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

**SECOND QUARTERLY
ENVIRONMENTAL MONITORING &
AUDIT REPORT
(NOVEMBER 2008 – JANUARY
2009)**

Prepared By:

ALLIED ENVIRONMENTAL CONSULTANTS LTD.

COMMERCIAL-IN-CONFIDENCE

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EXECUTIVE SUMMARY

Allied Environmental Consultants Limited (AEC) has been appointed to conduct an environmental monitoring and audit (EM&A) program for the proposed Joint User Complex and Wholesale Fish Market at Area 44, Tuen Mun. The construction works was commenced on 31st July 2008. This report is the second quarterly EM&A report, which summarizes the environmental monitoring and audit results recorded during the period from 1st November 2008 to 31st January 2009.

Based on the monitoring results, the air quality and construction noise level complied with the environmental requirements in EM&A Manual. There were no environmental complaints received in this quarter. No notification of summons or prosecution was received.

Construction activities undertaken from November 2008 to January 2008 included jack piling, drainage diversion, and some internal finishing. Potential environmental impacts include dust generation from stockpiles of dusty materials and the drainage diversion work, noise from operation of the equipments and jack piling; runoff from drainage diversion works and the storage of various C&D and chemical wastes. The Contractor should properly implement the required environmental mitigation measures as per the implementation schedule in the EM&A manual to ensure no significant adverse environmental impacts to be arisen from the construction works. The Contractor was reminded to maintain good housekeeping throughout the construction phase.

1. 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 categorized 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.

1.1 Project Organization and Contact Personnel

Key personnel and contact particulars are summarized in Table 1.

Table 1 Contact Details of Key Personnel

Role	Department / Company	Names	Contact Number	Fax Number
Lead User Department	Agriculture, Fisheries, and Conservation Department	Mr. K.H. Chan Ms. Louise Li	2150 7092 2150 7140	2314 2866
Environmental Permit Holder	Architecture Services Department	Mr. S.W. Chow Ms. Susana Chan	2867 3716 2867 6706	2523 9622
Architect	P&T Architects and Engineers Ltd.	Ms. Sarah Ng Ms. Vivian Law	2835 3548 2832 3046	2891 3834
Main Contractor	W. Hing Construction Co. Ltd.	Mr. Andy Chan Mr. Tim Wong	9630 7404 6478 4623	8343 9188
Environmental Team Leader	Allied Environmental Consultants Ltd.	Ms. Grace Kwok	2815 7028	2815 5399
Independent Environmental Checker	Cinotech Consultants Ltd.	Mr. Alex Ngai	2151 2083	3107 1388

2. SENSITIVE RECEIVERS

Air Sensitive Receivers (ASRs) within 500m include Yuet Wu Villa, Lawn Bowling Field, Tennis Court, which are less than 100m away from the subject site. Tuen Mun Wu Hong Clinic is located to the west at about 100m to the site boundary. Two secondary schools, namely Ka Chi Secondary School and South Tuen Mun Government Secondary School, are approximately 300m to the south of the site boundary.

Noise Sensitive Receivers (NSRs) within 300m are Yuet Wu Villa, Siu Hei Court, Yan Chai Hospital Low Chan Chor Si Primary School and Wu King Estate. The nearest NSR will be Block 15 of Yuet Wu Villa.

3. SUMMARY OF EM&A REQUIREMENT

For regular impact monitoring, the sampling frequency of at least once in every six-days, shall be strictly observed at the monitoring station for 24-hr TSP monitoring. For 1-hr TSP monitoring, the sampling frequency of at least three times in every six-days should be undertaken when the highest dust impact occurs. For noise monitoring, one set of measurement between 0700-1900 hours on normal weekdays. Leq(30 min) shall be used as the monitoring parameter.

From baseline monitoring results, the proposed Action and Limit Levels for air quality are summarized in Table 2. The average baseline 1-hr TSP value of 129 $\mu\text{g}/\text{m}^3$ and 24-hr TSP value of 65 $\mu\text{g}/\text{m}^3$ 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 3.

Table 2 Action and Limit Level for Air Quality Impact Monitoring at Yuet Wu Villa

<i>Parameters</i>	<i>Baseline Level ($\mu\text{g}/\text{m}^3$)</i>	<i>Action Level ($\mu\text{g}/\text{m}^3$)</i>	<i>Limit Level ($\mu\text{g}/\text{m}^3$)</i>
24 Hour TSP Level	65	173	260
1 Hour TSP Level	129	334	500

Table 3 Action and Limit Levels for Construction Noise Impact Monitoring

<i>Time Period</i>	<i>Action Level</i>	<i>Limit Level</i>
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

<i>Time Period</i>	<i>Action Level</i>	<i>Limit Level</i>
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 action in accordance with the proposed Event Action Plan given in EM&A Manual. A summarized general Event Action Plan is given in Table 4. Details should be referred to the Event Action Plan in the EM&A Manual.

Table4 Event Action Plan

Level	Step 1	Step 2	Step 3
Action	<ul style="list-style-type: none"> ● Identify source ● Check monitoring data and working methods 	<ul style="list-style-type: none"> ● Contact project manager to discuss and implement remedial action ● Rectify any unacceptable practice ● Amend working methods if appropriate ● If exceedance continues, commence additional monitoring 	<ul style="list-style-type: none"> ● Notify client/project manager following correct of the situation ● Cease additional monitoring if exceedance stops
Limit	<ul style="list-style-type: none"> ● Identify source ● Notify client/project manager ● Check monitoring data and working methods ● Repeat measurement to confirm finding ● Commence additional monitoring 	<ul style="list-style-type: none"> ● Take immediate action to avoid further exceedance ● Submit proposal for remedial actions to client/project manager within 3 working days ● Implement the agreed proposal ● If exceedance continues, amend and resubmit the proposal 	<ul style="list-style-type: none"> ● Notify client/project manager following correction of the situation ● Cease additional monitoring if exceedance stops

4. MONITORING METHODOLOGY

4.1 Monitoring Programme

Air quality monitoring and noise monitoring were conducted at Block 15, 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.

A construction site for the proposed Junior Police Officers' Married Quarters is located at Wu Hong Street which is 110m northwest from the monitoring location, which is also a potential major source of the TSP generation. Figure 6 shows the photos of the construction site.

4.2 Air Quality Monitoring

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

4.3 Noise Monitoring

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 5 and the Calibration Certificate for the sound level meter and calibrator is given in Appendix B.

Table 5 Noise Monitoring Equipment

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

Noise levels measurements were recorded in terms of thirty minutes A-weighted equivalent continuous sound pressure level (Leq(30min)) on a weekly 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.

5. RESULTS

5.1. Air Quality

No exceedance was recorded in this quarter. Summary and graphical plots of air quality monitoring record of 1-hour TSP levels and 24-hour TSP levels are provided in Appendices C and D.

5.2. Noise

Noise monitoring results in terms of $L_{eq(30min)}$, $L_{10(30min)}$ $L_{90(30min)}$ were measured at the designated noise monitoring location. 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.

No exceedance was recorded in this quarter. Summary of noise monitoring record is provided in Appendix E.

5.3. Weather Conditions

Weather 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). Table 6 summarizes the wind data during the monitoring dates. Wind record from HKO is shown in Appendix F.

Table 6 Summary of Weather Conditions during the Monitoring Period

Date	Weather	Prevailing Wind Direction	Daily Average Wind Speed (m/s)
3 Nov 2008	Cloudy	NE	2.66
8 Nov 2008	Sunny	N	3.66
14 Nov 2008	Sunny	N	1.93
20 Nov 2008	Sunny	NE	3.07
26 Nov 2008	Sunny	N	2.34
2 Dec 2008	Sunny	S	2.22
8 Dec 2008	Sunny	N	2.20
13 Dec 2008	Cloudy	N	1.83
19 Dec 2008	Sunny	SE	1.78
23 Dec 2008	Sunny	NE	2.78
29 Dec 2008	Cloudy	NE	2.80

3 Jan 2009	Sunny	N	1.61
9 Jan 2009	Sunny	N	3.20
15 Jan 2009	Sunny	N	1.85
21 Jan 2009	Cloudy	N	1.47
29 Jan 2009	Cloudy	NW	1.75

6. SITE INSPECTION & AUDIT

Weekly site inspections were carried out by representatives of the ET. Thirteen site inspections were conducted on 6th, 14th, 21st, and 28th November 2008; 4th, 12th, 19th, 23rd December 2008 and 2nd, 10th, 15th, 22nd, and 30th January 2009. Key findings are summarized in Table 7.

The mitigation measures undertaken by the Contractor are effective in minimizing the environmental impact; however, the Contractor should implement these mitigation measures more effectively in order to prevent causing any adverse environmental impact.

Table 7 Summary of Site Inspections

Date	Observations	Action taken by contractor	Outcome
6/11/2008	No outstanding observations during inspection.	Contractor was required to keep up with the mitigation measures.	
14/11/2008	Oil drums were placed on bare land.	Contractor was requested to provide drip tray for oil drums.	The situation was rectified immediately.
21/11/2008	No outstanding observations during inspection.	Contractor was required to keep up with the mitigation measures.	
28/11/2008	No outstanding observations during inspection.	Contractor was required to keep up with the mitigation measures.	
4/12/2008	No outstanding observations during inspection.	Contractor was required to keep up with the mitigation measures.	
12/12/2008	No outstanding observations during inspection.	Contractor was required to keep up with the mitigation measures.	
19/12/2008	No outstanding observations during inspection.	Contractor was required to keep up with the mitigation measures.	
23/12/2008	No outstanding observations during inspection.	Contractor was required to keep up with the mitigation measures.	
2/1/2009	No outstanding observations during inspection.	Contractor was required to keep up with the mitigation measures.	

10/1/2009	Stockpiles were compacted.	The contractor was advised to cover the stockpiles after work.	The situation was rectified after work immediately.
15/1/2008	No outstanding observations during inspection.	Contractor was required to keep up with the mitigation measures.	
22/1/2009	No outstanding observations during inspection.	Contractor was required to keep up with the mitigation measures.	
30/1/2009	No outstanding observations during inspection.	Contractor was required to keep up with the mitigation measures.	

During site inspections in this quarter, no non-conformance of implementation of environmental mitigation measures was identified. All environmental mitigation measures for construction stages stated in the approved EIA Report, EM&A Manual and Environmental Permit shall be carried out throughout the whole construction period as shown in Appendix G.

7. NON-COMPLIANCE, COMPLAINTS, NOTIFICATIONS OF SUMMONS AND SUCCESSFUL PROSECUTIONS

In this quarter, no complaints, inspection notices, and notifications of summons or prosecution were received.

8. OTHERS

5243.85 tonnes of inert C&D waste was disposed at public fill. 17.37 tonnes of waste was disposed to landfill. No chemical waste was transported off site in this quarter.

9. RECOMMENDATIONS AND CONCLUSIONS

9.1. Recommendations

In accordance with the environmental site audits undertaken during the reporting quarter, the following recommendations are made:

- Drip trays should be used for storing the fuel drum and it should be cleaned up regularly to prevent any leakage; and
- Stockpiles should be covered properly when no works were being undertaken.

The ET will keep track on the EM&A programme to ensure compliance of environmental requirements and proper implementation of all necessary mitigation measures.

9.2. Conclusions

Environmental monitoring has been carried out for the proposed Joint User Complex and Wholesale Fish Market at Area 44, Tuen Mun. 1-hour and 24-hour TSP air quality monitoring and noise monitoring was conducted at Block 15, Yuet Wu Villa during the period from 1st November 2008 to 31st January 2009, in accordance with EM&A Manual and the requirement under Environmental Permit (No. EP-296/2007). All monitoring results were checked and reviewed. 48 sets of 1-hour TSP level monitoring, 16 sets of 24-hour TSP level monitoring, and 16 sets of noise monitoring were carried out during the reporting quarter. No exceedance of any of the monitoring data was recorded. No environmental complaints and notification of summons or prosecution were received during the second quarter.