthly maxima and minima of daily averages of PM <sub>10</sub>	17
Table 4.5b : The monthly averages of PM <sub>10</sub>	18
Table 4.6a : The monthly maxima and minima of daily averages of PM <sub>2.5</sub>	19
Table 4.6b : The monthly averages of PM <sub>2.5</sub>	20

## List of Figures

	<u>Page</u>
Figure 2.1 : Spatial Distribution of Monitoring Stations in the Network	4

## 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 and 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), sulphur 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 PRD Regional Air Quality Monitoring Network in the first quarter of 2017, which is the thirteenth report published in the form of a quarterly report and the tenth 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 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 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 of these 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 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

The operation of the Network was smooth in the first quarter of 2017. The average hourly data capture rate of air pollutant concentrations in all monitoring stations was 97.4%.

### 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<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 2017.

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

Monitoring Station	January 2017		February 2017		March 2017	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	5	26	2	30	4	43
Modiesha (Guangzhou)	3	39	3	43	4	64
Wanqingsha (Guangzhou)	8	141	7	74	8	66
Tianhu (Guangzhou)	4	29	4	37	3	29
Zhudong (Guangzhou)	7	93	7	50	8	43
Liyuan (Shenzhen)	4	11	4	12	4	18
Jinjuzui (Foshan)	0	44	1	44	4	50
Huijingcheng (Foshan)	1	73	2	62	2	41
Tangjia (Zhuhai)	1	38	1	36	1	53
Donghu (Jiangmen)	2	52	2	47	3	32
Duanfen (Jiangmen)	3	40	3	34	3	54
Huaguoshan (Jiangmen)	7	94	7	63	9	243
Chengzhong (Zhaoqing)	5	61	6	56	8	112
Xiapu (Huizhou)	2	27	3	23	4	28
Xijiao (Huizhou)	1	49	1	57	2	60
Jinguowan (Huizhou)	0	40	0	33	5	15
Zimaling (Zhongshan)	6	51	5	38	1	34
Nanchengyuanling (Dongguan)	5	42	5	58	4	44
Tap Mun (Hong Kong)	7	19	8	23	7	25
Tsuen Wan (Hong Kong)	9	81	9	45	10	79
Yuen Long (Hong Kong)	7	29	7	26	7	25
Tung Chung (Hong Kong)	7	35	7	24	7	60
Taipa Grande (Macao)	2	80	2	48	0	70

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 2017		February 2017		March 2017	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	6	14	4	18	5	21
Modiesha (Guangzhou)	3	24	4	20	5	33
Wanqingsha (Guangzhou)	10	47	10	33	11	31
Tianhu (Guangzhou)	5	16	6	24	4	16
Zhudong (Guangzhou)	9	22	9	32	14	29
Liyuan (Shenzhen)	5	7	4	9	5	9
Jinjuzui (Foshan)	1	20	2	18	5	23
Huijingcheng (Foshan)	3	32	3	29	6	24
Tangjia (Zhuhai)	2	10	2	9	3	17
Donghu (Jiangmen)	4	22	4	21	5	22
Duanfen (Jiangmen)	4	16	4	16	5	18
Huaguoshan (Jiangmen)	8	38	9	33	14	55
Chengzhong (Zhaoqing)	6	22	7	22	10	33
Xiapu (Huizhou)	2	14	4	12	5	13
Xijiao (Huizhou)	3	17	2	14	4	13
Jinguowan (Huizhou)	3	9	2	11	6	10
Zimaling (Zhongshan)	7	17	7	20	3	17
Nanchengyuanling (Dongguan)	6	21	6	23	6	23
Tap Mun (Hong Kong)	9	13	9	15	8	15
Tsuen Wan (Hong Kong)	10	27	10	17	10	24
Yuen Long (Hong Kong)	8	14	8	15	8	15
Tung Chung (Hong Kong)	9	18	8	13	8	20
Taipa Grande (Macao)	3	19	4	17	2	16

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

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

Monitoring Station	January 2017	February 2017	March 2017
Luhu (Guangzhou)	9	9	9
Modiesha (Guangzhou)	10	11	12
Wanqingsha (Guangzhou)	21	18	19
Tianhu (Guangzhou)	9	11	8
Zhudong (Guangzhou)	15	17	19
Liyuan (Shenzhen)	6	6	6
Jinjuzui (Foshan)	8	9	12
Huijingcheng (Foshan)	12	12	13
Tangjia (Zhuhai)	5	5	7
Donghu (Jiangmen)	10	11	11
Duanfen (Jiangmen)	9	8	9
Huaguoshan (Jiangmen)	18	18	23
Chengzhong (Zhaoqing)	10	13	17
Xiapu (Huizhou)	6	7	7
Xijiao (Huizhou)	9	5	8
Jinguowan (Huizhou)	6	6	7
Zimaling (Zhongshan)	12	11	9
Nanchengyuanling (Dongguan)	12	12	12
Tap Mun (Hong Kong)	11	11	11
Tsuen Wan (Hong Kong)	14	13	14
Yuen Long (Hong Kong)	10	10	10
Tung Chung (Hong Kong)	11	10	11
Taipa Grande (Macao)	8	8	7

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

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

Monitoring Station	January 2017		February 2017		March 2017	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	10	274	10	201	18	135
Modiesha (Guangzhou)	9	315	0	220	15	153
Wanqingsha (Guangzhou)	8	251	0	154	12	154
Tianhu (Guangzhou)	4	67	0	85	6	77
Zhudong (Guangzhou)	7	132	0	104	10	108
Liyuan (Shenzhen)	10	131	9	103	10	97
Jinjuzui (Foshan)	2	191	7	155	0	131
Huijingcheng (Foshan)	5	249	5	199	10	168
Tangjia (Zhuhai)	1	150	6	110	1	124
Donghu (Jiangmen)	11	231	11	148	8	128
Duanfen (Jiangmen)	6	90	0	50	4	126
Huaguoshan (Jiangmen)	2	141	0	114	1	121
Chengzhong (Zhaoqing)	7	151	7	152	8	131
Xiapu (Huizhou)	5	136	5	136	3	117
Xijiao (Huizhou)	4	40	0	40	5	44
Jinguowan (Huizhou)	4	53	0	46	5	95
Zimaling (Zhongshan)	7	238	4	117	3	132
Nanchengyuanling (Dongguan)	8	171	9	167	21	152
Tap Mun (Hong Kong)	5	37	4	49	4	64
Tsuen Wan (Hong Kong)	15	224	10	175	12	160
Yuen Long (Hong Kong)	13	211	14	146	14	136
Tung Chung (Hong Kong)	8	152	8	113	3	139
Taipa Grande (Macao)	0	163	6	122	8	130

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



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

Monitoring Station	January 2017		February 2017		March 2017	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	19	173	23	119	37	105
Modiesha (Guangzhou)	24	188	21	119	40	102
Wanqingsha (Guangzhou)	15	142	18	82	31	77
Tianhu (Guangzhou)	6	30	5	33	8	26
Zhudong (Guangzhou)	12	66	14	68	25	83
Liyuan (Shenzhen)	16	68	14	60	19	54
Jinjuzui (Foshan)	20	112	16	67	38	75
Huijingcheng (Foshan)	19	180	18	108	37	92
Tangjia (Zhuhai)	11	87	13	66	26	76
Donghu (Jiangmen)	16	112	18	81	26	92
Duanfen (Jiangmen)	13	46	11	34	11	60
Huaguoshan (Jiangmen)	8	78	4	58	15	62
Chengzhong (Zhaoqing)	14	81	16	74	18	73
Xiapu (Huizhou)	11	67	10	51	14	40
Xijiao (Huizhou)	7	20	7	20	10	24
Jinguowan (Huizhou)	8	29	8	20	11	28
Zimaling (Zhongshan)	14	78	12	53	9	77
Nanchengyuanling (Dongguan)	14	115	16	111	34	82
Tap Mun (Hong Kong)	8	24	7	16	9	40
Tsuen Wan (Hong Kong)	35	115	39	103	43	95
Yuen Long (Hong Kong)	25	101	30	77	39	83
Tung Chung (Hong Kong)	26	79	20	76	17	85
Taipa Grande (Macao)	23	97	25	64	24	89

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 2017	February 2017	March 2017
Luhu (Guangzhou)	66	62	67
Modiesha (Guangzhou)	68	55	67
Wanqingsha (Guangzhou)	55	44	56
Tianhu (Guangzhou)	12	15	15
Zhudong (Guangzhou)	30	32	45
Liyuan (Shenzhen)	37	28	30
Jinjuzui (Foshan)	56	45	52
Huijingcheng (Foshan)	70	54	65
Tangjia (Zhuhai)	37	32	54*
Donghu (Jiangmen)	53	40	52
Duanfen (Jiangmen)	29	19	29
Huaguoshan (Jiangmen)	38	24	40
Chengzhong (Zhaoqing)	41	39	46
Xiapu (Huizhou)	32	26	29
Xijiao (Huizhou)	14	12	16
Jinguowan (Huizhou)	17	13	18
Zimaling (Zhongshan)	40	32	39
Nanchengyuanling (Dongguan)	48	45	53
Tap Mun (Hong Kong)	14	11	15
Tsuen Wan (Hong Kong)	68	62	66
Yuen Long (Hong Kong)	55	49	52
Tung Chung (Hong Kong)	48	44	39
Taipa Grande (Macao)	50	42	50

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

\* The validated daily data capture rate of the pollutant is below 85%.

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

Monitoring Station	January 2017		February 2017		March 2017	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	3	178	1	221	1	214
Modiesha (Guangzhou)	4	201	2	204	2	344
Wanqingsha (Guangzhou)	5	310	6	343	4	216
Tianhu (Guangzhou)	10	170	24	209	4	320
Zhudong (Guangzhou)	4	216	6	278	5	235
Liyuan (Shenzhen)	5	175	5	179	5	182
Jinjuzui (Foshan)	4	301	6	336	4	215
Huijingcheng (Foshan)	2	194	4	221	1	187
Tangjia (Zhuhai)	9	163	6	136	5	138
Donghu (Jiangmen)	1	266	2	308	1	194
Duanfen (Jiangmen)	4	270	6	212	4	158
Huaguoshan (Jiangmen)	3	316	4	312	3	176
Chengzhong (Zhaoqing)	2	201	2	187	1	148
Xiapu (Huizhou)	3	155	6	203	3	178
Xijiao (Huizhou)	3	162	5	224	4	246
Jinguowan (Huizhou)	3	170	15	194	3	181
Zimaling (Zhongshan)	4	222	4	330	4	187
Nanchengyuanling (Dongguan)	1	236	1	260	1	188
Tap Mun (Hong Kong)	5	203	18	190	21	177
Tsuen Wan (Hong Kong)	3	114	2	133	1	167
Yuen Long (Hong Kong)	3	210	2	158	2	169
Tung Chung (Hong Kong)	0	202	1	143	1	144
Taipa Grande (Macao)	8	234	8	168	10	156

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

**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 2017			February 2017			March 2017		
	Min	Max	90 <sup>th</sup> per	Min	Max	90 <sup>th</sup> per	Min	Max	90 <sup>th</sup> per
Luhu (Guangzhou)	14	135	124	13	182	136	3	152	99
Modiesha (Guangzhou)	12	148	116	52	158	127	5	170	142
Wanqingsha (Guangzhou)	16	223	160	20	175	171	19	135	125
Tianhu (Guangzhou)	35	130	124	54	189	148	36	220	148
Zhudong (Guangzhou)	25	164	146	31	239	162	8	180	133
Liyuan (Shenzhen)	10	142	128	30	148	134	27	149	129
Jinjuzui (Foshan)	9	250	147	21	242	156	6	155	125
Huijingcheng (Foshan)	11	126	114	16	180	148	5	151	106
Tangjia (Zhuhai)	26	120	105	20	109	104	25	89	74
Donghu (Jiangmen)	8	214	161	19	222	163	3	163	126
Duanfen (Jiangmen)	18	227	172	33	176	145	28	148	127
Huaguoshan (Jiangmen)	10	268	184	23	216	160	5	153	122
Chengzhong (Zhaoqing)	12	137	120	27	151	110	3	121	91
Xiapu (Huizhou)	33	115	113	53	157	137	24	158	118
Xijiao (Huizhou)	41	132	127	48	206	155	32	185	160
Jinguowan (Huizhou)	32	139	127	51	161	148	41	160	127
Zimaling (Zhongshan)	8	174	162	14	208	163	9	165	135
Nanchengyuanling (Dongguan)	17	183	116	23	190	147	14	137	99
Tap Mun (Hong Kong)	35	152	143	43	177	155	63	158	147
Tsuen Wan (Hong Kong)	13	100	83	12	111	108	29	125	108
Yuen Long (Hong Kong)	10	138	100	21	116	108	35	125	104
Tung Chung (Hong Kong)	4	118	91	4	107	104	19	141	116
Taipa Grande (Macao)	14	180	121	20	139	125	36	149	125

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

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

Monitoring Station	January 2017	February 2017	March 2017
Luhu (Guangzhou)	38	43	25
Modiesha (Guangzhou)	41	59	35
Wanqingsha (Guangzhou)	62	67	44
Tianhu (Guangzhou)	76	84	73
Zhudong (Guangzhou)	54	63	37
Liyuan (Shenzhen)	63	73	78
Jinjuzui (Foshan)	50	63	37
Huijingcheng (Foshan)	36	48	28
Tangjia (Zhuhai)	50	53	36
Donghu (Jiangmen)	49	62	37
Duanfen (Jiangmen)	64	74	66
Huaguoshan (Jiangmen)	57	59	35
Chengzhong (Zhaoqing)	41	45	26
Xiapu (Huizhou)	57	72	62
Xijiao (Huizhou)	54	67	63
Jinguowan (Huizhou)	64	81	68
Zimaling (Zhongshan)	54	67	48
Nanchengyuanling (Dongguan)	43	53	37
Tap Mun (Hong Kong)	83	90	93
Tsuen Wan (Hong Kong)	44	50	58
Yuen Long (Hong Kong)	45	54	53
Tung Chung (Hong Kong)	37	43	65
Taipa Grande (Macao)	56	65	65

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

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

Monitoring Station	January 2017		February 2017		March 2017	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	0.5	2.4	0.5	1.8	0.3	2.3
Modiesha (Guangzhou)	0.0	3.2	0.1	2.0	0.0	3.8
Wanqingsha (Guangzhou)	0.6	1.9	0.6	1.4	0.3	1.6
Tianhu (Guangzhou)	0.0	1.3	0.2	1.1	0.2	1.9
Zhudong (Guangzhou)	0.4	1.7	0.5	1.3	0.4	1.4
Liyuan (Shenzhen)	0.4	1.5	0.2	1.4	0.5	1.3
Jinjuzui (Foshan)	0.4	3.3	0.1	1.4	0.4	2.0
Huijingcheng (Foshan)	0.2	3.7	0.3	2.0	0.2	3.0
Tangjia (Zhuhai)	0.5	1.8	0.2	1.4	0.2	1.6
Donghu (Jiangmen)	0.5	3.7	0.4	2.1	0.4	2.6
Duanfen (Jiangmen)	0.0	2.1	0.3	1.6	0.0	1.8
Huaguoshan (Jiangmen)	0.2	2.2	0.3	2.2	0.2	2.6
Chengzhong (Zhaoqing)	0.4	2.7	0.3	1.8	0.5	2.6
Xiapu (Huizhou)	0.7	2.9	0.6	1.9	0.7	1.8
Xijiao (Huizhou)	0.3	1.6	0.5	1.7	0.0	2.1
Jinguowan (Huizhou)	0.0	1.1	0.2	0.8	0.3	1.4
Zimaling (Zhongshan)	0.3	2.5	0.3	1.3	0.3	2.0
Nanchengyuanling (Dongguan)	0.6	2.6	0.6	1.7	0.6	1.9
Tap Mun (Hong Kong)	0.5	1.9	0.7	1.3	0.0	1.2
Tsuen Wan (Hong Kong)	0.4	1.6	0.4	1.3	0.5	1.7
Yuen Long (Hong Kong)	0.1	1.5	0.4	1.5	0.6	1.4
Tung Chung (Hong Kong)	0.4	1.7	0.3	1.6	0.3	1.9
Taipa Grande (Macao)	0.4	1.7	0.4	1.1	0.4	1.5

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 2017			February 2017			March 2017		
	Min	Max	95 <sup>th</sup> per	Min	Max	95 <sup>th</sup> per	Min	Max	95 <sup>th</sup> per
Luhu (Guangzhou)	0.6	1.8	1.5	0.6	1.2	1.1	0.6	1.4	1.3
Modiesha (Guangzhou)	0.2	2.3	2.0	0.6	1.5	1.4	0.3	2.2	1.8
Wanqingsha (Guangzhou)	0.6	1.3	1.2	0.8	1.1	1.1	0.5	1.3	1.2
Tianhu (Guangzhou)	0.2	1.1	0.9	0.2	0.9	0.9	0.3	1.4	1.3
Zhudong (Guangzhou)	0.5	1.5	1.3	0.6	1.0	1.0	0.6	1.1	1.1
Liyuan (Shenzhen)	0.6	1.4	1.4	0.4	1.1	0.9	0.6	1.1	1.0
Jinjuzui (Foshan)	0.7	1.7	1.7	0.3	1.0	0.9	0.7	1.5	1.3
Huijingcheng (Foshan)	0.4	1.9	1.9	0.5	1.2	1.0	0.5	1.3	1.3
Tangjia (Zhuhai)	0.6	1.3	1.3	0.5	1.0	1.0	0.4	1.0	0.8
Donghu (Jiangmen)	0.7	1.8	1.7	0.6	1.3	1.0	0.7	1.3	1.3
Duanfen (Jiangmen)	0.3	1.6	1.4	0.4	1.5	1.0	0.1	0.8	0.8
Huaguoshan (Jiangmen)	0.8	1.7	1.6	0.7	1.3	1.2	0.5	1.8	1.8
Chengzhong (Zhaoqing)	0.9	1.6	1.6	0.7	1.4	1.3	0.8	1.8	1.6
Xiapu (Huizhou)	0.8	1.4	1.3	0.7	1.2	1.1	0.8	1.2	1.1
Xijiao (Huizhou)	0.4	1.3	1.2	0.6	0.9	0.9	0.3	1.1	1.1
Jinguowan (Huizhou)	0.1	0.8	0.7	0.3	0.6	0.5	0.4	0.9	0.9
Zimaling (Zhongshan)	0.3	1.6	1.5	0.5	1.0	1.0	0.5	1.5	1.2
Nanchengyuanling (Dongguan)	0.8	1.6	1.5	0.7	1.1	1.1	0.7	1.3	1.1
Tap Mun (Hong Kong)	0.6	1.6	1.6	0.8	1.1	1.1	0.1	1.1	1.0
Tsuen Wan (Hong Kong)	0.6	1.4	1.2	0.6	1.1	1.0	0.7	1.1	1.1
Yuen Long (Hong Kong)	0.3	1.1	1.1	0.5	1.0	1.0	0.8	1.1	1.0
Tung Chung (Hong Kong)	0.5	1.5	1.4	0.3	0.9	0.9	0.5	0.9	0.9
Taipa Grande (Macao)	0.4	1.3	1.3	0.5	1.0	0.9	0.5	1.1	0.9

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 2017	February 2017	March 2017
Luhu (Guangzhou)	1.1	0.9	0.9
Modiesha (Guangzhou)	0.9	1.1	1.2
Wanqingsha (Guangzhou)	1.0	0.9	0.8
Tianhu (Guangzhou)	0.6	0.6	0.7
Zhudong (Guangzhou)	0.9	0.8	0.9
Liyuan (Shenzhen)	0.9	0.8	0.8
Jinjuzui (Foshan)	1.2	0.6	0.9
Huijingcheng (Foshan)	1.1	0.7	0.9
Tangjia (Zhuhai)	0.9	0.7	0.6
Donghu (Jiangmen)	1.2	0.8	1.0
Duanfen (Jiangmen)	0.9	0.6	0.5
Huaguoshan (Jiangmen)	1.2	1.0	1.2
Chengzhong (Zhaoqing)	1.2	1.0	1.2
Xiapu (Huizhou)	1.1	0.9	1.0
Xijiao (Huizhou)	0.8	0.7	0.8
Jinguowan (Huizhou)	0.3	0.4	0.7
Zimaling (Zhongshan)	1.0	0.7	0.8
Nanchengyuanling (Dongguan)	1.2	0.9	0.9
Tap Mun (Hong Kong)	1.0	0.9	0.5
Tsuen Wan (Hong Kong)	0.9	0.8	0.9
Yuen Long (Hong Kong)	0.7	0.8	0.9
Tung Chung (Hong Kong)	1.0	0.6	0.7
Taipa Grande (Macao)	0.8	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	January 2017		February 2017		March 2017	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	10	176	17	113	30	105
Modiesha (Guangzhou)	14	228	23	119	30	149
Wanqingsha (Guangzhou)	29	130	30	95	35	114
Tianhu (Guangzhou)	5	99	13	69	9	89
Zhudong (Guangzhou)	12	160	17	110	19	130
Liyuan (Shenzhen)	22	98	20	74	27	82
Jinjuzui (Foshan)	20	159	26	90	26	112
Huijingcheng (Foshan)	17	262	23	99	28	96
Tangjia (Zhuhai)	27	95	25	85	32	97
Donghu (Jiangmen)	24	217	29	103	42	148
Duanfen (Jiangmen)	18	102	23	94	27	98
Huaguoshan (Jiangmen)	22	269	32	123	36	144
Chengzhong (Zhaoqing)	9	196	18	105	24	124
Xiapu (Huizhou)	13	116	17	86	23	95
Xijiao (Huizhou)	7	73	10	68	10	72
Jinguowan (Huizhou)	11	104	21	64	23	80
Zimaling (Zhongshan)	24	103	26	73	26	96
Nanchengyuanling (Dongguan)	15	142	19	107	22	107
Tap Mun (Hong Kong)	11	69	16	69	21	82
Tsuen Wan (Hong Kong)	10	63	19	60	21	85
Yuen Long (Hong Kong)	27	101	25	78	25	99
Tung Chung (Hong Kong)	32	116	30	71	19	90
Taipa Grande (Macao)	39	105	27	93	30	112

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 2017	February 2017	March 2017
Luhu (Guangzhou)	66	58	62
Modiesha (Guangzhou)	78	65	73
Wanqingsha (Guangzhou)	75	57	66
Tianhu (Guangzhou)	45	45	38
Zhudong (Guangzhou)	68	61	61
Liyuan (Shenzhen)	52	43	45
Jinjuzui (Foshan)	71	57	63
Huijingcheng (Foshan)	78	55	65
Tangjia (Zhuhai)	62	50	55
Donghu (Jiangmen)	83	62	82
Duanfen (Jiangmen)	60	48	59
Huaguoshan (Jiangmen)	98	69	88
Chengzhong (Zhaoqing)	77	60	72
Xiapu (Huizhou)	63	52	53
Xijiao (Huizhou)	45	42	37
Jinguowan (Huizhou)	53	42	49
Zimaling (Zhongshan)	59	46	52
Nanchengyuanling (Dongguan)	71	57	61
Tap Mun (Hong Kong)	39	40	49
Tsuen Wan (Hong Kong)	37	38	42
Yuen Long (Hong Kong)	55	47	49
Tung Chung (Hong Kong)	54	43	41
Taipa Grande (Macao)	64	55	58

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

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

Monitoring Station	January 2017		February 2017		March 2017	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	6	128	12	67	13	82
Modiesha (Guangzhou)	6	123	11	58	14	59
Wanqingsha (Guangzhou)	17	79	17	59	20	66
Tianhu (Guangzhou)	4	67	11	53	6	47
Zhudong (Guangzhou)	7	124	14	74	11	75
Liyuan (Shenzhen)	12	67	13	64	18	53
Jinjuzui (Foshan)	12	106	16	61	14	56
Huijingcheng (Foshan)	15	215	17	81	22	64
Tangjia (Zhuhai)	18	62	19	64	17	53
Donghu (Jiangmen)	14	123	14	82	15	73
Duanfen (Jiangmen)	9	68	6	64	15	58
Huaguoshan (Jiangmen)	17	219	20	93	26	108
Chengzhong (Zhaoqing)	8	143	16	90	17	77
Xiapu (Huizhou)	10	89	11	58	12	55
Xijiao (Huizhou)	6	59	8	54	9	47
Jinguowan (Huizhou)	5	81	13	50	12	48
Zimaling (Zhongshan)	18	83	17	67	16	65
Nanchengyuanling (Dongguan)	13	102	14	65	19	59
Tap Mun (Hong Kong)	6	47	9	50	12	44
Tsuen Wan (Hong Kong)	9	49	13	49	13	63
Yuen Long (Hong Kong)	9	52	14	52	16	52
Tung Chung (Hong Kong)	19	76	14	55	11	61
Taipa Grande (Macao)	22	72	14	67	11	69

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

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

Monitoring Station	January 2017	February 2017	March 2017
Luhu (Guangzhou)	42	38	43
Modiesha (Guangzhou)	46	36	35
Wanqingsha (Guangzhou)	44	36	33
Tianhu (Guangzhou)	33	33	22
Zhudong (Guangzhou)	50	44	37
Liyuan (Shenzhen)	35	30	28
Jinjuzui (Foshan)	47	37	35
Huijingcheng (Foshan)	61	43	44
Tangjia (Zhuhai)	38	35	30
Donghu (Jiangmen)	57	43	43
Duanfen (Jiangmen)	35	29	31
Huaguoshan (Jiangmen)	78	55	64
Chengzhong (Zhaoqing)	60	49	48
Xiapu (Huizhou)	43	35	30
Xijiao (Huizhou)	37	34	27
Jinguowan (Huizhou)	33	28	27
Zimaling (Zhongshan)	46	35	33
Nanchengyuanling (Dongguan)	53	41	36
Tap Mun (Hong Kong)	26	25	26
Tsuen Wan (Hong Kong)	28	27	28
Yuen Long (Hong Kong)	29	26	25
Tung Chung (Hong Kong)	37	27	23
Taipa Grande (Macao)	39	34	31

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

## 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. 17, Qintian Road, Zhaoqing	Urban: mixed residential/commercial	21m	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

<b>Monitoring Stations</b>	<b>Address</b>	<b>Area Type</b>	<b>Sampling Height (Above P.D.)</b>	<b>Above Ground</b>	<b>Date Commenced Operation</b>
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**

<b>Pollutants</b>	<b>Measuring Principles</b>
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