
**Improvements to
San Tin Interchange
(Contract No. HY/2004/09)**

**Monthly Environmental
Monitoring & Audit Report**

Report No. 13

June 2006

ATKINS

1	Environmental Status	1
1.1	Works undertaken during the Reporting Period.....	1
1.2	Environmental Permit and Licences.....	1
1.3	Environmental Document Submissions to EPD	1
1.4	Environmental Monitoring Locations	1
2	Environmental Measures and Implementation Status	2
3	Monitoring Results	3
3.1	Noise Monitoring.....	3
3.2	Water Quality Monitoring	4
3.3	Landscape and Visual Resources.....	5
3.4	Ad-hoc Air Quality Monitoring	5
3.5	Waste Management	5
4	Environmental Audits	6
4.1	Site Inspection and Audit	6
4.2	Environmental Exceedances	6
4.3	Environmental Complaint and Prosecution	7
5	Forecast and Schedule	7
5.1	Key Issues for the Coming Months.....	7
5.2	Monitoring Schedules for the Next Month	8
6	Conclusion	8

List of Annexes

Annex A	Contractor's Works Programme
Annex B	Mitigation Measures Checklist
Annex C	Calibration Certificates
Annex D	Noise Monitoring Results
Annex E	Water Quality Visual Inspection Reports
Annex F	Landscape & Visual Resources Inspection Reports
Annex G	Weekly Site Inspection Reports
Annex H	Notification of Environmental Exceedances and Non-compliance Forms
Annex I	Action and Limit Levels
Annex J	Environmental Complaint Form
Annex K	Cumulative Statistics on Complaints, Notifications of Summons and Successful Prosecutions

List of Tables

Table 1.1	Details of Permits and Licenses issued in June 2006
Table 1.2	Summary of Environmental Submissions to EPD in June 2006
Table 1.3	Noise Monitoring Stations
Table 3.1	Summary of Noise Monitoring Results during Normal Working Hours
Table 3.2	Summary of Noise Monitoring Results during Restricted Hours – All days during the evening (1900 to 2300 hours), and general holidays (including Sundays) during the day-time and evening (0700-2300 hours)
Table 3.3	Summary of Noise Monitoring Results during Restricted Hours – All days during the night-time (2300 to 0700 hours)
Table 3.4	Summary of Waste Disposal for June 2006
Table 5.1	Proposed Noise Monitoring Schedule for July 2006

List of Figures

Figure 1	Site Plan & Locations of Noise and Air Quality Monitoring Stations
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Executive Summary

Atkins China Limited (ACL) has been appointed by Chun Wo Construction & Engineering Co., Ltd. to implement the Environmental Monitoring and Audit (EM&A) programme for the construction works under Contract No. HY/2004/09 Improvements to San Tin Interchange (hereinafter, the Project).

The construction of the Project commenced since 21st June 2005. This report is the thirteenth monthly EM&A report for the Project which summarises the monitoring results and audit findings during the reporting period from 1st to 30th June 2006.

Environmental Monitoring and Audit Progress

The monthly EM&A programme was undertaken in accordance with the EM&A Manual. A summary of the monitoring activities in this reporting period is listed below:

- Weekly site inspections were undertaken jointly with the Contractor and Engineer's Representative (ER) on 1st, 8th, 15th, 22nd and 29th June 2006. The Independent Environmental Checker (IEC) joined the site inspection on 22nd June 2006.
- Noise monitoring at three designated monitoring stations was undertaken on 5th, 13th, 21st and 29th June 2006 during normal working hours; and 4th, 11th, 13th, 18th, 21st and 25th June 2006 during the restricted hour periods on a weekly basis when there were construction activities scheduled during those periods.
- Visual site surveillance for water quality was undertaken three times a week.
- Site inspections for landscape and visual resources were undertaken on 16th and 28th June 2006.

Breaches of Action and Limit Levels

There were totally nine environmental exceedances recorded during the reporting period, of which six were recorded during restricted hours noise monitoring on 4th, 11th, 13th, 18th, 21st and 25th June 2006, and three were recorded during water quality site surveillances on 22nd, 26th and 28th June 2006.

For the restricted hours noise monitoring, the exceedances were proved not to have been caused by the site activities of the Contractor.

There were three environmental exceedances and two non-compliances regarding the water quality visual site surveillance recorded due to an improper wastewater discharge to EMDC via a non-designated discharge point with respect to the Drainage Management Plan (DMP) and the Effluent Discharge License. The Contractor was asked to stop the discharge immediately and reminded that all effluent should be diverted to a designated discharge point via sedimentation tank in order to comply with the requirements set out in the EIA Report, EM&A Manual, the DMP, and the Effluent Discharge License. No discharge at the concerned location was observed during the inspection conducted on 29th June 2006 and thereafter.

Complaint Log

There was one environmental complaint received during this reporting period.

Notifications of Summons and Prosecutions

There were no notifications of summons or prosecutions received during this reporting period.

Reporting Changes

This report has been developed in compliance with the reporting requirements for the subsequent monthly EM&A reports as required by the Project EM&A Manual.

Future Key Issues

Installation of viaduct segments will continue in July 2006. Contamination Assessment Report (CAR) together with the Remediation Action Plan of Site A and Site E have been further reviewed by the IEC and will be finalized for the IEC's verification and submission to EPD.

1 ENVIRONMENTAL STATUS

1.1 Works undertaken during the Reporting Period

The major construction activities undertaken during this reporting period are summarised below:

- Laying of drainage pipes;
- Road widening works;
- Trench works;
- Storage and preparation of precast viaduct segments; and
- Erection of precast viaduct segments.

The site plan of the Project is shown in Figure 1. The Contractor's works programme is provided in Annex A.

1.2 Environmental Permit and Licences

There were no changes or clarification to the Environmental Permit (EP-190/2004) during the reporting period.

Two Construction Noise Permits (CNP) were issued in June 2006. Details of the CNP are summarised in Table 1.1.

Table 1.1 Details of Permits and Licenses issued in June 2006

Permit / License	Reference No.	Issue Date	Expiry Date
Construction Noise Permit for general construction work	GW-RN0293-06	6 th June 2006	6 th July 2006
Construction Noise Permit for general construction work	GW-RN0317-06	20 th June 2006	4 th July 2006

1.3 Environmental Document Submissions to EPD

A summary of the status of the submissions to EPD as provided during the month of June 2006 is presented in Table 1.2.

Table 1.2 Summary of Environmental Submissions to EPD in June 2006

Item No.	Document Title	Date of Submission
1	Monthly EM&A Report No. 12 for May 2006	13 th June 2006
2	Quarterly EM&A Summary Report No. 4	30 th June 2006

1.4 Environmental Monitoring Locations

Noise monitoring was undertaken at three monitoring stations CM1, CM2 and CM3. The locations are shown on Figure 1. Description of these monitoring stations is provided in Table 1.3.

Table 1.3 Noise Monitoring Stations

Monitoring Station ID	Description	Easting	Northing
CM1	Village house near San Tin Highway	826133	839839
CM2	Village house near San Tin Highway	826291	839918
CM3	Village house near Kwu Tung Road	826605	840076

2 ENVIRONMENTAL MEASURES AND IMPLEMENTATION STATUS

The mitigation measures listed in the Project EIA Report, EM&A Manual and Environmental Permit and the implementation status are provided in Annex B.

During the water quality visual site surveillances conducted on 22nd, 26th and 28th June 2006, effluent discharge into EMDC via a non-designated discharge point with respect to the DMP and Effluent Discharge License was observed. The Contractor was asked to cease the discharge immediately and to properly divert all site drainage to the designated discharge point via sedimentation tank in accordance with the requirements of the DMP and the Effluent Discharge License. Following the Event and Action Plan for water quality visual surveillance, the ET notified the IEC, ER and the Contractor accordingly of the unsatisfactory practice. During the inspection conducted on 29th June 2006, no discharge at the concerned location was observed. The Contractor was reminded to divert all site drainage to the designated discharge point via sedimentation tank in accordance with the DMP and the Effluent Discharge License.

A ditch was seen to have been excavated within the area of the potential contaminated Site E. Site investigation works undertaken (according to the EPD approved Contamination Assessment Plan (CAP)) found that the soil samples from Site E were within the Dutch B levels according to the preliminary analysis results. It is, however, noted that the approved CAP has stated that the whole of the site area has been identified as having high levels of arsenic in the soil, which have been attributed to the natural soil conditions. To ensure that direct exposure to arsenic contaminated soil is limited, the following measures have been recommended:

- Uncontaminated clean material (i.e. arsenic level proved to be within the Dutch A limit) shall be provided as a cover for the surface of backfilled areas where excavated material is re-used on-site. For areas backfilled that will have concrete or asphalt material laid on top, about 100 mm thick of uncontaminated clean material shall be used on top of the backfilled soil between the backfill soil, and the concrete or asphalt material.
- For areas where a higher risk of exposure to contaminants may exist (for example, areas where human contact may occur and no concrete / asphalt will be laid on top), a minimum of 0.5 m thick of uncontaminated clean soil should be used as fill on top of the contaminated material.
- When handling contaminated material, special care and precautionary measures for the protection of site workers (e.g. protective clothes, masks and personal protective equipment should be provided for all workers when handling the excavated materials) shall be implemented.

The ditch was seen to have been covered with concrete material to minimize exposure as precautionary measures.

3 MONITORING RESULTS

3.1 Noise Monitoring

3.1.1 Noise Monitoring Equipment

The details of the noise monitoring equipment are listed below and the calibration certificates are presented in Annex C:

- Sound level meter ONO-SOKKI LA-5110
- Acoustical calibrator ONO-SOKKI SC-2110
- Hand-held anemometer

3.1.2 Noise Monitoring Methodology

The sound level meter was calibrated with an acoustical calibrator prior to each measurement. It was set on a tripod at 1.2 m above local ground level at the monitoring station. Measurement of the A-weighted $L_{eq(30 \text{ minutes})}$ noise level for normal daytime hours was undertaken. Three consecutive A-weighted $L_{eq(5 \text{ minutes})}$ noise levels were measured for restricted hours monitoring. Wind speed was checked during the monitoring period using the hand-held anemometer to ensure steady wind speed did not exceed 5 m/s, or gusts did not exceed 10 m/s. After the noise measurement the sound level meter was re-calibrated using the acoustical calibrator.

3.1.3 Noise Monitoring Results

Noise monitoring was undertaken on a weekly basis when noise generating activities were underway. The noise monitoring results obtained in June 2006, during the normal working hours, restricted hours from 1900 to 2300 hours on normal working days and from 0700 to 1900 hours on general holidays, and restricted hours from 2300 to 0700 hours of next day are summarised in Table 3.1, Table 3.2 and Table 3.3, respectively. There were no environmental exceedances of the Action and Limit Levels for noise monitoring recorded during the normal daytime hours within the reporting period but six exceedances were recorded during the restricted hours. Details of the monitoring time period and weather condition during the monitoring period and the graphical presentation of the noise monitoring results are provided in Annex D.

Table 3.1 Summary of Noise Monitoring Results during Normal Working Hours

Date of Monitoring	Normal Hours. Noise Monitoring Results $L_{eq(30 \text{ minutes})}$ dB(A)		
	CM1	CM2	CM3
5 th June 2006	68	72	65
13 th June 2006	69	72	67
21 st June 2006	69	71	65
29 th June 2006	69	72	62

Remarks:

- (1) CM2 is a non-façade measurement location. A positive correction of 3dB(A) has been applied to the measured noise level at CM2 according to EPD's guideline.

Table 3.2 Summary of Noise Monitoring Results during Restricted Hours – All days during the evening (1900 to 2300 hours), and general holidays (including Sundays) during the day-time and evening (0700-2300 hours)

Date of Monitoring	Restricted Hours Noise Monitoring Results $L_{eq(15 \text{ minutes})}$ dB(A)		
	CM1	CM2	CM3
4 th June 2006	63	<u>69</u>	57
11 th June 2006	63	<u>68</u>	57
13 th June 2006	64	<u>69</u>	59
18 th June 2006	63	<u>67</u>	57
21 st June 2006	64	<u>70</u>	58
25 th June 2006	63	<u>67</u>	58

Remark:

- (1) CM2 is a non-façade measurement location. A positive correction of 3dB(A) has been applied to the measured noise level at CM2 according to EPD's guideline.
- (2) Underlined figure indicates exceedance of the Limit Level of 65dB(A).

Table 3.3 Summary of Noise Monitoring Results during Restricted Hours – All days during the night-time (2300 to 0700 hours)

Date of Monitoring	Restricted Hours Noise Monitoring Results $L_{eq(15 \text{ minutes})}$ dB(A)		
	CM1	CM2	CM3
13 th June 2006	<u>64</u>	<u>70</u>	<u>54</u>
21 st June 2006	<u>64</u>	<u>69</u>	<u>53</u>

Remark:

- (1) CM2 is a non-façade measurement location. A positive correction of 3dB(A) has been applied to the measured noise level at CM2 according to EPD's guideline.
- (2) Underlined figure indicates exceedance of the Limit Level of 50dB(A).
- (3) The Date of Monitoring refers to the date of which nighttime noise monitoring started.

3.2 Water Quality Monitoring

Visual site surveillances for water quality were undertaken three times a week.

During the water quality visual site surveillances at the N2 Division conducted on 22nd, 26th and 28th June 2006, effluent discharge into EMDC via a non-designated discharge point with respect to the DMP and Effluent Discharge License was observed. This was not in compliance with the requirements mentioned in EIA Report, EM&A Manual, DMP and Effluent Discharge License. Following the Event and Action Plan for water quality visual surveillance, the ET notified the IEC, ER and the Contractor accordingly of the unsatisfactory practice. The Contractor was asked to cease the discharge immediately and reminded to divert all site drainage to the designated discharge point via sedimentation tank in accordance with the requirements of the DMP and the Effluent Discharge License. The ET conducted a final visual surveillance for this reporting period on 29th June 2006 and no discharge at the concerned location was observed.

In general, the Contractor has followed all necessary site practices for the maintenance of the site drainage system, including:

- Regular and prompt removal of stagnant water pools to prevent mosquito breeding.

- Placing unused sedimentation basins up-side-down to prevent water accumulation after rainstorm events.
- Regular removal of deposited sediment in sedimentation basin, drainage channel and sump pit for proper maintenance of the site drainage system.
- Replacing the broken sandbags at the discharge outlet which act as a silt retention barrier.
- Adding coagulant to sedimentation tank to improve the silt removal process.
- Replacing the damaged geotextile to prevent silt and sand being washed into the gully.

The details of the water quality visual inspection reports are provided in Annex E.

3.3 Landscape and Visual Resources

Two site inspections on the landscape and visual resources were undertaken in June 2006.

Weeds were seen to have been grown inside the transplantation nursery behind the site office in the N1 Division area. The Contractor was reminded to clear up the weeds as proper maintenance for the nursery.

Soil inside the transplantation nursery in the N2 Division Area was found to be waterlogged due to excessive rainwater accumulation. A shallow ditch has been excavated as for temporary drainage at the transplantation nursery in the N2 Division area, although minor water-logging condition was still observed at the nursery during the second inspection. The Contractor was advised to improve the rainwater diversion effectiveness, e.g., excavating a deeper ditch.

The details of the landscape and visual resources inspection reports are provided in Annex F.

3.4 Ad-hoc Air Quality Monitoring

No ad-hoc air quality monitoring was required during the reporting period.

3.5 Waste Management

The Contractor has adopted a trip ticket system for the disposal of construction wastes. According to the records provided by the Contractor, the disposal of construction waste within the reporting period is summarised in Table 3.4.

Table 3.4 Summary of Waste Disposal for June 2006

Waste Type	Destination	No. of Trips	Quantity
C&D Waste	NENT Landfill	22	110 m ³
C&D Waste	WENT Landfill	2	10 m ³
Building debris	CEDD's Tuen Mun Area 38 Fill Bank	587	2,935 m ³
	CEDD's Tuen Mun Area 38 C&D Materials Recycling Facility	8	40 m ³
Chemical Waste	Collected by Dunwell Enviro-Tech (Holdings) Ltd.	Nil	Nil
Chemical Toilet Waste	Collected by Proenvironmental Services Ltd.	40	-
Sewage Holding Tank Waste	Collected by Waylung Waste Services Ltd.	14	-

4 ENVIRONMENTAL AUDITS

4.1 Site Inspection and Audit

Site inspections were undertaken on 1st, 8th, 15th, 22nd, and 29th June 2006, and jointly with the IEC on 22nd June 2006. Specific locations within the site were identified during the inspection for improvements in proper implementation of the environmental mitigation measures. These include:

- Regular and prompt removal of stagnant water pools to prevent mosquito breeding.
- Regular removal of deposited sediment in sedimentation basin, drainage channel and sump pit for proper maintenance of the site drainage system.
- Covering the exposed soil surface of an excavated ditch located within the potential contaminated Site E with a layer of concrete material.
- Diversion of site drainage to the designated discharge point via sedimentation tank.
- Adding coagulant to sedimentation tank to improve the silt removal process.
- Regular check and replacement of the geotextile sediment filter.
- Daily cleaning up of rubbish inside works area for site cleanliness and tidiness.

The record of the weekly site inspection findings is provided in Annex G.

4.2 Environmental Exceedances

During the reporting period, there were totally nine environmental exceedances recorded. Six of which were noise exceedances of the limit level during restricted hours noise monitoring recorded on 4th, 11th, 13th, 18th, 21st and 25th June 2006, and three were recorded during water quality site surveillances conducted on 22nd, 26th and 28th June 2006.

For the noise exceedances, the project-related works being undertaken during the measurement period were located at a distance away (at least over 200m) from the monitoring stations. The exceedances were due to the high ambient background noise caused by road traffic on San Tin Highway. Thus, the noise exceedances recorded were found not to be attributable to project works.

For the exceedances of water quality monitoring, discharge into EMDC via a non-designated discharge point with respect to the DMP and Effluent Discharge License was observed. This was not in compliance with the requirements mentioned in EIA Report, EM&A Manual, DMP and Effluent Discharge License and two non-compliance forms were issued. Following the Event and Action Plan for water quality visual surveillance, the ET notified the IEC, ER and the Contractor accordingly of the unsatisfactory practice. The Contractor was asked to cease the discharge immediately and reminded to divert all site drainage to the designated discharge point via sedimentation tank in accordance with the requirements of the DMP and the Effluent Discharge License. The ET conducted a final visual surveillance for this reporting period on 29th June 2006 and no discharge at the concerned location was observed.

Records of the notification of environmental exceedances and the non-compliance forms are provided in Annex H. The Action and Limit Levels for impact monitoring are provided in Annex I.

4.3 Environmental Complaint and Prosecution

During the reporting period, no prosecutions or summons were received. However, one environmental complaint was received from EPD on 26th June 2006.

According to the EPD's description, the complaint was regarding a polluting effluent discharge event at San Tin Highway near Lok Ma Chau roundabout on 9th June 2006. The ET undertook a complaint investigation on 26th June 2006 following the requirements of the EM&A Manual. Based on investigation findings, the location in question was at the existing slip road off San Tin Highway in between the junction of Castle Peak Road – San Tin, and Castle Peak Road – Chau Tau. There were no project related site works located in this area at this stage (and also on 9th June 2006). No effluent discharge was seen at this location during the investigation inspection. It should be noted that heavy rainstorm condition (black rainstorm warning signal was in force) was recorded on 9th June 2006. The concerned location was flooded caused by the heavy rainfall, and was considered to be not related to the project.

Details of the complaints investigations are provided in the Environmental Complaints Forms and are attached in Annex J. Cumulative statistics on complaints, notifications of summons and successful prosecutions for the Project are provided in Annex K.

5 FORECAST AND SCHEDULE

5.1 Key Issues for the Coming Months

The key issues with respect to the works in the forthcoming 2 months include:

- Laying of drainage pipes;
- Road widening works;
- Bored piling works;
- Trench works;
- Storage and preparation of precast viaduct segments;
- Erection of precast viaduct segments; and
- Percussive piling.

5.2 Monitoring Schedules for the Next Month

The proposed schedule for noise monitoring in July 2006 is provided in Table 5.1 below:

Table 5.1 Proposed Noise Monitoring Schedule for July 2006

Date	Noise Monitoring Station
7 th July 2006 (Friday)	CM1, CM2 and CM3
10 th July 2006 (Monday)	CM1, CM2 and CM3
18 th July 2006 (Tuesday)	CM1, CM2 and CM3
26 th July 2006 (Wednesday)	CM1, CM2 and CM3

6 CONCLUSION

There were six exceedances of the Limit Level recorded during the restricted hours noise monitoring during the reporting period. However, they were found not to be attributable to project works.

There were three environmental exceedances and two non-compliances recorded during water quality site surveillances related to effluent discharge to EMDC via a non-designated discharge point during the reporting period.

No environmental prosecution or summons were received during the reporting period. There was one environmental complaint received from EPD. Further to the compliant investigation, it was considered to be not related to the project.