

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

**October to December 2016**

**Statistical Summary of the Fourth 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, it has been reporting PRD Regional Air Quality Index (RAQI) to the public on a daily basis. Starting from 2006, a half-yearly and an annual air quality monitoring reports were published every year. The network was enhanced and expanded in September 2014 and the network was renamed “Guangdong-Hong Kong-Macao Pearl River Delta Regional Air Quality Monitoring Network” (the “Network”) accordingly.

With the enhancement of the Network, the update of the national ambient air quality standards and the increase of reporting frequency of monitoring results, we have been reporting real time monitoring data of the Network on an hourly basis to replace the daily RAQI through a new internet platform and publish a quarterly air quality monitoring report to replace the previous half-yearly report and continue the publishing of annual air quality monitoring reports starting from 2014. The quarterly report is mainly a brief statistical summary of the monitoring results of the regional air quality in a quarter while the annual report, in addition to the reporting of the relevant data, will provide a more detailed analysis and comparison of the condition of air quality in the year. Since the fourth quarterly report in 2014, statistical results of carbon monoxide (CO) and fine suspended particulates (PM<sub>2.5</sub> or FSP) have been 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, “Statistical Summary of the 2016 Fourth Quarter Monitoring Results of PRD Regional Air Quality Monitoring Network”, is the twelfth one published in the form of a quarterly report and is the ninth one reporting 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) in the Network.

## 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. The network came into operation on 30 November 2005.

In view of the growing needs of air pollution control and economic development of the region, the environmental protection departments of Guangdong and Hong Kong have worked in collaboration with the environmental protection cum meteorological authority of Macao to enhance the network by extending the coverage of monitoring area to the 3 places, i.e. Guangdong, Hong Kong and Macao, in September 2014. The enhancement included the increase of number of monitoring station from 16 to 23 to further improve the spatial distribution; and the addition of two more monitoring parameters, i.e. carbon monoxide (CO) and fine suspended particulates (PM<sub>2.5</sub>), to enrich the air quality monitoring information. The network was accordingly renamed “Guangdong-Hong Kong-Macao Pearl River Delta Regional Air Quality Monitoring Network” (the “Network”). The GDEMC, HKEPD, Environmental Protection Bureau of Macao SARG and Meteorological and Geophysical Bureau of Macao SARG have jointly established the "Quality Management Committee of Guangdong-Hong Kong-Macao Pearl River Delta Regional Air Quality Monitoring Network" to undertake quality management and dissemination of information for the Network.

The Network comprises 23 automatic air quality monitoring stations (see Figure 2.1) across the PRD region. Ten of these stations are operated by the Environmental Monitoring Centres of the individual cities in Guangdong or the operation-and-maintenance agencies commissioned by the State, while eight regional stations are operated by the GDEM. 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 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 set out, respectively, the site information of the monitoring stations in the Network and the methods used for measuring air pollutant concentrations.



**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 operation of the Network was generally smooth in the fourth quarter of 2016. The average hourly data capture rate of all monitoring stations in the Network was 96.5%.

### 4. Statistical Analysis of Pollutant Concentrations

Table 4.1a to Table 4.6b list the statistical summaries of monitoring 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>) during the reporting period from October to December 2016.

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

Monitoring Station	October 2016		November 2016		December 2016	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	5	32	6	40	5	28
Modiesha (Guangzhou)	3	35	3	50	4	39
Wanqingsha (Guangzhou)	7	68	8	90	9	95
Tianhu (Guangzhou)	5	23	4	34	4	29
Zhudong (Guangzhou)	7	64	7	67	8	89
Liyuan (Shenzhen)	5	18	4	12	5	16
Jinjuzui (Foshan)	4	35	3	75	2	42
Huijingcheng (Foshan)	2	89	1	66	4	80
Tangjia (Zhuhai)	2	42	1	44	1	63
Donghu (Jiangmen)	5	50	1	79	5	80
Duanfen (Jiangmen)	3	34	3	31	4	44
Huaguoshan (Jiangmen)	7	68	8	98	8	136
Chengzhong (Zhaoqing)	5	351	6	166	3	104
Xiapu (Huizhou)	3	31	5	24	6	28
Xijiao (Huizhou)	2	51	2	50	2	56
Jinguowan (Huizhou)	2	24	4	17	5	32
Zimaling (Zhongshan)	8	41	6	47	6	53
Nanchengyuanling (Dongguan)	4	43	4	46	5	42
Tap Mun (Hong Kong)	7	17	7	19	7	21
Tsuen Wan (Hong Kong)	7	37	7	30	9	57
Yuen Long (Hong Kong)	7	27	7	21	8	35
Tung Chung (Hong Kong)	5	39	5	30	5	67
Taipa Grande (Macao)	0	30	1	43	2	40

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

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

Monitoring Station	October 2016		November 2016		December 2016	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	7	16	10	23	7	16
Modiesha (Guangzhou)	5	17	5	26	7	21
Wanqingsha (Guangzhou)	11	26	13	37	14	51
Tianhu (Guangzhou)	5	15	5	21	4	20
Zhudong (Guangzhou)	8	26	9	35	12	33
Liyuan (Shenzhen)	5	13	5	10	6	14
Jinjuzui (Foshan)	5	19	6	29	5	25
Huijingcheng (Foshan)	4	31	5	32	8	42
Tangjia (Zhuhai)	5	19	9	22	4	23
Donghu (Jiangmen)	8	23	4	25	9	37
Duanfen (Jiangmen)	4	17	5	22	9	23
Huaguoshan (Jiangmen)	9	30	10	45	14	49
Chengzhong (Zhaoqing)	7	43	6	49	6	26
Xiapu (Huizhou)	4	9	6	15	8	19
Xijiao (Huizhou)	2	20	3	19	3	23
Jinguowan (Huizhou)	4	8	5	12	6	15
Zimaling (Zhongshan)	9	26	8	26	9	28
Nanchengyuanling (Dongguan)	7	20	6	23	6	24
Tap Mun (Hong Kong)	7	11	7	14	9	16
Tsuen Wan (Hong Kong)	7	17	8	15	10	22
Yuen Long (Hong Kong)	7	14	8	14	9	19
Tung Chung (Hong Kong)	5	22	6	12	8	20
Taipa Grande (Macao)	1	10	2	16	4	19

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	October 2016	November 2016	December 2016
Luhu (Guangzhou)	11	14	11
Modiesha (Guangzhou)	9	13	13
Wanqingsha (Guangzhou)	19	21	28
Tianhu (Guangzhou)	9	10	12
Zhudong (Guangzhou)	19	19	21
Liyuan (Shenzhen)	7	7	8
Jinjuzui (Foshan)	11	14	14
Huijingcheng (Foshan)	12	15	19
Tangjia (Zhuhai)	11	14	13
Donghu (Jiangmen)	13	13	17
Duanfen (Jiangmen)	10	11	16
Huaguoshan (Jiangmen)	22	25	29
Chengzhong (Zhaoqing)	17	19	16
Xiapu (Huizhou)	6	9	13
Xijiao (Huizhou)	9	7	10
Jinguowan (Huizhou)	6	7	9
Zimaling (Zhongshan)	16	15	18
Nanchengyuanling (Dongguan)	13	12	15
Tap Mun (Hong Kong)	9	10	13
Tsuen Wan (Hong Kong)	10	10	14
Yuen Long (Hong Kong)	10	10	12
Tung Chung (Hong Kong)	9	8	11
Taipa Grande (Macao)	6	8	11

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	October 2016		November 2016		December 2016	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	5	159	5	232	18	221
Modiesha (Guangzhou)	13	118	14	270	16	269
Wanqingsha (Guangzhou)	0	105	4	161	16	196
Tianhu (Guangzhou)	3	54	4	47	5	39
Zhudong (Guangzhou)	3	80	6	123	14	92
Liyuan (Shenzhen)	5	87	10	198	14	125
Jinjuzui (Foshan)	5	148	0	195	0	164
Huijingcheng (Foshan)	10	161	12	263	13	237
Tangjia (Zhuhai)	1	76	1	131	13	149
Donghu (Jiangmen)	7	83	15	210	18	194
Duanfen (Jiangmen)	0	55	4	79	8	97
Huaguoshan (Jiangmen)	5	101	0	123	6	163
Chengzhong (Zhaoqing)	3	101	5	149	12	150
Xiapu (Huizhou)	1	70	1	140	6	148
Xijiao (Huizhou)	2	29	5	52	5	48
Jinguowan (Huizhou)	3	56	4	32	9	49
Zimaling (Zhongshan)	1	85	2	161	10	148
Nanchengyuanling (Dongguan)	11	144	12	172	16	176
Tap Mun (Hong Kong)	1	90	3	34	6	71
Tsuen Wan (Hong Kong)	8	183	13	176	15	241
Yuen Long (Hong Kong)	10	120	13	164	19	217
Tung Chung (Hong Kong)	0	143	12	209	13	211
Taipa Grande (Macao)	3	88	4	165	5	184

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	October 2016		November 2016		December 2016	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	19	68	26	119	34	141
Modiesha (Guangzhou)	25	72	23	129	36	167
Wanqingsha (Guangzhou)	22	56	15	88	28	137
Tianhu (Guangzhou)	3	26	6	23	7	24
Zhudong (Guangzhou)	16	41	16	71	20	54
Liyuan (Shenzhen)	15	46	17	77	23	70
Jinjuzui (Foshan)	23	61	24	92	25	85
Huijingcheng (Foshan)	24	78	26	149	25	137
Tangjia (Zhuhai)	6	41	17	60	20	80
Donghu (Jiangmen)	20	50	28	119	28	112
Duanfen (Jiangmen)	3	31	12	57	22	57
Huaguoshan (Jiangmen)	19	46	28	63	24	98
Chengzhong (Zhaoqing)	12	47	12	95	17	102
Xiapu (Huizhou)	5	27	10	63	19	73
Xijiao (Huizhou)	7	14	9	21	12	20
Jinguowan (Huizhou)	8	21	10	20	14	28
Zimaling (Zhongshan)	5	42	18	75	25	93
Nanchengyuanling (Dongguan)	18	70	20	73	24	95
Tap Mun (Hong Kong)	4	19	6	18	8	28
Tsuen Wan (Hong Kong)	28	76	39	91	37	115
Yuen Long (Hong Kong)	24	61	33	86	35	102
Tung Chung (Hong Kong)	10	69	23	71	20	112
Taipa Grande (Macao)	14	57	18	76	11	114

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	October 2016	November 2016	December 2016
Luhu (Guangzhou)	38	65	72
Modiesha (Guangzhou)	42	68	75
Wanqingsha (Guangzhou)	34	44	69
Tianhu (Guangzhou)	9	12	11
Zhudong (Guangzhou)	27	34	36
Liyuan (Shenzhen)	30	40	48
Jinjuzui (Foshan)	36	51	62
Huijingcheng (Foshan)	43	68	79
Tangjia (Zhuhai)	22	35	49
Donghu (Jiangmen)	34	51	69
Duanfen (Jiangmen)	17	24	39
Huaguoshan (Jiangmen)	33	42	58
Chengzhong (Zhaoqing)	22	44	55
Xiapu (Huizhou)	17	27	37
Xijiao (Huizhou)	10	14	16
Jinguowan (Huizhou)	12	15	20
Zimaling (Zhongshan)	25	33	58
Nanchengyuanling (Dongguan)	36	43	56
Tap Mun (Hong Kong)	10	11	16
Tsuen Wan (Hong Kong)	49	55	72
Yuen Long (Hong Kong)	45	56	67
Tung Chung (Hong Kong)	34	43	58
Taipa Grande (Macao)	34	44	61

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	October 2016		November 2016		December 2016	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	1	186	3	329	2	228
Modiesha (Guangzhou)	8	197	8	297	5	200
Wanqingsha (Guangzhou)	5	269	5	442	7	316
Tianhu (Guangzhou)	2	195	6	235	8	142
Zhudong (Guangzhou)	4	248	0	401	0	183
Liyuan (Shenzhen)	1	194	1	234	4	193
Jinjuzui (Foshan)	7	234	3	361	4	263
Huijingcheng (Foshan)	6	185	4	332	0	212
Tangjia (Zhuhai)	9	182	6	159	6	230
Donghu (Jiangmen)	1	235	1	372	1	233
Duanfen (Jiangmen)	6	282	6	252	4	260
Huaguoshan (Jiangmen)	3	229	3	319	3	204
Chengzhong (Zhaoqing)	1	192	2	308	2	157
Xiapu (Huizhou)	1	137	1	179	1	151
Xijiao (Huizhou)	3	170	2	209	3	167
Jinguowan (Huizhou)	3	131	3	188	5	155
Zimaling (Zhongshan)	1	233	3	281	4	233
Nanchengyuanling (Dongguan)	1	200	1	286	1	171
Tap Mun (Hong Kong)	4	182	17	204	6	208
Tsuen Wan (Hong Kong)	1	183	2	116	1	119
Yuen Long (Hong Kong)	2	214	3	199	2	193
Tung Chung (Hong Kong)	1	295	1	195	1	197
Taipa Grande (Macao)	8	266	8	299	8	230

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

**Table 4.3b : The monthly maxima and minima of daily maximum 8-hour averages of O<sub>3</sub>**

Monitoring Station	October 2016		November 2016		December 2016	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	16	128	8	240	15	148
Modiesha (Guangzhou)	17	147	13	252	13	152
Wanqingsha (Guangzhou)	25	228	12	344	48	210
Tianhu (Guangzhou)	44	168	23	220	50	134
Zhudong (Guangzhou)	33	205	11	325	27	147
Liyuan (Shenzhen)	35	131	15	149	50	152
Jinjuzui (Foshan)	24	151	7	284	33	198
Huijingcheng (Foshan)	14	148	10	247	17	155
Tangjia (Zhuhai)	29	137	24	130	27	167
Donghu (Jiangmen)	14	164	9	274	19	147
Duanfen (Jiangmen)	42	222	23	215	17	187
Huaguoshan (Jiangmen)	18	173	14	275	23	150
Chengzhong (Zhaoqing)	14	160	6	229	9	107
Xiapu (Huizhou)	26	116	22	148	41	134
Xijiao (Huizhou)	31	134	33	160	64	135
Jinguowan (Huizhou)	32	110	25	151	58	131
Zimaling (Zhongshan)	19	185	7	234	29	166
Nanchengyuanling (Dongguan)	25	157	8	210	29	138
Tap Mun (Hong Kong)	53	148	38	173	65	181
Tsuen Wan (Hong Kong)	15	124	21	97	37	95
Yuen Long (Hong Kong)	20	133	15	125	44	131
Tung Chung (Hong Kong)	17	180	5	140	28	96
Taipa Grande (Macao)	28	195	13	201	37	173

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	October 2016	November 2016	December 2016
Luhu (Guangzhou)	41	37	43
Modiesha (Guangzhou)	45	47	48
Wanqingsha (Guangzhou)	54	59	68
Tianhu (Guangzhou)	75	76	84
Zhudong (Guangzhou)	63	48	56
Liyuan (Shenzhen)	43	48	60
Jinjuzui (Foshan)	54	51	46
Huijingcheng (Foshan)	41	38	41
Tangjia (Zhuhai)	51	49	59
Donghu (Jiangmen)	49	42	45
Duanfen (Jiangmen)	74	67	74
Huaguoshan (Jiangmen)	51	45	51
Chengzhong (Zhaoqing)	58	47	40
Xiapu (Huizhou)	48	49	62
Xijiao (Huizhou)	52	49	64
Jinguowan (Huizhou)	51	58	70
Zimaling (Zhongshan)	54	47	51
Nanchengyuanling (Dongguan)	50	43	46
Tap Mun (Hong Kong)	66	77	89
Tsuen Wan (Hong Kong)	37	43	49
Yuen Long (Hong Kong)	40	37	52
Tung Chung (Hong Kong)	37	36	40
Taipa Grande (Macao)	60	58	65

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	October 2016		November 2016		December 2016	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	0.4	2.1	0.4	2.8	0.5	2.0
Modiesha (Guangzhou)	0.5	1.4	0.4	3.2	0.5	2.7
Wanqingsha (Guangzhou)	0.4	1.2	0.3	1.5	0.4	1.9
Tianhu (Guangzhou)	0.4	1.2	0.3	1.4	0.1	1.3
Zhudong (Guangzhou)	0.3	1.1	0.3	1.9	0.4	1.3
Liyuan (Shenzhen)	0.5	1.7	0.6	2.1	0.5	1.8
Jinjuzui (Foshan)	0.3	1.3	0.2	2.9	0.6	2.6
Huijingcheng (Foshan)	0.4	1.7	0.4	3.3	0.3	3.1
Tangjia (Zhuhai)	0.2	1.4	0.3	1.2	0.4	1.7
Donghu (Jiangmen)	0.4	2.0	0.5	6.5	0.4	4.0
Duanfen (Jiangmen)	0.3	1.4	0.1	1.3	0.3	1.5
Huaguoshan (Jiangmen)	0.3	1.5	0.2	2.4	0.2	1.9
Chengzhong (Zhaoqing)	0.4	1.5	0.5	2.4	0.5	2.8
Xiapu (Huizhou)	0.6	1.9	0.4	3.0	0.6	2.8
Xijiao (Huizhou)	0.4	1.4	0.0	1.0	0.1	1.8
Jinguowan (Huizhou)	0.2	1.5	0.2	1.2	0.0	1.0
Zimaling (Zhongshan)	0.3	1.5	0.3	2.3	0.3	2.1
Nanchengyuanling (Dongguan)	0.5	1.7	0.6	2.3	0.7	2.5
Tap Mun (Hong Kong)	0.5	1.6	0.5	1.1	0.6	1.6
Tsuen Wan (Hong Kong)	0.5	1.5	0.6	1.5	0.4	1.6
Yuen Long (Hong Kong)	0.3	1.5	0.4	1.7	0.3	2.2
Tung Chung (Hong Kong)	0.6	1.5	0.6	1.6	0.3	1.9
Taipa Grande (Macao)	0.4	1.6	0.5	1.4	0.4	1.7

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

**Table 4.4b : The monthly maxima and minima of daily averages of CO**

Monitoring Station	October 2016		November 2016		December 2016	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	0.6	1.2	0.6	1.8	0.7	1.4
Modiesha (Guangzhou)	0.7	1.2	0.7	1.9	0.8	1.7
Wanqingsha (Guangzhou)	0.5	1.1	0.4	1.1	0.5	1.3
Tianhu (Guangzhou)	0.5	1.0	0.5	1.0	0.1	1.1
Zhudong (Guangzhou)	0.4	0.9	0.6	1.1	0.6	1.2
Liyuan (Shenzhen)	0.6	1.2	0.7	1.2	0.7	1.6
Jinjuzui (Foshan)	0.4	1.2	0.5	1.5	0.8	1.6
Huijingcheng (Foshan)	0.6	1.1	0.7	2.1	0.5	1.8
Tangjia (Zhuhai)	0.3	1.1	0.4	1.0	0.6	1.2
Donghu (Jiangmen)	0.7	1.3	0.7	2.7	0.6	1.8
Duanfen (Jiangmen)	0.3	0.9	0.2	1.1	0.4	1.2
Huaguoshan (Jiangmen)	0.6	1.1	0.5	1.4	0.6	1.5
Chengzhong (Zhaoqing)	0.6	1.0	0.8	1.6	0.7	1.7
Xiapu (Huizhou)	0.7	1.3	0.6	1.5	0.9	1.4
Xijiao (Huizhou)	0.5	0.9	0.2	0.7	0.3	1.1
Jinguowan (Huizhou)	0.3	1.2	0.3	0.7	0.1	0.9
Zimaling (Zhongshan)	0.6	1.4	0.6	1.3	0.5	1.4
Nanchengyuanling (Dongguan)	0.7	1.3	0.8	1.4	0.8	1.4
Tap Mun (Hong Kong)	0.7	1.1	0.6	1.1	0.6	1.4
Tsuen Wan (Hong Kong)	0.6	1.0	0.8	1.2	0.5	1.4
Yuen Long (Hong Kong)	0.5	1.0	0.6	1.1	0.5	1.3
Tung Chung (Hong Kong)	0.7	1.2	0.7	1.2	0.3	1.5
Taipa Grande (Macao)	0.4	1.2	0.6	1.2	0.5	1.3

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	October 2016	November 2016	December 2016
Luhu (Guangzhou)	0.9	1.0	1.0
Modiesha (Guangzhou)	0.9	1.0	1.2
Wanqingsha (Guangzhou)	0.8	0.7	0.9
Tianhu (Guangzhou)	0.8	0.7	0.7
Zhudong (Guangzhou)	0.7	0.8	0.8
Liyuan (Shenzhen)	0.9	0.9	1.0
Jinjuzui (Foshan)	0.7	0.9	1.1
Huijingcheng (Foshan)	0.8	1.1	1.1
Tangjia (Zhuhai)	0.7	0.6	0.9
Donghu (Jiangmen)	0.9	1.0	1.1
Duanfen (Jiangmen)	0.7	0.7	0.8
Huaguoshan (Jiangmen)	0.9	0.9	1.0
Chengzhong (Zhaoqing)	0.8	1.1	1.2
Xiapu (Huizhou)	1.0	1.0	1.1
Xijiao (Huizhou)	0.7	0.4	0.7
Jinguowan (Huizhou)	0.6	0.5	0.5
Zimaling (Zhongshan)	0.8	0.8	1.0
Nanchengyuanling (Dongguan)	0.9	1.0	1.2
Tap Mun (Hong Kong)	0.8	0.8	0.9
Tsuen Wan (Hong Kong)	0.8	0.9	0.9
Yuen Long (Hong Kong)	0.8	0.8	0.9
Tung Chung (Hong Kong)	0.9	0.9	0.9
Taipa Grande (Macao)	0.8	0.8	0.9

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	October 2016		November 2016		December 2016	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	11	61	10	134	31	112
Modiesha (Guangzhou)	16	74	17	158	44	195
Wanqingsha (Guangzhou)	19	64	16	106	27	128
Tianhu (Guangzhou)	4	58	3	79	21	73
Zhudong (Guangzhou)	10	105	9	124	29	102
Liyuan (Shenzhen)	12	56	16	83	33	117
Jinjuzui (Foshan)	16	61	19	133	35	136
Huijingcheng (Foshan)	18	83	14	165	28	142
Tangjia (Zhuhai)	13	67	11	86	37	118
Donghu (Jiangmen)	27	73	16	215	35	196
Duanfen (Jiangmen)	13	79	15	89	53	124
Huaguoshan (Jiangmen)	26	131	11	268	38	187
Chengzhong (Zhaoqing)	27	85	8	175	28	150
Xiapu (Huizhou)	19	65	9	102	25	110
Xijiao (Huizhou)	14	54	6	64	15	73
Jinguowan (Huizhou)	18	59	7	77	22	91
Zimaling (Zhongshan)	10	64	16	94	32	121
Nanchengyuanling (Dongguan)	18	66	11	115	22	124
Tap Mun (Hong Kong)	16	46	6	68	25	89
Tsuen Wan (Hong Kong)	7	43	12	58	23	87
Yuen Long (Hong Kong)	10	57	11	79	38	105
Tung Chung (Hong Kong)	5	59	11	82	36	124
Taipa Grande (Macao)	20	93	13	104	47	130

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	October 2016	November 2016	December 2016
Luhu (Guangzhou)	43	58	69
Modiesha (Guangzhou)	46	72	89
Wanqingsha (Guangzhou)	47	54	86
Tianhu (Guangzhou)	32	36	48
Zhudong (Guangzhou)	49	60	68
Liyuan (Shenzhen)	35	46	69
Jinjuzui (Foshan)	45	62	81
Huijingcheng (Foshan)	45	58	79
Tangjia (Zhuhai)	41	45	78
Donghu (Jiangmen)	54	73	94
Duanfen (Jiangmen)	49	53	86
Huaguoshan (Jiangmen)	77	111	114
Chengzhong (Zhaoqing)	49	72	83
Xiapu (Huizhou)	40	54	73
Xijiao (Huizhou)	33	37	48
Jinguowan (Huizhou)	36	40	56
Zimaling (Zhongshan)	41	48	76
Nanchengyuanling (Dongguan)	45	57	76
Tap Mun (Hong Kong)	31	35	51
Tsuen Wan (Hong Kong)	24	33	48
Yuen Long (Hong Kong)	36	44	66
Tung Chung (Hong Kong)	26	43	68
Taipa Grande (Macao)	49	55	86

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	October 2016		November 2016		December 2016	
	Min	Max	Min	Max	Min	Max
Luhu (Guangzhou)	10	45	5	71	17	61
Modiesha (Guangzhou)	8	38	5	83	15	86
Wanqingsha (Guangzhou)	12	45	12	67	28	77
Tianhu (Guangzhou)	3	42	2	54	15	54
Zhudong (Guangzhou)	7	78	6	95	19	70
Liyuan (Shenzhen)	7	36	11	46	17	73
Jinjuzui (Foshan)	10	39	11	84	18	84
Huijingcheng (Foshan)	16	65	11	160	20	103
Tangjia (Zhuhai)	5	49	11	57	14	75
Donghu (Jiangmen)	17	57	6	147	24	128
Duanfen (Jiangmen)	3	47	4	52	13	116
Huaguoshan (Jiangmen)	15	71	8	157	18	131
Chengzhong (Zhaoqing)	17	67	7	134	19	99
Xiapu (Huizhou)	10	40	5	61	15	68
Xijiao (Huizhou)	8	40	5	48	11	54
Jinguowan (Huizhou)	10	38	4	48	8	63
Zimaling (Zhongshan)	5	42	9	56	16	83
Nanchengyuanling (Dongguan)	14	47	8	80	16	73
Tap Mun (Hong Kong)	8	28	5	39	13	55
Tsuen Wan (Hong Kong)	5	28	5	44	12	60
Yuen Long (Hong Kong)	6	34	7	44	13	76
Tung Chung (Hong Kong)	3	41	9	52	17	79
Taipa Grande (Macao)	2	43	3	52	11	78

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	October 2016	November 2016	December 2016
Luhu (Guangzhou)	26	34	38
Modiesha (Guangzhou)	24	35	45
Wanqingsha (Guangzhou)	30	36	51
Tianhu (Guangzhou)	23	25	33
Zhudong (Guangzhou)	36	42	47
Liyuan (Shenzhen)	23	29	42
Jinjuzui (Foshan)	28	39	49
Huijingcheng (Foshan)	36	54	58
Tangjia (Zhuhai)	26	30	47
Donghu (Jiangmen)	36	50	63
Duanfen (Jiangmen)	26	29	61
Huaguoshan (Jiangmen)	42	64	73
Chengzhong (Zhaoqing)	35	53	58
Xiapu (Huizhou)	22	31	43
Xijiao (Huizhou)	25	27	37
Jinguowan (Huizhou)	21	22	36
Zimaling (Zhongshan)	28	31	51
Nanchengyuanling (Dongguan)	31	39	51
Tap Mun (Hong Kong)	19	21	32
Tsuen Wan (Hong Kong)	17	22	33
Yuen Long (Hong Kong)	22	25	39
Tung Chung (Hong Kong)	19	29	43
Taipa Grande (Macao)	24	28	48

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

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 <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