


Territory Development Department
NT EAST Development Office

Sha Tin New Town, Stage II
Road T3 and Associated Roadworks
Environmental Monitoring and Audit
Monthly Report (Version 1.0)

June 2003

Certified By



(Environmental Team Leader)

REMARKS:

The information supplied and contained within this report is, to the best of our knowledge, correct at the time of printing.

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ABBREVIATION AND ACRONYM

AL Levels	Action and Limit Levels
E / ER	Engineer/Engineer's Representative
EIA	Environmental Impact Assessment
EM&A	Environmental Monitoring and Audit
EMIS	Environmental Mitigation Implementation Schedule
EP	Environmental Permit
EPD	Environmental Protection Department
ET	Environmental Team
HVS	High Volume Sampler
IEC	Independent Environmental Checker
RE	Resident Engineer
RH	Relative Humidity
TSP	Total Suspended Particulates
TDD	Territory Development Department
QA/QC	Quality Assurance / Quality Control
SLM	Sound Level Meter
WMP	Waste Management Plan

EXECUTIVE SUMMARY

Introduction

1. This is the third monthly Environmental Monitoring and Audit (EM&A) Report prepared by Cinotech Consultants Limited for the “Road T3 and Associated Roadworks” (the Project). This report documents the findings of EM&A Works conducted in June 2003 (25th of each month as the cut-off day).
2. The site activities undertaken in the reporting month were:
 - Site clearance works
 - Site office erection
 - Tree felling and tree transplanting works
 - Drilling and ground investigation works
 - Demolition of asbestos containing materials

Environmental Monitoring Works

3. Environmental monitoring for the Project was performed regularly as stipulated in the updated EM&A Manual and the results were checked and reviewed. Site audits were conducted once per week. The implementation of the environmental mitigation measures, Event Action Plans and environmental complaint handling procedures were also checked.

Air Quality

1-hour TSP Monitoring

4. All 1-hour TSP monitoring was conducted as scheduled in this reporting month except 9th, 12th and 13th June 2003. Due to the rainstorm, the monitoring work at AQ1 and AQ2 on 9th June 2003 was postponed to 10th June 2003, the monitoring work at all stations on 12th June 2003 was cancelled, and monitoring work at AQ1 on 13th June 2003 was cancelled. No Action/Limit Level exceedance was recorded in the reporting month.

24-hour TSP Monitoring

5. All 24-hour TSP monitoring was conducted as scheduled and all the results complied with the Action and Limit Levels in the reporting month.

Construction Noise

Pre-Construction Noise Monitoring at N7

6. Pre-construction noise monitoring at Sha Tin Public School, N7, was conducted between 21st May and 3rd June 2003. The noise monitoring results are summarized in the following table.

	Range of Noise Level, dB(A)								
	L _{eq} (30 min)			L ₁₀ (30 min)			L ₉₀ (30 min)		
	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min
Day-Time 0700-1900 hr on normal weekdays	66.7	73.7	63.2	68.6	75.6	65.5	62.2	70.8	59.1
	L _{eq} (5 min)			L ₁₀ (5 min)			L ₉₀ (5 min)		
	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min
Evening-Time 1900-2300 hrs on all days & Holidays 0700-2300	65.0	75.4	60.0	67.6	76.0	62.5	60.0	74.5	52.5
Night-Time 2300-0700 hrs of the next day	60.4	69.5	51.3	63.5	72.0	55.5	54.1	66.5	42.5

7. Following the criteria set out in the Updated EM&A Manual, the Action and Limit Levels for construction noise impact monitoring at N7 have been set as follows:

Action Level	Limit Level
0700-1900 hrs on normal weekdays	70* dB(A)
0700-2300 hrs on holidays & 1900-2300 hrs on all other days	70** dB(A)
2300-0700 hrs of next day	55** dB(A)

(*) reduce to 65 dB(A) during school examination periods.

(**) if Specified Powered Mechanical Equipment (SPME) is employed, the noise limits should be 15 dB(A) less than that shown above for the restricted hours.

Impact Monitoring

8. All construction noise monitoring was conducted as scheduled in this reporting month except that monitoring work on 12th June 2003 was cancelled due to adverse weather.
9. One Limit Level exceedance was recorded at monitoring station N4 on 18th June 2003. However, no direct evidence showed that the exceedance was due to the Project works and the exceedance was considered as invalid. No Action Level Exceedance was recorded.

Water Quality

10. There was no discharge from the construction sites to the nearby surface channel to the Shing Mun River in this reporting month. Water quality monitoring works were conducted at the two designated control points (C1 and C2) only. No Action/Limit Level exceedance was recorded in the reporting month.

Environmental Licenses and Permits

11. License/Permit granted to the Project includes the Environmental Permit (EP) for the Project.

Complaints and Prosecutions

12. No environmental prosecution or complaint was received during the reporting month.
13. A public enquiry was received by TDD on 21st May 2003 and TDD subsequently referred the enquiry to the Environmental Team (ET) Leader of the Project on 23rd May 2003. The enquiry was about the traffic noise and dust problem after the tree felling and site clearance in the site adjacent to Holford Garden.
14. Investigation was conducted by the ET who submitted investigation report to TDD and ER on 5th June 2003.

Future Key Issues

15. Major site activities for the coming month include:
- Site clearance and formation works
 - Site office erection
 - Tree felling and tree transplanting works
 - Drilling and ground investigation works
 - Demolition of asbestos containing materials

1. INTRODUCTION

Background

- 1.1 The Road T3 Project forms part of the continuing programme for the development for the Sha Tin New Town. It will provide the essential link between R9-CSWST with the high speed road networks in the north east New Territories and alleviate the traffic congestion at the local roads in Tai Wai, Sha Tin. The Project site is shown in Figure 1.
- 1.2 The Project is a designated project and an Environmental Permit No. EP-135/2002 was issued in May 2002 (T3 EP) to the Territory Development Department (hereinafter called the “Project Proponent”) as the Permit Holder. The Environmental Permit was later amended (Environmental Permit No. EP-135/2002/A). Under Condition 2.3 of the T3 EP, an updated Environmental Monitoring and Audit Manual (Updated EM&A Manual) was prepared in October 2002 to include the latest EM&A requirements in accordance with the information and recommendation described in the T3 Environmental Review Report (ERR) which was completed in April 2002. The Updated EM&A Manual was subsequently approved by the Environmental Protection Department (EPD) in October 2003.
- 1.3 The works of the Project will be constructed under the Project Proponent’s construction Contract No. ST 79/02 “Road T3 and Associated Roadworks”, which was commenced on 26th March 2003. The commencement date of construction of the Project was scheduled to 5th June 2003. MBH Joint Venture, a joint venture company formed by Maeda Corporation, Barbican Construction Company Ltd. and Hsin Chong Construction Company Ltd. is the Contractor for TDD Contract ST 79/02.
- 1.4 Cinotech Consultants Limited was commissioned by the Project Proponent to undertake the Environmental Monitoring and Audit (EM&A) works for “Sha Tin New Town, Stage II – Environmental Team (ET) for Road T3 and Associated Roadworks”. Dr. Priscilla CHOY of Cinotech Consultants Ltd. was appointed as the ET Leader under Condition 2.1 of the EP. Mr. David YEUNG of CH2M-IDC Hong Kong Ltd. was first appointed as the IEC for Pre-Construction Stage of the Project and Mr. FAN Kin Wing of Enpro Environmental Technologies Company Ltd. was appointed as the IEC for the Construction stage of the Project. This is the third monthly EM&A report summarizing the EM&A works for the Project in June 2003.

Project Organizations

- 1.5 Different parties with different levels of involvement in the project organization include:
 - Project Proponent – New Territories East Development Office (NTEDevO) of Territory Development Department (TDD)
 - Engineer (E) – Maunsell Consultants Asia Limited (MCAL)
 - Engineer’s Representative (ER) – Chief Resident Engineer/T3 (CRE/T3)

- Environmental Team (ET) – Cinotech Consultants Limited
- Independent Environmental Checker (IEC) – Enpro Environmental Technologies Co. Ltd.
- Contractor - MBH Joint Venture

1.6 The responsibilities of respective parties are detailed in Sections 1.14 to 1.17 of the Updated EM&A Manual of the Project.

1.7 The key contacts of the Project are shown in Table 1.1.

Table 1.1 Key Project Contacts

Party	Role	Name	Position	Phone No.	Fax No.
TDD	Permit Holder	Mr. C.W. Kam	Chief Engineer/Shu Tin	2301 1383	2739 0076
		Mr. Simon C.K. Tam	Senior Engineer	2301 1394	2721 8630
		Mr. T.K. Lee	Engineer	2301 1378	2721 8630
		Mr. W.H. Kwan	Engineer	2301 1372	2739 0076
MCAL	Engineer	Mr. Conder Yan	Project Engineer	2605 6262	2691 2649
	Engineer's Representative	Mr. K.H. Cheng	CRE/T3	2687 0838	2687 0332
		Mr. David Kwan	SRE/T3		
		Mr. Gault Rice	SRE/T3		
Cinotech	Environmental Team	Dr. Priscilla Choy	The ET Leader	2151 2089	3107 1388
		Mr. Joshua Hui	Audit Team Leader	2151 2079	3107 1388
		Mr. Henry Leung	Monitoring Team Leader	9779 7340	3107 1388
Enpro	Independent Environmental Checker	Mr. Magnum Fan	Independent Environmental Checker	3104 1533	3104 1588
		Dr. To Wai Ming	Assistant Independent Environmental Checker		
MBH JV	Contractor	Mr. Gerry Palmer	Project Manager	3417 2100	3417 2111
		Mr. Norman K.M. Sheh	Engineer Manager/ Community Relation Officer	6283 9138	-

Construction Programme

1.8 The site activities undertaken in the reporting month were:

- Site clearance works
- Site office erection
- Tree felling and tree transplanting works
- Drilling and ground investigation works
- Demolition of asbestos containing materials

Summary of EM&A Requirements

- 1.9 The EM&A programme requires construction phase monitoring for air quality and construction noise, water quality and environmental site audit. The EM&A requirements for each parameter are described in following sections, including:
- All monitoring parameters;
 - Action and Limit levels for all environmental parameters;
 - Event / Action Plans;
 - Environmental mitigation measures, as recommended in the project EIA study final report;
 - Environmental requirements in contract documents.
- 1.10 The advice on the implementation status of environmental protection and pollution control/mitigation measures is summarized in Section 5 of this report.
- 1.11 This report presents the monitoring results, observations, locations, equipment, period, methodology and QA/QC procedures of the required monitoring parameters, namely dust and noise levels and audit works for the Project in June 2003.

2. AIR QUALITY

Monitoring Requirements

- 2.1 1-hour and 24-hour TSP monitoring was conducted to monitor the air quality. Appendix A shows the established Action/Limit Levels for the environmental monitoring works.

Monitoring Locations

- 2.2 Three designated monitoring stations, AQ1, AQ2 and AQ3 were selected for impact dust monitoring. Table 2.1 describes the air quality monitoring locations, which are also depicted in Figure 2.

Table 2.1 Locations for Air Quality Monitoring

Monitoring Stations	Description
AQ1	1 Tai Wai New Village
AQ2	60-68 Chik Cheung Street, Tai Wai
AQ3	1 Tung Lo Wan Village

Monitoring Equipment

- 2.3 Table 2.2 summarizes the equipment used in the impact air monitoring programme. Copies of calibration certificates are attached in Appendix B.

Table 2.2 Air Quality Monitoring Equipment

Equipment	Model and Make	Quantity
Calibrator	G25A; S/N: 1536	1
1-hour TSP Dust Meter	Laser Dust Monitor – Model LD3	2
HVS Sampler	GMWS 2310 c/w of TSP sampling inlet	3

Monitoring Parameters, Frequency and Duration

- 2.4 Table 2.3 summarizes the monitoring parameters and frequencies of impact dust monitoring for the whole construction period. The air quality monitoring schedule for the reporting period is shown in Appendix C.

Table 2.3 Impact Dust Monitoring Parameters, Frequency and Duration

Parameters	Frequency
1-hr TSP	Three times / 6 days
24-hr TSP	Once / 6 days

Monitoring Methodology and QA/QC Procedure

1-hour TSP Monitoring

Measuring Procedures

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

- Pull up the air sampling inlet cover
- Change the Mode 0 to BG with once
- Push Start/Stop switch once
- Turn the knob to SENSI.ADJ and press it
- Push Start/Stop switch once
- Return the knob to the position MEASURE slowly
- Push the timer set switch to set measuring time
- Remove the cap and make a measurement

Maintenance/Calibration

2.6 The following maintenance/calibration was required for the direct dust meters:

- Check the meter at 3-month intervals and calibrate the meter at 1-year intervals throughout all stages of the air quality monitoring.

24-hour TSP Monitoring

Instrumentation

2.7 High volume (HVS) samplers (Model GMWS-2310 Accu-Vol) completed with appropriate sampling inlets were employed for 24-hour TSP monitoring. The sampler was composed of a motor, a filter holder, a flow controller and a sampling inlet and its performance specification complied with that required by USEPA Standard Title 40, Code of Federation Regulations Chapter 1 (Part 50). Moreover, the HVS also met all the requirements in section 2.4 of the Updated EM&A Manual.

Operating/Analytical Procedures

2.8 Operating/analytical procedures for the operation of HVS were as follows:

- A horizontal platform was provided with appropriate support to secure the samplers against gusty wind.
- No two samplers were placed less than 2 meters apart.
- The distance between the sampler and an obstacle, such as buildings, was at least twice the height that the obstacle protrudes above the sampler.
- A minimum of 2 meters of separation from walls, parapets and penthouses was required for rooftop samples.
- A minimum of 2 meters separation from any supporting structure, measured horizontally was required.

- No furnaces or incineration flues were nearby.
 - Airflow around the sampler was unrestricted.
 - The sampler was more than 20 meters from the drip line.
 - Any wire fence and gate, to protect the sampler, should not cause any obstruction during monitoring.
- 2.9 Prior to the commencement of the dust sampling, the flow rate of the high volume sampler was properly set (between 1.1 m³/min. and 1.4 m³/min.) in accordance with the manufacturer's instruction to within the range recommended in USEPA Standard Title 40, CFR Part 50.
- 2.10 For TSP sampling, fiberglass filters (G810) were used [Note: these filters have a collection efficiency of > 99% for particles of 0.3 mm diameter].
- 2.11 The power supply was checked to ensure the sampler worked properly.
- 2.12 On sampling, the sampler was operated for 5 minutes to establish thermal equilibrium before placing any filter media at the designated air monitoring station.
- 2.13 The filter holding frame was then removed by loosening the four nuts and carefully a weighted and conditioned filter was centered with the stamped number upwards, on a supporting screen.
- 2.14 The filter was aligned on the screen so that the gasket formed an airtight seal on the outer edges of the filter. Then the filter holding frame was tightened to the filter holder with swing bolts. The applied pressure should be sufficient to avoid air leakage at the edges.
- 2.15 The shelter lid was closed and secured with the aluminum strip.
- 2.16 The timer was then programmed. Information was recorded on the record sheet, which included the starting time, the weather condition and the filter number (the initial weight of the filter paper can be found out by using the filter number).
- 2.17 After sampling, the filter was removed and sent to the laboratory for weighing. The elapsed time was also recorded.
- 2.18 Before weighing, all filters were equilibrated in a conditioning environment for 24 hours. The conditioning environment temperature should be between 25°C and 30°C and not vary by more than ±3°C; the relative humidity (RH) should be < 50% and not vary by more than ±5%. A convenient working RH is 40%.

Maintenance/Calibration

- 2.19 The following maintenance/calibration was required for the HVS:
- The high volume motors and their accessories were properly maintained. Appropriate maintenance such as routine motor brushes replacement and electrical wiring checking were made to ensure that the equipment and necessary power supply are in good working condition.
 - High volume samplers were calibrated at bi-monthly intervals using GMW-25 Calibration Kit throughout all stages of the air quality monitoring.

Results and Observations

- 2.20 All 1-hour TSP monitoring was conducted as scheduled in this reporting month except 9th, 12th and 13th June 2003. Due to the rainstorm, the monitoring work at AQ1 and AQ2 on 9th June 2003 was postponed to 10th June 2003, the monitoring work at all stations on 12th June 2003 was cancelled, and monitoring work at AQ1 on 13th June 2003 was cancelled. No Action/Limit Level exceedance was recorded.
- 2.21 All 24-hour TSP monitoring was conducted as scheduled and all the results complied with the Action and Limit Levels in the reporting month.
- 2.22 The monitoring data and graphical presentations of 1-hour and 24-hour TSP monitoring results are shown in Appendices D and E respectively.
- 2.23 Wind data monitoring equipment has been installed in Shatin Heights for logging wind speed and wind direction. These wind data for the reporting month is summarized in Appendix G.
- 2.24 The weather during the monitoring session was mainly cloudy or rainy. Weather conditions on the monitoring days are provided in Appendix G.

1-hour and 24-hour TSP Monitoring

- 2.25 All monitoring data complied with the Action and Limit Levels. No exceedance was reported.
- 2.26 According to our field observations, the identified dust sources were mainly from the road traffic emission and the construction works of the project.

3. NOISE

Monitoring Requirements

- 3.1 Six designated noise monitoring stations, namely N1, N2, N3, N4, N5 and N6, were included in the Updated EM&A Manual for impact monitoring. An additional noise monitoring station, N7, was proposed and confirmed in the meeting held on 19th May 2003. Appendix A shows the established Action and Limit Levels for the environmental monitoring works.

Monitoring Locations

- 3.2 Noise monitoring was conducted at seven designated monitoring stations as summarized in Table 3.1. Figure 3 shows the locations of these stations.

Table 3.1 Noise Monitoring Stations

Monitoring Stations	Description
N1	1 Tai Wai New Village
N2	Holford Garden
N3	60-68 Chik Cheung Street, Tai Wai
N4	Buddhist Wong Wan Tin College
N5	1 Tung Lo Wan Village
N6	Scenery Court
N7	Sha Tin Public School

Monitoring Equipment

- 3.3 Table 3.2 summarizes the noise monitoring equipment model being used. Copies of calibration certificates are attached in Appendix B.

Table 3.2 Noise Monitoring Equipment

Equipment	Model and Make	Qty.
Integrating Sound Level Meter	B&K Model 2238 / 2238F	2
Calibrator	B&K 4231	1
Wind Speed Anemometer	RS232 Integral Vane Digital Anemometer	1

Monitoring Parameters, Frequency and Duration

- 3.4 Table 3.3 summarizes the monitoring parameters, frequency and total duration of monitoring. The noise monitoring schedule is shown in Appendix C.

Table 3.3 Noise Monitoring Parameters, Frequency and Duration

Monitoring Stations	Parameter	Period	Frequency	Measurement
N1	L ₁₀ (30 min.)dB(A) L ₉₀ (30 min.)dB(A) L _{eq} (30 min.)dB(A)	0700-1900 hrs. on weekdays	Once per week	Facade
N2				Free Field
N3				Façade
N4				Façade
N5				Façade
N6				Façade
N7				Façade

Monitoring Methodology and QA/QC Procedures

- The Sound Level Meter was set on a tripod at a height of 1.2 m above the ground.
- For free field measurement, the meter was positioned away from any nearby reflective surfaces. All records for free field noise levels were adjusted with a correction of +3 dB(A).
- The battery condition was checked to ensure the correct functioning of the meter.
- Parameters such as frequency weighting, the time weighting and the measurement time were set as follows:
 - frequency weighting : A
 - time weighting : Fast
 - time measurement : 30 minutes / 5 minutes
- Prior to and after each noise measurement, the meter was calibrated using a Calibrator for 94.0 dB at 1000 Hz. If the difference in the calibration level before and after measurement was more than 1.0 dB, the measurement would be considered invalid and repeat of noise measurement would be required after re-calibration or repair of the equipment.
- The wind speed was frequently checked with the portable wind meter.
- At the end of the monitoring period, the L_{eq}, L₉₀ and L₁₀ were recorded. In addition, site conditions and noise sources were recorded on a standard record sheet.
- Noise measurement was paused during periods of high intrusive noise if possible and observation was recorded when intrusive noise was not avoided.
- Noise monitoring was cancelled in the presence of fog, rain, and wind with a steady speed exceeding 5 m/s, or wind with gusts exceeding 10 m/s.

Maintenance and Calibration

- 3.5 The microphone head of the sound level meter and calibrator was cleaned with soft cloth regularly.
- 3.6 The meters were sent to the supplier to check and calibrate on a yearly interval.

Results and Observations

Pre-construction Noise Monitoring at N7

- 3.7 Pre-construction noise monitoring at N7 was conducted between 21st May 2003 and 3rd June 2003. The monitoring schedule is shown in Appendix C. The monitoring results are summarized in Table 3.4. Details of noise monitoring data are provided in Appendix P.

Table 3.4 Noise Monitoring Results at N7 for Pre-construction Period

	Range of Noise Level, dB(A)								
	L _{eq} (30 min)			L ₁₀ (30 min)			L ₉₀ (30 min)		
	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min
Day-Time 0700-1900 hr on normal weekdays	66.7	73.7	63.2	68.6	75.6	65.5	62.2	70.8	59.1
	L _{eq} (5 min)			L ₁₀ (5 min)			L ₉₀ (5 min)		
	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min
Evening-Time 1900-2300 hrs on all days & Holidays 0700-2300	65.0	75.4	60.0	67.6	76.0	62.5	60.0	74.5	52.5
Night-Time 2300-0700 hrs of the next day	60.4	69.5	51.3	63.5	72.0	55.5	54.1	66.5	42.5

- 3.8 The major noise source identified was road traffic from Tai Po Road.
- 3.9 The Action and Limit Levels were established in accordance with the Updated EM&A Manual. The pre-construction noise level shall act as a basis for the correction to the impact noise monitoring. Table 3.5 presents the Action and Limit Levels for construction noise.

Impact Monitoring

- 3.10 Noise monitoring was performed at the seven designated locations during the daytime period (0700 to 1900) as scheduled in this reporting month except that monitoring work on 12th June 2003 was cancelled due to adverse weather. Results and graphical presentations are shown in Appendix F.
- 3.11 The weather during the monitoring sessions was mainly cloudy or rainy. Weather conditions are provided in Appendix G.
- 3.12 One Limit Level exceedance was recorded at monitoring station N4 on 18th June 2003. However, no direct evidence showed that the exceedance was due to the Project works and the exceedance was considered as invalid. Exceedance recorded in the reporting month and the associated action taken are summarized in Appendix Q.

3.13 No Action Level Exceedance was recorded. The major noise sources identified at these designated stations were traffic noise.

Table 3.5 Action Limit Level for Noise during Construction Period for N7

Action Level		Limit Level
0700-1900 hrs on normal weekdays	One or more complaint(s) received in one week	70* dB(A)
0700-2300 hrs on holidays & 1900-2300 hrs on all other days		70** dB(A)
2300-0700 hrs of next day		55** dB(A)

(*) reduce to 65 dB(A) during school examination periods.

(**) if Specified Powered Mechanical Equipment (SPME) is employed, the noise limits should be 15 dB(A) less than that shown above for the restricted hours.

4. WATER QUALITY

Monitoring Requirements

- 4.1 Turbidity, Suspended Solid (SS) and pH monitoring were conducted to monitor the water quality. Appendix A shows the established Action/Limit Levels for the environmental monitoring works.

Monitoring Locations

- 4.2 In accordance with the Updated EM&A Manual, water quality monitoring shall be carried out at all discharge points from the construction site to the nearby surface channels and two control points (C1 and C2) upstream of the site. Table 4.1 describes the locations of the two control points. The locations are also shown on Figure 4.

Table 4.1 Locations for Water Quality Monitoring

Monitoring Stations	Coordination
C1	835723.1E
	826439.6N
C2	836451.3E
	826572.6N

Monitoring Equipment

- 4.3 Table 4.2 summarizes the equipment used in the water quality monitoring program. All the monitoring equipment complied with the specifications stipulated in the Updated EM&A Manual. Copies of the calibration certificates of the equipment are attached in Appendix B

Table 4.2 Water Quality Monitoring Equipment

Equipment	Model and Make	Qty.
Multi-parameter Water Quality System	YSI 6820	2
Monitoring Position Equipment	“Magellan” Handheld GPS Model GPS-320	1

Monitoring Parameters, Frequency and Duration

- 4.4 Table 4.3 summarizes the monitoring parameters, monitoring period and frequencies of water quality monitoring.

Table 4.3 Frequency and Parameters of Water Quality Monitoring

Station	Parameters	Frequency
C1	Turbidity, SS & pH	3 times per week
C2		

Monitoring Methodology, Calibration Details and QA/QC Procedures

- 4.5 Two multi-parameter meters (Model YSI 6820-C-M) was used to measure turbidity and pH .
- 4.6 At each measurement, two consecutive measurements of turbidity and pH were taken. The probes were retrieved out of the water after the first measurement and then re-deployed for the second measurement. Where the difference in the value between the first and second readings of each set was more than 25% of the value of the first reading, the reading was discarded and further readings were taken.
- 4.7 For SS measurement, grab samples were collected. Water samples of about 500 ml were collected and stored in polyethylene bottles. The sample bottles were packed into an ice-box and delivered to a HOKLAS Laboratory, WELLAB Ltd., for the analysis of suspended solids contents within 24 hours.

Maintenance and Calibration

- 4.8 Before each round of monitoring, a zero check in distilled water was performed with the turbidity probe of YSI 6820. The probe was then calibrated with a solution of known NTU.
- 4.9 Quality Control Reports for SS analysis by the HOKLAS-accredited laboratory, WELLAB Ltd. are attached in Appendix B.

Results and Observations

- 4.10 Water quality monitoring was conducted as scheduled in the reporting month. The monitoring data and graphical presentations of the monitoring results are shown in Appendix H.
- 4.11 The weather during the monitoring session was mainly rainy or cloudy.
- 4.12 No Action/Limit level exceedance was recorded.

5. ENVIRONMENTAL AUDIT

Site Audits

- 5.1 Site audits were carried out on a weekly basis to monitor the timely implementation of proper environmental management practices and mitigation measures in the Project site. The summaries of site audits are attached in Appendix I.
- 5.2 Site audits were conducted on 27th May 2003, 3rd, 10th, 17th and 24th June 2003.

Review of Environmental Monitoring Procedures

- 5.3 The monitoring works conducted by the monitoring team were inspected regularly. The following observations have been recorded for the monitoring works:

Air Quality Monitoring

- The monitoring team recorded all observations around the monitoring stations within and outside the construction site.
- The monitoring team recorded the temperature and weather conditions on the monitoring days.

Noise Monitoring

- The monitoring team recorded all observations around the monitoring stations, which might affect the monitoring result.
- Major noise sources were identified and recorded. Other intrusive noise attributing to the result was trimmed off by pausing the monitoring temporarily.

Water Quality Monitoring

- The monitoring team recorded all observations around the monitoring stations, which might affect the monitoring result.
- The monitoring team recorded the weather condition on the monitoring day.

Status of Environmental Licensing and Permitting

- 5.4 All permits/licenses obtained for the Project are summarized in Table 5.1.

Status of Waste Management

- 5.5 The amounts of wastes generated by the activities of the project in June 2003 are shown in Appendix J.
- 5.6 No violation was observed during site inspections.

Implementation Status of Environmental Mitigation Measures

- 5.7 During site inspections in the reporting period, no non-conformance was identified. The observations and recommendations are summarized in Table 5.2.

Table 5.1 Summary of Environmental Licensing and Permit Status

Permit No.	Valid Period		Section	Status
	From	To		
Environmental Permit				
EP-135/2002 (It was amended as EP-135/2002/A) * a copy was attached in the monthly report of May 2003	13/05/02	N/A	Construction & operation of about 2kms of elevated roadworks, underpass, slip road and associated works at Tai Wai. Works include construction of elevated roads between Lion Rock Tunnel Road and Tai Po Road at Sha Tin Heights including slip road connections to Tai Wai; construction of vehicular underpass for proposed Road T3 at Sha Tin Heights; reconstruction and realignment of Tai Po Road (Tai Wai Section) between Mei Tin Road and Lion Rock Tunnel Road; construction of a traffic gyratory system at the Mei Tin Road/Heung Fan Liu Street junction including a two lane bridge over the Shing Mun River Channel; reconstruction of Chung Ling Road at Tung Lo Wan; reconstruction of Chik Wan Street; construction of a two land elevated road between Tai Po Road and Lower Shing Mun Road; and road improvement works for sections of Tai Po Road (Sha Tin Height Section).	Valid

Summary of Exceedances of the Environmental Quality Performance Limit

- 5.8 No non-compliance (exceedance) was recorded in this reporting month.

Implementation Status of Event Action Plans

- 5.9 The Event Action Plans for air quality, noise and water quality are presented in Appendix K.
- 5.10 No exceedance of Action/Limit Levels for 1-hour TSP and 24-hour TSP concentrations was reported in this reporting month.
- 5.11 No exceedance of Action Level for construction noise was reported in this reporting month.

Table 5.2 Observations and Recommendations of Site Audit

Parameters	Date	Observations	Remedial Actions
Air Quality	10 Jun 03	The wheel washing bay was under-construction at Portion J2	-
	17 June 03, 24 June 03	Vehicle wheel washing was noticed at Portion J2.	-
	24 June 03	The entrance of Portion J2 should be cleaned up more frequently.	-
Noise	Whole period	No violation was observed.	-
Water Quality	27 May 03	Following up the last audit, stagnant water inside the drip tray had been cleared near the site office (Heung Fan Liu Street).	-
	10 Jun 03	Muddy water at Portion J2 was about to overflow into Holford Garden.	Following up the last audit, muddy water had been cleared in the audit session on 17 th June 2003.
	17 Jun 03	Vehicle wheel washing water flowed into the public drain directly.	No reoccurrence was observed in subsequent site inspection on 24 June 03.
	24 June 03	Stagnant water accumulated inside the drip tray at Heung Fan Liu Street.	-
Chemical and Waste Management	27 May 03	Following up the last audit, drip tray has been provided for the chemical drum near the site office (Heung Fan Liu Street).	-
	17 Jun 03	No drip tray was provided for power generator and drilling meters.	-
		Cement was placed improperly.	No reoccurrence was observed in subsequent site inspection on 24 June 03.
	24 Jun 03	Oil stain on the bare ground was observed at Heung Fan Liu Street.	-

5.12 One exceedance of Limit Level for construction noise was recorded at monitoring station N4. However, no direct evidence showed that the exceedance was due to the Project works and the exceedance was considered as invalid. The summary of exceedance is attached in Appendix Q.

5.13 No exceedance of Action/Limit Levels for water quality was reported in this reporting

month.

- 5.14 A public enquiry was received by TDD on 21st May 2003 and TDD subsequently referred the enquiry to the Environmental Team (ET) Leader of the Project on 23rd May 2003. The complaint was about the traffic noise and dust problem after the tree felling and site clearance in the site adjacent to Holford Garden.
- 5.15 Investigation was conducted by the ET and an investigation report was submitted to TDD and ER on 5th June 2003. The investigation report is attached in Appendix O.

Summary of Complaints and Prosecutions

- 5.16 There are two complaints received since the commencement date of construction of the Project. The details of each of the complaint are summarized in Appendix N.
- 5.17 No environmental complaint or prosecution was received in the reporting month.
- 5.18 A public enquiry was received by TDD on 21st May 2003 and TDD subsequently referred the enquiry to the Environmental Team (ET) Leader of the Project on 23rd May 2003. The complaint was about the traffic noise and dust problem after the tree felling and site clearance in the site adjacent to Holford Garden.
- 5.19 Investigation was conducted by ET and an investigation report was submitted to TDD and ER on 5th June 2003. The investigation report is attached in Appendix O.

6. FUTURE KEY ISSUES

Key Issues for the Coming Month

6.1 Key issues to be considered in the coming month include:

- Generation of dust from stockpiles, haul road and vehicle movement on-site.
- Noise from operation equipment and machinery on-site.
- Regular removal of mud, sand and silt along u-channel.
- Wastewater discharge from site.
- Storage of chemicals/fuel and chemical waste/waste oil on site.
- Surface runoff generated in rainy season.

Monitoring Schedule for the Next Month

6.2 The tentative environmental monitoring schedule for the next month is shown in Appendix C.

7. CONCLUSIONS AND RECOMMENDATIONS

Conclusions

- 7.1 Environmental monitoring works were performed in the reporting month and all monitoring results were checked and reviewed.
- 7.2 All 1-hour TSP monitoring was conducted as scheduled in this reporting month except 9th, 12th and 13th June 2003. Due to the rainstorm, the monitoring work at AQ1 and AQ2 on 9th June 2003 was postponed to 10th June 2003, the monitoring work at all stations on 12th June 2003 was cancelled, and monitoring work at AQ1 on 13th June 2003 was cancelled. No Action/Limit Level exceedance was recorded in the reporting month.
- 7.3 All 24-hour TSP monitoring was conducted as scheduled and all the results complied with the Action and Limit Levels in this reporting month.
- 7.4 Pre-construction noise monitoring at N7 was conducted between 21st May 2003 and 3rd June 2003. Details of monitoring results are provided in Appendix P.
- 7.5 Construction noise monitoring was performed as scheduled except that monitoring work on 12th June 2003 was cancelled due to adverse weather. No exceedance of Action Level was recorded in the reporting month.
- 7.6 One Limit Level exceedance for construction noise was recorded at monitoring station N4 on 18th June 2003. However, no direct evidence showed that the exceedance was due to the Project works and the exceedance was considered as invalid.
- 7.7 Water quality monitoring was performed as schedule. No exceedance of Action and Limit Levels was recorded.
- 7.8 No environmental prosecution or complaint was received in this reporting month.
- 7.9 A public enquiry was received by TDD on 21st May 2003 and TDD subsequently referred the enquiry to the Environmental Team (ET) Leader of the Project on 23rd May 2003. The enquiry was about the complaint was about the traffic noise and dust problem after the tree felling and site clearance in the site adjacent to Holford Garden.
- 7.10 Investigation was conducted by ET and an investigation report was submitted to TDD and ER on 5th June 2003.

Recommendations

- 7.11 According to the environmental audit performed in the reporting month, the following recommendations were made:

Dust Impact

- To prohibit any open burning on site.
- To regularly maintain the machinery and vehicles on site.
- To follow up any exceedance caused by the construction works.
- To implement dust suppression measures on all haul roads, stockpiles and dry surfaces.

Noise Impact

- To inspect the noise sources inside the site.
- To follow up any exceedance caused by the construction works.
- To space out noisy equipment and position the equipment as far away as possible from sensitive receivers.
- To provide temporary noise barriers for operations of noisy equipment near the noise sensitive receivers.

Water Impact

- To identify any wastewater discharge from site.
- To regularly maintain the condition of u-channel, catch pits and wheel washing facilities on site.
- To regularly maintain the sediment control measures after rainstorms.

Waste/Chemical Management

- To check for any accumulation of waste materials or rubbish on site.
- To avoid any discharge of chemical waste or oil directly from the site.

Table 1.1 Key Project Contacts

Party	Role	Name	Position	Phone No.	Fax No.
TDD	Permit Holder	Mr. C.W. Kam	Chief Engineer/Shu Tin	2301 1383	2739 0076
		Mr. Simon C.K.Tam	Senior Engineer	2301 1394	2721 8630
		Mr. T.K. Lee	Engineer	2301 1378	2721 8630
		Mr. W.H. Kwan	Engineer	2301 1372	2739 0076
MCAL	Engineer	Mr. Conder Yan	Project Engineer	2605 6262	2691 2649
	Engineer's Representative	Mr. K.H. Cheng	CRE/T3	2687 0838	2687 0332
		Mr. David Kwan	SRE/T3		
		Mr. Gault Rice	SRE/T3		
Cinotech	Environmental Team	Dr. Priscilla Choy	The ET Leader	2151 2089	3107 1388
		Mr. Joshua Hui	Audit Team Leader	2151 2079	3107 1388
		Mr. Henry Leung	Monitoring Team Leader	9779 7340	3107 1388
Enpro	Independent Environmental Checker	Mr. Magnum Fan	Independent Environmental Checker	3104 1533	3104 1588
		Dr. To Wai Ming	Assistant Independent Environmental Checker		
MBH JV	Contractor	Mr. Gerry Palmer	Project Manager	3417 2100	3417 2111
		Mr. Norman K.M. Sheh	Engineer Manager/ Community Relation Officer	6283 9138	-

Table 2.1 Locations for Air Quality Monitoring

Monitoring Stations	Description
AQ1	1 Tai Wai New Village
AQ2	60-68 Chik Cheung Street, Tai Wai
AQ3	1 Tung Lo Wan Village

Table 2.2 Air Quality Monitoring Equipment

Equipment	Model and Make	Quantity
Calibrator	G25A; S/N: 1536	1
1-hour TSP Dust Meter	Laser Dust Monitor – Model LD3	2
HVS Sampler	GMWS 2310 c/w of TSP sampling inlet	3

Table 2.3 Impact Dust Monitoring Parameters, Frequency and Duration

Parameters	Frequency
1-hr TSP	Three times / 6 days
24-hr TSP	Once / 6 days

Table 3.1 Noise Monitoring Stations

Monitoring Stations	Description
N1	1 Tai Wai New Village
N2	Holford Garden
N3	60-68 Chik Cheung Street, Tai Wai
N4	Buddhist Wong Wan Tin College
N5	1 Tung Lo Wan Village
N6	Scenery Court
N7	Sha Tin Public School

Table 3.2 Noise Monitoring Equipment

Equipment	Model and Make	Qty.
Integrating Sound Level Meter	B&K Model 2238 / 2238F	2
Calibrator	B&K 4231	1
Wind Speed Anemometer	RS232 Integral Vane Digital Anemometer	1

Table 3.3 Noise Monitoring Parameters, Frequency and Duration

Monitoring Stations	Parameter	Period	Frequency	Measurement
N1	L ₁₀ (30 min.)dB(A) L ₉₀ (30 min.)dB(A) L _{eq} (30 min.)dB(A)	0700-1900 hrs. on weekdays	Once per week	Facade
N2				Free Field
N3				Façade
N4				Façade
N5				Façade
N6				Façade
N7				Façade

Table 3.4 Noise Monitoring Results at N7 for Pre-construction Period

	Range of Noise Level, dB(A)								
	L _{eq} (30 min)			L ₁₀ (30 min)			L ₉₀ (30 min)		
	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min
Day-Time 0700-1900 hr on normal weekdays	66.7	73.7	63.2	68.6	75.6	65.5	62.2	70.8	59.1
	L _{eq} (5 min)			L ₁₀ (5 min)			L ₉₀ (5 min)		
	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min
Evening-Time 1900-2300 hrs on all days & Holidays 0700-2300	65.0	75.4	60.0	67.6	76.0	62.5	60.0	74.5	52.5
Night-Time 2300-0700 hrs of the next day	60.4	69.5	51.3	63.5	72.0	55.5	54.1	66.5	42.5

Table 3.5 Action Limit Level for Noise during Construction Period for N7

Action Level		Limit Level
0700-1900 hrs on normal weekdays	One or more complaint(s) received in one week	70* dB(A)
0700-2300 hrs on holidays & 1900-2300 hrs on all other days		70** dB(A)
2300-0700 hrs of next day		55** dB(A)

(*) reduce to 65 dB(A) during school examination periods.

(**) if Specified Powered Mechanical Equipment (SPME) is employed, the noise limits should be 15 dB(A) less than that shown above for the restricted hours.

Table 4.1 Locations for Water Quality Monitoring

Monitoring Stations	Coordination
C1	835723.1E 826439.6N
C2	836451.3E 826572.6N

Table 4.2 Water Quality Monitoring Equipment

Equipment	Model and Make	Qty.
Multi-parameter Water Quality System	YSI 6820	2
Monitoring Position Equipment	“Magellan” Handheld GPS Model GPS-320	1

Table 4.3 Frequency and Parameters of Water Quality Monitoring

Station	Parameters	Frequency
C1	Turbidity, SS & pH	3 times per week
C2		

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		Cement was placed improperly.	No reoccurrence was observed in subsequent site inspection on 24 June 03.
	24 Jun 03	Oil stain on the bare ground was observed at Heung Fan Liu Street.	-