



**Proposed Road Improvement Works in
West Kowloon Reclamation Development – Phase 1**

Environmental Baseline Monitoring Report
(1-hr TSP, 24-hr TSP & Noise)

Prepared by:

Andy Tsang

A handwritten signature in black ink, appearing to read 'Andy Tsang', written over a horizontal line.

Certificated by:

Goldie Fung

A handwritten signature in black ink, appearing to read 'Goldie Fung', written over a horizontal line.

(Environmental Team Leader)

Environmental Pioneers & Solutions Limited

Flat A, 8/F, Chaiwan Industrial Centre,
20 Lee Chung Street, Chai Wan, Hong Kong

Tel: 2556 9172

Fax: 2856 2010

TABLE OF CONTENTS

EXECUTIVE SUMMARY	3
1. INTRODUCTION	4
1.1 Project Background Information.....	4
1.2 Purpose.....	4
2. AIR QUALITY MONITORING	5
2.1 Monitoring Methodology and Parameters	5
2.2 Monitoring Location and Relocation	7
2.3 Monitoring Equipment	9
2.4 Quality Assurance / Quality Control Results and Detection Limits	9
2.5 Monitoring Results and Observations.....	9
2.6 Action and Limit Levels	10
3. NOISE MONITORING	12
3.1 Monitoring Methodology and Parameters	12
3.2 Monitoring Locations.....	13
3.3 Monitoring Equipment	13
3.4 Quality Assurance / Quality Control Results and Detection Limits	14
3.5 Monitoring Results and Observations.....	14
3.6 Action and Limit Levels	15
4. REVISIONS FOR INCLUSION IN THE EM&A MANUAL	16
5. CONCLUSION	17
Appendix A Monitoring Locations	
Appendix B Calibration Certificate	
Appendix C Monitoring Results and Graphical Plots	

EXECUTIVE SUMMARY

This baseline monitoring report presents the baseline air quality and noise monitoring results performed before the construction works commenced.

The baseline monitoring for 14 consecutive days were conducted as stipulated in their respective sections in the Environmental Monitoring and Audit Manual. Data obtained from the monitoring was processed to establish action and limit levels.

3 times 1-hr Total Suspended Particulates (TSP) measurements at AM1, AM2, AM3 and AM4 were conducted from 31 October 2015 to 13 November 2015.

24-hr TSP measurements at AM1 were conducted from 8 January 2016 to 21 January 2016. 24-hr TSP measurements at AM2 were conducted from 19 March 2016 to 1 April 2016. 24-hr TSP measurements at AM3-A were conducted from 19 December 2015 to 1 January 2016. 24-hr TSP measurements at AM4-A were conducted from 6 August 2016 to 19 August 2016.

30-min L_{Aeq} Noise measurements at NM1, NM2, NM3, NM4 and NM5 were conducted from 31 October 2015 to 13 November 2015.

Details of the monitoring locations, alternative locations, results and action limit levels are presented in this baseline monitoring report.

1. INTRODUCTION

1.1 Project Background Information

This is a road improvement project in West Kowloon Reclamation Development (WKRd) for completing the developments and the commissioning of the new transport facilities.

Apart from the additional traffic impacts arising from the major development and transport facilities in WKRd, several major junctions in the area are currently operating with insufficient capacity causing serious congestion to some existing major road corridors such as Jordan Road (JRD), Ferry Street (FST) and Canton Road (CRD).

To enhance the road network of the area, Transport Department commissioned the “West Kowloon Reclamation Development Traffic Study” which identified and recommended Core and Additional Schemes together with the improvement works at the junction of CRD/FST/JRD. Implementation of these schemes would enable most of the key road junctions in the study area to operate with spare capacity, and the traffic queue length would also be reduced avoiding blockage to the upstream junctions.

In accordance with the requirements stated in the Environmental Permit (no.: EP-455/2013) based on the Environmental Monitoring and Audit (EM&A) Manual and reference to Annex 21 Technical Memorandum under the Environmental Impact Assessment Ordinance (EIAO-TM), baseline monitoring of air quality and noise are required to be carried out prior to the commencement of construction of the project.

1.2 Purpose

By establishing the baseline level of air quality and noise, the performance of the construction contractor shall be measured in meeting required environmental protection standards and requirements of the EM&A Manual. This report presents the methodology, monitoring location, equipment, period, results and observations for the environmental measurements during the baseline monitoring period.

2. AIR QUALITY MONITORING

According to the EM&A Manual, monitoring of the Total Suspended Particulate (TSP) levels should be carried out for 3 sets of 1-hr TSP and 1 set of 24-hr TSP at four monitoring locations.

Due to the rejection from the representative/property management of the premises for installation of High Volume Samples (HVSs), two of the monitoring locations of 24-hr TSP monitoring was amended to alternative locations. Details of the monitoring locations and alternative locations are presented in Section 2.2.

2.1 Monitoring Methodology and Parameters

1-hr TSP Monitoring

Measurements of 1-hr TSP monitoring were taken by a Dust Trak aerosol monitor or its equivalent that is a portable and battery-operated laser photometer capable of performing real time 1-hr TSP measurements.

Field monitoring procedures are as follows:

- The monitoring station was set at a point 1m from the exterior of the sensitive receivers building façade and set at a position 1.2m above the ground.
- The battery condition was checked to ensure good functioning of the dust monitor.
- Zero Cal was conducted to the dust monitor to each test for ensuring more accurate data.
- Logging setup and Instrument setup such as log interval, test length, number of test and impactor adaptor will set as follows:
 - log interval : 1min
 - test length : 60mins
 - number of test : 3
 - Impactor adaptor: 10 μ (PM₁₀)
- Start the monitoring lasting 3 hours for each monitoring location
- At the end of the monitoring period, the Average, Maximum and Minimum of each TSP test shall be recorded.

24-hr TSP Monitoring

Measurements of 24-hr TSP monitoring were taken by High Volume Samplers (HVSs).

HVS fitted with appropriate sampling inlets were employed for air quality monitoring. Each sampler was composed of a motor, a filter holder, a flow controller and a sampling inlet and its performance specification complies with that required by USEPA Standard Title 40, Code of Federation Regulations Chapter 1 (Part 50).

Installation of HVS:

- A horizontal platform with appropriate support to secure the samplers against gusty wind should be provided;
- No two samplers should be placed less than 2 meters apart;
- The distance between the sampler and an obstacle, such as buildings, must be at least twice the height that the obstacle protrudes above the sampler;
- A minimum of 2 meters of separation from walls, parapets and penthouses is required for rooftop samplers;
- A minimum of 2 meters separation from any supporting structure, measured horizontally is required;
- No furnace or incinerator flue is nearby;
- Airflow around the sampler is unrestricted;
- The sampler is more than 20 meters from the dripline;
- Any wire fence and gate, to protect the sampler, should not cause any obstruction during monitoring;
- Permission must be obtained to set up the samplers and to obtain access to the monitoring stations; and
- A secured supply of electricity is needed to operate the samplers.

Data of wind speed and wind direction was extracted from King's Park Meteorological Station of Hong Kong Observatory. The collection of wind data meets the prescribed criteria in S.3.4.3 of the EM&A Manual.

Other relevant data such as monitoring location, time, weather conditions and any other special phenomena at the construction site were recorded during the measurement period. The monitoring parameters and frequency are summarized in **Table 2.1.1**.

Table 2.1.1 Baseline Monitoring Parameters and Frequency

Parameter	Frequency	Monitoring Period
1-hr TSP	1 hour x 3 per day	14 consecutive days
24-hr TSP	24 hours x 1 per day	14 consecutive days

2.2 Monitoring Location and Relocation

1-hr TSP Monitoring

Measurements of 1-hr TSP were conducted at four locations which are in line with the EM&A Manual. Details are shown in **Table 2.2.1** and **Appendix A**.

Table 2.2.1 1-hr TSP Baseline Monitoring Locations

Identification No.	Monitoring Locations	Description	Monitoring Period
AM1	Marine Department New Yau Ma Tei Public Cargo Working Area Administrative Building	Ground Floor Face to Hoi Po Road	31 Oct 15 to 13 Nov 25
AM2	Garden Building	Ground Floor Face to Canton Road	31 Oct 15 to 13 Nov 25
AM3	The Cullinan I	Ground Floor Face to Nga Cheung Road	31 Oct 15 to 13 Nov 25
AM4	Lai Chack Middle School	Ground Floor Face to Canton Road	31 Oct 15 to 13 Nov 25

24-hr TSP Monitoring

Measurements of 24-hr TSP were conducted AM1 and AM2 which are in line with the EM&A Manual.

The designated 24-hr TSP monitoring location AM3 listed on the EM&A Manual is The Cullinan I. Due to the rejection from the representatives/ property management of The Cullinan I for the premises, the HVS was not installed at AM3. Alternative monitoring location AM3-A, International Commerce Centre was proposed. Baseline monitoring has been conducted at AM3-A before the construction works started.

The designated 24-hr TSP monitoring location AM4 listed on the EM&A Manual is Lai Chack Middle School. Installation of HVS at AM4, Lai Chack Middle School was rejected by the representatives of premises due to the concern of public access. 24hr-TSP monitoring was proposed to be carried out at an alternative location AM4-A, Kowloon Park as stated in the submitted Proposal. As installation of the HVS at AM4-A was rejected by the representative of the premises of Kowloon Park, ET and the Contractor kept searching for another alternative monitoring location. After negotiating with the Main Contractor of Xiqu Centre, Hip Hing Engineering Co. Ltd., the problem of power supply has been solved and the 24-hr TSP baseline monitoring was finally carried out at the alternative location AM4-A, Tsim Sha Tsui Fire Station.

The considerations listed on the EM&A Manual Section 3.5.1, have been taken into account for setting up the monitoring locations and alternative locations, which was approved by the ER and IEC. Details of 24-hr TSP monitoring locations and alternative locations are shown in **Table 2.2.2** and **Appendix A**.

Table 2.2.2 24-hr TSP Baseline Monitoring Locations

Designated on EM&A Manual		Alternative		Description	Monitoring Period
ID.	Monitoring Location	ID.	Monitoring Location		
AM1	Marine Department New Yau Ma Tei Public Cargo Working Area Administrative Building	N/A	N/A	Ground Floor Face to Hoi Po Road	8 Jan 16 to 21 Jan 16
AM2	Garden Building	N/A	N/A	Ground Floor Face to Canton Road	9 Mar 16 to 1 Apr 16
AM3	The Cullinan I	AM3-A*	International Commerce Centre	Ground Floor Face to Nga Cheung Road	19 Dec 16 to 1 Jan 16
AM4	Lai Chack Middle School	AM4-A	Tsim Sha Tsui Fire Station	Ground Floor Face to Canton Road	6 Aug 16 to 19 Aug 16

*Remark:

Impact monitoring was carried out at AM3-A from February 2016 to September 2016 and was amended to AM3-B from October 2016. AM3-B is located at the site boundary of Scheme I of this Project. There is no obstacle between the site (dust emission source) and monitoring point. It is more representative for monitoring the dust impact caused by the construction activities. The monitoring results recorded at

AM3-B should be more representative than AM3-A.

2.3 Monitoring Equipment

1-hr TSP was measured by using the portable dust meter. 24-hr TSP was measured by using the High Volume Samplers (HVSs). The measurement equipment is listed in **Table 2.3.1** and Calibration Certificates of the equipment is shown in **Appendix B**.

Table 2.3 Air Quality Monitoring Equipment

Equipment	Manufacturer & Model No.	Parameter
Dusk Trak aerosol monitor	AM510 (SN:11510002) AM510 (SN:11510003) AM510 (SN:11510004) AM510 (SN:11510005)	1-hr TSP
HVSs	Tisch TE-5170 001 Tisch TE-5170 002 Tisch TE-5170 003 Tisch TE-5170 004	24-hr TSP
Calibration Kit for HVS	Tisch TE-5028A	N/A

2.4 Quality Assurance / Quality Control Results and Detection Limits

The portable dust meter for 1-hr TSP was calibrated annually by the manufacturer or a HOKLAS laboratory. The detection limits of the dust meter meet with the prescribed standard. For 24-hr TSP measurement, calibration was first been conducted after installing the HVS and repeated on bi-monthly basis. Calibration Kit for HVS was calibrated annually by the manufacturer or a HOKLAS laboratory. The detection limits of the HVS meet with the prescribed standard. Calibration details and current Calibration Certificates are shown in **Appendix B**.

2.5 Monitoring Results and Observations

There were total 168 sets of 1-hr TSP monitoring data and 56 sets of 24-hr TSP monitoring data obtained during the baseline monitoring. The monitoring results are summarized in **Table 2.5.1** and **Table 2.5.2**. All monitoring data and the graphical plot are shown in **Appendix C**.

Table 2.5.1 Summary of average 1-hr TSP Baseline Monitoring Results

Monitoring Location	Average 1-hr TSP ($\mu\text{g}/\text{m}^3$)
AM1	58
AM2	76
AM3	76
AM4	82

Table 2.5.2 Summary of Average 24-hr TSP Baseline Monitoring Results

Monitoring Location	Average 24-hr TSP ($\mu\text{g}/\text{m}^3$)
AM1	42
AM2	81
AM3-A	72
AM4-A	70

During the monitoring period, vehicle emissions were identified as one of the main dust sources for AM1, AM2, AM3, AM3-A, AM4 and AM4-A. Construction activities from other construction sites near Canton Road were the influencing factors for AM4 and AM4-A.

2.6 Action and Limit Levels

According to the EM&A Manual, the criteria of establishing Action and Limit levels of 1-hr TSP and 24-hr TSP are summarized in **Table 2.6.1** and **Table 2.6.2**.

Table 2.6.1 Action and Limit Levels for 1-hr TSP

Cases	Action Level	Limit Level
Averaged baseline level $\leq 384 \mu\text{g}/\text{m}^3$	$= (\text{Baseline level} \times 1.3 + \text{Limit level}) / 2$	$500 \mu\text{g}/\text{m}^3$
Averaged baseline level $> 384 \mu\text{g}/\text{m}^3$	$= \text{Limit level}$	

Table 2.6.2 Action and Limit Levels for 24-hr TSP

Cases	Action Level	Limit Level
Averaged baseline level $\leq 200 \mu\text{g}/\text{m}^3$	$= (\text{Baseline level} \times 1.3 + \text{Limit level}) / 2$	$260 \mu\text{g}/\text{m}^3$
Averaged baseline level $> 200 \mu\text{g}/\text{m}^3$	$= \text{Limit level}$	

The baseline monitoring results have formed the basis of air quality requirements for the impact monitoring. According to the measured baseline results, Action and Limit levels for 1-hr TSP impact monitoring are established in **Table 2.6.3** and **Table 2.6.4**.

Table 2.6.3 Established 1-hr TSP Action and Limit Levels

Monitoring Location	Action Level	Limit Level
AM1	288 $\mu\text{g}/\text{m}^3$	500 $\mu\text{g}/\text{m}^3$
AM2	299 $\mu\text{g}/\text{m}^3$	
AM3	299 $\mu\text{g}/\text{m}^3$	
AM4	303 $\mu\text{g}/\text{m}^3$	

Table 2.6.4 Established 24-hr TSP Action and Limit Levels

Monitoring Location	Action Level	Limit Level
AM1	157 $\mu\text{g}/\text{m}^3$	260 $\mu\text{g}/\text{m}^3$
AM2	183 $\mu\text{g}/\text{m}^3$	
AM3-A	177 $\mu\text{g}/\text{m}^3$	
AM4-A	176 $\mu\text{g}/\text{m}^3$	

3. NOISE MONITORING

3.1 Monitoring Methodology and Parameters

Monitoring was undertaken to establish baseline noise levels of this project, and to provide data against which any environmental impacts due to construction activities can be compared.

The baseline noise level was measured in terms of the A-weighted equivalent continuous sound pressure level of L_{eq} , L_{10} and L_{90} . The measurement time period are shown as below:

L_{eq} (30min) for time period between 0700 – 1900 hours

The monitoring parameters, frequency and duration of baseline noise monitoring are summarized in **Table 3.1.1**. Consecutive noise measurements were carried out for 14 consecutive days (31st October 2015 to 13th November 2015).

Table 3.1.1 Noise Monitoring Parameters, Frequency and Period

Time Period	Duration	Parameters
0700-1900	30 minutes	L_{eq} , L_{10} , L_{90}

Field monitoring procedures are as follows:

- The monitoring station was set at a point 1m from the exterior of the sensitive receivers building façade and set at a position 1.2m above the ground.
- The battery condition was checked to ensure good functioning of the meter.
- Parameters such as frequency weighting, the time weighting and the measurement time will set as follows:
 - frequency weighting : A
 - time weighting : Fast
- Prior to and after noise measurement, the meter shall be calibrated using the calibrator for 94.0 dB at 1000 Hz. If the difference in the calibration level before and after measurement is more than 1.0 dB, the measurement will be considered invalid and repeat of noise measurement is required after re-calibration or repair of the equipment.
- Noise monitoring should be cancelled in the presence of fog, rain, and wind with a steady speed exceeding 5 m/s, or wind with gusts exceeding 10 m/s. Noise

measurement should be paused during periods of high intrusive noise if possible and observation shall be recorded when intrusive noise is not avoided.

- At the end of the monitoring period, the Leq, L₁₀ and L₉₀ shall be recorded. In addition, site conditions and noise sources should be recorded.

3.2 Monitoring Locations

Noise monitoring was established at five locations, which is summarized in **Table 3.2.1** and shown in **Appendix A**.

Measurement should normally be taken at a point 1m from the exterior of the sensitive receivers building façade. The measurement point should be at a position 1.2m above ground.

Table 3.2.1 Noise Baseline Monitoring Location

Identification No.	Noise Monitoring Location	Description	Measurement Type
NM1*	Sorrento - Tower 1	Ground Floor Face to Nga Cheung Road	Façade
NM2	Yau Ma Ti Catholic Primary School (Hoi Wang Road)	Ground Floor Face to Hoi Ting Road	Façade
NM3	The Cullinan I	Ground Floor Face to Nga Cheung Road	Façade
NM4	Lai Chack Middle School	Ground Floor Face to Canton Road	Façade
NM5	Yue Tak Building	Ground Floor Face to Jordan Road	Façade

*Remark:

Impact monitoring at NM1 was amended from ground level (road side) to the podium of Sorrento Tower 1 from June 2016 for avoiding traffic noise impact.

3.3 Monitoring Equipment

Baseline monitoring was conducted by using BSWA 806 which complied with the International Electrotechnical Commission Publications 61672:2002 (Type 1), 60651:1979 (Type 1) and 60804:1985 (Type 1) Specifications as referred to the Technical Memorandum to the Noise Control Ordinance. The equipment was calibrated

and verified by certified laboratory or manufacturer every year to ensure they can perform to the same level of accuracy as stated in the manufacturer's specification. Before and after the baseline measurement, the reading of sound level meter was checked with the acoustic calibrator and the measurements were accepted as valid if the calibration levels before and after the noise measurement agreed to within 1.0 dB. The measurement equipment is listed in **Table 3.3.1** and Calibration Certificates of the equipment is shown in **Appendix B**.

Table 3.3.1 Equipment List for Noise Monitoring

Equipment	Manufacturer & Model No.	Precision Grade
Integrated sound level meter	BSWA 806 (SN:34461)	IEC 61672 Type 1
Acoustical calibrator	NC-74 (SN:34857296)	IEC 60942 Type 1

3.4 Quality Assurance / Quality Control Results and Detection Limits

The sound level meter and calibrator were calibrated annually by the manufacturer or a HOKLAS laboratory. The detection limits of the sound level meter meet with the prescribed standard. Calibration details and current Calibration Certificates are shown in **Appendix B**.

3.5 Monitoring Results and Observations

Monitoring during the daytime period (0700-1900) on normal weekdays is represented with a logging interval of 30 minutes. The monitoring results are summarized in **Table 3.5.1**. All monitoring data and the graphical plot are shown in **Appendix C**.

Table 3.5.1 Summary of Day-Time (0700-1900) Monitoring Results

Daytime (0700-1900)	Noise Level, dB(A) Leq (30 min)		
	L _{Aeq}	L ₁₀	L ₉₀
NM1	75.1	78.1	70.6
NM2	66.5	69.6	62.5
NM3	74.5	77.4	70.4
NM4	73.3	76.4	68.0
NM5	71.8	74.7	67.6

During the monitoring period, traffic noise was identified as the main noise source

nearby.

The weather conditions during the monitoring period were mostly fine. No noise monitoring was conducted under increment weather condition such as in the presence of fog, rain, and wind with a steady speed exceeding 5 m/s or gust exceeding 10 m/s.

3.6 Action and Limit Levels

The Action and Limit Levels were established in accordance with the EM&A Manual. The baseline noise level shall be referenced during the compliance check in the impact noise monitoring period. For restricted periods, limit level shall be subjected to the control under the Noise Control Ordinance (NCO) and the condition in the Construction Noise Permit (CNP).

The Action and Limit levels are shown in **Table 3.6.1**, which would be applied for compliance assessment of construction noise for this project.

Table 3.6.1 Action and Limit Levels for Construction Noise at All Sensitive Receivers

Time Period	Location	Action	Limit
Daytime 0700 – 1900 hrs on normal weekdays	NM1	When one documented complaint is received	75 dB(A)
	NM2		70 dB(A) / 65dB(A)*
	NM3		75 dB(A)
	NM4		70 dB(A) / 65dB(A)*
	NM5		75 dB(A)

Remark:

* 70dB(A) and 65dB(A) for schools normal teaching periods and examination periods respectively.

4. REVISIONS FOR INCLUSION IN THE EM&A MANUAL

1-hr Total Suspended Particulates (TSP) and Noise baseline monitoring for 14 consecutive days have been conducted in accordance with to the EM&A Manual.

24-hr TSP monitoring was not conducted in the same monitoring period as 1-hr TSP monitoring due to the infeasibility of HVS installation.

Installations of HVSs at AM3 and AM4 were rejected by the representatives / property management of premises. The 24-hr TSP cannot be carried out at the designated locations, AM3 and AM4, in accordance with the EM&A Manual. The baseline monitoring of 24-hr TSP was conducted at alternative locations, AM3-A and AM4-A. The conditions given in S.3.5.1 of the EM&A Manual were been taken into account for choosing the alternative locations.

5. CONCLUSION

1-hr TSP, 24-hr TSP and Noise baseline monitoring for 14 consecutive days have been conducted at timeframe when there is no construction works underwent by this project.

Average of 1-hr TSP level was $58\mu\text{g}/\text{m}^3$ for AM1, $76\mu\text{g}/\text{m}^3$ for AM2, $76\mu\text{g}/\text{m}^3$ for AM3 and $82\mu\text{g}/\text{m}^3$ for AM4.

The established action level for 1-hr TSP measurement was $288\mu\text{g}/\text{m}^3$ for AM1, $299\mu\text{g}/\text{m}^3$ for AM2, $299\mu\text{g}/\text{m}^3$ for AM3 and $303\mu\text{g}/\text{m}^3$ for AM4. The limit level for 1-hr TSP measurement was $500\mu\text{g}/\text{m}^3$ for AM1, AM2, AM3 and AM4.

Average 24-hr TSP level was $42\mu\text{g}/\text{m}^3$ for AM1, $81\mu\text{g}/\text{m}^3$ for AM2, $72\mu\text{g}/\text{m}^3$ for AM3-A and $70\mu\text{g}/\text{m}^3$ for AM4-A.

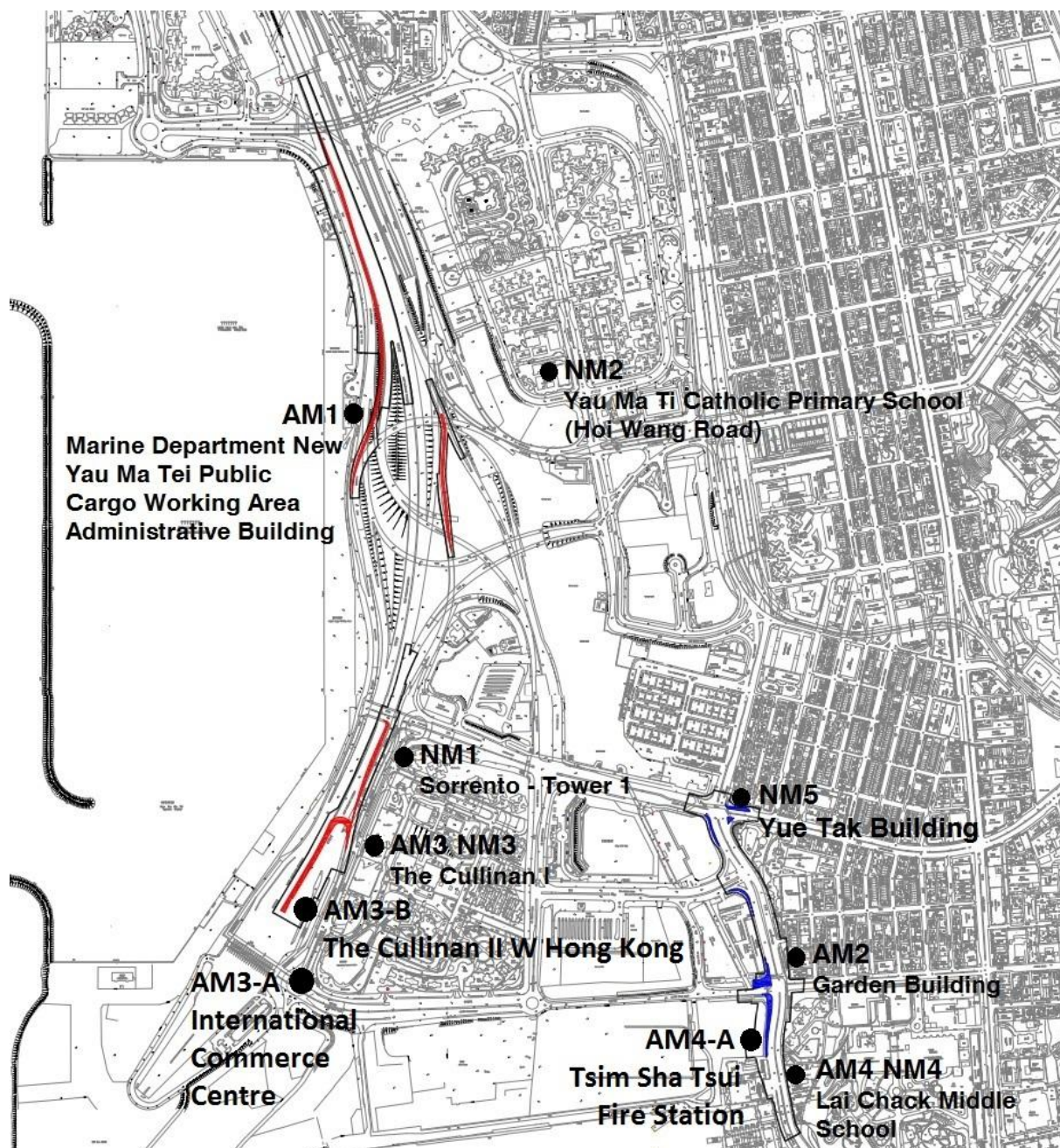
The established action level for 24-hr TSP measurement was $157\mu\text{g}/\text{m}^3$ for AM1, $183\mu\text{g}/\text{m}^3$ for AM2, $177\mu\text{g}/\text{m}^3$ for AM3-A and $176\mu\text{g}/\text{m}^3$ for AM4-A. The limit level for 24-hr TSP measurement was $260\mu\text{g}/\text{m}^3$ for AM1, AM2, AM3-A and AM4-A.





Average L_{Aeq} (30min) was 75.1dB(A) for NM1, 66.5dB(A) for NM2, 74.5dB(A) for NM3, 73.3dB(A) for NM4 and 71.8dB(A) for NM5.

The established construction noise action level for all stations was “When one documented complaint is received”. The limit level was 75dB(A) for monitoring stations NM1, NM3 and NM5 and 70dB(A)/65 dB(A) for NM2 and NM4 during normal schooldays and examination period respectively.

Appendix A






Monitoring Locations



Monitoring Location	Photo Record
<p>AM1 (1-hrTSP)</p> <p>Marine Department New Yau Ma Tei Public Cargo Working Area Administrative Building</p>	
<p>AM2 (1-hrTSP)</p> <p>Garden Building</p>	
<p>AM3 (1-hrTSP)</p> <p>The Cullinan I</p>	
<p>AM4 (1-hrTSP)</p> <p>Lai Chack Middle School</p>	

Monitoring Location	Photo Record
<p>AM1 (24-hr TSP)</p> <p>Marine Department New Yau Ma Tei Public Cargo Working Area Administrative Building</p>	
<p>AM2 (24-hr TSP)</p> <p>Garden Building</p>	
<p>AM3-A (24-hr TSP) *</p> <p>International Commerce Centre (Contractor Work Area 4)</p>	
<p>AM3-B (24-hr TSP) *</p> <p>The Cullinan II (W Hong Kong)</p>	
<p>AM4-A (24-hr TSP)</p> <p>Tsim Sha Tsui Fire Station</p>	

*Remark: Monitoring station was amended from AM3-A to AM3-B from October 2016 for impact monitoring. AM3-B is located at the site boundary of Scheme I. There is no obstacle between the site (dust emission source) and monitoring point. It is more representative for monitoring the dust impact caused by the construction activities.

Monitoring Location	Photo Record
<p>NM1</p> <p>Sorrento - Tower 1</p>	
<p>NM2</p> <p>Yau Ma Ti Catholic Primary School (Hoi Wang Road)</p>	
<p>NM3</p> <p>The Cullinan I</p>	
<p>NM4</p> <p>Lai Chack Middle School</p>	
<p>NM5</p> <p>Yue Tak Building</p>	

Appendix B

Calibration Certificate



CERTIFICATE OF CALIBRATION AND TESTING

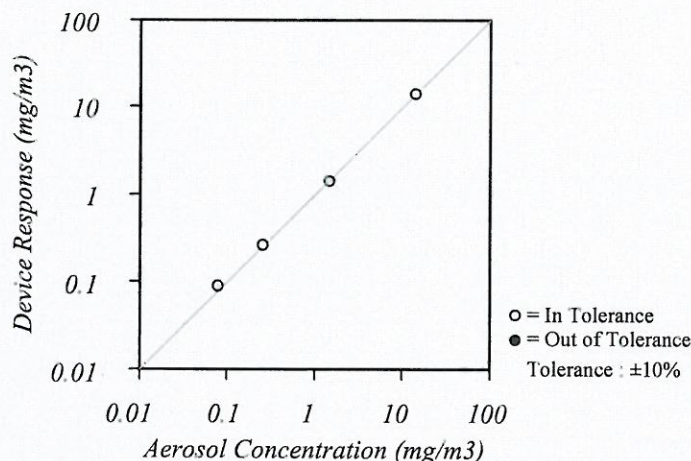
TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA
Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 <http://www.tsi.com>

Environment Condition			Model	AM510
Temperature	74.2 (23.4)	°F (°C)	Serial Number	11510002
Relative Humidity	29	%RH		
Barometric Pressure	29.45 (997.3)	inHg (hPa)		

☒ As Left
☐ As Found

☒ In Tolerance
☐ Out of Tolerance

Concentration Linearity Plot



System ID: DTII01-01

TSI Incorporated does hereby certify that all materials, components, and workmanship used in the manufacture of this equipment are in strict accordance with the applicable specifications agreed upon by TSI and the customer and with all published specifications. All performance and acceptance tests required under this contract were successfully conducted according to required specifications. There is no NIST standard for optical mass measurements. Calibration of this instrument performed by TSI has been done using emery oil and has been nominally adjusted to respirable mass of standard ISO 12103-1, A1 test dust (Arizona dust). Our calibration ratio is greater than 1.2:1

Measurement Variable	System ID	Last Cal	Cal Due
Photometer	E003433	09-09-15	03-09-16
DC Voltage(Keithley)	E002859	06-18-15	06-18-16
Temp/Humidity	E005409	04-16-15	04-16-16
Pressure	E003440	08-04-15	08-04-16

Measurement Variable	System ID	Last Cal	Cal Due
Flowmeter	E002371	03-02-15	03-02-16
Microbalance	M001324	01-05-15	01-05-17
Temp/Humidity	E005410	04-17-15	04-17-16

Linda Hillheimer

Calibrated

☒ Final Function Check

October 2, 2015

Date



大成環境科技拓展有限公司

ENVIRONMENTAL PIONEERS & SOLUTIONS LIMITED

豐盛創建環保科技集團附屬公司 Subsidiary of FSE Environmental Technologies Group

豐盛創建成員 Member of FSE Holdings

REPORT OF EQUIPMENT CALIBRATION

INSTRUMENT DESCRIPTION

It is certified that the item under calibration has been calibrated by corresponding calibrated High Volume Sampler.

Instrument:	TSP meter
Brand Name:	TSI
Model No.:	AM510
Serial No.:	11510002
Date of Issue:	27/10/2015
Date of Calibration:	12/10/2015
Date of Next Calibration:	11/10/2016

ISSUING ORGANISATION

Environmental Pioneers & Solutions Limited

Flat A 19/F. Chaiwan Industrial Centre
20 Lee Chung Street
Chai Wan, Hong Kong

Phone: 852 - 2556 9172

Fax: 852 - 2856 2010

Mr. Ip Wing Hong, John
Manager



大成環境科技拓展有限公司

ENVIRONMENTAL PIONEERS & SOLUTIONS LIMITED

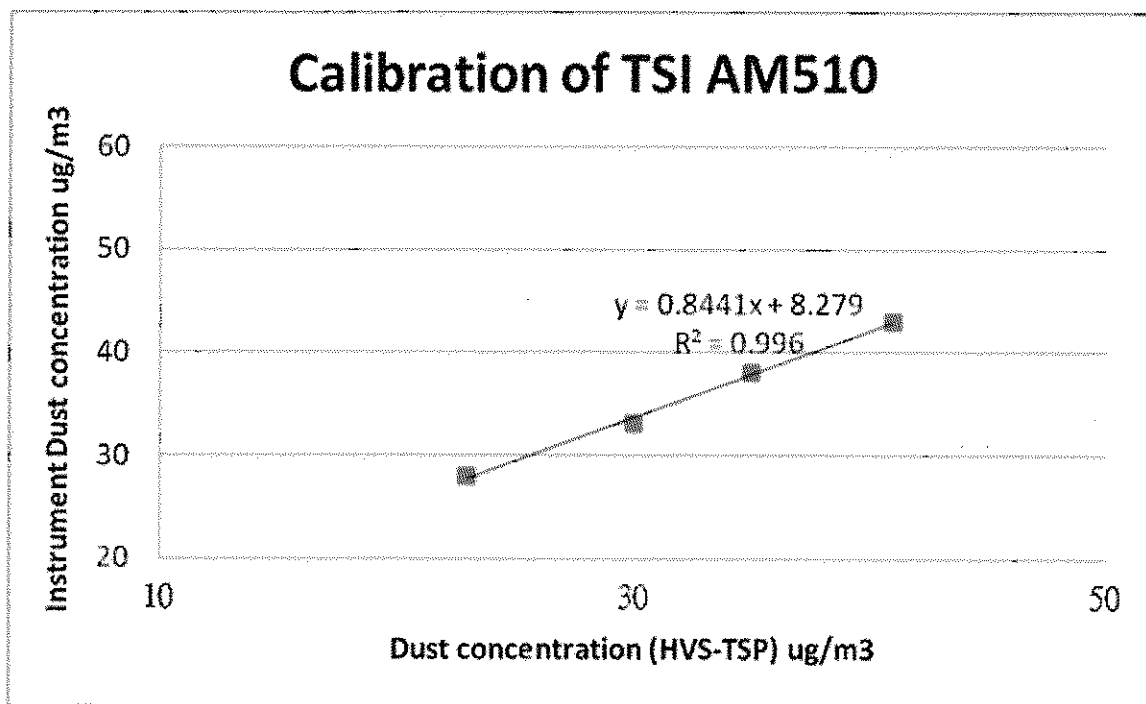
豐盛創建環保科技集團附屬公司 Subsidiary of FSE Environmental Technologies Group

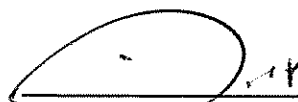
豐盛創建成員 Member of FSE Holdings

Brand Name: TSI
Model No.: AM510
Serial No.: 11510002
HVS No.: TE-5028A
HVS Calibration Kit No.: TISCH 2137
Date of Calibration: 12/10/2015
Date of next Calibration: 11/10/2016

Calibration Record

HVS - TSP	23	30	35	41
TSI AM510	28	33	38	43




Mr. Ip Wing Hong, John
Manager



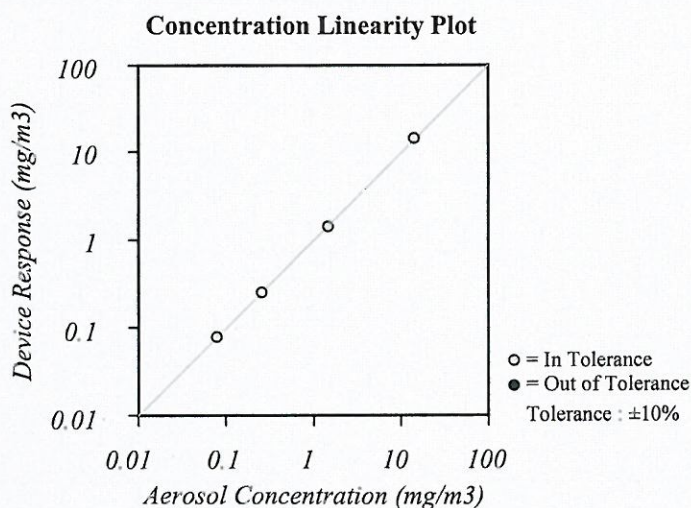
CERTIFICATE OF CALIBRATION AND TESTING

TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA
Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 <http://www.tsi.com>

Environment Condition			Model	AM510
Temperature	74.2 (23.4)	°F (°C)	Serial Number	11510003
Relative Humidity	29	%RH		
Barometric Pressure	29.45 (997.3)	mHg (hPa)		

☒ As Left
☐ As Found

☒ In Tolerance
☐ Out of Tolerance



System ID: DTII01-01

TSI Incorporated does hereby certify that all materials, components, and workmanship used in the manufacture of this equipment are in strict accordance with the applicable specifications agreed upon by TSI and the customer and with all published specifications. All performance and acceptance tests required under this contract were successfully conducted according to required specifications. There is no NIST standard for optical mass measurements. Calibration of this instrument performed by TSI has been done using emery oil and has been nominally adjusted to respirable mass of standard ISO 12103-1, A1 test dust (Arizona dust). Our calibration ratio is greater than 1.2:1

Measurement Variable	System ID	Last Cal	Cal. Due	Measurement Variable	System ID	Last Cal.	Cal. Due
Photometer	E003433	09-09-15	03-09-16	Flowmeter	E002371	03-02-15	03-02-16
DC Voltage(Keithley)	E002859	06-18-15	06-18-16	Microbalance	M001324	01-05-15	01-05-17
Temp/Humidity	E005409	04-16-15	04-16-16	Temp/Humidity	E005410	04-17-15	04-17-16
Pressure	E003440	08-04-15	08-04-16				

Linda Hill-Kramer

Calibrated

☒ Final Function
Check

October 2, 2015

Date



大成環境科技拓展有限公司

ENVIRONMENTAL PIONEERS & SOLUTIONS LIMITED

豐盛創建環保科技集團附屬公司 Subsidiary of FSE Environmental Technologies Group

豐盛創建成員 Member of FSE Holdings

REPORT OF EQUIPMENT CALIBRATION

INSTRUMENT DESCRIPTION

It is certified that the item under calibration has been calibrated by corresponding calibrated High Volume Sampler.

Instrument:	TSP meter
Brand Name:	TSI
Model No.:	AM510
Serial No.:	11510003
Date of Issue:	27/10/2015
Date of Calibration:	12/10/2015
Date of Next Calibration:	11/10/2016

ISSUING ORGANISATION

Environmental Pioneers & Solutions Limited

Flat A 19/F. Chaiwan Industrial Centre
20 Lee Chung Street
Chai Wan, Hong Kong

Phone: 852 - 2556 9172

Fax: 852 - 2856 2010

Mr. Ip Wing Hong, John
Manager



大成環境科技拓展有限公司

ENVIRONMENTAL PIONEERS & SOLUTIONS LIMITED

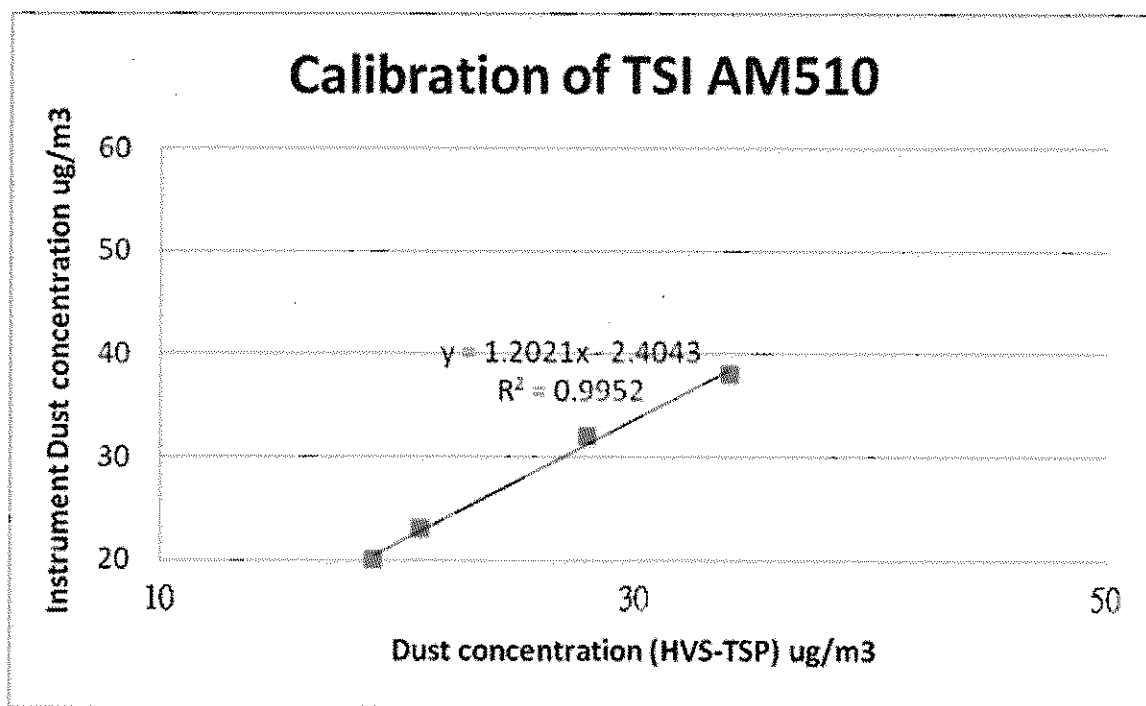
豐盛創建環保科技集團附屬公司 Subsidiary of FSE Environmental Technologies Group

豐盛創建成員 Member of FSE Holdings

Brand Name: TSI
Model No.: AM510
Serial No.: 11510003
HVS No.: TE-5028A
HVS Calibration Kit No.: TISCH 2137
Date of Calibration: 12/10/2015
Date of next Calibration: 11/10/2016

Calibration Record

HVS - TSP	19	21	28	34
TSI AM510	20	23	32	38



Mr. Ip Wing Hong, John
Manager



CERTIFICATE OF CALIBRATION AND TESTING

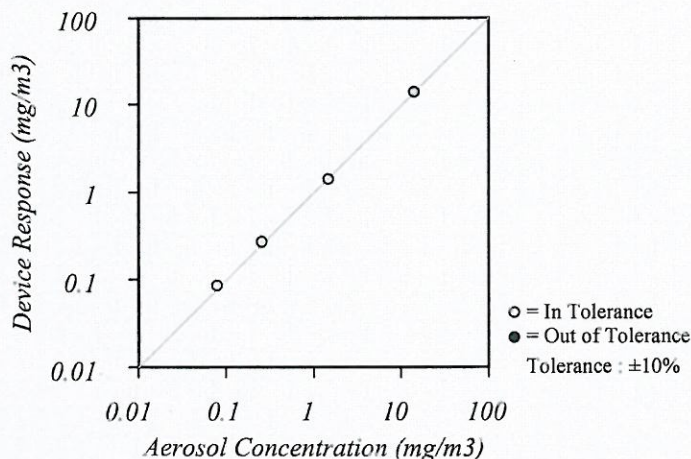
TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA
Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 <http://www.tsi.com>

Environment Condition			Model	AM510
Temperature	74.2 (23.4)	°F (°C)	Serial Number	11510004
Relative Humidity	29	%RH		
Barometric Pressure	29.45 (997.3)	inHg (hPa)		

☒ As Left
☐ As Found

☒ In Tolerance
☐ Out of Tolerance

Concentration Linearity Plot



System ID: DTII01-01

TSI Incorporated does hereby certify that all materials, components, and workmanship used in the manufacture of this equipment are in strict accordance with the applicable specifications agreed upon by TSI and the customer and with all published specifications. All performance and acceptance tests required under this contract were successfully conducted according to required specifications. There is no NIST standard for optical mass measurements. Calibration of this instrument performed by TSI has been done using emery oil and has been nominally adjusted to respirable mass of standard ISO 12103-1, A1 test dust (Arizona dust). Our calibration ratio is greater than 1.2:1

Measurement Variable	System ID	Last Cal.	Cal. Due	Measurement Variable	System ID	Last Cal.	Cal. Due
Photometer	E003433	09-09-15	03-09-16	Flowmeter	E002371	03-02-15	03-02-16
DC Voltage(Keithley)	E002859	06-18-15	06-18-16	Microbalance	M001324	01-05-15	01-05-17
Temp/Humidity	E005409	04-16-15	04-16-16	Temp/Humidity	E005410	04-17-15	04-17-16
Pressure	E003440	08-04-15	08-04-16				

Linda Hillshamer

Calibrated

☒ Final Function
Check

October 2, 2015

Date



大成環境科技拓展有限公司

ENVIRONMENTAL PIONEERS & SOLUTIONS LIMITED

豐盛創建環保科技集團附屬公司 Subsidiary of FSE Environmental Technologies Group

豐盛創建成員 Member of FSE Holdings

REPORT OF EQUIPMENT CALIBRATION

INSTRUMENT DESCRIPTION

It is certified that the item under calibration has been calibrated by corresponding calibrated High Volume Sampler.

Instrument:	TSP meter
Brand Name:	TSI
Model No.:	AM510
Serial No.:	11510004
Date of Issue:	27/10/2015
Date of Calibration:	13/10/2015
Date of Next Calibration:	12/10/2016

ISSUING ORGANISATION

Environmental Pioneers & Solutions Limited

Flat A 19/F. Chaiwan Industrial Centre
20 Lee Chung Street
Chai Wan, Hong Kong

Phone: 852 - 2556 9172

Fax: 852 - 2856 2010

Mr. Ip Wing Hong, John
Manager



大成環境科技拓展有限公司

ENVIRONMENTAL PIONEERS & SOLUTIONS LIMITED

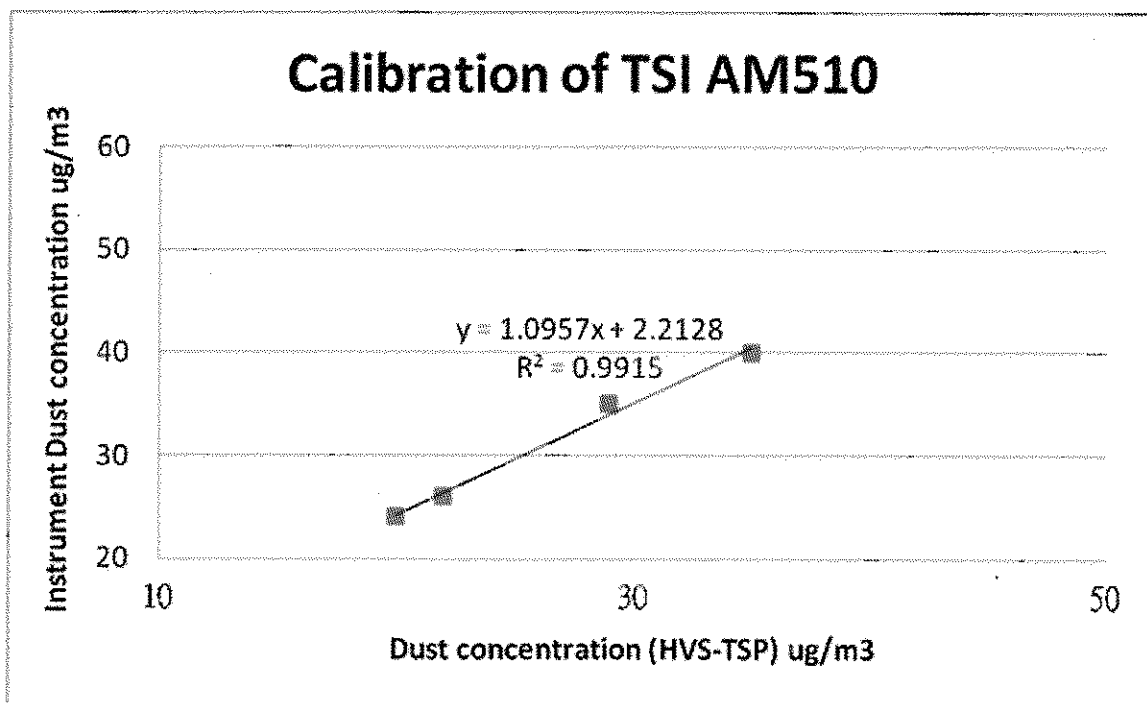
豐盛創建環保科技集團附屬公司 Subsidiary of FSE Environmental Technologies Group

豐盛創建成員 Member of FSE Holdings

Brand Name: TSI
Model No.: AM510
Serial No.: 11510004
HVS No.: TE-5028A
HVS Calibration Kit No.: TISCH 2137
Date of Calibration: 13/10/2015
Date of next Calibration: 12/10/2016

Calibration Record

HVS - TSP	20	22	29	35
TSI AM510	24	26	35	40



Mr. Ip Wing Hong, John
Manager



CERTIFICATE OF CALIBRATION AND TESTING

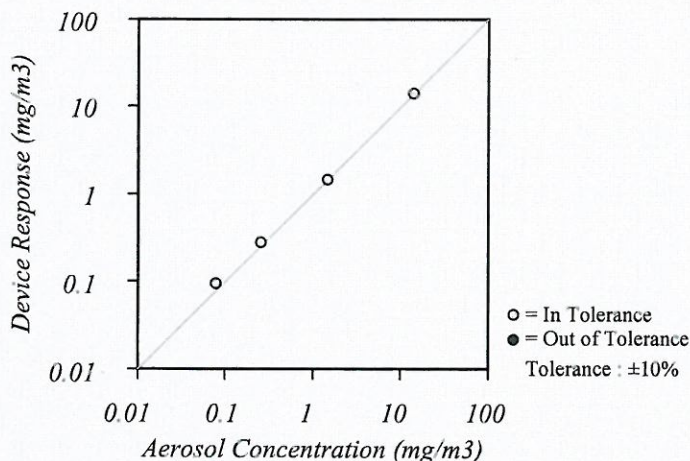
TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA
Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 <http://www.tsi.com>

Environment Condition			Model	AM510
Temperature	74.2 (23.4)	°F (°C)	Serial Number	11510005
Relative Humidity	29	%RH		
Barometric Pressure	29.45 (997.3)	inHg (hPa)		

☒ As Left
☐ As Found

☒ In Tolerance
☐ Out of Tolerance

Concentration Linearity Plot



System ID: DTII01-01

TSI Incorporated does hereby certify that all materials, components, and workmanship used in the manufacture of this equipment are in strict accordance with the applicable specifications agreed upon by TSI and the customer and with all published specifications. All performance and acceptance tests required under this contract were successfully conducted according to required specifications. There is no NIST standard for optical mass measurements. Calibration of this instrument performed by TSI has been done using emery oil and has been nominally adjusted to respirable mass of standard ISO 12103-1, A1 test dust (Arizona dust). Our calibration ratio is greater than 1.2:1

Measurement Variable	System ID	Last Cal.	Cal. Due
Photometer	E003433	09-09-15	03-09-16
DC Voltage(Keithley)	E002859	06-18-15	06-18-16
Temp/Humidity	E005409	04-16-15	04-16-16
Pressure	E003440	08-04-15	08-04-16

Measurement Variable	System ID	Last Cal.	Cal. Due
Flowmeter	E002371	03-02-15	03-02-16
Microbalance	M001324	01-05-15	01-05-17
Temp/Humidity	E005410	04-17-15	04-17-16

Xida Hillman
Calibrated

☒ Final Function
Check

October 2, 2015

Date



大成環境科技拓展有限公司

ENVIRONMENTAL PIONEERS & SOLUTIONS LIMITED

豐盛創建環保科技集團附屬公司 Subsidiary of FSE Environmental Technologies Group

豐盛創建成員 Member of FSE Holdings

REPORT OF EQUIPMENT CALIBRATION

INSTRUMENT DESCRIPTION

It is certified that the item under calibration has been calibrated by corresponding calibrated High Volume Sampler.

Instrument: TSP meter
Brand Name: TSI
Model No.: AM510
Serial No.: 11510005
Date of Issue: 27/10/2015
Date of Calibration: 13/10/2015
Date of Next Calibration: 12/10/2016

ISSUING ORGANISATION

Environmental Pioneers & Solutions Limited

Flat A 19/F. Chaiwan Industrial Centre
20 Lee Chung Street
Chai Wan, Hong Kong

Phone: 852 - 2556 9172
Fax: 852 - 2856 2010

Mr. Ip Wing Hong, John
Manager



大成環境科技拓展有限公司

ENVIRONMENTAL PIONEERS & SOLUTIONS LIMITED

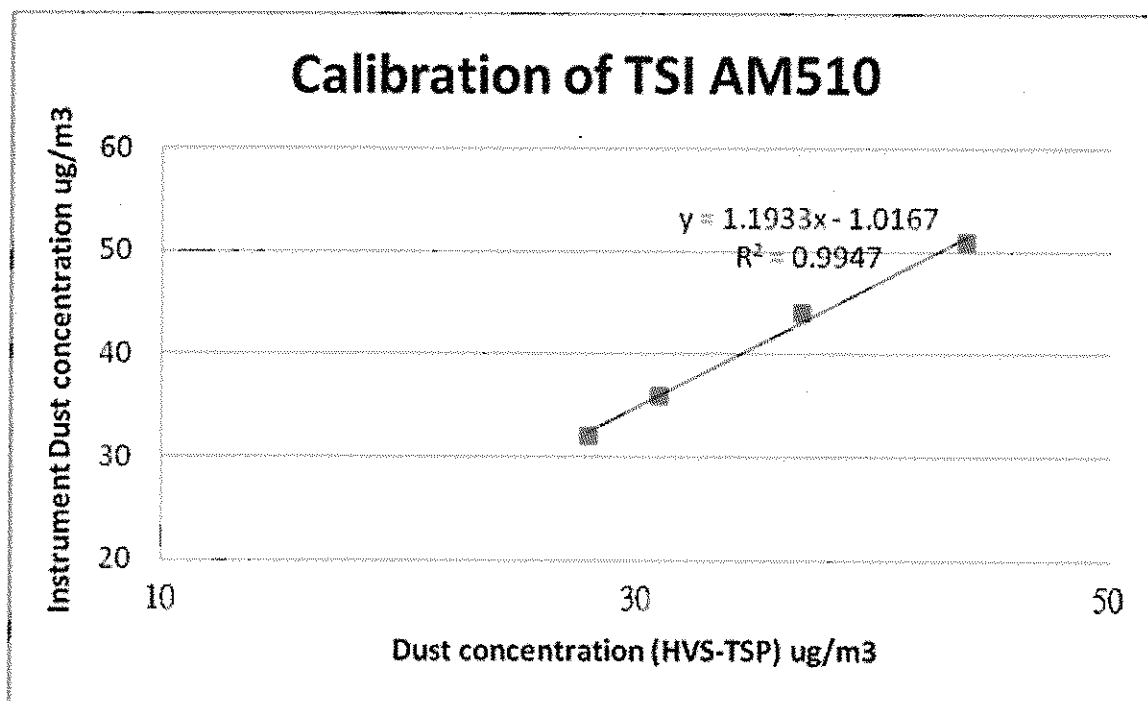
豐盛創建環保科技集團附屬公司 Subsidiary of FSE Environmental Technologies Group

豐盛創建成員 Member of FSE Holdings

Brand Name: TSI
Model No.: AM510
Serial No.: 11510005
HVS No.: TE-5028A
HVS Calibration Kit No.: TISCH 2137
Date of Calibration: 13/10/2015
Date of next Calibration: 12/10/2016

Calibration Record

HVS - TSP	28	31	37	44
TSI AM510	32	36	44	51



Mr. Ip Wing Hong, John
Manager



TISCH ENVIRONMENTAL, INC.
145 SOUTH MIAMI AVE
VILLAGE OF CLEVELAND, OH
45002
513.467.9000
877.263.7610 TOLL FREE
513.467.9009 FAX

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5028A

Date - Jan 30, 2015 Rootmeter S/N 9833620 Ta (K) - 293
Operator Tisch Orifice I.D. - 2137 Pa (mm) - 762

PLATE OR VDC #	VOLUME START (m3)	VOLUME STOP (m3)	DIFF VOLUME (m3)	DIFF TIME (min)	METER DIFF Hg (mm)	ORFICE DIFF H2O (in.)
1	NA	NA	1.00	1.3460	4.1	1.50
2	NA	NA	1.00	1.0420	6.9	2.50
3	NA	NA	1.00	0.9580	8.1	3.00
4	NA	NA	1.00	0.8820	9.6	3.50
5	NA	NA	1.00	0.6710	16.3	6.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)	Va	(x axis) Qa	(y axis)
1.0142	0.7535	1.2368	0.9946	0.7389	0.7595
1.0104	0.9697	1.5967	0.9909	0.9509	0.9805
1.0088	1.0530	1.7491	0.9893	1.0327	1.0740
1.0068	1.1415	1.8892	0.9873	1.1194	1.1601
0.9978	1.4871	2.4735	0.9785	1.4583	1.5189
Qstd slope (m) = 1.68658			Qa slope (m) = 1.05611		
intercept (b) = -0.03417			intercept (b) = -0.02098		
coefficient (r) = 0.99991			coefficient (r) = 0.99991		

y axis = $\sqrt{H_2O(Pa/760)(298/Ta)}$

y axis = $\sqrt{H_2O(Ta/Pa)}$

CALCULATIONS

$$Vstd = \text{Diff. Vol}[(Pa - \text{Diff. Hg})/760](298/Ta)$$

$$Qstd = Vstd/Time$$

$$Va = \text{Diff Vol} [(Pa - \text{Diff Hg})/Pa]$$

$$Qa = Va/Time$$

For subsequent flow rate calculations:

$$Qstd = 1/m\{[\sqrt{H_2O(Pa/760)(298/Ta)}] - b\}$$

$$Qa = 1/m\{[\sqrt{H_2O(Ta/Pa)}] - b\}$$

**TSP Sampler Calibration
(Dickson recorder)**

SITE

Location: **YMT Public Cargo Working Area** Date: **8-Jan-16**
 Sampler: **TE-5170 MFC** Tech: **Andy Tsang**

CONDITIONS

Barometric Pressure (in Hg):	17.00	Corrected Pressure (mm Hg):	432
Temperature (deg F):	63	Temperature (deg K):	290
Average Press. (in Hg):	17.00	Corrected Average (mm Hg):	432
Average Temp. (deg F):	63	Average Temp. (deg K):	290

CALIBRATION ORIFICE

Make: Tisch	Qstd Slope: 2.01000
Model: TE-5028A	Qstd Intercept: -0.02003
Serial#: 5	Date Certified: Original

CALIBRATIONS

Plate or Test #	H2O (in)	Qstd (m3/min)	I (chart)	IC (corrected)	LINEAR REGRESSION
1	2.70	0.635	35.5	27.13	Slope = 45.3725
2	3.80	0.751	42.8	32.70	Intercept = -1.5821
3	5.00	0.860	48.7	37.21	Corr. coeff.= 0.9997
4	6.10	0.949	54.5	41.64	
5	7.20	1.030	59.0	45.08	# of Observations: 5

Calculations

Qstd = $1/m[\text{Sqrt}(H2O(Pa/Pstd)(Tstd/Ta)) - b]$
 IC = $I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$

Qstd = standard flow rate
 IC = corrected chart response
 I = actual chart response
 m = calibrator Qstd slope
 b = calibrator Qstd intercept
 Ta = actual temperature during calibration (deg K)
 Pa = actual pressure during calibration (mm Hg)
 Tstd = 298 deg K
 Pstd = 760 mm Hg
 For subsequent calculation of sampler flow:
 $1/m((I)[\text{Sqrt}(298/Tav)(Pav/760)] - b)$

m = sampler slope
 b = sampler intercept
 I = chart response
 Tav = daily average temperature
 Pav = daily average pressure

**Tisch Environmental, Inc.
TSP Sampler Calibration
(Dickson recorder)**

SITE

Location: Garden Building, Canton Road Date: 19-Mar-16
Sampler: TE-5170 MFC Tech: Andy Tsang

CONDITIONS

Barometric Pressure (in Hg):	17.00	Corrected Pressure (mm Hg):	432
Temperature (deg F):	63	Temperature (deg K):	290
Average Press. (in Hg):	17.00	Corrected Average (mm Hg):	432
Average Temp. (deg F):	63	Average Temp. (deg K):	290

CALIBRATION ORIFICE

Make:	Tisch	Qstd Slope:	2.01000
Model:	TE-5028A	Qstd Intercept:	-0.02003
Serial#:	9833620	Date Certified:	11-Feb-16

CALIBRATIONS

Plate or Test #	H2O (in)	Qstd (m3/min)	I (chart)	IC (corrected)	LINEAR REGRESSION
1	0.30	0.218	26.0	19.86	Slope = 63.9655
2	0.70	0.328	32.0	24.44	Intercept = 4.5476
3	1.00	0.390	38.0	29.02	Corr. coeff.= 0.9880
4	1.50	0.475	44.0	33.61	
5	2.20	0.574	56.0	42.77	# of Observations: 5

Calculations

$Qstd = 1/m[\text{Sqrt}(H2O(Pa/Pstd)(Tstd/Ta)) - b]$
 $IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$

Qstd = standard flow rate
 IC = corrected chart response
 I = actual chart response
 m = calibrator Qstd slope
 b = calibrator Qstd intercept
 Ta = actual temperature during calibration (deg K)
 Pa = actual pressure during calibration (mm Hg)
 Tstd = 298 deg K
 Pstd = 760 mm Hg
 For subsequent calculation of sampler flow:
 $1/m((I)[\text{Sqrt}(298/Tav)(Pav/760)] - b)$

m = sampler slope
 b = sampler intercept
 I = chart response
 Tav = daily average temperature
 Pav = daily average pressure

**TSP Sampler Calibration
(Dickson recorder)**

SITE

Location: **Nga Cheung Road**
Sampler: **TE-5170 MFC**

Date: **19-Dec-15**
Tech: **Andy Tsang**

CONDITIONS

Barometric Pressure (in Hg):	17.00	Corrected Pressure (mm Hg):	432
Temperature (deg F):	63	Temperature (deg K):	290
Average Press. (in Hg):	17.00	Corrected Average (mm Hg):	432
Average Temp. (deg F):	63	Average Temp. (deg K):	290

CALIBRATION ORIFICE

Make: Tisch	Qstd Slope: 2.01000
Model: TE-5028A	Qstd Intercept: -0.02003
Serial#: 5	Date Certified: Original

CALIBRATIONS

Plate or Test #	H2O (in)	Qstd (m3/min)	I (chart)	IC (corrected)	LINEAR REGRESSION
1	9.80	1.200	60.0	45.83	Slope = 35.3979
2	8.20	1.098	56.0	42.77	Intercept = 3.6204
3	7.10	1.023	52.0	39.72	Corr. coeff.= 0.9988
4	5.80	0.925	48.0	36.66	
5	4.20	0.789	41.0	31.32	# of Observations: 5

Calculations

$Qstd = 1/m[\text{Sqrt}(H2O(Pa/Pstd)(Tstd/Ta)) - b]$
 $IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$

Qstd = standard flow rate
 IC = corrected chart response
 I = actual chart response
 m = calibrator Qstd slope
 b = calibrator Qstd intercept
 Ta = actual temperature during calibration (deg K)
 Pa = actual pressure during calibration (mm Hg)
 Tstd = 298 deg K
 Pstd = 760 mm Hg
 For subsequent calculation of sampler flow:
 $1/m((I)[\text{Sqrt}(298/Tav)(Pav/760)] - b)$

m = sampler slope
 b = sampler intercept
 I = chart response
 Tav = daily average temperature
 Pav = daily average pressure



TE-5170 Calibration Worksheet

Site Information

Location: **Tsim Sha Tsui Fire Station**
Location ID: **AM4-A**
Sampler: **TE-5170 MFC**

Date: **6-Aug-16**
Tech: **Andy Tsang**

Site Conditions

Barometric Pressure (in Hg): 29.50	Corrected Pressure (mm Hg): 749
Temperature (deg F): 68	Temperature (deg K): 293
Average Press. (in Hg): 29.65	Corrected Average (mm Hg): 753
Average Temp. (deg F): 70	Average Temp. (deg K): 294

Calibration Orifice

Make: **Tisch**
Model: **TE-5028A**
Serial#: **2137**

Qstd Slope: **1.66881**
Qstd Intercept: **-0.02897**
Date Certified: **11-Feb-16**

Calibration Information

Plate or Test #	H2O (in)	Qstd (m3/min)	I (chart)	IC (corrected)	Linear Regression
1	1.40	0.727	34.0	34.05	Slope: 32.6245
2	3.20	1.091	44.0	44.06	Intercept: 9.6301
3	4.00	1.217	49.0	49.07	Corr. Coeff: 0.9974
4	5.40	1.412	56.0	56.08	
5	6.40	1.535	60.0	60.08	# of Observations: 5

Calculations

$Qstd = 1/m[\text{Sqrt}(H_2O(P_a/P_{std})(T_{std}/T_a)) - b]$
 $IC = I[\text{Sqrt}(P_a/P_{std})(T_{std}/T_a)]$

Qstd = standard flow rate

IC = corrected chart response

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pa = actual pressure during calibration (mm Hg)

Tstd = 298 deg K

Pstd = 760 mm Hg

For subsequent calculation of sampler flow:

$1/m((I[\text{Sqrt}(298/T_{av})(P_{av}/760)] - b)$

m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure

Average I (chart): 45.0

Average Flow Calculation m3/min

1.086933785

Average Flow Calculation in CFM

38.37963195

Sample Time (Hrs): 24.0

Total Flow/Volume in m3

1565.18465

Total Flow in CFM

55266.67001

FACTORY CALIBRATION DATA OF THE BSWA 806 No. 34461

with preamplifier SVANTEK type SV18 No. 47248

1. LINEARITY TEST* (electrical)

LEVEL METER function; Range: Low; Characteristic: A; $f_{\sin} = 31.5$ Hz

Nominal result LEQ [dB]	24.0	25.0	26.0	28.0	30.0	40.0	60.0	83.0
Error [dB]	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0

LEVEL METER function; Range: Low; Characteristic: A; $f_{\sin} = 1000$ Hz

Nominal result LEQ [dB]	24.0	25.0	26.0	28.0	30.0	40.0	60.0	80.0	100.0	123.0
Error [dB]	0.1	0.1	0.0	0.0	-0.0	-0.0	-0.0	-0.0	0.0	-0.0

LEVEL METER function; Range: Low; Characteristic: A; $f_{\sin} = 8000$ Hz

Nominal result LEQ [dB]	24.0	25.0	26.0	28.0	30.0	40.0	60.0	80.0	100.0	122.0
Error [dB]	0.1	0.1	0.0	0.0	-0.0	-0.1	-0.0	-0.0	0.0	-0.0

LEVEL METER function; Range: High; Characteristic: A; $f_{\sin} = 31.5$ Hz

Nominal result LEQ [dB]	34.0	35.0	36.0	38.0	40.0	60.0	80.0	97.0
Error [dB]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

LEVEL METER function; Range: High; Characteristic: A; $f_{\sin} = 1000$ Hz

Nominal result LEQ [dB]	34.0	35.0	36.0	38.0	40.0	60.0	80.0	100.0	120.0	137.0
Error [dB]	0.0	0.0	0.0	-0.0	-0.0	-0.1	-0.0	0.0	-0.0	-0.0

LEVEL METER function; Range: High; Characteristic: A; $f_{\sin} = 8000$ Hz

Nominal result LEQ [dB]	34.0	35.0	36.0	38.0	40.0	60.0	80.0	100.0	120.0	136.0
Error [dB]	0.0	-0.0	0.0	-0.0	-0.0	-0.1	0.0	0.0	-0.0	-0.0

1/3 OCTAVE (1kHz); Range: Low; $f_{\sin} = 1000$ Hz

Nominal result [dB]	25.0	30.0	40.0	60.0	80.0	100.0	120.0	123.0
Error [dB]	0.1	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0

2. TONE BURST RESPONSE*

LEVEL METER function; Characteristic: A; $f_{\sin} = 4000$ Hz; Burst duration: 2s

Range: Low; Steady level nominal result = 120dB

Result	Detector	Duration [ms]	1000	500	200	100	50	20	10	5	2	1	0.5	0.25
MAX	Fast	Indication [dB]	120.1	120.0	119.1	117.5	115.3	111.8	108.9	106.0	102.1	99.0	96.0	93.0
		Error [dB]	0.0	0.0	0.0	0.0	-0.0	-0.0	-0.1	0.0	-0.0	-0.0	-0.1	-0.1
	Slow	Indication [dB]	118.0	116.0	112.6	109.8	106.9	103.0	100.0	97.0	93.0	-	-	-
		Error [dB]	-0.0	-0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-	-	-
SEL	-	Indication [dB]	120.1	117.1	113.1	110.1	107.1	103.1	100.1	97.1	93.1	90.0	87.0	84.0
		Error [dB]	0.0	-0.0	0.0	0.0	-0.0	0.0	-0.0	-0.0	-0.0	-0.0	-0.1	-0.1

Range: Low; Steady level nominal result = 60dB

Result	Detector	Duration [ms]	1000	500	200	100	50	20	10	5	2	1	0.5
MAX	Fast	Indication [dB]	60.1	60.0	59.1	57.5	55.2	51.8	48.9	46.0	42.1	39.0	36.0
		Error [dB]	0.0	0.0	0.0	0.0	-0.0	0.0	-0.0	0.0	-0.0	-0.0	-0.1
	Slow	Indication [dB]	58.0	56.0	52.6	49.8	46.9	43.0	40.0	37.0	33.0	-	-
		Error [dB]	-0.0	-0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-	-
SEL	-	Indication [dB]	60.1	57.1	53.1	50.1	47.1	43.1	40.1	37.1	33.1	30.1	27.1
		Error [dB]	0.0	-0.0	0.0	0.0	-0.0	0.0	0.0	-0.0	0.0	0.0	0.0

Result	Detector	Duration [ms]	1000	500	200
MAX	Fast	Indication [dB]	35.1	35.0	34.1
		Error [dB]	0.0	0.0	0.0
	Slow	Indication [dB]	33.1	31.0	27.6
		Error [dB]	-0.0	0.0	-0.1
SEL	-	Indication [dB]	35.1	32.1	28.2
		Error [dB]	0.0	0.0	0.1

Range: High; Steady level nominal result = 134dB

Result	Detector	Duration [ms]	1000	500	200	100	50	20	10	5	2	1	0.5	0.25
MAX	Fast	Indication [dB]	134.1	134.0	133.1	131.5	129.3	125.8	122.9	120.0	116.1	113.0	110.0	107.0
		Error [dB]	0.0	0.0	0.0	0.0	-0.0	-0.0	-0.0	0.0	-0.0	-0.0	-0.1	-0.1
	Slow	Indication [dB]	132.0	129.9	126.6	123.8	120.9	116.9	114.0	111.0	107.0	-	-	-
		Error [dB]	-0.1	-0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-	-	-
SEL	-	Indication [dB]	134.1	131.1	127.1	124.1	121.1	117.1	114.1	111.1	107.1	104.0	101.0	98.0
		Error [dB]	0.0	-0.0	0.0	-0.0	-0.0	0.0	-0.0	-0.0	-0.0	-0.1	-0.1	-0.1

Range: High; Steady level nominal result = 54dB

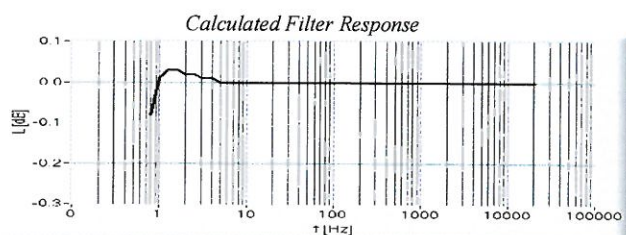
Result	Detector	Duration [ms]	1000	500	200	100	50
MAX	Fast	Indication [dB]	54.0	54.0	53.1	51.4	49.2
		Error [dB]	-0.0	0.0	0.0	-0.0	-0.0
	Slow	Indication [dB]	52.0	49.9	46.5	43.7	40.8
		Error [dB]	-0.1	-0.0	-0.1	-0.1	-0.1
SEL	-	Indication [dB]	54.0	51.0	47.1	44.1	41.1
		Error [dB]	-0.0	-0.0	0.0	0.0	0.0

Range: High; Steady level nominal result = 45dB

Result	Detector	Duration [ms]	1000	500	200
MAX	Fast	Indication [dB]	45.1	45.0	44.2
		Error [dB]	0.0	0.0	0.1
	Slow	Indication [dB]	43.1	41.0	37.6
		Error [dB]	-0.1	-0.0	-0.1
SEL	-	Indication [dB]	45.1	42.1	38.2
		Error [dB]	-0.0	-0.0	0.1

3. FREQUENCY RESPONSE* (electrical)

LEVEL METER function; Characteristic: Z; Range: Low; Input signal =120 dB;



Measured Filter Response with Preamplifier SV18
(f-frequency, L-level)

f [Hz]	L [dB]	f [Hz]	L [dB]	f [Hz]	L [dB]
10	-0.1	63	0.0	4000	-0.0
12.5	0.0	125	0.0	8000	-0.0
16	0.0	250	0.0	16000	-0.0
20	0.0	500	0.0	20000	-0.0
25	0.0	1000	0.0		
31.5	0.0	2000	-0.0		

All frequencies are nominal center values for the 1/3 octave bands

4. INTERNAL NOISE LEVEL* (electrical - compensated)

LEVEL METER function; Range: Low; (Back-light – off) ; Calibration factor: 0dB

Characteristic	Z	A	C
Level [dB]	≤20	≤12	≤12

* measured with preamplifier SVANTEK type SV18 No. 47248.

ENVIRONMENTAL CONDITIONS


Temperature	Relative humidity	Ambient pressure
25 °C	22%	1005 hPa

TEST EQUIPMENT

Item	Manufacturer	Model	Serial no.	Description
1.	SVANTEK	SVAN 401	100	Signal generator
2.	SVANTEK	SVAN 912A	15900	Sound & Vibration Analyser
3.	KEITHLEY	2000	0910165	Digital multimeter
4.	SVANTEK	SV30A	24563	Acoustic calibrator
5.	SVANTEK	ST02	-	Microphone equivalent electrical impedance (18pF)

CONFORMITY & TEST DECLARATION

1. Herewith Svantek company declares that this instrument has been calibrated and tested in compliance with the internal ISO9001 procedures and meets all specification given in the Manual(s) or respectively surpass them.
2. The acoustic calibration was performed using the Sound Calibrator and is traceable to the GUM (Central Office of Measures) reference standard - sound level calibrator type 4231 No 2292773.
3. The vibrational calibration was performed using the Back-to-Back Comparison method and is traceable to the GUM (Central Office of Measures) reference standard - accelerometer type 8305 No 1435233.
4. The information appearing on this sheet has been compiled specifically for this instrument. This form is produced with advanced equipment & procedures which permit comprehensive quality assurance verification of all data supplied herein.
5. This calibration sheet shall not be reproduced except in full, without written permission of the SVANTEK Ltd.

Calibration specialist: 

Test date: 2015-10-20

TEST REPORT
for
SOUND CALIBRATOR

Model : NC - 7 4

Serial No. : 34857296

Condition : Temperature 25 °C

Humidity 64 %RH

Date : September, 8, 2015

Signature : Y. Kitajima

1. Sound Pressure Level	94.0 ± 0.25 dB	<u>94.00 dB</u>
2. Frequency	1000 ± 7 Hz	<u>1002.0 Hz</u>
3. Distortion	3 % or less	<u>Pass</u>
4. Alarm Function		<u>Pass</u>
5. Appearance		<u>Pass</u>

Applicable standards

JIS C 1515:2004 class1

IEC 60942:2003 class1

Appendix C

Monitoring Results and Graphical plots

1-hr TSP Monitoring Result for AM1

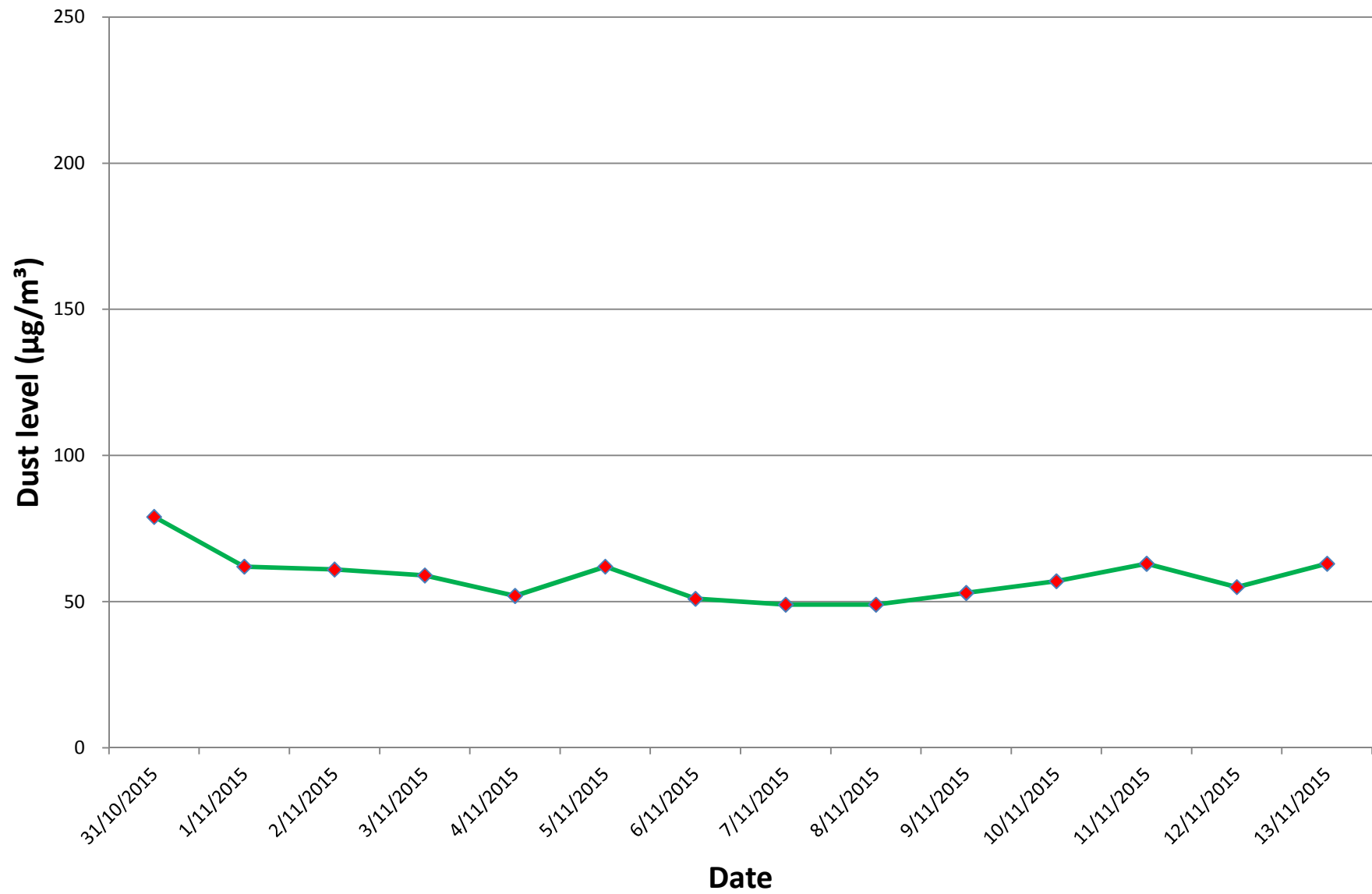
Date	31/10/2015			1/11/2015			2/11/2015			3/11/2015			4/11/2015		
Weather	Sunny			Sunny			Sunny			Sunny			Sunny		
Time	15:00-16:00	16:00-17:00	17:00-18:00	14:00-15:00	15:00-16:00	16:00-17:00	14:00-15:00	15:00-16:00	16:00-17:00	14:00-15:00	15:00-16:00	16:00-17:00	9:00-10:00	10:00-11:00	11:00-12:00
Temperature (°C) *	27.2	27.2	27.2	24.5	24.5	24.5	25.4	25.4	25.4	25.0	25.0	25.0	24.2	24.2	24.2
Wind Direction *	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Wind Speed (m/s) *	2.2	3.6	4.1	2.8	3.1	3.3	1.4	3.3	0.6	3.6	3.6	2.5	2.5	1.7	3.1
Dust Concentration (µg/m³)	80	80	78	65	62	60	63	60	60	70	69	39	73	41	43
Average Concentration (µg/m³)	79			62			61			59			52		

Date	5/11/2015			6/11/2015			7/11/2015			8/11/2015			9/11/2015		
Weather	Sunny			Sunny			Sunny			Sunny			Sunny		
Time	14:00-15:00	15:00-16:00	16:00-17:00	9:00-10:00	10:00-11:00	11:00-12:00	14:00-15:00	15:00-16:00	16:00-17:00	14:00-15:00	15:00-16:00	16:00-17:00	9:00-10:00	10:00-11:00	11:00-12:00
Temperature (°C) *	27.8	27.8	27.8	25.2	25.2	25.2	27.5	27.5	27.5	27.9	27.9	27.9	26.4	26.4	26.4
Wind Direction *	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Wind Speed (m/s) *	4.9	3.9	3.6	4.2	3.3	2.8	2.2	3.3	2.8	2.8	2.5	2.2	1.1	0.8	1.7
Dust Concentration (µg/m³)	58	61	68	40	45	68	50	50	48	50	50	48	51	52	55
Average Concentration (µg/m³)	62			51			49			49			53		

Date	10/11/2015			11/11/2015			12/11/2015			13/11/2015		
Weather	Sunny			Sunny			Cloudy			Cloudy		
Time	9:00-10:00	10:00-11:00	11:00-12:00	14:00-15:00	15:00-16:00	16:00-17:00	14:00-15:00	15:00-16:00	16:00-17:00	9:00-10:00	10:00-11:00	11:00-12:00
Temperature (°C) *	24.4	24.4	24.4	23.8	23.8	23.8	24.1	24.1	24.1	24.2	24.2	24.2
Wind Direction *	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Wind Speed (m/s) *	1.9	3.3	4.2	4.2	4.7	3.9	3.9	3.6	2.5	3.3	2.8	2.2
Dust Concentration (µg/m³)	68	52	50	64	64	60	62	54	49	64	65	60
Average Concentration (µg/m³)	57			63			55			63		

*Remark: Data of temperature, wind direction and wind speed was extracted from King's Park Meteorological Station of HKO

AM1 - 1h TSP Graph plot



1-hr TSP Monitoring Result for AM2

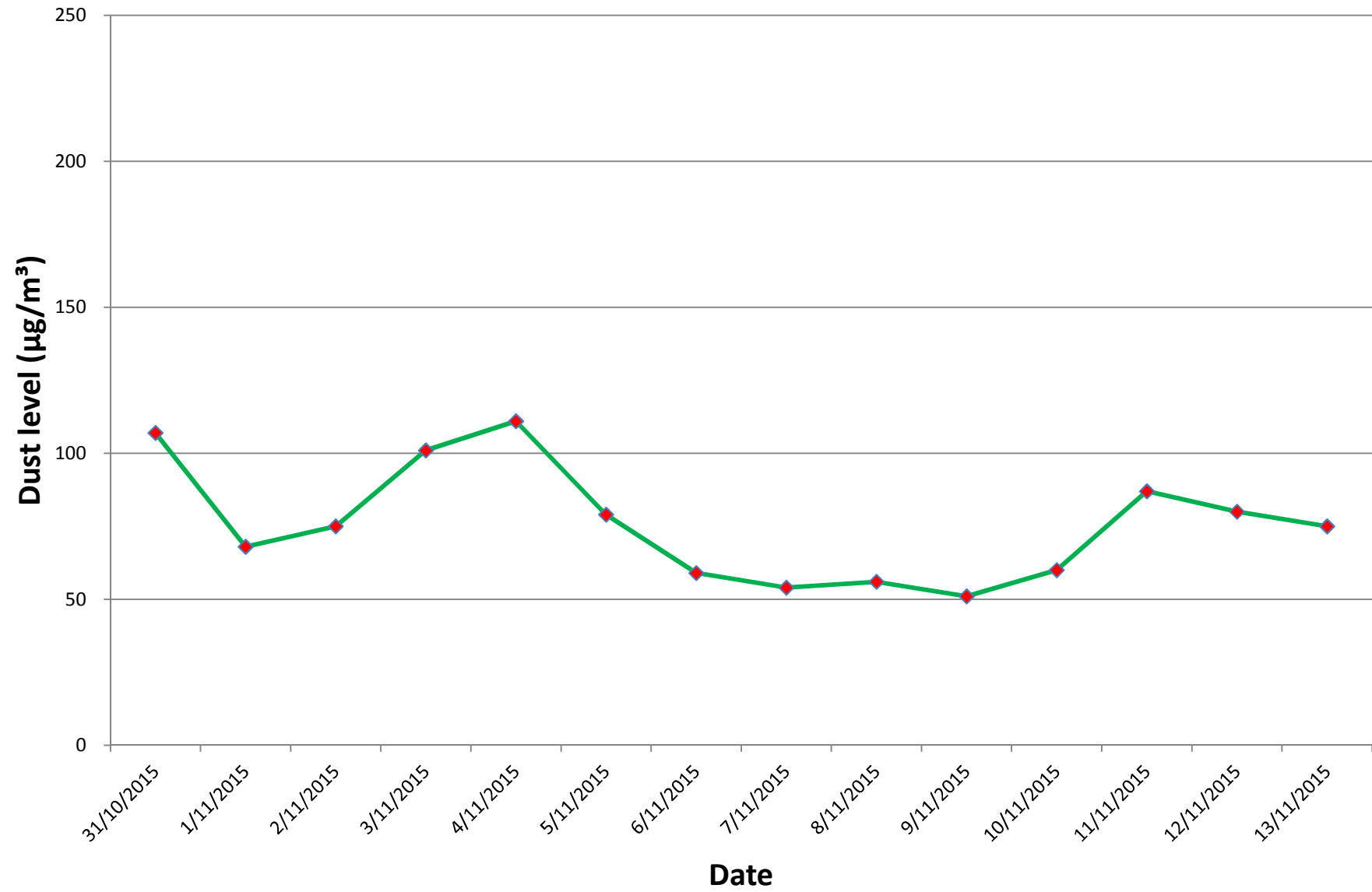
Date	31/10/2015			1/11/2015			2/11/2015			3/11/2015			4/11/2015		
Weather	Sunny			Sunny			Sunny			Sunny			Sunny		
Time	15:00-16:00	16:00-17:00	17:00-18:00	14:00-15:00	15:00-16:00	16:00-17:00	14:00-15:00	15:00-16:00	16:00-17:00	14:00-15:00	15:00-16:00	16:00-17:00	09:00-10:00	10:00-11:00	11:00-12:00
Temperature (°C) *	29.5	28.9	28.6	25.5	25.6	25.1	25.2	24.4	24.6	27.3	27.3	27.0	24.2	25.1	25.6
Wind Direction *	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Wind Speed (m/s) *	2.2	3.6	4.1	2.8	3.1	3.3	1.4	3.3	0.6	3.6	3.6	2.5	2.5	1.7	3.1
Dust Concentration (µg/m³)	103	112	106	66	63	74	59	79	88	102	98	104	148	94	91
Average Concentration (µg/m³)	107			68			75			101			111		

Date	5/11/2015			6/11/2015			7/11/2015			8/11/2015			9/11/2015		
Weather	Sunny			Sunny			Sunny			Sunny			Sunny		
Time	14:00-15:00	15:00-16:00	16:00-17:00	09:00-10:00	10:00-11:00	11:00-12:00	14:00-15:00	15:00-16:00	16:00-17:00	14:00-15:00	15:00-16:00	16:00-17:00	09:00-10:00	10:00-11:00	11:00-12:00
Temperature (°C) *	29.9	29.5	29.5	28.8	29.5	29.9	29.9	29.8	29.5	30.6	30.6	30.5	28.6	29.5	31.0
Wind Direction *	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Wind Speed (m/s) *	4.9	3.9	3.6	4.2	3.3	2.8	2.2	3.3	2.8	2.8	2.5	2.2	1.1	0.8	1.7
Dust Concentration (µg/m³)	78	81	79	49	62	67	56	55	50	56	59	54	49	53	50
Average Concentration (µg/m³)	79			59			54			56			51		

Date	10/11/2015			11/11/2015			12/11/2015			13/11/2015		
Weather	Sunny			Sunny			Cloudy			Cloudy		
Time	09:00-10:00	10:00-11:00	11:00-12:00	14:00-15:00	15:00-16:00	16:00-17:00	14:00-15:00	15:00-16:00	16:00-17:00	09:00-10:00	10:00-11:00	11:00-12:00
Temperature (°C) *	26.7	27.0	27.3	26.8	26.8	26.6	26.6	26.5	26.3	25.6	26.1	26.5
Wind Direction *	N	N	N	N	N	N	N	N	N	N	N	N
Wind Speed (m/s) *	1.9	3.3	4.2	4.2	4.7	3.9	3.9	3.6	2.5	3.3	2.8	2.2
Dust Concentration (µg/m³)	68	54	58	86	84	90	80	82	77	76	75	75
Average Concentration (µg/m³)	60			87			80			75		

*Remark: Data of temperature, wind direction and wind speed was extracted from King's Park Meteorological Station of HKO

AM2 - 1h TSP Graph plot



1-hr TSP Monitoring Result for AM3

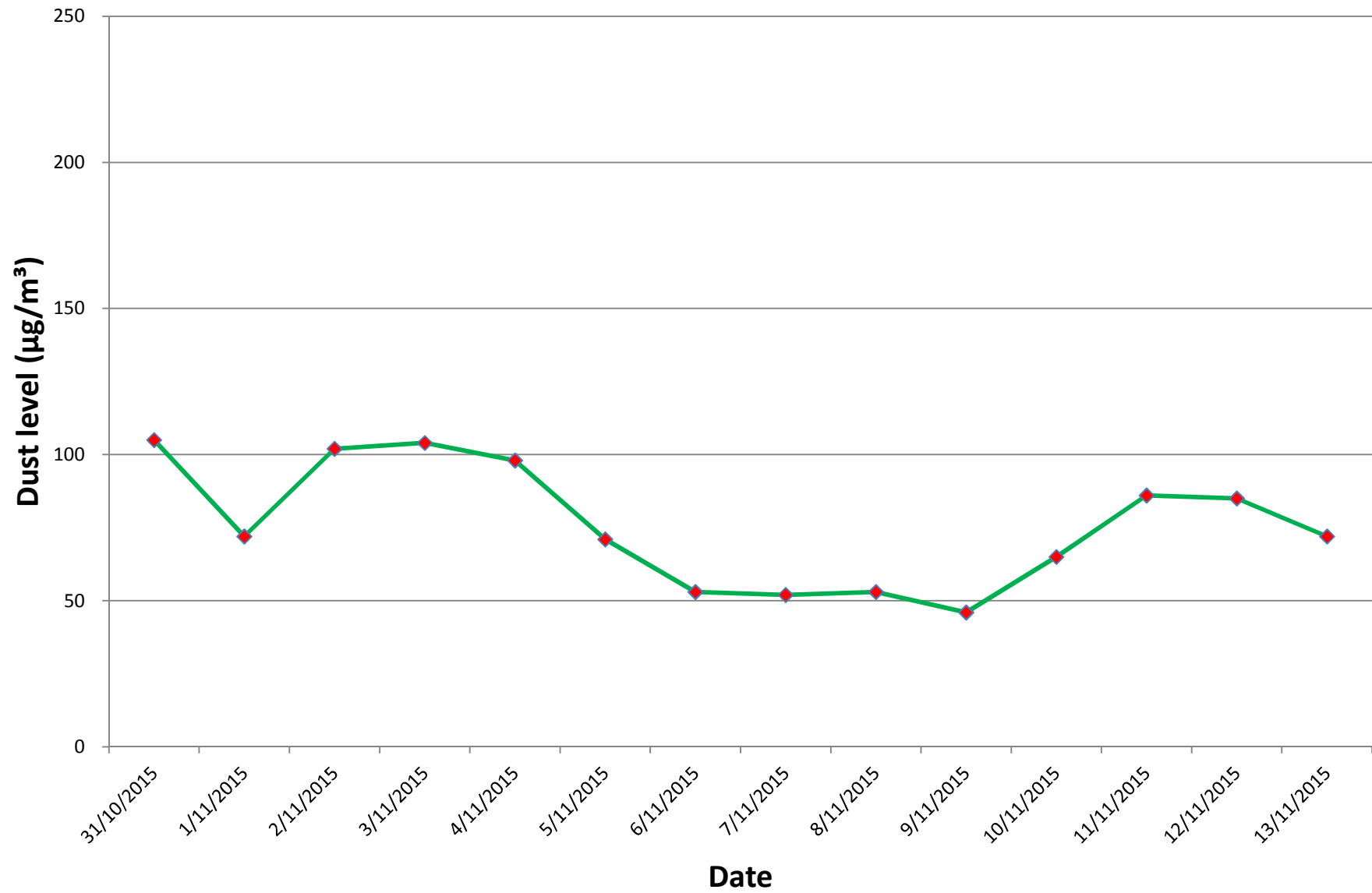
Date	31/10/2015			1/11/2015			2/11/2015			3/11/2015			4/11/2015		
Weather	Sunny			Sunny			Sunny			Sunny			Sunny		
Time	15:00-16:00	16:00-17:00	17:00-18:00	14:00-15:00	15:00-16:00	16:00-17:00	14:00-15:00	15:00-16:00	16:00-17:00	14:00-15:00	15:00-16:00	16:00-17:00	09:00-10:00	10:00-11:00	11:00-12:00
Temperature (°C) *	29.5	28.9	28.6	25.5	25.6	25.1	25.2	24.4	24.6	27.3	27.3	27.0	24.2	25.1	25.6
Wind Direction *	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Wind Speed (m/s) *	2.2	3.6	4.1	2.8	3.1	3.3	1.4	3.3	0.6	3.6	3.6	2.5	2.5	1.7	3.1
Dust Concentration (µg/m³)	100	110	105	69	75	72	104	100	101	101	102	109	145	74	76
Average Concentration (µg/m³)	105			72			102			104			98		

Date	5/11/2015			6/11/2015			7/11/2015			8/11/2015			9/11/2015		
Weather	Sunny			Sunny			Sunny			Sunny			Sunny		
Time	14:00-15:00	15:00-16:00	16:00-17:00	09:00-10:00	10:00-11:00	11:00-12:00	14:00-15:00	15:00-16:00	16:00-17:00	14:00-15:00	15:00-16:00	16:00-17:00	09:00-10:00	10:00-11:00	11:00-12:00
Temperature (°C) *	29.9	29.5	29.5	28.8	29.5	29.9	29.9	29.8	29.5	30.6	30.6	30.5	28.6	29.5	31.0
Wind Direction *	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Wind Speed (m/s) *	4.9	3.9	3.6	4.2	3.3	2.8	2.2	3.3	2.8	2.8	2.5	2.2	1.1	0.8	1.7
Dust Concentration (µg/m³)	70	70	73	53	57	50	56	52	49	53	55	51	49	47	41
Average Concentration (µg/m³)	71			53			52			53			46		

Date	10/11/2015			11/11/2015			12/11/2015			13/11/2015		
Weather	Sunny			Sunny			Cloudy			Cloudy		
Time	09:00-10:00	10:00-11:00	11:00-12:00	14:00-15:00	15:00-16:00	16:00-17:00	14:00-15:00	15:00-16:00	16:00-17:00	09:00-10:00	10:00-11:00	11:00-12:00
Temperature (°C) *	26.7	27.0	27.3	26.8	26.8	26.6	26.6	26.5	26.3	25.6	26.1	26.5
Wind Direction *	N	N	N	N	N	N	N	N	N	N	N	N
Wind Speed (m/s) *	1.9	3.3	4.2	4.2	4.7	3.9	3.9	3.6	2.5	3.3	2.8	2.2
Dust Concentration (µg/m³)	74	58	62	91	82	84	88	82	85	76	70	71
Average Concentration (µg/m³)	65			86			85			72		

*Remark: Data of temperature, wind direction and wind speed was extracted from King's Park Meteorological Station of HKO

AM3 - 1h TSP Graph plot



1-hr TSP Monitoring Result for AM4

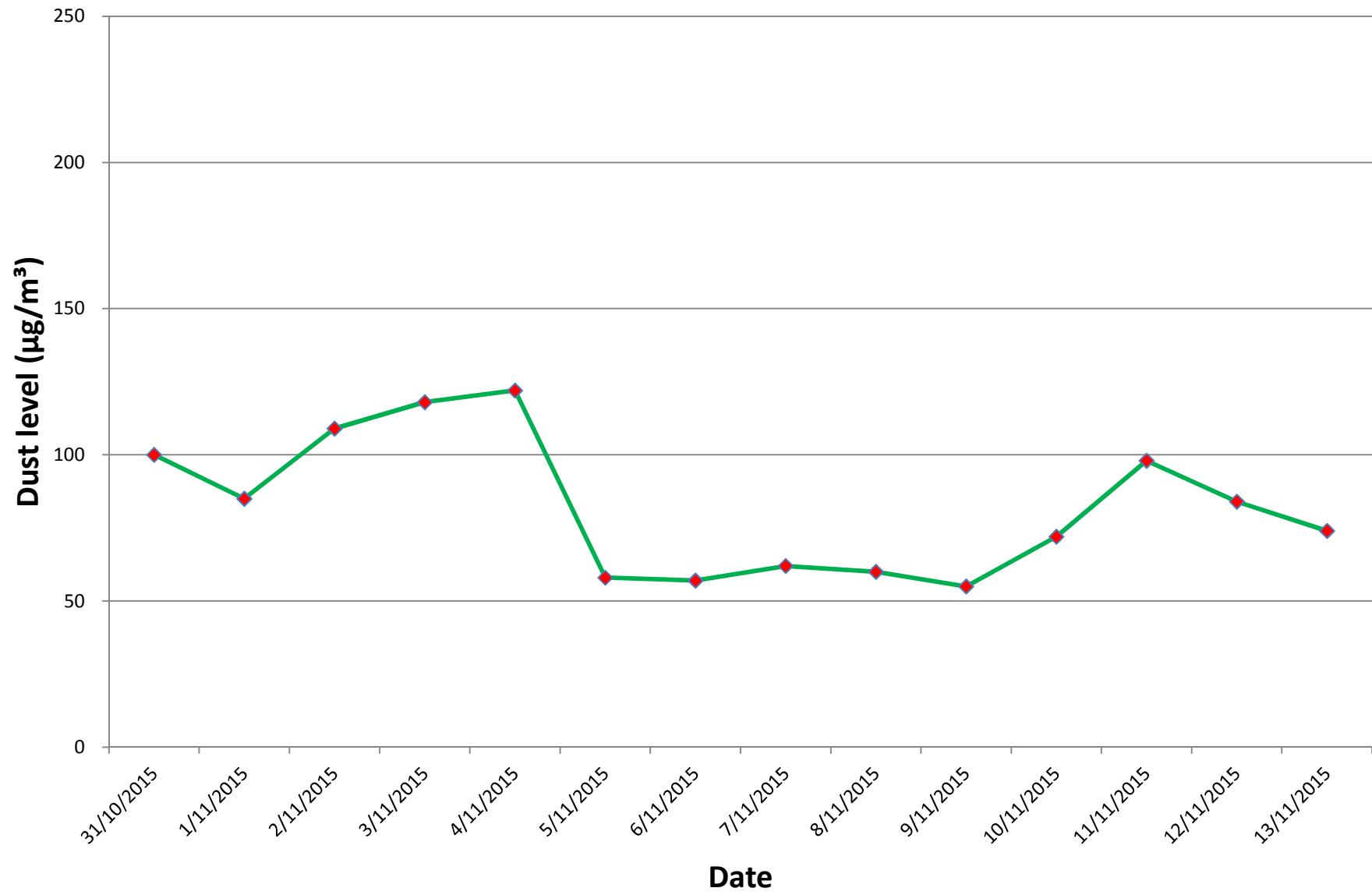
Date	31/10/2015			1/11/2015			2/11/2015			3/11/2015			4/11/2015		
Weather	Sunny			Sunny			Sunny			Sunny			Sunny		
Time	15:00-16:00	16:00-17:00	17:00-18:00	14:00-15:00	15:00-16:00	16:00-17:00	14:00-15:00	15:00-16:00	16:00-17:00	14:00-15:00	15:00-16:00	16:00-17:00	09:00-10:00	10:00-11:00	11:00-12:00
Temperature (°C) *	29.5	28.9	28.6	25.5	25.6	25.1	25.2	24.4	24.6	27.3	27.3	27.0	24.2	25.1	25.6
Wind Direction *	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Wind Speed (m/s) *	2.2	3.6	4.1	2.8	3.1	3.3	1.4	3.3	0.6	3.6	3.6	2.5	2.5	1.7	3.1
Dust Concentration (µg/m³)	102	102	96	90	75	89	107	112	108	117	118	118	169	107	89
Average Concentration (µg/m³)	100			85			109			118			122		

Date	5/11/2015			6/11/2015			7/11/2015			8/11/2015			9/11/2015		
Weather	Sunny			Sunny			Sunny			Sunny			Sunny		
Time	14:00-15:00	15:00-16:00	16:00-17:00	09:00-10:00	10:00-11:00	11:00-12:00	14:00-15:00	15:00-16:00	16:00-17:00	14:00-15:00	15:00-16:00	16:00-17:00	09:00-10:00	10:00-11:00	11:00-12:00
Temperature (°C) *	29.9	29.5	29.5	28.8	29.5	29.9	29.9	29.8	29.5	30.6	30.6	30.5	28.6	29.5	31.0
Wind Direction *	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Wind Speed (m/s) *	4.9	3.9	3.6	4.2	3.3	2.8	2.2	3.3	2.8	2.8	2.5	2.2	1.1	0.8	1.7
Dust Concentration (µg/m³)	60	56	57	56	57	59	60	60	66	61	62	58	56	55	53
Average Concentration (µg/m³)	58			57			62			60			55		

Date	10/11/2015			11/11/2015			12/11/2015			13/11/2015		
Weather	Sunny			Sunny			Cloudy			Cloudy		
Time	09:00-10:00	10:00-11:00	11:00-12:00	14:00-15:00	15:00-16:00	16:00-17:00	14:00-15:00	15:00-16:00	16:00-17:00	09:00-10:00	10:00-11:00	11:00-12:00
Temperature (°C) *	26.7	27.0	27.3	26.8	26.8	26.6	26.6	26.5	26.3	25.6	26.1	26.5
Wind Direction *	N	N	N	N	N	N	N	N	N	N	N	N
Wind Speed (m/s) *	1.9	3.3	4.2	4.2	4.7	3.9	3.9	3.6	2.5	3.3	2.8	2.2
Dust Concentration (µg/m³)	66	81	70	101	95	97	85	86	81	74	77	70
Average Concentration (µg/m³)	72			98			84			74		

*Remark: Data of temperature, wind direction and wind speed was extracted from King's Park Meteorological Station of HKO

AM4 - 1h TSP Graph plot





CERTIFICATE OF ANALYSIS

<i>Client</i>	: ENVIRONMENTAL PIONEERS & SOLUTION LTD	<i>Laboratory</i>	: ALS Technichem (HK) Pty Ltd	<i>Page</i>	: 1 of 2
<i>Contact</i>	: ALLEN CHAN	<i>Contact</i>	: Fung Lim Chee, Richard	<i>Work Order</i>	: HK1603585
<i>Address</i>	: FLAT A, 8/F, CHAI WAN INDUSTRIAL CENTRE, 20 LEE CHUNG STREET, CHAI WAN HONG KONG	<i>Address</i>	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
<i>E-mail</i>	: allenchan@fsenv.com.hk	<i>E-mail</i>	: Richard.Fung@alsglobal.com		
<i>Telephone</i>	: +852 2185 0157	<i>Telephone</i>	: +852 2610 1044		
<i>Facsimile</i>	: +852 2258 0568	<i>Facsimile</i>	: +852 2610 2021		
<i>Project</i>	: PROPOSED ROAD IMPROVEMENT WORKS IN WEST KOWLOON RECLAMATION DEVELOPMENT - PHASE 1	<i>Quote number</i>	: ----	<i>Date received</i>	: 22-JAN-2016
<i>Order number</i>	: ----			<i>Date of issue</i>	: 29-JAN-2016
<i>C-O-C number</i>	: ----			<i>No. of samples</i>	- Received : 14
<i>Site</i>	: ----				- Analysed : 14

Report Comments

This report for ALS Technichem (HK) Pty Ltd work order reference HK1603585 supersedes any previous reports with this reference. The completion date of analysis is 25-JAN-2016. Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release. When date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for process purposes. Abbreviations: CAS number = Chemical Abstract Services number. LOR = Limit of reporting.

Specific Comments for Work Order HK1603585 :

Sample(s) were picked up from client by ALS Technichem (HK) staff in an ambient condition.
Sample(s) analysed and reported on an as received basis.

This report may not be reproduced except with prior written approval from ALS Technichem (HK) Pty Ltd.

This document has been signed by those names that appear on this report and are the authorised signatories.

<i>Signatory</i>	<i>Position</i>	<i>Authorised results for:</i>
Fung Lim Chee, Richard	General Manager	Inorganics



Analytical Results

Sub-Matrix: FILTER (TSP/RSP)

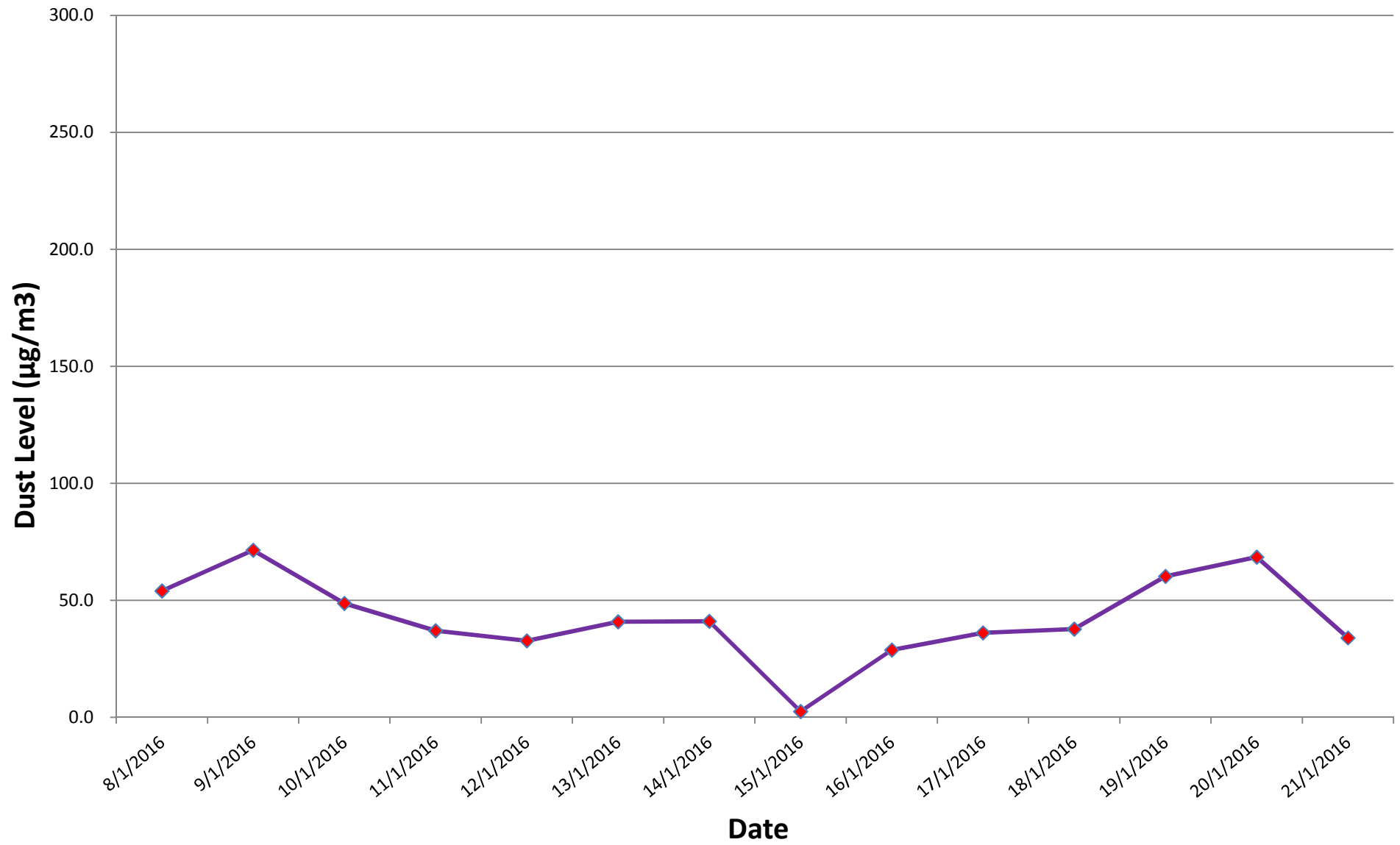
			Compound	HK-TSP: Total Suspended Particulates	HK-TSP: Initial Weight	HK-TSP: Final Weight		
			LOR Unit	0.0010 g	0.0010 g	0.0010 g		
Client sample ID	Client sampling date / time	Laboratory sample ID		EA/ED: Physical and Aggregate Properties	EA/ED: Physical and Aggregate Properties	EA/ED: Physical and Aggregate Properties		
AM10108 200501	[08-JAN-2016]	HK1603585-001		0.1234	2.8105	2.9339		
AM10109 200509	[09-JAN-2016]	HK1603585-002		0.1632	2.8200	2.9832		
AM10110 200502	[10-JAN-2016]	HK1603585-003		0.1113	2.8009	2.9122		
AM10111 200503	[11-JAN-2016]	HK1603585-004		0.0846	2.8162	2.9008		
AM10112 200504	[12-JAN-2016]	HK1603585-005		0.0748	2.8138	2.8886		
AM10113 200508	[13-JAN-2016]	HK1603585-006		0.0933	2.8193	2.9126		
AM10114 200505	[14-JAN-2016]	HK1603585-007		0.0938	2.8159	2.9097		
AM10115 200506	[15-JAN-2016]	HK1603585-008		0.0058	2.8197	2.8255		
AM10116 200521	[16-JAN-2016]	HK1603585-009		0.0658	2.8835	2.9493		
AM10117 200520	[17-JAN-2016]	HK1603585-010		0.0825	2.9005	2.9830		
AM10118 200517	[18-JAN-2016]	HK1603585-011		0.0862	2.8795	2.9657		
AM10119 200507	[19-JAN-2016]	HK1603585-012		0.1376	2.8070	2.9446		
AM10120 200518	[20-JAN-2016]	HK1603585-013		0.1564	2.8710	3.0274		
AM10121 200519	[21-JAN-2016]	HK1603585-014		0.0776	2.8717	2.9493		

24-hr TSP Monitoring Result for AM1

Sampling Date	Paper No.	Wt. of paper (g)			Flow Rate (CFM)			Total Volume (m ³)	TSP Concentration (µg/m ³)	Temperature (°C) *	Wind Diection *	Wind Speed (m/s) *
		Initial Wt.	Final Wt.	Wt. of dust	Initial	Final	Avg Flow					
08/01/16	200501	2.8105	2.9339	0.1234	56	56	56.0	2283.47	54.0406	15 - 22	E	0-4.5
09/01/16	200509	2.8200	2.9832	0.1632	56	56	56.0	2283.47	71.4702	17 - 20	E	1.4-5.3
10/01/16	200502	2.8009	2.9122	0.1113	56	56	56.0	2283.47	48.7416	17 - 19	E	0.8-7.5
11/01/16	200503	2.8162	2.9008	0.0846	56	56	56.0	2283.47	37.0489	17 - 21	NW	0-4.2
12/01/16	200504	2.8138	2.8886	0.0748	56	56	56.0	2283.47	32.7572	16 - 19	NW	0-2.8
13/01/16	200508	2.8193	2.9126	0.0933	56	56	56.0	2283.47	40.8589	14 - 20	E	0-4.7
14/01/16	200505	2.8159	2.9097	0.0938	56	56	56.0	2283.47	41.0778	15 - 18	E	0-1.4
15/01/16	200506	2.8197	2.8255	0.0058	56	56	56.0	2283.47	2.5400	14 - 16	E	1.9-6.4
16/01/16	200521	2.8835	2.9493	0.0658	56	56	56.0	2283.47	28.8158	16 - 18	E	0-1.4
17/01/16	200520	2.9005	2.9830	0.0825	56	56	56.0	2283.47	36.1292	14 - 22	NW	0.8-1.4
18/01/16	200517	2.8795	2.9657	0.0862	56	56	56.0	2283.47	37.7496	11 - 17	E	0.2-1.4
19/01/16	200507	2.8070	2.9446	0.1376	56	56	56.0	2283.47	60.2592	15 - 18	E	0.6-4.4
20/01/16	200518	2.8710	3.0274	0.1564	56	56	56.0	2283.47	68.4922	15 - 17	E	1.7-6.4
21/01/16	200519	2.8717	2.9493	0.0776	56	56	56.0	2283.47	33.9834	16 - 17	NW	0-2.8

*Remark: Data of temperature, wind direction and wind speed was extracted from King's Park Meteorological Station of HKO

AM1 - 24hr TSP Graph plot





CERTIFICATE OF ANALYSIS

<i>Client</i>	: ENVIRONMENTAL PIONEERS & SOLUTION LTD	<i>Laboratory</i>	: ALS Technichem (HK) Pty Ltd	<i>Page</i>	: 1 of 2
<i>Contact</i>	: ANDY TSANG	<i>Contact</i>	: Fung Lim Chee, Richard	<i>Work Order</i>	: HK1613845
<i>Address</i>	: FLAT A, 8/F, CHAI WAN INDUSTRIAL CENTRE, 20 LEE CHUNG STREET, CHAI WAN HONG KONG	<i>Address</i>	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
<i>E-mail</i>	: kytsang@fsenv.com.hk	<i>E-mail</i>	: Richard.Fung@alsglobal.com		
<i>Telephone</i>	: +852 2185 0159	<i>Telephone</i>	: +852 2610 1044		
<i>Facsimile</i>	: +852 2258 0568	<i>Facsimile</i>	: +852 2610 2021		
<i>Project</i>	: PROPOSED ROAD IMPROVEMENT WORKS IN WEST KOWLOON RECLAMATION DEVELOPMENT - PHASE 1	<i>Quote number</i>	: ----	<i>Date received</i>	: 07-APR-2016
<i>Order number</i>	: ----			<i>Date of issue</i>	: 19-APR-2016
<i>C-O-C number</i>	: ----			<i>No. of samples</i>	- Received : 7
<i>Site</i>	: ----				- Analysed : 7

Report Comments

This report for ALS Technichem (HK) Pty Ltd work order reference HK1613845 supersedes any previous reports with this reference. The completion date of analysis is 12-APR-2016. Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release. When date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for process purposes. Abbreviations: CAS number = Chemical Abstract Services number. LOR = Limit of reporting.

Specific Comments for Work Order HK1613845 :

Samples were picked up from client by ALS Technichem (HK) staff in an ambient condition.
Sample(s) analysed and reported on an as received basis.

This report may not be reproduced except with prior written approval from ALS Technichem (HK) Pty Ltd.

This document has been signed by those names that appear on this report and are the authorised signatories.

<i>Signatory</i>	<i>Position</i>	<i>Authorised results for:</i>
Fung Lim Chee, Richard	General Manager	Inorganics



Analytical Results

Sub-Matrix: FILTER (TSP/RSP)

			Compound	HK-TSP: Total Suspended Particulates	HK-TSP: Initial Weight	HK-TSP: Final Weight		
			LOR Unit	0.0010 g	0.0010 g	0.0010 g		
Client sample ID	Client sampling date / time	Laboratory sample ID		EA/ED: Physical and Aggregate Properties	EA/ED: Physical and Aggregate Properties	EA/ED: Physical and Aggregate Properties		
AM20326 200597	[26-MAR-2016]	HK1613845-001		0.1782	2.8483	3.0265		
AM20327 200588	[27-MAR-2016]	HK1613845-002		0.1159	2.8408	2.9567		
AM20328 200587	[28-MAR-2016]	HK1613845-003		0.2128	2.8458	3.0586		
AM20329 200594	[29-MAR-2016]	HK1613845-004		0.1950	2.8364	3.0314		
AM20330 200586	[30-MAR-2016]	HK1613845-005		0.2236	2.8396	3.0632		
AM20331 200589	[31-MAR-2016]	HK1613845-006		0.3495	2.8373	3.1868		
AM20401 200585	[01-APR-2016]	HK1613845-007		0.2098	2.8057	3.0155		



CERTIFICATE OF ANALYSIS

<i>Client</i>	: ENVIRONMENTAL PIONEERS & SOLUTION LTD	<i>Laboratory</i>	: ALS Technichem (HK) Pty Ltd	<i>Page</i>	: 1 of 2
<i>Contact</i>	: ANDY TSANG	<i>Contact</i>	: Fung Lim Chee, Richard	<i>Work Order</i>	: HK1613846
<i>Address</i>	: FLAT A, 8/F, CHAI WAN INDUSTRIAL CENTRE, 20 LEE CHUNG STREET, CHAI WAN HONG KONG	<i>Address</i>	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
<i>E-mail</i>	: kytsang@fsenv.com.hk	<i>E-mail</i>	: Richard.Fung@alsglobal.com		
<i>Telephone</i>	: +852 2185 0159	<i>Telephone</i>	: +852 2610 1044		
<i>Facsimile</i>	: +852 2258 0568	<i>Facsimile</i>	: +852 2610 2021		
<i>Project</i>	: PROPOSED ROAD IMPROVEMENT WORKS IN WEST KOWLOON RECLAMATION DEVELOPMENT - PHASE 1	<i>Quote number</i>	: ---	<i>Date received</i>	: 07-APR-2016
<i>Order number</i>	: ---			<i>Date of issue</i>	: 19-APR-2016
<i>C-O-C number</i>	: ---			<i>No. of samples</i>	- Received : 7
<i>Site</i>	: ---				- Analysed : 7

Report Comments

This report for ALS Technichem (HK) Pty Ltd work order reference HK1613846 supersedes any previous reports with this reference. The completion date of analysis is 12-APR-2016. Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release. When date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for process purposes. Abbreviations: CAS number = Chemical Abstract Services number. LOR = Limit of reporting.

Specific Comments for Work Order HK1613846 :

Samples were picked up from client by ALS Technichem (HK) staff in an ambient condition.
Sample(s) analysed and reported on an as received basis.

This report may not be reproduced except with prior written approval from ALS Technichem (HK) Pty Ltd.

This document has been signed by those names that appear on this report and are the authorised signatories.

<i>Signatory</i>	<i>Position</i>	<i>Authorised results for:</i>
Fung Lim Chee, Richard	General Manager	Inorganics



Analytical Results

Sub-Matrix: FILTER (TSP/RSP)

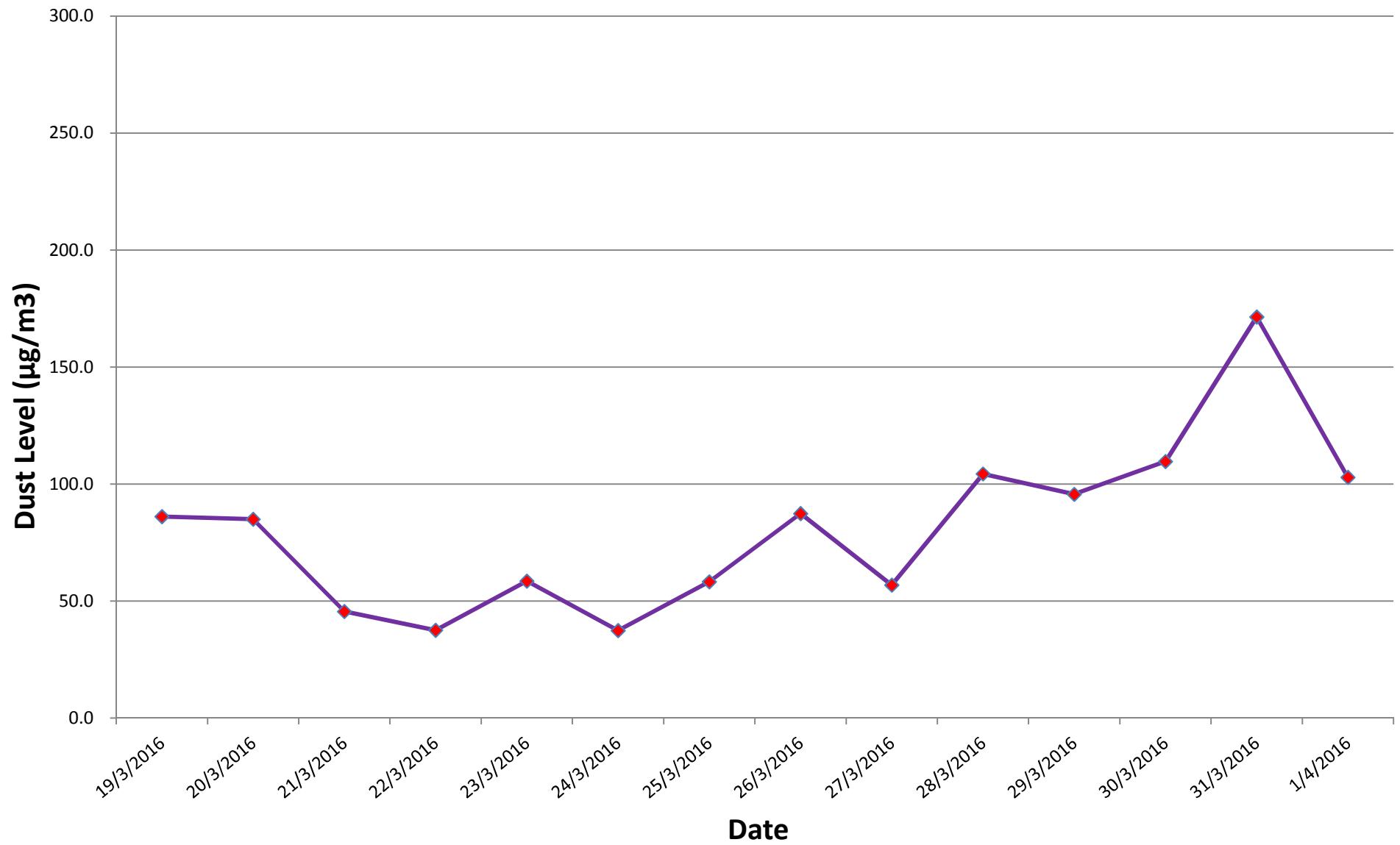
			Compound	HK-TSP: Total Suspended Particulates	HK-TSP: Initial Weight	HK-TSP: Final Weight		
			LOR Unit	0.0010 g	0.0010 g	0.0010 g		
Client sample ID	Client sampling date / time	Laboratory sample ID		EA/ED: Physical and Aggregate Properties	EA/ED: Physical and Aggregate Properties	EA/ED: Physical and Aggregate Properties		
AM20319 200590	[19-MAR-2016]	HK1613846-001		0.1756	2.8261	3.0017		
AM20320 200591	[20-MAR-2016]	HK1613846-002		0.1733	2.8270	3.0003		
AM20321 200592	[21-MAR-2016]	HK1613846-003		0.0929	2.8401	2.9330		
AM20322 200593	[22-MAR-2016]	HK1613846-004		0.0766	2.8391	2.9157		
AM20323 200595	[23-MAR-2016]	HK1613846-005		0.1194	2.8490	2.9684		
AM20324 200596	[24-MAR-2016]	HK1613846-006		0.0763	2.8495	2.9258		
AM20325 200598	[25-MAR-2016]	HK1613846-007		0.1188	2.8401	2.9589		

24-hr TSP Monitoring Result for AM2

Sampling ID & Paper No.	Sampling Date	Wt. of paper (g)			Flow Rate (CFM)			Total Volume (m ³)	TSP Concentration (µg/m3)	Temperature (°C) *	Wind Diection *	Wind Speed (m/s) *
		Initial Wt.	Final Wt.	Wt. of dust	Initial	Final	Avg Flow					
AM20319 200590	19/03/16	2.8261	3.0017	0.1756	50	50	50.0	2038.81	86.1286	20 - 25	SE	0.1-4.7
AM20320 200591	20/03/16	2.8270	3.0003	0.1733	50	50	50.0	2038.81	85.0004	17 - 18	SE	0.8-7.8
AM20321 200592	21/03/16	2.8401	2.9330	0.0929	50	50	50.0	2038.81	45.5657	16 - 18	SE	2.2-8.9
AM20322 200593	22/03/16	2.8391	2.9157	0.0766	50	50	50.0	2038.81	37.5709	15 - 17	SE	3-8
AM20323 200595	23/03/16	2.8490	2.9684	0.1194	50	50	50.0	2038.81	58.5635	17 - 20	SE	0-6.7
AM20324 200596	24/03/16	2.8495	2.9258	0.0763	50	50	50.0	2038.81	37.4237	13 - 15	SE	0-5.2
AM20325 200598	25/03/16	2.8401	2.9589	0.1188	50	50	50.0	2038.81	58.2692	13 - 16	NE	0-4.4
AM20326 200597	26/03/16	2.8483	3.0265	0.1782	50	50	50.0	2038.81	87.4038	13 - 19	SE	0.1-4.7
AM20327 200588	27/03/16	2.8408	2.9567	0.1159	50	50	50.0	2038.81	56.8468	14 - 22	NE	0.1-4.2
AM20328 200587	28/03/16	2.8458	3.0586	0.2128	50	50	50.0	2038.81	104.3745	15 - 19	SE	0-5.2
AM20329 200594	29/03/16	2.8364	3.0314	0.1950	50	50	50.0	2038.81	95.6439	15 - 21	SE	0-3.9
AM20330 200586	30/03/16	2.8396	3.0632	0.2236	50	50	50.0	2038.81	109.6717	18 - 23	SE	0-4.4
AM20331 200589	31/03/16	2.8373	3.1868	0.3495	50	50	50.0	2038.81	171.4233	19 - 24	W	0.1-2.7
AM20401 200585	01/04/16	2.8057	3.0155	0.2098	50	50	50.0	2038.81	102.9030	20 - 25	SE	0-3.9

*Remark: Data of temperature, wind direction and wind speed was extracted from King's Park Meteorological Station of HKO

AM2 - 24-hr TSP Graph plot





CERTIFICATE OF ANALYSIS

<i>Client</i>	: ENVIRONMENTAL PIONEERS & SOLUTION LTD	<i>Laboratory</i>	: ALS Technichem (HK) Pty Ltd	<i>Page</i>	: 1 of 2
<i>Contact</i>	: ALLEN CHAN	<i>Contact</i>	: Fung Lim Chee, Richard	<i>Work Order</i>	: HK1603587
<i>Address</i>	: FLAT A, 8/F, CHAI WAN INDUSTRIAL CENTRE, 20 LEE CHUNG STREET, CHAI WAN HONG KONG	<i>Address</i>	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
<i>E-mail</i>	: allenchan@fsenv.com.hk	<i>E-mail</i>	: Richard.Fung@alsglobal.com		
<i>Telephone</i>	: +852 2185 0157	<i>Telephone</i>	: +852 2610 1044		
<i>Facsimile</i>	: +852 2258 0568	<i>Facsimile</i>	: +852 2610 2021		
<i>Project</i>	: PROPOSED ROAD IMPROVEMENT WORKS IN WEST KOWLOON RECLAMATION DEVELOPMENT - PHASE 1	<i>Quote number</i>	: ---	<i>Date received</i>	: 22-JAN-2016
<i>Order number</i>	: ----			<i>Date of issue</i>	: 29-JAN-2016
<i>C-O-C number</i>	: ----			<i>No. of samples</i>	- Received : 14
<i>Site</i>	: ----				- Analysed : 14

Report Comments

This report for ALS Technichem (HK) Pty Ltd work order reference HK1603587 supersedes any previous reports with this reference. The completion date of analysis is 25-JAN-2016. Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release. When date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for process purposes. Abbreviations: CAS number = Chemical Abstract Services number. LOR = Limit of reporting.

Specific Comments for Work Order HK1603587 :

Sample(s) were picked up from client by ALS Technichem (HK) staff in an ambient condition.
Sample(s) analysed and reported on an as received basis.

This report may not be reproduced except with prior written approval from ALS Technichem (HK) Pty Ltd.

This document has been signed by those names that appear on this report and are the authorised signatories.

<i>Signatory</i>	<i>Position</i>	<i>Authorised results for:</i>
Fung Lim Chee, Richard	General Manager	Inorganics



Analytical Results

Sub-Matrix: FILTER (TSP/RSP)

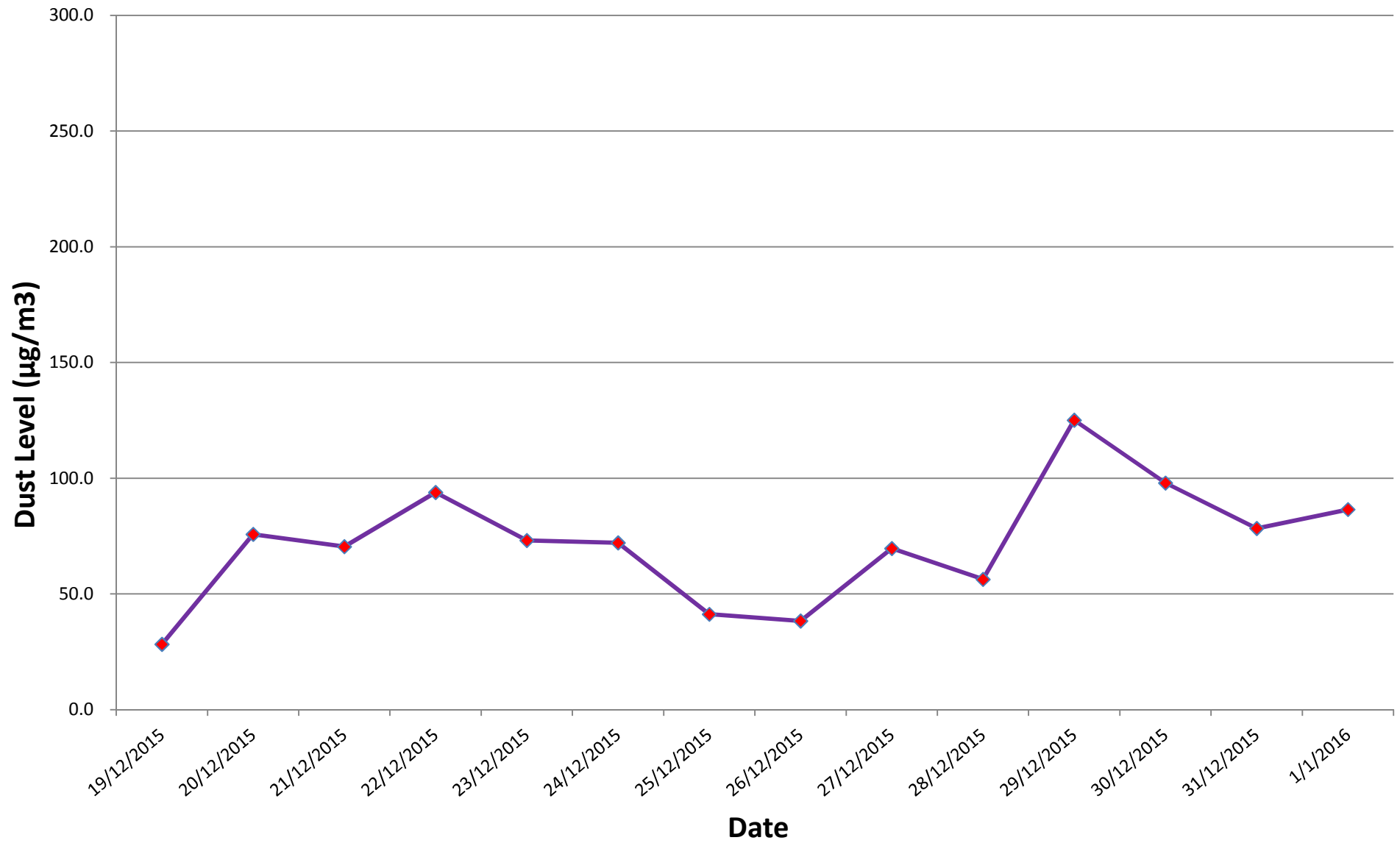
			Compound	HK-TSP: Total Suspended Particulates	HK-TSP: Initial Weight	HK-TSP: Final Weight		
			LOR Unit	0.0010 g	0.0010 g	0.0010 g		
Client sample ID	Client sampling date / time	Laboratory sample ID		EA/ED: Physical and Aggregate Properties	EA/ED: Physical and Aggregate Properties	EA/ED: Physical and Aggregate Properties		
AM3-A1219 200492	[19-DEC-2015]	HK1603587-001		0.0634	2.8256	2.8890		
AM3-A1220 200357	[20-DEC-2015]	HK1603587-002		0.1699	2.6818	2.8517		
AM3-A1221 200358	[21-DEC-2015]	HK1603587-003		0.1580	2.6833	2.8413		
AM3-A1222 200359	[22-DEC-2015]	HK1603587-004		0.2105	2.6802	2.8907		
AM3-A1223 200360	[23-DEC-2015]	HK1603587-005		0.1640	2.6896	2.8536		
AM3-A1224 200361	[24-DEC-2015]	HK1603587-006		0.1617	2.6893	2.8510		
AM3-A1225 200362	[25-DEC-2015]	HK1603587-007		0.0925	2.6847	2.7772		
AM3-A1226 200363	[26-DEC-2015]	HK1603587-008		0.0860	2.6700	2.7560		
AM3-A1227 200364	[27-DEC-2015]	HK1603587-009		0.1562	2.6838	2.8400		
AM3-A1228 200365	[28-DEC-2015]	HK1603587-010		0.1263	2.6633	2.7896		
AM3-A1229 200366	[29-DEC-2015]	HK1603587-011		0.2805	2.6705	2.9510		
AM3-A1230 200493	[30-DEC-2015]	HK1603587-012		0.2197	2.8214	3.0411		
AM3-A1231 200494	[31-DEC-2015]	HK1603587-013		0.1757	2.8154	2.9911		
AM3-A0101 200496	[01-JAN-2016]	HK1603587-014		0.1940	2.8145	3.0085		

24-hr TSP Monitoring Result for AM3-A

Sampling ID & Paper No.	Sampling Date	Wt. of paper (g)			Flow Rate (CFM)			Total Volume (m ³)	TSP Concentration (µg/m ³)	Temperature (°C) *	Wind Direction *	Wind Speed (m/s) *
		Initial Wt.	Final Wt.	Wt. of dust	Initial	Final	Avg Flow					
AM3-A1219 200492	19/12/15	2.8256	2.8890	0.0634	42	42	55.0	2242.69	28.2696	13 - 20	SE	0-3.3
AM3-A1220 200357	20/12/15	2.6818	2.8517	0.1699	44	44	55.0	2242.69	75.7571	17 - 19	NW	0-2.8
AM3-A1221 200358	21/12/15	2.6833	2.8413	0.1580	44	44	55.0	2242.69	70.4510	17 - 23	E	0-1.4
AM3-A1222 200359	22/12/15	2.6802	2.8907	0.2105	44	44	55.0	2242.69	93.8603	19 - 22	E	0-8.5
AM3-A1223 200360	23/12/15	2.6896	2.8536	0.1640	46	46	55.0	2242.69	73.1263	19 - 24	E	0-3.3
AM3-A1224 200361	24/12/15	2.6893	2.8510	0.1617	46	46	55.0	2242.69	72.1008	20 - 27	SE	0-4.2
AM3-A1225 200362	25/12/15	2.6847	2.7772	0.0925	46	46	55.0	2242.69	41.2450	16 - 19	NW	0-6.6
AM3-A1226 200363	26/12/15	2.6700	2.7560	0.0860	52	52	55.0	2242.69	38.3467	16 - 20	NW	0-3.3
AM3-A1227 200364	27/12/15	2.6838	2.8400	0.1562	52	52	55.0	2242.69	69.6484	16 - 18	NW	0-4.2
AM3-A1228 200365	28/12/15	2.6633	2.7896	0.1263	50	50	55.0	2242.69	56.3162	16 - 19	NW	0-3.3
AM3-A1229 200366	29/12/15	2.6705	2.9510	0.2805	52	52	55.0	2242.69	125.0728	16 - 21	E	0-1.4
AM3-A1230 200493	30/12/15	2.8214	3.0411	0.2197	50	50	55.0	2242.69	97.9625	15 - 19	NW	0-3.3
AM3-A1231 200494	31/12/15	2.8154	2.9911	0.1757	50	50	55.0	2242.69	78.3433	15 - 19	NW	0-1.4
AM3-A0101 200396	01/01/16	2.8145	3.0085	0.1940	50	50	55.0	2242.69	86.5031	16 - 22	E	0-4.7

*Remark: Data of temperature, wind direction and wind speed was extracted from King's Park Meteorological Station of HKO

AM3-A - 24hr TSP Graph plot





CERTIFICATE OF ANALYSIS

Client	: ENVIRONMENTAL PIONEERS & SOLUTION LTD	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 3
Contact	: ANDY TSANG	Contact	: Fung Lim Chee, Richard	Work Order	: HK1634163
Address	: FLAT A, 8/F, CHAI WAN INDUSTRIAL CENTRE, 20 LEE CHUNG STREET, CHAI WAN HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: kytsang@fsenv.com.hk	E-mail	: Richard.Fung@alsglobal.com		
Telephone	: +852 2185 0159	Telephone	: +852 2610 1044		
Facsimile	: +852 2258 0568	Facsimile	: +852 2610 2021		
Project	: PROPOSED ROAD IMPROVEMENT WORKS IN WEST KOWLOON RECLAMATION DEVELOPMENT - PHASE 1	Quote number	: ----	Date Samples Received	: 23-AUG-2016
Order number	: ----			Issue Date	: 26-AUG-2016
C-O-C number	: ----			No. of samples received	: 7
Site	: ----			No. of samples analysed	: 7

General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. Testing period is from 23-AUG-2016 to 24-AUG-2016.

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific Comments for Work Order: HK1634163

Sample(s) were picked up from client by ALS Technichem (HK) staff in an ambient condition.

Sample(s) analysed and reported on an as received basis.

This report may not be reproduced except with prior written approval from the testing laboratory.

This document has been signed by those names that appear on this report and are the authorised signatories.

Signatories

Position

Authorised results for

Fung Lim Chee, Richard

General Manager

Inorganics



Analytical Results

Sub-Matrix: FILTER (TSP/RSP)

Client sample ID

				AM40806 (201307)	AM40807 (201308)	AM40808 (201296)	AM40809 (201312)	AM40810 (201310)
				[06-AUG-2016]	[07-AUG-2016]	[08-AUG-2016]	[09-AUG-2016]	[10-AUG-2016]
Compound	CAS Number	LOR	Unit	HK1634163-001	HK1634163-002	HK1634163-003	HK1634163-004	HK1634163-005
EA/ED: Physical and Aggregate Properties								
HK-TSP: Total Suspended Particulates	----	0.0010	g	0.1821	0.1337	0.0736	0.2204	0.1842
HK-TSP: Initial Weight	----	0.0010	g	2.7552	2.7524	2.7694	2.8083	2.7641
HK-TSP: Final Weight	----	0.0010	g	2.9373	2.8861	2.8430	3.0287	2.9483



Sub-Matrix: FILTER (TSP/RSP)				Client sample ID	AM40811 (201321)	AM40812 (201309)			
				Client sampling date / time	[11-AUG-2016]	[12-AUG-2016]			
Compound	CAS Number	LOR	Unit		HK1634163-006	HK1634163-007			
EA/ED: Physical and Aggregate Properties									
HK-TSP: Total Suspended Particulates	----	0.0010	g		0.0816	0.1590			
HK-TSP: Initial Weight	----	0.0010	g		2.8123	2.7510			
HK-TSP: Final Weight	----	0.0010	g		2.8939	2.9100			



CERTIFICATE OF ANALYSIS

Client	: ENVIRONMENTAL PIONEERS & SOLUTION LTD	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 3
Contact	: ANDY TSANG	Contact	: Fung Lim Chee, Richard	Work Order	: HK1634166
Address	: FLAT A, 8/F, CHAI WAN INDUSTRIAL CENTRE, 20 LEE CHUNG STREET, CHAI WAN HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: kytsang@fsenv.com.hk	E-mail	: Richard.Fung@alsglobal.com		
Telephone	: +852 2185 0159	Telephone	: +852 2610 1044		
Facsimile	: +852 2258 0568	Facsimile	: +852 2610 2021		
Project	: PROPOSED ROAD IMPROVEMENT WORKS IN WEST KOWLOON RECLAMATION DEVELOPMENT - PHASE 1	Quote number	: ----	Date Samples Received	: 23-AUG-2016
Order number	: ----			Issue Date	: 25-AUG-2016
C-O-C number	: ----			No. of samples received	: 7
Site	: ----			No. of samples analysed	: 7

General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. Testing period is from 23-AUG-2016 to 24-AUG-2016.

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific Comments for Work Order: HK1634166

Sample(s) were received in ambient condition.

Sample(s) analysed and reported on an as received basis.

This report may not be reproduced except with prior written approval from the testing laboratory.

This document has been signed by those names that appear on this report and are the authorised signatories.

Signatories

Position

Authorised results for

Fung Lim Chee, Richard

General Manager

Inorganics



Analytical Results

Sub-Matrix: FILTER (TSP/RSP)

Client sample ID

				AM40813 (201311)	AM40814 (201320)	AM40815 (201325)	AM40816 (201324)	AM40817 (201322)
				[13-AUG-2016]	[14-AUG-2016]	[15-AUG-2016]	[16-AUG-2016]	[17-AUG-2016]
Compound	CAS Number	LOR	Unit	HK1634166-001	HK1634166-002	HK1634166-003	HK1634166-004	HK1634166-005
EA/ED: Physical and Aggregate Properties								
HK-TSP: Total Suspended Particulates	----	0.0010	g	0.0982	0.0471	0.1102	0.0710	0.0282
HK-TSP: Initial Weight	----	0.0010	g	2.8145	2.8048	2.8059	2.8080	2.8032
HK-TSP: Final Weight	----	0.0010	g	2.9127	2.8519	2.9161	2.8790	2.8314



Sub-Matrix: FILTER (TSP/RSP)				Client sample ID	AM40818 (201323)	AM40819 (201329)			
				Client sampling date / time	[18-AUG-2016]	[19-AUG-2016]			
Compound	CAS Number	LOR	Unit		HK1634166-006	HK1634166-007			
EA/ED: Physical and Aggregate Properties									
HK-TSP: Total Suspended Particulates	----	0.0010	g		0.0552	0.0874			
HK-TSP: Initial Weight	----	0.0010	g		2.8068	2.8018			
HK-TSP: Final Weight	----	0.0010	g		2.8620	2.8892			

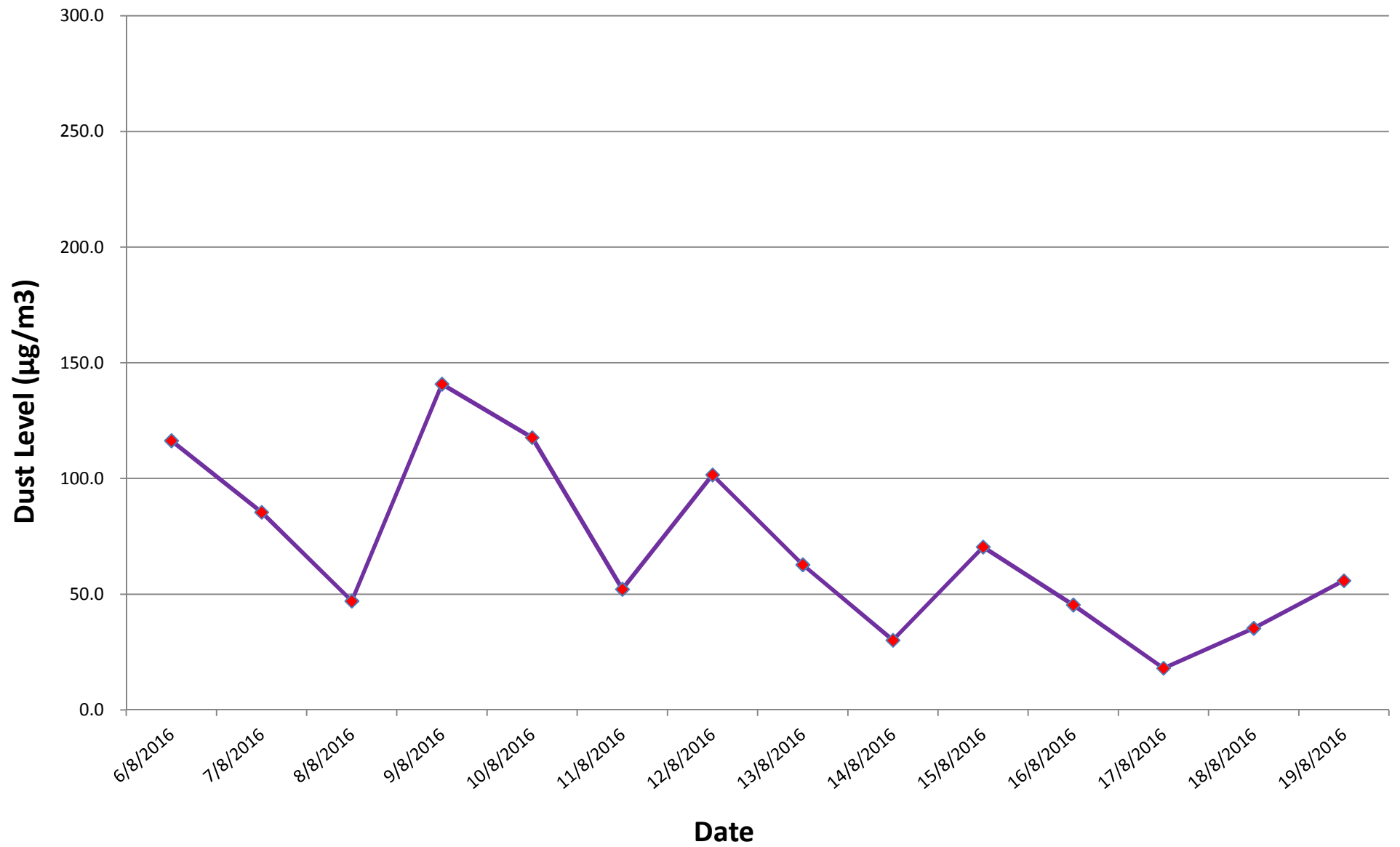
24-hr TSP Monitoring Result for AM4-A

Sampling ID & Paper No.	Sampling Date	Wt. of paper (g)			Flow Rate (CFM)			Total Volume # (m ³)	TSP Concentration (µg/m ³)	Temperature (°C) *	Wind Direction *	Wind Speed (m/s) *
		Initial Wt.	Final Wt.	Wt. of dust	Initial	Final	Avg Flow					
AM40806 201307	06/08/16	2.7552	2.9373	0.1821	45	45	45.0	1565.18	116	27 - 33	W	0.1-3.6
AM40807 201308	07/08/16	2.7524	2.8861	0.1337	45	45	45.0	1565.18	85	27 - 33	W	0-3.6
AM40808 201296	08/08/16	2.7694	2.8430	0.0736	45	45	45.0	1565.18	47	28 - 32	W	0-4.2
AM40809 201312	09/08/16	2.8083	3.0287	0.2204	45	45	45.0	1565.18	141	25 - 33	W	0-5.8
AM40810 201310	10/08/16	2.7641	2.9483	0.1842	45	45	45.0	1565.18	118	24 - 28	SE	0-5
AM40811 201307	11/08/16	2.8123	2.8939	0.0816	45	45	45.0	1565.18	52	25 - 29	W	0-3.3
AM40812 201307	12/08/16	2.7510	2.9100	0.1590	45	45	45.0	1565.18	102	27 - 30	NW	0-3.1
AM40813 201311	13/08/16	2.8145	2.9127	0.0982	45	45	45.0	1565.18	63	26 - 32	SE	0.1-5
AM40814 201320	14/08/16	2.8048	2.8519	0.0471	45	45	45.0	1565.18	30	25 - 29	SE	0.1-5.3
AM40815 201325	15/08/16	2.8059	2.9161	0.1102	45	45	45.0	1565.18	70	25 - 28	NE	0-3.3
AM40816 201324	16/08/16	2.8080	2.8790	0.0710	45	45	45.0	1565.18	45	25 - 27	SE	0-4.2
AM40817 201322	17/08/16	2.8032	2.8314	0.0282	45	45	45.0	1565.18	18	26 - 28	SE	0.83-6.4
AM40818 201323	18/08/16	2.8068	2.8620	0.0552	45	45	45.0	1565.18	35	26 - 29	SE	1.1-6.9
AM40819 201329	19/08/16	2.8018	2.8892	0.0874	45	45	45.0	1565.18	56	26 - 31	SE	0.83-5

*Remark: Data of temperature, wind direction and wind speed was extracted from King's Park Meteorological Station of HKO

#Remark: Total volume of the 24 hrs sampling was calculated from the Calibration worksheet (refer to Appendix B)

AM4-A - 24-hr TSP Graph plot

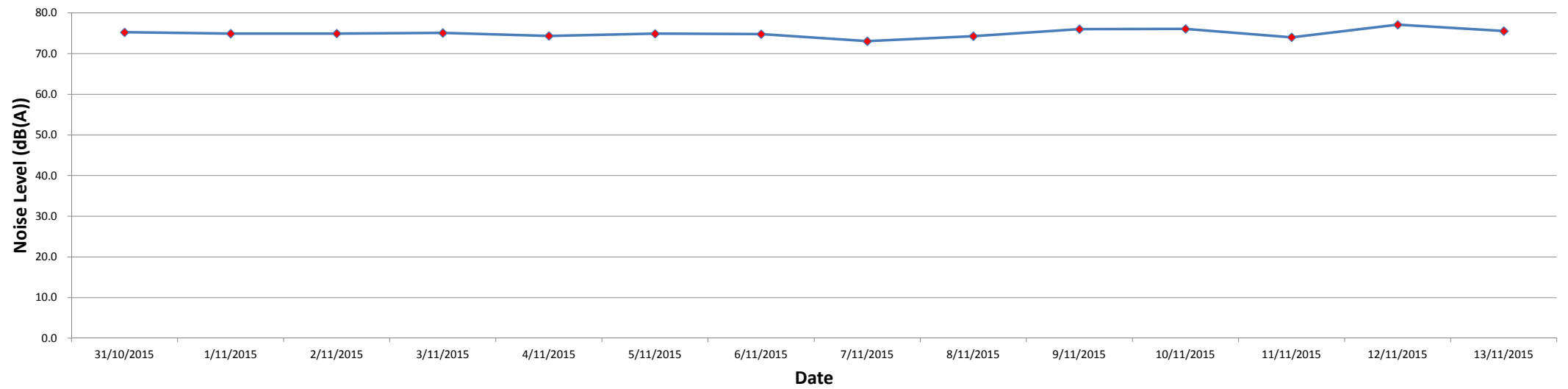


Noise Monitoring Result for NM1

Date	31/10/2015	1/11/2015	2/11/2015	3/11/2015	4/11/2015	5/11/2015	6/11/2015
Weather	Sunny	Sunny	Sunny	Sunny	Sunny	Sunny	Sunny
Temperature (°C)	27.2	24.5	25.4	25	24.2	27.8	25.2
Wind Direction	E	E	E	NE	NE	E	NE
Wind Speed (m/s)	<5	<5	<5	<5	<5	<5	<5
Start Time	15:00	14:00	14:00	14:00	9:00	14:00	9:00
Leq30min (dB(A))	75.2	74.9	75.0	75.1	74.4	74.9	74.8
L10 (dB(A))	79.2	77.4	78.0	78.5	77.4	77.2	77.4
L90 (dB(A))	69.9	71.7	70.0	69.1	69.3	71.5	69.6

Date	7/11/2015	8/11/2015	9/11/2015	10/11/2015	11/11/2015	12/11/2015	13/11/2015
Weather	Sunny	Sunny	Sunny	Sunny	Sunny	Cloudy	Cloudy
Temperature (°C)	27.5	27.9	26.4	24.4	23.8	24.1	24.2
Wind Direction	NE	E	E	NE	E	E	E
Wind Speed (m/s)	<5	<5	<5	<5	<5	<5	<5
Start Time	14:00	14:00	9:00	9:00	14:00	14:00	9:00
Leq30min (dB(A))	73.1	74.3	76.0	76.1	74.0	77.1	75.5
L10 (dB(A))	75.8	76.7	78.7	79.0	77.3	80.3	78.8
L90 (dB(A))	69.0	70.8	71.9	72.0	68.6	72.8	71.4

NM1 - Leq (30min) Graph plot

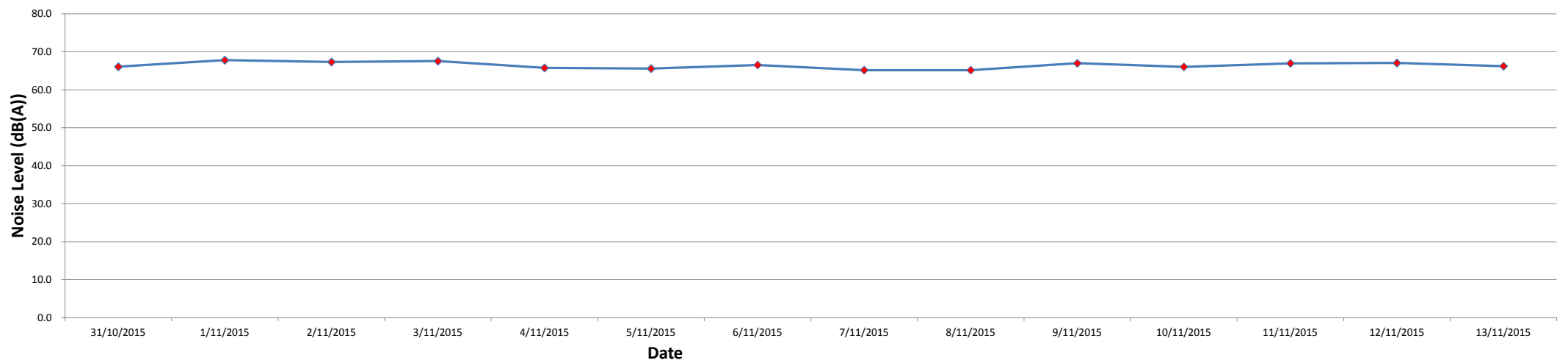


Noise Monitoring Result for NM2

Date	31/10/2015	1/11/2015	2/11/2015	3/11/2015	4/11/2015	5/11/2015	6/11/2015
Weather	Sunny	Sunny	Sunny	Sunny	Sunny	Sunny	Sunny
Temperature (°C)	27.2	24.5	25.4	25	24.2	27.8	25.2
Wind Direction	E	E	E	NE	NE	E	NE
Wind Speed (m/s)	<5	<5	<5	<5	<5	<5	<5
Start Time	17:30	16:30	16:30	16:30	11:30	16:30	11:30
Leq30min (dB(A))	66.1	67.8	67.3	67.6	65.8	65.6	66.5
L10 (dB(A))	69.3	70.2	69.8	70.3	68.1	68.6	70.4
L90 (dB(A))	62.3	63.4	62.1	63.7	62.5	59.1	63.5

Date	7/11/2015	8/11/2015	9/11/2015	10/11/2015	11/11/2015	12/11/2015	13/11/2015
Weather	Sunny	Sunny	Sunny	Sunny	Sunny	Cloudy	Cloudy
Temperature (°C)	27.5	27.9	26.4	24.4	23.8	24.1	24.2
Wind Direction	NE	E	E	NE	E	E	E
Wind Speed (m/s)	<5	<5	<5	<5	<5	<5	<5
Start Time	16:30	16:30	11:30	11:30	16:30	16:30	11:30
Leq30min (dB(A))	65.2	65.2	67.0	66.0	67.0	67.1	66.2
L10 (dB(A))	67.7	67.7	70.7	70.0	69.7	69.6	71.0
L90 (dB(A))	62.1	61.9	61.5	61.5	63.3	63.8	61.6

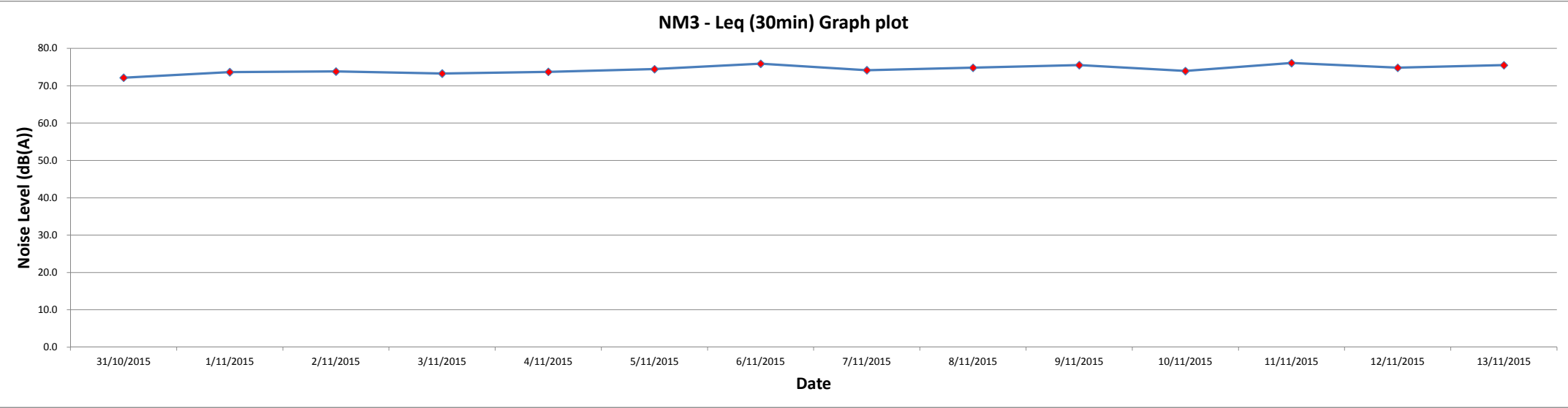
NM2 - Leq (30min) Graph plot



Noise Monitoring Result for NM3

Date	31/10/2015	1/11/2015	2/11/2015	3/11/2015	4/11/2015	5/11/2015	6/11/2015
Weather	Sunny	Sunny	Sunny	Sunny	Sunny	Sunny	Sunny
Temperature (°C)	27.2	24.5	25.4	25	24.2	27.8	25.2
Wind Direction	E	E	E	NE	NE	E	NE
Wind Speed (m/s)	<5	<5	<5	<5	<5	<5	<5
Start Time	15:30	14:30	14:30	14:30	9:30	14:30	9:30
Leq30min (dB(A))	72.2	73.6	73.8	73.3	73.7	74.4	75.9
L10 (dB(A))	75.6	76.8	76.9	76.6	76.9	77.5	78.4
L90 (dB(A))	67.1	68.4	69.5	66.7	68.8	70.8	72.4

Date	7/11/2015	8/11/2015	9/11/2015	10/11/2015	11/11/2015	12/11/2015	13/11/2015
Weather	Sunny	Sunny	Sunny	Sunny	Sunny	Cloudy	Cloudy
Temperature (°C)	27.5	27.9	26.4	24.4	23.8	24.1	24.2
Wind Direction	NE	E	E	NE	E	E	E
Wind Speed (m/s)	<5	<5	<5	<5	<5	<5	<5
Start Time	14:30	14:30	9:30	9:30	14:30	14:30	9:30
Leq30min (dB(A))	74.2	74.8	75.5	74.0	76.1	74.8	75.5
L10 (dB(A))	77.0	77.7	78.1	76.4	79.0	77.7	77.6
L90 (dB(A))	69.9	71.7	71.2	69.9	72.0	70.9	72.1

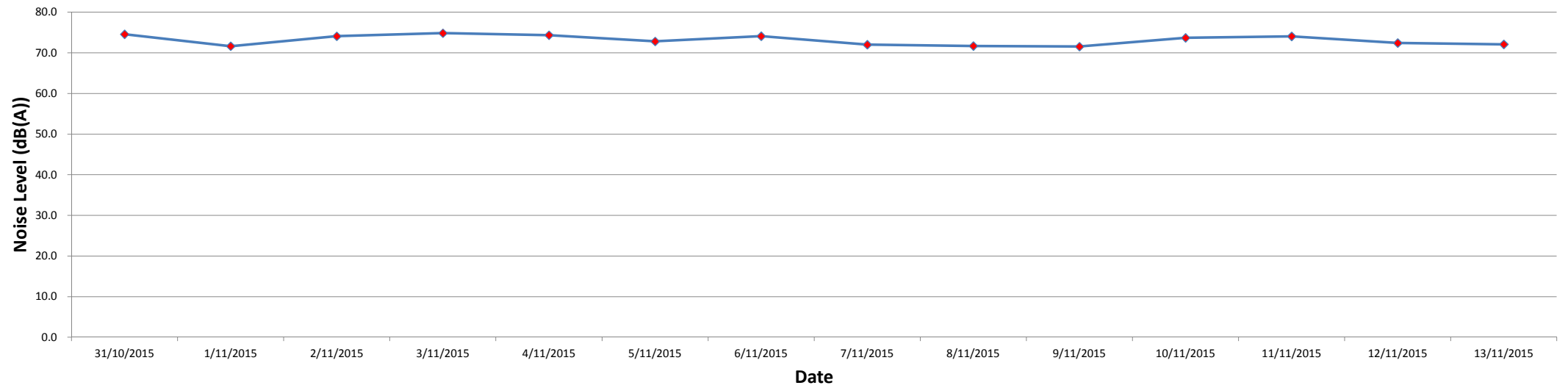


Noise Monitoring Result for NM4

Date	31/10/2015	1/11/2015	2/11/2015	3/11/2015	4/11/2015	5/11/2015	6/11/2015
Weather	Sunny	Sunny	Sunny	Sunny	Sunny	Sunny	Sunny
Temperature (°C)	27.2	24.5	25.4	25	24.2	27.8	25.2
Wind Direction	E	E	E	NE	NE	E	NE
Wind Speed (m/s)	<5	<5	<5	<5	<5	<5	<5
Start Time	16:15	15:15	15:15	15:15	10:15	15:15	10:15
Leq30min (dB(A))	74.6	71.7	74.1	74.8	74.4	72.8	74.1
L10 (dB(A))	77.2	74.5	77.1	78.0	78.1	75.5	77.3
L90 (dB(A))	69.6	67.0	67.1	69.3	67.7	67.7	68.3

Date	7/11/2015	8/11/2015	9/11/2015	10/11/2015	11/11/2015	12/11/2015	13/11/2015
Weather	Sunny	Sunny	Sunny	Sunny	Sunny	Cloudy	Cloudy
Temperature (°C)	27.5	27.9	26.4	24.4	23.8	24.1	24.2
Wind Direction	NE	E	E	NE	E	E	E
Wind Speed (m/s)	<5	<5	<5	<5	<5	<5	<5
Start Time	15:15	15:15	10:15	10:15	15:15	15:15	10:15
Leq30min (dB(A))	72.0	71.7	71.5	73.7	74.1	72.4	72.1
L10 (dB(A))	75.5	74.6	74.3	76.7	77.1	75.5	75.0
L90 (dB(A))	66.9	67.3	67.0	69.0	68.7	67.7	67.3

NM4 - Leq (30min) Graph plot



Noise Monitoring Result for NM5

Date	31/10/2015	1/11/2015	2/11/2015	3/11/2015	4/11/2015	5/11/2015	6/11/2015
Weather	Sunny	Sunny	Sunny	Sunny	Sunny	Sunny	Sunny
Temperature (°C)	27.2	24.5	25.4	25	24.2	27.8	25.2
Wind Direction	E	E	E	NE	NE	E	NE
Wind Speed (m/s)	<5	<5	<5	<5	<5	<5	<5
Start Time	16:50	15:50	15:50	15:50	10:50	15:50	10:50
Leq30min (dB(A))	71.3	72.1	71.0	72.5	71.3	71.8	71.2
L10 (dB(A))	74.4	75.0	74.1	75.1	73.5	75.4	74.2
L90 (dB(A))	65.9	68.4	66.3	68.1	68.3	66.3	66.6

Date	7/11/2015	8/11/2015	9/11/2015	10/11/2015	11/11/2015	12/11/2015	13/11/2015
Weather	Sunny	Sunny	Sunny	Sunny	Sunny	Cloudy	Cloudy
Temperature (°C)	27.5	27.9	26.4	24.4	23.8	24.1	24.2
Wind Direction	NE	E	E	NE	E	E	E
Wind Speed (m/s)	<5	<5	<5	<5	<5	<5	<5
Start Time	15:50	15:50	10:50	10:50	15:50	15:50	10:50
Leq30min (dB(A))	71.6	70.8	71.1	71.5	71.5	72.7	73.7
L10 (dB(A))	74.4	72.6	74.0	73.8	74.7	75.8	76.7
L90 (dB(A))	67.7	68.0	67.7	68.5	67.0	68.0	68.3

NM5 - Leq (30min) Graph plot

