Civil Engineering and Development Department

Contract No. KLN/2010/04

Environmental Monitoring Works at Kai Tak Development

Baseline Air Quality Monitoring Report for
Air Quality Monitoring Station AA1 and AA2

July 2014
(Version 1.3)

Approved By	(Environmental Team Leader)

REMARKS:

The information supplied and contained within this report is, to the best of our knowledge, correct at the time of printing.

CINOTECH accepts no responsibility for changes made to this report by third parties

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EXECUTIVE SUMMARY

1. This Baseline Air Quality Monitoring Report is prepared by Cinotech Consultants Limited for the "Contract No. KLN/2013/16 - Environmental Monitoring Works for Kai Tak Development" (hereinafter called "the Project"). This report presents the baseline air quality monitoring works performed at Ching Long Shopping (AA1) Centre between 6th June 2014 and 19th June 2014 and Tak Long Estate (AA2) between 19th June 2014 and 2nd July 2014.

2. The baseline air quality monitoring period for the parameters of 1-hour and 24-hour Total Suspended Particulates (TSP) conducted at Ching Long Shopping Centre (AA1) and Tak Long Estate (AA2) are presented in **Table I**.

Table I Baseline Air Quality Monitoring Period

Designated Monitoring Stations under Contract	Baseline Monitoring Period
AA1 - Ching Long Shopping Centre	6/6/2014 – 19/6/2014
AA2 - Tak Long Estate	19/6/2014 – 2/7/2014

3. The baseline air quality monitoring results were reviewed and compared with the baseline air quality monitoring results at existing air quality monitoring stations, AM1(A), AM2, AM3(A), AM4(A) and AM5(A) (baseline air quality monitoring completed prior to the commencement of Kai Tak Development) to determine the appropriate Action and Limit Level for station AA1 and AA2. Details of the methodology, locations and results are presented in the report.

1 INTRODUCTION

Background

1.1 Cinotech Consultants Limited (Cinotech) was commissioned by Civil Engineering and Development Department (CEDD) to undertake the role of the Environmental Team (ET) for the "Environmental Monitoring Works for Kai Tak Development (KTD)" Project under Contract No. KLN/2013/16. The site layout plan is shown in **Figure 1**.

1.2 Air quality monitoring at Ching Long Shopping Centre (AA1) and Tak Long Estate (AA2) was required under the Project Specification. According to Clause 2.4.1 of the Specification, air quality monitoring shall be conducted at the designated locations representing the ASRs (within or outside of KTD Boundary) during construction phase of the Project.

1.3 Baseline air quality monitoring was conducted at the proposed air quality monitoring station Ching Long Shopping Centre (AA1) and Tak Long Estate (AA2) in accordance with Table 2.1 of Annex I to Specification. The location of air quality monitoring AA1 and AA2 is shown in **Figure 2**.

Purpose of the Report

1.4 The purpose of the Report is to set out baseline levels for air quality in accordance with the EM&A Manual. These baseline levels will be used as the basis for compliance check during the impact monitoring in construction stage of the Project. This Report presents the locations, equipment, period, methodology, results and observations for the baseline air quality monitoring.

Structure of the Report

1.5 This Baseline Environmental Monitoring Report comprises the following sections:

Section 1:	Introduction -	Project background, purpose and the structure of the report
Section 2:	Air Quality -	Description of baseline air quality monitoring and results
Section 3:	Conclusions	

2 AIR QUALITY MONITORING

Monitoring Requirements

2.1 Baseline monitoring of 1-hr TSP shall be carried out at least three times per day while that of 24-hr TSP shall be conducted daily for 14 consecutive days prior to the commissioning of major construction works of the Project.

Monitoring Location

2.2 The location of the monitoring station is tabulated in **Table 2.1** and illustrated in **Figure 2**.

Table 2.1 Location of Air Quality Monitoring Station

Air Quality Monitoring Station	Description	Location of Measurement
AA1	Ching Long Shopping Centre	Rooftop
AA2	Tak Long Estate	Rooftop

Monitoring Equipment

2.3 High Volume Samplers (HVS) was used to carry out 24-hr TSP monitoring. Direct reading dust meter was used to measure 1-hr average TSP levels. The 1-hour sampling was determined periodically by HVS to check the validity and accuracy of the results measured by direct reading method. Copies of calibration certificates are attached in **Appendix A1. Table 2.2** summarizes the equipment used in the baseline air quality monitoring programme.

Table 2.2 Air Quality Monitoring Equipment

Monitoring Equipment	Brand and Model	Quantity
Direct reading dust meter (1-hr TSP)	Laser Dust Monitor – Model LD3B	5
HVS Sampler (24-hr TSP)	TISCH Model: TE-5170	2
Calibrator	TISCH Model: TE-5025A	1

Monitoring Parameters, Frequency and Duration

2.4 **Table 2.3** summarizes the monitoring parameters, monitoring period and frequency of baseline air quality monitoring.

Table 2.3 Summary of Monitoring Parameters, Frequency and Duration

Monitoring Station	Location for Measurement	Parameter	Period	Frequency
AA1	Ching Long Shopping Centre and Tak Long Estate	1-hr TSP	0700-1900	3 times/day
AA2		24-hr TSP	24 hours	Daily

Monitoring Methodology and QA/QC Procedure

1-hour TSP Monitoring

Measuring Procedures

2.5 The measuring procedures of the 1-hour dust meter are in accordance with the Manufacturer's Instruction Manual as follows:

- The 1-hour dust meter is placed at least 1.3 meters above ground.
- Set POWER to "ON" and make sure that the battery level was not flash or in low level.
- Allow the instrument to stand for about 3 minutes and then the cap of the air sampling inlet has been released.
- Push the knob at MEASURE position.
- Set time/mode setting to [BG] by pushing the time setting switch. Then, start the background measurement by pushing the start/stop switch once. It will take 6 sec. to complete the background measurement.
- Push the time setting switch to change the time setting display to [MANUAL] at the bottom left of the liquid crystal display. Finally, push the start/stop switch to stop the measuring after 1 hour sampling.
- Information such as sampling date, time, count value and site condition were recorded during the monitoring period.

Maintenance/Calibration

2.6 The following maintenance/calibration is required for the 1-hour dust meter;

- Check and calibrate the meter by HVS to check the validity and accuracy of the results measured by direct reading method at 2-month intervals throughout all stages of the air quality monitoring.

24-hour TSP Monitoring

Instrumentation

2.7 High volume samplers (HVS) (TISCH Model: TE-5170) complete with appropriate sampling inlets was employed for 24-hour TSP monitoring. The sampler was composed of a motor, a filter holder, a flow controller and a sampling inlet and its performance specification complied with that required by USEPA Standard Title 40, Code of Federation Regulations Chapter 1 (Part 50).

HVS Installation

2.8 The following guidelines were adopted during the installation of HVS:

- Sufficient support was provided to secure the samplers against gusty wind.
- No two samplers were placed less than 2 meters apart.
- The distance between the sampler and an obstacle, such as buildings, was at least twice the height that the obstacle protrudes above the sampler.
- A minimum of 2 meters of separation from walls, parapets and penthouses was required for rooftop samples.
- A minimum of 2 meters separation from any supporting structure, measured horizontally was required.

- No furnaces or incineration flues were nearby.
- Airflow around the sampler was unrestricted.
- The samplers were more than 20 meters from the drip line.
- Any wire fence and gate, to protect the sampler, should not cause any obstruction during monitoring.

Operating/Analytical Procedures

2.9 Operating/analytical procedures for the air quality monitoring were highlighted as follows:

- Prior to the commencement of the dust sampling, the flow rate of the HVS was properly set (between 1.1 m^3/min. and 1.4 m^3/min.) in accordance with the manufacturer's instruction to within the range recommended in USEPA Standard Title 40, CFR Part 50.
- The power supply was checked to ensure the sampler worked properly.
- On sampling, the sampler was operated for 5 minutes to establish thermal equilibrium before placing any filter media at the designated air quality monitoring station.
- The filter holding frame was then removed by loosening the four nuts and carefully a weighted and conditioned filter was centered with the stamped number upwards, on a supporting screen.
- The filter was aligned on the screen so that the gasket formed an airtight seal on the outer edges of the filter. Then the filter holding frame was tightened to the filter holder with swing bolts. The applied pressure should be sufficient to avoid air leakage at the edges.
- The shelter lid was closed and secured with the aluminum strip.
- The timer was then programmed. Information was recorded on the record sheet, which included the starting time, the weather condition and the filter number (the initial weight of the filter paper can be found out by using the filter number).
- After sampling, the filter was removed and sent to the Wellab Ltd. for weighing. The elapsed time was also recorded.
- Before weighing, all filters were equilibrated in a conditioning environment for 24 hours. The conditioning environment temperature should be between 25°C and 30°C and not vary by more than ±3°C; the relative humidity (RH) should be < 50% and not vary by more than ±5%. A convenient working RH is 40%. Weighing results were returned to Cinotech for further analysis of TSP concentrations collected by each filter.

Maintenance/Calibration

2.10 The following maintenance/calibration was required for the HVS:

- The high volume motors and their accessories were properly maintained. Appropriate maintenance such as routine motor brushes replacement and electrical wiring checking were made to ensure that the equipment and necessary power supply are in good working condition.
- All HVS were calibrated (five point calibration) using Calibration Kit prior to the commencement of the baseline monitoring and thereafter at bi-monthly intervals.

Results and Observations

2.11 The baseline air quality monitoring at AA1 and AA2 were conducted between 6 June 2014 and 2 July 2014. The monitoring schedule is presented in **Appendix B**. Major dust source affecting the monitoring results was observed as the nearby traffic emissions and construction dust within Kai Tak Development Area for the monitoring stations. Weather condition also affected the monitoring results.

2.12 The baseline monitoring results for 1-hr TSP and 24-hr TSP at AA1 and AA2 are summarized in **Table 2.4 and 2.5**. The baseline air monitoring results and established action and limit level at existing air quality monitoring stations (AM1(A), AM2, AM3(A), AM4(A) and AM5(A)) were also provided for comparison. Monitoring data and graphical presentations of 1-hour and 24-hour TSP are presented in **Appendix A**. Detailed weather conditions during the baseline monitoring period are shown in **Appendix C**.

Table 2.4 Summary of Baseline 1-hour TSP Monitoring Results

Monitoring Station	Average TSP Concentration, µg/m^3 (Range)	Action Level, µg/m^3	Limit Level, µg/m^3
AA1	87.1 (38.7 – 113.5)	-	500
AA2	95.3 (63.8 – 135.1)	-	
AM1(A)	142.1 (57.9 – 235.7)	342	
AM2	147.9 (64.4 – 216.8)	346	
AM3(A)	155.2 (108.4 – 196.3)	351	
AM4(A)	186.8 (156.3 – 213.0)	371	
AM5(A)	145.8 (77.5 – 203.0)	345	

Table 2.5 Summary of Baseline 24-hour TSP Monitoring Results

Monitoring Station	Average TSP Concentration, µg/m^3 (Range)	Action Level, µg/m^3	Limit Level, µg/m^3
AA1	52.1 (29.3 – 83.9)	-	260
AA2	54.6 (33.2 – 83.7)	-	
AM1(A)	44.4 (22.9 – 61.3)	159	
AM2	42.0 (26.7 – 57.1)	157	
AM3(A)	56.3 (30.2 – 82.5)	167	
AM4(A)	88.3 (43.0 – 137.3)	187	
AM5(A)	39.6 (22.6 – 68.7)	156	

Action and Limit Levels

2.13 The baseline air quality monitoring results at AA1 and AA2 were reviewed and compared with the baseline air quality monitoring results at all existing air quality monitoring stations, AM1(A), AM2, AM3(A), AM4(A) and AM5(A) (baseline monitoring completed prior to the commencement of Kai Tak Development).

2.14 The measured 1-hr TSP baseline data at Ching Long Shopping Centre (AA1) and Tak Long Estate (AA2) was adopted to establish the action and limit level of 1-hour TSP concentration respectively, while the action and limit level of 24-hr TSP at existing air quality monitoring station AM5(A) was adopted based on the following reasons:

- Precipitation was recorded throughout the baseline monitoring period as referred to **Appendix C**. Although the baseline monitoring at AA1 & AA2 were conducted after the commencement of Kai Tak Development, the rainfall act as the dust mitigation measure to minimise the construction dust impact from nearby Kai Tak Development Project sites. Therefore, adverse dust impact is not anticipated.

- The average 1-hour TSP concentrations measured at Ching Long Shopping Centre (AA1) and Tak Long Estate (AA2) were consistently lower than the baseline air quality monitoring results at existing air quality monitoring stations. For 24-hour TSP concentrations, the most stringent action and limit level at existing air quality monitoring stations (AM5(A)) was adopted. The established baseline value served as a worst case scenario for Station AA1 and AA2 and hence suitable to be adopted from a conservative point of view.

2.15 The Action and Limit Levels have been set in accordance with the EM&A Manual, which are summarized in **Table 2.6.**

Table 2.6 Guidelines for Establishing Action and Limit Levels for Air Quality

Parameters	Action Level	Limit Level
1-hour TSP Level in $\mu g/m^3$	For baseline level $\leq 384\mu g/m^3$, Action level = (Baseline level * 1.3 + Limit level)/2 For baseline level > $384\mu g/m^3$, Action level = Limit level	500
24-hour TSP Level in $\mu g/m^3$	For baseline level $\leq 200\mu g/m^3$, Action level = (Baseline level * 1.3 + Limit level)/2 For baseline level > $200\mu g/m^3$, Action level = Limit level	260

2.16 Following the above guidelines, the Action and Limit Levels for air quality impact monitoring have been calculated and presented in **Table 2.7 and 2.8**.

Table 2.7 Action and Limit Levels for 1-hour TSP

Location	Action Level, µg/m^3	Limit Level, µg/m^3
AA1	307	500
AA2	312	

Table 2.8 Action and Limit Levels for 24-hour TSP

Location	Action Level, µg/m^3	Limit Level, µg/m^3
AA1	156	260
AA2	156	

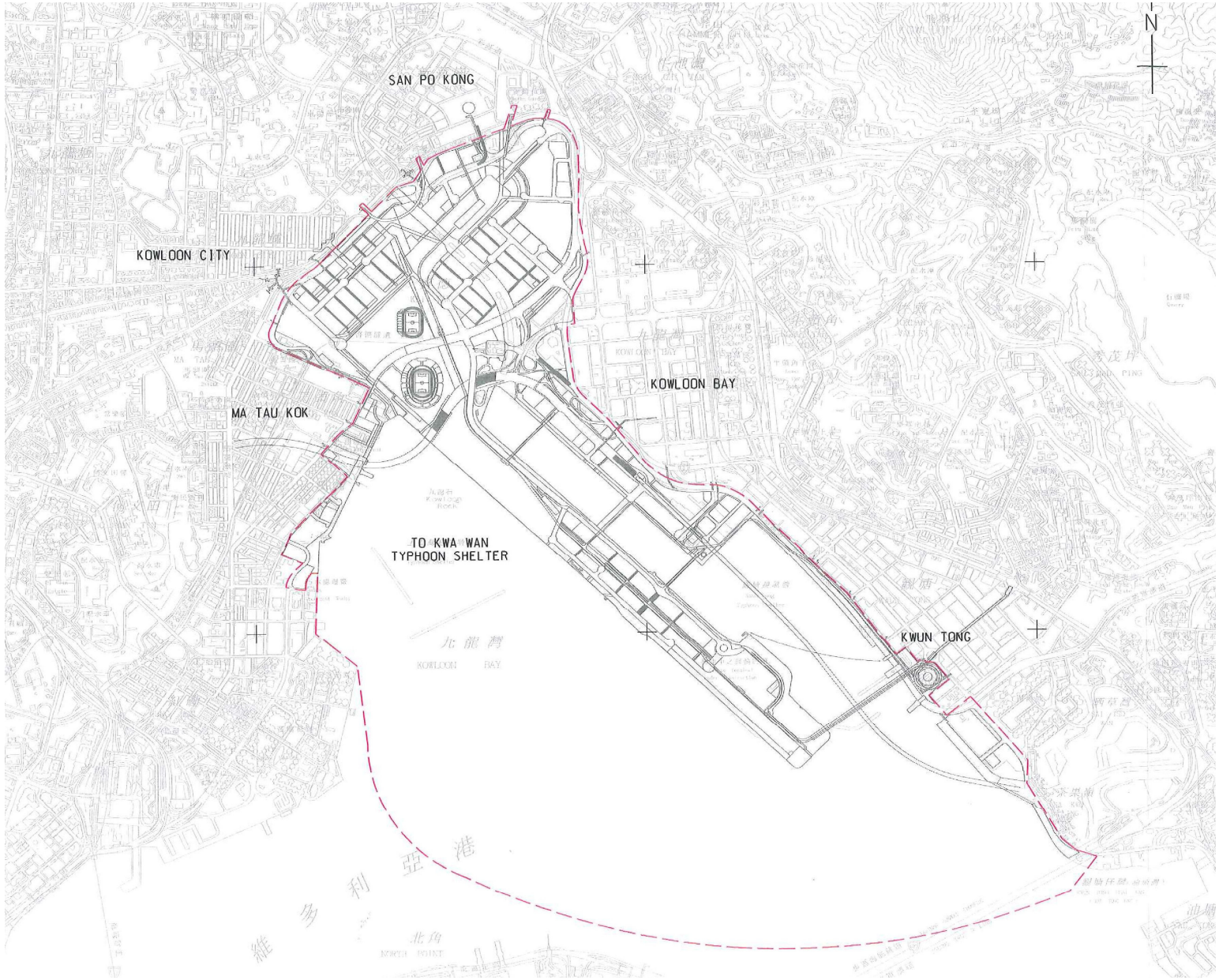
3 CONCLUSIONS

3.1 The baseline air quality monitoring for Station AA1 – Ching Long Shopping Centre and Station AA2 – Tak Long Estate was carried out in accordance with the Specification of the Project between 19th June 2014 and 2nd July 2014.

3.2 The baseline air quality monitoring results were reviewed and compared with the baseline air quality monitoring results at existing air quality monitoring stations AM1(A), AM2, AM3(A), AM4(A) and AM5(A) (baseline monitoring completed prior to the commencement of Kai Tak Development).

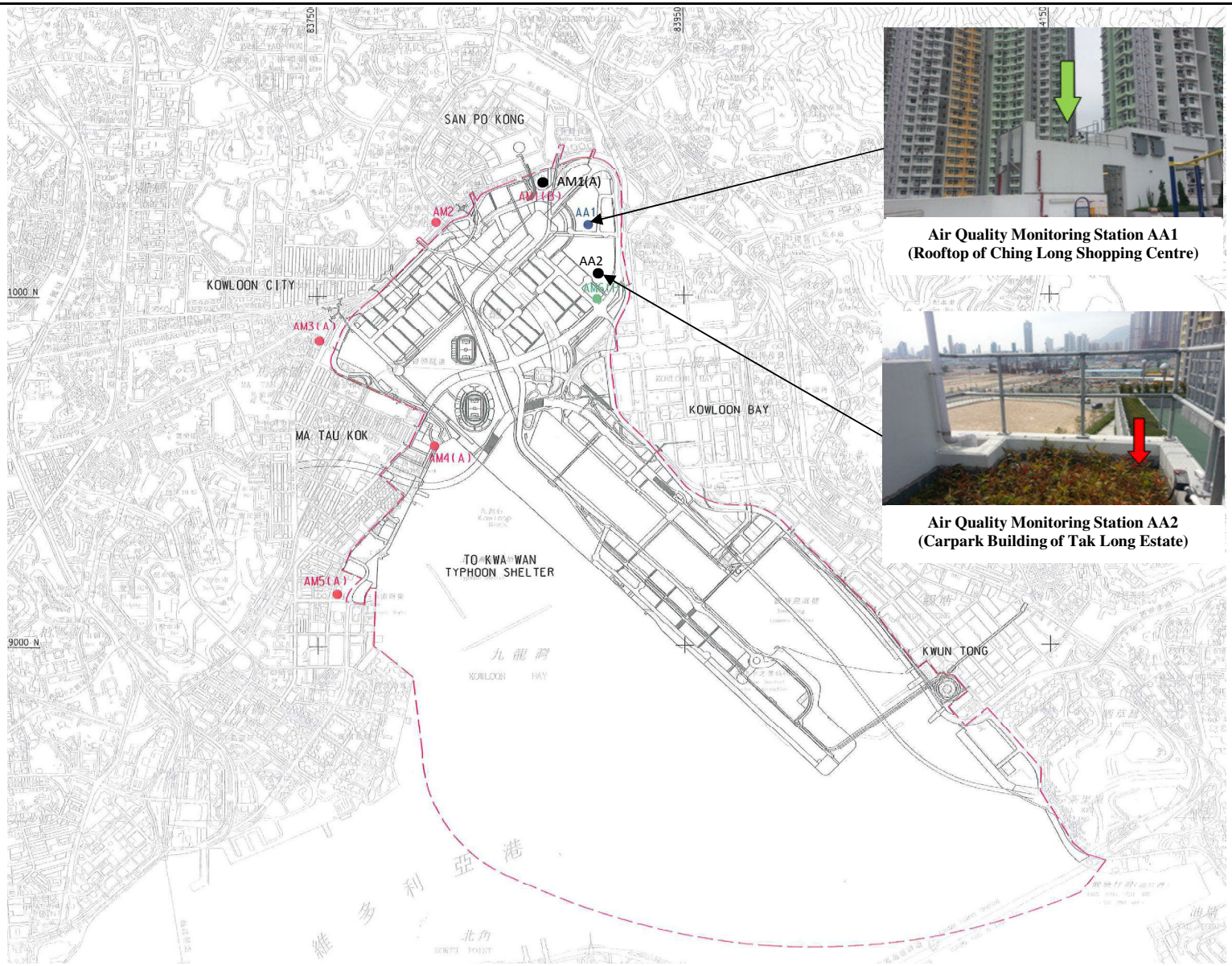
3.3 The Action and Limit Levels for the air quality were established in accordance with the EM&A Manual.

FIGURES



Title	Contract No. KLN/2013/16 Environmental Monitoring Works for Kai Tak Development Site Layout Plan	Scale: N.T.S Date: Apr-14	Project No.: MA14008 Figure: 1

CINOTECH



Air Quality Monitoring Station AA1
(Rooftop of Ching Long Shopping Centre)

Air Quality Monitoring Station AA2
(Carpark Building of Tak Long Estate)

Title: Contract No. KLN/2013/16 Environmental Monitoring Works for Kai Tak Development Location of Air Quality Monitoring Station	Scale: N.T.S	Project No.: MA14008	CINOTECH
	Date: Jul-14	Figure: 2	

APPENDIX A1
CALIBRATION CERTIFICATE FOR AIR QUALITY MONITORING EQUIPMENT

High-Volume TSP Sampler
5-POINT CALIBRATION DATA SHEET

CINOTECH

File No. MA14008/71/0001

Project No. AA1 - Ching Long Shopping Centre Operator: WK

Date: 17-Jun-14 Next Due Date: 16-Aug-14

Equipment No.: A-01-71 Serial No. 3220

Ambient Condition			
Temperature, Ta (K)	303.8	Pressure, Pa (mmHg)	755.1

Orifice Transfer Standard Information					
Equipment No.:	A-04-04	Slope, mc	0.0588	Intercept, bc	-0.0461
Last Calibration Date:	30-Sep-13	$mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	29-Sep-14	$Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

Calibration of TSP Sampler

Calibration Point	Orfice			HVS	
	ΔH (orifice), in. of water	$[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (CFM) **X - axis**	ΔW (HVS), in. of oil	$[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ **Y-axis**
1	11.8	3.39	58.46	7.6	2.72
2	9.7	3.07	53.07	6.5	2.52
3	7.5	2.70	46.76	4.9	2.19
4	5.0	2.21	38.33	3.3	1.79
5	3.2	1.77	30.82	2.0	1.40

By Linear Regression of Y on X

Slope , mw = 0.0483 **Intercept, bw :** -0.0744

Correlation coefficient* = 0.9991

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 43 CFM

From the Regression Equation, the "Y" value according to

$$mw \times Qstd + bw = [\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$$

Therefore, Set Point; $W = (mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ **4.11**

Remarks:

Conducted by: WK Tang Signature: Kwai Date: 17/6/14

Checked by: [illegible] Signature: [illegible] Date: 17 June 2014

High-Volume TSP Sampler
5-POINT CALIBRATION DATA SHEET

CINOTECH

File No. MA14008/51/0001

Station: AA2 - Tak Long Estate | Operator: WK

Date: 6-Jun-14 | Next Due Date: 5-Aug-14

Equipment No.: A-01-51 | Serial No. 1790

Ambient Condition			
Temperature, Ta (K)	300.8	Pressure, Pa (mmHg)	754.1

Orifice Transfer Standard Information					
Equipment No.:	A-04-04	Slope, mc	0.0588	Intercept, bc	-0.0461
Last Calibration Date:	30-Sep-13	$mc \times Qstd + bc = [\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$			
Next Calibration Date:	29-Sep-14	$Qstd = \{[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2} - bc\} / mc$			

Calibration of TSP Sampler

Calibration Point	Orfice			HVS	
	ΔH (orifice), in. of water	$[\Delta H \times (Pa/760) \times (298/Ta)]^{1/2}$	Qstd (CFM) **X - axis**	ΔW (HVS), in. of oil	$[\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$ **Y-axis**
1	11.8	3.41	58.71	6.7	2.57
2	9.4	3.04	52.48	5.6	2.35
3	7.1	2.64	45.71	4.2	2.03
4	4.6	2.13	36.95	2.8	1.66
5	3.2	1.77	30.95	1.9	1.37

By Linear Regression of Y on X

Slope , mw = 0.0435 **Intercept, bw :** 0.0400

Correlation coefficient* = 0.9991

*If Correlation Coefficient < 0.990, check and recalibrate.

Set Point Calculation

From the TSP Field Calibration Curve, take Qstd = 43 CFM

From the Regression Equation, the "Y" value according to

$$mw \times Qstd + bw = [\Delta W \times (Pa/760) \times (298/Ta)]^{1/2}$$

Therefore, Set Point; $W = (mw \times Qstd + bw)^2 \times (760 / Pa) \times (Ta / 298) =$ **3.71**

Remarks:

Conducted by: WK Tang Signature: Kwai Date: 6/6/14

Checked by: [illegible] Signature: [illegible] Date: 6 June 2014

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TEST REPORT

Description	Calibration Orifice	**Manufacturer**	TISCH
Serial No.	0993	**Temperature,Ta (K)**	300.8
Model No.	TE-5025A	**Pressure, Pa (mmHg)**	759.3
Date	30 September 2013	**Equipment No.:**	A-04-04

Plate	Diff.Vol (m^3)	Diff.Time (min)	Diff.Hg (mm)	Diff.H_2O (in.)
1	1.00	1.4103	3.4	2.00
2	1.00	0.9980	6.8	4.00
3	1.00	0.8970	8.5	5.00
4	1.00	0.8540	9.4	5.50
5	1.00	0.7060	13.6	8.00

DATA TABULATION

Vstd	(X axis) Qstd	(Y axis)
0.9853	0.6986	1.4069
0.9808	0.9828	1.9897
0.9786	1.0910	2.2245
0.9775	1.1446	2.3331
0.9720	1.3768	2.8138

Y axis= SQRT[H_2O(Pa/760)(298/Ta)]

Qstd Slope (m) = 2.07768
Intercept (b) = -0.04613
Coefficient (r) = 0.99997

Va	(X axis) Qa	(Y axis)
0.9955	0.7059	0.8901
0.9910	0.9930	1.2589
0.9888	1.1023	1.4074
0.9876	1.1565	1.4761
0.9821	1.3911	1.7803

Y axis= SQRT[H_2O(Ta/Pa)]

Qa Slope (m) = 1.30101
Intercept (b) = -0.02919
Coefficient (r) = 0.99997

CALCULATIONS

Vstd=Diff. Vol[(Pa-Diff.Hg)/760](298/Ta)
Qstd=Vstd/Time
Va=Diff.Vol[(Pa-Diff.Hg)/Pa]
Qa=Va/Time

For subsequent flow rate calculations:
Qstd=I/m{[SQRT(H_2O(Pa/760)(298/Ta))]-b}
Qa=I/m{[SQRT H_2O(Ta/Pa)]-b}

PREPARED AND CHECKED BY:
For and On Behalf of **WELLAB Ltd.**

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Laboratory Manager

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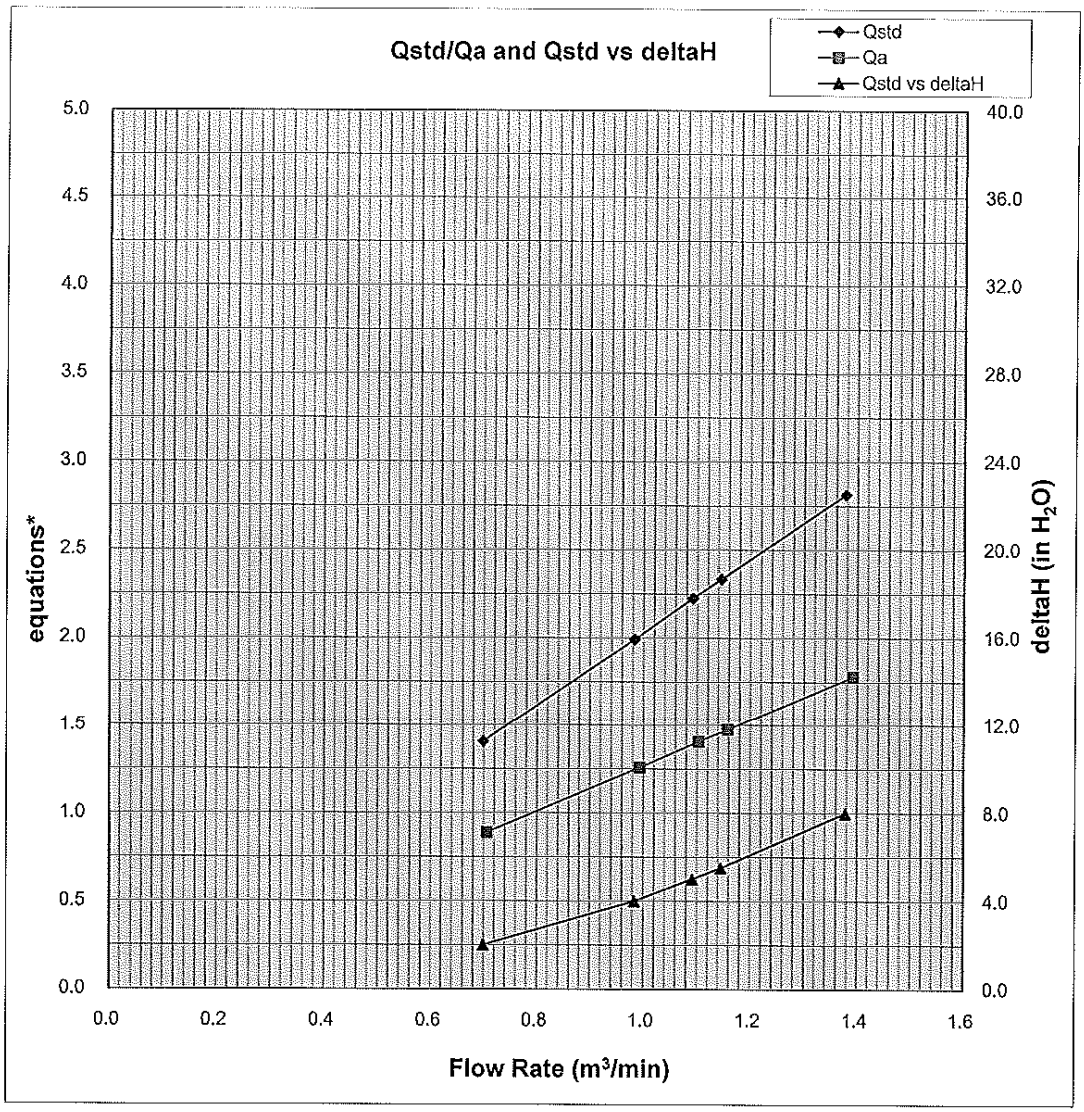
TEST REPORT



Y-axis equations:

Qstd series: SQRT[ΔH(Pa/Pstd)(Tstd/Ta)]

Qa series: SQRT[ΔH(Ta/Pa)]

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TEST REPORT

APPLICANT: **Cinotech Consultants Limited**
Room 1710, Technology Park,
18 On Lai Street,
Shatin, NT, Hong Kong

Test Report No.:	C/140417/1
Date of Issue:	2014-04-19
Date Received:	2014-04-17
Date Tested:	2014-04-17
Date Completed:	2014-04-19
Next Due Date:	2014-06-18

ATTN: **Mr. WK Tang**

Page: 1 of 1

Certificate of Calibration

Item for Calibration:

Description	: Laser Dust Monitor
Manufacturer	: Sibata
Model No.	: LD-3B
Serial No.	: 954253
Sensitivity (K) 1 CPM	: 0.001 mg/m^3
Sen. Adjustment Scale Setting	: 772 CPM
Equipment No.	: A-02-05

Test Conditions:

Room Temperature	: 19 degree Celsius
Relative Humidity	: 65%

Test Specifications & Methodology:

1. Instruction and Operation Manual High Volume Sampler, Andersen Samplers, Inc.
2. In-house method in according to the instruction manual: The Laser Dust Monitor was compared with a calibrated High Volume Sampler and the result was used to generate the Correlation Factor (CF) between the Laser Dust Monitor and High Volume Sampler.

Results:

Correlation Factor (CF)	0.0029

****

PREPARED AND CHECKED BY:
For and On Behalf of **WELLAB Ltd.**

PATRICK TSE
Laboratory Manager

WELLAB 匯力 Testing & Research

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TEST REPORT

APPLICANT: **Cinotech Consultants Limited**
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ATTN: **Mr. WK Tang**

Test Report No.:	C/140617/1
Date of Issue:	2014-06-19
Date Received:	2014-06-17
Date Tested:	2014-06-17
Date Completed:	2014-06-19
Next Due Date:	2014-08-18
Page:	1 of 1

Certificate of Calibration

Item for Calibration:

Description	: Laser Dust Monitor
Manufacturer	: Sibata
Model No.	: LD-3B
Serial No.	: 954253
Sensitivity (K) 1 CPM	: 0.001 mg/m^3
Sen. Adjustment Scale Setting	: 772 CPM
Equipment No.	: A-02-05

Test Conditions:

Room Temperature	: 22 degree Celsius
Relative Humidity	: 60%

Test Specifications & Methodology:

1. Instruction and Operation Manual High Volume Sampler, Andersen Samplers, Inc.
2. In-house method in according to the instruction manual: The Laser Dust Monitor was compared with a calibrated High Volume Sampler and the result was used to generate the Correlation Factor (CF) between the Laser Dust Monitor and High Volume Sampler.

Results:

Correlation Factor (CF)	0.0030

****

PREPARED AND CHECKED BY:
For and On Behalf of **WELLAB Ltd.**

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Laboratory Manager

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TEST REPORT

APPLICANT: **Cinotech Consultants Limited**
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ATTN: **Mr. W. K. Tang**

Test Report No.:	C/140502/3
Date of Issue:	2014-05-05
Date Received:	2014-05-02
Date Tested:	2014-05-02
Date Completed:	2014-05-05
Next Due Date:	2014-07-04
Page:	1 of 1

Certificate of Calibration

Item for Calibration:

Description	: Laser Dust Monitor
Manufacturer	: Sibata
Model No.	: LD-3B
Serial No.	: 014750
Sensitivity (K) 1 CPM	: 0.001 mg/m^3
Sen. Adjustment Scale Setting	: 790 CPM
Equipment No.	: A-02-06

Test Conditions:

Room Temperature	: 22 degree Celsius
Relative Humidity	: 67%

Test Specifications & Methodology:

1. Instruction and Operation Manual High Volume Sampler, Andersen Samplers, Inc.
2. In-house method in according to the instruction manual: The Laser Dust Monitor was compared with a calibrated High Volume Sampler and the result was used to generate the Correlation Factor (CF) between the Laser Dust Monitor and High Volume Sampler.

Results:

Correlation Factor (CF)	0.0028

****

PREPARED AND CHECKED BY:
For and On Behalf of **WELLAB Ltd.**

PATRICK TSE
Laboratory Manager

WELLAB LIMITED
Rms 816, 1516 & 1701, Technology Park,
18 On Lai Street, Shatin, N.T, Hong Kong.
Tel: 2898 7388 Fax: 2898 7076
Website: www.wellab.com.hk

TEST REPORT

APPLICANT: **Cinotech Consultants Limited**
Room 1710, Technology Park,
18 On Lai Street,
Shatin, NT, Hong Kong

ATTN: **Mr. W. K. Tang**

Test Report No.:	C/140430/1
Date of Issue:	2014-05-02
Date Received:	2014-04-30
Date Tested:	2014-04-30
Date Completed:	2014-05-02
Next Due Date:	2014-07-01
Page:	1 of 1

Certificate of Calibration

Item for Calibration:

Description	: Laser Dust Monitor
Manufacturer	: Sibata
Model No.	: LD-3B
Serial No.	: 095039
Sensitivity (K) 1 CPM	: 0.001 mg/m^3
Sen. Adjustment Scale Setting	: 764 CPM
Equipment No.	: A-02-08

Test Conditions:

Room Temperature	: 22 degree Celsius
Relative Humidity	: 65%

Test Specifications & Methodology:

1. Instruction and Operation Manual High Volume Sampler, Andersen Samplers, Inc.
2. In-house method in according to the instruction manual: The Laser Dust Monitor was compared with a calibrated High Volume Sampler and the result was used to generate the Correlation Factor (CF) between the Laser Dust Monitor and High Volume Sampler.

Results:

Correlation Factor (CF)	0.0030

****

PREPARED AND CHECKED BY:
For and On Behalf of **WELLAB Ltd.**

Patrick Tse

PATRICK TSE
Laboratory Manager

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TEST REPORT

APPLICANT: **Cinotech Consultants Limited**
Room 1710, Technology Park,
18 On Lai Street,
Shatin, NT, Hong Kong

ATTN: **Mr. W. K. Tang**

Test Report No.:	C/140430/2
Date of Issue:	2014-05-02
Date Received:	2014-04-30
Date Tested:	2014-04-30
Date Completed:	2014-05-02
Next Due Date:	2014-07-01
Page:	1 of 1

Certificate of Calibration

Item for Calibration:

Description	: Laser Dust Monitor
Manufacturer	: Sibata
Model No.	: LD-3B
Serial No.	: 095050
Sensitivity (K) 1 CPM	: 0.001 mg/m^3
Sen. Adjustment Scale Setting	: 577 CPM
Equipment No.	: A-02-09

Test Conditions:

Room Temperature	: 22 degree Celsius
Relative Humidity	: 65%

Test Specifications & Methodology:

1. Instruction and Operation Manual High Volume Sampler, Andersen Samplers, Inc.
2. In-house method in according to the instruction manual: The Laser Dust Monitor was compared with a calibrated High Volume Sampler and the result was used to generate the Correlation Factor (CF) between the Laser Dust Monitor and High Volume Sampler.

Results:

Correlation Factor (CF)	0.0029

****

PREPARED AND CHECKED BY:
For and On Behalf of **WELLAB Ltd.**

Patrick Tse

PATRICK TSE
Laboratory Manager

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Rms 816, 1516 & 1701, Technology Park,
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Tel: 2898 7388 Fax: 2898 7076
Website: www.wellab.com.hk

TEST REPORT

APPLICANT: **Cinotech Consultants Limited**
Room 1710, Technology Park,
18 On Lai Street,
Shatin, NT, Hong Kong

ATTN: **Mr. W. K. Tang**

Test Report No.:	C/140430/3
Date of Issue:	2014-05-02
Date Received:	2014-04-30
Date Tested:	2014-04-30
Date Completed:	2014-05-02
Next Due Date:	2014-07-01
Page:	1 of 1

Certificate of Calibration

Item for Calibration:

Description	: Laser Dust Monitor
Manufacturer	: Sibata
Model No.	: LD-3B
Serial No.	: 095029
Sensitivity (K) 1 CPM	: 0.001 mg/m^3
Sen. Adjustment Scale Setting	: 551 CPM
Equipment No.	: A-02-10

Test Conditions:

Room Temperature	: 22 degree Celsius
Relative Humidity	: 65%

Test Specifications & Methodology:

1. Instruction and Operation Manual High Volume Sampler, Andersen Samplers, Inc.
2. In-house method in according to the instruction manual: The Laser Dust Monitor was compared with a calibrated High Volume Sampler and the result was used to generate the Correlation Factor (CF) between the Laser Dust Monitor and High Volume Sampler.

Results:

Correlation Factor (CF)	0.0029

****

PREPARED AND CHECKED BY:
For and On Behalf of **WELLAB Ltd.**

PATRICK TSE
Laboratory Manager

APPENDIX A2
1-HOUR TSP BASELINE MONITORING RESULTS

Appendix A2 - 1-hour TSP Monitoring Results

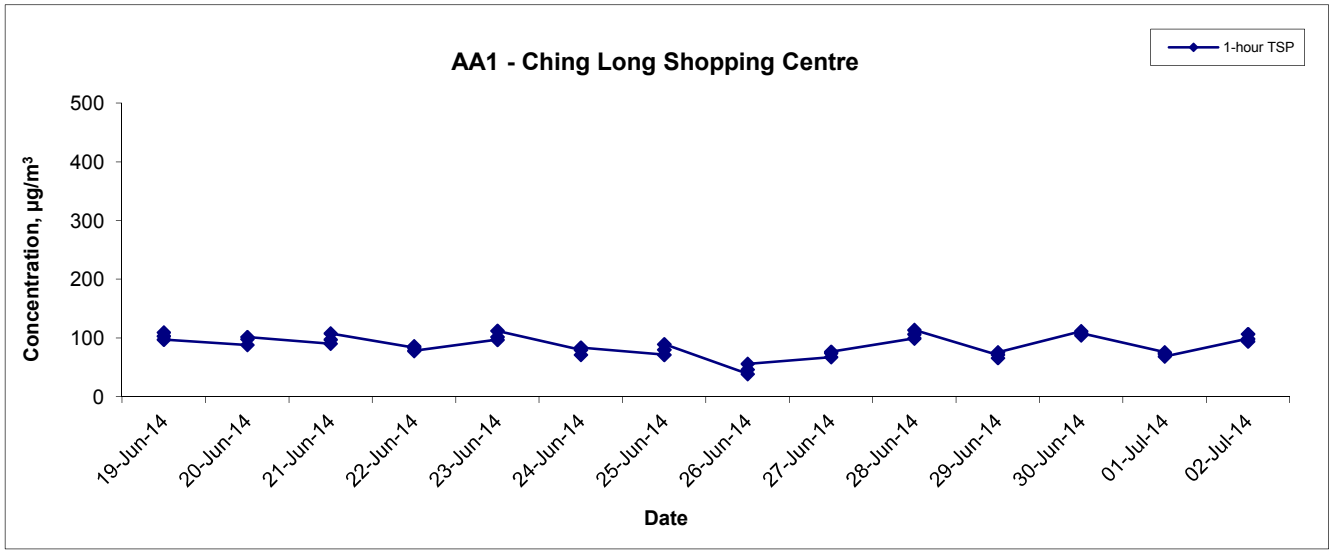
Location AA1 -Ching Long Shopping Centre			
Date	Time	Weather	Particulate Concentration ($\mu g/m^3$)
19-Jun-14	13:30	Cloudy	103.1
	14:30	Cloudy	109.3
	15:30	Cloudy	97.2
20-Jun-14	9:00	Cloudy	88.1
	10:00	Cloudy	97.9
	11:00	Cloudy	101.6
21-Jun-14	9:00	Cloudy	90.3
	10:00	Cloudy	97.1
	11:00	Cloudy	107.7
22-Jun-14	9:00	Cloudy	83.5
	10:00	Cloudy	86.1
	11:00	Cloudy	78.1
23-Jun-14	9:00	Cloudy	97.0
	10:00	Cloudy	101.8
	11:00	Cloudy	112.0
24-Jun-14	9:00	Cloudy	79.5
	10:00	Cloudy	71.2
	11:00	Cloudy	83.5
25-Jun-14	9:00	Cloudy	71.4
	10:00	Cloudy	80.0
	11:00	Cloudy	89.3
26-Jun-14	9:00	Cloudy	38.7
	10:00	Cloudy	46.1
	11:00	Cloudy	55.9
27-Jun-14	9:00	Cloudy	67.3
	10:00	Cloudy	74.3
	11:00	Cloudy	76.4
28-Jun-14	9:00	Sunny	99.3
	10:00	Sunny	106.4
	11:00	Sunny	113.5
29-Jun-14	9:00	Sunny	71.2
	10:00	Sunny	66.0
	11:00	Sunny	75.4
30-Jun-14	9:00	Sunny	111.6
	10:00	Sunny	104.4
	11:00	Sunny	108.1
1-Jul-14	9:00	Cloudy	75.8
	10:00	Cloudy	73.2
	11:00	Cloudy	68.4
2-Jul-14	9:00	Cloudy	98.6
	10:00	Cloudy	106.8
	11:00	Cloudy	94.3
		Min	38.7
		Max	113.5
		Average	87.1

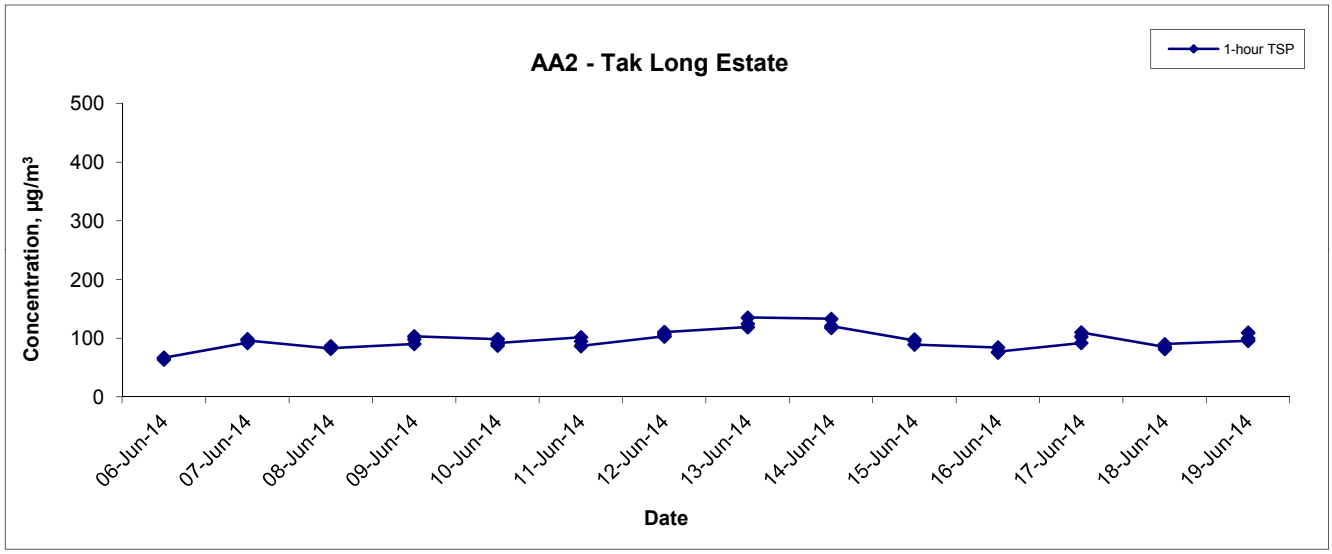
Appendix A2 - 1-hour TSP Monitoring Results

Location AA2 -Tak Long Estate			
Date	Time	Weather	Particulate Concentration (μg/m^3)
6-Jun-14	13:40	Cloudy	63.8
	14:40	Cloudy	66.5
	15:40	Cloudy	66.8
7-Jun-14	9:30	Cloudy	92.0
	10:30	Cloudy	98.4
	11:30	Cloudy	96.3
8-Jun-14	13:00	Sunny	82.4
	14:00	Sunny	86.5
	15:00	Sunny	83.0
9-Jun-14	9:00	Sunny	87.1
	10:00	Sunny	94.6
	11:00	Sunny	99.7
10-Jun-14	9:00	Sunny	84.7
	10:00	Sunny	87.9
	11:00	Sunny	91.6
11-Jun-14	9:00	Cloudy	98.2
	10:00	Cloudy	91.4
	11:00	Cloudy	83.9
12-Jun-14	13:15	Cloudy	103.2
	14:15	Cloudy	106.6
	15:15	Cloudy	110.5
13-Jun-14	9:00	Sunny	119.0
	10:00	Sunny	124.9
	11:00	Sunny	135.1
14-Jun-14	9:00	Sunny	132.9
	10:00	Sunny	117.7
	11:00	Sunny	120.8
15-Jun-14	9:00	Cloudy	96.0
	10:00	Cloudy	97.8
	11:00	Cloudy	89.1
16-Jun-14	9:00	Cloudy	84.2
	10:00	Cloudy	75.5
	11:00	Cloudy	76.8
17-Jun-14	9:00	Cloudy	91.9
	10:00	Cloudy	102.6
	11:00	Cloudy	109.8
18-Jun-14	9:00	Sunny	82.0
	10:00	Sunny	79.1
	11:00	Sunny	87.0
19-Jun-14	9:00	Cloudy	95.6
	10:00	Cloudy	99.6
	11:00	Cloudy	109.3
		Min	63.8
		Max	135.1
		Average	95.3

APPENDIX A3
GRAPHICAL PRESENTATION OF BASELINE 1-HOUR TSP LEVELS

1-hour TSP Concentration Levels





Title: Contract No. KLN/2013/16 Environmental Monitoring Works for Kai Tak Development Graphical Presentation of 1-hour TSP Baseline Monitoring Results	Scale: N.T.S Date: Jul 14	Project No.: MA14008 Appendix: A3	CINOTECH

APPENDIX A4
24-HOUR TSP BASELINE MONITORING RESULTS

Appendix A4 - 24-hour TSP Baseline Monitoring Results

Location AA1 -Ching Long Shopping Centre

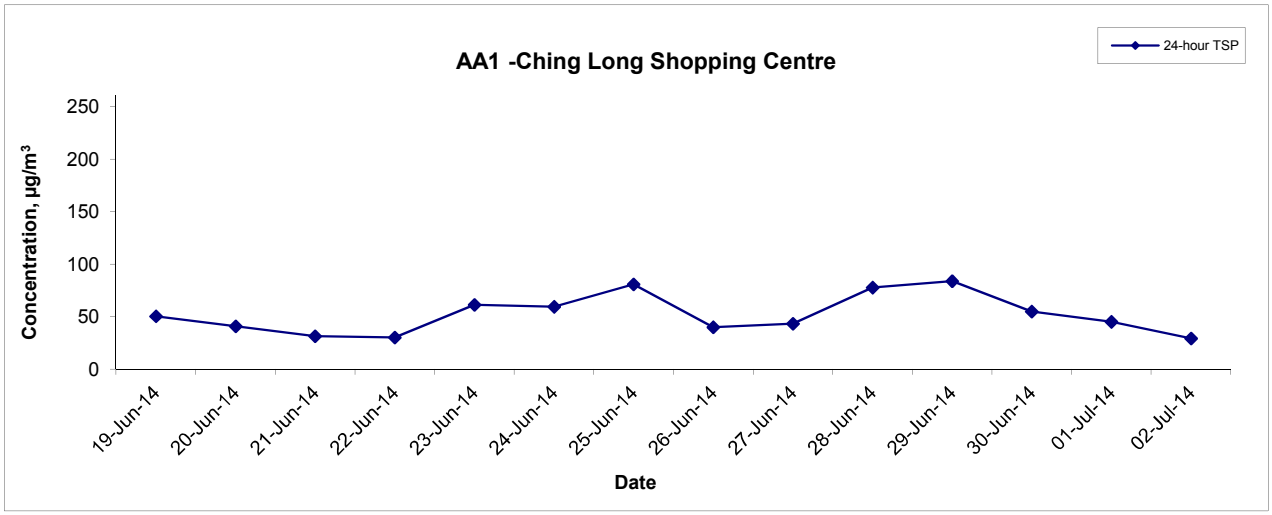
Start Date	Weather Condition	Air Temp. (K)	Atmospheric Pressure, Pa (mmHg)	Filter Weight (g)		Particulate weight (g)	Elapse Time		Sampling Time(hrs.)	Flow Rate (m^3/min.)		Av. flow (m^3/min)	Total vol. (m^3)	Conc. ($\mu g/m^3$)
				Initial	Final		Initial	Final		Initial	Final			
19-Jun-14	Sunny	301.5	755.3	3.1802	3.2688	0.0886	1288.9	1312.9	24.0	1.22	1.22	1.22	1756.2	50.5
20-Jun-14	Sunny	300.1	755.4	3.1569	3.2290	0.0721	1312.9	1336.9	24.0	1.22	1.23	1.22	1760.0	41.0
21-Jun-14	Fine	298.6	755.1	3.1710	3.2266	0.0556	1336.9	1360.9	24.0	1.23	1.22	1.22	1763.9	31.5
22-Jun-14	Fine	299.1	755.1	3.1628	3.2162	0.0534	1360.9	1384.9	24.0	1.22	1.22	1.22	1762.6	30.3
23-Jun-14	Sunny	300.2	756.0	3.2690	3.3768	0.1078	1384.9	1408.9	24.0	1.22	1.22	1.22	1760.5	61.2
24-Jun-14	Fine	300.4	756.5	3.2050	3.3098	0.1048	1408.9	1432.9	24.0	1.22	1.22	1.22	1760.5	59.5
25-Jun-14	Sunny	301.8	757.2	3.1902	3.3321	0.1419	1432.9	1456.9	24.0	1.22	1.22	1.22	1757.4	80.7
26-Jun-14	Sunny	303.5	757.2	3.1698	3.2399	0.0701	1456.9	1480.9	24.0	1.22	1.22	1.22	1752.5	40.0
27-Jun-14	Sunny	304.4	756.6	3.1989	3.2747	0.0758	1480.9	1504.9	24.0	1.22	1.21	1.21	1749.5	43.3
28-Jun-14	Sunny	304.1	756.0	3.2240	3.3599	0.1359	1504.9	1528.9	24.0	1.21	1.22	1.22	1749.7	77.7
29-Jun-14	Fine	302.6	757.1	3.2102	3.3574	0.1472	1528.9	1552.9	24.0	1.22	1.22	1.22	1754.9	83.9
30-Jun-14	Sunny	301.1	758.9	3.1893	3.2862	0.0969	1552.9	1576.9	24.0	1.22	1.23	1.22	1761.2	55.0
1-Jul-14	Sunny	302.1	758.5	3.1571	3.2363	0.0792	1576.9	1600.9	24.0	1.23	1.22	1.22	1757.9	45.1
2-Jul-14	Sunny	304.1	756.4	3.1502	3.2015	0.0513	1600.9	1624.9	24.0	1.22	1.21	1.22	1750.0	29.3
													Min	29.3
													Max	83.9
													Average	52.1

Location AA2 - Tak Long Estate

Start Date	Weather Condition	Air Temp. (K)	Atmospheric Pressure, Pa (mmHg)	Filter Weight (g)		Particulate weight (g)	Elapse Time		Sampling Time(hrs.)	Flow Rate (m^3/min.)		Av. flow (m^3/min)	Total vol. (m^3)	Conc. ($\mu g/m^3$)
				Initial	Final		Initial	Final		Initial	Final			
6-Jun-14	Cloudy	299.5	755.0	3.2861	3.3711	0.0850	5916.2	5940.2	24.0	1.21	1.22	1.22	1754.1	48.5
7-Jun-14	Cloudy	300.2	754.3	3.2043	3.3509	0.1466	5940.2	5964.2	24.0	1.22	1.21	1.22	1751.3	83.7
8-Jun-14	Sunny	301.1	753.9	3.2579	3.3634	0.1055	5964.2	5988.2	24.0	1.21	1.22	1.21	1748.0	60.4
9-Jun-14	Sunny	300.1	754.3	3.2875	3.3900	0.1025	5988.2	6012.2	24.0	1.22	1.22	1.22	1751.6	58.5
10-Jun-14	Sunny	300.5	754.4	3.2664	3.3512	0.0848	6012.2	6036.2	24.0	1.22	1.21	1.22	1750.4	48.4
11-Jun-14	Cloudy	301.0	754.6	3.2022	3.3102	0.1080	6036.2	6060.2	24.0	1.21	1.21	1.21	1749.3	61.7
12-Jun-14	Cloudy	302.0	754.6	3.1855	3.2435	0.0580	6060.2	6084.2	24.0	1.21	1.21	1.21	1746.2	33.2
13-Jun-14	Sunny	303.4	754.8	3.1977	3.3384	0.1407	6084.2	6108.2	24.0	1.21	1.21	1.21	1742.5	80.7
14-Jun-14	Sunny	301.1	754.8	3.1845	3.2914	0.1069	6108.2	6132.2	24.0	1.21	1.22	1.21	1749.3	61.1
15-Jun-14	Cloudy	300.9	754.2	3.1519	3.2300	0.0781	6132.2	6156.2	24.0	1.22	1.21	1.21	1749.0	44.7
16-Jun-14	Cloudy	303.0	755.1	3.1408	3.2615	0.1207	6156.2	6180.2	24.0	1.21	1.21	1.21	1743.8	69.2
17-Jun-14	Cloudy	301.4	756.2	3.1672	3.2343	0.0671	6180.2	6204.2	24.0	1.21	1.22	1.22	1750.0	38.3
18-Jun-14	Sunny	300.8	755.6	3.1541	3.2184	0.0643	6204.2	6228.2	24.0	1.22	1.21	1.22	1750.9	36.7
19-Jun-14	Sunny	300.8	754.7	3.1682	3.2373	0.0691	6228.2	6252.2	24.0	1.21	1.22	1.22	1750.0	39.5
													Min	33.2
													Max	83.7
													Average	54.6

APPENDIX A5
GRAPHICAL PRESENTATION OF BASELINE 24-HOUR TSP LEVELS

24-hour TSP Concentration Levels



Title: Contract No. KLN/2013/16 Environmental Monitoring Works at Kai Tak Development Graphical Presentation of 24-hour TSP Baseline Monitoring Results	Scale: N.T.S	Project No.: MA14008	CINOTECH
	Date: Jul 14	Appendix: A5	

APPENDIX B
BASELINE AIR QUALITY MONITORING SCHEDULE

Contract No. KLN/2013/16

Environmental Monitoring Works at Kai Tak Development

Baseline Air Quality Monitoring Schedule for Station AA1 and AA2

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1-Jun	2-Jun	3-Jun	4-Jun	5-Jun	6-Jun	7-Jun
					AA2 1 hr TSP X 3 24 hr TSP	AA2 1 hr TSP X 3 24 hr TSP
8-Jun	9-Jun	10-Jun	11-Jun	12-Jun	13-Jun	14-Jun
AA2 1 hr TSP X 3 24 hr TSP	AA2 1 hr TSP X 3 24 hr TSP	AA2 1 hr TSP X 3 24 hr TSP	AA2 1 hr TSP X 3 24 hr TSP	AA2 1 hr TSP X 3 24 hr TSP	AA2 1 hr TSP X 3 24 hr TSP	AA2 1 hr TSP X 3 24 hr TSP
15-Jun	16-Jun	17-Jun	18-Jun	19-Jun	20-Jun	21-Jun
AA2 1 hr TSP X 3 24 hr TSP	AA2 1 hr TSP X 3 24 hr TSP	AA2 1 hr TSP X 3 24 hr TSP	AA2 1 hr TSP X 3 24 hr TSP	AA1 & AA2 1 hr TSP X 3 24 hr TSP	AA1 1 hr TSP X 3 24 hr TSP	AA1 1 hr TSP X 3 24 hr TSP
22-Jun	23-Jun	24-Jun	25-Jun	26-Jun	27-Jun	28-Jun
AA1 1 hr TSP X 3 24 hr TSP	AA1 1 hr TSP X 3 24 hr TSP	AA1 1 hr TSP X 3 24 hr TSP	AA1 1 hr TSP X 3 24 hr TSP	AA1 1 hr TSP X 3 24 hr TSP	AA1 1 hr TSP X 3 24 hr TSP	AA1 1 hr TSP X 3 24 hr TSP
29-Jun	30-Jun	1-Jul	2-Jul			
AA2 1 hr TSP X 3 24 hr TSP	AA1 1 hr TSP X 3 24 hr TSP	AA1 1 hr TSP X 3 24 hr TSP	AA1 1 hr TSP X 3 24 hr TSP			

The schedule may be changed due to unforeseen circumstances (adverse weather, etc)

Air Quality Monitoring Station

AA1 - Ching Long Shopping Centre
AA2 - Tak Long Estate

APPENDIX C
WEATHER CONDITIONS DURING BASELINE MONITORING PERIOD

APPENDIX C – WEATHER CONDITIONS DURING THE BASELINE AIR QUALITY MONITORING PERIOD

I. General Information

Date	Mean Air Temperature (°C)	Mean Relative Humidity (%)	Precipitation (mm)
6 June 2014	26.3 – 30.9	70 – 93	17.2
7 June 2014	24.5 – 29.1	73 – 95	7.6
8 June 2014	25.4 – 31.4	70 – 97	57.6
9 June 2014	25.4 – 30.1	72 – 93	Trace
10 June 2014	26.2 – 30.3	69 – 87	Trace
11 June 2014	26.6 – 28.8	71 – 82	Trace
12 June 2014	26.2 – 32.0	51 – 82	0
13 June 2014	25.5 – 32.5	39 – 73	0
14 June 2014	27.4 – 33.6	47 – 73	Trace
15 June 2014	25.2 – 31.1	64 – 94	9.9
16 June 2014	26.1 – 31.9	71 – 95	3.8
17 June 2014	28.0 – 32.1	73 – 85	1.1
18 June 2014	27.3 – 33.0	69 – 92	6.0
19 June 2014	27.1 – 32.3	73 – 95	10.5
20 June 2014	25.6 – 30.2	78 – 96	29.2
21 June 2014	25.0 – 30.1	82 – 97	47.6
22 June 2014	24.8 – 28.0	88 – 98	114.9
23 June 2014	26.0 – 29.0	82 – 96	41.5
24 June 2014	25.6 – 30.8	76 – 98	45.9
25 June 2014	25.8 – 30.1	82 – 97	18.5
26 June 2014	27.3 – 33.2	65 – 89	0.1
27 June 2014i	27.7 – 33.3	64 – 88	0
28 June 2014	27.7 – 33.0	66 – 86	0
29 June 2014	26.0 – 32.2	71 – 98	20.4
30 June 2014	26.7 – 32.2	74 – 96	0.9
1 July 2014	25.7 – 31.6	78 – 98	13.9
2 July 2014	27.3 – 32.3	71 – 90	Trace

* The above information was extracted from the daily weather summary by Hong Kong Observatory.