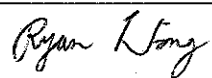
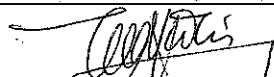


Highways Department

Agreement No. CE 20/2009 (EP)

**Environmental Team for the Widening of
Tolo Highway / Fanling Highway between
Island House Interchange and Fanling****(Stage 1)****Between Island House Interchange and
Tai Hang - Investigation****Monthly EM&A Report
for December 2009**

[01/2010]

| | Name | Signature |
|----------------------|-----------|---|
| Prepared & Checked: | Ryan Wong |  |
| Reviewed & Approved: | Y T Tang |  |

Version: Rev. 0 Date: 14 January 2010

The information contained in this report is, to the best of our knowledge, correct at the time of printing. The interpretation and recommendations in the report are based on our experience, using reasonable professional skill and judgment, and based upon the information that was available to us. These interpretations and recommendations are not necessarily relevant to any aspect outside the restricted requirements of our brief. This report has been prepared for the sole and specific use of our client and AECOM Environment accepts no responsibility for its use by others.

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Important Message**Rebranding as AECOM**

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Hong Kong.

13 January 2010

Mr. Tony Wong

By Fax (2805 5028) and Post

Dear Sir,

**Widening of Tolo Highway between
Island House Interchange and Tai Hang
Environmental Permit No.: EP-324/2008
Condition 3.3 – Submission of Monthly EM&A Report – December 2009 (Stage 1)**

We refer to the Monthly EM&A Report received on 12 January 2010 submitted by ET via email. Pursuant to EP Condition 3.3, I hereby verify the Monthly EM&A Report Rev. 0 - December 2009 (Stage 1) for the Project.

Yours faithfully
for MOTT MACDONALD HONG KONG LIMITED

A handwritten signature in black ink that reads "Joseph Chan".

Joseph Chan
IEC

c.c. Sr Engr 3/Tolo Highway, HyD – Mr. C K Chiang
ETL, AECOM – Mr. Y T Tang

(Fax: 2761 4864)
(Fax: 2891 0305)

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EXECUTIVE SUMMARY

The proposed widening of Tolo Highway and Fanling Highway between Island House Interchange and Fanling (the Project) is a Designated Project under the Environmental Impact Assessment Ordinance (Cap. 499) (EIAO) and is governed by an Environmental Permit (EP-324/2008)(EP). The Project aims to widen Tolo Highway and Fanling Highway to dual 4-lane carriageway in order to alleviate the current traffic congestion problems and to cope with the increasing transport demands to and from the urban areas and also cross boundary traffic.

The construction works for this Project will be delivered in 2 stages i.e. Stage 1 (between Island House Interchange and Tai Hang) and Stage 2 (between Tai Hang and Wo Hop Shek Interchange). The construction works of Stage 1 were commenced on 23 November 2009 and will tentatively be completed in mid 2013; while Stage 2 will be commenced in late 2010 and completed in 2014. This report focuses on Stage 1 of the Project only.

The construction phase of Stage 1 under the EP commenced on 23 November 2009.

The EM&A programme for Stage 1 of the Project commenced on 23 November 2009. The impact environmental monitoring and audit includes air quality and noise monitoring.

This report documents the findings of EM&A works conducted in the period between 1 and 31 December 2009. As informed by the Contractor, construction activities in the reporting period were:

- Ground investigation;
- Site clearance;
- Tree felling;
- Bored pile;
- Soil nail works;
- Demolition of existing boxculvert;
- Excavation; and
- Sheetpile installation.

Reporting Change

There was no reporting change required in the reporting month.

Breaches of Action and Limit Levels for Air Quality

No exceedance of Action and Limit Level was recorded for 1-hour TSP and 24-hour TSP monitoring in the reporting month.

Breaches of Action and Limit Levels for Noise

There was one (1) noise related complaint received in the reporting month, hence one Action Level of noise was recorded.

No Limit Level exceedance of noise was recorded in the reporting month.

Complaint, Notification of Summons and Successful Prosecution

Two (2) environmental complaints, but no notification of summons and successful prosecution were received in the reporting month.

Future Key Issues

Key issues to be considered in the coming month included:

- Properly store and label oils and chemicals on site;
- Chemical and waste management;
- Collection of construction waste should be carried out regularly;
- Site runoff should be properly collected and treated prior to discharge;
- Suppress dust generated from excavation activities and haul road traffic;
- Properly maintain the drainage system and treat the site effluent before discharging to public drains;
and
- Quieter powered mechanical equipment should be used.

1 INTRODUCTION

1.1. Background

- 1.1.1. Tolo Highway and Fanling Highway are expressways in the North East New Territories connecting Sha Tin, Tai Po and Fanling. These highways form a vital part of the strategic Route 1, which links Hong Kong Island to Shenzhen. At present, this section of Route 1 is dual 3-lane carriageway. However, at several major interchanges along this section of Route 1, the highway is only dual-2 lane. Severe congestion is a frequent occurrence during peak periods, particularly in the Kowloon bound direction.
- 1.1.2. The objective of the Project “Widening of Tolo Highway / Fanling Highway between Island House Interchange and Fanling” is to widen Tolo Highway and Fanling Highway to dual 4-lane carriageway in order to alleviate the current traffic congestion problems and to cope with the increasing transport demands to and from the urban areas and also cross boundary traffic.
- 1.1.3. The Project is a designated project and is governed by an Environmental Permit (EP-324/2008)(EP).
- 1.1.4. The scope of the Project comprises mainly:
- (i) Widening of a 5.7 km section of Tolo Highway and 3.0 km section of Fanling Highway between Island House Interchange and Wo Hop Shek Interchange from the existing dual 3-lane to dual 4-lane, including construction of new vehicular bridges;
 - (ii) Widening of interchange sections at Island House Interchange, Tai Po North Interchange, and Lam Kam Road Interchange from dual 2-lane to dual 3-lane, including realignment of various slip roads;
 - (iii) Modification and reconstruction of highways, vehicular bridges, underpasses and footbridges.
- 1.1.5. The construction works for this Project will be delivered in 2 stages i.e. Stage 1 (between Island House Interchange and Tai Hang) and Stage 2 (between Tai Hang and Wo Hop Shek Interchange). The construction works of Stage 1 commenced on 23 November 2009 and will tentatively be completed in mid 2013; while Stage 2 will be commenced in late 2010 and completed in 2014. This report focuses on Stage 1 of the Project only.
- 1.1.6. The construction works for Stage 1 of the Project will be implemented under 2 works contracts (Contract 1 and Contract 2). Contract 1 covers the section of Tolo Highway between Island House Interchange and Ma Wo, Contract 2 covers the section of Tolo Highway between Ma Wo and Tai Hang.
- 1.1.7. China State Construction Engineering Ltd. (CSCE) was commissioned as the Contractor of Contract 1 of Stage 1 of the Project. AECOM Asia Co. Ltd. was employed by Highways Department as the Environmental Team to undertake the EM&A works for Stage 1 of the Project.
- 1.1.8. Hyder-Arup-Black and Veatch Joint Venture are appointed by Highways Department as the consultants for the design and construction assignment for the Tolo project under Agreement No. CE 58/2000 (i.e. the Engineer for the Contracts) and Mott MacDonald Hong Kong Ltd. acts as the Independent Environmental Checker (IEC) for the Contracts.
- 1.1.9. The construction phase of Stage 1 under the EP commenced on 23 November 2009.
- 1.1.10. According to the updated EM&A Manual of Stage 1 of the Project, there is a need of an EM&A programme including air quality and noise monitoring. The EM&A programme for Stage 1 of the Project commenced on 23 November 2009.

1.2. Scope of Report

1.2.1. This is the second monthly Environmental Monitoring and Audit (EM&A) Report under the Agreement No. CE 20/2009 (EP) - Widening of Tolo Highway between Island House Interchange and Tai Hang – Investigation. This report presents a summary of the environmental monitoring and audit works, list of activities and mitigation measures proposed by the ET for Stage 1 of the Project in December 2009.

1.3. Project Organization

1.3.1. The project organization is shown in Appendix A. The key personnel contact names and numbers are summarized in Table 1.1

Table 1.1 Contact Information of Key Personnel

| Party | Position | Name | Telephone | Fax |
|--|--------------------------------------|---------------|-----------|-----------|
| ER of Stage 1, Contract 1 (Hyder-Arup-Black & Veatch Joint Venture) | Chief Resident Engineer /TOLO1 | James Tsang | 9038 8797 | 26674000 |
| IEC of Stage 1 (Mott MacDonald Hong Kong Limited) | Independent Environmental Checker | Joseph Chan | 2828 5920 | 2827 1823 |
| Contractor of Stage 1, Contract 1 (CSCE) | Site Agent | S Y Tse | 9078 0458 | 2667 5666 |
| | Environmental Officer | Michael Tsang | 9277 4956 | 2667 5666 |
| ET of Stage 1 (AECOM) | ET Leader | Y T Tang | 2893 1551 | 2891 0305 |

1.4. Summary of Construction Works

1.4.1. The construction phase of Stage 1 under the EP commenced on 23 November 2009. Details of the construction works carried out by the Contractor in this reporting period are listed below:

- Ground investigation;
- Site clearance;
- Tree felling;
- Bored pile;
- Soil nail works;
- Demolition of existing boxculvert;
- Excavation; and
- Sheetpile installation.

1.4.2. The Construction Programme is shown in Appendix B.

1.4.3. The general layout plan of the Project site showing the contract area is shown in Figure 1.1.

1.4.4. The mitigation measures implementation schedule are presented in Appendix C.

1.5. Summary of EM&A Programme Requirements

1.5.1. The EM&A programme required environmental monitoring for air quality, noise and environmental site inspections for air quality, noise, waste management, ecology, and landscape and visual. The EM&A requirements for each parameter described in the following sections include:

- All monitoring parameters;
- Monitoring schedules for the reporting month and forthcoming months;
- Action and Limit levels for all environmental parameters;
- Event / Action Plan;
- Environmental mitigation measures, as recommended in the Project EIA study final report; and
- Environmental requirement in contract documents.

2 AIR QUALITY MONITORING

2.1 Monitoring Requirements

2.1.1 In accordance with the updated EM&A Manual, baseline 1-hour and 24-hour TSP levels at 4 air quality monitoring stations were established. Impact 1-hour TSP monitoring was conducted for at least three times every 6 days, while impact 24-hour TSP monitoring was carried out for at least once every 6 days. The Action and Limit level of the air quality monitoring is provided in Appendix D.

2.2 Monitoring Equipment

2.2.1 24-hour TSP air quality monitoring was performed using High Volume Sampler (HVS) located at each designated monitoring station. The HVS meets all the requirements of the updated EM&A Manual. Portable direct reading dust meters were used to carry out the 1-hour TSP monitoring. Brand and model of the equipment is given in Table 2.1.

Table 2.1 Air Quality Monitoring Equipment

| Equipment | Brand and Model |
|---|--|
| Portable direct reading dust meter (1-hour TSP) | Sibata Digital Dust Monitor (Model No. LD-3) |
| High Volume Sampler (24-hour TSP) | Tisch Total Suspended Particulate Mass Flow Controlled High Volume Air Sampler (Model No. TE-5170) |

2.3 Monitoring Locations

2.3.1 Monitoring locations AM2 and AM3 were set up at the proposed locations in accordance with updated EM&A Manual. However, for monitoring locations: Dynasty View (AM1) and Tai Po Garden (AM4), proposed in the updated EM&A Manual, as approval could not be obtained from the owner's corporation of the premises impact air quality monitoring was conducted at alternative monitoring locations. Figure 2.1 shows the locations of monitoring stations. Table 2.2 describes the details of the monitoring stations.

Table 2.2 Locations of Impact Noise Monitoring Stations

| Monitoring Station | Location | Description |
|--------------------|----------------------------|-----------------------------------|
| AM1 | 13 Ha Wun Yiu | Ground floor outside the premises |
| AM2 | 12 Shan Tong New Village | Ground floor outside the premises |
| AM3 | Riverain Bayside | Roof of the switch room |
| AM4 | Tai Kwong Secondary School | Roof of the school |

2.4 Monitoring Parameters, Frequency and Duration

2.4.1 Table 2.3 summarizes the monitoring parameters, frequency and duration of impact TSP monitoring.

Table 2.3 Air Quality Monitoring Parameters, Frequency and Duration

| Parameter | Frequency and Duration |
|-------------|---|
| 1-hour TSP | Three times every 6 days while the highest dust impact was expected |
| 24-hour TSP | Once every 6 days |

2.5 Monitoring Methodology

2.5.1 24-hour TSP Monitoring

- (a) The HVS was installed in the vicinity of the air sensitive receivers. The following criteria were considered in the installation of the HVS.
- (i) A horizontal platform with appropriate support to secure the sampler against gusty wind was provided.
 - (ii) The distance between the HVS and any obstacles, such as buildings, was at least twice the height that the obstacle protrudes above the HVS.
 - (iii) A minimum of 2 meters separation from walls, parapets and penthouse for rooftop sampler.
 - (iv) No furnace or incinerator flues nearby.
 - (v) Airflow around the sampler was unrestricted.
 - (vi) Permission was obtained to set up the samplers and access to the monitoring stations.
 - (vii) A secured supply of electricity was obtained to operate the samplers.
 - (viii) The sampler was located more than 20 meters from any dripline.
 - (ix) Any wire fence and gate, required to protect the sampler, did not obstruct the monitoring process.
 - (x) Flow control accuracy was kept within $\pm 2.5\%$ deviation over 24-hour sampling period.
- (b) Preparation of Filter Papers
- (i) Glass fibre filters, G810 were labelled and sufficient filters that were clean and without pinholes were selected.
 - (ii) All filters were equilibrated in the conditioning environment for 24 hours before weighing. The conditioning environment temperature was around 25 °C and not variable by more than ± 3 °C; the relative humidity (RH) was < 50% and not variable by more than $\pm 5\%$. A convenient working RH was 40%.
 - (iii) All filter papers were prepared and analysed by ALS Technichem (HK) Pty Ltd., which is a HOKLAS accredited laboratory and has comprehensive quality assurance and quality control programmes.
- (c) Field Monitoring
- (i) The power supply was checked to ensure the HVS works properly.
 - (ii) The filter holder and the area surrounding the filter were cleaned.
 - (iii) The filter holder was removed by loosening the four bolts and a new filter, with stamped number upward, on a supporting screen was aligned carefully.
 - (iv) The filter was properly aligned on the screen so that the gasket formed an airtight seal on the outer edges of the filter.
 - (v) The swing bolts were fastened to hold the filter holder down to the frame. The pressure applied was sufficient to avoid air leakage at the edges.
 - (vi) Then the shelter lid was closed and was secured with the aluminum strip.
 - (vii) The HVS was warmed-up for about 5 minutes to establish run-temperature conditions.
 - (viii) A new flow rate record sheet was set into the flow recorder.

- (ix) On site temperature and atmospheric pressure readings were taken and the flow rate of the HVS was checked and adjusted at around 1.1 m³/min, and complied with the range specified in the updated EM&A Manual (i.e. 0.6-1.7 m³/min).
 - (x) The programmable digital timer was set for a sampling period of 24 hrs, and the starting time, weather condition and the filter number were recorded.
 - (xi) The initial elapsed time was recorded.
 - (xii) At the end of sampling, on site temperature and atmospheric pressure readings were taken and the final flow rate of the HVS was checked and recorded.
 - (xiii) The final elapsed time was recorded.
 - (xiv) The sampled filter was removed carefully and folded in half length so that only surfaces with collected particulate matter were in contact.
 - (xv) It was then placed in a clean plastic envelope and sealed.
 - (xvi) All monitoring information was recorded on a standard data sheet.
 - (xvii) Filters were then sent to ALS Technichem (HK) Pty Ltd. for analysis.
- (d) Maintenance and Calibration
- (i) The HVS and its accessories were maintained in good working condition, such as replacing motor brushes routinely and checking electrical wiring to ensure a continuous power supply.
 - (ii) 5-point calibration of the HVS was conducted using TE-5025A Calibration Kit prior to the commencement of baseline monitoring. Bi-monthly 5-point calibration of the HVS will be carried out during impact monitoring.
 - (iii) Calibration certificate of the HVSs are provided in Appendix E.

2.5.2 1-hour TSP Monitoring

(a) Measuring Procedures

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

- (i) Turn the power on.
- (ii) Close the air collecting opening cover.
- (iii) Push the "TIME SETTING" switch to [BG]
- (iv) Push "START/STOP" switch to perform background measurement for 6 seconds.
- (v) Turn the knob at SENSI ADJ position to insert the light scattering plate.
- (vi) Leave the equipment for 1 minute upon "SPAN CHECK" is indicated in the display.
- (vii) Push "START/STOP" switch to perform automatic sensitivity adjustment. This measurement takes 1 minute.
- (viii) Pull out the knob and return it to MEASURE position.
- (ix) Push the "TIME SETTING" switch the time set in the display to 3 hours.
- (x) Lower down the air collection opening cover.
- (xi) Push "START/STOP" switch to start measurement.

(b) Maintenance and Calibration

- (i) The 1-hour TSP meter was calibrated at 1-year intervals against a continuous particulate TEOM Monitor, Series 1400ab. Calibration certificates of the Laser Dust Monitors are provided in Appendix E.
- (ii) 1-hour validation checking of the TSP meter against HVS is carried out yearly at the air quality monitoring locations.

2.6 Monitoring Schedule for the Reporting Month

2.6.1 The schedule for environmental monitoring in December 2009 is provided in Appendix F.

2.7 Monitoring Results

2.7.1 The baseline condition of air quality in the Project site was reviewed in October and November 2009. A baseline monitoring of air quality, in terms of 1-hour Total Suspended Particulates (TSP) and 24-hour TSP, was carried out from 20 October 2009 to 4 November 2009 for 14 days. The baseline monitoring report was submitted by ETL and approved by the ER and the IEC on 9 November 2009. Action Levels for air quality were established and are summarized in Table 2.4, Table 2.5 and Appendix D.

2.8 Results and Observations

2.8.1 The monitoring results for 1-hour TSP and 24-hour TSP are summarized in Table 2.4 and 2.5 respectively. Detailed air quality monitoring results are presented in Appendix G.

Table 2.4 Summary of 1-hour TSP Monitoring Results in the Reporting Period

| | Average ($\mu\text{g}/\text{m}^3$) | Range ($\mu\text{g}/\text{m}^3$) | Action Level ($\mu\text{g}/\text{m}^3$) | Limit Level ($\mu\text{g}/\text{m}^3$) |
|------------|--------------------------------------|------------------------------------|---|--|
| AM1 | 82.1 | 74.9 – 97.5 | 302.1 | 500 |
| AM2 | 81.3 | 72.6 – 94.8 | 301.9 | 500 |
| AM3 | 81.2 | 72.0 – 96.3 | 301.9 | 500 |
| AM4 | 81.0 | 71.7 – 93.7 | 302.3 | 500 |

Table 2.5 Summary of 24-hour TSP Monitoring Results in the Reporting Period

| | Average ($\mu\text{g}/\text{m}^3$) | Range ($\mu\text{g}/\text{m}^3$) | Action Level ($\mu\text{g}/\text{m}^3$) | Limit Level ($\mu\text{g}/\text{m}^3$) |
|------------|--------------------------------------|------------------------------------|---|--|
| AM1 | 49.2 | 34.9 – 67.2 | 176.6 | 260 |
| AM2 | 57.2 | 40.8 – 77.3 | 178.6 | 260 |
| AM3 | 53.3 | 29.8 – 85.0 | 193.1 | 260 |
| AM4 | 61.8 | 40.1 – 95.7 | 198.5 | 260 |

2.8.2 All 1-hour TSP and 24-hour TSP results were below the Action and Limit Level at all monitoring locations in the reporting month.

2.8.3 The event action plan is annexed in Appendix J.

2.8.4 Weather information including wind speed and wind direction is annexed in Appendix H. The information was obtained from Hong Kong Observatory Sha Tin and Tai Mei Tuk Automatic Weather Station.

3 NOISE MONITORING

3.1 Monitoring Requirements

3.1.1 In accordance with the EM&A Manual, impact noise monitoring was conducted for at least once per week during the construction phase of Stage 1 of the Project. The Action and Limit level of the noise monitoring is provided in Appendix D.

3.2 Monitoring Equipment

3.2.1 Noise monitoring was performed using sound level meter at each designated monitoring station. The sound level meters deployed comply with the International Electrotechnical Commission Publications (IEC) 651:1979 (Type 1) and 804:1985 (Type 1) specifications. Acoustic calibrator was deployed to check the sound level meters at a known sound pressure level. Brand and model of the equipment is given in Table 3.1.

Table 3.1 Noise Monitoring Equipment

| Equipment | Brand and Model |
|------------------------------|----------------------|
| Integrated Sound Level Meter | B&K (Model No. 2238) |
| | Rion NL-31 |
| Acoustic Calibrator | B&K (Model No. 4231) |
| | Rion NC-73 |

3.3 Monitoring Locations

3.3.1 Monitoring stations NM3, NM6 and NM7 were set up at the proposed locations in accordance with updated EM&A Manual. However, for monitoring locations: Tai Po Garden (NM1), Dynasty View (NM2), Hong Kong Teachers' Association Lee Heng Kwei Secondary School (NM4) and Grand Palisades (NM5), proposed in the updated EM&A Manual, impact noise monitoring was conducted at alternative monitoring locations, as approval of access could not be obtained from the owner's corporation of the premises or the principal of the education institutes. Figure 2.1 shows the locations of the monitoring stations. Table 3.2 describes the details of the monitoring stations.

Table 3.2 Locations of Impact Noise Monitoring Stations

| Monitoring Station | Location | Description |
|--------------------|--------------------------------|---|
| NM1 | Tai Kwong Secondary School | 1m from the exterior of the roof top façade of the School |
| NM2 | 38 Ha Wun Yiu | 1.2m from the ground floor free-field of the village house |
| NM3 | Wong Shiu Chi Middle School | 1m from the exterior of the roof top façade of the New Wing |
| NM4 | Uptown Plaza | 1m from the exterior of the roof top façade of Block 4 |
| NM5 | The Paragon | 1m from the exterior of the roof top façade of the club house |
| NM6 | PLK Tin Ka Ping Primary School | 1.2m ground floor free-field near the entrance |
| NM7 | Riverain Bayside | 1m from the exterior of the roof façade of the switch room |

3.4 Monitoring Parameters, Frequency and Duration

3.4.1 Table 3.3 summarizes the monitoring parameters, frequency and duration of impact noise monitoring.

Table 3.3 Noise Monitoring Parameters, Frequency and Duration

| Parameter | Frequency and Duration |
|--|------------------------|
| 30-mins measurement at each monitoring station between 0700 and 1900 on normal weekdays. L_{eq} , L_{10} and L_{90} would be recorded. | At least once per week |

3.5 Monitoring Methodology

3.5.1 Monitoring Procedure

- (a) Façade measurements were made at all monitoring locations, except monitoring stations NM2 and NM6.
- (b) The sound level meter was set on a tripod at a height of 1.2 m above the ground for free-field measurements at NM2 and NM6.
- (c) The battery condition was checked to ensure the correct functioning of the meter.
- (d) Parameters such as frequency weighting, the time weighting and the measurement time were set as follows:
 - (i) frequency weighting: A
 - (ii) time weighting: Fast
 - (iii) time measurement: $L_{eq(30\text{-minutes})}$ during non-restricted hours i.e. 07:00 – 1900 on normal weekdays; $L_{eq(5\text{-minutes})}$ during restricted hours i.e. 19:00 – 23:00 and 23:00 – 07:00 of normal weekdays, whole day of Sundays and Public Holidays
- (e) Prior to and after each noise measurement, the meter was calibrated using the acoustic calibrator for 94dB(A) at 1000 Hz. If the difference in the calibration level before and after measurement was more than 1 dB(A), the measurement would be considered invalid and repeat of noise measurement would be required after re-calibration or repair of the equipment.
- (f) During the monitoring period, the L_{eq} , L_{10} and L_{90} were recorded. In addition, site conditions and noise sources were recorded on a standard record sheet.
- (g) Noise measurement was paused during periods of high intrusive noise (e.g. dog barking, helicopter noise) if possible. Observations were recorded when intrusive noise was unavoidable.
- (h) Noise monitoring was cancelled in the presence of fog, rain, wind with a steady speed exceeding 5m/s, or wind with gusts exceeding 10m/s.

3.5.2 Maintenance and Calibration

- (a) The microphone head of the sound level meter was cleaned with soft cloth at regular intervals.
- (b) The meter and calibrator were sent to the supplier or HOKLAS laboratory to check and calibrate at yearly intervals.
- (c) Calibration certificates of the sound level meters and acoustic calibrators are provided in Appendix E.

3.6 Monitoring Schedule for the Reporting Month

3.6.1 The schedule for environmental monitoring in December 2009 is provided in Appendix F.

3.7 Monitoring Results

3.7.1 The monitoring results for construction noise are summarized in Table 3.4 and the monitoring data is provided in Appendix I.

Table 3.4 Summary of Construction Noise Monitoring Results in the Reporting Period

| | Average, dB(A), L_{eq} (30 mins) | Range, dB(A), L_{eq} (30 mins) | Limit Level, dB(A), L_{eq} (30 mins) |
|-----|---------------------------------------|-------------------------------------|---|
| NM1 | 62.8 | 47.9 – 64.2 | 70 [#] |
| NM2 | 65.7* | 63.8 – 66.8* | 75 |
| NM3 | 61.8 | 58.4 – 64.7 | 70 [#] |
| NM4 | 60.5 | 55.9 – 62.0 | 75 |
| NM5 | 64.2 | 63.9 – 64.6 | 75 |
| NM6 | 63.6* | 62.4 – 64.5* | 70 [#] |
| NM7 | 58.4 | 57.1 – 60.0 | 75 |

*+3dB(A) Façade correction included

Limit Level of 65 dB(A) during school examination period

3.7.2 There was one (1) noise related complaint received in the reporting period. Hence, one Action Level exceedance was recorded.

3.7.3 A public complaint about construction noise at TP 4 & 5 was received from Contractor's complaint hotline at 9:15am on 19 December 2009. As informed by the Contractor, concrete breaking works were carrying out at TP 4 & 5 at the time. Although, under the Noise Control Ordinance, construction works are permitted during the period from 7:00am to 19:00am on Saturdays, to minimize the noise nuisance to the public, the Contractor had suspended the concrete breaking works at once, upon receipt of the complaint, until 13:00pm of the date. The temporary noise barrier opposite to King Nga Court had been erected in accordance with the EP requirement. Regular impact noise monitoring record at PLK Tin Ka Ping Primary School (NM6) on 30 December 2009 at 10:15am was 64.4 dB(A) and ad hoc monitoring conducted on 30 December 2009 at King Nga Court – King Yuet House G/F 2.5m above ground facing Tolo Highway, at 1:15pm during rock breaking and sheet piling works being taken place was 69.6 dB(A), which complied with the noise Limit Level of 75 dB(A). Follow-up site visit to Wan Tau Tong Estate was carried out on 30 December 2009 at 9:45am. No noisy construction work was carried out at the time. The Contractor deferred the noisy construction activities in the morning.

3.7.4 No Limit Level exceedance of noise was recorded at all monitoring stations in the reporting period.

3.7.5 The event action plan is annexed in Appendix J.

3.7.6 Major noise sources during the noise monitoring included construction activities of Stage 1 of the Project, nearby traffic noise and general school activities.

4 ENVIRONMENTAL SITE INSPECTION AND AUDIT

4.1 Site Inspection

4.1.1 Site Inspections were carried out on a weekly basis to monitor the implementation of proper environmental pollution control and mitigation measures for Stage 1 of the Project. In the reporting month, 5 site inspections were carried out on 2, 7, 16, 23 and 30 December 2009. The environmental site inspection summaries are provided in Appendix K. Particular observations are described below:

Air Quality

4.1.2 No adverse observation was identified in the reporting month.

Noise

4.1.3 No adverse observation was identified in the reporting month.

Water Quality

4.1.4 Leaves and debris was observed accumulated inside the perimeter u-channel at Banyan Bridge and stagnant water was resulted inside the u-channel. The Contractor was reminded to unblock the u-channel.

Chemical and Waste Management

4.1.5 Small amount of oil stain was observed on the top soil layer at 10A Bridge. The Contractor was reminded to clear the contaminated soil and treat it as chemical waste.

Landscape and Visual

4.1.6 A few retained trees at TP4 & 5 were not fenced off. The Contractor was reminded to properly fence off all the retained trees on site.

4.2 Advice on the Solid and Liquid Waste Management Status

4.2.1 The Contractor is registered as a chemical waste producer for Stage 1 of the Project. C & D material sorting was carried out on site. Sufficient numbers of receptacles were available for general refuse collection.

4.2.2 As advised by the Contractor, 60 m³ of inert C&D material was disposed as public fill to Tuen Mun 38 while 142kg and 3.068 m³ of general refuse were disposed at NENT landfill in the reporting month. No waste was reused on site.

4.2.3 The Contractor is advised to maintain on site waste sorting and recording system and maximize reuse / recycle of C&D wastes.

4.3 Environmental Licenses and Permits

4.3.1 The environmental licenses and permits for Stage 1 of the Project and valid in the reporting month is summarized in Table 4.1.

Table 4.1 Summary of Environmental Licensing and Permit Status

| Statutory Reference | License/ Permit/ Notification | License or Permit No. | Valid Period | | Remarks |
|---------------------|--------------------------------------|-----------------------|---|------------|---|
| | | | From | To | |
| EIAO | Environmental Permit | EP-324/2008 | 23/12/2008 | N/A | Tolo Highway/Fanling Highway between Island House Interchange and Ma Wo |
| WPCO | Discharge License (Office) | WT00005096-2009 | 3/12/2009 | 31/12/2014 | Discharge at Site Office |
| | Discharge License (Site) | WT00005445-2009 | 15/12/2009 | 31/12/2014 | Discharge of Construction Runoff |
| WDO | Chemical Waste Producer Registration | 5213-727-C3249-46 | 25/09/2009 | N/A | Chemical waste produced in Contract HY/2008/09 |
| WDO | Waste Charges Account | 7009328 | 08/09/2009 | N/A | Waste disposal in Contract HY/2008/09 |
| NCO | Construction Noise Permit | N/A | Application was submitted on 15/12/2009 | N/A | Construction of TB1 & TB2 |
| | | N/A | Application was submitted on 17/12/2009 | N/A | Loading and unloading along Tolo Highway |

4.4 Implementation Status of Environmental Mitigation Measures

- 4.4.1 In response to the site audit findings, the Contractor carried out corrective actions.
- 4.4.2 A summary of the Implementation Schedule of Mitigation Measures (EMIS) is presented in Appendix C. Most of the necessary mitigation measures were implemented properly.

4.5 Summary of Exceedances of the Environmental Quality Performance Limit

- 4.5.1 All 1-hour TSP and 24-hour TSP monitoring results complied with the Action / Limit Levels in the reporting period.
- 4.5.2 There was one (1) noise related complaint received in the reporting period. Hence, one Action Level exceedance was recorded.
- 4.5.3 No monitoring Limit Level exceedance for noise was recorded at all monitoring stations in the reporting period.

4.6 Summary of Complaints, Notification of Summons and Successful Prosecutions

- 4.6.1 The Environmental Complaint Handling Procedure is annexed in Figure 4.1.
- 4.6.2 There were two (2) environmental complaints received in the reporting period.
- 4.6.3 A public complaint about construction noise at TP 4 & 5 was received on 19 December 2009 from Contractor's complaint hotline at 9:15am. As informed by the Contractor, concrete breaking works were carrying out at TP 4 & 5 at the time. Although, under the Noise Control Ordinance, construction works are permitted during the period from 7:00am to 19:00am on Saturdays, to minimize the noise nuisance to the public, the Contractor had suspended the concrete breaking works at once, upon receipt of the complaint, until 13:00pm of the date. The temporary noise barrier opposite to King Nga Court had been erected in accordance with the EP requirement. Regular impact noise monitoring record at PLK Tin Ka Ping Primary School (NM6) on 30 December 2009 at 10:15am was 64.4 dB(A) and ad hoc monitoring conducted on 30 December 2009 at King Nga Court – King Yuet House G/F 2.5m above ground facing Tolo Highway, at 1:15pm during rock breaking and sheet piling works being taken place was 69.6 dB(A), which complied with the noise Limit Level of 75 dB(A). Follow-up site visit to Wan Tau Tong Estate was carried out on 30 December 2009 at 9:45am. No noisy construction work was carried out at the time. The Contractor deferred the noisy construction activities in the morning.
- 4.6.4 Another complaint was lodged by Drainage Services Department on 23 December 2009 regarding muddy water discharged from construction site into Tai Po River near Shan Tong Road observed during routine inspection on 16 December 09. As advised by the Contractor, muddy water collected in the sump pit on ground level was found leaked to the drainage system. The Contractor immediately blocked the u-channel to prevent further leakage on 24 December 09 and built a metal tank to replace the original soil type sump pit on 28 December 09. Water discharged to Tai Po River near Shan Tong Road was observed clear during the follow-up site inspection on 30 December 2009.
- 4.6.5 No notification of summons and successful prosecution was received in the reporting period.
- 4.6.6 Statistics on complaints, notifications of summons and successful prosecutions are summarized in Appendix L.

5 FUTURE KEY ISSUES

5.1 Construction Programme for the Coming Months

5.1.1 The major construction works in January 2010 will be:

- Ground investigation;
- Site clearance;
- Tree felling;
- Bored pile;
- Soil nail works;
- Demolition of existing boxculvert;
- Excavation; and
- Sheetpile installation.

5.2 Key Issues for the Coming Month

5.2.1 Key issues to be considered in the coming month included:

- Properly store and label oils and chemicals on site;
- Chemical and waste management;
- Collection of construction waste should be carried out regularly;
- Site runoff should be properly collected and treated prior to discharge;
- Suppress dust generated from excavation activities and haul road traffic;
- Quieter powered mechanical equipment should be used; and
- Properly maintain all drainage facilities on site.

5.3 Monitoring Schedule for the Coming Month

5.3.1 The tentative schedule for environmental monitoring in January 2010 is provided in Appendix F.

6 CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

6.1.1 The construction phase and EM&A programme of Stage 1 of the project commenced on 23 November 2009.

6.1.2 1-hour TSP, 24-hour TSP and noise monitoring were carried out in the reporting period.

6.1.3 All 1-hour TSP and 24-hour TSP monitoring results complied with the Action / Limit Level.

6.1.4 One (1) noise related complaint was received in the reporting period. Hence, one Action Level exceedance was recorded. No Limit Level exceedance for noise was recorded at all monitoring stations in the reporting month.

6.1.5 Environmental site inspection was carried out 5 times in December 2009. Recommendations on remedial actions were given to the Contractor for the deficiencies identified during the site audits.

6.1.6 Two (2) environmental complaints were received in the reporting month, while no notification of summons and prosecution was received.

6.2 Recommendations

6.2.1 According to the environmental site inspection performed in the reporting month, the following recommendations were provided:

Air Quality Impact

- All plants on site should be properly maintained to avoid dark smoke emission.
- All vehicles should be washed to remove any dusty materials before leaving the site.
- Haul roads should be sufficiently dampened to minimize fugitive dust generation.
- Wheel washing facilities should be properly maintained to ensure properly functioning.
- Temporary exposed slopes and open stockpiles should be properly covered.
- Enclosure should be erected for cement mixing operations.

Construction Noise Impact

- Noise barriers should be closely packed and properly aligned to ensure effective noise reduction.
- Noisy operations should be oriented to a direction away from sensitive receivers as far as possible.

- Sound insulation materials shall be wrapped at the breaker tip for concrete breaking works.

Water Quality Impact

- Stagnant water accumulated in drip trays should be removed.
- Silt, debris and leaves accumulated at public drains and perimeter u-channels should be cleaned up regularly.
- Silty effluent should be treated/desilted before discharged. Untreated effluent should be prevented from entering public drain channel.

Chemical and Waste Management

- C&D material should be sorted and removed timely.
- All plants and vehicles on site should be properly maintained to prevent oil leakage.
- Oil stains on soil surface and empty chemical containers should be cleared and disposed of as chemical waste.

Landscape and Visual Impact

- All retained trees should be properly fenced off at the works area.

6.2.2 The Contractor has rectified all the observations as identified during environmental site inspections in the reporting month within agreed time frame.