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

**Monthly Environmental
Monitoring & Audit Report**

Report No.1

June 2005

ATKINS

1	Introduction	1
1.1	Basic Project Information.....	1
1.2	Project Organisation and Management Structure	2
1.3	Construction Programme.....	2
2	Environmental Status.....	3
2.1	Work undertaken during the Reporting Period.....	3
2.2	Environmental Permit and License	3
2.3	Environmental Document Submission to EPD	3
2.4	Environmental Monitoring Locations	3
3	EM&A Requirements	4
3.1	Summary of Impact EM&A Requirements.....	4
3.2	Environmental Quality Performance Limits	4
3.3	Event Action Plan	5
3.4	Environmental Measures and Implementation Status	5
4	Monitoring Results	6
4.1	Noise Monitoring Equipment.....	6
4.2	Noise Monitoring Methodology.....	6
4.3	Noise Monitoring Results	6
4.4	Ad-hoc Air Quality Monitoring	6
4.5	Waste Management	6
5	Site Inspection, Environmental Complaint and Non-Compliance.....	7
5.1	Site Inspection and Audit	7
5.2	Environmental Exceedance	7
5.3	Environmental Complaint and Prosecution	7
6	Forecast and Schedule	8
6.1	Key Issues for the Coming Months.....	8
6.2	Monitoring Schedules for the Next Month.....	8
7	Conclusion	9

List of Annexes

Annex A	Contractor's Works Programme
Annex B	Event & Action Plan
Annex C	Mitigation Measures Checklist
Annex D	Calibration Certificates
Annex E	Noise Monitoring Results
Annex F	Site Inspection Reports

List of Tables

Table 2.1	Summary of Environmental Document Submission to EPD
Table 2.2	Monitoring Stations Description
Table 3.1	Summary of Impact EM&A Requirements
Table 3.2	Action and Limit Levels for Impact Noise Monitoring
Table 3.3	Action and Limit Levels for Air Quality Monitoring
Table 4.1	Summary of Noise Monitoring Results
Table 6.1	Noise Monitoring Schedule for July 2005

List of Figures

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

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) and will be providing Environmental Team Services to the Project during the course of construction works. The aim of the EM&A programme is to ensure the environmental protection and pollution prevention recommendations and requirements set out in the EM&A Manual are fully implemented in a timely manner, and all the on-site activities are in compliance with the statutory environmental guidelines and legislations.

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

Environmental Monitoring and Audit Progress

The monthly EM&A programme was undertaken in accordance with the EM&A Manual. Since the project commenced on 21st June 2005, the EM&A programme was implemented for ten days only in the reporting month. A summary of the monitoring activities in this reporting month is listed below:

- Site inspection was undertaken jointly with the Contractor, Engineer Representative and Independent Environmental Checker on 30th June 2005.
- Noise monitoring at three designated monitoring stations was undertaken on 30th June 2005.

Breaches of Action and Limit Levels

There were no environmental exceedances recorded during this reporting period.

Complaint Log

There were no environmental complaints received during this reporting period.

Notifications of Summons and Prosecutions

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

Environmental Non-compliance

There were no environmental non-compliances recorded during this reporting period.

Reporting Changes

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

Future Key Issues

Pre-drilling works for borepiles of Bridge K and Slip Roads E & F will continue in July 2005.

1 INTRODUCTION

1.1 Basic Project Information

The Project is located at the current San Tin Interchange in the San Tin region of the North-West New Territories. The Project area is generally rural in nature, with the surrounding areas comprising village houses at Tung Chan Wai, Wing Ping Tsuen and Tai Fu Tai, and open storage areas for containers and temporary car parks along Kwu Tung Road and Castle Peak Road.

The Project includes two elevated slip roads from westbound Fanling Highway and eastbound San Tin Highway merging to form a 4-lane carriageway and then connect to San Sham Road leading to the existing vehicle holding area at the Lok Ma Chau Boundary Crossing. Details of the Project are described below:

- construction of a single two-lane road of 1.5 km in length for the westbound traffic from Fanling Highway (FH) to the vehicle holding area (VHA) in Lok Ma Chau including 800 m of elevated highway structures;
- construction of a single two-lane road of 850 m in length for the eastbound traffic from San Tin Highway (STH) to the VHA in Lok Ma Chau including 450 m of elevated highway structures;
- construction of a single two-lane road of 50 m in length connecting Kwu Tung Road (KTR) to the road mentioned in the first bullet above;
- construction of a single two-lane road of about 250 m between Castle Peak Road (CPR) and San Sham Road (SSR);
- modification of the junction of STH / CPR / Tun Yu Road (TYR) including signalisation of the junction of CPR and slip roads from STH, and widening of a 300 m section of CPR from a single two-lane to a dual two-lane road;
- construction of a single-lane road bridge of 70 m in length across the San Tin Eastern Main Drainage Channel (STEMDC) connecting an existing unnamed road along the eastern side of STEMDC near the VHA and TYR;
- installation of noise barriers 120 m in length and 1.5 m in height at STH near Wing Ping Tsuen;
- provision of a traffic control and surveillance system (TCSS); and
- associated works on junction improvements, landscaping, slopeworks, drainage, traffic management measures and street lighting.

The site plan of the Project is shown in Figure 1.

The Project is a Designated Project under Schedule 2, Part I A.8 of the Environmental Impact Assessment Ordinance (EIAO) (Cap. 499) and requires an environmental permit under the EIAO for its construction and operation. An Environmental Impact Assessment (EIA) for the Project has been undertaken. The EIA was endorsed under the EIAO (AEIAR-077/2004) on 3rd May 2004 and the Environmental Permit (EP-190/2004) for the Project was granted under the EIAO on 15th June 2004.

1.2 Project Organisation and Management Structure

The key personnel contact names and contact numbers regarding the Project environmental works are as follows:

Engineer Representative (ER):

Maunsell Consultants Asia Ltd.

Contact: Mr Bonny Huang

Phone: 2685 6254

Fax: 2375 6455

Contractor:

Chun Wo Construction & Engineering Co. Ltd.

Contact: Mr John Yip

Phone: 9269 9519

Fax: 2744 6937

Independent Environmental Checker (IEC):

Environmental Resources Management Ltd.

Contact: Mr Freeman Cheung

Phone: 2271 3000

Fax: 2723 5660

Environmental Team Leader (ETL):

Atkins China Limited

Contact: Ms Susana Bezy

Phone: 2972 1717

Fax: 2881 0056

Environmental Protection Department (EPD):

Strategic Assessment Group

Contact: Mr Tom Tam

Phone: 2835 1843

Fax: 2591 0558

Environmental Protection Department (EPD):

Regional Office

Contact: Mr John Chung

Phone: 2158 5852

Fax: 2650 6033

1.3 Construction Programme

The Contractor's 3-month construction programme is provided in Annex A.

2 ENVIRONMENTAL STATUS

2.1 Work undertaken during the Reporting Period

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

- General site clearance, grass and shrubs cutting and debris removal.
- Erection of site hoarding.
- Pre-drilling for borepiles of Bridge K and Slip Roads E & F.
- Mobilization of bore-piling rig for Bridge K foundation.
- Trench excavation for drainpipes between manhole and the existing Nullah

2.2 Environmental Permit and License

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

The contractor submitted to EPD an application of a discharge licence on 13th June 2005.

2.3 Environmental Document Submission to EPD

A summary of the status of the submissions specified in the Project EP during the month of June 2005 is presented in Table 2.1.

Table 2.1 Summary of Environmental Document Submission to EPD

Item No.	Document Title	Date of Submission
1	Baseline Environmental Monitoring Report	9 th June 2005
2	Memo informing the construction commencement	7 th June 2005

2.4 Environmental Monitoring Locations

There are three noise monitoring stations and two ad-hoc air quality monitoring stations designated for the Project and the locations are shown on Figure 1. Description of these monitoring stations is provided in Table 2.2.

Table 2.2 Monitoring Stations Description

Monitoring Station ID	Description	Easting	Northing
CM1 / AM2	Village house near San Tin Highway	826133	839839
CM2	Village house near San Tin Highway	826291	839918
CM3 / AM1	Village house near Kwu Tung Road	826605	840076

Notes: CM1, CM2, CM3 = Noise Monitoring Stations
AM1, AM2 = Air Quality Monitoring Stations (ad-hoc monitoring)

3 EM&A REQUIREMENTS

3.1 Summary of Impact EM&A Requirements

The EM&A programme requires quantitative monitoring on noise and dust (Total Suspended Particulates (TSP) on an ad-hoc basis), and regular site inspections to be undertaken. A summary of key impact EM&A requirements is presented in Table 3.1.

Table 3.1 Summary of Impact EM&A Requirements

Parameter	Description	Frequency
Noise: Leq(30min)	On-site measurement using sound level meter	Once a week. One set of measurements between 0700 and 1900 hours on normal weekdays. If there is construction work during the restricted hours (between 1900 and 0700 hours), the frequency and scope of monitoring shall be determined by the Construction Noise Permit (CNP) application and the Noise Control Authority).
Air Quality: 1-hr TSP 24-hr TSP	On-site measurement using High Volume Sampler for TSP	Ad-hoc monitoring when required by ER or IEC, or on receipt of a complaint.
Water Quality	Visual inspection including a walkover of works areas	Three days per week.

Note: TSP = Total Suspended Particulates

Changes to EM&A Requirements for Water Quality Monitoring

Due to the unsuitability of the water monitoring stations proposed and the lack of other suitable alternative locations for sampling, that are not affected by outside influences, it is considered that the physical sampling programme detailed in the EM&A is not presently practicable. Accordingly, alternative methods of determining if the Contractor's mitigation is effective for controlling sediment laden runoff and other materials from leaving the site have been proposed. The monitoring methodology, which has been certified by the ET, reviewed and verified by IEC, and accepted by EPD, involves regular visual inspections of the runoff containment within and around the site so as to ensure the effectiveness of the Drainage Management Plan and mitigation measures outlined in the Project EIA and EM&A Manual.

Water quality inspections will be undertaken three days per week. This will include a walkover of the works areas and surroundings, in particular within the areas of discharge from the site as detailed in the Project Drainage Management Plan.

3.2 Environmental Quality Performance Limits

Action & Limit Levels for noise and air quality have been developed for the Project in the Baseline Monitoring Report and are summarised in Table 3.2 and Table 3.3, respectively.

Table 3.2 Action and Limit Levels for Impact Noise Monitoring

Time Period	Action Level	Limit Level
07:00 – 19:00 hours	When one documented complaint is received	75 dB(A) ($L_{eq(30 \text{ min})}$)
07:00 – 19:00 hours 23:00 – 07:00 hours of the next day	Following Construction Noise Permit conditions	

Table 3.3 Action and Limit Levels for Air Quality Monitoring

Monitoring Station ID	1-Hour TSP Level in $\mu\text{g}/\text{m}^3$	
	Action Level	Limit Level
AM1	357	500
AM2	361	

3.3 Event Action Plan

Event and Action Plans for noise, air quality and water quality monitoring have been developed as part of the Baseline Monitoring Report for the Project and the details are provided in Annex B.

3.4 Environmental Measures and Implementation Status

The mitigation measures listed in the Project EIA Report, EM&A Manual and Environmental Permit are provided in Annex C. Based on the site inspection findings, it appears that the Contractor has implemented the required mitigation measures during construction works to date.

4 MONITORING RESULTS

4.1 Noise Monitoring Equipment

The sound level meter used for the noise monitoring complies with the International Electrotechnical Commission Publication 651:1979 (Type 1) and 804:1985 (Type 1) specification. An acoustic calibrator was used to calibrate the sound level meter before and after each set of noise measurements. The sound level meter and the acoustical calibrator have been calibrated by a HOKLAS laboratory and the calibration certificates are presented in Annex D. The details of the noise monitoring equipment are listed below:

- Sound level meter RION NL-14
- Acoustical calibrator RION NC-73
- Hand-held anemometer

4.2 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 was undertaken. 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.

4.3 Noise Monitoring Results

Noise monitoring results obtained in June 2005 are summarised in Table 4.1. Details of the monitoring time period and weather condition during the monitoring period are provided in Annex E.

Table 4.1 Summary of Noise Monitoring Results

Date of Monitoring	Daytime Noise Monitoring Results $L_{eq(30 \text{ minutes})}$ noise		
	CM1	CM2	CM3
30 th June 2005	70.0	72.5	64.7

4.4 Ad-hoc Air Quality Monitoring

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

4.5 Waste Management

There was no construction waste / chemical disposed of within the reporting period.

The Contractor has been registered as a chemical waste producer with EPD.

5 SITE INSPECTION, ENVIRONMENTAL COMPLAINT AND NON-COMPLIANCE

5.1 Site Inspection and Audit

A joint site inspection with the IEC and the Contractor was undertaken on 30th June 2005. All the works areas were observed to be generally in compliance with the environmental mitigation requirements and no particular water quality impacts found. Specific locations within the site were identified during the inspection for improvements in proper implementation of the environmental mitigation measures. These include:

- Rainwater was found accumulated at N1 Open Lay-down Area (behind stockpiles in storage area). It should be pumped away regularly especially in the wet season to avoid the pooling of stagnant water.
- A stockpile in the storage area was not fully covered with tarpaulin. The stockpile storage area should be checked regularly to ensure the stockpile is completely covered to avoid potential fugitive dust and washing away of the materials.
- Dust preventive measures, such as enclosure should be provided at grouting areas.

The record of the site inspection findings is provided in Annex F. Following the environmental inspection, the Contractor has undertaken remedial actions to improve the implementation of mitigation measures.

The Contractor has prepared a Waste Management Plan for the project, although it is not an EP requirement. During the site inspection, the Contractor was seen to have implemented good site practices and mitigation measures as stated in the EM&A Manual.

5.2 Environmental Exceedance

During the reporting period, there were no exceedances of Action and Limit Level recorded.

5.3 Environmental Complaint and Prosecution

No environmental complaints and no prosecution or summons were received during the reporting period.

6 FORECAST AND SCHEDULE

6.1 Key Issues for the Coming Months

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

- Pre-drilling works
- Temporary works-platform formation work
- Bore piles construction
- Tree felling and transplanting
- Sheet piling
- Pre-bored H-pile installation
- Temporary Support work
- Demolition of existing NB-Wall
- Subway extension
- Band drains installation
- Drainage pipe laying

6.2 Monitoring Schedules for the Next Month

The schedule for noise monitoring in July 2005, which has been agreed by IEC, is provided in Table 6.1 below.

Table 6.1 Noise Monitoring Schedule for July 2005

Date	Noise Monitoring Station
6 th July 2005 (Wednesday)	CM1, CM2 & CM3
12 th July 2005 (Tuesday)	CM1, CM2 & CM3
18 th July 2005 (Monday)	CM1, CM2 & CM3
29 th July 2005 (Friday)	CM1, CM2 & CM3

7 CONCLUSION

Construction of the Project commenced on 21st June 2005.

There were no environmental, non-compliance attributable to the Project works during the reporting period. Also, no environmental complaint, prosecution or summons was received during the reporting period. Mitigation Measures stated in the Project EIA have been implemented.