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JOINT USER COMPLEX AND WHOLESALE FISH MARKET AT AREA 44, TUEN MUN

BASELINE ENVIRONMENTAL MONITORING REPORT

Prepared By:

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COMMERCIAL-IN-CONFIDENCE

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沛然環境評估工程顧問有限公司

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To provide a summary of the results from the baseline environmental monitoring conducted at the proposed Joint User Complex and Wholesale Fish Market at Area 44, Tuen Mun and to derive Action and Limit Levels for noise and air quality monitoring during the construction period.

EXECUTIVE SUMMARY

Baseline environmental monitoring for the proposed Joint User Complex and Wholesale Fish Market at Area 44, Tuen Mun has been carried out from 4 July 2008 to 17 July 2008 at Block 15, Yuet Wu Villa. Baseline 1-hr TSP and noise monitoring were conducted within the period of 0700-1900 hours, where baseline 24-hr TSP monitoring was conducted continuously. No major construction work occurred during the monitoring period.

1-hour TSP monitoring results at the monitoring location ranged from 96μg/m^3 to 188μg/m^3 with an average of 129μg/m^3. 24-hour TSP monitoring results ranged from 49μg/m^3 to 84μg/m^3 with an average of 65μg/m^3.

Noise monitoring results at the monitoring location ranged from 60.5dB(A) to 66.3dB(A) with an average of 62.9dB(A).

Action and Limit levels for air quality and noise impact monitoring were derived from the baseline monitoring results.The action level for noise impact monitoring is predefined as when any documented compliant is received. The limit level is $L_{eq(30min)}$75dB(A) at 1m away from the façade of a dwelling and $L_{eq(30min)}$70dB(A) ($L_{eq(30min)}$65dB(A) during examinations) at 1m away from the façade of a school.

From the monitoring results, the action and limit level for 1-hr and 24-hr TSP air quality impact monitoring were derived. The action level for 1-hour TSP impact monitoring is 334μg/m^3 and limit level is 500μg/m^3. The action level for 24-hour TSP impact monitoring is 173μg/m^3 and limit level is 260μg/m^3.

In the event of non-compliance with environmental regulations or contractual requirements, a recommended Event/Action Plan is given to be implemented by the Contractor.

1. INTRODUCTION

Baseline environmental monitoring was conducted for the proposed Joint User Complex and Wholesale Fish Market at Area 44, Tuen Mun. Results serve as a basis to evaluate the environmental performance of construction work at the subject site.

2. PROJECT BACKGROUND

A Joint User Complex and Wholesale Fish Market (WFM Complex) at Area 44 in Tuen Mun is proposed to be designed and built by Architectural Services Department on behalf of Agriculture, Fisheries and Conservation Department, Marine Department, and Food and Environmental Hygiene Department of the Hong Kong SAR. The WFM Complex is to provide a permanent site for the relocation of the existing temporary wholesale fish market at Tuen Mun Area 27 and to accommodate a community hall and dragon boat racing spectator stand for public use. The proposed development is a 3-storey complex to accommodate the wholesale fish market at the ground floor, a community hall on the first and second floors, and an extensive landscaped deck on roof level. The proposed Wholesale Fish Market is categorised as a designated project under the Environmental Impact Assessment Ordinance (EIAO) and therefore a detailed Environmental Impact Assessment (EIA-085/2002) has been conducted in year 2002 and an Environmental Permit (EP-296/2007) was issued by Environmental Protection Department in December 2007.

The subject site is located at Castle Peak Bay of Tuen Mun given in Figure 1. The subject site is bounded to the north by a future local open space presently used as a temporary car park, to the east by Castle Peak Bay typhoon shelter, to the south by a future lorry park and to the west by Wu Shan Road. Yuet Wu Villa being the nearest residential establishment is located at around 85m from the site boundary.

3. MONITORING LOCATION

Baseline Monitoring was conducted at Block 15 of Yuet Wu Villa. Air quality monitoring station was set up at the roof top of the residential block and noise monitoring was conducted at 1.2m above ground level at the junction of Wu Sau Street and Wu On Street as given in Figure 2 and 3. Figure 4 and 5 show photos taken during monitoring at the two locations.

4. CONSTRUCTION PROGRAMME

The construction of the proposed WFM complex is anticipated to last for 23 months. It is estimated that 6 months will be required for foundation construction and 15 months for superstructure construction. The foundation work will be commenced in end-July 2008 and the superstructure work will be commenced in February 2009.

All environmental mitigation measures for construction stages stated in approved EIA Report, EM&A Manual and Environmental Permit shall be carried out throughout the whole construction period as shown in Appendix A.

5. ENVIRONMENTAL REGULATIONS

5.1 Air Quality

5.1.1 Air Pollution Control Ordinance

Air quality is regulated under the provisions of the Air Pollution Control Ordinance (APCO). Under the current legislation, the Hong Kong Air Quality Objectives (HKAQO) provides the statutory AQOs for different air pollutants, as shown in Table 1.

Table 1 Hong Kong Air Quality Objectives

	Averaging Time				
Pollution μg/m^3	1 Hours (ii)	8 Hours (iii)	24 Hours (iii)	3 Months (iv)	1 Year (iv)
Sulphur Dioxide	800		350		80
Total Suspended Particulate			260		80
Respirable Suspended Particulate (v)			180		55
Carbon Monoxide	30000	10000			
Nitrogen Dioxide	300		150		80
Photochemical Oxidants (as ozone) (vi)	240				
Lead				1.5	

Note: (i) Measured at 298K (25^{o}C) and 101.325 kPa (one atmosphere)
(ii) Not to be exceeded more than three times per year
(iii) Not to be exceeded more than once per year
(iv) Yearly and three monthly figures calculated as arithmetic means
(v) Respirable suspended particulate means suspended particulates in air with nominal aerodynamic diameter of 10 micrometres and smaller
(vi) Photochemical oxidants are determined by measurement of ozone only

5.1.2 Construction Dust Criteria

In accordance with the requirements set out in the tender specifications, the Contractor shall adhere to the construction dust criteria stated in the *TM-EIAO*. The construction dust criteria adopted for the project shall comply with the Air Pollution Control Ordinance and its subsidiary regulations, particularly the Air Pollution Control (Open Burning) Regulation, Air Pollution Control (Construction Dust) Regulation, and the Air Pollution Control (Smoke) Regulation and the Environmental Impact Assessment Ordinance. Therefore, construction dust levels shall not exceed an hourly Total Suspended Particulate (TSP) concentration of 500μg/m^3 and daily TSP concentration of 260μg/m^3.

5.2 Noise

5.2.1 Environmental Legislation and Guidelines

The principal legislation for the control of construction noise is given in the Noise Control Ordinance (NCO). Various Technical Memoranda (TMs), which stipulate the control approaches and criteria for construction noise have been issued under the NCO. The following TMs are applicable to the control of noise from construction activities:

- Technical Memorandum on Noise from Construction Work other than Percussive Piling (GW-TM);
- Technical Memorandum on Noise from Construction Work in Designated Areas (DA-TM); and

GW-TM governs the use of specified powered mechanical equipment (PME) including compressors, bored piling, concrete pumps, concrete mixers, generators, excavators, etc.

DA-TM governs construction works to be carried out within Designated Area during restricted hours (1900-0700). It covers Prescribed Construction Works (PCW) including erection or dismantling of formwork or scaffolding; loading, unloading or handling of rubble, wooden boards, steel bars, wood or scaffolding material; and hammering. If the subject site falls within a Designated Area, any PCW carried out during restricted hours shall require a valid CNP.

A Construction Noise Permit (CNP) is required for any construction work carried out during the night-time (2300 to 0700 hours), evening (1900 to 2300 hours) and any time on general holidays, including Sundays.

The NCO requires construction noise levels to comply with the stipulated Acceptable Noise Level (ANL) as given in GW-TM and DA-TM. The ANL is dependent on the Area Sensitivity Rating assigned for the NSR.

In addition, other related regulations, namely the Noise Control (Hand held percussive breakers) Regulation and Noise Control (Air Compressors) Regulation control the noise emission from hand held breakers and air compressors with respect to relevant noise emission standards and fixing of noise emission labels.

5.2.2 Construction Noise Criteria

The Contractor shall adhere to the noise criteria found in the *TM-EIAO*, as the criteria laid down in ProPECC PN 2/93.

The noise standards are dependent on the type of sensitive uses of the receivers of concern. According to EPD's Practical Note for Professional Persons: Noise from construction activities: Non-statutory Contols (ProPECC PN 2/93), the recommended day-time construction noise level (0700-1900 on any day not being a Sunday or general holiday) shall be limited to 75dB(A) (Leq, 30mins) at sensitive residential buildings with opened windows and, 70dB(A) and 65dB(A) (during examinations) at school and educational buildings in the neighbourhood, as given in Table 2.

Table 2 Acceptable Noise Levels for day, evening and night periods

	Noise Standards, dB(A), Leq (30mins)	
Uses	0700 to 1900 hours on any day not being a Sunday or general holiday	1900 to 0700 hours or any time on Sunday or general holiday
All domestic premises including temporary housing accommodation	75	(see Note)
Hotels and hostels	75	(see Note)
Educational institutions including kindergartens, nurseries and all others where unaided noise communication is required	70 65 (during exam.)	(see Note)

Note: The criteria laid down in the relevant technical memoranda under the Noise Control Ordinance for designated areas and construction works other than percussive piling may be used for planning purposes. A Construction Noise Permit (CNP) shall be required for carrying out construction work during the period (night time 2300-0700, evening 1900-2300, and any Sunday or general holiday).

6. MONITORING METHODOLOGY

6.1 Baseline Monitoring Programme

Baseline 1-hr TSP air quality monitoring and noise monitoring were conducted at Block 15, Yuet Wu Villa from 4 July 2008 to 17 July 2008 between 0700-1900 hours. Baseline 24-hr TSP was conducted continuously during the monitoring period.

No major construction work took place during the monitoring periods.

6.2 Air Quality Monitoring

Baseline 1-hour and 24-hour TSP air quality monitoring was conducted at the designated air quality monitoring location using two sets of High Volume TSP Samplers (Model No: Anderson GMWS-2310 ACCU-VOL) at the designated location between 0700-1900 hours. The Calibration Record of the High-Volume TSP Sampler is given in Appendix B. 1-hour TSP samples were taken three times a day.

6.3 Noise Monitoring

Baseline noise monitoring was conducted at the designated noise monitoring location between 0700-1900 hours using a sound level meter which complies with the International Electrotechnical Commission Publications 651:1979 (Type 1) and 804:1985 (Type 1). Noise instrumentation details are given in Table 3 and the Calibration Certificate for the sound level meter and calibrator is given in Appendix C.

Table 3 Noise Monitoring Equipment

Manufacturer	Type/Model No.	Equipment
RION	Model NL 31	Precision Sound Level Analyser with windshield
RION	Model NC 73	Calibrator

Baseline noise levels measurements were recorded in terms of thirty minutes A-weighted equivalent continuous sound pressure level (Leq(30min)) on a daily basis. The sound level meter was calibrated immediately prior to and following each noise measurement. The meter was mounted on a tripod at a height of 1.2m and the microphone was positioned at 1m away the building façade of the noise monitoring station facing the construction site.

Noise measurements were not made in the presence of fog, rain, and wind with a steady speed exceeding 5m/s or wind with gusts exceeding 10m/s. The wind speed was checked with a portable anemometer capable of measuring the wind speed in m/s.

7. RESULTS

7.1. Air Quality

1-hour and 24-hour TSP monitoring results are summarized in Table 4 and 5 and serve as the basis for determining the action and limit levels. The minimum and maximum 1-hour TSP measured at Yuet Wu Villa was 96μg/m^3 and 188μg/m^3 respectively with an average of 129μg/m^3. The minimum and maximum 24-hour TSP measured was 49μg/m^3 and 84μg/m^3 respectively with an average of 65μg/m^3. Summary of air quality monitoring record will be provided in Appendix D and E.

Table 4 1-Hour TSP Monitoring Results

Day	Date	1-hr TSP (μg/m^3)				***Average (μg/m^3)***
		Reading 1	Reading 2	Reading 3	Average	
1	4 Jul 2008	159	122	129	137	***129***
2	5 Jul 2008	139	143	156	146	
3	6 Jul 2008	115	110	122	116	
4	7 Jul 2008	98	110	100	103	
5	8 Jul 2008	94	112	123	110	
6	9 Jul 2008	104	100	104	103	
7	10 Jul 2008	94	81	112	96	
8	11 Jul 2008	101	97	104	101	
9	12 Jul 2008	123	125	102	117	
10	13 Jul 2008	119	134	105	119	
11	14 Jul 2008	134	136	151	140	
12	15 Jul 2008	143	151	172	156	
13	16 Jul 2008	181	180	202	188	
14	17 Jul 2008	164	193	180	179	

Table 5 24-Hour TSP Monitoring Results

Day	Date	24-hr TSP (μg/m^3)	Day	Date	24-hr TSP (μg/m^3)
1	4 Jul 2008	66	8	11 Jul 2008	49
2	5 Jul 2008	70	9	12 Jul 2008	65
3	6 Jul 2008	68	10	13 Jul 2008	58
4	7 Jul 2008	60	11	14 Jul 2008	53
5	8 Jul 2008	58	12	15 Jul 2008	79
6	9 Jul 2008	63	13	16 Jul 2008	84
7	10 Jul 2008	57	14	17 Jul 2008	82
				Average	***65***

7.2. Noise

Noise monitoring results in terms of $L_{eq(30min)}$, $L_{10(30min)}$ $L_{90(30min)}$ measured at the designated noise monitoring location are summarized in Table 6. L_{10} and L_{90} represent sound levels that are exceeded 10% and 90% of the time respectively. Normally, L_{10} measurements can be considered as the average peak levels, whilst L_{90} levels can be considered as the average background noise levels.

Noise monitoring results are summarized in Table 6 serve as a basis for determining the action and limit levels. Baseline noise monitoring results also represent the background noise climate of the area and may be used to carry out background noise corrections to determine the actual noise impact caused by construction work at the site. The minimum and maximum baseline noise level measured at Yuet Wu Villa was 60.5dB(A) $L_{eq(30min)}$ and 66.3dB(A) $L_{eq(30min)}$ respectively with an average of 62.9dB(A) $L_{eq(30min)}$. Summary of noise monitoring record will be provided in Appendix F.

Table 6 Noise Monitoring Results

Day	Date	$L_{10(30mins)}$ (dB(A))	$L_{90(30mins)}$ (dB(A))	$L_{eq(30mins)}$ (dB(A))
1	4 Jul 2008	66.2	53.4	65.4
2	5 Jul 2008	64.1	56.0	62.5
3	6 Jul 2008	63.6	55.9	62.5
4	7 Jul 2008	65.0	56.6	63.5
5	8 Jul 2008	63.2	57.9	61.4
6	9 Jul 2008	67.1	56.1	66.3
7	10 Jul 2008	64.7	54.5	63.5
8	11 Jul 2008	63.6	58.1	61.7
9	12 Jul 2008	63.1	57.2	60.9
10	13 Jul 2008	62.8	57.4	60.5
11	14 Jul 2008	64.1	58.2	62.1
12	15 Jul 2008	65.5	54.8	63.1
13	16 Jul 2008	64.7	53.7	63.4
14	17 Jul 2008	65.2	55.1	63.7
	Average	***64.5***	***56.1***	***62.9***

7.3. Wind data

According to the EM&A Manual, wind data monitoring equipment shall be provided and set up at conspicuous locations for logging wind speed and wind direction near to the dust monitoring locations with the following requirements:

a) The wind sensors shall be installed at least 10m above ground so that they are clear of obstructions or turbulence caused by buildings;
b) The wind data shall be captured by a data logger. The data shall be down loaded for analysis at least once a month;
c) The wind data monitoring equipment shall be re-calibrated at least once every six months; and;
d) Wind direction shall be divided into 16 sectors of 22.5 degrees each.

Wind data of the monitoring station were obtained from the nearest Hong Kong Observatory (HKO) Tuen Mun automatic weather station located at Tuen Mun Town Park (63 mPD), which shall satisfy the above requirements. Table 7 summarises the wind data during the baseline monitoring period. Wind record from HKO will be shown in Appendix G.

Table 7 Summary of Weather Conditions during the Baseline Monitoring Period

Date	*Weather*	*Prevailing Wind direction*	*Daily Average Wind speed (m/s)*
4 Jul 2008	Sunny	SSE	2.9
5 Jul 2008	Sunny	S	3.0
6 Jul 2008	Rainy	SE	2.3
7 Jul 2008	Rainy	N	2.1
8 Jul 2008	Rainy	SSE	2.5
9 Jul 2008	Rainy	S	2.2
10 Jul 2008	Rainy	SSE	1.8
11 Jul 2008	Rainy	SSE	2.3
12 Jul 2008	Cloudy	SSW	2.3
13 Jul 2008	Rainy	SSE	2.1
14 Jul 2008	Fine	S	2.3
15 Jul 2008	Fine	*No data*	*No data*
16 Jul 2008	Sunny	SSE	2.1
17 Jul 2008	Sunny	SSW	1.9

8. MAJOR INFLUENCING FACTORS

A construction site for the proposed Junior Police Officers' Married Quarters is located at 110m away from the monitoring location, which is the major source of the TSP generation during the baseline monitoring period. Figure 6 shows the photos of the construction site.

The weather condition is also a major factor affecting the monitoring results. As shown in Table 7 above, 7 out of 14 days were rainy, which generally resulted in a lower TSP concentration.

9. ACTION AND LIMIT LEVELS

Baseline monitoring results form the basis for determining the noise and air quality criteria for impact monitoring assessment during the construction phase of the project. The criteria shall be referred to as the Action and Limit Levels. According to EM&A Guidelines as shown in Table 8, the proposed Action and Limit Levels for air quality are summarized in Table 9. The average baseline 1-hr TSP value of 129μg/m^3 and 24-hr TSP value of 65μg/m^3 measured at Block 15, Yuet Wu Villa was used to determine the action and limit level for air quality impact monitoring. The proposed Action and Limit Levels for construction noise are summarized in Table 10.

Table 8 Action and Limit Level for Air Quality from EM&A Guidelines

Parameters	*Action*	*Limit (μg/m³)*
24 Hour TSP Level in μg/m³	For baseline level <= 200 μg/m³, Action level = (Baseline level * 1.3 + Limit level)/2; For baseline level > 200 μg/m³, Action level = Limit level	260
1 Hour TSP Level in μg/m³	For baseline level <= 384 μg/m³, Action level = (Baseline level *1.3 + Limit level)/2 For baseline level > 384 μg/m³, Action level = Limit level	500

Table 9 Action and Limit Level for Air Quality Impact Monitoring at Yuet Wu Villa

Parameters	*Baseline Level (μg/m^3)*	*Action Level (μg/m^3)*	*Limit Level (μg/m^3)*
24 Hour TSP Level	65	173	260
1 Hour TSP Level	129	334	500

Table 10 Action and Limit Levels for Construction Noise Impact Monitoring

Time Period	*Action Level*	*Limit Level*
Daytime (0700-1900 hours) on weekdays	When one documented compliant is received	Dwelling 75dB(A)[1] School 70dB(A)[1] (65dB(A) during examinations)[1]
1900-2300 on any day and 0700-2300 on Sunday and general holidays, for use of PME[2]	When one documented compliant is received	65dB(A)[3]
All days during the night-time (2300-0700 hours) [2]	When one documented compliant is received	50dB(A)[3]

Note: 1. Construction noise criteria stipulated in the TM-EIAO
2. A Construction Noise Permit (CNP) shall be required for the carrying out of the construction work during the restricted hours (1900-2300 on any day and 0700-2300 on Sunday and general holidays, for use of PME; and All days during the night-time (2300-0700 hours))
3. Area sensitivity rating of the monitoring location is "B".

Should non-compliance of the above Action and Limit levels occurs, the contractor shall undertake corresponding in accordance with the proposed Event and Action Plan given in Table 11 and the Event/ Action Plans given in EM&A Manual.

Table 11 Event Contingency Plan

Level	**Step 1**	**Step 2**	**Step 3**
Action	• Identify source • Check monitoring data and working methods	• Contact project manager to discuss and implement remedial action • Rectify any unacceptable practice • Amend working methods if appropriate • If exceedance continues, commence additional monitoring	• Notify client/project manager following correct of the situation • Cease additional monitoring if exceedance stops
Limit	• Identify source • Notify client/project manager • Check monitoring data and working methods • Repeat measurement to confirm finding	• Take immediate action to avoid further exceedance • Submit proposal for remedial actions to client/project manager within 3 working days • Implement the agreed	• Notify client/project manager following correction of the situation • Cease additional monitoring if exceedance stops

	• Commence additional monitoring	proposal • If exceedance continues, amend and resubmit the proposal	

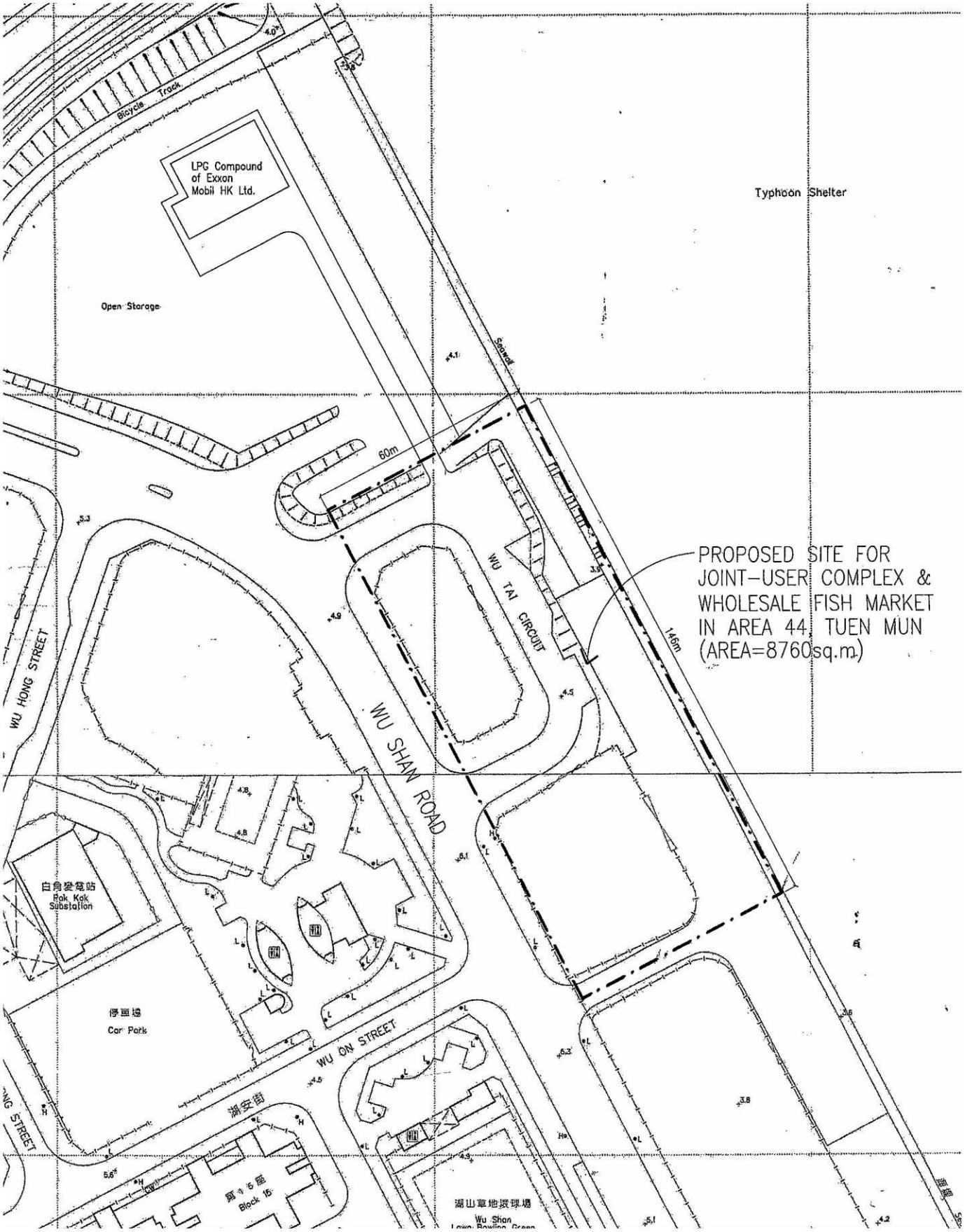
10. CONCLUSIONS

Baseline environmental monitoring has been carried out for the proposed Joint User Complex and Wholesale Fish Market at Area 44, Tuen Mun.

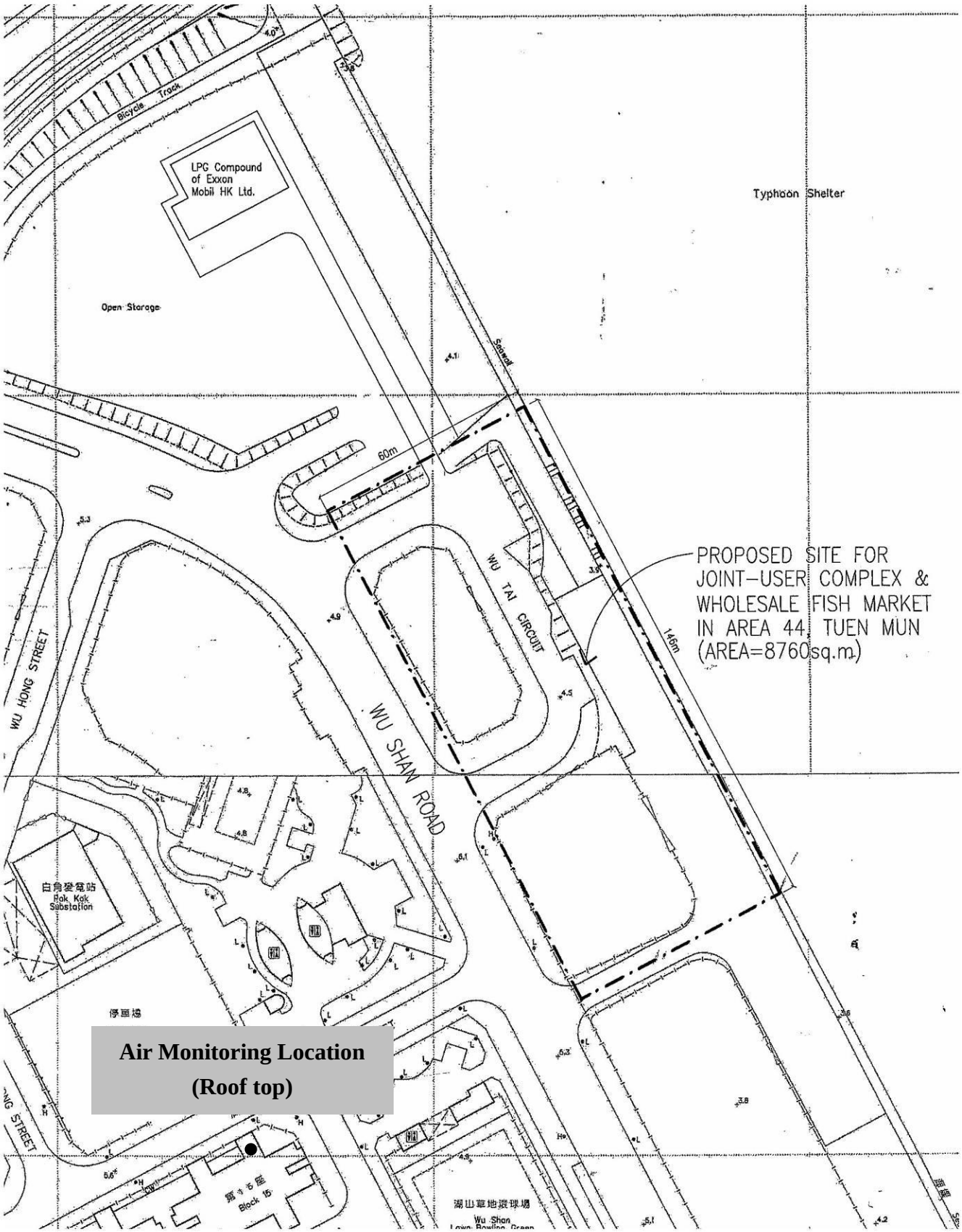
Baseline 1-hour and 24-hour TSP air quality monitoring and noise monitoring was conducted at Block 15, Yuet Wu Villa from 4 July 2008 to 17 July 2008.

Action and Limit levels for air quality and noise impact monitoring were derived from the baseline monitoring results. For 1-hour TSP air quality impact monitoring, the action level is 334 and the limit level is 500. For 24-hour TSP air quality impact monitoring, the action level is 173 and the limit level is 260.For impact noise monitoring, the action level is predefined as when one documented complaint is received. The limit level is the daytime construction noise criteria given in ProPECC PN 2/93.

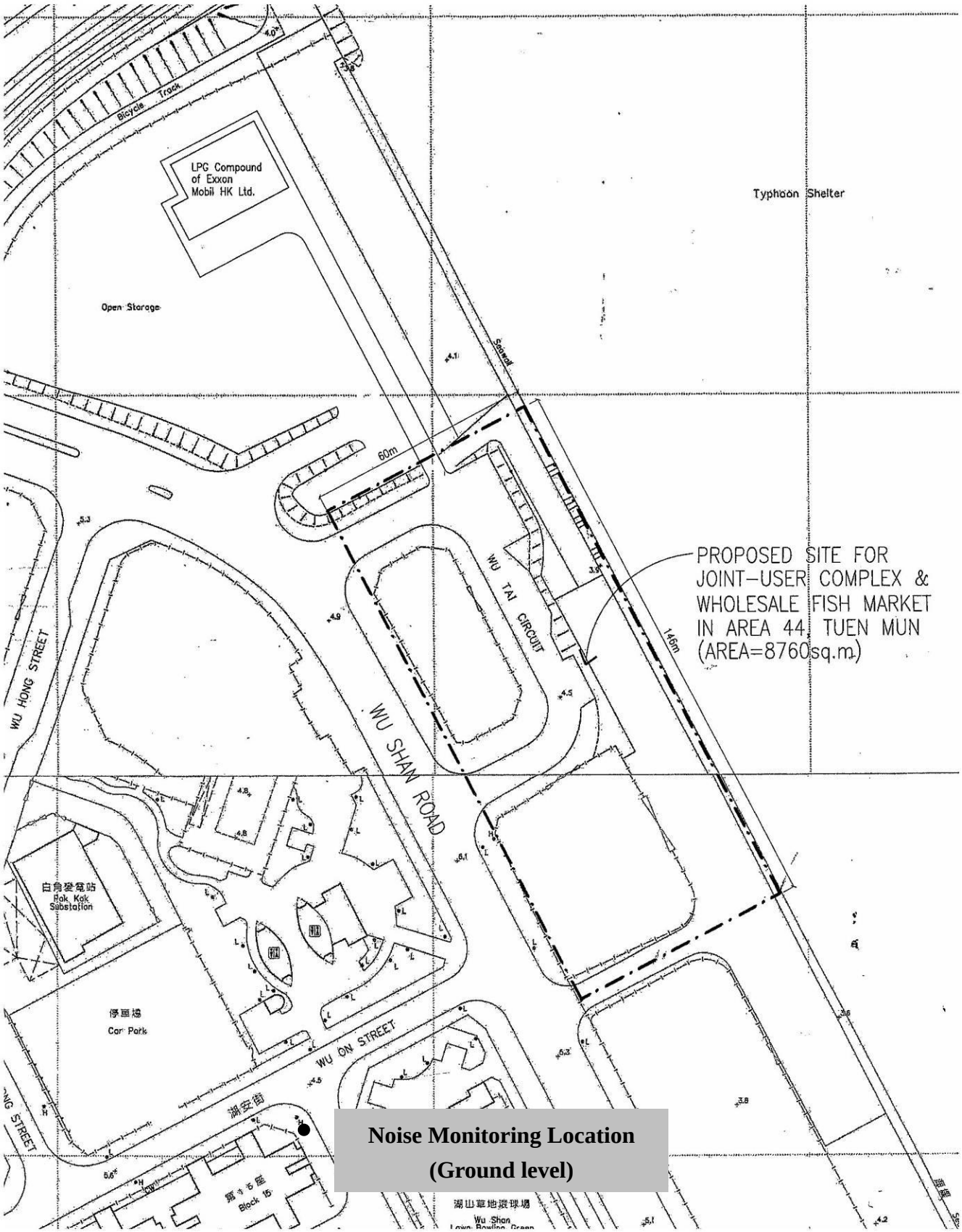
Baseline noise monitoring results also represent the background noise climate of the area and may be used to carry out background noise corrections to determine the actual noise impact caused by construction work at the site. In the event of non-compliance with environmental regulations or contractual requirements, a recommended Event/Action Plan is given to be implemented by the Contractor.



JOINT USER COMPLEX AND WHOLESALE FISH MARKET AT AREA 44, TUEN MUN **SITE LOCATION PLAN**	Figure No. 1	Rev.: 0
	Scale NTS	Date 07/08



JOINT USER COMPLEX AND WHOLESALE FISH MARKET AT AREA 44, TUEN MUN	Figure No. 2	Rev.: 0	AEC
	Scale NTS	Date 07/08	
LOCATION OF AIR QUALITY MONITORING STATION			

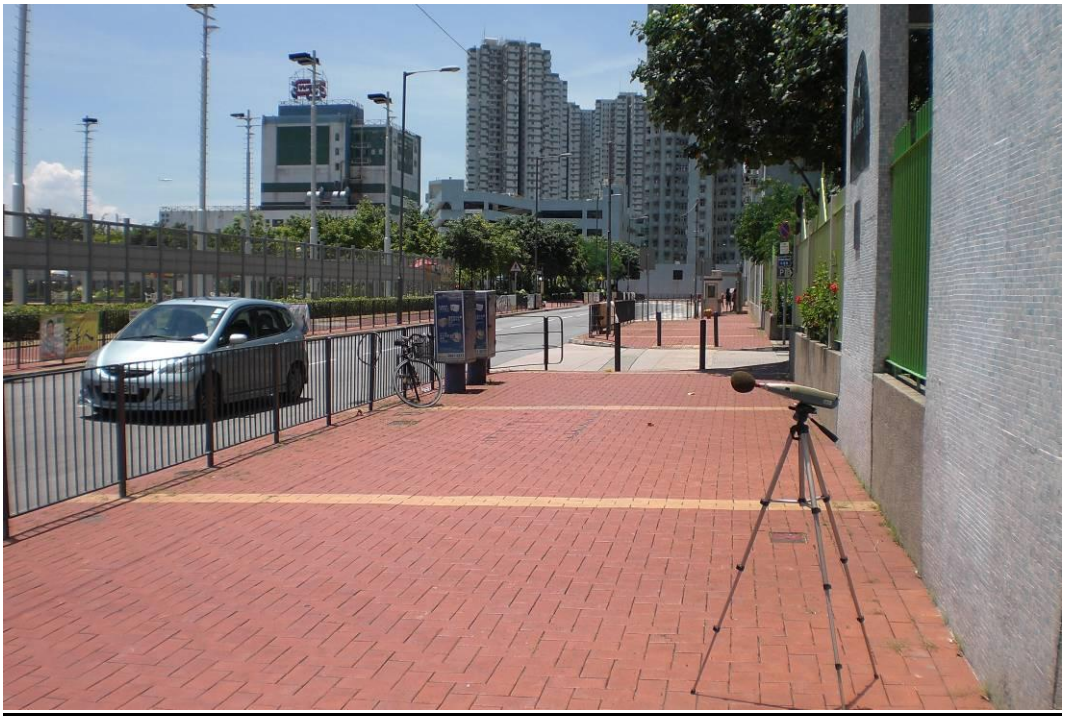


JOINT USER COMPLEX AND WHOLESALE FISH MARKET AT AREA 44, TUEN MUN **LOCATION OF NOISE MONITORING STATION**	Figure No. 3	Rev.: 0
	Scale NTS	Date 07/08

Roof top of Block 15, Yuet Wu Villa

High-Volume Dust Sampler

JOINT USER COMPLEX AND WHOLESALE FISH MARKET AT AREA 44, TUEN MUN **PHOTOS OF AIR QUALITY MONITORING STATION**	Figure No. 4	Rev.: 0
	Scale NTS	Date 07/08



Noise monitoring station

View from the noise monitoring station

JOINT USER COMPLEX AND WHOLESALE FISH MARKET AT AREA 44, TUEN MUN **PHOTOS OF NOISE MONITORING STATION**	Figure No. 5	Rev.: 0	AEC
	Scale NTS	Date 07/08	

JOINT USER COMPLEX AND WHOLESALE FISH MARKET AT AREA 44, TUEN MUN **PHOTOS OF CONSTRUCTION SITE FOR JUNIOR POLICE OFFICERS' MARRIED QUARTERS**	Figure No. 6	Rev.: 0	AEC
	Scale NTS	Date 07/08	

Appendix A

Mitigation Measures Implementation Schedule for Construction Stage

MITIGATION MEASURES IMPLEMENTATION SCHEDULE FOR CONSTRUCTION STAGE

EIA Ref. Section	EM&A Ref. Section	Environmental Protection Measures	Location/Duration of Measures/ Timing of completion measures	Relevant Legislation & Guidelines
4.7	2.8	**Air Quality** • Hoarding of not less than 2.4m high shall be provided along the site boundary section adjoins a road, street, service land or other area accessible to the public • Spray water to where excavation to be taken place immediately prior to, during and after excavation • Any stockpile of dusty material shall be either: (a) covered entirely by impervious sheeting; (b) placed in an area sheltered on the top and the three sides; or (c) sprayed with water or a dust suppression chemical so as to maintain the entire surface wet • Cement bags or any other dusty materials collected during the work should be disposed of in totally enclosed containers • All dusty materials should be sprayed with water immediately prior to any loading, unloading or transfer operation so as to minimise the dusty materials wet • Any dusty material remaining after a stockpile of cement or other materials is removed should be wetted and removed from the surface of roads • Where a vehicle leaving the construction site is carrying a load of dusty materials, the load shall be covered entirely by clean impervious sheeting to ensure that the dusty materials do not leak from the vehicle • Conveyor belts shall be fitted with windboards, and conveyor transfer points and hopper discharge areas shall be enclosed and fitted with belt cleaners • Skip hoist for the transport of construction wastes should be properly enclosed • Vehicle washing facilities including a high pressure water jet shall be provided at the designated vehicle exit point and every vehicle immediately before leaving the construction site shall be washed to remove any dusty materials from its body and wheels • Every main haul road, vehicle washing areas and the section of road between the washing facilities and the exit point shall be paved with concrete, bituminous materials, hardcore or metal plates and kept clear of dusty materials or sprayed with water so as to maintain the entire road surface wet • Debris from the construction of the WFM shall be covered entirely by impervious sheeting or stored in a sheltered debris collection area	Construction site of the proposed WFM/ Throughout the construction period	APCO/EIA Study
5.7	3.7	**Noise** • Use quiet construction equipment • Use silencers / mufflers, noise barriers / enclosure where practicable • The Contractor is required to determine the number and type of construction equipment taking	Construction site of the proposed WFM throughout the	NCO/EIA Study

EIA Ref. Section	EM&A Ref. Section	Environmental Protection Measures	Location/Duration of Measures/ Timing of completion measures	Relevant Legislation & Guidelines
		into account the use of quiet plant while devising a feasible work programme • Only well-maintained plant shall be operated on-site and all equipment shall be routinely checked • Turn off or throttle down idle plant • Plants known to emit noise strongly shall be oriented away from NSRs • Mobile plants shall be sited as far away from NSRs as possible • Stockpiles and other structures shall be effectively utilised as practicable to screen noise from on-site construction activities • Obtain valid noise permits for construction work during restricted hours	construction period	
6.7	4.1	**Water Quality** • Site shall be kept clean and tidy to avoid construction materials and waste being washed off from site • Works shall be planned to avoid rainy season so as to minimize the runoff and reduce the amount of soil that can be carried offsite • Surface run-off from the construction site shall be directed to silt traps or sedimentation basin before reuse or discharge with help of channels, earth bunds or sand bag barriers for suspended solids removal prior to its being discharged to storm water drain. Silt trap design shall conform to the guidelines laid down in Appendix A1 of ProPECC PN 1/94 • Wastewater likely to be contaminated with oil or grease should be passed through an oil separator or grease trap before entering the site drainage system • Hoarding gaps should be tightly sealed to avoid the seepage of wastewater to the nullah and outside the site • Perimeter channels shall be provide at site boundaries, where necessary, to intercept storm-water runoff from outside the site • Silt traps, sedimentation basins, channels and manholes shall be regularly cleaned to remove the deposited silt and grit • Temporarily exposed slope surfaces and construction material stockpiles shall be covered with tarpaulin or similar fabric to prevent erosion • Wastewater generated from bored-piling shall be re-circulated after sedimentation as practicable. The final discharge of the wastewater shall be via silt removal facilities • All fuel tanks and chemical storage areas shall be surrounded by bunds with a capacity equal to 110% of the storage capacity of the largest tank to prevent spilled oil, fuel and chemicals from reaching the receiving waters • Obtain valid discharge license for construction site discharges • Chemical toilets shall be provided on site • Monitor the quality of water discharge to ensure compliance of the license condition	Construction site of the proposed WFM Throughout the construction period	WPCO/EIA Study

EIA Ref. Section	EM&A Ref. Section	Environmental Protection Measures	Location/Duration of Measures/ Timing of completion measures	Relevant Legislation & Guidelines
		• Surface drainage channels of operational areas shall be easily cleaned and connected to foul sewerage		
7.2	5.1	**Waste Management** • Reuse of excavated soils for back-filling and landscaping purposes • All reusable and recyclable waste materials shall be segregated and stored in different containers, skips or stockpiled • Separate the inert and non-inert portions of construction material for disposal of public fill and landfill respectively • Employ approved licensed waste collectors to collect the inert construction materials to be disposed of at public fill • Provide a temporary storage areas for storing and stockpiling reusable and recyclable materials • Contractor should register as chemical waste producer should chemical waste is produced • Licensed waste collectors shall be employed for collecting chemical wastes for disposal • Handling and Disposal of chemical waste shall be in accordance with the Code of Practice on the Practice on the Packaging, Labelling and Storage of Chemical Wastes issued under the Waste Disposal Ordinance • Quantities of waste materials generated on site and disposal record (e.g. trip ticket) shall be kept on site for inspection • A Waste Management Plan (WMP) shall be prepared to set out waste handling and disposal strategy and submitted for the architect's approval • Material being temporary used for construction shall be recyclable as possible • Design and provide an area within the construction site to allow on-site sorting and segregation of waste materials • Training shall be provided to site staff on waste minimisation practices including waste reduction, reuse and recycling • Disposal of C&D material shall be monitored by Trip-Ticket System • In order to minimize the amount of waste disposal, durable and reusable containers should be used, where practicable, instead of plastic bags	Construction site of the proposed WFM Throughout the construction period	WDO/EIA Study WBTC No.5/99
8.7	6.1	**Hazard to Life** • Cranes shall be located away from the LPG compound and its access as far as possible • Before excavation work is undertaken, the gas company should be contacted to obtain information (drawings, plans) of all gas pipes in the vicinity of the site. Suitable pipe locating devices must be used to locate underground pipes. Hand dug trial holes must then be used to confirm the position of underground pipes. Excavation must be carried out with extreme care following any advice given by the Gas Authority or Gas Company	Construction site of the proposed WFM Throughout the construction period	

EIA Ref. Section	EM&A Ref. Section	Environmental Protection Measures	Location/Duration of Measures/ Timing of completion measures	Relevant Legislation & Guidelines
		• Sufficient guidance shall be given to all workers before carrying out excavation in the vicinity of pipelines • Manually operated warning siren shall be installed to instruct people to take timely shelter • Fire drill exercises shall be organized for the workers at the site and users of the WFM		

Appendix B

Calibration Record of High-Volume TSP Sampler

High-Volume TSP Sampler
5-Point Calibration Record

Location	:	A1, Yuet Wu Villa (1- hr Monitoring)
Calibrated by	:	P.F.Yeung
Date	:	4/7/08

Sampler

Model	:	GMWS-2310 ACCU-VOL
Serial Number	:	S/N 8790

Calibration Orfice and Standard Calibration Relationship

Serial Number	:	CM-AIR-43
Service Date	:	2 July 2007
Slope (m)	:	0.057452
Intercept (b)	:	-0.026137
Correlation Coefficient(r)	:	0.999910

Standard Condition

Pstd (hpa)	:	1013
Tstd (K)	:	298.18

Calibration Condition

Pa (hpa)	:	1012
Ta(K)	:	302

Zero Erro of Sampler Flow Rate Indication

IO	:	0.0

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC	Y
1	18 holes	10.9	3.287	1.663	46	45.7
2	13 holes	8.9	2.970	1.504	40	39.8
3	10 holes	6.7	2.577	1.308	37	36.8
4	7 holes	4.3	2.064	1.052	26	25.9
5	5 holes	2.1	1.443	0.741	18	17.9

Sampler Calibration Relationship

Slope(m): 35.953 Intercept(b): -9.528 Correlation Coefficient(r): 0.9989

Checked by: Magnum Fan Date: 5/07/08

High-Volume TSP Sampler
5-Point Calibration Record

Location	:	A1, Yuet Wu Villa (24 hr Monitoring)
Calibrated by	:	P.F.Yeung
Date	:	4/07/08

Sampler

Model	:	GMWS-2310 ACCU-VOL
Serial Number	:	S/N 0890

Calibration Orfice and Standard Calibration Relationship

Serial Number	:	CM-AIR-43
Service Date	:	2 July 2007
Slope (m)	:	0.057452
Intercept (b)	:	-0.026137
Correlation Coefficient(r)	:	0.999910

Standard Condition

Pstd (hpa)	:	1013
Tstd (K)	:	298.18

Calibration Condition

Pa (hpa)	:	1012
Ta(K)	:	302

Zero Erro of Sampler Flow Rate Indication

IO : 0.0

Resistance Plate		dH [green liquid] (inch water)	Z	X=Qstd (cubic meter/min)	IC (indicated flow)	Y
1	18 holes	9.3	3.104	1.512	54	55.0
2	13 holes	7.5	2.788	1.359	49	49.9
3	10 holes	5.7	2.430	1.186	42	42.8
4	7 holes	3.6	1.931	0.945	34	34.6
5	5 holes	2.1	1.475	0.724	26	26.5

Sampler Calibration Relationship

Slope(m): 36.327 Intercept(b): 0.1381 Correlation Coefficient(r): 0.9965

Checked by: Magnum Fan Date: 5/07/08

Appendix C

Calibration Certification of the Sound Level Meter and Calibrator

輝創工程有限公司
Sun Creation Engineering Limited Calibration and Testing Laboratory

Certificate No. : C081909

Certificate of Calibration

This is to certify that the equipment

Description : Sound Level Meter

Manufacturer : Rion

Model No. : NL-31

Serial No. : 00410224

has been calibrated for the specific items and ranges.
The results are shown in the Calibration Report No. C081909.

The equipment is supplied by

Co. Name : Envirotech Services Co.

Address : Shop 6, G/F., Casio Mansion, 209 Shaukeiwan Road, Hong Kong

Date of Issue : 14 April 2008

Certified by : K C Lee

Calibration and Testing Laboratory of Sun Creation Engineering Limited
6/F., Tsing Sum Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
Tel: 2927 2606 Fax: 2744 8086 E-mail : callab@suncreation.com Website: www.suncreation.com

輝創工程有限公司
Sun Creation Engineering Limited Calibration and Testing Laboratory

Certificate No. : C083194

Certificate of Calibration

This is to certify that the equipment

Description : Sound Level Calibrator

Manufacturer : Rion

Model No. : NC-73

Serial No. : 10997142

has been calibrated for the specific items and ranges.
The results are shown in the Calibration Report No. C083194.

The equipment is supplied by

Co. Name : Envirotech Services Co.

Address : Shop 6, G/F., Casio Mansion, 209 Shaukeiwan Road, Hong Kong

Date of Issue : 25 June 2008

Certified by : K C Lee

Calibration and Testing Laboratory of Sun Creation Engineering Limited
c/o 4/F, Tsing Shan Wan Exchange Building, 8 Hing On Lane, Tuen Mun, New Territories, Hong Kong
Tel: 2927 2606 Fax: 2744 8986 E-mail: callab@suncreation.com Website: www.suncreation.com

Appendix D

Summary of 1-Hour TSP Monitoring Record

Joint User Complex and Wholesale Fish Market in Tuen Mun

Summary of 1-hour TSP monitoring results

Date	Time	1-hr TSP (μg/m3)	Average
4-Jul-08	11:15-12:15	159	137
	12:17-13:17	122	
	13:19-14:19	129	
5-Jul-08	12:00-13:00	139	146
	13:02-14:02	143	
	14:04-15:04	156	
6-Jul-08	12:08-13:08	115	116
	13:10-14:10	110	
	14:12-15:12	122	
7-Jul-08	10:00-11:00	98	103
	11:02-12:02	110	
	12:04-13:04	100	
8-Jul-08	09:10-10:10	94	110
	10:12-11:12	112	
	11:14-12:14	123	
9-Jul-08	09:00-10:00	104	103
	10:02-11:02	100	
	11:04-12:04	104	
10-Jul-08	09:10-10:10	94	96
	10:12-11:12	81	
	11:14-12:14	112	
11-Jul-08	13:05-14:05	101	101
	14:07-15:07	97	
	15:09-16:09	104	
12-Jul-08	08:50-09:50	123	117
	09:52-10:52	125	
	10:54-11:54	102	
13-Jul-08	09:00-10:00	119	119
	10:02-11:02	134	
	11:04-12:04	105	
14-Jul-08	08:55-09:55	134	140
	09:57-10:57	136	

	10:59-11:59	151	
15-Jul-08	12:15-13:15	143	156
	13:17-14:17	151	
	14:19-15:19	175	
16-Jul-08	13:10-14:10	181	188
	14:12-15:12	180	
	15:14-16:14	202	
17-Jul-08	14:00-15:00	164	179
	15:02-16:02	193	
	16:04-17:04	180	
		Average	129
		Maximum	188
		Minimum	96

Appendix E

Summary of 24-Hour TSP Monitoring Record

Joint User Complex and Wholesale Fish Market in Tuen Mun

Summary of 24-hour TSP monitoring results

Date	Filter Weight (g)		Flow Rate (m^3/min.)		Elapse Time		Sampling Time (hrs.)	Conc. ($\mu g/m^3$)	Weather Condition
	Initial	Final	Initial	Final	Initial	Final			
4-Jul-08	2.7856	2.8942	1.15	1.15	4268.65	4292.65	24.00	65.6	Sunny
5-Jul-08	2.8021	2.9179	1.15	1.15	4292.65	4316.65	24.00	69.9	Sunny
6-Jul-08	2.7909	2.9035	1.15	1.15	4316.65	4340.65	24.00	68.0	Rainy
7-Jul-08	2.7913	2.8909	1.15	1.15	4340.65	4364.65	24.00	60.1	Rainy
8-Jul-08	2.7929	2.8892	1.15	1.15	4364.65	4388.65	24.00	58.2	Rainy
9-Jul-08	2.7852	2.8901	1.15	1.15	4388.65	4412.65	24.00	63.3	Rainy
10-Jul-08	2.7860	2.8800	1.15	1.15	4412.65	4436.65	24.00	56.8	Rainy
11-Jul-08	2.7795	2.8611	1.15	1.15	4436.65	4460.65	24.00	49.3	Rainy
12-Jul-08	2.7921	2.9004	1.15	1.15	4460.65	4484.65	24.00	65.4	Cloudy
13-Jul-08	2.7925	2.8891	1.15	1.15	4484.65	4508.65	24.00	58.3	Rainy
14-Jul-08	2.7822	2.8700	1.15	1.15	4508.65	4532.65	24.00	53.0	Fine
15-Jul-08	2.7837	2.9148	1.15	1.15	4532.65	4556.65	24.00	79.2	Fine
16-Jul-08	2.7900	2.9286	1.15	1.15	4556.65	4580.65	24.00	83.7	Sunny
17-Jul-08	2.7951	2.9309	1.15	1.15	4580.65	4604.65	24.00	82.0	Sunny

Minimum	49.3
Maximum	83.7
Average	65.2

Appendix F

Summary of Noise Monitoring Record

Joint User Complex and Wholesale Fish Market in Tuen Mun

Baseline Noise Monitoring

Date	Time	$L_{10(30mins)}$ (dB(A))	$L_{90(30mins)}$ (dB(A))	$L_{eq(30mins)}$ (dB(A))
4-Jul-08	11:55-12:25	66.2	53.4	65.4
5-Jul-08	14:10-14:40	64.1	56	62.5
6-Jul-08	13:18-13:48	63.6	55.9	62.5
7-Jul-08	10:12-10:42	65	56.6	63.5
8-Jul-08	10:15-10:45	63.2	57.9	61.4
9-Jul-08	09:10-09:40	67.1	56.1	66.3
10-Jul-08	10:20-10:50	64.7	54.5	63.5
11-Jul-08	13:15-13:45	63.6	58.1	61.7
12-Jul-08	09:00-09:30	63.1	57.2	60.9
13-Jul-08	09:18-09:48	62.8	57.4	60.5
14-Jul-08	12:05-12:35	64.1	58.2	62.1
15-Jul-08	12:25-12:55	65.5	54.8	63.1
16-Jul-08	13:16-13:46	64.7	53.7	63.4
17-Jul-08	14:08-14:38	65.2	55.1	63.7
Average		64.5	56.1	62.9

Appendix G

Wind Record from Hong Kong Observatory

Wind Direction at Hong Kong Observatory Tuen Mun Automatic Weather Station

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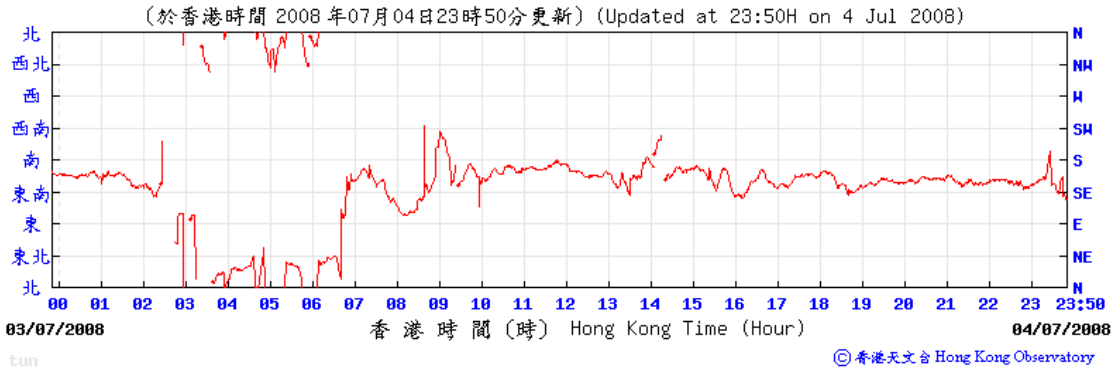

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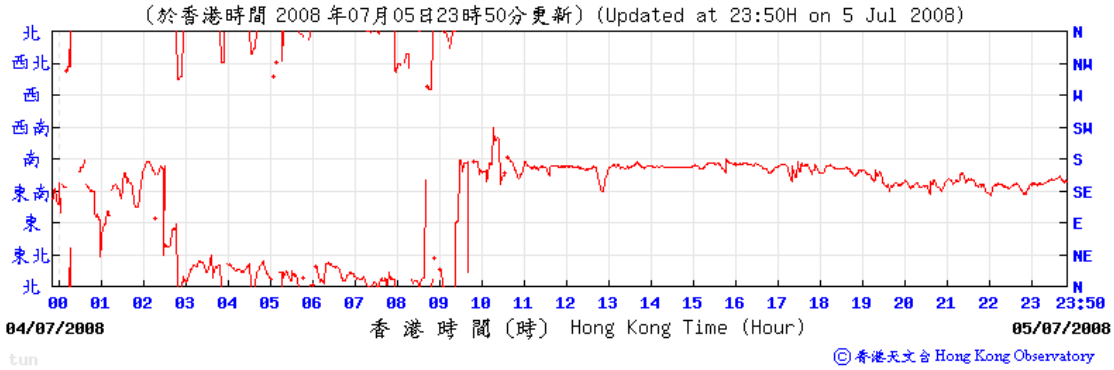

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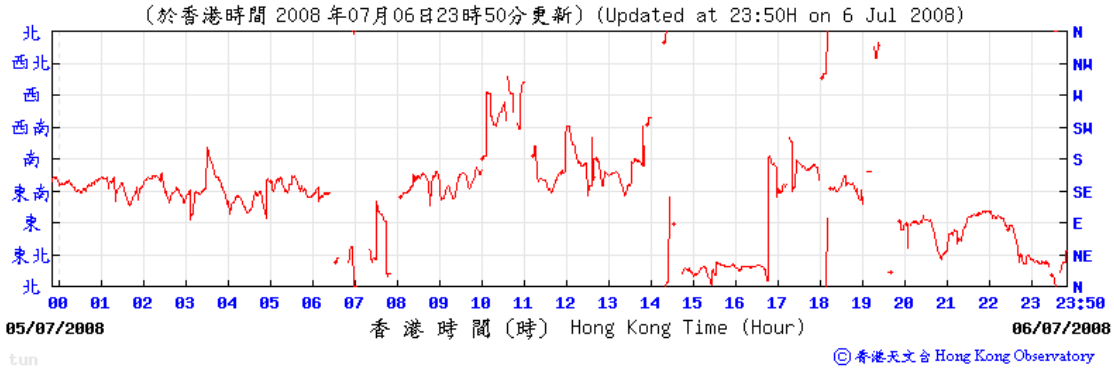

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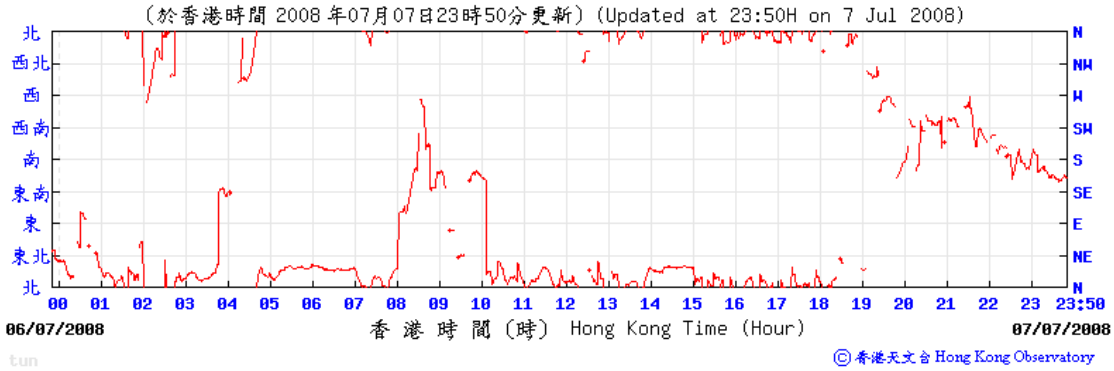

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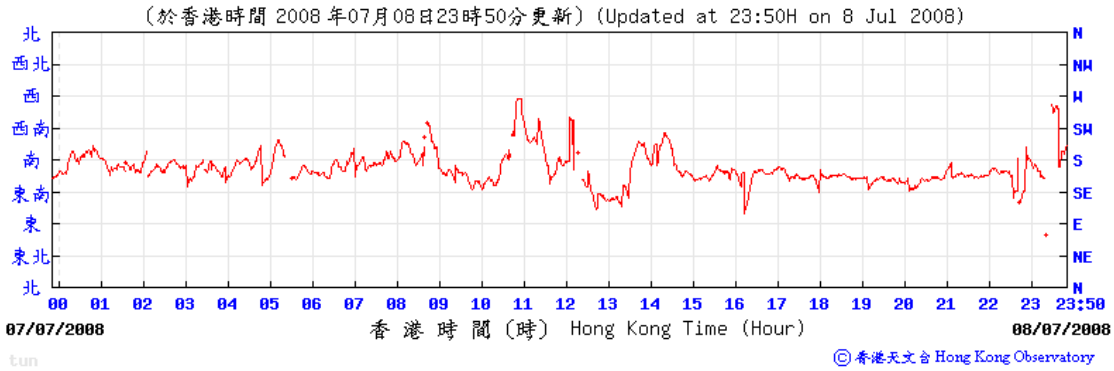

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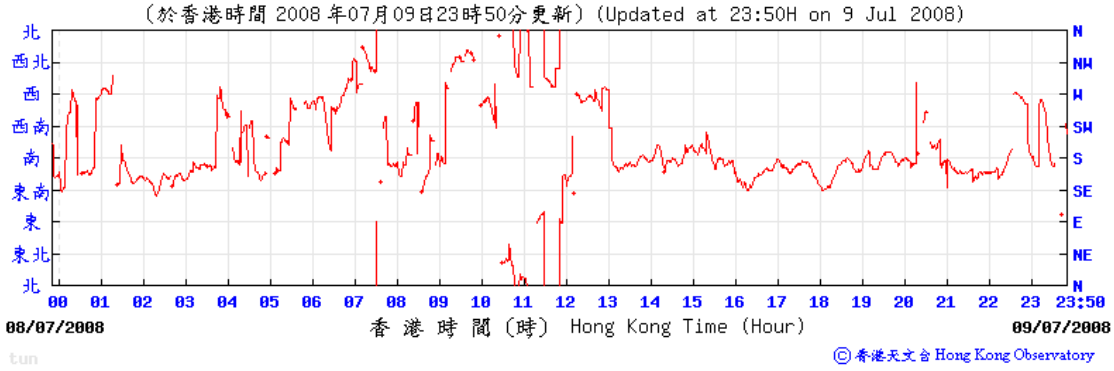

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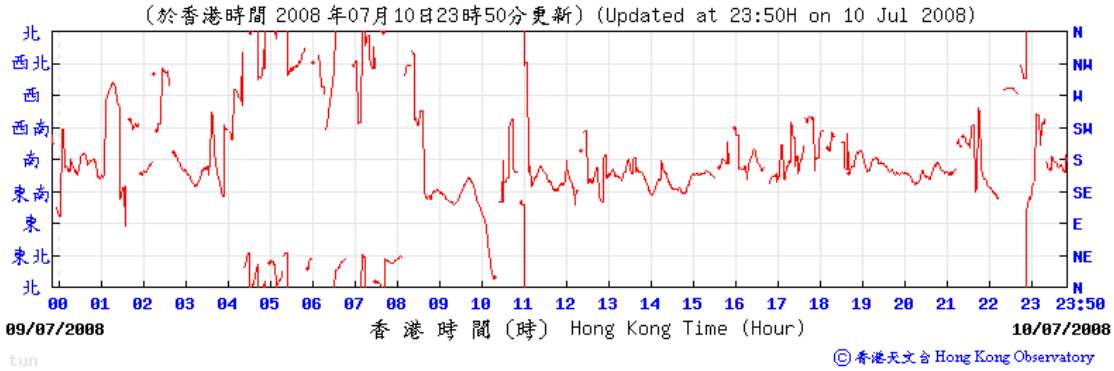

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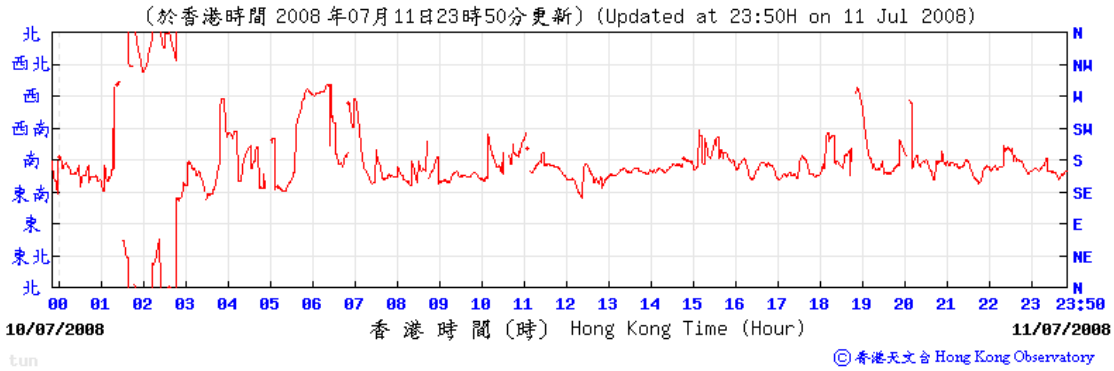

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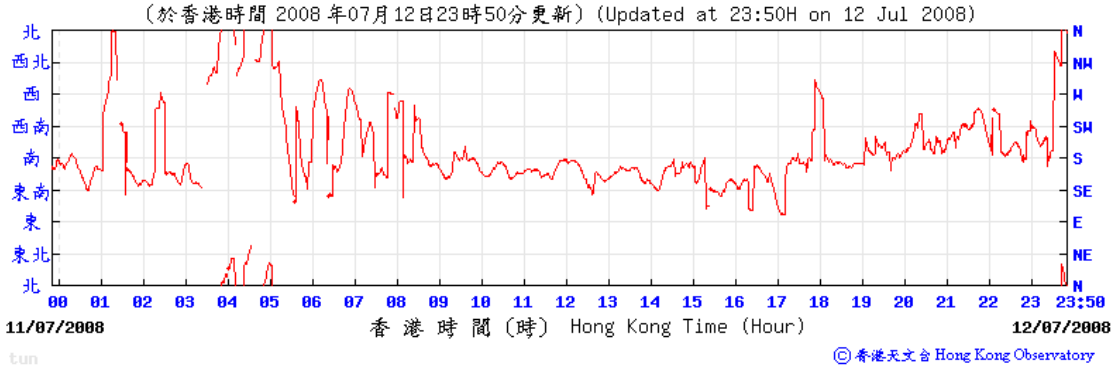

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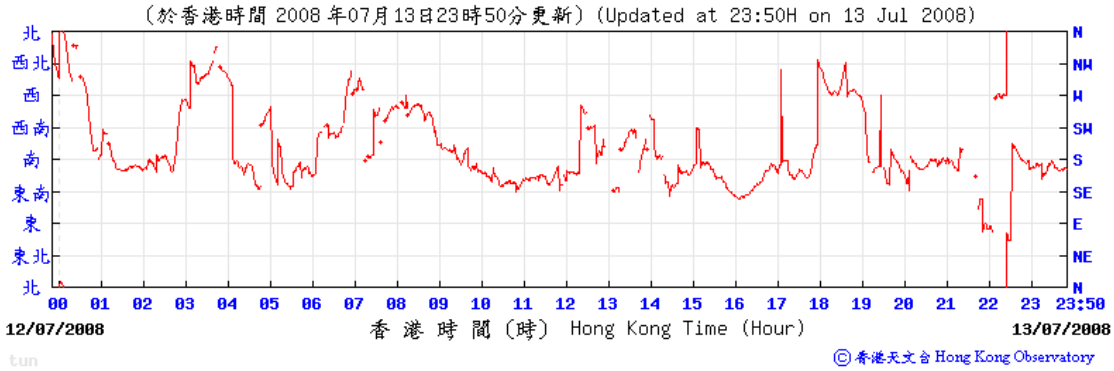

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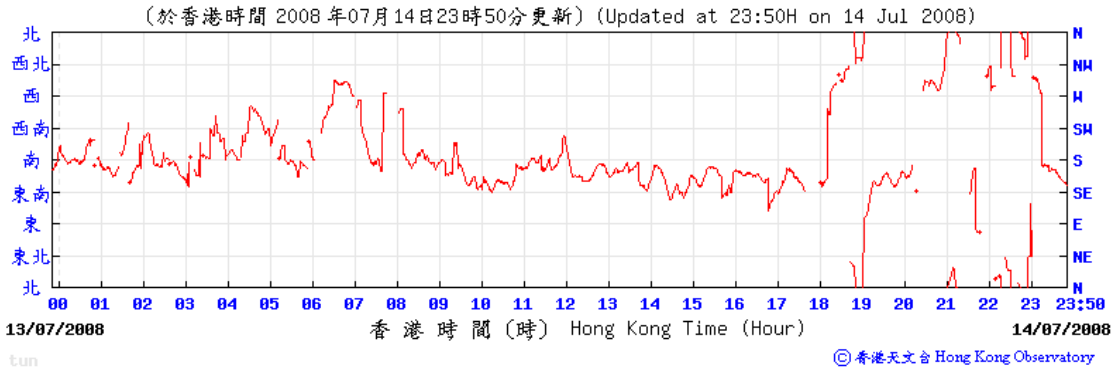

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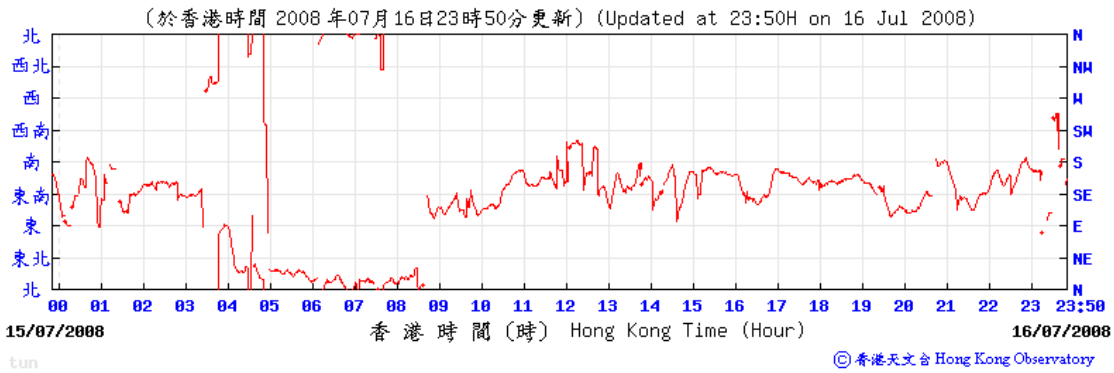

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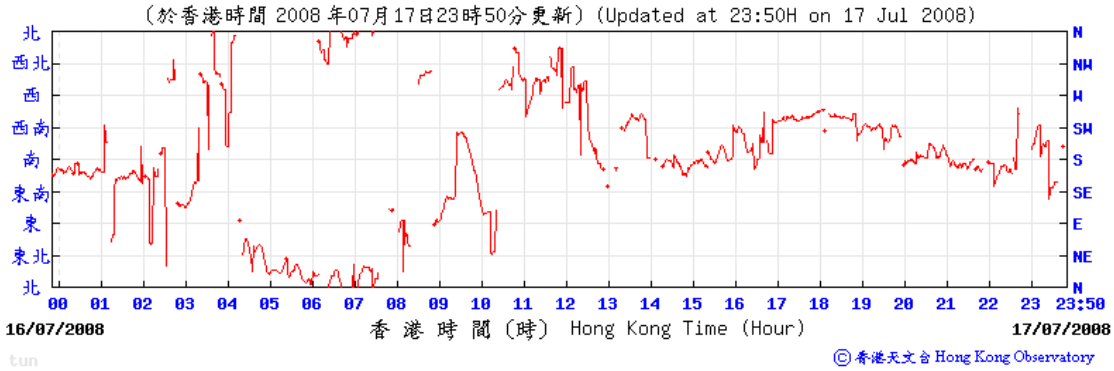
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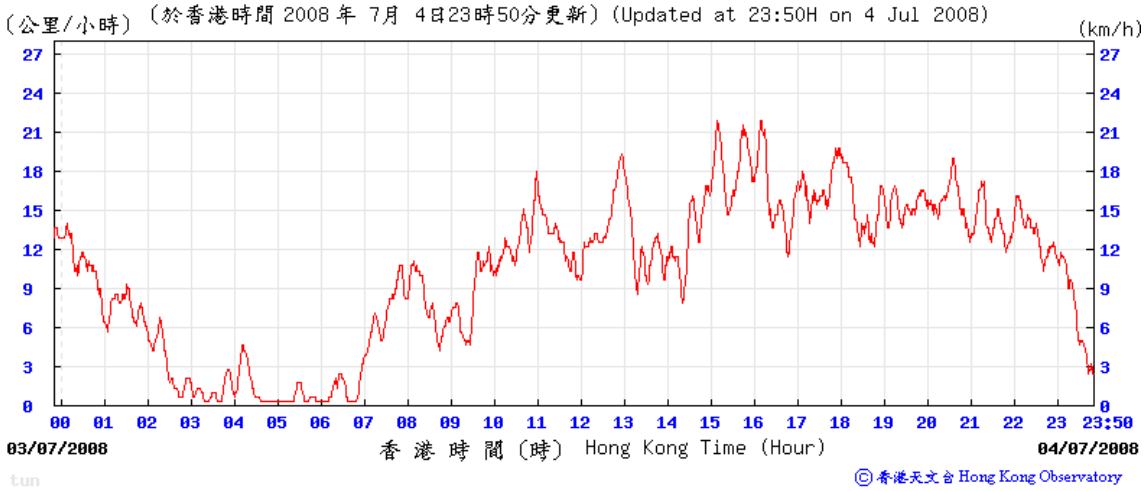
Wind Speed at Tuen Mun Station

4/7/2008



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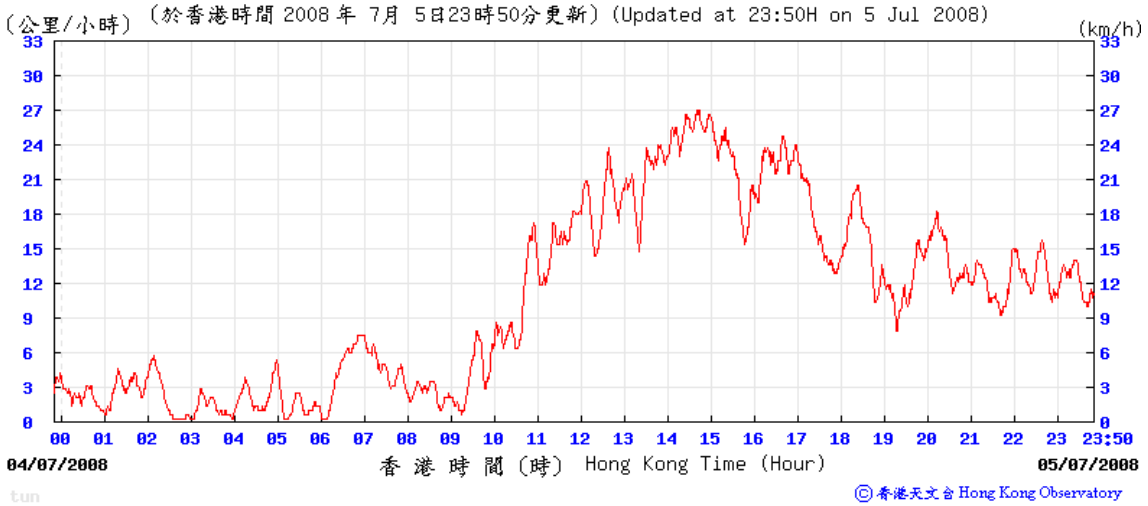

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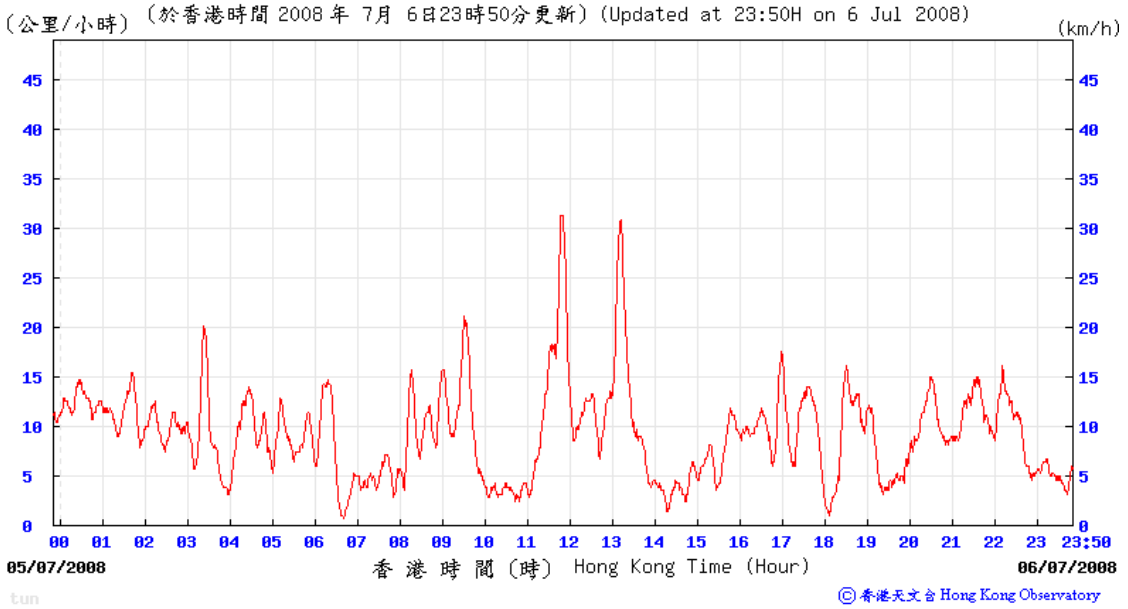

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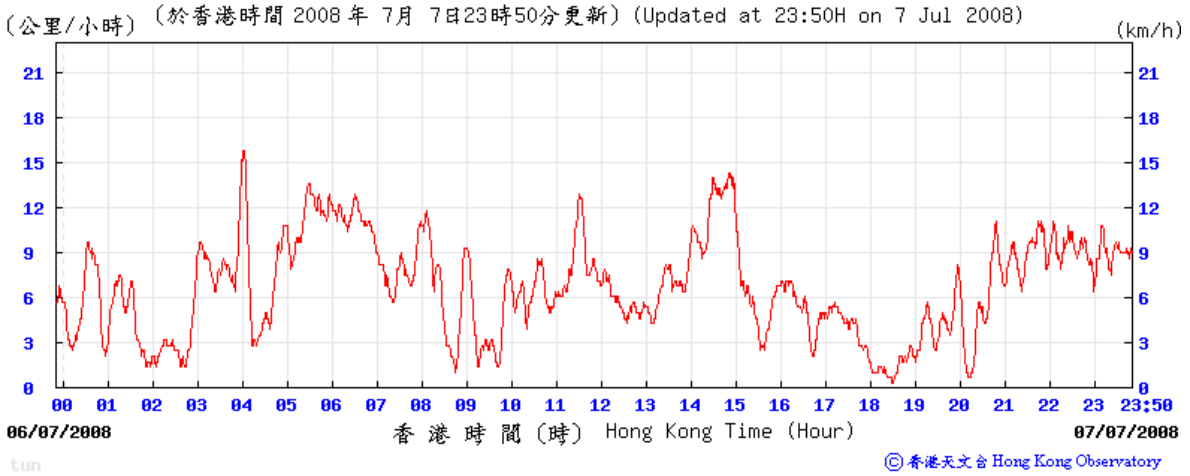

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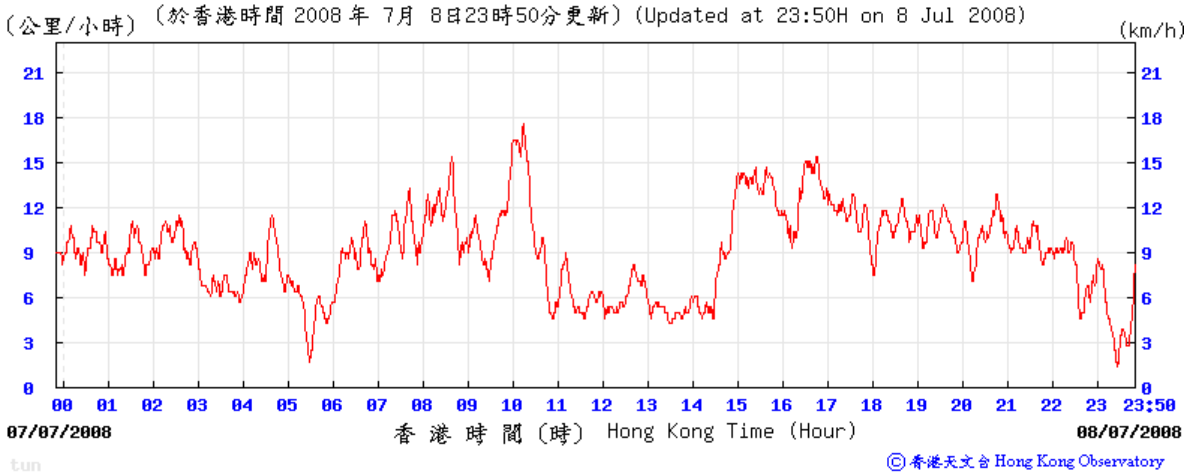

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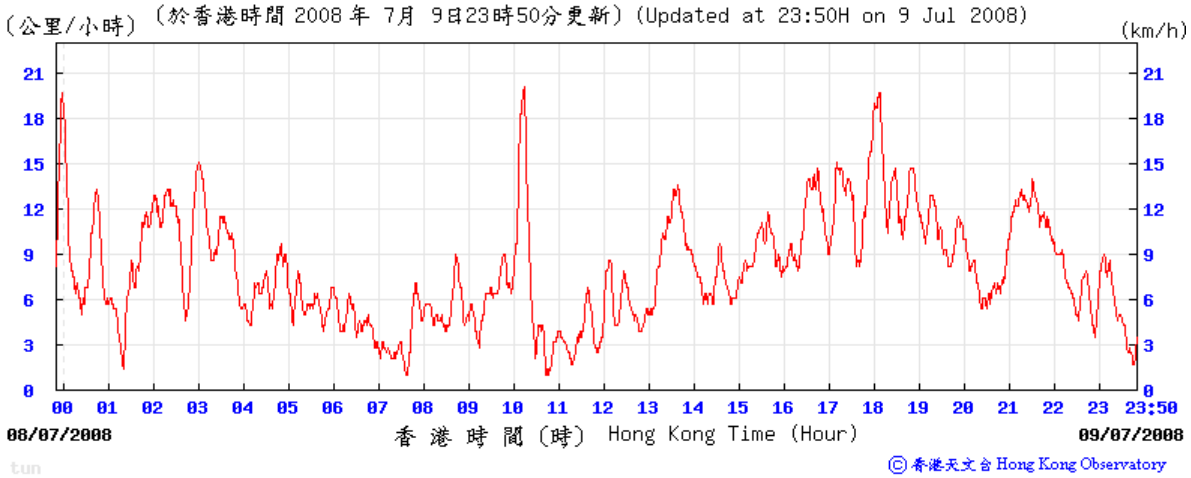

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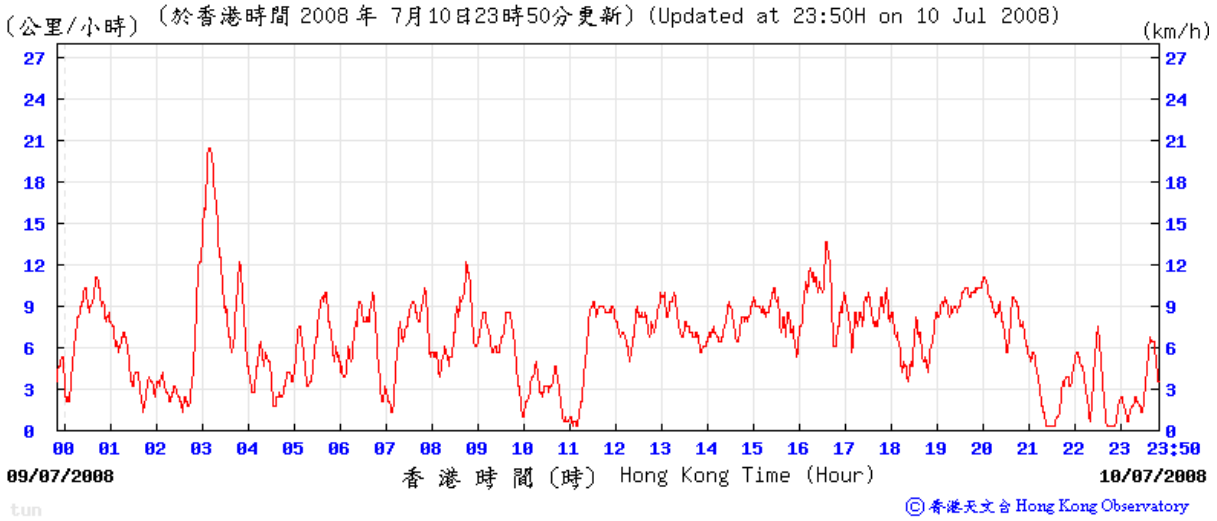
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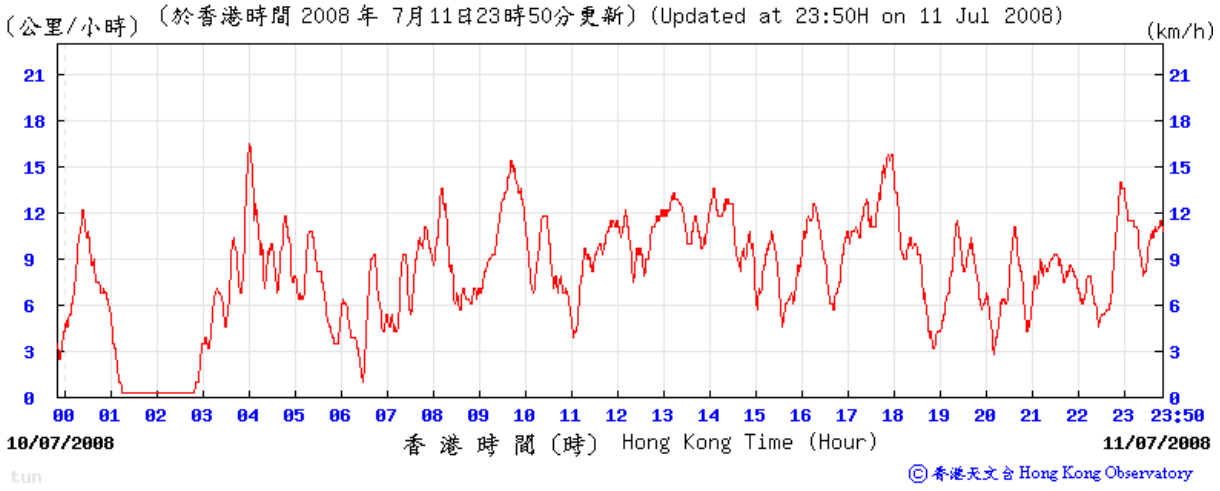
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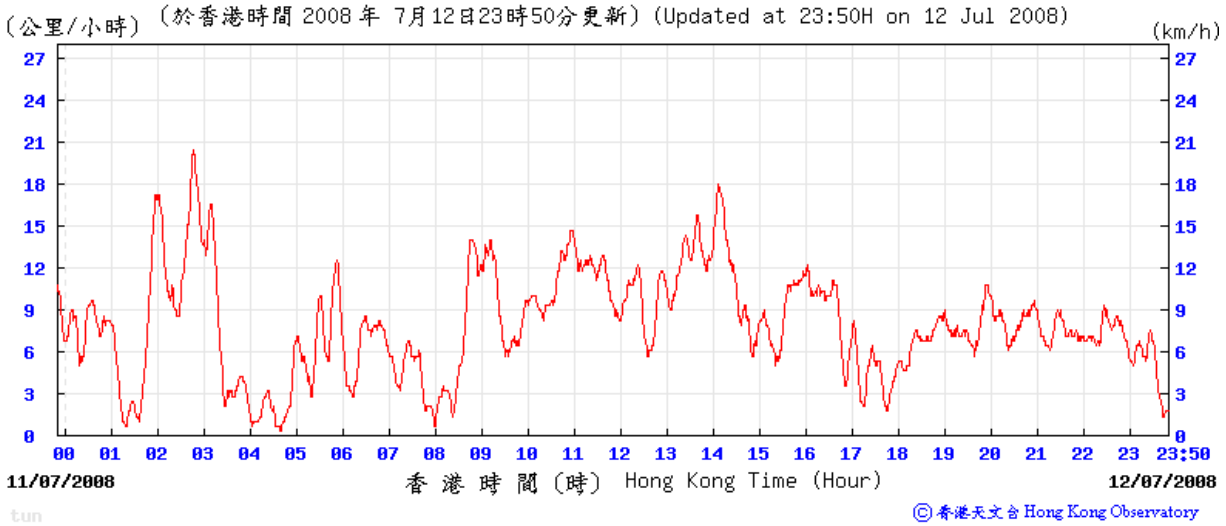
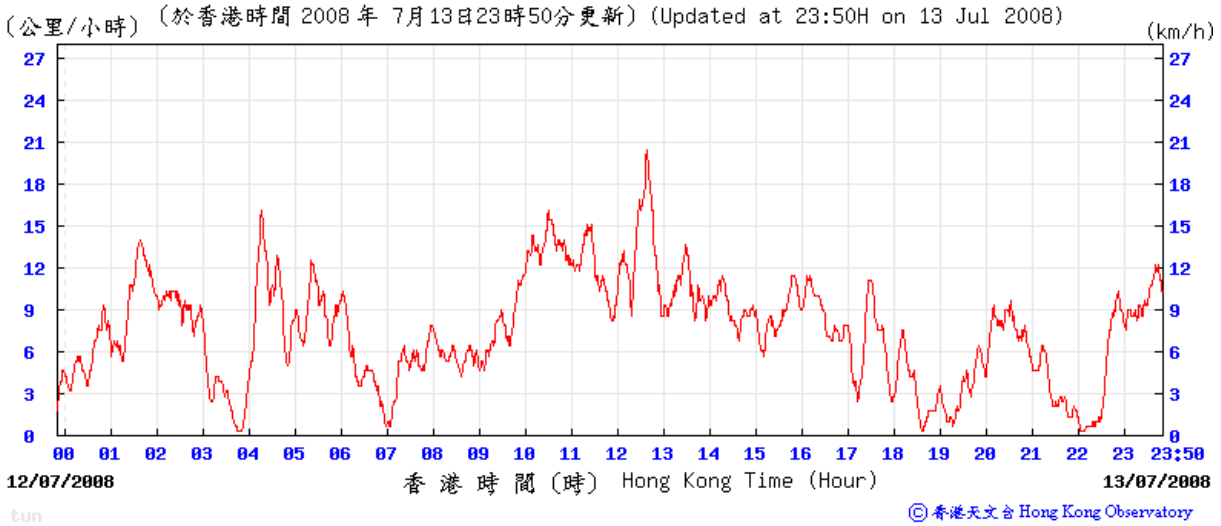
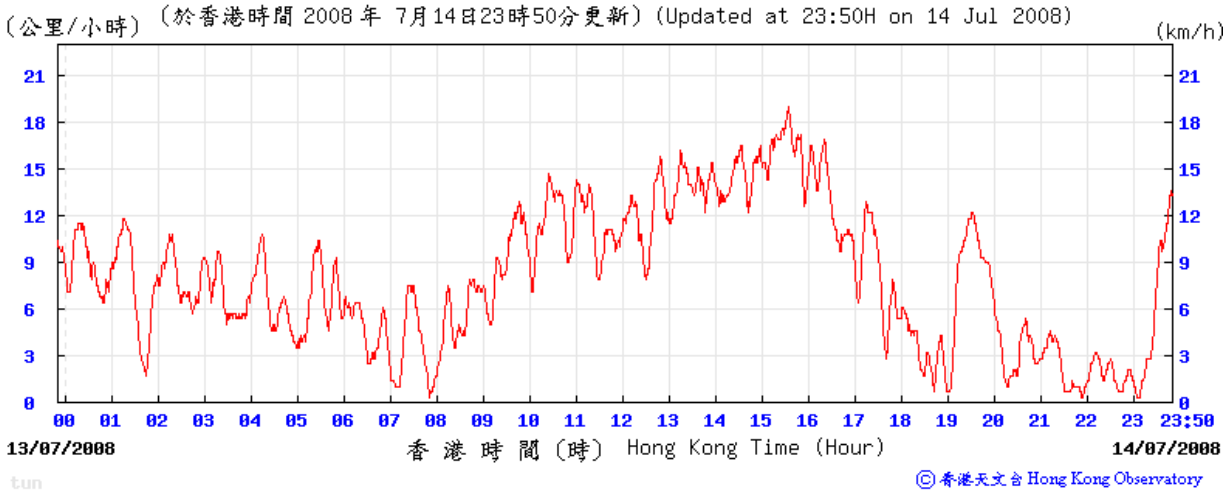
12/7/2008



13/7/2008



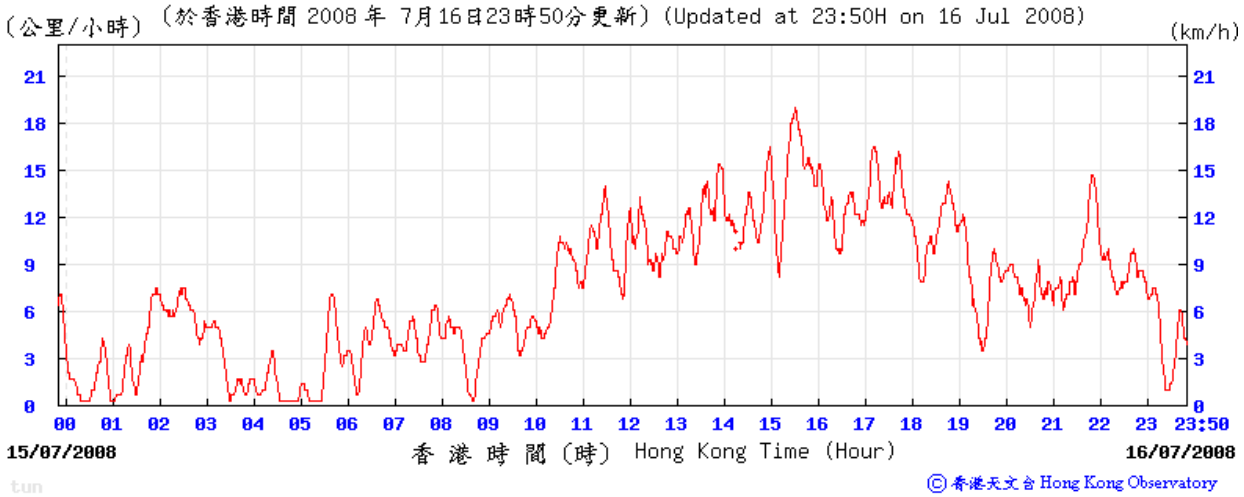
14/7/2008



15/7/2008

(No data)

16/7/2008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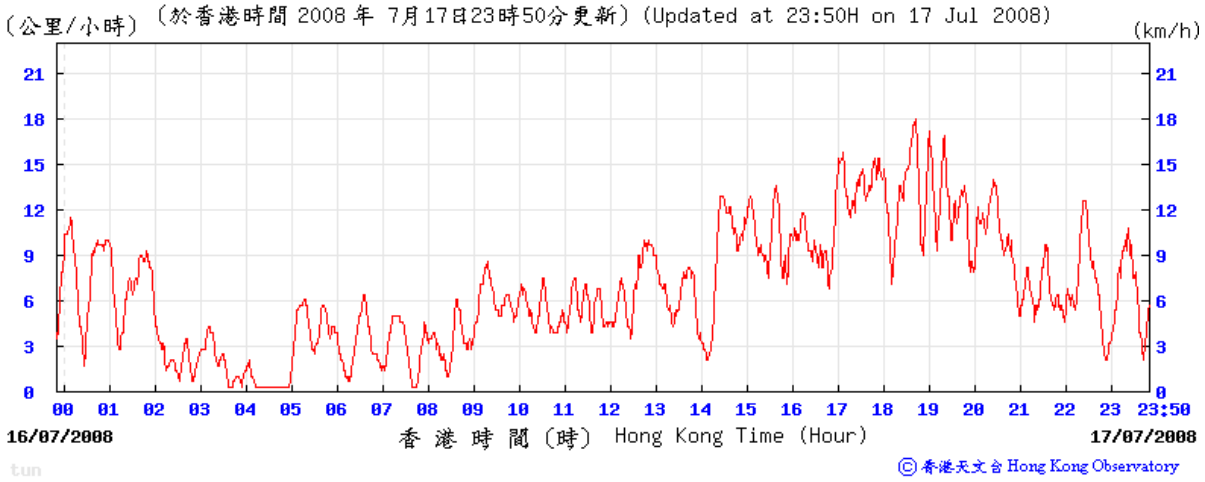
17/7/2008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香 港 時 間 (時) Hong Kong Time (Hour)
17/07/2008
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