Guangdong-Hong Kong-Macao

Pearl River Delta

Regional Air Quality Monitoring Network

October to December 2014

Statistical Summary of the Fourth Quarter Monitoring Results

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Approved by	**:**	**Quality Management Committee of Guangdong-Hong Kong-Macao Pearl River Delta Regional Air Quality Monitoring Network**
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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 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 Monitoring Network" (the "Network") accordingly.

In conjunction with the enhancement of the Network, the update of national ambient air quality standards and the increase of reporting frequency of monitoring results, starting from 2014, we report real time monitoring data of the Network on hourly basis to replace the daily RAQI through a new internet platform and publish a quarterly air quality monitoring report every quarter to replace the previous half-yearly report and continue the publishing of annual air quality monitoring report. 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.

This is the fourth report published in the form of quarterly report, i.e. Statistical Summary of the 2014 Fourth Quarter Monitoring Results of PRD Regional Air Quality Monitoring 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 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 include 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 ($PM_{2.5}$), to enrich the air quality monitoring information. The network was then renamed "Guangdong-Hong Kong-Macao Pearl River Delta Regional Air Monitoring Network". The GDEMC, HKEPD, Environmental Protection Bureau of Macau 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 while 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 equipment to measure the ambient concentrations of respirable suspended particulates (PM_{10} or RSP), fine suspended particulates ($PM_{2.5}$ or FSP), sulphur dioxide (SO_2), nitrogen dioxide (NO_2), ozone (O_3) and carbon monoxide (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

3. Operation of the Network

The operation of the Network was generally smooth in the fourth quarter of 2014. The average hourly monitoring data capture rates of all monitoring stations in the Network was 96%.

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 (sulphur dioxide (SO_2), nitrogen dioxide (NO_2), ozone (O_3), carbon monoxide (CO), particulate matters PM_{10} and $PM_{2.5}$) during the reporting period from October to December 2014, and their brief comparisons with the short-term air quality indicators of the class II limits of the latest national "Ambient Air Quality Standards" (NAAQS) (GB3095-2012).

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

[Class II limit: 500 μg/m^3]

Monitoring Station	October 2014		November		December		Exceedance Hours
	Min	Max	Min	Max	Min	Max	
Luhu (Guangzhou)	2	57	1	45	1	61	0
Modiesha (Guangzhou)	0	98	3	69	4	87	0
Wanqingsha (Guangzhou)	7	72	10	107	11	111	0
Tianhu (Guangzhou)	4	80	0	37	0	60	0
Zhudong (Guangzhou)	6	105	5	120	5	103	0
Liyuan (Shenzhen)	2	32	1	29	5	42	0
Jinjuzui (Foshan)	6	61	5	76	4	100	0
Huijingcheng (Foshan)	1	142	6	124	3	158	0
Tangjia (Zhuhai)	4	54	1	40	1	36	0
Donghu (Jiangmen)	7	78	7	114	7	157	0
Duanfen (Jiangmen)	3	54	0	86	1	71	0
Huaguoshan (Jiangmen)	4	147	5	102	5	136	0
Chengzhong (Zhaoqing)	3	76	7	110	7	106	0
Xiapu (Huizhou)	4	28	5	35	0	113	0
Xijiao (Huizhou)	3	144	4	146	3	104	0
Jinguowan (Huizhou)	5	23	5	33	5	46	0
Zimaling (Zhongshan)	0	64	16	56	13	105	0
Nanchengyuanling (Dongguan)	8	86	6	83	5	97	0
Tap Mun (Hong Kong)	1	20	2	19	3	39	0
Tsuen Wan (Hong Kong)	7	50	7	84	8	83	0
Yuen Long (Hong Kong)	4	35	5	36	1	35	0
Tung Chung (Hong Kong)	7	46	7	75	7	58	0
Taipa Grande (Macao)	1	38	2	29	2	69	0

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

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

[Class II limit: 150 μg/m^3]

Monitoring Station	October 2014		November		December		Exceedance Days
	Min	Max	Min	Max	Min	Max	
Luhu (Guangzhou)	8	25	3	29	4	33	0
Modiesha (Guangzhou)	6	39	7	33	7	40	0
Wanqingsha (Guangzhou)	10	37	16	46	18	68	0
Tianhu (Guangzhou)	9	25	2	26	7	47	0
Zhudong (Guangzhou)	16	39	14	54	12	59	0
Liyuan (Shenzhen)	3	10	2	13	7	30	0
Jinjuzui (Foshan)	13	33	6	37	7	47	0
Huijingcheng (Foshan)	14	52	13	57	8	68	0
Tangjia (Zhuhai)	11	28	4	21	3	24	0
Donghu (Jiangmen)	9	35	10	52	8	61	0
Duanfen (Jiangmen)	5	33	2	33	8	38	0
Huaguoshan (Jiangmen)	11	46	16	52	13	67	0
Chengzhong (Zhaoqing)	8	43	9	37	9	45	0
Xiapu (Huizhou)	6	17	7	22	8	32	0
Xijiao (Huizhou)	8	27	8	34	7	34	0
Jinguowan (Huizhou)	7	14	6	19	6	30	0
Zimaling (Zhongshan)	3	37	18	35	15	37	0
Nanchengyuanling (Dongguan)	13	48	12	41	10	40	0
Tap Mun (Hong Kong)	4	12	4	14	4	27	0
Tsuen Wan (Hong Kong)	9	20	8	29	9	28	0
Yuen Long (Hong Kong)	6	15	6	18	4	25	0
Tung Chung (Hong Kong)	8	19	9	23	9	33	0
Taipa Grande (Macao)	3	17	3	17	4	28	0

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

Table 4.1c：The monthly averages of Sulphur Dioxide

Monitoring Station	October 2014	November	December
Luhu (Guangzhou)	16	14	16
Modiesha (Guangzhou)	22	19	23
Wanqingsha (Guangzhou)	24	28	38
Tianhu (Guangzhou)	16	14	24
Zhudong (Guangzhou)	28	26	33
Liyuan (Shenzhen)	7	6	16
Jinjuzui (Foshan)	19	20	24
Huijingcheng (Foshan)	28	30	35
Tangjia (Zhuhai)	21	10	15
Donghu (Jiangmen)	19	22	20
Duanfen (Jiangmen)	15	13	23
Huaguoshan (Jiangmen)	29	28	39
Chengzhong (Zhaoqing)	20	22	22
Xiapu (Huizhou)	13	13	18
Xijiao (Huizhou)	16	19	22
Jinguowan (Huizhou)	10	10	15
Zimaling (Zhongshan)	21	26	27
Nanchengyuanling (Dongguan)	22	22	26
Tap Mun (Hong Kong)	7	7	12
Tsuen Wan (Hong Kong)	13	13	17
Yuen Long (Hong Kong)	10	10	12
Tung Chung (Hong Kong)	13	15	19
Taipa Grande (Macao)	9	9	15

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

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

[Class II limit: 200 μg/m^3]

Monitoring Station	October 2014		November		December		Exceedance Hours
	Min	Max	Min	Max	Min	Max	
Luhu (Guangzhou)	9	192	11	173	5	167	0
Modiesha (Guangzhou)	6	194	21	200	17	222	4
Wanqingsha (Guangzhou)	0	124	8	158	15	219	1
Tianhu (Guangzhou)	3	89	2	66	6	48	0
Zhudong (Guangzhou)	5	108	6	106	10	103	0
Liyuan (Shenzhen)	4	151	6	159	14	177	0
Jinjuzui (Foshan)	6	150	13	157	13	274	4
Huijingcheng (Foshan)	12	242	18	247	18	258	34
Tangjia (Zhuhai)	7	94	1	100	2	134	0
Donghu (Jiangmen)	12	162	15	186	15	261	4
Duanfen (Jiangmen)	2	138	0	66	12	129	0
Huaguoshan (Jiangmen)	0	131	11	101	13	141	0
Chengzhong (Zhaoqing)	0	89	5	88	4	96	0
Xiapu (Huizhou)	4	97	0	116	2	141	0
Xijiao (Huizhou)	12	44	6	46	5	61	0
Jinguowan (Huizhou)	5	34	6	55	8	73	0
Zimaling (Zhongshan)	0	99	5	90	5	194	0
Nanchengyuanling (Dongguan)	5	147	15	154	13	166	0
Tap Mun (Hong Kong)	2	51	3	87	5	90	0
Tsuen Wan (Hong Kong)	11	167	14	207	10	224	6
Yuen Long (Hong Kong)	7	164	13	154	16	225	4
Tung Chung (Hong Kong)	4	162	11	181	15	281	10
Taipa Grande (Macao)	7	118	12	137	19	186	0

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

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

[Class II limit: 80 μg/m^3]

Monitoring Station	October 2014		November		December		Exceedance Days
	Min	Max	Min	Max	Min	Max	
Luhu (Guangzhou)	40	100	22	91	21	105	8
Modiesha (Guangzhou)	31	102	31	107	32	122	21
Wanqingsha (Guangzhou)	10	50	24	76	27	130	4
Tianhu (Guangzhou)	7	31	4	27	9	25	0
Zhudong (Guangzhou)	23	64	13	59	20	76	0
Liyuan (Shenzhen)	19	75	20	91	38	117	8
Jinjuzui (Foshan)	25	80	24	87	29	141	5
Huijingcheng (Foshan)	37	140	33	151	32	152	31
Tangjia (Zhuhai)	12	36	11	56	19	77	0
Donghu (Jiangmen)	20	97	29	91	37	142	15
Duanfen (Jiangmen)	11	55	3	48	24	79	0
Huaguoshan (Jiangmen)	8	80	23	60	21	106	5
Chengzhong (Zhaoqing)	11	51	15	44	9	54	0
Xiapu (Huizhou)	15	38	13	52	12	75	0
Xijiao (Huizhou)	18	27	11	28	13	30	0
Jinguowan (Huizhou)	11	20	11	26	12	40	0
Zimaling (Zhongshan)	12	60	19	57	18	91	1
Nanchengyuanling (Dongguan)	15	59	21	77	20	86	2
Tap Mun (Hong Kong)	5	16	6	22	9	27	0
Tsuen Wan (Hong Kong)	49	80	46	92	41	121	9
Yuen Long (Hong Kong)	35	90	37	89	43	117	15
Tung Chung (Hong Kong)	24	89	29	89	39	137	14
Taipa Grande (Macao)	23	71	26	89	34	123	7

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

Table 4.2c：The monthly averages of Nitrogen Dioxide

Monitoring Station	October 2014	November	December
Luhu (Guangzhou)	59	48	54
Modiesha (Guangzhou)	60	65	70
Wanqingsha (Guangzhou)	30	51	62
Tianhu (Guangzhou)	13	11	15
Zhudong (Guangzhou)	41	34	42
Liyuan (Shenzhen)	33	44	63
Jinjuzui (Foshan)	47	52	61
Huijingcheng (Foshan)	68	72	85
Tangjia (Zhuhai)	22	30	42
Donghu (Jiangmen)	40	50	75
Duanfen (Jiangmen)	24	25	40
Huaguoshan (Jiangmen)	32	38	54
Chengzhong (Zhaoqing)	25	25	25
Xiapu (Huizhou)	25	25	33
Xijiao (Huizhou)	22	18	20
Jinguowan (Huizhou)	16	17	21
Zimaling (Zhongshan)	34	31	42
Nanchengyuanling (Dongguan)	30	46	48
Tap Mun (Hong Kong)	10	11	16
Tsuen Wan (Hong Kong)	64	63	68
Yuen Long (Hong Kong)	59	63	71
Tung Chung (Hong Kong)	50	58	70
Taipa Grande (Macao)	39	52	65

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

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

[Class II limit: 200 μg/m^3]

Monitoring Station	October 2014		November		December		Exceedance Hours
	Min	Max	Min	Max	Min	Max	
Luhu (Guangzhou)	0	263	0	238	0	147	36
Modiesha (Guangzhou)	4	279	4	288	4	147	71
Wanqingsha (Guangzhou)	7	358	3	349	3	205	169
Tianhu (Guangzhou)	14	284	16	280	21	143	35
Zhudong (Guangzhou)	2	306	3	320	3	130	83
Liyuan (Shenzhen)	4	187	1	129	1	147	0
Jinjuzui (Foshan)	2	313	2	269	2	138	76
Huijingcheng (Foshan)	5	266	2	284	0	125	47
Tangjia (Zhuhai)	4	271	1	161	33	123	62
Donghu (Jiangmen)	1	264	1	233	1	176	63
Duanfen (Jiangmen)	7	301	2	232	2	191	113
Huaguoshan (Jiangmen)	1	294	1	283	0	152	87
Chengzhong (Zhaoqing)	6	293	13	217	7	116	45
Xiapu (Huizhou)	9	218	0	221	0	130	5
Xijiao (Huizhou)	1	192	1	219	3	131	4
Jinguowan (Huizhou)	9	305	6	251	8	168	19
Zimaling (Zhongshan)	0	276	1	196	0	158	50
Nanchengyuanling (Dongguan)	4	269	4	335	4	162	70
Tap Mun (Hong Kong)	10	219	5	180	11	201	16
Tsuen Wan (Hong Kong)	5	181	3	161	3	113	0
Yuen Long (Hong Kong)	1	272	1	196	1	133	5
Tung Chung (Hong Kong)	2	247	2	156	2	135	16
Taipa Grande (Macao)	17	248	4	180	2	185	28

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

Table 4.3b：The monthly maxima and minima of daily maximum 8-hour averages of Ozone **[Class II limit: 160 μg/m^3]**

Monitoring Station	October 2014		November		December		Exceedance Days
	Min	Max	Min	Max	Min	Max	
Luhu (Guangzhou)	56	198	9	168	4	105	12
Modiesha (Guangzhou)	68	242	25	231	25	113	23
Wanqingsha (Guangzhou)	84	318	26	226	26	144	28
Tianhu (Guangzhou)	112	227	53	267	47	132	17
Zhudong (Guangzhou)	124	285	25	264	17	118	26
Liyuan (Shenzhen)	69	149	15	111	12	120	0
Jinjuzui (Foshan)	62	256	10	199	9	111	20
Huijingcheng (Foshan)	57	237	12	209	6	88	16
Tangjia (Zhuhai)	72	238	10	123	45	107	14
Donghu (Jiangmen)	65	239	8	189	6	134	17
Duanfen (Jiangmen)	87	271	20	184	8	159	22
Huaguoshan (Jiangmen)	53	246	7	219	5	111	24
Chengzhong (Zhaoqing)	113	253	25	193	26	113	19
Xiapu (Huizhou)	105	190	33	172	28	118	9
Xijiao (Huizhou)	105	167	36	189	58	124	3
Jinguowan (Huizhou)	124	238	48	202	41	152	14
Zimaling (Zhongshan)	77	228	4	147	6	120	15
Nanchengyuanling (Dongguan)	89	233	33	272	35	135	28
Tap Mun (Hong Kong)	84	211	44	164	53	166	14
Tsuen Wan (Hong Kong)	45	143	26	104	24	92	0
Yuen Long (Hong Kong)	66	201	16	132	16	93	4
Tung Chung (Hong Kong)	57	188	15	113	12	105	9
Taipa Grande (Macao)	36	230	11	145	3	130	14

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

Table 4.3c：The monthly averages of Ozone

Monitoring Station	October 2014	November	December
Luhu (Guangzhou)	77	35	33
Modiesha (Guangzhou)	96	60	46
Wanqingsha (Guangzhou)	140	62	48
Tianhu (Guangzhou)	136	94	89
Zhudong (Guangzhou)	98	56	50
Liyuan (Shenzhen)	73	41	34
Jinjuzui (Foshan)	100	45	34
Huijingcheng (Foshan)	89	41	29
Tangjia (Zhuhai)	100	47	76
Donghu (Jiangmen)	86	44	36
Duanfen (Jiangmen)	110	61	51
Huaguoshan (Jiangmen)	96	46	37
Chengzhong (Zhaoqing)	110	67	54
Xiapu (Huizhou)	108	63	52
Xijiao (Huizhou)	75	57	60
Jinguowan (Huizhou)	121	78	78
Zimaling (Zhongshan)	91	32	26
Nanchengyuanling (Dongguan)	111	67	58
Tap Mun (Hong Kong)	118	94	84
Tsuen Wan (Hong Kong)	80	50	44
Yuen Long (Hong Kong)	86	45	37
Tung Chung (Hong Kong)	94	50	40
Taipa Grande (Macao)	109	60	47

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

Table 4.4a：The monthly maxima and minima of hourly averages of Carbon Monoxide

[Class II limit: 10 mg/m^3]

Monitoring Station	October 2014		November		December		Exceedance Hours
	Min	Max	Min	Max	Min	Max	
Luhu (Guangzhou)	0.5	1.8	0.5	2.7	0.4	2.8	0
Modiesha (Guangzhou)	0.1	1.5	0.0	1.4	0.1	3.7	0
Wanqingsha (Guangzhou)	0.0	1.7	0.5	3.4	0.6	2.5	0
Tianhu (Guangzhou)	0.4	1.6	0.4	1.9	0.2	1.6	0
Zhudong (Guangzhou)	0.4	2.0	0.2	1.9	0.4	1.9	0
Liyuan (Shenzhen)	0.8	3.0	0.1	2.3	0.7	3.2	0
Jinjuzui (Foshan)	0.6	1.8	0.8	2.6	0.4	4.5	0
Huijingcheng (Foshan)	0.3	2.4	0.4	3.4	0.2	4.1	0
Tangjia (Zhuhai)	0.8	2.4	0.6	2.0	0.5	3.1	0
Donghu (Jiangmen)	0.1	1.8	0.1	3.0	0.0	6.5	0
Duanfen (Jiangmen)	0.3	1.9	0.3	1.5	0.5	1.7	0
Huaguoshan (Jiangmen)	0.3	2.0	0.8	2.6	0.4	2.6	0
Chengzhong (Zhaoqing)	0.1	2.3	0.2	1.6	0.1	2.6	0
Xiapu (Huizhou)	0.0	1.1	0.0	1.9	0.5	4.8	0
Xijiao (Huizhou)	0.5	1.8	0.3	1.8	0.1	2.4	0
Jinguowan (Huizhou)	0.4	1.1	0.3	1.4	0.2	2.1	0
Zimaling (Zhongshan)	0.2	1.8	0.2	1.9	0.5	3.0	0
Nanchengyuanling (Dongguan)	0.2	1.6	0.3	1.9	0.3	3.2	0
Tap Mun (Hong Kong)	0.4	1.2	0.3	1.5	0.2	1.4	0
Tsuen Wan (Hong Kong)	0.3	1.4	0.4	1.2	0.5	1.6	0
Yuen Long (Hong Kong)	0.2	1.5	0.4	1.4	0.4	2.7	0
Tung Chung (Hong Kong)	0.6	1.3	0.4	1.5	0.4	1.5	0
Taipa Grande (Macao)	0.5	1.7	0.5	1.9	0.5	2.0	0

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

Table 4.4b：The monthly maxima and minima of daily averages of Carbon Monoxide

[Class II limit: 4 mg/m^3]

Monitoring Station	October 2014		November		December		Exceedance Days
	Min	Max	Min	Max	Min	Max	
Luhu (Guangzhou)	0.6	1.3	0.9	2.0	0.5	1.8	0
Modiesha (Guangzhou)	0.4	1.1	0.2	1.0	0.2	1.8	0
Wanqingsha (Guangzhou)	0.6	1.3	0.6	1.5	0.7	1.6	0
Tianhu (Guangzhou)	0.4	1.3	0.7	1.5	0.3	1.0	0
Zhudong (Guangzhou)	0.6	1.5	0.8	1.6	0.6	1.4	0
Liyuan (Shenzhen)	0.9	1.5	0.3	1.7	0.8	1.7	0
Jinjuzui (Foshan)	0.7	1.4	1.0	1.8	0.7	2.2	0
Huijingcheng (Foshan)	0.5	1.6	0.7	1.7	0.7	2.1	0
Tangjia (Zhuhai)	0.8	2.1	0.7	1.7	0.6	2.2	0
Donghu (Jiangmen)	0.2	1.1	0.3	1.1	0.2	1.9	0
Duanfen (Jiangmen)	0.5	1.2	0.4	1.1	0.6	1.3	0
Huaguoshan (Jiangmen)	0.6	1.4	1.0	2.0	0.9	2.2	0
Chengzhong (Zhaoqing)	0.4	1.3	0.6	1.2	0.5	1.2	0
Xiapu (Huizhou)	0.1	0.8	0.2	0.8	0.6	1.7	0
Xijiao (Huizhou)	0.6	1.1	0.6	1.4	0.4	1.2	0
Jinguowan (Huizhou)	0.4	0.8	0.4	0.8	0.3	1.1	0
Zimaling (Zhongshan)	0.3	1.6	0.3	1.5	0.7	1.7	0
Nanchengyuanling (Dongguan)	0.7	1.2	0.8	1.3	0.6	1.7	0
Tap Mun (Hong Kong)	0.5	1.0	0.3	1.2	0.2	1.0	0
Tsuen Wan (Hong Kong)	0.5	1.2	0.6	1.0	0.7	1.3	0
Yuen Long (Hong Kong)	0.4	1.1	0.6	1.1	0.6	1.3	0
Tung Chung (Hong Kong)	0.6	1.0	0.4	1.1	0.5	1.2	0
Taipa Grande (Macao)	0.5	1.3	0.5	1.6	0.6	1.6	0

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

Table 4.4c：The monthly averages of Carbon Monoxide

Monitoring Station	October 2014	November	December
Luhu (Guangzhou)	1.1	1.3	1.2
Modiesha (Guangzhou)	0.7	0.6	1.0
Wanqingsha (Guangzhou)	1.0	0.9	1.1
Tianhu (Guangzhou)	0.8	0.8	0.6
Zhudong (Guangzhou)	1.0	1.0	0.9
Liyuan (Shenzhen)	1.2	1.3	1.4
Jinjuzui (Foshan)	0.9	1.3	1.2
Huijingcheng (Foshan)	0.9	1.1	1.3
Tangjia (Zhuhai)	1.5	1.2	1.2
Donghu (Jiangmen)	0.5	0.8	0.8
Duanfen (Jiangmen)	0.8	0.9	0.9
Huaguoshan (Jiangmen)	0.9	1.3	1.3
Chengzhong (Zhaoqing)	0.8	0.9	0.8
Xiapu (Huizhou)	0.5	0.5	1.1
Xijiao (Huizhou)	0.8	0.9	0.9
Jinguowan (Huizhou)	0.6	0.7	0.7
Zimaling (Zhongshan)	1.0	0.9	1.1
Nanchengyuanling (Dongguan)	0.9	1.0	1.1
Tap Mun (Hong Kong)	0.7	0.7	0.6
Tsuen Wan (Hong Kong)	0.9	0.8	0.9
Yuen Long (Hong Kong)	0.8	0.8	1.0
Tung Chung (Hong Kong)	0.8	0.8	0.8
Taipa Grande (Macao)	1.0	1.0	1.1

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

Table 4.5a：The monthly maxima and minima of daily averages of PM_{10}

[Class II limit: 150 μg/m^3]

Monitoring Station	October 2014		November		December		Exceedance Days
	Min	Max	Min	Max	Min	Max	
Luhu (Guangzhou)	41	125	13	96	15	114	0
Modiesha (Guangzhou)	52	160	14	134	19	166	5
Wanqingsha (Guangzhou)	40	120	28	110	18	157	1
Tianhu (Guangzhou)	35	129	7	109	13	110	0
Zhudong (Guangzhou)	75	174	21	173	20	143	4
Liyuan (Shenzhen)	37	128	22	103	18	162	1
Jinjuzui (Foshan)	47	117	19	122	19	174	3
Huijingcheng (Foshan)	57	156	41	169	20	209	9
Tangjia (Zhuhai)	39	141	40	116	50	111	0
Donghu (Jiangmen)	48	153	21	134	20	172	3
Duanfen (Jiangmen)	34	169	30	114	21	149	2
Huaguoshan (Jiangmen)	64	185	29	182	18	201	14
Chengzhong (Zhaoqing)	39	179	14	137	15	106	1
Xiapu (Huizhou)	47	136	26	105	17	131	0
Xijiao (Huizhou)	43	88	13	90	34	85	0
Jinguowan (Huizhou)	58	119	25	100	15	123	0
Zimaling (Zhongshan)	39	138	30	108	21	142	0
Nanchengyuanling (Dongguan)	49	113	21	106	35	135	0
Tap Mun (Hong Kong)	27	111	25	93	19	123	0
Tsuen Wan (Hong Kong)	33	99	16	84	19	98	0
Yuen Long (Hong Kong)	40	120	31	111	31	158	1
Tung Chung (Hong Kong)	34	97	25	98	23	126	0
Taipa Grande (Macao)	42	161	42	122	25	162	3

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

Table 4.5b：The monthly averages of PM_{10}

Monitoring Station	October 2014	November	December
Luhu (Guangzhou)	72	60	63
Modiesha (Guangzhou)	102	84	95
Wanqingsha (Guangzhou)	77	67	84
Tianhu (Guangzhou)	70	58	60
Zhudong (Guangzhou)	110	84	85
Liyuan (Shenzhen)	74	59	86
Jinjuzui (Foshan)	76	70	88
Huijingcheng (Foshan)	93	92	108
Tangjia (Zhuhai)	79	68	83
Donghu (Jiangmen)	78	77	93
Duanfen (Jiangmen)	84	69	86
Huaguoshan (Jiangmen)	116	98	111
Chengzhong (Zhaoqing)	91	75	63
Xiapu (Huizhou)	87	73	73
Xijiao (Huizhou)	60	53	55
Jinguowan (Huizhou)	77	64	68
Zimaling (Zhongshan)	75	67	85
Nanchengyuanling (Dongguan)	78	71	79
Tap Mun (Hong Kong)	66	56	71
Tsuen Wan (Hong Kong)	64	51	58
Yuen Long (Hong Kong)	73	66	92
Tung Chung (Hong Kong)	61	57	74
Taipa Grande (Macao)	90	81	92

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

Table 4.6a：The monthly maxima and minima of daily averages of $PM_{2.5}$

[Class II limit: 75 μg/m^3]

Monitoring Station	October 2014		November		December		Exceedance Days
	Min	Max	Min	Max	Min	Max	
Luhu (Guangzhou)	31	100	11	76	8	101	10
Modiesha (Guangzhou)	19	72	4	54	17	101	5
Wanqingsha (Guangzhou)	37	109	23	81	10	109	15
Tianhu (Guangzhou)	24	91	6	71	12	85	2
Zhudong (Guangzhou)	48	135	15	124	13	105	22
Liyuan (Shenzhen)	23	82	18	67	13	91	4
Jinjuzui (Foshan)	26	90	12	78	13	120	9
Huijingcheng (Foshan)	30	109	26	120	12	157	29
Tangjia (Zhuhai)	29	98	32	81	22	120	12
Donghu (Jiangmen)	30	108	17	121	10	125	26
Duanfen (Jiangmen)	19	112	18	71	10	88	6
Huaguoshan (Jiangmen)	29	119	16	96	10	119	21
Chengzhong (Zhaoqing)	31	144	11	111	7	74	16
Xiapu (Huizhou)	27	86	15	71	14	92	4
Xijiao (Huizhou)	34	74	11	77	29	69	1
Jinguowan (Huizhou)	32	79	13	67	10	74	1
Zimaling (Zhongshan)	26	106	22	73	12	101	13
Nanchengyuanling (Dongguan)	40	91	19	75	17	107	10
Tap Mun (Hong Kong)	12	76	20	71	18	70	1
Tsuen Wan (Hong Kong)	25	74	14	60	11	64	0
Yuen Long (Hong Kong)	29	94	25	93	27	97	12
Tung Chung (Hong Kong)	19	65	15	69	15	74	0
Taipa Grande (Macao)	26	108	19	89	11	92	9

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

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

Monitoring Station	October 2014	November	December
Luhu (Guangzhou)	59	45	51
Modiesha (Guangzhou)	40	33	51
Wanqingsha (Guangzhou)	65	50	59
Tianhu (Guangzhou)	46	40	36
Zhudong (Guangzhou)	77	59	58
Liyuan (Shenzhen)	43	40	51
Jinjuzui (Foshan)	51	46	56
Huijingcheng (Foshan)	56	62	73
Tangjia (Zhuhai)	52	53	64
Donghu (Jiangmen)	61	58	66
Duanfen (Jiangmen)	49	41	52
Huaguoshan (Jiangmen)	68	56	63
Chengzhong (Zhaoqing)	66	57	41
Xiapu (Huizhou)	47	44	51
Xijiao (Huizhou)	48	44	44
Jinguowan (Huizhou)	45	39	43
Zimaling (Zhongshan)	55	49	63
Nanchengyuanling (Dongguan)	56	46	59
Tap Mun (Hong Kong)	35	38	44
Tsuen Wan (Hong Kong)	42	35	38
Yuen Long (Hong Kong)	51	50	64
Tung Chung (Hong Kong)	36	35	45
Taipa Grande (Macao)	53	50	58

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

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	13m	12m	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

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	mixed residential/commercial/ industrial	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	UV fluorescence / Differential Optical Absorption Spectroscopy
Nitrogen Dioxide	Chemiluminescence / Differential Optical Absorption Spectroscopy
Ozone	UV absorption / Differential Optical Absorption Spectroscopy
Respirable Suspended Particulates (PM_{10})	Oscillating microbalance (TEOM) Beta particulate monitor
Fine Suspended Particulates ($PM_{2.5}$)	Oscillating microbalance (TEOM) Beta particulate monitor
Carbon Monoxide	Gas filter correlation infrared absorption method Non-dispersive infrared absorption method