PROJECT NO.: TCS/00116/03/600/R0379
ISSUE NO.: 1
DATE: 12 JUNE 2003

HONG KONG DRAINAGE SERVICES DEPARTMENT
CONTRACT NO. DC/2000/08
VILLAGE FLOOD PROTECTION WORKS FOR WANG CHAU, MAI PO LO WAI AND MAI PO SAN TSUEN AND DRAINAGE IMPROVEMENT WORKS AT TAN KWAI TSUEN

ENVIRONMENTAL MONITORING & AUDIT (EM&A) REPORT – MAY 2003 (REVISION A)

PREPARED FOR
CHING CHIT CHEUNG CONSTRUCTION CO., LIMITED

Quality Index

Date	Reference No.	Prepared by	Approved By
12 June 2003	TCS/00116/03/600/R0379	Kin Hoo Ho (Environmental Consultant)	Cliff Lam (Environmental Team Leader)

13/06 03 FRI 09:53 FAX +852 2268 3950 OVE ARUP & PARTNERS 002

Ove Arup & Partners
奧雅納工程顧問

Level 5, Festival Walk
80 Tat Chee Avenue
Kowloon Tong, Kowloon
Hong Kong
Tel +852 2528 3031
Fax +852 2268 3950
Direct Tel +852 2268 3211
sam.tsoi@arup.com

www.arup.com

Our ref 23597/L027/ST/fl
Date 12 May 2003

Engineer's Representative
Drainage Services Department
Drainage Projects Division
45/F Revenue Tower
Wan Chai, Hong Kong

Attn: Mr Cheng Pan

ARUP

By Fax & By Post
Fax No 2827 8700

Dear Sir,

Agreement No DP 01/2002
Hire of Services for an Independent Environmental Checker for Contract No DC/2000/08 Village Flood Protection Works for Wang Chau, Mai Po Lo Wai and Mai Po San Tsuen and Drainage Improvement Works at Tan Kwai Tsuen
Verification of EM&A Report for May 2003 (Revision A)

We refer to ET's fax dated 12 June 2003 (ref: TCS/00116/03/300/F0381) regarding the captioned subject.

We hereby verify that the captioned report shall be submitted to the EPD in accordance with the requirement as stipulated in the EP/ FEP.

If you require any further information, please do not hesitate to contact the undersigned or our Mr Fredrick Leong at 2268 3639.

Yours sincerely,

Sam Tsoi
Independent Environmental Checker

cc AUES – Mr TW Tam (by fax only: 2959 6079)
CCC – Mr Wayne Kee (by fax only: 2482 4746)

G:\ENVPROJECT\23597\LETTERS\L027.DOC

Abbreviations

A1	Air Sensitive Receiver
AUES	Action United Environmental Services
ET	Environmental Team
DSD	Drainage Services Department
EAP	Event and Action Plan
EIA	Environmental Impact Assessment
EM&A	Environmental Monitoring and Audit
EP	Environmental Permit
EPD	Environmental Protection Department
FEP	Further Environmental Permit
HOKLAS	Hong Kong Laboratory Accreditation Scheme
HVS	High Volume Sampler
IEC	Independent Environmental Checker
N1	Noise Sensitive Receiver
QA/QC	Quality Assurance and Quality Control
TAT	Trigger/ Action/ Target
TSP	Total Suspended Particulates
W(D)1	Water Sensitive Receiver (Downstream)
W(U)1	Water Sensitive Receiver (Upstream)

Executive Summary

Ching Chit Cheung Construction Co., Ltd. (The Contractor) has been awarded the Contract DC/2000/08 from the Drainage Services Department (DSD) to undertake the Village Flood Protection Works for Wang Chau, Mai Po Lo Wai and Mai Po San Tsuen and Drainage Improvement Works at Tan Kwai Tsuen (the Project).

Action-United Environmental Services and Consulting (AUES) has been commissioned by the Contractor to undertake an impact Environmental Monitoring and Audit (EM&A) program for this project.

This report presents the findings of the impact EM&A reporting month (No. 8) for the Project from **27 April 2003** to **26 May 2003** in accordance with the Environmental Monitoring & Audit (EM&A) Manual.

Environmental Monitoring and Audit Progress

The impact EM&A program was undertaken in accordance with the EM&A manual. A summary of the monitoring activities in this reporting month is listed below:

- 1-Hr TSP Monitoring 0 Events
- 24-Hr TSP Monitoring 0 Events
- Noise Monitoring 0 Events
- Water Quality Monitoring 0 Monitoring Day
- Site Inspection 0 Time
- Waste Management Audit 1 Time
- Ecological Monitoring 2 Occasions

Air Quality

No monitoring was undertaken as there was no construction work in this reporting month.

Construction Noise

No monitoring was undertaken as there was no construction work in this reporting month.

Water Quality

No monitoring was undertaken as there was no construction work in this reporting month.

Ecological Monitoring

The second and third ecological monitoring at the Mai Po Village egretry was conducted on 3 and 18 May 2003. A total of 30 and 46 Little Egrets (*Egretta garzetta*) and Cattle Egrets (*Bubulcus ibis*) nests were seen from different vantage points outside the egretry on 3 and 18 May 2003, respectively. For the 20 nests marked in the April survey, one was lost most probably due to nest destruction by a storm in early May. The 19 nests have been identified as belonging to 3 different species of egrets, the Little Egret, the Cattle Egret and the Great Egret. Of these 19 nests, 16 belonged to the Little Egrets and 89% of the nests had either two or three chicks in them.

Environmental Complaints

No environmental complaint was received in this reporting month.

Environmental Summons

No summon or prosecution related to environmental issue was received in this reporting month.

Site Inspection and Audit

Environmental site inspections have been suspended until the start of August when construction works at the site will resume. The ET undertook an independent waste management audit on 22 May 2003 for construction works at Wang Chau and Tan Kwai Tsuen.

Future Key Issues

The construction works of the box culvert, the pumping station and the flood protection wall has been temporarily suspended at Mai Po Lo Wai and Mai Po San Tsuen from April until the end of July. This is to allow for the breeding season of the egrets and related waterfowl in and around Mai Po village egretry (Site of Special Scientific Interest) to go undisturbed.

No construction noise, air and water quality impacts are envisaged during the suspension of works. Environmental impact monitoring will therefore be suspended and will resume when the construction work restarts in August 2003. Ecological monitoring of the Mai Po village egretry commenced in April 2003 for four months to study the breeding success of the egrets and related waterfowl.

Table of Contents

1.0 INTRODUCTION 1

1.1 PROJECT BACKGROUND 1
1.2 STRUCTURE OF THE MONTHLY EM&A REPORT 1

2.0 PROJECT ACTIVITIES 2

2.1 CONSTRUCTION WORKS IN MAY 2003 2

3.0 STATUS OF ENVIRONMENTAL PERMITS 3

3.1 ENVIRONMENTAL PERMITS 3

4.0 SUMMARY OF EM&A ACTIVITIES IN MAY 2003 4

5.0 AIR QUALITY MONITORING 5

5.1 MONITORING EQUIPMENT 5
5.2 MONITORING LOCATION 5
5.3 TRIGGER/ACTION/TARGET LEVELS OF AIR QUALITY 5
5.4 MONITORING PROCEDURE AND CALIBRATION DETAILS 6
5.5 IMPACT AIR QUALITY MONITORING RESULTS AND AUDITS 7

6.0 NOISE MONITORING 8

6.1 MONITORING EQUIPMENT 8
6.2 MONITORING LOCATION 8
6.3 TRIGGER/ACTION/TARGET LEVELS OF CONSTRUCTION NOISE 8
6.4 MONITORING PROCEDURE AND CALIBRATION DETAILS 9
6.5 NOISE MONITORING RESULTS AND AUDITS 9

7.0 WATER QUALITY MONITORING 10

7.1 MONITORING EQUIPMENT 10
7.2 MONITORING LOCATIONS 10
7.3 TRIGGER/ACTION/TARGET LEVELS OF WATER QUALITY 10
7.4 MONITORING METHODOLOGY 11
7.5 WATER MONITORING RESULTS AND AUDITS 11
8.0 WASTE MANAGEMENT 12

9.0 ECOLOGICAL MONITORING 13

9.1 MONITORING PARAMETERS AND FREQUENCY 13
9.2 MONITORING LOCATION 13
9.3 MONITORING METHODOLOGY 13
9.4 MONITORING EQUIPMENT 13
9.5 ECOLOGICAL MONITORING AND AUDIT 14

10.0 ENVIRONMENTAL NON-COMPLIANCE AND COMPLAINT 15

10.1 ENVIRONMENTAL COMPLIANCE REQUIREMENT 15
10.2 SUMMARY OF MONITORING EXCEEDANCES 15
10.3 SUMMARY OF ENVIRONMENTAL COMPLAINTS 16
10.4 ENVIRONMENTAL SUMMONS 16

11.0 SITE INSPECTION 16

12.0 IMPLEMENTATION STATUS OF MITIGATION MEASURES 16

13.0 IMPACT FORECAST AND MONITORING SCHEDULE FOR JUNE 2003.... 17

13.1 KEY ISSUES FOR THE COMING MONTH 17
13.2 UPCOMING EM&A SCHEDULE IN JUNE 2003 17
13.3 CONSTRUCTION WORKS FOR THE 3 MONTHS ROLLING PROGRAM 18

14.0 CONCLUSIONS AND RECOMMENDATIONS 18

List of Tables

Table 2-1 Major Construction Activities in May 2003
Table 3-1 Summary of the Licence/Permit Status
Table 4-1 EM&A Activities in May 2003
Table 5-1 Air Quality Monitoring Equipment
Table 5-2 Location of Air Monitoring Station
Table 5-3 Trigger/Action/Target Levels for 24-Hr TSP Monitoring
Table 5-4 Trigger/Action/Target Levels for 1-Hr TSP Monitoring
Table 5-5 Impact Air Quality Monitoring Results
Table 6-1 Noise Monitoring Equipment
Table 6-2 Location of Noise Monitoring Station
Table 6-3 Trigger/Action Levels for Construction Noise
Table 6-4 Target Levels for Construction Noise
Table 6-5 Summary of Construction Noise Monitoring Results
Table 7-1 Water Quality Monitoring Equipment
Table 7-2 Locations of Water Monitoring Stations
Table 7-3 Trigger/Action/Target Levels for Water Quality
Table 7-4 Analytical Methods of Water Samples
Table 7-5 Summary of Impact Water Quality Monitoring Results
Table 7-6 Laboratory Testing Results of Suspended Solids and Total Zinc
Table 8-1 Summary of Quantities of Waste for Disposal
Table 9-1 Ecological Monitoring Equipment
Table 9-2 Summary of Mai Po Village Egretry Nesting Population
Table 9-3 Summary of Species Type and Breeding Success Monitoring of Nests
Table 10-1 Statistical Summary of Environmental Complaints
Table 10-2 Statistical Summary of Environmental Summons
Table 13-1 Upcoming EM&A Schedule

List of Appendices

Appendix A Locations of Environmental Monitoring Stations
Appendix B HOKLAS Certificates and QA/QC Procedures
Appendix C Schedule of Calibration Certificates
Appendix D Graphical Plots of Air Quality Monitoring Results
Appendix E Graphical Plot of Noise Monitoring Results
Appendix F Meteorological Data
Appendix G Raw Data of Water Quality Monitoring
Appendix H Graphical Plots of Water Quality Monitoring Results
Appendix I Tentative Environmental Mitigation Implementation Schedule
Appendix J Construction Program
Appendix K Record of Waste Management Audit
Appendix L Ecological Monitoring Report

1.0 INTRODUCTION

1.1 PROJECT BACKGROUND

Ching Chit Cheung Construction Co., Ltd. (the Contractor) has been awarded the Contract DC/2000/08 from the Drainage Services Department (DSD) to construct the Village Flood Protection Works for Wang Chau, Mai Po Lo Wai and Mai Po San Tsuen and drainage improvement works at Tan Kwai Tsuen (the Project).

Action-United Environmental Services and Consulting (AUES) has been commissioned by the Contractor to implement an environmental monitoring and audit (EM&A) program in compliance with the legal and the contractual requirements of the Project.

The construction works at Mai Po Lo Wai and Mai Po San Tsuen are the section classified as Designated Project governed by an Environmental Permit (EP) issued by the environmental protection department (EPD). A Further Environmental Permit (FEP-01/088/2002) was issued to the Contractor on 22 Aug 2002. According to Condition 4.0 of the FEP, an Environmental Monitoring and Audit (EM&A) program is required for Mai Po Lo Wai and Mai Po San Tsuen of this Project.

This monthly EM&A report (No. 8) presents the results of EM&A works conducted in the reporting month of May 2003 (from 27 April to 26 May 2003).

1.2 STRUCTURE OF THE MONTHLY EM&A REPORT

The structure of this EM&A report is organized into 14 sections as follows:

Section 1	Introduction
Section 2	Project Activities
Section 3	Status of Environmental Permit
Section 4	Summary of Impact EM&A Activities in May 2003
Section 5	Air Quality Monitoring
Section 6	Noise Monitoring
Section 7	Water Quality Monitoring
Section 8	Waste Management
Section 9	Ecological Monitoring
Section 10	Environmental Complaint and Non-Compliance
Section 11	Site Inspection
Section 12	Implementation Status of Mitigation Measures
Section 13	Forecast and Schedule
Section 14	Conclusion

2.0 PROJECT ACTIVITIES

2.1 CONSTRUCTION WORKS IN MAY 2003

A summary of the major construction activities undertaken in this reporting month is shown in ***Table 2-1***.

Table 2-1 Major Construction Activities in May 2003

Site Area	Construction	Description of Construction Activities
Wang Chau	Pump House	Backfilling work
		Wall and slab construction
	Control building	Wall and slab construction
	U/G storage tank / outlet main	Base slab, wall, roof construction and backfilling works
Mai Po	Pump House	NIL
	Box Culvert	NIL
	Flood Wall	NIL
Tan Kwai Tsuen	Drainage Improvement	Sheetpiling and Excavation
		Base slab and wall construction
		Drainage channel (including break wall & slab)
		Filling work (Granular)

3.0 STATUS OF ENVIRONMENTAL PERMITS

3.1 ENVIRONMENTAL PERMITS

The current status of all environmental permits, licences, and/or notification to EPD for this project as of May 2003 is presented in ***Table 3-1***.

Table 3-1 Summary of the Licence/Permit Status

Item	Item Description	Permit Status
1	Further Environmental Permit, FEP-01/088/2002	Issued to Ching Chit Cheung on 29 July 2002
2	Air Pollution Control (Construction Dust) – Mai Po	Notified EPD on 13 Aug 02
3	Air Pollution Control (Construction Dust) – Wang Chau	Notified EPD on 13 Aug 02
4	Air Pollution Control (Construction Dust) – Tan Kwai Tsuen	Notified EPD on 13 Aug 02
5	Water Pollution Control (Discharge Licence) – Septic Tanks, RE and Contractor's Offices No.IS38N/1	Issued on 7 February 03
6	Water Pollution Control (Discharge Licence) – Mai Po No.IS39/1	Valid (27 Nov 02 – 30 Nov 07)
7	Water Pollution Control (Discharge Licence) – Wang Chau, No.IU366/1	Valid (9 Sep 02 – 30 Sept 07)
8	Noise Control (Percussive Piling) – Wang Chau, PP-TW0037-02	Valid (4 Sep 02 – 3 Jul 03)
9	Noise Control (Percussive Piling) – Tan Kwai Tsuen, PP-TW0038-02	Valid (4 Sep 02 – 31 Jul 03)
10	Chemical Waste Producer Registration – Mai Po WPN: 5113-542-C3234-03	Issued on 23 October 02
11	Chemical Waste Producer Registration – Wang Chau WPN: 5113-528-C3234-01	Issued on 10 October 02
12	Chemical Waste Producer Registration – Tan Kwai Tsuen, WPN: 5211-519-C3234-02	Issued on 3 October 02
13	Water Pollution Control (Discharge Licence) - Tan Kwai Tsuen No.IT301/1	Valid (4 Feb 03 – 31 Jan 08)

4.0 SUMMARY OF EM&A ACTIVITIES IN MAY 2003

24-Hr and 1-Hr TSP:

Monitoring at designated (A1) station has been suspended until the end of July 2003.

Noise:

Monitoring at designated (N1) station has been suspended until the end of July 2003.

Water Quality:

Monitoring at the two designated (W(U)1 & W(D)1) stations has been suspended until the end of July 2003.

The schedule which details all monitoring activities during the reporting month is presented in ***Table 4-1***.

Table 4-1 EM&A Activities in May 2003

Date of Monitoring		Water Quality	Noise (Leq30)	Air Quality (1-Hr and 24-Hr)	Ecological Monitoring
27-Apr-03	Sun				
28-Apr-03	Mon				
29-Apr-03	Tue				
30-Apr-03	Wed				
1-May-03	Thu				
2-May-03	Fri				
3-May-03	Sat				
4-May-03	Sun				
5-May-03	Mon				
6-May-03	Tue				
7-May-03	Wed				
8-May-03	Thu				
9-May-03	Fri				
10-May-03	Sat				
11-May-03	Sun				
12-May-03	Mon				
13-May-03	Tue				
14-May-03	Wed				
15-May-03	Thu				
16-May-03	Fri				
17-May-03	Sat				
18-May-03	Sun				
19-May-03	Mon				
20-May-03	Tue				
21-May-03	Wed				
22-May-03	Thu				
23-May-03	Fri				
24-May-03	Sat				
25-May-03	Sun				
26-May-03	Mon				

Remarks:

Sunday or Public Holiday
Monitoring Event

5.0 AIR QUALITY MONITORING

The potential air quality impact arising from the construction is measured in terms of 1-Hr and 24-Hr Total Suspended Particulates (TSP).

5.1 MONITORING EQUIPMENT

24-Hr TSP Monitoring

The impact dust monitoring of 24-Hr TSP was undertaken in accordance with the Code of Federal Regulations Chapter 1 (Part 50) Appendix B. For all monitoring events, the 24-Hr TSP levels were determined by drawing air through a pre-conditioned, pre-weighed glass fiber filter inside a high volume sampler (HVS) at a controlled flow rate for 24 ± 1 hours.

1-Hr TSP Monitoring

The 1-Hr TSP levels were determined by using the 1-Hr TSP portable meter, which is capable of measuring and recording 1-hour time weighted average dust concentration between 0.01 and 100 mg/m^3. ***Table 5-1*** summaries the equipment that was used in the air quality monitoring program.

Table 5-1 Air Quality Monitoring Equipment

Equipment	Model
24-Hr TSP Monitoring	
HVS	Grasby Anderson GMWS 2310 HVS
Calibration Kit	TE-5025A TISCH Orifice
1-Hr TSP Monitoring	
Portable meter	TSI DustTrak Aerosol Monitor

5.2 MONITORING LOCATION

The air quality monitoring location is presented in ***Table 5-2*****.** The geographic location of the monitoring station is shown in ***Appendix A***:

Table 5-2 Location of Air Monitoring Station

Monitoring Station	Name of Location	Description
A1	Mai Po Lo Wai	An open area close to a village house

5.3 TRIGGER/ACTION/TARGET LEVELS OF AIR QUALITY

The Trigger/Action/Target (TAT) Levels for air quality monitoring were proposed in the baseline monitoring report. The TAT levels for 24-Hr and 1-Hr TSP monitoring are presented in ***Table 5-3*** **and** ***5-4*** respectively.

Table 5-3 Trigger/Action/Target Levels for 24-Hr TSP Monitoring

Monitoring Station	Name of Location	Trigger Level mg/m^3	Action Level mg/m^3	Target Level mg/m^3
A1	Mai Po Lo Wai	114	187	260

Table 5-4 Trigger/Action/Target Levels for 1-Hr TSP Monitoring

Air Monitoring Stations	Name of Location	Trigger Level mg/m³	Action Level mg/m³	Target Level mg/m³
A1	Mai Po Lo Wai	165	333	500

5.4 MONITORING PROCEDURE AND CALIBRATION DETAILS

Installation

The HVS was placed at the aforesaid location, which was freestanding with no obstruction. The following criteria were considered in the installation of the HVS.

- A horizontal platform with appropriate support to secure the samplers;
- The distance between the sampler and obstacle, such as buildings, must be at least twice the height that the obstacle protrudes above the sampler;
- A minimum of 2 m separation from walls, parapets and penthouses for rooftop samplers;
- A minimum of 2 m separation from any supporting structure measured horizontally;
- No furnace or incinerator flue nearby;
- Unrestricted airflow around the sampler;
- A minimum separation of 20 m from the dripline; and
- Any wire fence and gate to protect the sampler will not cause any obstruction during monitoring.

Preparation of Filter Papers by HOKLAS-accredited laboratory

- Glass-fibre filters, were labeled and sufficient filters that were clean and without pinholes were selected;
- All filters were equilibrated in the conditioning environment for 24 hours before weighing. The conditioning environment temperature was around 25 °C and not variable by more than ±3 °C; the relative humidity (RH) was < 50% and not variable by more than ±5%. A convenient working RH was 40%; and
- *ALS Technichem (HK) Pty Ltd* has comprehensive quality assurance and quality control programs for TSP analysis and has attained HOKLAS accreditation for a range of other environmental testing. The certificate for the laboratory is shown in ***Appendix B***.

Field Monitoring

- The power supply was checked to ensure that the HVS worked properly;
- The filter holder and the area surrounding the filter were cleaned;
- The filter holder was removed by loosening the four bolts and a new filter, with stamped number upward, on a supporting screen aligned carefully;
- The filter was properly aligned on the screen so that the gasket formed an airtight seal on the outer edges of the filter;
- The swing bolts were fastened to hold the filter holder down to the frame. The pressure applied should be sufficient to avoid air leakage at the edges;
- Then the shelter lid was closed and secured with the aluminum strip;
- The HVS was warmed-up for about 5 minutes to establish run-temperature conditions;
- A new flow rate record sheet was set into the flow recorder;
- The flow rate of the HVS was checked and adjusted at around 1.1 m^3/min. The range specified in the EM&A Manual was between 0.6-1.7 m^3/min;
- The programmable timer was set for a sampling period of 24 hrs $\pm$ 1 hr, and the starting time, weather condition and the filter number were recorded;
- The initial elapsed time was recorded;

- At the end of sampling, the sampled filter was removed carefully and folded in half length so that only surfaces with collected particulate matter were in contact;
- It was then placed in a clean plastic envelope and sealed;
- All monitoring information was recorded on a standard data sheet; and
- Filters were sent to *ALS Technichem (HK) Pty Ltd* for analysis.

Maintenance & Calibration

- The HVSs and their accessories was maintained in good working condition, such as replacing motor brushes routinely and checking electrical wiring to ensure a continuous power supply;
- The HVSs were calibrated at quarterly intervals using TE-5025A TISCH Calibration Kit throughout all stages of the air quality monitoring; and
- The portable dust meter was calibrated by the manufacturer before the instrument was shipped to the site. The zero response of the instrument was checked before and after each monitoring event. The schedule of calibration and/or certificates is provided in ***Appendix C***.

5.5 IMPACT AIR QUALITY MONITORING RESULTS AND AUDITS

Monitoring at designated (A1) station has been suspended until the end of July 2003.

6.0 NOISE MONITORING

6.1 MONITORING EQUIPMENT

An Integrating Sound Level Meter is used for noise monitoring. It is a Type 1 sound level meter capable of giving a continuous readout of the noise level readings including equivalent continuous sound pressure level (L_{eq}) and percentile sound pressure level (L_x). It complies with International Electrotechnical Commission Publications 651:1979 (Type 1) and 804:1985 (Type 1). A portable electronic wind speed indicator capable of measuring the wind speed in m/s was employed to check the wind speed. ***Table 6-1*** details the noise monitoring equipment used.

Table 6-1 Noise Monitoring Equipment

Equipment	Model
Integrating Sound Level Meter	Rion NL-14
Calibrator	Rion NC-73
Portable Wind Speed Indicator	Testo Anemometer

6.2 MONITORING LOCATION

The noise monitoring was undertaken at one designated monitoring location as shown in ***Table 6-2*** and geographically in ***Appendix A*****.**

Table 6-2 Location of Noise Monitoring Station

Monitoring stations	Location	ASR	Description
N1	Mai Po Lo Wai	A	Village house - Facing the construction site

ASR refers to Area Sensitivity Rating as defined in the Technical Memorandum under the Noise Control Ordinance.

6.3 TRIGGER/ACTION/TARGET LEVELS OF CONSTRUCTION NOISE

The Trigger/Action/Target (TAT) Levels for noise monitoring were adopted from the baseline monitoring data. ***Table 6-3*** and ***Table 6.4*** presents the established TAT levels for the noise monitoring.

Table 6-3 Trigger / Action Levels for Construction Noise

Time Period		Trigger Level	Action Level
Normal hours	07:00-19:00 hrs on normal weekdays	Receipt of a single documented complaint of construction noise level.	Receipt of more than one documented complaint of construction noise in any two weeks period on the same event or at the same location.
Restricted hours	07:00-23:00 hrs on public holidays; and 19:00-23:00 hrs on all other days		
	23:00-07:00 hrs of next day		

Table 6-4 Target Levels for Construction Noise

Time Period		Target Level
Normal hours	07:00-19:00 hrs on normal weekdays	Leq (30 min) 75 dB(A) Leq (30 min) 70 dB(A) for schools and 65 dB(A) during examination periods.
Restricted hours	07:00-23:00 hrs on public holidays; and 19:00-23:00 hrs on all other days	60 dB(A) for ASR* "A" Areas
	23:00-07:00 hrs of next day	45 dB(A) for ASR* "A" Areas

ASR refers to Area Sensitivity Rating as defined in the Technical Memorandum of Noise Control Ordinance.

6.4 MONITORING PROCEDURE AND CALIBRATION DETAILS

Field Monitoring

- 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. For reference, a correction of +3dB(A) was made to the free field measurements.
- 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 noise measurement, the meter was calibrated using a Calibrator for 94 dB at 1000 Hz (if the difference in the calibration level before and after measurement are more than 1 dB(A), the measurement will be considered invalid and repeat of noise measurement will be required after re-calibration or repair of the equipment).
- The wind speed was frequently checked with a portable wind meter.
- During the monitoring period, the L_{eq}, L_{90} and L_{10} were recorded. In addition, site conditions and noise sources were recorded on a standard record sheet.
- During normal construction working hours (0700-1900 Monday to Saturday), monitoring of $L_{Aeq, 30min}$ noise levels (as six consecutive $L_{Aeq, 5min}$ readings) were carried out.
- Noise measurement was paused during periods of high intrusive noise (e.g. dog barking, human noise or another sources are not come from the construction works) if possible. Observations were recorded when intrusive noise was unavoidable.

Maintenance and Calibration

- The microphone head of the sound level meter and calibrator is cleaned with soft cloth at quarterly intervals.
- The meter was sent to HOKLAS laboratory for calibration at yearly intervals. The schedule of calibration and certificates are provided in ***Appendix C***.

6.5 NOISE MONITORING RESULTS AND AUDITS

Monitoring at designated (N1) station has been suspended until the end of July 2003.

7.0 WATER QUALITY MONITORING

7.1 MONITORING EQUIPMENT

The equipment for the water quality monitoring is presented in ***Table 7-1***.

Table 7-1 Water Quality Monitoring Equipment

Equipment	Model / Description
Water Depth Detector	Steel Ruler
Water Sampling Equipment	Telfon bailor
Thermometer	YSI Model 55
Sample Container	High density polythene bottles (provided by laboratory)
Storage Container	Cooled box with ice pack

7.2 MONITORING LOCATIONS

Water quality monitoring was undertaken at the two designated locations as shown in ***Table 7-2*** and geographically in ***Appendix A***. The water samples were analysed for Suspended Solids and Total Zinc.

Table 7-2 Locations of Marine Water Monitoring Stations

Station	Location
W(U)1	Upstream of site - Control Station
W(D)1	Downstream of site - Impact Station

7.3 TRIGGER/ACTION/TARGET LEVELS OF WATER QUALITY

The Trigger/Action/Target (TAT) Levels for water monitoring were proposed in the baseline monitoring report. The TAT levels for water quality monitoring are presented in ***Table 7-3***.

Table 7-3 Trigger / Action / Target Levels for Water Quality

Parameter	Trigger Level	Action Level	Target Level
Suspended Solids (mg/L)	Trigger Level is exceeded if Suspended Solids (SS) at water sampling station W(D)1 exceeds 203mg/L and 120% of SS level at the upstream control water sampling station W(U)1 at the same monitoring day	Action Level is exceeded if Suspended Solids (SS) at water sampling station W(D)1 exceeds 203mg/L and 130% of SS level at the upstream control water sampling station W(U)1 at the same monitoring day	Target Level is exceeded if SS at water sampling station W(D)1 exceeds 203 mg/L and 130% of the SS level at water sampling station W(U)1 for three consecutive monitoring days.
Total Zinc (ug/L)	Trigger Level is exceeded if Zinc at water sampling station W(D)1 exceeds 145 ug/L, and 120% of zinc level at the upstream control water sampling station W(U)1 at the same monitoring day	Action Level is exceeded if Zinc at water sampling station W(D)1 exceeds 145ug/L and 130% of zinc level at the upstream water sampling station W(U)1 at the same monitoring day	Target Level is exceeded if Zinc at water sampling station W(D)1 exceeds 145ug/L and 130% of zinc level at water sampling station W(U)1 for three consecutive monitoring days.

7.4 MONITORING METHODOLOGY

Sampling

A strain steel ruler was used for the determination of water depth at each designated monitoring station. As the water column at the monitoring station was less than 1.5 m at the time of sampling, one water sample was taken in the middle of the water column.

Water samples were collected using a telfon bailor and the samples were stored in high-density polythene bottles. Sampling bottles were pre-rinsed with the same water samples. The sample bottles were then packed in cool boxes (cooled at $4^{o}C$ without being frozen), and delivered to *ALS Technichem (HK) Pty Ltd* for analysis of suspended solids and zinc.

The results of the in-situ measurements were recorded on the field data sheets and subsequently input into a computer database for data interpretation.

Laboratory Analysis

All laboratory work is carried out by a local HOKLAS-accredited laboratory. The analyses followed the standard methods according to the APHA Standard Methods for the Examination of Water and Wastewater unless otherwise specified. The analytical methods of the water samples are presented in ***Table 7-4*** below:

Table7-4 Analytical Methods of Water Samples

Determinants	Testing Method	Detection Limit
Suspended Solids	APHA 19ed 2540D	2 mg/L
Zinc	APHA 17ed 3111B	10 ug/L

7.5 WATER MONITORING RESULTS AND AUDITS

Monitoring at the two designated (W(U)1 & W(D)1) stations has been suspended until the end of July 2003.

8.0 WASTE MANAGEMENT

The ET carried out a waste management audit on 22 May 2003. A summary of the waste audit findings and follow up actions are presented in ***Table 8-1***. The audit findings are presented in ***Appendix K*** and some observations are noted as follows:

ET's Waste Audit Findings*:*

- Trip ticket records of waste disposal were taken;
- No chemical waste was produced;
- The generator and chemical drums/containers should be provided with a drip tray; and
- Waste skips should be provided onsite to collect waste when necessary and to improve house keeping.

Table 8-1 Summary of Waste Audit Findings and Follow Up Action

Item	Aspects	Key Audit Findings	Date Observed
Site Observation			
1	Waste	No waste management issues observed at Wang Chau or Tan Kwai Tsuen	22 May 2003
Follow Up Action			
1	Waste		

Records of Waste Quantities

All type of wastes arising from the construction work are classified into the following:

- Excavated material;
- Construction & demolition (C&D) material;
- Chemical waste; and
- Dredged materials.

The quantities of waste for disposal in this reporting month are summarized in ***Table 8-2*****.**

Table 8-2 Summary of Quantities of Waste for Disposal

Type of Waste	Quantity	Disposal Location
Excavated Material (Contaminated) (m^3)	Nil	From Mai Po site to East Sha Chau
Excavated Material (Uncontaminated) (m^3)	Nil	From Mai Po site to South Cheung Chau
Soil Material from Wang Chau (m^3)	Nil	WENT
Soil Material from Tan Kwai Tsuen (m^3)	180	WENT
Construction & Demolition Material (Inert) (m^3)	Nil	NA
Construction & Demolition Material (Non-inert) (m^3)	Nil	NA
Chemical Waste (m^3)	Nil	NA

9.0 ECOLOGICAL MONITORING

The ecological assessment reported in the EIA has been carried out in this reporting month at the Mai Po Village Egretry.

9.1 MONITORING PARAMETERS AND FREQUENCY

The monitoring of the egretry is carried out during the construction phase of the project to identify and evaluate any impacts from the new channel construction. Annual counts and species identification of nesting birds is conducted during the nesting season from April through to July. Nest productivity is estimated from sample numbers of eggs and chicks in nests at each egretry. The nest occupancy and productivity is then determined based on 4 counts at each egretry conducted between 1 April and 31 July. Trends in numbers and species representation at egretries are assessed for any indications of adverse impacts from channel construction. The monitoring results are reported in the relevant monthly report.

9.2 MONITORING LOCATION

The monitoring location of the egretry is at Mai Po Lo Wai and Mai Po San Tsuen in accordance with the EM&A Manual.

9.3 MONITORING METHODOLOGY

A combined monitoring methodology was used consisting of nest counting from a distance which determines the nesting population of the study area and egg counting / hatching which determines the breeding success of the egrets. Little Egrets are the target species of this monitoring exercise as they accounted for 40% of the total nests in the Mai Po Village Egretry in 2002. A maximum of 30 Little Egret nests will be studied and where possible the breeding success of other nesting ardeids would also be monitored.

Nests are to be tagged with a red ribbon and marked with a numbered plastic label. Each nest is visited on average once a month with the main focus being on the peak breeding season. The first and second surveys are aimed at investigating clutch size and hatching success. Sufficient time (about 21 days) will be given to allow the eggs to hatch so that the hatching success of the eggs can be estimated. A mirror attached to a pole will be used to view nests high from the ground. A digital camera is used to record contents of each nest during every visit.

The hatching success of a tagged nest is defined as the number of chicks hatched divided by the clutch size. The clutch size is determined as the total number of eggs present before hatching occurs in the monitoring sample under study. Those nests where re-visits were not possible due to the loss of tags or labels will not be considered in the estimation of clutch size and hatching success.

9.4 MONITORING EQUIPMENT

The main equipment used for the breeding success monitoring and the nesting population count is presented as follows:

Table 9-1 Ecological Monitoring Equipment

Equipment	Model
Binoculars	Leica 10x42
Digital Camera	Leica Digilux 4.3

9.5 ECOLOGICAL MONITORING AND AUDIT

Ecological monitoring at the Mai Po Village egretry was conducted on 3 and 18 May 2003. The ecological monitoring exercise is divided into two parts, nesting population and breeding success monitoring.

Nesting Population

A total of 30 and 46 nests were counted on 3 and 18 May 2003 respectively during the determination of the nesting population at different vantage points from outside the egretry. The vantage points are along Castle Peak Road and the road to Ngau Tam Mei. These points cover different sections of the egretry, which helps to minimise over counting of egret nests. The possibility of over counting the egret nests is further reduced by visually separating the different nesting habitats in the egretry, which includes bamboo, banyan and other exotic trees such as *Melaleuca leucadendroncan.* The 30 nests counted on 3 May 2003 consisted of 27 Little Egret (Egretta garzetta) nests and 3 Cattle Egret (Bubulcus ibis) nests. The 46 nests counted on 18 May 2003 consisted of 42 Little Egret nests, 3 Cattle Egret nests and 1 Great Egret (*Egretta alba*) nest. The nesting population at Mai Po Village Egretry is summarised in ***Table 9-2***.

Breeding Success Monitoring

On 3 May 2003, all but two (nest number 3 and 8) of the 20 tagged nests had hatched and were in the chick raising stage. One nest (nest number 14) was completely lost most probably due to a storm and will be discounted from the monitoring study. Of the 17 nests that are in the chick raising stage, 13 nests (77%) had 2 chicks, while the other 4 nests had 3 chicks in them.

All the existing nests were in the chick raising stage during the 18 May 2003 monitoring event. Seventeen out of the 19 (89%) nests had either 2 or 3 chicks in them while the remaining two nests had 1 chick in them.

Species Identification

Out of the 19 nests, 16 of them belonged to the Little Egret, 2 of them to the Cattle Egret and 1 from a Great Egret. The number and types of nests and eggs under study is summarised in ***Table 9-3***.

The increase in nesting population between this months and last months ecological monitoring is most probably related to birds starting their breeding late this year. The late breeding of the egrets and herons this year has also been observed at other egretries, e.g. Tai Po Market.

Although the nesting population, in terms of the number of nests in May (max count: 46 nests) was higher than April (18 nests) there were fewer nests found this year compared with last year (2002), when a maximum of 73 nests of four species; Great Egrets, Little Egrets, Cattle Egrets and Black-crowned Night Herons (*Nycticorax nycticorax*) were recorded.

The lost of one nest during breeding success monitoring is most probably due to nest destruction by a storm in early May 2003. The majority of nests were of Little Egrets and this corresponds with the nest count and the observation that the Little Egret is the dominant species in the Mai Po Village Egretry.

Table 9-2 Summary of Mai Po Village Egretry Nesting Population

Date	Little Egret	Great Egret	Cattle Egret	Total
19 April	15		3	**18**
3 May	27		3	**30**
18 May	42	1	3	**46**

Table 9-3 Summary of Species Type and Breeding Success Monitoring of Nests

Nest	Species	19 April		3 May		18 May	
		No of eggs	No of chicks	No of eggs	No of chicks	No of eggs	No of chicks
1	LE	3			2		2
2	GE	3			2		1
3	CE	4		2	1		2
4	LE		2		2		2
5	LE	3	1		3		3
6	LE	1	1		2		2
7	LE	3			2		2
8	LE	3		3			3
9	LE	4			3		3
10	LE		2		2		2
11	LE	2			2		2
12	LE	4			2		2
13	LE		2		2		2
14	-		3		-		-
15	LE	3			2		2
16	LE	3			3		3
17	LE	4			2		1
18	LE	4			3		2
19	LE	4			2		2
20	CE		2		2		2

LE = Little Egret, CE = Cattle Egret and GE = Great Egret

No direct impact on the nests has been observed attributable to the project. There is no conclusive evidence at this stage of the monitoring to suggest that the Project has had a direct impact on this year's decrease in the number of egret nests. The second and third ecological monitoring report is presented in ***Appendix L*** along with photos of the egretry monitoring at the Mai Po Village egretry monitoring location.

10.0 ENVIRONMENTAL NON-COMPLIANCE AND COMPLAINT

10.1 ENVIRONMENTAL COMPLIANCE REQUIREMENT

Should there be any monitoring exceedance of TAT Levels, the Event and Action Plan (EAP) will be followed. The EAP is as outlined in the EM&A Manual.

10.2 SUMMARY OF MONITORING EXCEEDANCES

Air Quality Monitoring

Monitoring at designated (A1) station has been suspended until the end of July 2003.

Construction Noise Monitoring

Monitoring at designated (N1) station has been suspended until the end of July 2003.

Water Quality Monitoring

Monitoring at the two designated (W(U)1 & W(D)1) stations has been suspended until the end of July 2003.

10.3 SUMMARY OF ENVIRONMENTAL COMPLAINTS

No environmental complaint was received in this reporting month. A statistical summary of environmental complaints since project commencement is presented in ***Table 10-1***.

Table 10-1 Statistical Summary of Environmental Complaints

Reporting Month	Complaint Statistics		
	Frequency	Cumulative	Complaint Nature
September 2002	0	0	NA
October 2002	0	0	NA
November 2002	0	0	NA
December 2002	0	0	NA
January 2003	0	0	NA
February 2003	0	0	NA
March 2003	0	0	NA
April 2003	0	0	NA
May 2003	0	0	NA

10.4 ENVIRONMENTAL SUMMONS

No summon was received in this reporting month. A statistical summary of legal proceedings since project commencement is presented in ***Table 10-2***.

Table 10-2 Statistical Summary of Environmental Summons

Reporting Month	Summon Statistics		
	Frequency	Cumulative	Nature of Summons
September 2002	0	0	NA
October 2002	0	0	NA
November 2002	0	0	NA
December 2002	0	0	NA
January 2003	0	0	NA
February 2003	0	0	NA
March 2003	0	0	NA
April 2003	0	0	NA
May 2003	0	0	NA

11.0 SITE INSPECTION

Environmental site inspections have been suspended until the start of August when works at the site will resume. The ET undertook an independent site inspection and waste management audit on 22 May 2003 for works at Wang Chau and Tan Kwai Tsuen. Details of the ET's waste management audit are presented in ***Appendix K.***

12.0 IMPLEMENTATION STATUS OF MITIGATION MEASURES

The Contractor has been implementing the required environmental mitigation measures according to the tentative Environmental Mitigation Implementation Schedule. A summary of the implementation status of the mitigation measures is presented in ***Appendix I***.

13.0 IMPACT FORECAST AND MONITORING SCHEDULE FOR JUNE 2003

13.1 KEY ISSUES FOR THE COMING MONTH

The construction works of the box culvert, the pumping station and the flood protection wall has been temporarily suspended from the start of April until the end of July. This is to allow for the breeding season of the egrets and related waterfowl in and around Mai Po village egretry (Site of Special Scientific Interest) to go undisturbed. No construction noise, air and water quality impacts are envisaged during the suspension of works. Environmental impact monitoring has also been suspended and will resume when construction works starts in August 2003. Ecological monitoring of the Mai Po village egretry will continue in June 2003.

13.2 UPCOMING EM&A SCHEDULE IN JUNE 2003

The EM&A schedules for the coming reporting month is presented as follows:

Table 13-1 Upcoming EM&A Schedule in June 2003

Date of Monitoring		Water Quality	Noise (Leq30)	Air Quality (1-Hr and 24-Hr)	Ecological Monitoring
27-May-03	Tue				
28-May-03	Wed				
29-May-03	Thu				
30-May-03	Fri				
31-May-03	Sat				
1-Jun-03	Sun				
2-Jun-03	Mon				
3-Jun-03	Tue				
4-Jun-03	Wed				
5-Jun-03	Thu				
6-Jun-03	Fri				
7-Jun-03	Sat				
8-Jun-03	Sun				
9-Jun-03	Mon				
10-Jun-03	Tue				
11-Jun-03	Wed				
12-Jun-03	Thu				
13-Jun-03	Fri				
14-Jun-03	Sat				
15-Jun-03	Sun				
16-Jun-03	Mon				
17-Jun-03	Tue				
18-Jun-03	Wed				
19-Jun-03	Thu				
20-Jun-03	Fri				
21-Jun-03	Sat				
22-Jun-03	Sun				
23-Jun-03	Mon				
24-Jun-03	Tue				
25-Jun-03	Wed				
26-Jun-03	Thu				

Remarks:

Sunday or Public Holiday
Monitoring Event

13.3 CONSTRUCTION WORKS FOR THE 3 MONTHS ROLLING PROGRAM

The construction works for the 3 months rolling program is included in ***Appendix J.***

14.0 CONCLUSIONS AND RECOMMENDATIONS

The EM&A program in May 2003 was undertaken in accordance with the EM&A manual.

Air Quality Monitoring

Monitoring at designated (A1) station has been suspended until the end of July 2003.

Construction Noise Monitoring

Monitoring at designated (N1) station has been suspended until the end of July 2003.

Water Quality Monitoring

Monitoring at the two designated (W(U)1 & W(D)1) stations has been suspended until the end of July 2003.

Ecology

The ecological impact of the drainage works on the Mai Po Village Egretry cannot be determined until monitoring of at least one breeding season has been completed.

Environmental Complaint/Summons

No environmental complaint or summon was received during the reporting month.

Recommendations

The ET will keep track of the EM&A program to ensure compliance of environmental requirements and the proper implementation of all necessary mitigation measures if and when necessary.