

Territory Development Department

Contract No. ST 77/01

**Sha Tin New Town, Stage II
Road D15 Linking Lok Shun Path
and Tai Po Road**

**Quarterly Environmental Monitoring & Audit Report –
January to March 2004**

April 2004

**Sha Tin New Town, Stage II Road D15 Linking Lok Shun Path and
Tai Po Road (Contract No. ST 77/01)**

**Quarterly Environmental Monitoring & Audit Report –
January to March 2004**

Checked in accordance with EML QP22 _____
Environmental Team Leader

EXECUTIVE SUMMARY

This quarterly environmental monitoring report was prepared by Environmental Management Limited (EML) for Environmental Monitoring & Audit (EM&A) Services of Sha Tin New Town, Stage II Road D15 Linking Lok Shun Path and Tai Po Road. This report summarizes the EM&A carried out in the period from January to March 2004.

Environmental monitoring for this Project included both air quality and noise measurements. The parameters measured for air quality were 24-hour and 1-hour Total Suspended Particulate (TSP) while for noise monitoring, the A-weighted continuous sound pressure level (L_{eq}) as well as percentile levels (L_{10} and L_{90}) were measured.

Over the reporting period, there were seven exceedances in Action Level recorded in measured 24-hour TSP. The 24-hour TSP exceedances occurred at Station A1 on 2 January 2004, three times at Station A2 separately on 2 January, 30 January and 17 February 2004, and three times at Station A3 separately on 2 January, 30 January and 17 February. Ad-hoc site inspections were carried out separately on 7 January, 5 and 26 February 2004 by ET, MCAL and BCCL to investigate the matters. It was noted that excavation work was carried out near Station A1 on 2 January 2004, and general site works were carried out near Stations A2 and A3 on 2 January, 30 January and 17 February 2004. No particular dust issues were observed on site during the monitoring period. The high TSP levels on 2 and 30 January were likely to be caused by ambient factors. This was supported by the fact that the maximum values of API recorded at Sha Tin Station on 2 and 30 January were 109 and 92 respectively, much higher than the maximum value of around 70 on an average winter day, and that high levels were recorded at all monitoring stations. As for the exceedances on 17 February, the high TSP levels would likely to be caused by the dust generated by the haulage and delivery vehicles crossing Bridge C during the backfilling works of the abutment between B1 and B2.

The regular site inspections had been conducted in this reporting period and mitigation measures were identified and implemented. The mitigation measures implemented in this quarter covered the aspects in noise, air, water, wastewater and land contamination.

In regard to the last quarter environmental issues, it was observed that the exposed soil faces and excavation trenches near Lok Lo Ha roundabout were properly covered with tarpaulic sheeting for dust control. The Wetsep pump sump was properly maintained.

However, it was noted from site inspection in March that sand and black mud was found accumulated at Lok Shun Path Roundabout. Besides, watermain leaks were found near Retaining Wall No. 12. Furthermore, debris and rubbish were found uncovered near Bridge B, site boundary near headwall and between Piers C1 and C2. The Contractor was reminded to clear off any sand and mud found at the roundabout. The Contractor was also asked to rectify the watermain leakage as soon as possible. Besides, the Contractor was reminded to cover the construction waste and debris with tarpaulin and remove the waste once the site access is reopened.

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1. INTRODUCTION

1.1 Background

Environmental Management Limited (EML) was appointed by Maunsell Consultants Asia Ltd. as the Environmental Specialist for the project *Sha Tin New Town, Stage II Road Linking Lok Shun Path and Tai Po road* (Agreement No. ST77/01).

The responsibilities of the Environmental Team included:

- Monitor the noise and air quality data as required in the Environmental Monitoring and Audit (EM&A) Manual;
- Analyse the monitoring data and review the success of EM&A program to cost effectively confirm the adequacy of mitigatory measures implemented and validity of the Environmental Impact Assessment Study predictions and to identify any adverse environmental impacts arising;
- Carry out site inspection to investigate and audit the Contractor's site practice, equipment and work methodologies with respect to pollution control and environmental mitigation, and anticipate environmental issues for proactive action before problems arise;
- Review the proposal for mitigation measures submitted by Contractor in accordance with Event and Action Plans.
- Propose any improvement or other alternative mitigation measures should Contractor's proposal be found to be inadequate;
- Adhere to the procedures for carrying out complaint investigation;
- Audit and prepare EM&A reports on environmental monitoring data and site environmental conditions;
- Report on EM&A results to Engineer, the ER and EPD;

This is the quarterly EM&A report for the period from January to March 2004. The report summarises the results of the impact air quality and noise monitoring in the reporting quarter as well as the environmental status and issues of the construction site for the Project. The remedial actions undertaken as a result of non-compliance with relevant environmental criteria or complaints related to the Project's construction works will also be discussed in the report.

The project area of the construction site for this Project is shown in **Figure 1.1** while the project organisation, contacts of key management for the project and EPD complaint hotline are shown in **Appendix D**.

1.2 Project Description

Road D15 Linking Lok Shun Path and Tai Po Road (hereinafter referred to as 'Road D15') is part of the development of Sha Tin New Town, Stage II by NT East Development Office/Territory Development Department. The project will provide a link between Lok Lo Ha Area (Planning Area 43 and 44) and Tai Po Road so as to relieve traffic congestion at the present access via Fo Tan Road. The construction of Road D15 includes the major components listed hereunder:

- (a) Construction of approximately 0.4km a single 2-lane carriageway forming part of Road D15 at Fo Tan. About 0.2km of road is on elevated structure.
- (b) Construction of vehicular bridge A, B and C with footpaths.

- (c) Construction of noise barriers.
- (d) Construction of associated footpaths, cycle tracks, drainage and workworks.
- (e) Construction of sewerage improvement works via Lok Lo Ha Village.
- (f) Slope works and landscaping works associated with the above roadworks.

1.3 Construction Activities During the Reporting Quarter

The major activities performed during the reporting period included:

- Construction of Bridges A, B and C, including pile caps (Bridge A), abutment walls (Bridge A), bridge decks (Bridges A, B and C), and installation of bridge bearings (Bridges A and B);
- Retaining walls 1, 2, 6,7 and 12;
- Noise barrier construction for noise barrier No. 1 and noise barrier No.4B;
- Box culvert extension of 1500 diameter pipe;
- Underground drainage and water pipes at Lok Shun Path Roundabout; and
- Construction of staircases 4, 10 and 11.

The work program for the current and next quarter is attached in **Appendix F**.

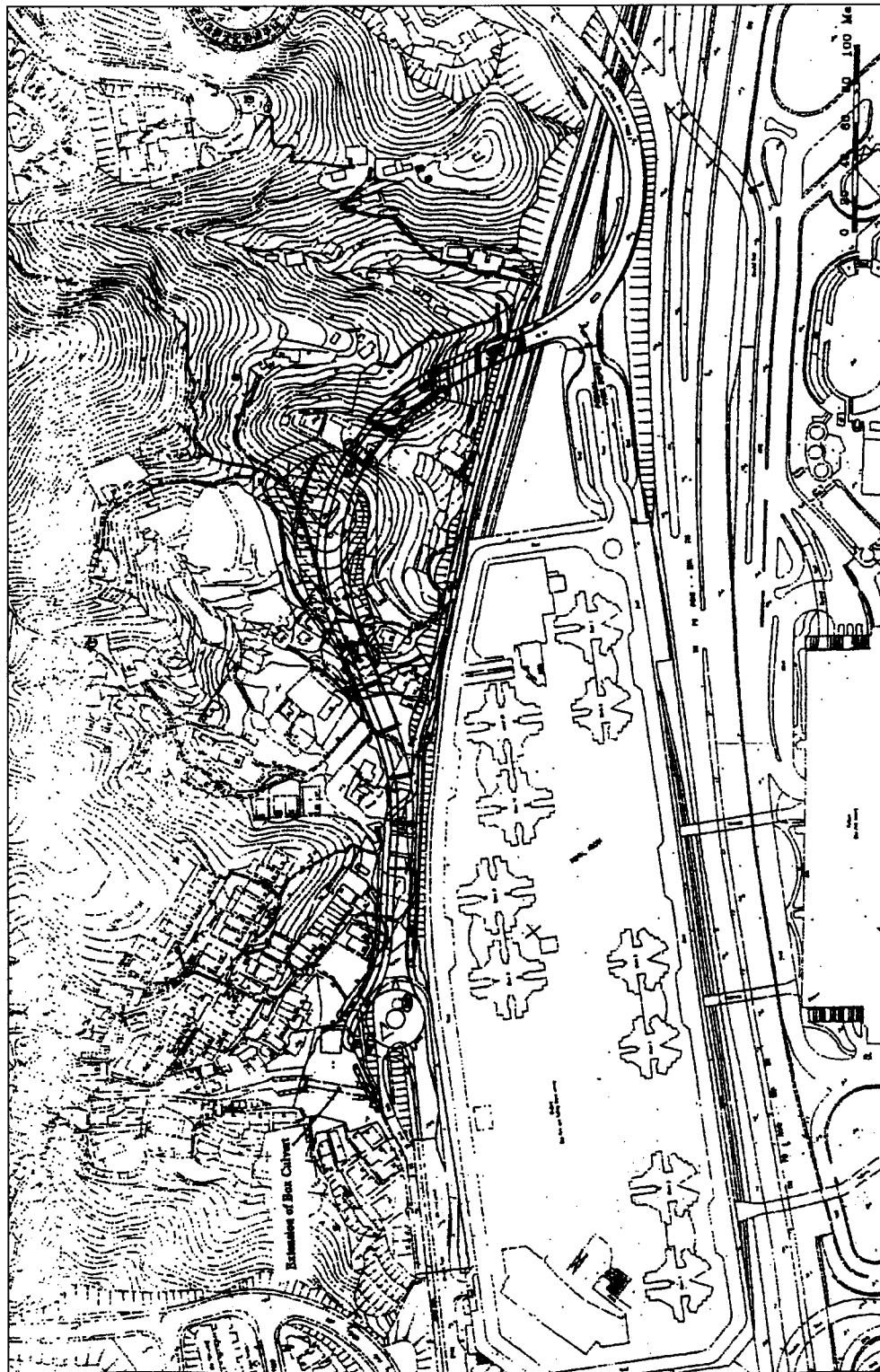


Figure 1.1 Project Area

2. ENVIRONMENTAL MONITORING & AUDIT REQUIREMENTS

2.1 Monitoring Parameters

Impact monitoring on the Road D15 Project involved both air quality and noise. For air impact monitoring, continuous 24-hour and 1-hour TSP levels were sampled. For 24-hour TSP, monitoring was performed once in every six days while for 1-hour TSP, monitoring was performed three times in every six days.

For noise monitoring, the A-weighted equivalent continuous sound pressure level (L_{eq}) was measured with duration of 30 minutes. The measured L_{eq} was used to compare with the relevant noise criteria and the monitoring was conducted once in every six days. As supplementary information for data auditing, statistical results, namely L_{10} and L_{90} , were also recorded for reference.

The monitoring parameters are summarised in **Table 2.1** below.

Table 2.1 Parameter, Frequency and Duration of Monitoring

Monitoring Type	Parameter	Duration
Air Quality	24-hour TSP	24 hours
	1-hour TSP	1 hour within 0700-1900 on working days
Noise	L_{eq} , L_{10} , L_{90}	30 minutes

2.2 Environmental Quality Performance Limits (Action & Limit Levels)

The Action and Limit (AL) Levels set the air quality and noise criteria for construction works. For air quality, the AL levels for the parameters 24 and 1-hour TSP are shown in **Table 2.2** below.

Table 2.2 Action / Limit Levels for Air Quality

Parameters	Action	Limit
24 Hour TSP Level in $\mu\text{g}/\text{m}^3$	For baseline level < $108 \mu\text{g}/\text{m}^3$, Action Level = average of baseline level plus 30% and Limit level; For baseline level > $108 \mu\text{g}/\text{m}^3$, and baseline level < $154 \mu\text{g}/\text{m}^3$, Action Level = $200 \mu\text{g}/\text{m}^3$; For baseline level > $154 \mu\text{g}/\text{m}^3$, Action Level = 130% of baseline level.	260
1 Hour TSP Level in $\mu\text{g}/\text{m}^3$	For baseline level < $154 \mu\text{g}/\text{m}^3$, Action Level = average of baseline level plus 30% and Limit Level; For baseline level > $154 \mu\text{g}/\text{m}^3$, and baseline level < $269 \mu\text{g}/\text{m}^3$, Action Level = $350 \mu\text{g}/\text{m}^3$; For baseline level > $269 \mu\text{g}/\text{m}^3$, Action Level = 130% of baseline level.	500

For noise monitoring, the AL levels for the parameters L_{eq} are shown in **Table 2.3** below:

Table 2.3 Action / Limit Levels for Construction Noise

Time Period	Action Level	Limit Level
0700-1900 hours on normal weekdays	When one documented complaint is received	75* dB(A)
0700-2300 hours on holidays; and 1900-2300 hours on all other days		60/65/70** dB(A)
2300- 0700 hours of next day		45/50/55** dB(A)

** to be selected based on Area Sensitivity Rating

Note: If works are to be carried out during restricted hours, the conditions stipulated in the construction noise permit issued by the Noise Control Authority have to be followed.

From the baseline study carried out in the period from 9 to 27 August 2001, the AL levels for air quality as specified in Table 2.2 were determined and are shown in Tables 2.4 and 2.5. Details of the baseline study were provided in the 'Baseline Environmental Monitoring Report' by Maunsell Environmental Management Consultants Ltd., carried out prior to the preparation of this EM&A report.

Table 2.4 Action and Limit Levels for 24-hour TSP

Location	Action Level, $\mu\text{g}/\text{m}^3$	Limit Level, $\mu\text{g}/\text{m}^3$
A1	156	260
A2	155	
A3	153	

Table 2.5 Action and Limit Levels for 1-hour TSP

Location	Action Level, $\mu\text{g}/\text{m}^3$	Limit Level, $\mu\text{g}/\text{m}^3$
A1	371	500
A2	378	
A3	368	

2.3 Environmental Mitigation Measures During Construction Phase

In order to minimise adverse environmental impacts to the surrounding area, the environmental impact assessment report and environmental review had recommended a number of mitigation measures on the Road D15 Project. These mitigation measures cover the aspects in air, water and noise and some of the mitigation measures are listed below:

Air

- Effective dust suppression equipment and other measures should be installed to ensure the concentration of air borne dust at the site boundary and any nearby sensitive receiver are within the established standard
- Wheel washing facilities should be installed and used by all vehicles leaving the construction site.
- All motorised vehicles should be restricted to a maximum speed of 8 km/h. Haulage and delivery vehicles should be confined to designated roadway inside the site
- In the process of material handling, any material which has the potential to create dust should be treated with water or sprayed with wetting agent.

Noise

- Temporary purposed-built barrier must be installed around heavy noise generated equipment. The design of the temporary barrier must meet the requirements specified in the *Technical Memorandum on Noise from Construction Works*. This provides reduction of noise level to at least 10 dB(A).
- The number of equipment, procedure and sequence of construction should be arranged such that the noise levels generated from the plants are kept to the minimum.
- Quietened equipment shall be used for the construction works
- A noise mitigation proposal describing the above measures must be submitted to the EPD with prior verification from the Environmental Team (ET)

Water

- Temporary barrier shall be provided in order to protect the water quality of the stream course located in the site. The barrier shall be installed at the stream bank to prevent accidental dumping or spillage of materials into the stream course during construction.
- Proper mitigation measures as described in **Annex A** of the Environmental Permit will need to be implemented to mitigate environmental impacts due to site runoff and other potential water pollution caused by construction activities. A copy of **Annex A** is attached in **Appendix A** of this report.

3. ENVIRONMENTAL STATUS

3.1 Air Quality

3.1.1 *Monitoring Requirements*

In accordance with the EM&A Manual, air quality impact monitoring was conducted in terms of 1-hour and 24-hour TSP at the designated monitoring locations.

Continuous 24-hour TSP monitoring was performed once in every six days while 1-hour TSP monitoring was performed 3 times in every 6 days. The Action and Limit levels for air quality are included in **Section 2** of this report.

3.1.2 *Monitoring Locations*

The designated impact air quality monitoring stations are listed in **Table 3.1** and are shown in **Figure 3.1**.

Table 3.1 Air Quality Monitoring Locations

Monitoring Station	Location
A1	Village house at Lok Lo Ha Village
A2	Lok Lo Ha Village House No. 104
A3	Village House near Tsun King Road

3.1.3 *Summary of Monitoring Results*

The monitoring results obtained in this quarter are summarised in **Table 3.2**. The graphical plots of the trends of 24-hour and 1-hour TSP in the quarter are presented in **Figures 3.2** and **3.3** respectively. **Appendix B** shows the meteorological conditions during the monitoring days.

Table 3.2 Summary of 24 and 1-hour TSP Monitoring Results

Parameter	Monitoring Location	Mean TSP Levels ($\mu\text{g}/\text{m}^3$)	Range ($\mu\text{g}/\text{m}^3$)	No. of Exceedance	
				Action Level	Limit Level
24 – hour TSP	A1	108.7	50 - 174	1	0
	A2	110.6	52 - 170	3	0
	A3	113.9	48 - 177	3	0
1 – hour TSP	A1	208.5	92 – 326	0	0
	A2	205.9	84 – 305	0	0
	A3	206.4	87 - 300	0	0



Figure 3.1 Air Quality Monitoring Locations

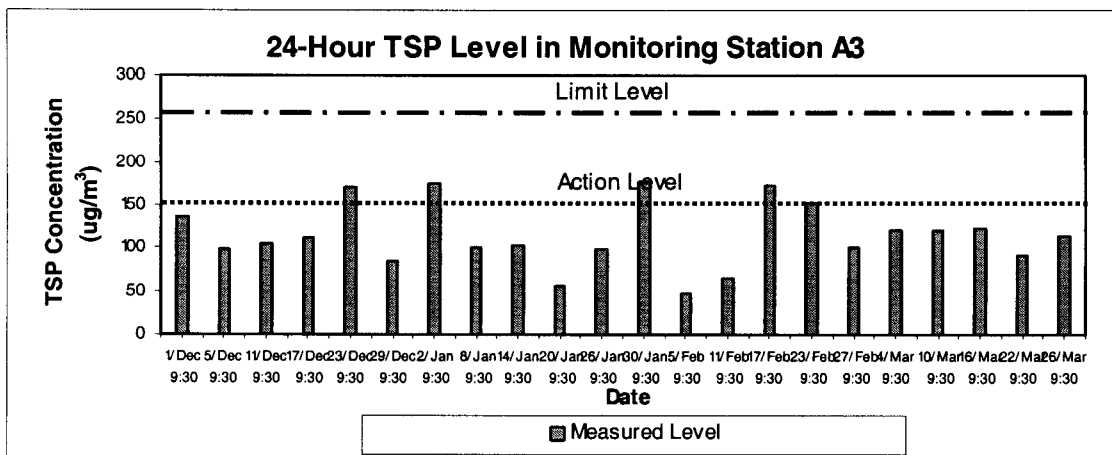
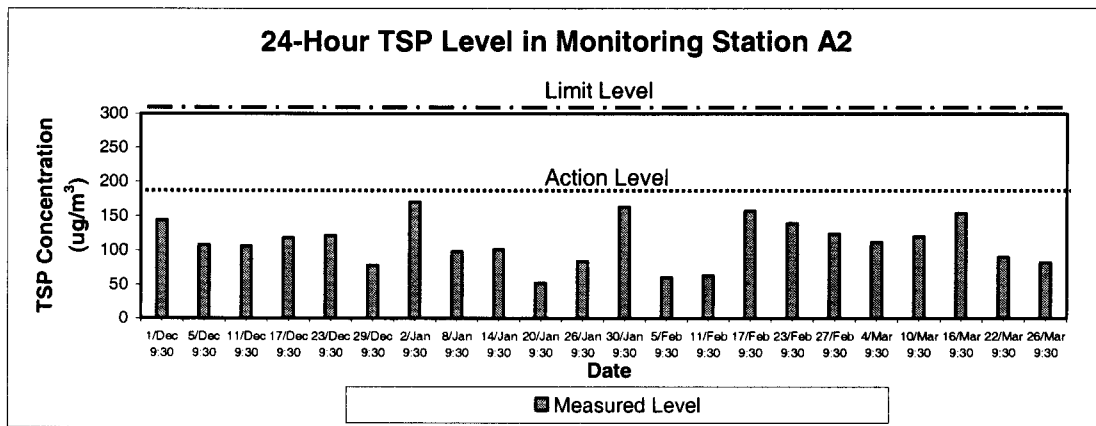
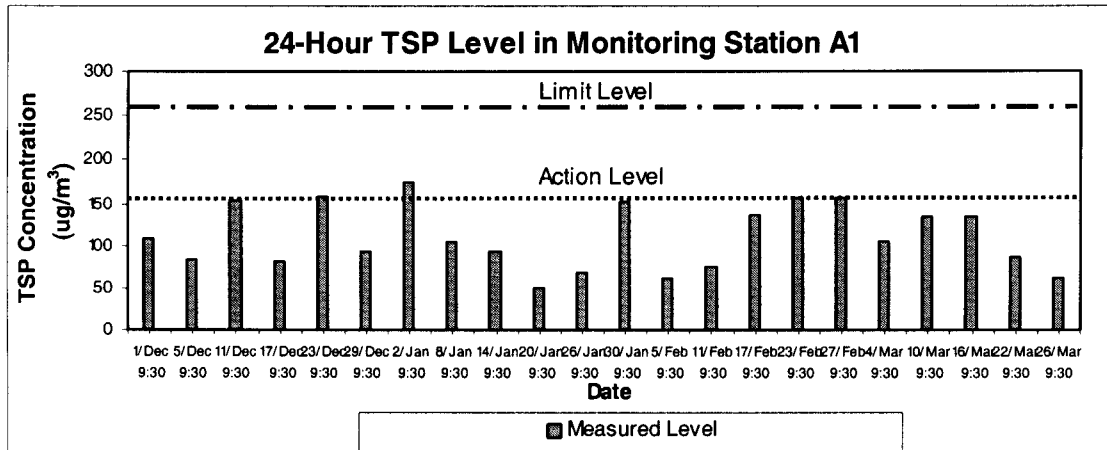


Figure 3.2 Plots of 24-hour TSP Concentration

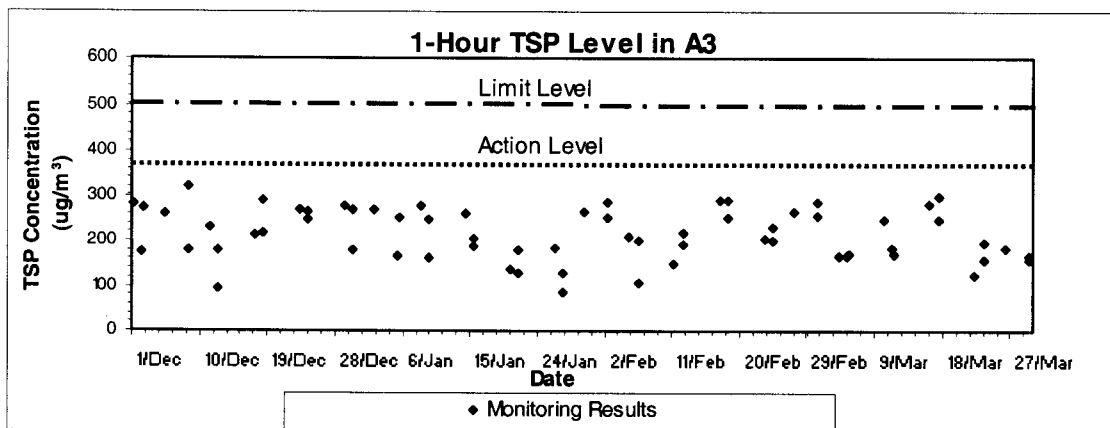
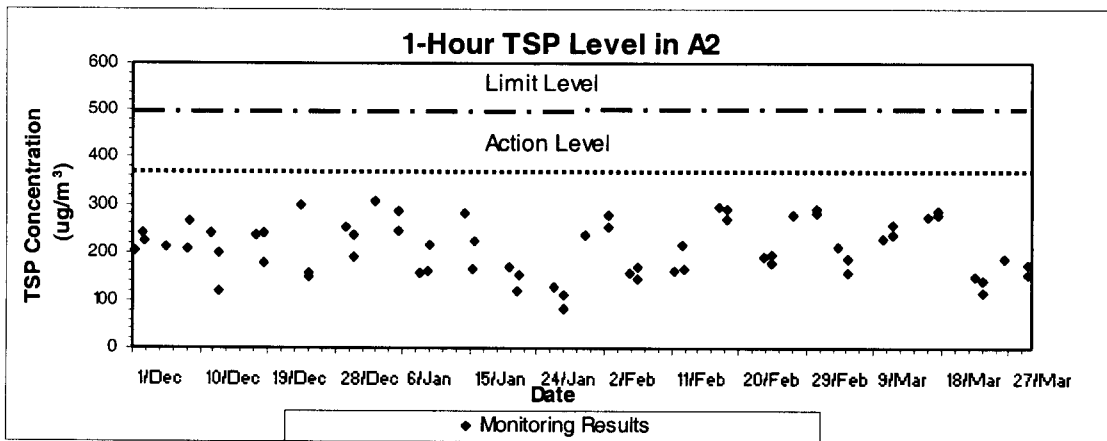
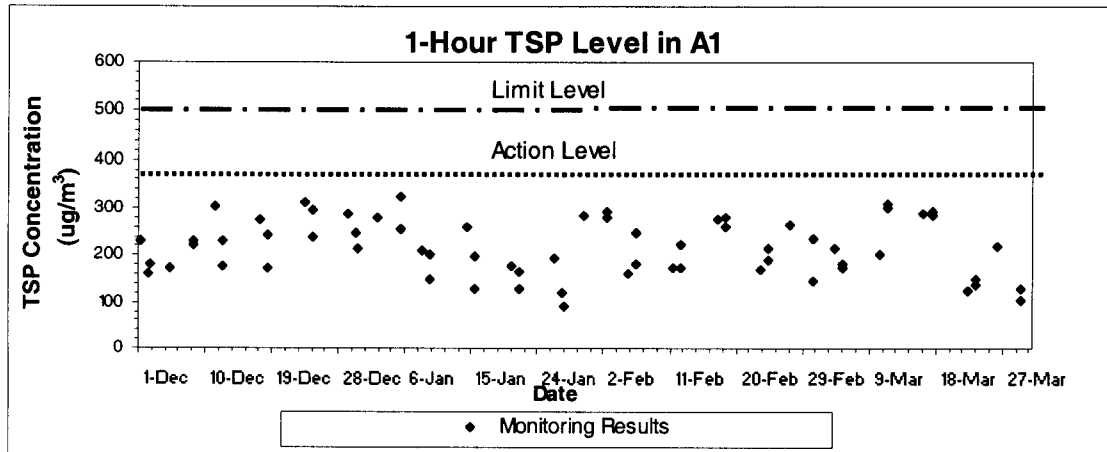


Figure 3.3 Plots of 1-hour TSP Concentrations

3.2 Noise

3.2.1 Monitoring Requirements

Impact noise monitoring was conducted once in every six days at the five designated monitoring locations in accordance with the specifications in the EM&A Manual. The duration of sampling was 30 minutes in the reporting period. The Action and Limit levels for noise are presented in **Section 2** of this report.

3.2.2 Monitoring Locations

The impact noise monitoring locations are presented in **Table 3.3** and shown in **Figure 3.4**.

Table 3.3 Noise Monitoring Locations

Monitoring Location	Measurement	Location
N1	Façade	Lok Lo Ha Village House No. 3B
N2	Façade	Lok Lo Ha Village House No. 32A
N3	Façade	Royal Ascot Block 9, Flat C
N4	Façade	Lok Lo Ha Village House No. 97
N5	Façade	Village near Royal Ascot

3.2.3 Summary of Monitoring Results

The monitoring results obtained in this quarter are summarised in **Table 3.4**. Graphical plots of the noise level trends in the quarter are presented in **Figure 3.5**. **Appendix B** shows the meteorological conditions during the monitoring days.

Table 3.4 Summary of Noise Monitoring Results

Parameter	Monitoring Location	Range of Results dB(A)	No. of Exceedance	
			Action Levels	Limit Levels
30-minute Noise Measurement (L_{eq})	N1	58.0 – 73.5	0	0
	N2	60.2 – 68.3	0	0
	N3	55.1 – 62.3	0	0
	N4	54.9 – 70.7	0	0
	N5	56.9 – 64.4	0	0



Figure 3.4 Noise Monitoring Locations

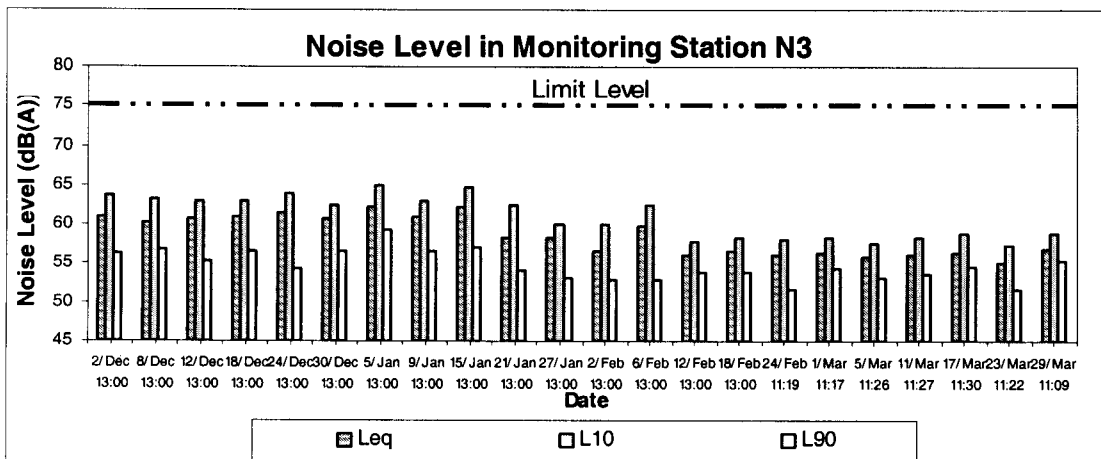
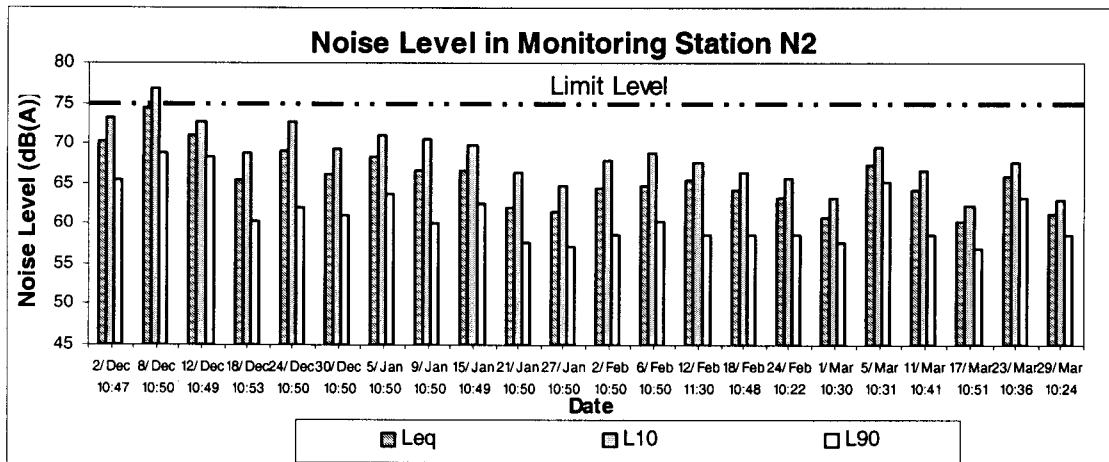
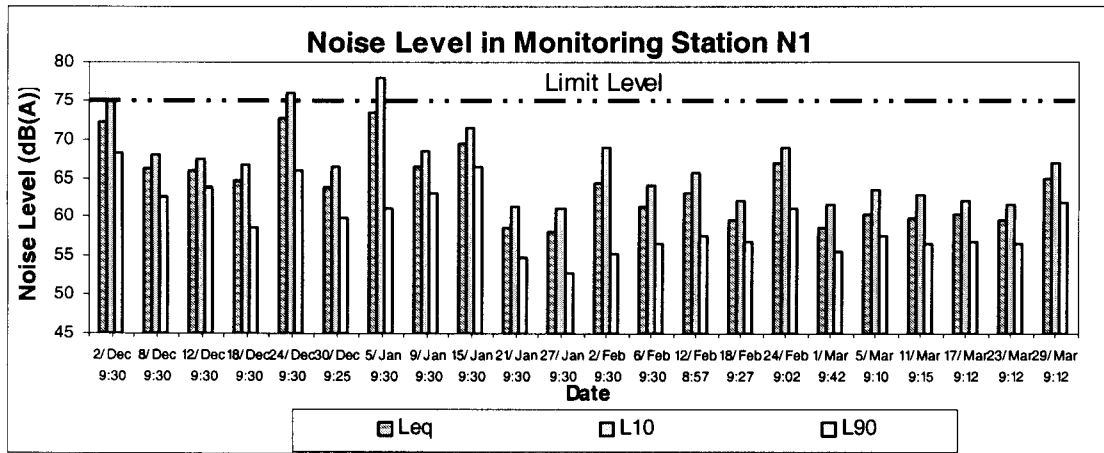


Figure 3.5 Plots of Noise Levels

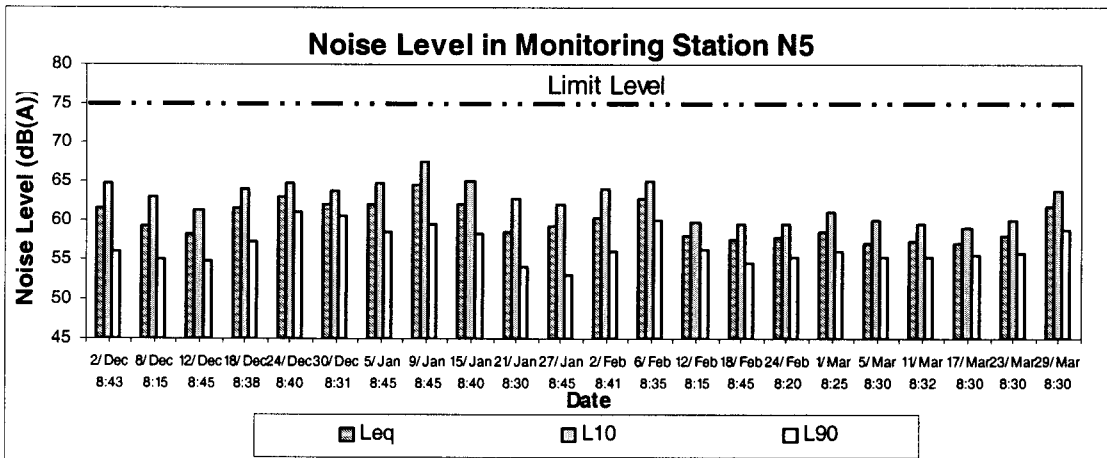
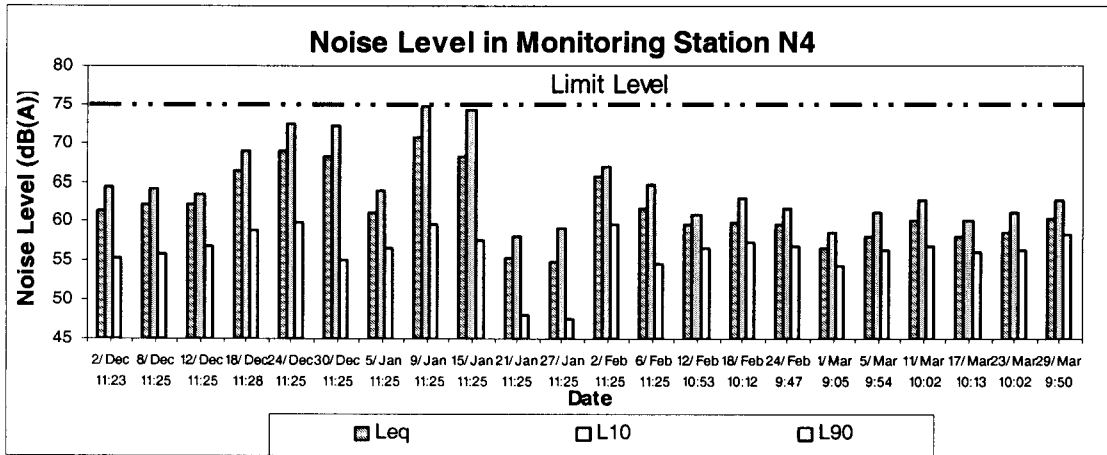


Figure 3.5 Plots of Noise Levels (con't)

4. ENVIRONMENTAL AUDIT

4.1 Summary of Environmental Monitoring Results

The monitoring work undertaken in this reporting quarter is summarised in **Table 4.1**.

Table 4.1 Summary of Environmental Monitoring

Item	Parameter	Monitoring Period	Total No. of Samples Taken (on all stations)	No. of Exceedance	
				Action Levels	Limit Levels
1	24 – hour TSP	01/01/04 to 31/03/04	48	7	0
2	1 – hour TSP	01/01/04 to 31/03/04	144	0	0
3	30-minute Noise Measurement (Leq)	01/01/04 to 31/03/04	80	0	0

In this reporting quarter, there were in total seven incidents of Action Level exceedance for 24-hour TSP while no exceedance was recorded for noise and 1-hour TSP monitoring. The exceedances recorded in this reporting period are summarized in **Table 4.2**.

Table 4.2 Summary of Non-Compliance with Relevant Criteria

Location	Parameter	Data & Time of Exceedance	Measured Level ($\mu\text{g}/\text{m}^3$)	Action Level ($\mu\text{g}/\text{m}^3$)	Type of Exceedance
Lok Lo Ha Village (Station A1)	24 – hour TSP Measurement ($\mu\text{g}/\text{m}^3$)	2 January (09:30 to 09:30 of next day)	174.0	156.0	Action Level (by 18 $\mu\text{g}/\text{m}^3$)
Lok Lo Ha Village House No. 104 (Station A2)	24 – hour TSP Measurement ($\mu\text{g}/\text{m}^3$)	2 January (09:30 to 09:30 of next day)	170.0	155.0	Action Level (by 15 $\mu\text{g}/\text{m}^3$)
Lok Lo Ha Village House No. 104 (Station A2)	24 – hour TSP Measurement ($\mu\text{g}/\text{m}^3$)	30 January (09:30 to 09:30 of next day)	163.0	155.0	Action Level (by 8 $\mu\text{g}/\text{m}^3$)
Lok Lo Ha Village House No. 104 (Station A2)	24 – hour TSP Measurement ($\mu\text{g}/\text{m}^3$)	17 February (09:30 to 09:30 of next day)	157.0	155.0	Action Level (by 2 $\mu\text{g}/\text{m}^3$)
Village House near Tsun King Road (Station A3)	24 – hour TSP Measurement ($\mu\text{g}/\text{m}^3$)	2 January (09:30 to 09:30 of next day)	175.0	153.0	Action Level (by 22 $\mu\text{g}/\text{m}^3$)
Village House near Tsun King Road (Station A3)	24 – hour TSP Measurement ($\mu\text{g}/\text{m}^3$)	30 January (09:30 to 09:30 of next day)	177.0	153.0	Action Level (by 24 $\mu\text{g}/\text{m}^3$)

Location	Parameter	Data & Time of Exceedance	Measured Level ($\mu\text{g}/\text{m}^3$)	Action Level ($\mu\text{g}/\text{m}^3$)	Type of Exceedance
Village House near Tsun King Road (Station A3)	24 – hour TSP Measurement ($\mu\text{g}/\text{m}^3$)	17 February (09:30 to 09:30 of next day)	173.0	153.0	Action Level (by $20 \mu\text{g}/\text{m}^3$)

Since exceedances in Action Levels had occurred, the Event and Action Plan for Air Quality attached in **Appendix C** was triggered. Ad-hoc site inspections were carried out separately on 7 January, 5 and 26 February 2004 by ET, MCAL and BCCL to investigate the matters. It was noted that excavation work was carried out near Station A1 on 2 January 2004, and general site works were carried out near Stations A2 and A3 on 2 January, 30 January and 17 February 2004. No particular dust issues were observed on site during the monitoring period. The high TSP levels on 2 and 30 January were likely to be caused by ambient factors. This was supported by the fact that the maximum values of API recorded at Sha Tin Station on 2 and 30 January were 109 and 92 respectively, much higher than the maximum value of around 70 on an average winter day, and that high levels were recorded at all monitoring stations. As for the exceedances on 17 February, the high TSP levels would likely to be caused by the dust generated by the haulage and delivery vehicles crossing Bridge C during the backfilling works of the abutment between B1 and B2.

The Contractor was reminded that proper dust control measures should be implemented as stated in the Environment Monitoring Checklist Item nos. A8, A9 and A10, in particular where a vehicle leaving and entering the construction site is carrying a load of dusty materials, the load should be covered entirely by clean impervious sheeting to ensure the dusty materials do not leak from the vehicle, and all dusty materials (except for cement and PFA and for cases where the moisture content is a matter of concern) shall be sprayed with water or a dust suppression chemical immediately prior to loading or unloading or transfer operation so as to maintain the dusty materials wet. Besides, every vehicle immediately before leaving the construction site shall be washed to remove any dusty materials from its body and wheels.

4.2 Environmental Complaints

No environmental complaint was received against the construction site in this reporting quarter.

Table 4.3 shows the complaint summary record for this reporting quarter while **Table 4.4** summarises the complaint statistics from the commencement of the project to date.

Table 4.3 Environmental Complaints / Enquiry Received in the Reporting Quarter

Complaint No.	Received date & Time	Description (inc. location/ nature of complaint)	Follow-up Taken	Action	Recommended Mitigation Measures	Status/ Remarks
N/a	N/a	N/a	N/a	N/a	N/a	N/a

Table 4.4 Summary of Total Number of Complaints Received to date

Total No. of Complaints to date	No. of Complaints in this reporting period	No. of Active Complaints	No. of Inactive/Closed Complaints
2	N/a	N/a	2

4.3 Assessment of Mitigation Measures

The mitigation measures listed in Table 4.5 below had been implemented in this reporting period.

Table 4.5 Summary of Major Mitigation Measures at the Site

Type	Mitigation Measure	Comments
Noise	Temporary purposed-built Noise Barrier	No longer required
Water	Wheel Washing Facility	Installed and in operation.
	Sand/Silt Removal Facilities	No longer required
	Measures along stream-banks north-east of Lok Shun Path Roundabout	No longer required
	Diversion of Stream Course via drainage pipe	Installed at the existing channel.
Wastewater	Water Reuse at wheel washing facility and site investigation drilling works.	Implemented
Land Contamination	Metal trays are placed underneath stationary machines where there are potential of oil leakage	Implemented
Air	Provide plastic sheeting covers on exposed soils	Implemented
	Regular water spraying on areas where there is likely generation of dust	Implemented
	Impervious sheeting was placed around the working area near monitoring station A1	Implemented

In regard to the last quarter environmental issues, it was observed that the exposed soil faces and excavation trenches near Lok Lo Ha roundabout were properly covered with tarpaulic sheeting for dust control. The Wetsep pump sump was properly maintained.

However, it was noted from site inspection in March that sand and black mud was found accumulated at Lok Shun Path Roundabout. Besides, watermain was found leaking near Retaining Wall No. 12. Furthermore, debris and rubbish were found uncovered near Bridge B, site boundary near headwall and between Piers C1 and C2. The Contractor was reminded to clear off any sand and mud found at the roundabout. The Contractor was also asked to rectify the watermain leakage as soon as possible. Besides, the Contractor was reminded to cover the construction waste and debris with tarpaulin and remove the waste once the site access is reopened.

5. COMMENTS & CONCLUSION

Weekly site inspection had been carried out in this quarter in order to investigate the implementation and effectiveness of the mitigation measures. The major mitigation measures were identified and were implemented as indicated in **Table 4.5**.

In respect to environmental monitoring for both air quality and noise, there were seven exceedances in Action Level on 24-hour TSP in this reporting period. Therefore the Event and Action Plan for Air Quality as set out in **Appendix C** was triggered.

No environmental complaint on the construction site was received in this reporting period.

The updated work program for the current and next quarters are attached in **Appendix F**.

APPENDIX A:

**Water Mitigation Measures –
Extract from Annex A of the
Environmental Permit**

EIAO V.L.
EPD

Annex A (as referred to in Condition 3.3)

Measures to Mitigate Environmental Impacts due to Site Run-off and Other Potential Water Pollution During Construction

(a) Surface Runoff

- (i) Surface run-off from the construction site shall be directed into adequately designed sand/silt removal facilities such as sand traps, silt traps and sediment basins before discharge into storm drains. Channels, earth bunds or sand bag barriers shall be provided on site to properly direct stormwater to such silt removal facilities.
- (ii) Catchpits and perimeter channels shall be constructed in advance of site formation works and earthworks.
- (iii) Silt removal facilities, channels and manholes shall be suitably maintained with the deposited silt and grit being removed at least once a week, and at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times.
- (iv) Earthworks final surfaces shall be well compacted and the subsequent permanent work or surface protection shall be carried out immediately after the final surfaces are formed to prevent erosion caused by rainstorms. Appropriate intercepting channels shall be provided along the site boundary or at the locations agreed with the ET Leader. Rainwater pumped out from trenches or foundation excavations shall be discharged into silt removal facilities before discharge into storm drains.
- (v) Open stockpiles of construction materials (e.g. aggregates and sand) on site shall be covered with tarpaulin or similar fabric during rainstorms. Measures such as providing sand bag barriers shall be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system.
- (vi) All generators, fuel and oil storage shall be within bunded areas. Drainage from the areas shall be connected to storm drains via a petrol interceptor.

(b) General Construction Activities

At all parts of all works areas and construction sites, and throughout the full duration of the construction contract(s), debris and rubbish on site shall be handled and disposed of to avoid entering the water column and causing water quality impacts. Temporary on-site storage of excavated materials from construction works shall be covered with tarpaulin or similar fabric during rainstorms. Any washout of construction or excavated materials should be diverted to the drainage system via sediment traps. Stockpiling of the excavated material shall be minimised by scheduling the construction programme in a way that one section of the alignment can be constructed and completed before the excavation works of the next section commence.

To mitigate environmental impacts from wastewater due to construction activities, water used for water testing, boring, drilling works, concrete batching and precast concrete casting shall be

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EPD

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環境許可證編號 EP-092/2001/A

recirculated and reused; wastewater from concrete batching and precast concrete casting shall be treated for pH adjustment and silt removed prior to discharge into stormwater drains and washwater from wheel washing facilities shall have sand, silt or other materials removed before discharge into stormwater drains; the access road sections between site exits and the public roads shall be paved with backfall to prevent site run-off from entering the public roads.

APPENDIX B:

**Weather Conditions During
Monitoring Periods**

**Weather Condition During Monitoring Period
(From 1 January to 31 March 2004)**

Date	Weather	Mean Air Temperature (°C)	Wind Speed (m/s)	Mean Relative Humidity (%)
02-Jan-03	Fine	19.8	1.0	69
05-Jan-03	Fine	19.8	1.0	77
08-Jan-03	Fine	18.5	1.0	77
09-Jan-03	Fine	18.5	1.0	76
14-Jan-03	Fine	15.9	1.0-1.7	71
15-Jan-03	Fine	17.8	1.0-1.7	79
20-Jan-03	Cloudy / Rainy	10.6	1.7-1.8	87
21-Jan-03	Fine - Cloudy	10.3	1.8-1.9	59
26-Jan-03	Fine	13.3	1.0	62
27-Jan-03	Fine	13.4	1.0	65
30-Jan-03	Misty	17.4	1.0	83
02-Feb-03	Fine	19.7	1.0	87
05-Feb-03	Rainy	9.5	1.0	90
06-Feb-03	Cloudy	12.1	1.0	74
11-Feb-03	Fine	15.8	1.0	70
12-Feb-03	Sunny	17.8	0.0-0.5	74
17-Feb-03	Fine	20.0	0.0	75
18-Feb-03	Cloudy / Fine	19.0	0.0-0.5	85
23-Feb-03	Fine	19.4	0.5	72
24-Feb-03	Cloudy	18.4	0.5-0.9	79
27-Feb-03	Fine	19.9	0.5	75
01-Mar-04	Cloudy	24.2	0.5	83
04-Mar-04	Fine	15.5	0.5	58
05-Mar-04	Fine	17.8	0.5	70
10-Mar-04	Fine	20.1	0.5	79
11-Mar-04	Sunny	22.5	0.5	76
16-Mar-04	Cloudy	20.2	0.5	84
17-Mar-04	Cloudy	22.3	0.5	91
22-Mar-04	Fine	19.8	0.5	74
23-Mar-04	Cloudy	18.8	0.5	81
26-Mar-04	Cloudy	16.7	0.5	91
29-Mar-04	Cloudy	18.4	0.5	94

APPENDIX C:

**Event and Action Plan for Air
Quality and Noise**

Event / Action Plan for Air Quality

EVENT	ACTION		
	ET	Engineer	CONTRACTOR
ACTION LEVEL			
1. Exceedance for one sample	<ol style="list-style-type: none"> 1. Identify source; 2. Inform the Engineer and Contractor; 3. Repeat measurement to confirm finding; and 4. Increase monitoring frequency to daily. 	<ol style="list-style-type: none"> 1. Notify Contractor; and 2. Check monitoring data and Contractor's working methods. 	<ol style="list-style-type: none"> 1. Rectify any unacceptable practice, if any; and 2. Amend working methods if appropriate.
2. Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> 1. Identify source; 2. Inform the Engineer and Contractor; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency to daily. 5. Discuss with Engineer for remedial actions required; 6. If exceedance continues, arrange meeting with the engineer; and 7. If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Check monitoring data and Contractor's working methods; 4. Discuss with ET and Contractor on potential remedial actions; and 5. Ensure remedial measures properly implemented. 	<ol style="list-style-type: none"> 1. Submit proposals for mitigation measures to the Engineer within 3 working days of notification; 2. Implement the agreed proposals; and 3. Amend proposal if appropriate.
LIMIT LEVEL			
1. Exceedance for one sample	<ol style="list-style-type: none"> 1. Identify source; 2. Inform the Engineer and Contractor; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency to daily; 5. Assess effectiveness of Contractor's remedial actions and keep EPD and the Engineer informed of results. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Check monitoring data and Contractor's working methods; 4. Discuss with ET and Contractor on potential remedial actions; and 5. Ensure remedial action properly implemented. 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to the Engineer within 3 working days of notification; 3. Implement the agreed proposals; and 4. Amend proposal if appropriate.
2. Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> 1. Identify source; 2. Inform the Engineer and Contractor; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency to daily. 5. Investigate the causes of exceedance; 6. Arrange meeting with EPD and the Engineer to discuss the remedial actions to be taken; 7. Assess effectiveness of Contractor's remedial actions and keep EPD and the Engineer informed of the results; and 8. If exceedance stops, cease additional monitoring 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 4. Discuss among ET and Contractor on potential remedial actions; 5. Review Contractor's remedial action whenever necessary to assure their effectiveness; and 6. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop portion of work until the exceedance is abated. 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to the Engineer within 3 working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by the Engineer until the exceedance is abated.

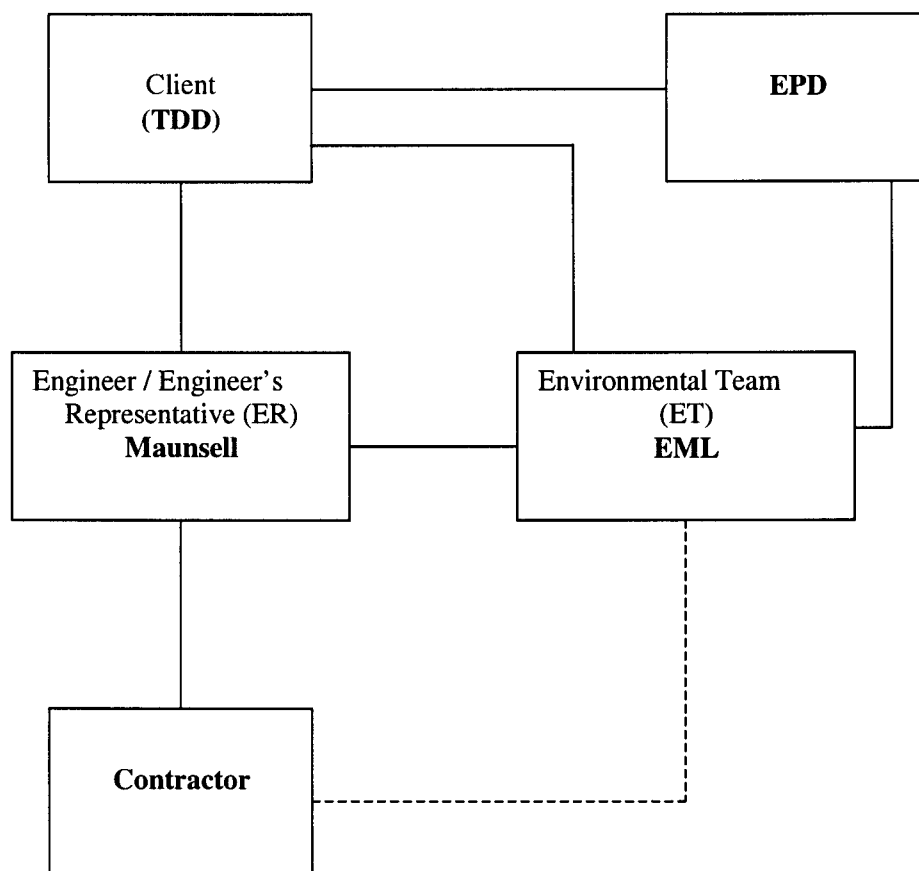
Event / Action Plan for Construction Noise

EVENT	ACTION	
	ET	Contractor
Action Level	<ol style="list-style-type: none"> 1. Notify the Engineer and Contractor; 2. Analyze investigation; 3. Require Contractor to propose measures for the analyzed noise problem; and 4. Increase monitoring frequency to check mitigation effectiveness. 	<ol style="list-style-type: none"> 1. Submit noise mitigation proposals to Environmental Team and the Engineer; and 2. Implement noise mitigation proposals.
Limit Level	<ol style="list-style-type: none"> 1. Notify the Engineer and Contractor; 2. Notify EPD; and 3. Require Contractor to implement mitigation measures; and increase monitoring frequency to check mitigation effectiveness. 	<ol style="list-style-type: none"> 1. Implement mitigation measures; and 2. Prove to Environmental Team and the Engineer effectiveness of measures applied.

APPENDIX D:

**Project Organisation and
Contacts of Key Personnel**

Figure D.1: Project Management Structure



Contacts of Key Personnel:

Organisation	Nature of Duty	Contact Personnel	Contact Number	
			Telephone	Fax
Territory Development Department (TDD)	Client	Mr. K.K. Law	2301-1397	2739-0076
Maunsell Consultants Asia Ltd. (MCAL)	Engineer	Mr. Conrad Ng	2685-6107	2691-2649
Environmental Management Ltd. (EML)	Environmental Team	Mr. W. K. Ng	2839-2800	2890-6901
EPD Complaint Hotline	24-hour Complaint Hotline	-	1823	

APPENDIX E:

**Summary Record of
Complaints Received**

Complaint No.	Received date & Time	Description (inc. location/ nature of complaint)	Follow-up Action Taken	Recommended Measures	Mitigation	Status/ Remarks
C02-N1	Morning, 29/7/2002	Around 9:30am on 29/7/02, police came on site to investigate a complaint of noise pollution emitted during rock breaking which carried out by the Contractor near the Site Office (near the box culvert and north Lok Shun Path Roundabout). The Contractor immediately halted the activity in response to police's advice	<ul style="list-style-type: none"> Ad hoc site inspection was carried out on 31/7/02, jointly with the Engineer and Contractor The complaint log sheet, the investigation findings and recommendations on mitigation measures were submitted to the Engineer and Contractor. A letter, addressing to the complainant, will be sent to the police. 	<p>Mitigation actions:</p> <ul style="list-style-type: none"> Excavator-mounted breaker shall not be carried out within 125m from any nearby noise sensitive receivers and; Temporary purpose built barrier should be installed whenever there are high noise level construction activities. 	<p>The complaint was considered as ad hoc rather than continuous. It is therefore considered not necessary to increase the noise monitoring frequency</p> <p>File Closed.</p>	
C02-N2	Night-time, 7 August, 2002	<ul style="list-style-type: none"> Nearby residents complained to police that a generator in Road D15 Site was operating in night-time near Lok Lo Ha Village. Police came to the site to investigate the complaint and inform watchmen to turn off the operating generator at around 8:30pm. The complaint was valid as it concerned with construction noise during the restricted hours. 	<ul style="list-style-type: none"> Ad hoc site inspection was carried out on 8 August 02, jointly with the Engineer and Contractor and ET. The complaint log sheet, the investigation findings and recommendations on mitigation measures were submitted to the Engineer and Contractor. A letter in both English and Chinese, addressing to the complainant, has been sent to the police. 	<p>Mitigation actions:</p> <ul style="list-style-type: none"> Under the Noise Control Ordinance, the carrying out of general construction work using powered mechanical equipment (including generators) during the restricted hours (between 7 p.m. and 7 a.m. or at any time on a general holiday (including Sunday) is prohibited unless a valid Construction Noise Permit is in force; A watchmen or site staff should be employed to check daily that all generators and plants are switched off after the permissible working hours. 	<p>File Closed.</p>	

APPENDIX F:

**Construction Program for
Current and Next Quarter**

Sha Tin New Town Stage II Contract No. ST77/01, Road D15 Linking Lok Shun Path and Tai Po Road

MASTER PROGRAMME (ST77/01/MP/13B)

ID	Task Name	Duration	Start	Finish	2004	2005											
					Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
448	11.2.1.5 Bore Piles Coming Test (dnos)	10 days	Fri 22/08/03	Thu 04/09/03													
449	11.2.1.8 RW Panel 1	80 days	Thu 27/11/03	Fri 05/03/04													
457	11.2.1.9 RW Panel 2	80 days	Mon 01/12/03	Tue 09/03/04													
469	11.2.1.10 RW Panel 3	34 days	Sat 29/11/03	Sat 10/01/04													
484	11.2.1.11 RW Panel 4	65 days	Fri 10/10/03	Wed 24/12/03													
500	11.2.1.12 RW Panel 5	49 days	Mon 29/09/03	Tue 25/11/03													
515	11.2.1.13 RW Panel 6	49 days	Tue 28/10/03	Tue 23/12/03													
530	11.2.1.14 RW Panel 7	46 days	Wed 27/09/03	Tue 21/10/03													
545	11.2.2 Additional Bore Piles	70 days	Thu 10/07/03	Tue 30/09/03													
546	11.2.2.1 Mobilisation of RCD	9 days	Thu 10/07/03	Sat 19/07/03													
547	11.2.2.1 ABP1	11 days	Mon 21/07/03	Fri 01/08/03													
559	11.2.2.2 ABP2	17 days	Sat 02/08/03	Thu 21/08/03													
571	11.2.3 Bore Piles Tests	12 days	Wed 17/09/03	Tue 30/09/03													
572	11.2.3.1 Sonic Test	1 day	Wed 17/09/03	Wed 17/09/03													
573	11.2.3.2 Core Test (2nos)	2 days	Sat 20/09/03	Sat 27/09/03													
574	11.2.3.3 Grouting Sonic Tubes and core holes	7 days	Mon 29/09/03	Tue 30/09/03													
575	11.2.3 Noise Barrier No. 4B	120 days	Thu 08/01/04	Sat 05/06/04													
581	11.2.3a Concrete Footing for Noise Barrier 4C	45 days	Wed 20/03/02	Wed 15/05/02													
582	11.2.4 Noise Barrier No. 5	69 days	Thu 16/05/02	Wed 07/06/02													
583	11.2.4.1 Excavation	12 days	Thu 16/05/02	Thu 30/05/02													
584	11.2.4.2 Construct Footing and Walls	45 days	Fri 31/05/02	Wed 24/07/02													
585	11.2.4.3 Backfill to Foundation of Noise Barrier No 5	12 days	Thu 25/07/02	Wed 07/08/02													
586	11.3 Noise Barrier Steel Post & Panels	1029 days	Wed 12/12/01	Thu 02/06/05													
587	11.3.1 Procurement and Fabrication of Noise Barrier	150 days	Wed 12/12/01	Tue 18/06/02													
588	11.4.1 Design, Submission for approval	250 days	Wed 19/06/02	Wed 16/04/03													
589	11.4.2 Fabrication and Delivery	200 days	Thu 17/04/03	Tue 16/12/03													
590	11.4.3 Noise Barrier Installation	363 days	Wed 10/03/04	Thu 02/06/05													
591	11.4.3.1 Noise Barrier No. 1	60 days	Wed 10/03/04	Mon 24/05/04													
592	11.4.3.2 Noise Barrier No. 2	40 days	Mon 07/03/05	Tue 26/04/05													
593	11.4.3.3 Noise Barrier No. 3	40 days	Mon 11/04/05	Thu 02/06/05													
594	11.4.3.4 Noise Barrier No. 4A	18 days	Fri 29/04/05	Sat 21/05/05													
595	11.4.3.5 Noise Barrier No. 4B	30 days	Mon 07/06/04	Tue 13/07/04													
596	11.4.3.6 Noise Barrier No. 4B at Bridge A, A2 to A3	10 days	Wed 20/04/05	Sat 30/04/05													
597	11.4.3.6 Noise Barrier No. 4C	30 days	Mon 03/05/04	Mon 07/06/04													
598	11.4.3.7 Noise Barrier No. 5	40 days	Tue 08/06/04	Mon 26/07/04													
599	12 Box Culvert Extension	745 days	Wed 12/12/01	Wed 16/06/04													
600	12.1 Remove existing inlet, water diversion	158 days	Wed 12/12/01	Thu 27/06/02													
601	12.2 Box culvert	156 days	Mon 31/12/01	Fri 12/07/02													
602	12.3 Flood Wall	29 days	Thu 30/05/02	Thu 04/07/02													
603	12.4 Construct 1400 box culvert (5 bays)	166 days	Thu 10/04/03	Wed 12/11/03													
604	12.5 Construct 1500 pipe	188 days	Tue 24/10/03	Wed 16/06/04													
605	12.5.1 Construct 1500 pipe CH 0 to CH 30 (MH/A44 to MH31)	100 days	Tue 28/10/03	Fri 27/02/04													
606	12.5.2 Construct 1500 pipe CH 30 to CH 60	44 days	Sat 28/02/04	Fri 23/04/04													
607	12.5.3 Construct 1500 pipe CH 60 to CH 82	44 days	Sat 24/04/04	Wed 16/06/04													
608	12.6 Construct CP15 (Deleted)	0 days	Sat 15/03/03	Sat 15/03/03													
609	12.7 Construct M/H31	60 days	Mon 22/09/03	Mon 01/12/03													
610	12.8 Construct 1400 Box Culvert Extension (bay A, B & manhole)	90 days	Mon 14/04/03	Mon 04/08/03													
611																	
612	13.0 Underground Drainage & Utilities	655 days	Wed 15/01/03	Tue 29/03/05													
613	13.1 Drainage & Roadworks at Lok He Lo roundabout	651 days	Wed 15/01/03	Thu 24/03/05													

Date: 18/10/2003

Task Progress: Task Critical Task Progress Milestone Summary

Rollled Up Task: Rollled Up Progress Project Summary

Rollled Up Critical Task: Split External Tasks

Rollled Up Milestone:

Page 5

MASTER PROGRAMME (ST77/01/MP/13B)

Sha Tin New Town Stage II Contract No. ST77/01, Road D15 Linking Lok Shun Path and Tai Po Road

ID	Task Name	Duration	Start	Finish	2004												2005		
					Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Jan	
664	18.4 Section III Completion	0 days	Wed 12/12/01	Wed 12/12/01															

Date: 18/10/2003

Task		Critical Task Progress		Rolled Up Task		Rolled Up Progress		Project Summary	
Task Progress		Milestone		Rolled Up Critical Task		Split			
Critical Task		Summary		Rolled Up Milestone		External Tasks			