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# Ocean Park Master Redevelopment Project

## Monthly Environmental Monitoring & Audit Report – July 2007



**Ocean Park Master Redevelopment Project**

**EP-249/2006/A – Condition 3.4**

**Monthly EM&A Report – July 2007**

Certified by  on 13-Aug-07

Terence Kong

Project Environmental Team Leader

**Verified by** Independent Environmental Checker **on** 13-Aug -07

IEC Certificate attached in the submission? Yes

**Submitted to Ocean Park on** 14-Aug-07

**Ocean Park Master Redevelopment Project**

**Environmental Permit No. EP-249/2006/A - Condition 3.4**

**Monthly EM&A Report – July 2007**

**Submitted by Maunsell Consultants Asia Ltd on 10-08-2007**

**This is to verify that**

**Monthly EM&A Report – July 2007**

**Submitted by Maunsell Consultants Asia Ltd**

**On 10-08-2007**

**Has been verified by the undersigned.**

Signed



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Dr Anne F Kerr  
Independent Environmental Checker (IEC)  
Retained by Ocean Park Corporation  
pursuant to Environmental Permit No. EP-249/2006/A

Date

13 August 2007

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#### **Appendix A IEC's Site Inspection Records**

**Part 2 CI-05 EM&A Monthly Report**

**Part 3 CS-01 EM&A Monthly Report**

## Part 1 Project Overview

### Executive Summary

This is the combined monthly EM&A Report for Ocean Park Master Redevelopment Project, which includes Contract CI-05 "Site Formation, Funicular Tunnel and Miscellaneous Work" and CS-01 "The Vet Hospital". This report presents the results of EM&A works conducted in the reporting month of July 2007 (from 26 June 2007 to 25 July 2007).

A summary of monitoring and audit activities conducted in the reporting period is listed below:

1-hour TSP monitoring	15 sessions for AM1 & AM2 13 sessions for AM3 (due to power failure)
24-hour TSP monitoring	5 sessions for AM1 & AM2 4 sessions for AM3 (due to power failure)
Daytime noise monitoring	4 sessions
Evening and night time noise monitoring	0 sessions
Holiday time noise monitoring	0 sessions
Terrestrial ecology monitoring	0 sessions
Coral monitoring	1 session for Site 1-4 2 sessions for Site 5 and Control Station
Environmental Site Inspection	4 sessions

No exceedance was recorded on the 1-hour TSP monitoring, 24-hour TSP monitoring, daytime noise and coral monitoring. No non-compliance from IEC, complaint, summons or prosecution related to environmental issues was made against the Ocean Park Master Redevelopment Project in the reporting period of July 2007.

## 1. Introduction

The “Master Redevelopment Project of Ocean Park” (hereinafter known as the “Project”) is implemented by the Ocean Park Corporation at its existing site of Ocean Park and Nam Long Shan, Aberdeen. The Project involves both reconstruction/modification of existing facilities and expansion of the Park, and therefore under Environmental Permit, EP-249/2006/A.

The construction works of the project consists of various contracts. Details of the contracts, which are required to perform the EM&A programme, are shown below.

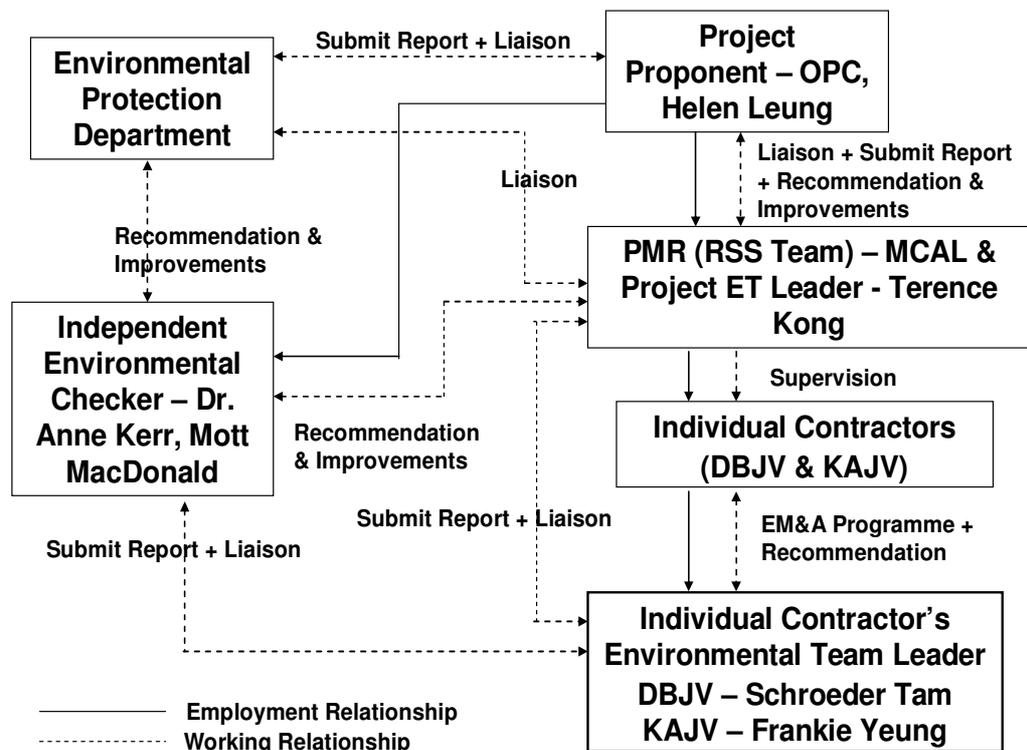
Contract No.	Contract Title	Contractor	Construction Commencement
CI-05	Site Formation, Funicular Tunnel and Miscellaneous Works	Dragages-Bouygues JV	12 March 2007
CS-01	Back of House for Marine Mammal Veterinary Hospital	Kaden – ATAL JV	26 March 2007

The contractors will conduct environmental monitoring and audits during the construction stage and produce contract specific monthly EM&A reports. The RSS will prepare a combined monthly EM&A report for the project. This is the combined monthly EM&A Report including the IEC audit findings, CI05 and CS01 Monthly EM&A Report. This report presents the results of EM&A works conducted in the reporting month of July 2007 (from 26 June 2007 to 25 July 2007).

## 2. Project Organisation

The structure of the environmental management team is shown in below figure.

### Management Organization



### 3. Construction Works Undertaken during the Reporting Month

In the reporting month, the construction activities summarise as follows.

#### CI-05

##### **Waterfront**

- Utilities Diversion for Waterfront Access Road and HKSM;
- Grouting Works at Electrical Supply Station Building;
- Excavation;
- Filling of Lagoon;
- Waterfront Access Road;
- Temporary Bus Terminus; and
- Boulder stabilization on North Portal

##### **Tai Shue Wan**

- Conveyor Belt Installation; and
- Barging Point.

#### CS-01

- Part of blinding the footings of Office Block and Pool Block;
- Blinding the Plant Block;
- Scaffolding works and formwork & fixing rebar for the tie beam;
- Concreting the columns of Pool block;

##### **Summit**

- Site Formation at Adit Portal and Explosive Magazine;
- Slope Improvement Work;
- Rock Fall Fence Installation;
- Utilities Diversion (Water main & Life Supporting System pipe);
- Haul Road Formation & Excavation;
- Conveyor System Installation; and
- Excavation at Summit

##### **Nam Long Shan Road Entrusted Works**

- Traffic Diversion for NLS Road Entrusted Work; and
- Excavation at NLS Road Entrusted Work & Wong Chuk Hang Road.

- Grouting the soil nails and take the pull out test;
- Disposal of unsuitable material to landfills;
- Breaking up the rock bedding level; and
- Installation of the water pipes and conduits laying

### 4. Permits and License Status

#### 4.1. Environmental Permit

The Environmental Impact Assessment (EIA) Report of the Project has been approved by the Environmental Protection Department (EPD) (Register No.: AEIAR-101/2006) on 12 July 2006. Subsequently, EPD issued Environmental Permit (EP) for the construction and operation of the project. Table below is a full list of the EPs.

EP No.	Issue Date	Key Variation
EP-249/2006	28 July 2006	First EP
EP-249/2006/A	25 September 2006	<ul style="list-style-type: none"> <li>• Enhance the roosting habitat for freshwater birds by enlarging Pond 35 and its surrounds with a total area of no less than 120 squares meters and no construction works and discharge from construction sites shall be allowed within Pond 35 after enhancement.</li> <li>• Filling of Pond 37 at the Lowland Area.</li> <li>• Submission of the as-built drawings showing the enhancement works of Pond 35.</li> </ul>

**4.2. CNP**

Table below shows a list of CNP within the reporting month.

Permit number	Starting Date	Expired Date	Valid Time	Location	Contract No.	Status
<b>CI-05 (DBJV)</b>						
GW-RS0200-07	5-Apr-07	30-Jun-07	<i>PME</i> Group A and C: 09:00 - 19:00 hours (General Holidays). Other groups: 19:00 - 23:00 hours (Not being a general holidays). 09:00 - 19:00 hours (General Holidays) One group of equipment shall be allowed in above time. <i>PCW</i> 00:00 - 24:00 hours (General Holidays) 00:00 - 07:00 hours and 19:00 - 24:00 hours (Not being a general holidays)	Waterfront (Panda Access Ramp)	CI-05	Expired
GW-RS0240-07	4-May-07	30-Jun-07	<i>PME</i> 19:00 - 23:00 hours (Not being a general holidays) 09:00 - 19:00 hours (General holidays)  <i>PCW</i> 00:00 - 07:00 hours, 19:00 - 24:00 hours (Not being a general holidays)	Summit (At top of Nam Long Shan Road)	CI-05	Expired
GW-RS0269-07	9-May-07	30-Jun-07	19:00 - 23:00 hours (Not being a general holidays) 09:00 - 19:00 hours (General holidays)	Ocean Park Shum Wan Road	CI-05	Expired
GW-RS0408-07	1-Jul-07	30-Aug-07	19:00 - 23:00 hours (Not being a general holidays) 09:00 - 19:00 hours (general holidays)	Summit (At the top of Nam Long Shan Road)	CI-05	Valid
GW-RS0434-07	16-Jul-07	10-Dec-07	<i>PME</i> 19:00 - 23:00 hours (Not being a general holiday) 09:00 - 19:00 hours (general holidays) <i>PCW</i> 19:00-23:00 hours (Not being a general holidays) 09:00-19:00 hours (general holidays)	Waterfront (Panda Access Ramp)	CI-05	Valid

Permit number	Starting Date	Expired Date	Valid Time	Location	Contract No.	Status
GW-RS0440-07	18-Jul-07	30-Aug-07	<i>PME</i> 19:00 - 23:00 hours (Not being a general holidays) 09:00 - 19:00 hours (General holidays) <i>PCW</i> 00:00 - 07:00 hours, 19:00 - 24:00 hours (Not being a general holidays)	Ocean Park Shum Wan Road	CI-05	Valid
GW-RS0448-07	20-Jul-07	20-Jan-08	<i>PME</i> 19:00 - 23:00 hours (Not being a general holidays) 09:00 - 19:00 hours (General holidays)	Entry Plaza (Hong Kong School of Motoring)	CI-05	Valid
<b>CS-01 (KAJV)</b>						
GW-RS0286-07	26-May-07	25-Nov-07	19:00 - 23:00 (Not being a general holidays). 07:00 - 19:00 (General holidays). One group of equipment shall be allowed in above time.	Summit (At top of Nam Long Shan Road)	CS-01	Valid
GW-RS0321-07	1-Jun-07	30-Nov-07	<i>PME</i> 19:00-23:00 (Not being a general holiday) 07:00-23:00 (general holiday)	Summit (At top of Nam Long Shan Road)	CS-01	Valid

### 4.3. Other Permits & Licenses

Tables below show lists of other permits & license for individual contracts.

#### CI – 05

Permit /Ref/ No	Valid Period		Section	Status
<b>Notification of Construction Work under APCO</b>				
001017998	-	-	Waterfront	Notified
001018054	-	-	Summit	Notified
<b>Effluent Discharge License</b>				
EP820/W9/XW232	20 Jun 07	30 Jun 12	Summit	Valid
EP820/W9/XW234	13 Jul 07	31 Jul 12	Waterfront	Valid
<b>Specific Process License</b>				
Application sent on 3-Apr-07 and the supplementary information was provided on 20 & 25 July 2007 for EPD consideration.				
<b>Registration as Chemical Waste Producer</b>				
WPN5213-199-D2373-01	7-May-07	-	For disposal of chemical wastes, mainly spent lubricants	Registered
<b>Construction Waste Disposal Charging Scheme</b>				
7004888	-	-	Waterfront + Summit	Issued

#### CS-01

Permit/Ref/No	Valid Period		Section	Status
<b>Notification of Construction Work under APCO</b>				
001018953	-	-	Vet Hospital	Notified
<b>Effluent Discharge License</b>				
EP820/W2/XC041	31 May 07	30 Jun 12	Vet Hospital	Valid
<b>Registration as Chemical Waste Producer</b>				
WPN5213-199-K2880-01	19 Mar 07	-	Used battery, used lubricating oil and lubricating oil / gasoline / diesel contaminated soil.	Registered
<b>Construction Waste Disposal Charging Scheme</b>				
7005185	-	-	Vet Hospital	Issued

**5. EP Submissions Status**

Environmental submissions to EPD since the commencement of construction works at Ocean Park, i.e. from 12 March 2007 to 25 July 2007 are as below,

<b>Contract</b>	<b>Submissions</b>
CI-05	<ul style="list-style-type: none"> <li>• Notification of Commencement Date</li> <li>• Management Organisation Chart</li> <li>• Construction Programme</li> <li>• Drainage Proposal</li> <li>• Silt Curtain Proposal</li> <li>• Waste Management Plan</li> <li>• Baseline Air Quality and Noise Monitoring Report</li> <li>• Transplantation Proposal for Uncommon Species</li> <li>• Baseline Coral Survey Report</li> <li>• As-built Drawings of Pond 35</li> </ul>
CI-05 & CS-01	<ul style="list-style-type: none"> <li>• Combined Monthly EM&amp;A Report (June 2007)</li> </ul>
City Bus Limited	<ul style="list-style-type: none"> <li>• Written Notice on Completion of TPH Contaminated Soil Disposal</li> <li>• Written Notice on Completion of Solidification Treatment of Heavy Metals Contaminated</li> <li>• As-built Remediation Plan</li> </ul>
Hong Kong School of Motoring Ltd.	<ul style="list-style-type: none"> <li>• Confirmation Letter to confirm that Land Contamination remediation Works within HKSM has been completed</li> </ul>

## 6. Waste Management

The estimated amounts of different types of waste generated by the activities of the Project in the month are shown in following table. Mitigation measures under the Waste Management Plan (WMP) have been implemented during the reporting period.

Waste Type	Disposal Locations	CI-05	CS-01	Total
C& D Waste	SENT	53.00 tonnes	1.64 tonnes	54.64 tonnes
	NENT	2.17 tonnes	--	2.17 tonnes
	WENT	--	2.69 tonnes	2.69 tonnes
	TKOSF	89.70 tonnes	--	89.70 tonnes
	TMSF	17.84 tonnes	--	17.84 tonnes
Excavated Material	QBBP	2,134.33 tonnes	3,027.17 tonnes	5,161.50 tonnes
	TKOFB	10.72 tonnes	--	10.72 tonnes
	Alternative site (Green Valley)	5,121.00 tonnes	--	5,121.00 tonnes
	Alternative site (Swire Sita)	10,881.00 tonnes	--	10,881.00 tonnes
	Internal Transfer	6,525.00 tonnes	--	6,525.00 tonnes
Chemical Waste	Collected by licensed collector	--	--	--
General Waste	Collected by licensed collector	40.0m <sup>3</sup>	--	40.0m <sup>3</sup>

## 7. Environmental Monitoring and Results

### 7.1. Requirements

Under EP-249/2006/A condition 3.2, impact environmental monitoring including sampling, measurements and necessary remedial action should be conducted in accordance with the requirements of the EM&A Manual. The environmental monitoring including air quality, noise and coral were conducted by the Contract of CI-05 within the reporting period. Since the transplantation proposal is still waiting for approval, no monitoring of terrestrial ecology has been undertaken.

The items below would not be described in Part 1 report and would be described in CI-05 monthly EM&A report (i.e. Part 2 of the report).

- Methodology and Criteria
- Action and Limit Levels
- Event and Action Plan

## 7.2. Monitoring Locations

### Air Quality (TSP)

The locations of the air monitoring stations are presented in the table below. The figure was shown in the CI-05 Monthly EM&A Report.

Air Quality Monitoring Stations	Identify/Description
AM1	Whisker's Theatre, Ocean Park
AM2	San Wai Village, Wong Chuk Hang
AM3	Ocean Park Road, 50m adjacent to Police Training School

### Construction Noise

The locations of the noise monitoring stations are presented in the table below. The figure was shown in the CI-05 Monthly EM&A Report.

Noise Monitoring Stations	Identify/Description
CN1	Open Area adjacent to Police Training School
CN2	Project Development Office, Ocean Park
CN3	Rinniped House, Ocean Park
CN4	Manly Villa

### Terrestrial Ecology

Monitoring of the health and condition of the transplanted plant species of conservation interest should be monitored at least once a month during the first 12 month after transplantation. Proposed monitoring location would be next to the Contract CI-05 site office shown in figure 1.3 of Part 2 of the report.

### Coral

The locations of the coral monitoring stations are presented in the table below. The figure was shown in the CI-05 Monthly EM&A Report.

Coral Impact Monitoring Stations	Identify/Description
Site 1	Seaside near the Lowland
Site2 to Site 5	Around Headland
Control Station	Between Near Round Island and Chung Hom Kok

### 7.3. Monitoring Results

#### Air Quality (TSP)

The monitoring data reported below was provided by the CI-05 Contractor's Environmental Team Leader.

Monitoring Period	1-hr TSP ( $\mu\text{g}/\text{m}^3$ )		
	AM1	AM2	AM3
26 June 07 to 25 July 07	72-129	83-179	86-174

Note: Please note that no measurement on 1-hr TSP was taken on 07 & 09 July 2007 at AM3 due to power failure.

Monitoring Period	24-hr TSP ( $\mu\text{g}/\text{m}^3$ )		
	AM1	AM2	AM3
26 June 07 to 25 July 07	26-44	28-56	34-56

Note: Please note that no measurement on 24-hr TSP was taken on 11 July 2007 at AM3 due to power failure.

#### Construction Noise

The monitoring data reported below was provided by the CI-05 Contractor's Environmental Team Leader.

Monitoring Period	Daytime Noise Level, Leq (30min), dB(A)			
	CN1	CN2	CN3	CN4
26 June 07 to 25 July 07	61.8-68.8	63.7-67.0	58.0-67.8	57.5-61.2

Note: No evening time noise monitoring was scheduled on 18 & 25 July 2007 due to no scheduled construction activities on these two weeks.

#### Terrestrial Ecology

Since the transplantation proposal is still waiting for approval, no monitoring has been undertaken.

#### Coral

The monitoring data summarized below was provided by the CI-05 Contractor's Environmental Team Leader. Detailed results would be described in CI-05 monthly EM&A report (i.e. in Appendix F of Part 2 of the report).

## Site 1

Code	Coral Species	Area (cm <sup>2</sup> )	Sedimentation (% , mm)			Bleaching (%)			Mortality (%)		
			Apr 07	16 Jun 07	21 Jul 07	Apr 07	16 Jun 07	21 Jul 07	Apr 07	16 Jun 07	21 Jul 07
			A01	<i>Platygyra carnosus</i>	1000	0, 0	0, 0	0, 0	0	0	0
A02	<i>Platygyra carnosus</i>	2000	0, 0	0, 0	0, 0	0	0	0	0	0	0
A03	<i>Favites pentagona</i>	200	0, 0	0, 0	2, 1▲	0	0	0	0	0	0
A04	<i>Leptastrea pruinosa</i>	400	5, 1	4, 1▼	4, 1▼	0	0	0	0	0	0
A05	<i>Platygyra carnosus</i>	1200	0, 0	0, 0	0, 0	0	0	0	5	5	5
A06	<i>Platygyra carnosus</i>	1600	0, 0	3, 1▲	0, 0	0	0	1▲	0	0	0
A07	<i>Favia rotumana</i>	800	5, 1	8, 1▲	5, 1	0	0	0	0	0	0
A08	<i>Platygyra carnosus</i>	1000	0, 0	0, 0	0, 0	0	0	0	0	0	0
A09	<i>Platygyra carnosus</i>	350	0, 0	0, 0	0, 0	0	0	1▲	0	0	0
A10	<i>Platygyra carnosus</i>	700	0, 0	0, 0	2, 1▲	0	0	0	0	0	0

## Site 2

Code	Coral Species	Area (cm <sup>2</sup> )	Sedimentation (% , mm)			Bleaching (%)			Mortality (%)		
			Apr 07	16 Jun 07	21 Jul 07	Apr 07	16 Jun 07	21 Jul 07	Apr 07	16 Jun 07	21 Jul 07
			B01	<i>Platygyra carnosus</i>	450	0, 0	0, 0	0, 0	0	0	0
B02	<i>Plesiastrea versipora</i>	300	0, 0	0, 0	0, 0	0	0	0	0	0	0
B03	<i>Psammocora superficialis</i>	1000	5, 1	5, 1	3, 1▼	0	0	0	0	0	0
B04	<i>Favia speciosa</i>	300	4, 1	7, 1▲	2, 1▼	0	0	0	0	0	0
B05	<i>Plesiastrea versipora</i>	900	3, 1	5, 1▲	3, 1	0	0	0	0	0	0
B06	<i>Platygyra carnosus</i>	600	0, 0	0, 0	1, 1▲	0	0	0	0	0	0
B07	<i>Cyphastrea serailia</i>	700	0, 0	1, 1▲	0, 0	0	0	0	0	0	0
B08	<i>Plesiastrea versipora</i>	1200	0, 0	0, 0	1, 1▲	0	0	0	0	0	0
B09	<i>Favites pentagona</i>	600	0, 0	0, 0	1, 1▲	0	0	0	0	0	0
B10	<i>Favites pentagona</i>	400	0, 0	30, 2▲	3, 1▲	0	0	2▲	0	0	0

## Site 3

Code	Coral Species	Area (cm <sup>2</sup> )	Sedimentation (% , mm)			Bleaching (%)			Mortality (%)		
			Apr 07	16 Jun 07	21 Jul 07	Apr 07	16 Jun 07	21 Jul 07	Apr 07	16 Jun 07	21 Jul 07
			C01	<i>Platygyra acuta</i>	2000	0, 0	0, 0	0, 0	0	0	0
C02	<i>Platygyra carnosus</i>	1000	0, 0	0, 0	0, 0	0	0	0	0	0	0
C03	<i>Porites sp.</i>	400	5, 1	6, 1▲	10, 1▲	0	0	0	1	1	1
C04	<i>Cyphastrea serailia</i>	600	4, 1	5, 1▲	5, 1▲	0	0	0	0	0	0
C05	<i>Pavona decussata</i>	600	0, 0	0, 0	0, 0	0	0	0	0	0	0
C06	<i>Pavona decussata</i>	1200	0, 0	0, 0	0, 0	0	0	0	0	0	0
C07	<i>Montipora cf. turgescens</i>	200	2, 1	6, 1▲	1, 1▼	0	3▲	0	0	0	0
C08	<i>Favia fava</i>	600	4, 1	2, 1▼	5, 1▲	0	0	0	4	4	4
C09	<i>Favites pentagona</i>	150	1, 1	1, 1	1, 1	0	0	0	0	0	0
C10	<i>Montipora peltiformis</i>	300	0, 0	0, 0	0, 0	0	5▲	5▲	0	0	0

## Site 4

Code	Coral Species	Area (cm <sup>2</sup> )	Sedimentation (% , mm)			Bleaching (%)			Mortality (%)		
			Apr 07	16 Jun 07	21 Jul 07	Apr 07	16 Jun 07	21 Jul 07	Apr 07	16 Jun 07	21 Jul 07
E01	<i>Goniopora stutchburyi</i>	300	0, 0	4, 1 ▲	5, 1 ▲	0	0	0	0	0	0
E02	<i>Goniopora stutchburyi</i>	200	0, 0	2, 1 ▲	2, 1 ▲	0	0	0	0	0	0
E03	<i>Goniopora stutchburyi</i>	150	0, 0	2, 1 ▲	2, 1 ▲	0	0	0	0	0	0
E04	<i>Porites sp.</i>	400	5, 1	5, 1	2, 1 ▼	0	0	0	0	0	0
E05	<i>Goniopora stutchburyi</i>	300	0, 0	3, 1 ▲	3, 1 ▲	0	0	0	0	0	0
E06	<i>Goniopora stutchburyi</i>	450	0, 0	0, 0	0, 0	0	0	0	0	0	0
E07	<i>Favia speciosa</i>	600	10, 1	3, 1 ▼	2, 1 ▼	0	0	0	0	0	0
E08	<i>Porites sp.</i>	150	0, 0	0, 0	0, 0	0	0	0	4	4	4
E09	<i>Porites sp.</i>	200	8, 1	6, 1 ▼	4, 1 ▼	0	0	2 ▲	4	4	4
E10	<i>Porites sp.</i>	500	0, 0	0, 0	2, 1 ▲	3	3	3	0	0	0

## Site 5

Code	Coral Species	Area (cm <sup>2</sup> )	Sedimentation (% , mm)				Bleaching (%)				Mortality (%)			
			Apr 07	16 Jun 07	08 Jul 07	21 Jul 07	Apr 07	16 Jun 07	08 Jul 07	21 Jul 07	Apr 07	16 Jun 07	08 Jul 07	21 Jul 07
D01	<i>Psammocora sp.</i>	600	10, 1	8, 1 ▼	2, 1 ▼	5, 1 ▼	0	0	0	0	0	0	0	0
D02	<i>Montipora cf. turgescens</i>	100	6, 1	4, 1 ▼	0, 0 ▼	1, 1 ▼	0	0	0	0	0	0	0	0
D03	<i>Goniopora stutchburyi</i>	400	0, 0	0, 0	1, 1 ▲	2, 1 ▲	0	0	0	0	0	0	0	0
D04	<i>Leptastrea pruinosa</i>	500	4, 1	8, 1 ▲	10, 1 ▲	13, 1 ▲	0	0	0	0	0	0	5 ▲	5 ▲
D05	<i>Porites sp.</i>	400	5, 1	5, 1	5, 1	5, 1	1	3 ▲	5 ▲	5 ▲	4	4	4	4
D06	<i>Plesiastrea versipora</i>	1000	0, 0	0, 0	2, 1 ▲	2, 1 ▲	0	1 ▲	2 ▲	2 ▲	5	5	5	5
D07	<i>Leptastrea pruinosa</i>	800	0, 0	3, 1 ▲	1, 1 ▲	3, 1 ▲	0	0	0	0	0	0	0	0
D08	<i>Plesiastrea versipora</i>	100	0, 0	0, 0	3, 1 ▲	3, 1 ▲	0	0	0	0	0	0	0	0
D09	<i>Leptastrea pruinosa*</i>	150	5, 1	5, 1	5, 1	5, 1	0	0	0	0	0	0	0	0
D10	<i>Montipora cf. turgescens</i>	200	0, 0	0, 0	0, 0	0, 0	0	0	0	0	0	0	0	0

\*D09 was mistakenly identified as *Cyphastrea sp.*

## Control Site C

Code	Coral Species	Area (cm <sup>2</sup> )	Sedimentation (% , mm)				Bleaching (%)				Mortality (%)			
			Apr 07	16 Jun 07	08 Jul 07	21 Jul 07	Apr 07	16 Jun 07	08 Jul 07	21 Jul 07	Apr 07	16 Jun 07	08 Jul 07	21 Jul 07
F01	<i>Favia speciosa</i>	900	0, 0	1, 1 ▲	3, 1 ▲	3, 1 ▲	0	0	0	0	0	0	0	0
F02	<i>Favites pentagona</i>	1000	4, 1	6, 1 ▲	10, 2 ▲	10, 2 ▲	0	0	2 ▲	2 ▲	0	0	1 ▲	1 ▲
F03	<i>Favites pentagona</i>	800	0, 0	0, 0	2, 1 ▲	2, 1 ▲	0	0	0	0	0	0	0	0
F04	<i>Porites sp.</i>	800	5, 1	7, 1 ▲	5, 1	8, 2 ▲	4	4	2 ▼	2 ▼	4	4	4	4
F05	<i>Cyphastrea serailia</i>	800	4, 1	3, 1 ▼	3, 1 ▼	5, 1 ▲	0	0	0	0	1	1	1	1
F06	<i>Psammocora sp.</i>	1800	0, 0	3, 1 ▲	3, 1 ▲	0, 0	0	0	1 ▲	1 ▲	0	0	0	0
F07	<i>Plesiastrea versipora</i>	3000	0, 0	0, 0	0, 0	0, 0	0	0	0	0	0	0	0	0
F08	<i>Favia speciosa &amp; Goniastrea favulus</i>	150	0, 0	3, 1 ▲	3, 1 ▲	3, 1 ▲	0	0	0	0	0	0	0	0
F09	<i>Favites pentagona</i>	300	0, 0	0, 0	1, 1 ▲	1, 1 ▲	0	0	0	0	0	0	0	0
F09	<i>Favites pentagona</i>	1800	10, 1	6, 1 ▼	6, 1 ▼	6, 1 ▼	0	0	1 ▲	1 ▲	0	0	1 ▲	1 ▲
F10	<i>Platygyra carnosus</i>	2800	0, 0	0, 0	0, 0	0, 0	0	0	0	0	0	0	0	0

The results of monitoring show that sediment cover on some of the tagged colonies from all monitoring stations and the control station slightly increased by 1 to 9% when compared with the Baseline Survey results on 7 to 12 April 2007. The enhanced sedimentation was believed to be contributed by multiple environmental factors, such as the lasting hot weather and the southwest wind in July 2007.

The health status of the tagged coral colonies was normal, with low to medium levels of sedimentation. Low levels of bleaching and mortality were observed in both monitoring and control sites. Neither action nor limit level of sedimentation, bleaching or mortality was recorded; hence no adverse impact by the construction activity on the coral community was evidenced.

#### 7.4. Exceedances

No exceedance was recorded on the 1-hour TSP monitoring, 24-hour TSP monitoring, daytime noise monitoring and coral monitoring for the reporting period.

#### 8. Site Audit

##### 8.1. IEC Site Audit

IEC conducted monthly site audit on CI-05 and CS-01 on 24 July 2007.

##### CI-05 Observations

Following up the previous audit, all the items were closed except the following:

##### Hong Kong School of Motoring

- The stockpile opposite to Citybus Depot was uncovered. Tarpaulin sheets shall be provided to cover the idle stockpile entirely.

Observations for the reporting period include the following:

##### Waterfront next to Giant Panda Habitat

- C & D materials and waste were banked around a few trees. The contractor shall remove and dispose the C&D materials and waste as soon as possible.

##### Top of Summit

- Haul road and access road were dry and dusty. Haul road and access road shall be provided with water spraying more frequently.
- Rock breaking activity was not provided with water spray. Water spray shall be provided during rock breaking activity to suppress dust.

##### CS-01 Observations

Observations for last month:

- Item 3 from the previous month (i.e. Exposed slope) was closed.
- Item 1 from the previous month was outstanding. Sedimentation tanks at the site entrance and discharge point shall be maintained more frequently.
- Item 2 from the previous month was outstanding. Haul roads were dry and dusty. Water spray shall be provided more frequently.

Observations for the month:

- Drainage channel was blocked by debris and rocks. Any blockage shall be cleared as soon as possible.

Audit checklists are attached in Appendix A of Part I.

##### 8.2. Non-Compliance

No non-compliances were recorded in July 2007.

## 9. Implementation status of Environmental Mitigation Measures

Please see Part 2 and Part 3 of the individual contractual reports for the details of the implementation of environmental mitigation measures.

## 10. Summary of Complaint, Summon or Prosecution

No complaint, summons or prosecution related to environmental issues was received or made against the Project in July 2007.

## 11. Future Issues

Key Issues to be considered in the coming month include:

### CI-05

- Noise from operating equipment and machinery on-site
- Maintenance of the silt curtain at Tai Shue Wan
- Construction waste management at the demolition work area
- Avoid accumulation of stagnant/muddy water on-site in order to prevent mosquito breeding.
- To implement dust suppression measures on dry surfaces
- Provision of temporary drainage system, treatment to turbid water from activities, run-off before discharge.

### CS-01

- Noise from operating equipment and machinery on-site
- On-site waste management
- Avoid accumulation of stagnant/muddy water on-site in order to prevent mosquito breeding.
- To implement dust suppression measures on dry surfaces
- Well maintenance to equipment to avoid black smoke from machinery

## 12. Conclusion and Recommendation

### 12.1. Conclusion

Environmental impact monitoring was performed in July 2007. All monitoring results in the reporting month were checked and reviewed.

No exceedance was recorded on the 1-hour TSP monitoring, 24-hour TSP monitoring, daytime noise monitoring and coral monitoring for the reporting period.

No non-compliance from IEC, complaint, summons or prosecution related to environmental issues was made against the Ocean Park Master Redevelopment Project in the reporting period of July 2007.

### 12.2. Recommendation

According to the environmental audit performed in the reporting month, the following recommendations are made:

#### Air Quality Impact

- To prohibit any open burning on site.
- To recommend that the Contractors should regularly maintain the machinery and vehicles on site.
- To follow up any exceedance caused by the construction works.
- To monitor the implementation dust suppression measures on dry surfaces by the Contractors.

#### Noise Impact

- To inspect the noise sources from inside and outside of the site.
- To follow up any exceedance caused by the construction works.
- To recommend that the Contractors should space out noisy equipment and position as far away as possible from sensitive receivers.
- To recommend the Contractors should have regular maintenance of vehicles and equipment used.

#### Water Quality Impact

- To recommend that the Contractor of CI-05 should regularly maintain the silt curtains and make sure they are in the right positions and maintain their functionalities.
- To monitor whether open stockpiles of construction materials are covered by Contractors with tarpaulin or similar fabric during rainstorm.
- To remind the Contractor to fully implementation of the temporary drainage system and all sedimentation tank and WetSep should be fully operated.

#### 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.
- To regularly and properly collect, store and dispose of all waste types, including floating refuses around the silt curtain.

## **Appendix A**

### **Independent Environmental Checker's Site Inspection Records**

**Ocean Park Master Redevelopment Project  
Contract P007  
Independent Environmental Checker**

**MONTHLY SITE INSPECTION CHECKLIST**

Inspection Date	24/7/2007	Time	9:00	Inspected By	EM: T. Kong IEC: F. Yuen Contractor: CI05; S. Tam CS01; F. Yeung
Site Location	CI05 CS01				

**Weather**

Condition	<input checked="" type="checkbox"/> Sunny	<input type="checkbox"/> Fine	<input type="checkbox"/> Overcast	<input type="checkbox"/> Drizzle	<input type="checkbox"/> Rain	<input type="checkbox"/> Storm	<input type="checkbox"/> Hazy
Temperature	33°C		Humidity	<input checked="" type="checkbox"/> High	<input type="checkbox"/> Moderate	<input type="checkbox"/> Low	
Wind	<input type="checkbox"/> Calm	<input checked="" type="checkbox"/> Light	<input type="checkbox"/> Breeze	<input type="checkbox"/> Strong	Direction <input type="text"/>		

		Close-out on last comments Y/N	N/A or not obs	Yes	No	Photo/Remarks
<b>Construction Noise</b>						
S2.18	Is a valid Construction Noise Permit (CNP) obtained for works during restricted hours?	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>	
S2.26	Good Site Practices:					
	• Are the operating plants well-maintained and serviced regularly?	<input checked="" type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	
	• Are silencers or mufflers utilized on construction equipment? Are they properly maintained?	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	• Is the mobile plant sited far enough from NSRs?	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	• Are intermittently used machines and plants shut down between work periods?	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	• Is the plant known to emit noise strongly in one direction, if any, oriented to direct noise away from the NSRs?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	• Is the stockpile or other structures utilized effectively, wherever practicable, in screening noise from the works?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
S2.27	Are suitable quiet plants adopted?	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>	
S2.28	Are movable barriers used for both movable PME and stationary PME?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
S2.29	Do the screening materials used achieve the predicted noise reduction?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
S2.30	Are the noisy works avoided during examination period of the nearby school?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Blasting Noise</b>						
S2.32	• Are the NSRs informed of the blasting work in advance?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

- Is sufficient time allowed for alerting all the potential NSRs prior to every blasting work? 

	✓		
--	---	--	--
- Are proper procedures put in place to alert and minimise any startling effect on the staff working in Ocean Park? 

	✓		
--	---	--	--
- Is the optimal amount of charge used evaluated for noise reduction? 

	✓		
--	---	--	--

**Landscape and Visual**

- S3.10 Consideration on existing surrounding vegetation:
- Are temporary tree nurseries set up? 

	✓		
--	---	--	--
  - Is "no-intrusion zones" implemented? 

	✓		
--	---	--	--
  - Is the existing vegetation protected from damage? 

			✓
--	--	--	---

CI05② P1030388
  - Are hill fire prevention measures taken? 

		✓	
--	--	---	--
  - Is dust and erosion controlled for exposed soil? 

		✓	
--	--	---	--
  - Are the irrigation networks set up throughout the Establishment Period? 

	✓		
--	---	--	--
  - Is Quarterly Report on existing trees to be retained or transplanted prepared by the Contractor? 

	✓		
--	---	--	--

- S3.11 Consideration on appearance and view:
- Is the appearance of hoardings suitable? 

		✓	
--	--	---	--
  - Is the appearance of construction workers, plants/machines suitable? 

		✓	
--	--	---	--
  - Are the screening and alignment of the temporary barging point and conveyor system suitable? 

	✓		
--	---	--	--
  - Are the selected security floodlights suitable? 

	✓		
--	---	--	--

**Ecology**

- S4.5 Transplantation:
- Is the transplantation work supervised by a qualified botanist/horticulturalist in the ET? 

	✓		
--	---	--	--
  - Are the transplanted plant species of conservation interest monitored during the first 12 months after transplantation? 

	✓		
--	---	--	--

- S4.7 Construction:
- Is the runoff entering watercourses avoided by control measure, especially during heavy rain? 

		✓	
--	--	---	--
  - Is the site runoff directed to regularly cleaned and maintained silt traps (or oil separators)? 

		✓	
--	--	---	--
  - Are sediment traps included in drainage to collect and control construction run-off? 

		✓	
--	--	---	--
  - Is suitable size silt traps or oil interceptor used? 

		✓	
--	--	---	--
  - Is vegetation survey carried out to determine the feasibility and suitability of individual plants for transplantation? 

		✓	
--	--	---	--
  - Are the trees located within the works area preserved suitably? 

		✓	
--	--	---	--
  - Are individual plants of conservation interest transplanted prior to the construction phase? 

	✓		
--	---	--	--

- Are the equipments and stockpiles placed in designated works areas and access routes selected on existing disturbed land to minimise disturbance to natural habitats? 

		✓	
--	--	---	--
- Are construction activities restricted to the work areas demarcated? 

		✓	
--	--	---	--
- Are waste skips provided to collect general refuse and construction wastes? 

		✓	
--	--	---	--
- Are the wastes disposed of timely and properly off-site? 

		✓	
--	--	---	--
- Is open burning on works sites prohibited? 

		✓	
--	--	---	--
- Are native plant species made use of as far as possible on newly formed land? 

	✓		
--	---	--	--

**Construction Waste**

S5.4

Good Site Practices

- Are arrangements made for collection and effective disposal of all wastes generated? 

		✓	
--	--	---	--
- Are the waste management and chemical handling procedures followed? 

		✓	
--	--	---	--
- Are sufficient waste disposal points provided? 

		✓	
--	--	---	--
- Are the wastes disposed of regularly? 

✓			
---	--	--	--
- Are appropriate measures taken to minimise windblown litter and dust during transportation of waste by either covering trucks or transporting wastes in enclosed containers? 

		✓	
--	--	---	--
- Are the drainage systems, sumps and oil interceptors regularly cleaned and maintained? 

			✓
--	--	--	---

CS01③ P1030419

S5.5

Waste Reduction Measures:

- Is the C&D waste from demolition and decommissioning of existing facilities sorted to recover recyclable materials? 

		✓	
--	--	---	--
- Are different types of wastes segregated and stored in different containers, skips or stockpiles to enhance reuse or recycling and the proper disposal? 

		✓	
--	--	---	--
- Are aluminium cans segregated in labelled bins and collected by individual collectors for recycling? 

		✓	
--	--	---	--
- Are proper storage and site practices maintained to minimise the potential for damage or contamination of construction material? 

		✓	
--	--	---	--
- Are the construction materials planned and stocked carefully to avoid unnecessary generation of waste? 

		✓	
--	--	---	--

S5.7

General Refuse

- Is the general refuse stored in enclosed bins or compaction units separate from C&D material? 

		✓	
--	--	---	--
- Is the general refuse removed regularly by a waste collector? 

		✓	
--	--	---	--

S5.8

C&D Material

- Are the excavated materials from site formation of the expansion areas and tunnel construction for the funicular system reused on-site as backfilling material and for landscape works? 

		✓	
--	--	---	--
- Are the surplus rock and other inert C&D material disposed of at the public fill sites? 

		✓	
--	--	---	--
- Is a waste management plan prepared? 

		✓	
--	--	---	--

	• Is a recording system present for the record of amount of wastes generated, recycled and disposed?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	• Is the trip-ticket system required in ETWB TCW No.31/2004 followed on site?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
S5.9	<b>Chemical Wastes</b> Is chemical wastes generated from the works? And if yes,	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	• Is the Contractor registered as a Chemical Waste Producer?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	• Are good quality containers used for separating and storing chemical wastes?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	• Are appropriate labels securely attached on each chemical waste container to indicate their corresponding chemical characteristics?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	• Is the Contractor licensed to transport and dispose of the chemical wastes?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	<b>Land Contamination</b>				
S6.11	• Is the contact of construction workers with contaminated materials minimised by using bulk earth-moving excavator equipment?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	• Are appropriate cloth, personal protective equipment, hygiene and washing facilities provided to minimise exposure to any contaminated material?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	• Is stockpiling of contaminated excavated materials avoided?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	• Is the use of contaminated soil for landscaping without proper treatment prohibited?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	• Are vehicles containing excavated materials covered properly to limit potential dust emissions or contaminated wastewater runoff?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	• Is the speed of the trucks carrying contaminated materials controlled?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	• Are the necessary waste disposal permits obtained from appropriate authorities in according with Waste Disposal (Chemical Waste) (General) Regulation?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	• Are silt removal facilities provided with retention time for silt/sand traps of 5 minutes under maximum flow conditions?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	• Are the records maintained for quantity of wastes generated and disposal of?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
S6.12	<b>Remediation Process</b> • Is biopile covered by tarpaulin or low permeable sheet to avoid dust emission?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	• Is vented air from biopile treated by blower and carbon adsorption system before released to the atmosphere?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	• Are the materials which may generate airborne dust emissions adequately wetted prior to and during the loading, unloading and handling operations?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	• Are silencers installed at biopile blower to minimise noise impact?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	• Are quiet plants such as generator and blower used for biopile?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- Are the mixing process and other associated material handling activities properly scheduled to minimise potential noise impact? 

	✓		
--	---	--	--
- Are impermeable liners placed at the bottom of biopile? 

	✓		
--	---	--	--
- Is leachate collection sump construction along the perimeter of biopile? 

	✓		
--	---	--	--
- Is the lachate recycled back to the biopile or truck away to Chemical Waste Treatment Centre for disposal? 

	✓		
--	---	--	--
- Is the mixing of contaminated soils and cement/water/other additive(s) undertaken at a solidification plant to minimise the potential for leaching? 

	✓		
--	---	--	--
- Is a concrete bund construction along the perimeter of the solidification/stabilisation area to prevent runoff? 

	✓		
--	---	--	--
- Are the loading, unloading, handling, transfer and storage of cement carried out in an enclose system? 

	✓		
--	---	--	--
- Are the contaminated soils transported by roll-off trucks (contrainersation)? 

	✓		
--	---	--	--
- Is temporary hoarding provided around the treatment area to minimise the visual impact? 

	✓		
--	---	--	--

**Air Quality**

S7.23

Good Site Practices

- Is watering carried out regularly with complete coverage to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather? 

			✓
--	--	--	---
- Is watering frequently carried out for particularly dusty construction areas, temporary stockpiles and areas close to ASRs? 

		✓	
--	--	---	--
- Are the aggregate or dusty material storage piles covered with their side enclosed to reduce emissions? Or if this is not practicable, is watering applied to aggregate fines? 

		✓	
--	--	---	--
- Is open stockpiles avoided or covered and placed far enough from the ASRs? 

			✓
--	--	--	---
- Is the dropping height of material restricted to minimise the fugitive dust from unloading/loading? 

	✓		
--	---	--	--
- Is tarpaulin used to cover all dusty vehicle loads transported to, from and within the site? 

		✓	
--	--	---	--
- Are vehicle wheel and body washing facilities available at the exit points of the site? 

		✓	
--	--	---	--
- Are wind shield and dust extraction units or similar dust mitigation measures provided at the loading points? If dust generation is likely during the process, particularly in dry seasons, is water sprinklers provided at the loading site? 

	✓		
--	---	--	--
- Do the vehicles comply with the recommended speed limit of 10 km/h on unpaved roads? 

		✓	
--	--	---	--
- Are dusty activities rescheduled during high-wind conditions? 

	✓		
--	---	--	--
- Are the routing of vehicles and positioning of construction plants at maximum possible distance from the ASRs? 

	✓		
--	---	--	--
- Is suitable buffer zone provided and work areas fenced off with hoarding (not less than 2.4m from ground level)? 

		✓	
--	--	---	--

CI05 ③ P1030392  
④ P1030391  
CS01 ② P1030416 & P1030418

CI05 ① P1030406 & P1030405

S7.24 Drilling & Blasting

- Is watering carried out on the exposed area after blasting? 

	✓		
--	---	--	--

 \_\_\_\_\_
- Is vacuum extraction drilling method used? 

	✓		
--	---	--	--

 \_\_\_\_\_
- Is the blasting process carefully sequenced? 

	✓		
--	---	--	--

 \_\_\_\_\_
  
- S7.25 Crushing Plant
  - Is water sprayed on the crusher? 

	✓		
--	---	--	--

 \_\_\_\_\_
  - Are fabric filters installed for the crushing plant? 

	✓		
--	---	--	--

 \_\_\_\_\_
  - Is chute or dust curtain used for controlling dust when transferring materials from crusher to the conveyors? 

	✓		
--	---	--	--

 \_\_\_\_\_
- S7.26 Barging Point & Conveyor Belt System
  - Are the conveyors placed within enclosed structures? 

	✓		
--	---	--	--

 \_\_\_\_\_
  - Is profiled steel cladding provided at two sides of loading point? 

	✓		
--	---	--	--

 \_\_\_\_\_
  - Are dust suppression sprays installed and operated at the feeding inlet and outlet? 

	✓		
--	---	--	--

 \_\_\_\_\_
  - Is the barging point placed within an enclosed structure incorporating an enclosed chute for material transfer to the barge? 

	✓		
--	---	--	--

 \_\_\_\_\_
  - Is a flexible curtain hanged on the enclosed chute to prevent dust emission when excavated materials/rocks transported into the barge? 

	✓		
--	---	--	--

 \_\_\_\_\_

**Water Quality**

- S8.3 Site Run-off and Drainage
  - Are all sewer and drainage connections sealed to prevent debris, soil, sand etc. from entering public sewer before commencing any site formation work? 

		✓	
--	--	---	--

 \_\_\_\_\_
  - Are temporary ditches provided to facilitate runoff discharge into appropriate watercourses, via appropriate sized silt retention pond? 

		✓	
--	--	---	--

 \_\_\_\_\_
  - Are cut-off ditches provided for all major site clearance/excavation works where soils would be exposed to control runoff from the areas? 

		✓	
--	--	---	--

 \_\_\_\_\_
  - Are channels, earth/concrete bunds and sand bags deployed to direct surface runoff? 

		✓	
--	--	---	--

 \_\_\_\_\_
  - Are catchpits and perimeter channels constructed in advance of relevant site formation works? 

		✓	
--	--	---	--

 \_\_\_\_\_
  - Are the boundaries of earthworks marked and surrounded by dykes or embankments for flood protection? 

		✓	
--	--	---	--

 \_\_\_\_\_
  - Are sand/silt traps and sediment basins provided to remove sand/silt particles from runoff? 

			✓
--	--	--	---

 \_\_\_\_\_
  - Are silt removal facilities, channels and manholes maintained and deposited silt/grit removed regularly to ensure that these facilities are functioning properly at all times? \_\_\_\_\_
  - Are exposed soil surfaces covered? 

		✓	
--	--	---	--

 \_\_\_\_\_
  - Is the water pumped out from foundation excavations discharged into silt removal facilities? 

		✓	
--	--	---	--

 \_\_\_\_\_
  - Are exposed soil areas minimised to reduce potential for increased siltation and contamination of runoff? 

		✓	
--	--	---	--

 \_\_\_\_\_

P1030417 &  
CS010 P1030421

• Are earthwork final surfaces well compacted and is subsequent permanent work or surface protection performed immediately?

		✓	
--	--	---	--

• Is the rainwater pumped out from trenches or excavation directed to silt removal facilities before discharge?

	✓		
--	---	--	--

• Are open stockpiles of construction materials or construction wastes of more than 50m<sup>3</sup> covered with tarpaulin during rainstorm?

	✓		
--	---	--	--

In case of an excavation in rainy seasons:

• Is temporary exposed slope/soil surfaces covered by tarpaulin as far as practicable?

			✓
--	--	--	---

See S7.23 &  
S8.3

• Are intercepting channels provided to prevent storm runoff from washing across exposed soil surfaces?

		✓	
--	--	---	--

• Are surface protection measures and arrangements implemented to prepare for arrival of a rainstorm?

		✓	
--	--	---	--

S8.4 Coral Sites

• Are enhanced (with the use of flocculants added) sand/silt removal facilities employed for treatment of runoff from the major excavation at the Summit?

		✓	
--	--	---	--

• Is a silt curtain system used to enclose the construction phase discharge point at Tai Shue Wan?

		✓	
--	--	---	--

• Are debris and refuse collected, handled and disposed of properly to avoid entering any nearby water bodies and public drainage system?

		✓	
--	--	---	--

• Are stockpiles of cement and other construction materials kept covered when not being used?

		✓	
--	--	---	--

• Are oils and fuels used and stored in designated areas which have pollution prevention facilities (Fuel tanks and storage areas provided with locks and sited on sealed areas, within bunds of a capacity equality to 110% of the storage capacity of the largest tank)?

✓			
---	--	--	--

• Are temporary sanitary facilities, such as portable chemical toilets, employed on-site where necessary to hand sewage from the workforce? Is a licensed contractor employed for disposal of waste matter and maintenance of these facilities?

		✓	
--	--	---	--

• Is a reputable waste collector should be employed by the Contractor to remove general refuse from the site, separately from construction and chemical wastes, on a daily basis to minimize odour, pest and litter impacts. Burning of refuse on construction sites is prohibited by law?

		✓	
--	--	---	--

• Are aluminium cans recovered from the waste stream and collected separate labelled bins?

		✓	
--	--	---	--

• Are office wastes reduced through the recycling of paper?

		✓	
--	--	---	--

• Are training provided to workers on site cleanliness & waste management procedure?

		✓	
--	--	---	--

**Cultural Heritage**

S10.6 If there is any work planned within one metre of the grave, is a one metre buffer zone provided around the grave and is the grave demarcated by temporary fence?

		✓	
--	--	---	--

**Hazard to Life**

S11.3 Good Site Practices:

• Is the area around the magazine free of vegetation?

		✓	
--	--	---	--

• Is the control of (small) fires planned and provided through the following?

- Weekly checking of fire fighting equipment and the on-site fire water tank level. 

	✓		
--	---	--	--
- Daily checking of all critical safety equipment on vehicle, including the fire extinguishers. 

	✓		
--	---	--	--
- Maintaining back-up means of fighting fire on the explosive vehicles. 

	✓		
--	---	--	--
- Providing safety training for drivers and other personnel present during explosive delivery with regard to operating fire hydrants and fighting of explosive fires. 

	✓		
--	---	--	--

• Is the magazine secured against unauthorised entry and theft of explosive through the following?

- Maintaining a list of persons authorised to enter the magazine and ensuring the list is available to the magazine security guard. 

	✓		
--	---	--	--
- Activating an alarm system that limits times at which explosive can be removed from the magazine and connecting the system to central security station. 

	✓		
--	---	--	--
- Incorporating "Duress code" function in the alarm system. 

	✓		
--	---	--	--
- Maintaining alarm system in good condition. 

	✓		
--	---	--	--

• Is the magazine security guard located separately from the magazine complex?

	✓		
--	---	--	--

• Is the communication maintained in emergency with the following measures?

- Providing non-hazardous electronic equipment for persons working within 60 m of detonators. 

	✓		
--	---	--	--
- Ensuring availability of phone numbers for all key personnel. 

	✓		
--	---	--	--

• If there is a typhoon signal no. 3 or above, or black rainstorm signal, are all operations at magazine and transport ceased?

	✓		
--	---	--	--

• Is the risk of detonators explosion on vehicle reduced during transit through the following?

- Ensuring that magazine within vehicle is lined. 

	✓		
--	---	--	--
- Limiting off-site transport to 5 to 6 a.m. each day. 

	✓		
--	---	--	--
- Escorting vehicles with separate security vehicle when using the public road. 

	✓		
--	---	--	--
- Ensuring that UN 1.4B packaging of detonators remains intact until handed over at blasting site. 

	✓		
--	---	--	--

• Is the fuel isolation switch available on vehicle to prevent fire spreading in case a fire breaks out?

	✓		
--	---	--	--

• Is an experienced driver with accident-free record employed for explosive vehicle and security escort?

	✓		
--	---	--	--

• Are the drivers checked for health before employing?

	✓		
--	---	--	--

• Are the vehicles regularly checked to maintain in good condition to reduce chance of accident due to breaking down?

	✓		
--	---	--	--

• Is the truck fuel fire escalating to cause explosion avoided through the following means?

- Ensuring that the Contractor is aware of the potential hazards to site. 

	✓		
--	---	--	--

- Maintaining appropriate fire fighting equipment.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Requiring the Contractor to plan and make emergency arrangements.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Is spare/redundant fire fighting equipment provided?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Can communications be maintained between two vehicles (drivers and security) during the trip to prevent collision of two explosive vehicles in case of an accident?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Are the processes of checking of condition of drivers to suspend any driver of concern carried out?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Project specific measures:				
• Is the speed of vehicle limited along the Ocean Park portion of Nam Long Shan Road within 100 m of the explosives magazine to 25 km/hr?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Is other contractors' use of the Ocean Park Internal service road restricted during delivery of explosives, i.e. 6 to 7 a.m?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Is the Ocean Park guard required to call to the magazine guard on an hourly basis when explosives are stored in magazines?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Is the evacuation of part or all of Ocean Park Headland Area arranged in case of the explosive magazine being engulfed in fire?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Is the risk to the public from accidental initiation during charging and blasting limited by the following means?				
- Closing the Ocean Park from commencement of charging holes until completion of blasting each day.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Arranging for relevant authorities to post notices to mariners – warning them of blasting operations and advising them to stay away from a strip 100m wide immediately to the east of Headland from commencement of charge holes until completion of blasting each day (i.e. 9 a.m).	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Not operating amusement rides in the event of accidental explosion until confirmed free of critical damage.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• If unexploded explosives are found in blasthole(s), is the opening of Ocean Park delayed or is part of the Ocean Park delayed when there are unspent explosives?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Is the opportunity for arson/deliberate initiation of explosive reduced with the following means?				
- Paying attention to the security alert status from the Government.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Developing a security plan to address high alert level.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Is an emergency plan developed to address uncontrolled fire in magazine area?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Is the transfer of explosives between 5 to 6 a.m agreed by Mines Division?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Is the road surface along the explosive transportation route maintained?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Are the contractor's driver and security escort tested in respect of safety plan? Is the route driven before the driver undertakes the first delivery of explosives?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Is adequate space provided for the explosive vehicle to manoeuvre without reversing close to the magazine to limit	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

the likelihood of vehicle accident?

	✓		
--	---	--	--

• Is lighting for explosive vehicles provided on temporary road(s)?

	✓		
--	---	--	--

S11.4 • Is ammonium nitrate emulsion (ANE) delivered outside of Park opening times?

	✓		
--	---	--	--

Contract CS01

Observations for last month

- Item No. 3 from last month was closed.
- ① Item No. ~~2~~ 1 from last month was outstanding. Sedimentation tank at site entrance shall be maintained more frequently.
- ② Item No. 2 from last month was outstanding. Haul roads were dry and dusty. Water spray shall be provided more frequently.

Observations for the month

- ③ Drainage channel was blocked by debris and rocks. Any blockage shall be cleared as soon as possible

IEC Representative

Environmental Manager

Contractor's Representative  
CS01

*Florence Yuen*

( Florence Yuen )

*Terence Kong*

( Terence Kong )

*Frankie Yeung*

( FRANKIE YEUNG )

Contract CI05

Observations for last month

Item No. 1 to 4 were closed from last month.

Hong Kong School of Motoring

- Item No. 5 from last month was outstanding.
- ① The stockpile opposite to Citybus Depot was uncovered. Tarpaulin sheets shall be provided to cover the idle stockpile.

Observations for the month

Next to Panda House

- ② C&D materials and waste were banked around a few trees. The Contractor shall remove and dispose the C&D materials and waste as soon as possible.

Top of Summit

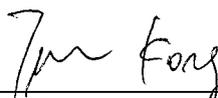
- ③ Rock breaking activity was not provided with water spray. Water spray shall be provided during rock breaking activity to suppress dust.
- ④ Haul roads were dry. Water spray shall be provided.

IEC Representative



( Florence Yuen )

Environmental Manager



( Terence King )

Contractor's  
Representative  
CI05



( SCHAROEDDE TAM )

**Ocean Park Master Redevelopment Project  
Contract P007  
Independent Environmental Checker  
MONTHLY SITE INSPECTION PHOTOS**

<b>Contract CI05 Site formation, Funicular Tunnel and Miscellaneous Works</b>	
<b>Follow up observations in June 2007</b>	
<b>Observation in last site inspection</b>	<b>Observation in this site inspection</b>
<b>Adit Portal</b>	
	
<p><b>P1030112: Waste skip was full and construction waste was accumulated around the skip. Waste shall be removed from the site more frequently.</b></p>	<p><b>Closed – P1030398: Construction waste accumulating around the waste skip was no longer observed.</b></p>
	
<p><b>P1030111 &amp; P1030114: Noise emission labels were not attached to two air compressors which were in operation.</b></p>	<p><b>Closed – P1030396: The two air compressors were not observed in operation during the site inspection.</b></p>
	
<p><b>P1030110: An oil drum was placed on bare ground. A drip tray shall be provided to the oil</b></p>	<p><b>Closed – P1030395: Drip tray was provided to oil drums to avoid oil spillage.</b></p>

**Ocean Park Master Redevelopment Project  
Contract P007  
Independent Environmental Checker  
MONTHLY SITE INSPECTION PHOTOS**

<p>drum to avoid oil spillage.</p>	
<p><b>Southern Access Road</b></p>	
	
<p>P1030104: Access road was dry and dusty. Access road shall be provided with water spray more frequently.</p>	<p>Closed – P1030394: Access road was provided with water sprinkler to suppress dust.</p>
<p><b>Hong Kong School of Motoring</b></p>	
	
<p>P1030120: Haul road was dry and dusty. Haul road shall be provided with water spray more frequently.</p>	<p>Closed – P1030407: Water spray was provided to haul roads to suppress dust.</p>
	
	
<p>P1030115 &amp; P1030122: Two idle stockpiles opposite to the Citybus Depot were either partly covered or uncovered. Tarpaulin sheets shall be</p>	<p>P1030406 &amp; P1030405: A stockpile was being operated by an excavator while another stockpile was idled and uncovered. Tarpaulin</p>

**Ocean Park Master Redevelopment Project  
Contract P007  
Independent Environmental Checker**

**MONTHLY SITE INSPECTION PHOTOS**

provided to cover the idle stockpiles entirely.	sheets shall be provided to cover the idle stockpile entirely.
<b>Observations in July 2007</b>	
<b>Next to Panda House/Near Wing Hing Road</b>	
	
<p style="color: red;">P1030388: Debris was banked around a couple of trees. The Contractor shall move the debris away from the trees and remove and dispose the debris as soon as possible.</p>	
<b>Top of Summit</b>	
	
<p style="color: red;">P1030392: Dust was observed generated from rock breaking activity. Water spray shall be provided during rock breaking activities to suppress dust.</p>	<p style="color: red;">P1030391: Haul roads were dry and dusty. Water spray shall be provided to suppress dust.</p>

**Ocean Park Master Redevelopment Project  
Contract P007  
Independent Environmental Checker  
MONTHLY SITE INSPECTION PHOTOS**

<b>Contract CS01 Back of House for Marine Mammal Veterinary Hospital</b>	
<b>Follow up observations in June 2007</b>	
<b>Observation in last site inspection</b>	<b>Observation in this site inspection</b>
	
	
<p>P1030087 &amp; P1030095: Sedimentation tanks at the discharge point as well as the site entrance shall be maintained more frequently.</p>	<p>P1030417 &amp; P1030421: Sedimentation tank at the discharge point was dry while sedimentation tank at the site entrance was still accumulated with stagnant water. Stagnant water in the sedimentation tank at site entrance shall be removed as soon as possible.</p>
	
	
<p>P1030082 &amp; P1030083: Haul roads were dry and dusty. Water Spray shall be provided more</p>	<p>P1030416 &amp; P1030418: Haul roads were dry and dusty. Water spray shall be provided more</p>

**Ocean Park Master Redevelopment Project  
Contract P007  
Independent Environmental Checker  
MONTHLY SITE INSPECTION PHOTOS**

frequently.	frequently.
	
<p>P1030088: Exposed slopes shall be covered entirely with tarpaulin sheets.</p>	<p>Closed - P1030426: Exposed slope was covered with tarpaulin sheets.</p>
<b>Observations in July 2007</b>	
	
<p>P1030419: Debris and rocks were accumulated along the temporary drainage channel. Any blockage of the drainage channel shall be cleared as soon as possible.</p>	

**Part 2      CI-05 EM&A REPORTS (July 2007)**

**OCEAN PARK MASTER  
REDEVELOPMENT PROJECT**

**CONTRACT NO. CI05**

**SITE FORMATION, FUNICULAR TUNNEL  
AND MISCELLANEOUS WORKS**

**Monthly EM&A Report - July 2007**

**CLIENT:**

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02 August 2007

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## EXECUTIVE SUMMARY

This is the [fifth](#) monthly Environmental Monitoring and Audit (EM&A) report prepared by Dragages Bouygues JV (DBJV), the Contractor Environmental Team (CET), for the Ocean Park Master Redevelopment Project Contract CI05 – Site Formation, Funicular Tunnel and Miscellaneous Works. This report presents the results of EM&A works conducted in the reporting month of [July 2007](#) (from [26 June 2007](#) to [25 July 2007](#)).

In the reporting month, the following construction activities took place:

### Waterfront

- Excavation;
- Boulder stabilization on North Portal;
- Grouting Works at ESS Building;
- Waterfront Access Road;
- Filling of Lagoon;
- Utilities Diversion for Waterfront Access Road and HKSM (watermain & stormdrain); and
- Temporary Bus Terminus.

### Summit

- Site formation at Adit Portal and Explosive Magazine;
- Slope Improvement Work;
- Rock Fall Fence Installation;
- Utilities Diversion (LSS pipe);
- Haul Road Formation & Excavation;
- Conveyor System Installation; and
- Excavation at Summit.

### Tai Shue Wan

- Conveyor Belt Installation at Tai Shue Wan; and
- Barging Point at Tai Shue Wan.

### Nam Long Shan Road Entrusted Work

- Traffic Diversion for NLS Road Entrusted Work; and
- Excavation at NLS Road Entrusted Work & Wong Chuk Hang Road.

The total disposal volume to the barging point, public fill and the sorting facilities in the reporting month of [July 2007](#) was [2,134.33](#) tonnes, [10.72](#) tonnes and [107.54](#) tonnes while the volume to the landfills was [55.17](#) tonnes. Apart from the above, the total disposal volume to the alternative dumpsites; Green Valley and Swire Sita were [5,121](#) tonnes and [10,881](#) tonnes respectively. The volume of internal transfer within the reporting month of [July 2007](#) was approx. [6,525](#) tonnes.

Monitoring of 1-hour & 24-hour Total Suspended Particulates (TSP) and noise were performed and the results were checked and reviewed. Site inspections were conducted on weekly basis. The implementation of the environmental mitigation measures, Event and Action Plans and environmental complaint handling procedures were also checked.

## Environmental Monitoring Works

### Environmental Monitoring and Audit Progress

A summary of monitoring and audit activities conducted in the reporting period is listed below:

1-hour TSP monitoring	15 sessions for air quality monitoring station AM1; 15 sessions for air quality monitoring station AM2; and 13 sessions for air quality monitoring station AM3
24-hour TSP monitoring	5 sessions for air quality monitoring stations AM1; 5 sessions for air quality monitoring station AM2; and 4 sessions for air quality monitoring station AM3
Daytime noise monitoring	4 sessions for all noise monitoring stations
Evening and night time noise monitoring	0 sessions for all noise monitoring stations
Holiday time noise monitoring	0 session for all noise monitoring stations
Terrestrial ecology monitoring	0 session
Subtidal monitoring	1 session for Site 1, Site 2, Site 3 and Site 4; 2 sessions for Site 5 and Control Station C
Joint environmental site inspection	4 sessions (include the IEC audit)

### Air Quality

The air quality monitoring results obtained in the reporting period of [July 2007](#) were audited for the compliance of the Action and Limit levels proposed in the Project Baseline Air Quality and Noise Monitoring Report (rev. B), which were issued in February 2007 and the audit finding showed no exceedance was recorded.

### Noise

The noise monitoring results obtained in the reporting period of [July 2007](#) were audited for the compliance of the Action and Limit levels proposed in the Project Baseline Air Quality and Noise Monitoring Report (rev. B), which were issued in February 2007 and the audit finding showed that no exceedance was recorded.

### Terrestrial Ecology

No terrestrial monitoring was conducted in the reporting period of [July 2007](#) since comments have received from AFCD in 23 July 2007 and revision is under preparation.

### Subtidal Monitoring

The [second](#) impact subtidal ecology monitoring was conducted in the reporting period of [July 2007](#). The results were audited for the compliance of the Action and Limit levels proposed in the Project Baseline Coral Survey Report (rev. A), which were issued in June 2007 and the audit finding showed no exceedance was recorded.

### Environmental Licensing and Permitting

Permits granted to the Project include the Environmental Permit for the Project, Construction Noise Permits, Effluent Discharge License and Chemical Waste Producer. Information of these permits is provided in Table 6.1.

### Implementation Status of Environmental Mitigation Measures

Dust generated by vehicle movement was observed occasionally, both Waterfront and Summit areas. Water hoses were deployed for the haul road watering; water sprinklers were in operation in some of the working areas. The Contractor was reminded to keep watering the haul road and working area surfaces once the surfaces are dry, especially during the hot sunny days.

Anti-mosquito agent has been applied in the required Works Areas and cleaned up stagnant water regularly in order to reduce the possibility of mosquito breeding.

Wheel washing bay has installed at Summit currently and the installation of wheel washing bay at Waterfront is in progress. The Contractor was reminded to inform the drivers to wash the vehicles before leaving the site.

Movable noise panels have stored on site and will use wherever necessary.

The disposal of C&D wastes by using both the Chits and trip tickets have been implemented in [July 2007](#). Most of the C&D materials were disposed of to the alternative dumpsite and disposal to the public fill or temporary public filling barging point would be the last resort. The C&D waste was disposed of to the sorting facilities or landfill.

General wastes were collected by a waste skip near the temporary site office in a regular basis. The frontline staff was reminded to keep good housekeeping in order to avoid waste accumulation.

### **Environmental Non-conformance**

No public complaint, warning from OPC or PMR, summons or prosecution related to environmental issues was made against the Ocean Park Master Redevelopment Project Contract CI05 in the reporting period of [July 2007](#).

### **Future Key Issues**

Key issues to be considered in the coming month include:

- Noise from operating equipment and machinery on-site.
- Construction waste management at temporary construction waste area.
- Avoid accumulation of stagnant / muddy water on-site.
- To implement dust suppression measures on dry surfaces.
- Provision of treatment to turbid water (control the SS level) from activities on-site before discharge.

## 1. INTRODUCTION

### Purpose

- 1.1 The purpose of this report is to present the EM&A work carried out during July 2007 (from 26 June 2007 to 25 July 2007) with respect to Ocean Park Master Redevelopment Project Contract No. CI05 – Site Formation, Funicular Tunnel and Miscellaneous Works.

### Background

- 1.2 Ocean Park planned to upgrade and expand the existing area to meet the anticipated visitor demands and to position Ocean Park as a premium tourist attraction and a regional leader in the themed recreational and educational park experience.

- 1.3 The redevelopment works of Ocean Park will involve

- Civil infrastructure works including road works (including modifying sections of Ocean Park Road, which is a local distributor, around the existing bus terminus as shown in Figure 1.1), drain works, tunnelling and geotechnical works, bulk excavation and slope works, retaining structures, site clearance, decommissioning and demolition works, funicular railway, modify to bus terminus, taxi stands and associated facilities.
- Utilities works including power supply distribution, electrical substations, freshwater and saltwater reservoirs, water supply distribution, gas supply distribution, telecommunications network and distribution, landscape irrigation network, etc.
- Primary life support system works for animal keeping.
- Area development works including service roads, EVAs, external escalators, bridges and elevated walkways, external lighting.
- Parkwide systems works including signage, background music system, toilets facilities, guard sheds, first aid facilities, communications systems, CCTV systems and waste facilities.
- Landscape or theming works including exterior building facade treatment works, themed concrete pavement/ hardscape, soft landscaping, water and faux rockwork features, visual intrusion screens, area props and artwork, etc.
- Works for the attractions venues including animal exhibits, marine animal, terrestrial animal, aviaries, bird exhibits, individual life support systems for animal exhibits; and others non-animal related attractions, e.g. shipwreck play area, bamboo maze, etc.
- Installation of rides including thrill rides, round rides, water rides, kids rides, interactive rides, transportation rides, etc.
- Works for the venues including event halls, outdoor live show area, cinemas and bandstands.
- Works for the merchandise / retail facilities including souvenir stores, novelty stores, games arcade, photo shops, etc.
- Works for the food and beverage facilities including restaurants, bakery, food carts and kiosks.
- Back of house facilities including offices, break areas, warehouses, centralized facilities, operational facilities, etc.

### Project Organisation

- 1.4 Under the requirement of EM&A Manual and Environmental Permit, the environmental management team should be set up and the structure of the team is shown in Figure 1.1.
- 1.5 Meanwhile the contacts of key environmental personnel for this project are shown in Appendix L.

### Construction Works undertaken during the Reporting Month

- 1.6 The major construction activities undertaken in July 2007 included Excavation; Boulder stabilization on North Portal; Grouting Works at ESS Building; Waterfront Access Road; Filling of Lagoon; Utilities Diversion for Waterfront Access Road and HKSM (watermain & stormdrain); and Temporary Bus Terminus at Waterfront works areas.
- 1.7 At Summit, Site formation at Adit Portal and Explosive Magazine; Slope Improvement Work; Rock Fall Fence Installation; Utilities Diversion (LSS pipe); Haul Road Formation & Excavation; Conveyor System Installation; and Excavation at Summit.
- 1.8 At Tai Shue Wan, conveyor belt installation and Barging Point formation are on-going and the Entrusted works including traffic diversion and excavation at Nam Long Shan Road and Wong Chuk Hang Road.
- 1.9 Layout plan of the Project is provided in Figures 1.2 and 1.3.
- 1.10 The amounts of different types of waste generated by the activities of the Project in the reporting month are shown in Table 1.1.

**Table 1.1 Amounts of Waste Generated in the reporting of July 2007**

Waste Type	Disposal Locations	Estimated Amount (tonnes unless specified)
C&D waste	SENT	53.00
	TKOSF	89.70
	TMSF	17.84
C&D material	Green Valley *	5,121.00
	Swire Sita	10,881.00
	QBBP	2,134.33
	TKOFB	10.72
	INTL **	6,525.00
Chemical waste	Collected by licensed collector	0 L
General waste	Collected by licensed collector	40.00m <sup>3</sup>

Notes: \* denotes alternative dumpsite as disposal location.  
 \*\* denotes internal transfer

**Compliance with EP conditions**

1.11 A summary of the reporting requirement of compliance with EP conditions of Contract CI05 of the Project as of July 2007 were listed in Table 1.2.

**Table 1.2 Environmental Permit Submission**

<b>Environmental Permit Submission</b>	<b>EP-249/2006/A Condition No.</b>	<b>Status</b>
Management Organization	2.3	Submitted on 15 December 2006.
Construction Programme	2.4	Submitted on 14 February 2007.
Drainage Proposal	2.13	Deposited in the EIAO Register Office for public inspection on 30 May 2007.
Silt Curtain Proposal	2.14	Deposited in the EIAO Register Office for public inspection on 01 March 2007.
Transplantation Proposal	2.20	Comments received on 23 July 2007 and revision is under preparation
Waste Management Plan	2.21	Comments received on 13 July 2007 and revision is under preparation
Baseline Air Quality and Noise Monitoring Report	3.2	Submitted on 28 February 2007.
Baseline Coral Survey Report	3.2	Submitted on 16 June 2007.
Monthly EM&A Report for Jun '07	4.2	Submitted on 13 July 2007.

**Summary of EM&A Requirements**

1.12 The EM&A programme requires environmental monitoring for air quality, noise, terrestrial ecology, subtidal and waste management. The EM&A requirements for each parameter are described in subsequent sections, including:

- All monitoring parameters;
- Action and Limit levels for all environmental parameters;
- Event-Action Plans;
- Environmental mitigation measures and their implementation schedule;
- Environmental requirements in contract documents.

1.13 The environmental licensing and permits are described in Section 6.

1.14 The advice on the implementation status of environmental protection and pollution control/mitigation measures is summarized in Section 6 of the Report.

## 2. AIR QUALITY MONITORING

### Monitoring Requirements

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

### Monitoring Equipment

- 2.2 High volume samplers (HVS - Model GMWS-2310 Accu-Vol) complete with the appropriate sampling inlets were installed for 24-hour and 1-hour TSP sampling. The HVS composed of a motor, a filter holder, a flow controller and a sampling inlet and its performance specification complies with USEPA Standard Title 40, Code of Federation Regulations Chapter 1 (Part 50 Appendix B). Table 2.1 summarises the equipment that was used in the dust-monitoring programme.

**Table 2.1 TSP Monitoring Equipment**

Equipment	Model
HVS	GMWS 2310 c/w of TSP sampling inlet
Calibration Kit	Tisch TE-5025 A
Dust Trak	TSI-8250

### Monitoring Parameters, Frequency and Duration

- 2.3 The monitoring parameters and frequency are summarised in Table 2.2. The monitoring schedule for the reporting month is shown in Appendix B.

**Table 2.2 Air Quality Monitoring Parameters and Frequency**

Location	Parameter	Duration	Frequency
AM1	1-hour TSP	1 hour	3 times every 6 days*
	24-hour TSP	24 hours	Once every six days
AM2	1-hour TSP	1 hour	3 times every 6 days*
	24-hour TSP	24 hours	Once every six days
AM3	1-hour TSP	1 hour	3 times every 6 days*
	24-hour TSP	24 hours	Once every six days

Notes: \* denotes three 1-hr TSP monitoring in three days.

### Monitoring Locations

- 2.4 In accordance with the EM&A Manual, three air quality monitoring stations, as shown in Figure 1.4, were selected for 24-hour and 1-hour TSP sampling. Table 2.3 describes the location of the air quality monitoring stations.

**Table 2.3 Location of Air Quality Monitoring Stations**

Air Quality Monitoring Stations	Identity / Description
AM1	Whisker's Theatre, Ocean Park
AM2	San Wai Village, Wong Chuk Hang
AM3	Ocean Park Road, 50m adjacent to Police Training School

- 2.5 As the works areas under the contract CI05 has been extended to the Ex-Hong Kong School of Motoring and will include the bus terminus at Ocean Park Road in the near future. The existing air quality monitoring location AM3 will no longer be appropriate as it will fall inside the works areas. The proposed re-location is the open areas of PMR & OPC temporary site offices. Proposal has sent to PMR and IEC for consideration and approval.

## **Monitoring Methodology**

### **24-hour / 1-hour TSP Monitoring**

#### ***Installation***

2.6 The HVSs were installed in the vicinity of the air sensitive receivers. The following criteria were considered in the installation of the HVS.

- A horizontal platform with appropriate support to secure the samplers against gusty wind was provided.
- No two HVSs were placed less than 2 meters apart.
- The distance between the HVS and any obstacles, such as buildings, was at least twice the height that the obstacle protrudes above the HVS.
- A minimum of 2 meters separation from walls, parapets and penthouses was required for rooftop samplers.
- No furnace or incinerator flues were nearby.
- Airflow around the sampler was unrestricted.
- Permission was obtained to set up the samplers and to obtain access to the monitoring stations.

#### ***Preparation of Filter Papers by ETS-Testconsult Limited.***

- Glass fibre filters, G810 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  $\pm 3$  °C; the relative humidity (RH) was < 50% and not variable by more than  $\pm 5$ %. A convenient working RH was 40%.

#### ***Field Monitoring***

- The power supply was checked to ensure the HVS works 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 was 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 was secured with the aluminum strip.
- The HVS was warmed-up for about 5 minutes to establish run-temperature conditions.
- A new flowrate record sheet was set into the flow recorder.
- The flow rate of the HVS was checked and adjusted at around 1.1 m<sup>3</sup>/min. The range specified in the EM&A Manual was between 0.6-1.7 m<sup>3</sup>/min.
- The programmable timer was set for a sampling period of 24 hrs  $\pm$  1 hr or 1 hr + 0.25 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.
- Filters were sent to *ETS-Testconsult Ltd.* for analysis.

**Maintenance & Calibration**

- The HVSs and their accessories are maintained in good working condition, such as replacing motor brushes routinely and checking electrical wiring to ensure a continuous power supply.
- HVSs are calibrated at bi-monthly intervals using GMW-25 Calibration Kit throughout all stages of the air quality monitoring. Calibration details are provided in Appendix G.

**Results and Observations**

- 2.7 The air quality monitoring results of 1-hr TSP and 24-hr TSP of the reporting month are summarized in Tables 2.4 and 2.5. All monitoring data and graphical presentation of the monitoring results are provided in Appendix C. No 1-hr TSP measurements have been conducted on 22 & 23 June 2007 and no 24-hr TSP measurement taken on 23 June 2007 at AM3 due to power supply failure.
- 2.8 All measured 1-hour & 24-hour TSP concentrations were below the Action and Limit (AL) Levels in the reporting month.

**Table 2.4 Monitoring Results of 1-hr TSP**

Date of Monitoring	1-hr TSP ( $\mu\text{g}/\text{m}^3$ )		
	AM1	AM2	AM3
27-Jun-07	89	97	130 ^
29-Jun-07	104	120	119
03-Jul-07	72	102	116
04-Jul-07	83	109	86
05-Jul-07	97	101	125
07-Jul-07	129	124	x
09-Jul-07	96	83	x
11-Jul-07	102	94	126
13-Jul-07	104	114	130
16-Jul-07	104	179	174
17-Jul-07	88	115	105
18-Jul-07	102	148	124
20-Jul-07	72	138	117
23-Jul-07	75	117	94
25-Jul-07	91	119	93

Notes: \* Exceedance of Limit Level  
 # Exceedance of Action Level  
 x No measurement due to power supply failure  
 ^ denotes measurement by Dust Trak

**Table 2.5 Monitoring Results of 24-hr TSP**

Date of Monitoring	24-hr TSP ( $\mu\text{g}/\text{m}^3$ )		
	AM1	AM2	AM3
29-Jun-07	44	56	41
05-Jul-07	31	40	37
11-Jul-07	42	56	x
17-Jul-07	39	37	56
23-Jul-07	26	28	34

Notes: \* Exceedance of Limit Level  
 # Exceedance of Action Level  
 x No measurement due to power supply failure

### 3. NOISE MONITORING

#### Monitoring Requirements

3.1 Noise monitoring was conducted at four monitoring stations as specified in the EM&A Manual. Appendix A shows the established Action and Limit Levels for noise.

#### Monitoring Equipment

3.2 Integrating Sound Level Meters were employed for noise monitoring. They were Type 1 sound level meters capable of giving a continuous readout of the noise level readings including equivalent continuous sound pressure level (Leq) and percentile sound pressure level (Lx). They comply with International Electrotechnical Commission Publications 651:1979 (Type 1) and 804:1985 (Type 1). Portable electronic wind speed indicator capable of measuring the wind speed in m/s was employed to check the wind speed. Table 3.1 details the noise monitoring equipment used.

**Table 3.1 Noise Monitoring Equipment**

Equipment	Model
Integrating Sound Level Meter	Rion NL 31
Calibrator	Rion NC-73
Portable Wind Speed Indicator	TSI Model 8340-M Air Velocity Meter

#### Monitoring Parameters, Frequency and Duration

3.3 Noise monitoring was conducted per monitoring day during the daytime. Monitoring to be conducted in the evening and/or night-time only when construction works is in progress. The monitoring period, duration, parameters and frequency of noise measurement are presented in Table 3.2. The monitoring schedule for the reporting month is provided in Appendix B.

**Table 3.2 Noise Monitoring Parameters, Period and Frequency**

Time Period	Duration (min)	Parameters	Frequency
Daytime (0700 to 1900)	30	Leq	Once a week
*Evening (1900 to 2300)	5		
*Night-time (2300 to 0700 of next day)	5		

Notes: \* denotes Noise monitoring to be conducted only when construction work is in progress.

#### Monitoring Locations

3.4 In accordance with the EM&A Manual, noise monitoring was conducted at four designated monitoring stations as shown in Figure 1.4. Table 3.3 describes the locations of these monitoring stations.

**Table 3.3 Noise Monitoring Locations**

Noise Monitoring Stations	Identity / Description
CN1	Open Area adjacent to Police Training School
CN2	Project Development Office, Ocean Park
CN3	Rinniped House, Ocean Park
CN4	Manly Villa

#### Monitoring Methodology

##### 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 and after each 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 was more than 1 dB(A), 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 a portable wind meter.
- During the monitoring period, the  $L_{eq}$  was 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 (e.g. dog barking, helicopter noise) if possible. Observations were recorded when intrusive noise was unavoidable.
- Noise monitoring was cancelled in the presence of fog, rain, wind with a steady speed exceeding 5 m/s, or wind with gusts exceeding 10 m/s.

**Maintenance and Calibration**

- The microphone head of the sound level meter and calibrator is cleaned with soft cloth at quarterly intervals.
- The meters and calibrators are sent to *Hong Kong Calibration Ltd* to check and calibrate at yearly intervals. Calibration details are provided in Appendix G.

**Results and Observations**

- 3.5 Noise monitoring was conducted at the 4 designated monitoring stations during daytime in the reporting month. The monitoring was carried out as scheduled in the reporting month of July 2007 and the monitoring results are summarized in Table 3.4. All monitoring data and graphical presentation of the monitoring results are provided in Appendix D.
- 3.6 No exceedance of limit level during daytime recorded in the reporting month.

**Table 3.4 Monitoring Results of Daytime Noise**

Date of Monitoring	Noise Level, Leq (30-min), dB(A)			
	CN1	CN2	CN3	CN4
03-Jul-07	66.3	65.9	67.8	59.2
09-Jul-07	61.8	63.7	58.0	57.5
16-Jul-07	68.8	67.0	66.3	60.4
23-Jul-07	68.2	66.4	65.8	61.2

Notes: \* Exceedance of Limit Level  
 # Exceedance of Action Level

#### **4. TERRESTRIAL ECOLOGY**

##### **Monitoring Requirements**

- 4.1. Monitoring of the health and condition of the transplanted plant species of conservation interest should be monitored at least once a month during the first 12 months after transplantation.

##### **Monitoring Parameters, Frequency and Duration**

- 4.2. Since the transplantation proposal is under revision, the proposed monitoring frequency and duration would be confirmed after the proposal has been agreed or approved by EPD.

##### **Monitoring Locations**

- 4.3. The proposed monitoring location is shown in Figure 1.3.

##### **Monitoring Methodology**

- 4.4. Since the revised transplantation proposal is under revision during the reporting month, the monitoring methodology would be confirmed after the proposal has been agreed or approved by EPD.

##### **Results and Observations**

- 4.5. Since the transplantation proposal is under revision during the reporting month, no monitoring has been undertaken.

## 5. SUBTIDAL MONITORING

### Monitoring Requirement

- 5.1 Even though the conclusion in the EIA stated that adverse impact on coral communities would not be expected during the construction phase of the Project, coral monitoring shall be conducted as a precautionary measure.
- 5.2 Appendix A shows the established Action/Limit Levels for the subtidal monitoring works.

### Monitoring Parameters, Frequency, Schedule

- 5.3 Subtidal monitoring is required to be conducted as follows:
- once per month in the first two months in Site 1, Site 2, Site 3, Site 4 and Control Site C.
  - twice a month at first three months in Site 5 and Control Site C.
  - once per month for the next three months in Site 5 and Control Site C.
  - If there is no exceedance, the monitoring frequency would be adjusted to once every three months (i.e. quarterly) until the end of the Contract No CI05 of the Project.

### Monitoring Locations

- 5.4 In accordance with the EM&A Manual, subtidal monitoring would be conducted at Tai Shue Wan and Chung Hom Kok. The monitoring locations are shown in Figure 5.1.

### Monitoring Procedures

- 5.5 Monitor the tagged corals (ten nos. at each station) for sedimentation, bleaching and mortality.
- 5.6 In the event that there is no exceedance record, the monitoring frequency shall be revised to once in every quarter until the end of the construction phase of CI05.
- 5.7 In the event that there is an exceedance of Action Level record, more frequent monitoring to be carried out until the exceedance stops.
- 5.8 In the event that there is an exceedance of Limit Level record, the Contractor shall suspend all works until an effective solution is identified.

### Results and Observations

- 5.9 The purpose of subtidal monitoring is monitor the potential impact during the construction phase of the Project. The [second](#) impact subtidal monitoring conducted within the reporting month of [July 2007](#).
- 5.10 The results of monitoring show that sediment cover, bleaching and mortality on some of the tagged colonies from all monitoring stations and the control station slightly increased by 1 to 9% when compared with the results in the Baseline Surveys on 07 to 12 April 2007. The enhanced sedimentation was believed to be contributed by multiple environmental factors, such as the lasting hot weather and the southwest wind in July 2007.
- 5.11 The healthy status of the tagged coral colonies was normal, with low to medium levels of sedimentation. Low levels of bleaching and mortality were observed in both monitoring and control sites. Neither action or limit level of sedimentation, bleaching or mortality was recorded; hence no adverse impact by the construction activity on the coral community was evidenced.
- 5.12 The details of the monitoring results are summarized in Appendix F.

## 6. ENVIRONMENTAL AUDIT

### Site Environmental Audit

- 6.1 Site audit would be carried out once per week to monitor environmental issues on the construction sites to ensure that all mitigation measures were implemented timely and properly.

### Review of Environmental Monitoring Procedures

- 6.2 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 of the construction site.
- The monitoring team recorded the temperature, air pressure and weather conditions on the monitoring day.

#### *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.

#### *Terrestrial Monitoring*

- No monitoring since the revised transplantation proposal has submitted and waiting for approval from EPD and AFCD.

#### *Subtidal Monitoring*

- The [second](#) impact subtidal monitoring conducted within the reporting month of [July 2007](#) since the site formation at Summit has commenced.

### Status of Environmental Licensing and Permitting

- 6.3 All permits/licences obtained as of [July 2007](#) are summarised in Table 6.1.

**Table 6.1 Summary of Environmental Licensing and Permit Status**

Permit No.	Valid Period		Section/Description	Status
	From	To		
<b>Environmental Permit</b>				
EP-249/2006/A	23-Oct-06	N/A	Add a new condition before Condition 2.18 in Part C stated that "To compensate for the loss of roosting site for freshwater birds due to the filling of Pond 37 at Lowland area; complete the enhancement works for Pond 35 and to avoid disturbing the roosting site for freshwater birds, no construction works and discharge from the construction site(s) shall be allowed with the existing freshwater ponds at Tai Shue Wan area".  Renumber Conditions 2.19 to 2.25 in Part C of the EP.	Valid
<b>Construction Noise Permits</b>				
GW-RS0200-07	05-Apr-07	30-Jun-07	Crane, mobile (tracked); Excavator, tracked; Vibratory hammer; Air compressor with noise emission label showing the SWL of 102dB(A); Breaker, excavator mounted (hydraulic); Concrete lorry mixer; Poker, vibratory, hand-held (electric); Lorry with crane; Lorry with grab; Generator, silenced, 75dB(A) at 7m; Saw circular, wood; Concrete pump, lorry mounted	Expired
GW-RS0240-07	04-May-07	30-Jun-07	Ventilation fan; Cherry picker; Generator, silenced, 75dB(A) at 7m; Welding set; Jumbo; Shotcrete machine, Excavator; Dump truck, Rock splitter; Concrete lorry mixer; and Air compressor with noise emission label showing the SWL of ≤ 102dB(A)	Expired
GW-RS0269-07	09-May-07	30-Jun-07	Aerial platform, mobilized; Trailer; Crane, mobile (diesel); and Lorry with crane	Expired
GW-RS0408-07	01-Jul-07	30-Aug-07	Ventilation fan; Cherry picker; Generator, silenced, 75dB(A) at 7m; Welding set; Jumbo; Shotcrete machine, Excavator; Dump truck, Rock splitter; Concrete lorry mixer; and Air compressor with noise emission label showing the SWL of ≤ 102dB(A)	Valid
GW-RS0434-07	16-Jul-07	10-Dec-07	Concrete lorry mixer; Poker, vibrating, hand-held (electric); Excavator, tracked; Generator, silenced, 75dB(A) at 7m; Crane, mobile (diesel); Excavator, tracked; Roller, vibratory; Breaker, hand-held, mass ≤ 10kg; Cutter, circular, steel (electric); Lorry with crane	Valid
GW-RS0440-07	18-Jul-07	30-Aug-07	Aerial platform, mobilized; Trailer; Crane, mobile (diesel); and Lorry with crane	Valid
GW-RS0448-07	20-Jul-07	20-Jan-08	Generator, silenced, 75 dB(A) at 7m	Valid
<b>Chemical Waste Producer Registration</b>				
WPN5213-199-D2373-01	07-May-07	N/A	For disposal of chemical wastes, mainly spent lubricants	Valid

**Table 6.1 Summary of Environmental Licensing and Permit Status**

Permit No.	Valid Period		Section/Description	Status
	From	To		
<b>Effluent Discharge License</b>				
EP820/W9/XW232	20-Jun-07	N/A	For discharge of industrial trade effluent arising from construction site at Summit and Tunnel	Valid
EP820/W9/XW234	16-Jul-07	N/A	For discharge of industrial trade effluent arising from construction site at Waterfront	Valid
<b>Specific Process License</b>				
Application sent on 03-Apr-07 and the supplementary information has provided on 20 June 2007 and 25 July 2007 for consideration and discussion with EPD is in progress.				
<b>Notification of Construction Works under APCO</b>				
Waterfront sent on 31-Jan-07 (ref. 001017998) Summit sent on 05-Feb-07 (ref. 001018054)				
<b>Billing Account under Construction Waste Disposal Charging Scheme</b>				
7004888	03-Jan-07	18-Dec-08	For disposal of C&D waste to public fills, sorting facilities and landfills	In use

**Implementation Status of Environmental Mitigation Measures**

- 6.4 The weekly joint site inspections have conducted on [7 & 15 June 2007](#). The IEC has undertaken the monthly audit on [24 July 2007](#). During site inspections in this reporting month, the following observations and recommendations were made.

**Land Based Water Quality Mitigation Measures**

- 6.5 The Contractor was reminded to remove the stagnant water regularly in order to minimize the potential mosquito breeding problems.

**Air Quality Mitigation Measures**

- 6.6 Some access roads were observed dry and the Contractor was reminded to provide water spray to haul roads more frequently to suppress the dust nuisance.
- 6.7 Stockpile and exposed slope surface were partly covered. The Contractor was reminded to cover them entirely and properly with tarpaulin.

**Noise**

- 6.8 No violation was observed during site inspections in the reporting month of [July 2007](#).

**Ecology**

- 6.9 No violation was observed during site inspections in the reporting month.

**Waste / Chemical Management**

- 6.10 Accumulation of waste was observed. However the wastes were collected by licensed haulers and disposed of properly after the move.
- 6.11 The Contractor and relevant party were reminded to provide a drip tray or tarpaulin when storing the oil drums on site.

***Landscape and Visual***

- 6.12 No violation was observed during site inspections in the reporting month of [July 2007](#).

***Environmental Mitigation Implementation Schedule (EMIS)***

- 6.13 According to the Environmental Permit, the mitigation measures detailed in the permits are required to be implemented. An updated summary of the EMIS is presented in Appendix H.

***Implementation Status of Event/Action Plans***

- 6.14 The Event and Action Plans for air quality, noise and subtidal monitoring are presented in Appendix I.
- 6.15 No exceedance of air quality (i.e. 1 hour & 24-hour TSP) was recorded during the reporting month of [July 2007](#).
- 6.16 No exceedance of noise limit level during daytime and evening was recorded in the reporting month of [July 2007](#).
- 6.17 No exceedance of subtidal monitoring was recorded in the reporting month of [July 2007](#).

***Implementation Status of Environmental Complaint Handling Procedures***

***Summary of the Complaints and Prosecutions***

- 6.18 Appendix J presents the environmental complaint flow diagram of the Project.
- 6.19 No complaint, summons or prosecution related to environmental issues was received or made against the Project in [July 2007](#).

## **7. FUTURE KEY ISSUES**

### **Key Issues for the Coming Month**

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

- Noise from operating equipment and machinery on-site.
- Maintenance of silt curtains.
- Construction waste management at the demolition work areas.
- Avoid accumulation of stagnant / muddy water on-site.
- To implement dust suppression measures on dry surfaces.
- Provision of treatment to turbid water from activities on-site before discharge.

### **Monitoring Schedules for the Next Month**

7.2 The environmental monitoring schedules for the next month are shown in Appendix B.

### **Construction Program for the Next 3 Months**

7.3 The construction programme for the next 3 months is shown in Appendix K.

## 8. CONCLUSIONS AND RECOMMENDATIONS

### Conclusions

- 8.1 Environmental impact monitoring was performed in [July 2007](#). All monitoring results in the reporting month were checked and reviewed.
- 8.2 No exceedances of Action and Limit Level for daytime noise, evening noise, 24-hour TSP and 1-hour TSP were recorded in the reporting month of [July 2007](#).
- 8.3 The second impact subtidal monitoring conducted within the reporting month of [July 2007](#) and the results showed that no exceedances of Action and Limit Levels.
- 8.4 No complaint, summons or prosecution related to environmental issues were made against the Project in the reporting period.

### Recommendations

- 8.5 According to the environmental audit performed in the reporting month, the following recommendations are made:

#### *Air Quality 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 dry surfaces.

#### *Noise Impact*

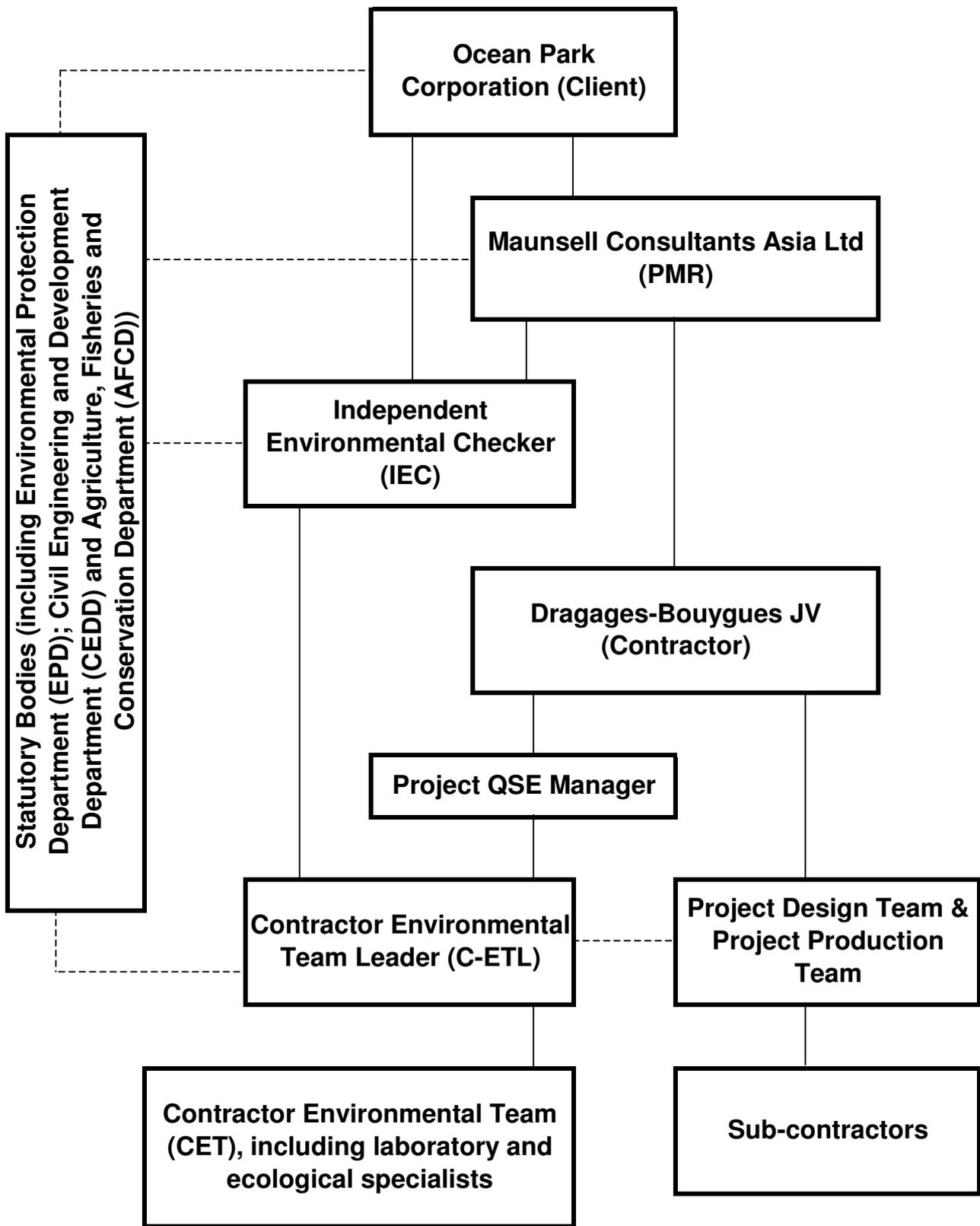
- To inspect the noise sources from inside and outside of the site.
- To follow up any exceedance caused by the construction works.
- To space out noisy equipment and position as far away as possible from sensitive receivers.
- To have regular maintenance of vessels and equipment used.

#### *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.
- To regularly and properly collect, store and dispose of all waste types, including floating refuses at the sea.

#### *Water Quality Impact*

- To minimize water discharge and surface runoff into nearby water body.
- To provide silt and sand traps in channels.
- To treat site surface runoffs and wastewater generated from various construction activities with wastewater treatment system (comprised of chemical coagulation, sedimentation and pH control).
- To review and implement temporary site drainage management plan.
- Silt removal facilities, channels, manholes and wastewater treatment system should be frequently cleaned the deposited silt and grit to maintain in proper condition.
- To review the adequacy of the desilting facilities' capacity.



**LEGEND:**

- Line of Communication
- Line of Authority

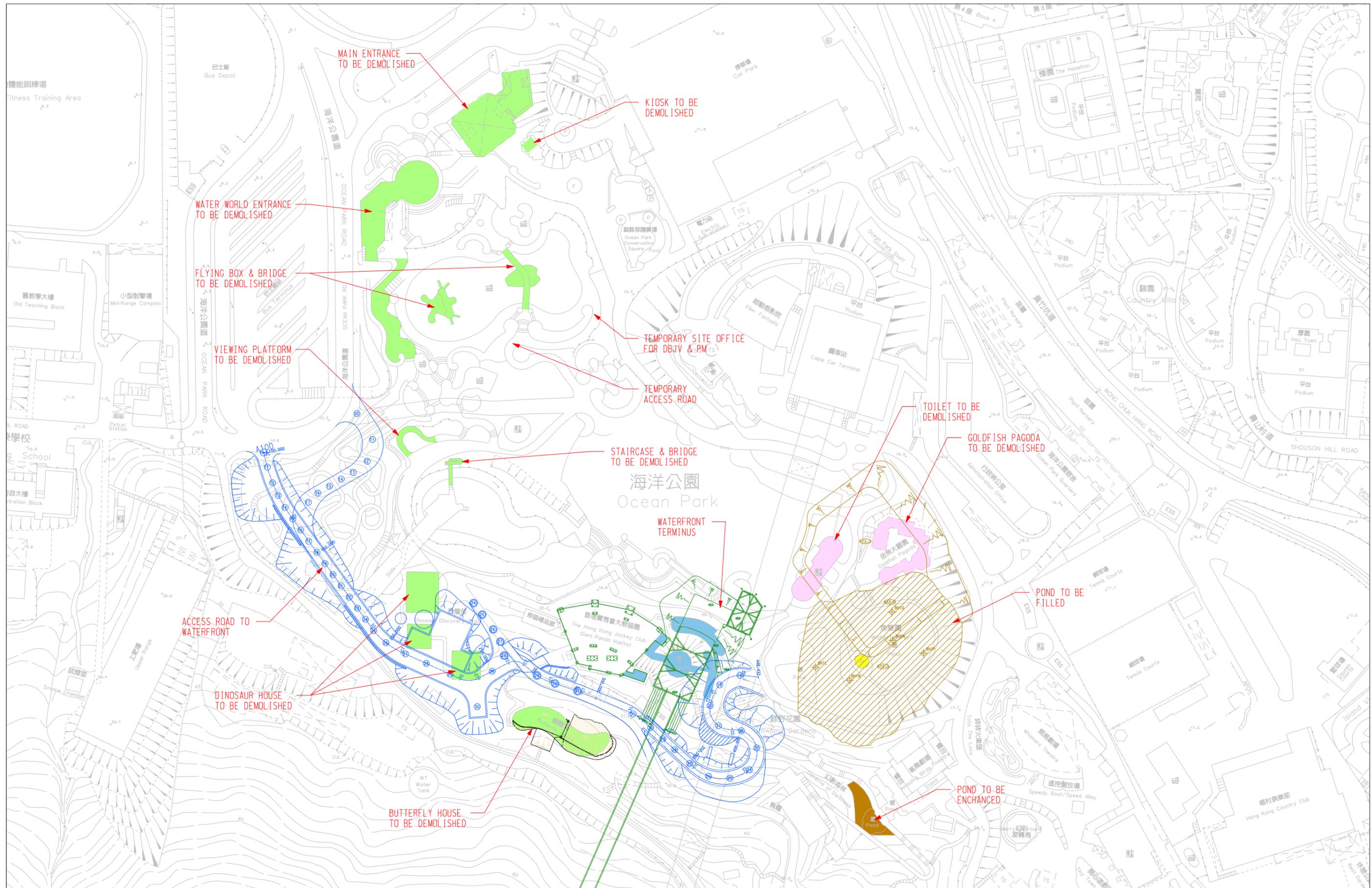


Dragages-Bouygues JV 寶嘉-布依格聯營

**Ocean Park Master Redevelopment Project Contract CI05**

Figure 1.1

**Project Environmental Organisation Chart**



DESIGNED BY	BLo
DRAWN BY	BLo
CHECKED BY	GCh
IN CHARGE	DNg
DATE	02APR2007

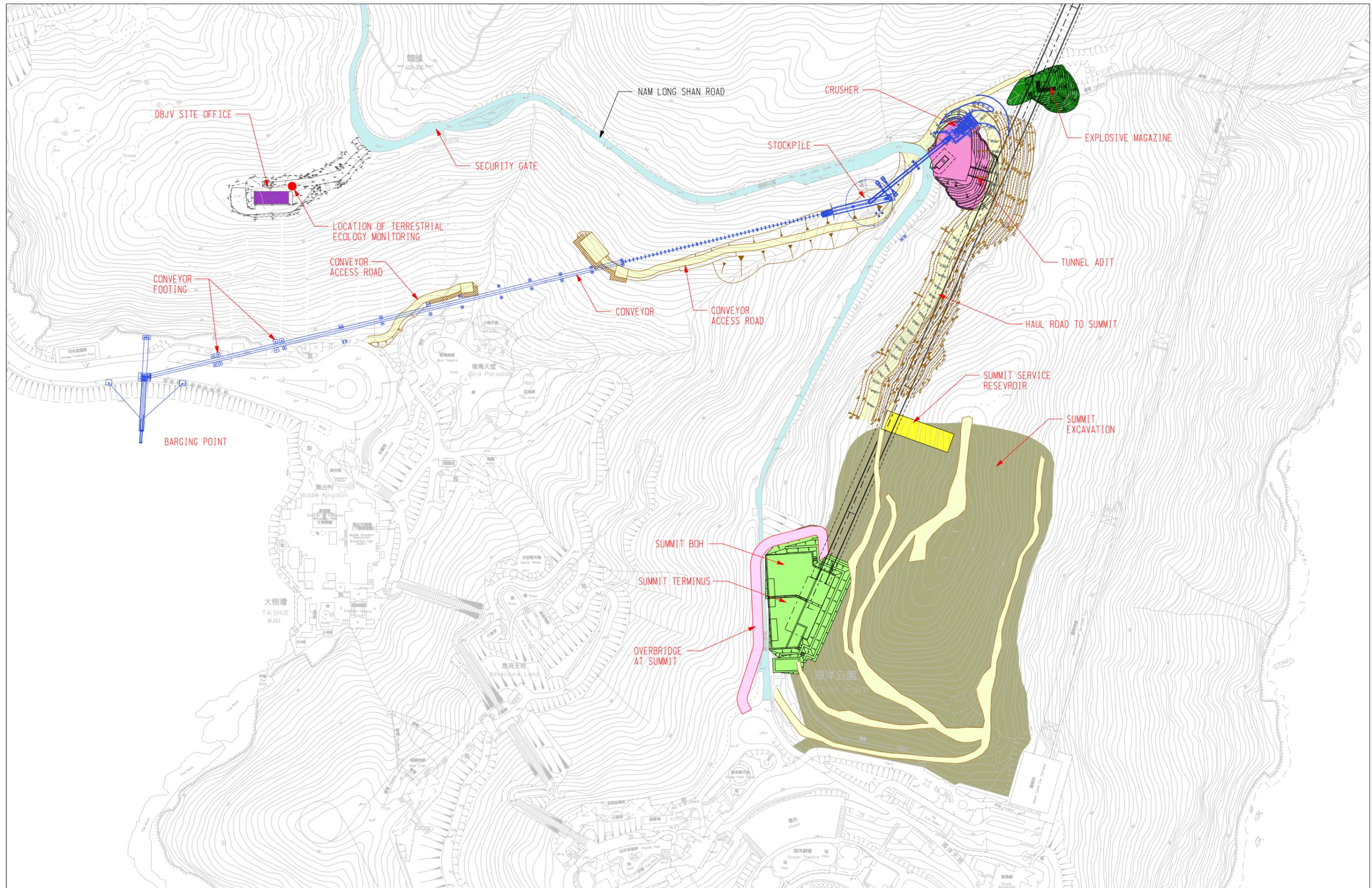
MAIN CONTRACTOR :	 Dragages-Bouygues JV 寶嘉-布依格聯營
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CLIENT :	 香港海洋公園 OCEAN PARK HONG KONG
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PROJECT TITLE :	<b>OCEAN PARK REDEVELOPMENT</b> Contract No. C105 Site Formation, Funicular Tunnel and Miscellaneous Works
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DRAWING TITLE :	<b>FIGURE 1.2</b> LAYOUT OF WORK SITE (WATERFRONT)
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CADD FILENAME :	O1ENV0013A.DGN
DATE :	02APR2007
SCALE :	1 : 1500 @ A3
DRAWING NUMBER :	DBJV/C105/01/ENV/0013
REV.	A



DESIGNED BY	BLo		
DRAWN BY	BLo		
CHECKED BY	GCb		
IN CHARGE	DNg		
DATE	02APR2007		
REV.	DATE	BY	DESCRIPTION
B	10AUG2007	GCb	E1B5T_ISSUE
A	02APR2007	GCb	E1B5T_ISSUE

MAIN CONTRACTOR :



Dragages-Bouygues JV 寶嘉-布依格聯營

CLIENT :



香港海洋公園  
OCEAN PARK HONG KONG

PROJECT TITLE :

**OCEAN PARK REDEVELOPMENT**  
Contract No. C105  
Site Formation, Funicular Tunnel  
and Miscellaneous Works

DRAWING TITLE :

**FIGURE 1.3**  
LAYOUT OF WORK SITE (SUMMIT)  
AND LOCATION OF  
TERRESTRIAL ECOLOGY MONITORING

CADD FILENAME :	Q1ENYQ014B-DGN
DATE :	10AUG2007
SCALE :	1 : 2500 @ A3
DRAWING NUMBER :	DBJV/C105/Q1/ENV/Q014
REV.	B



- LEGEND:
- PROPOSED NOISE MONITORING STATION
  - ▲ PROPOSED AIR QUALITY MONITORING STATION

深水灣  
DEEP WATER BAY  
(SHAM SHUI WAN)

DESIGNED BY	SIQ
DRAWN BY	BLQ
CHECKED BY	SIQ
IN CHARGE	YIS
DATE	02APR2007

MAIN CONTRACTOR :



Dragages-Bouygues JV 實嘉-布依格聯營

CLIENT :



香港海洋公園  
OCEAN PARK HONG KONG

PROJECT TITLE :

**OCEAN PARK REDEVELOPMENT**  
Contract No. C105  
Site Formation, Funicular Tunnel  
and Miscellaneous Works

DRAWING TITLE :

**FIGURE 1.4**  
AIR QUALITY AND  
NOISE MONITORING STATIONS  
LOCATION PLAN

CADD FILENAME :	Q1ENV0015A-DGN
DATE :	02APR2007
SCALE :	1 : 2500 @ A3
DRAWING NUMBER :	DBJV/C105/Q1/ENV/Q015
REV.	A

SUBTIDAL MONITORING  
STATION - SITE 3

SUBTIDAL MONITORING  
STATION - SITE 4

SUBTIDAL MONITORING  
STATION - SITE 5

SUBTIDAL MONITORING  
STATION - SITE 2

SUBTIDAL MONITORING  
STATION - SITE 1

REV.	DATE	BY	DESCRIPTION
A	02APR2007	STa	FIRST ISSUE

DESIGNED BY	STa
DRAWN BY	BLo
CHECKED BY	STa
IN CHARGE	YTS
DATE	02APR2007

MAIN CONTRACTOR :



CLIENT :



PROJECT TITLE :

**OCEAN PARK REDEVELOPMENT**  
Contract No. C105  
Site Formation, Funicular Tunnel  
and Miscellaneous Works

DRAWING TITLE :

FIGURE 5.1  
LOCATIONS OF  
SUBTIDAL MONITORING STATION

CADD FILENAME : 01ENV0016A.DGN

DATE : 02APR2007

SCALE : 1 : 7500 @ A3

DRAWING NUMBER : DBJV/C105/01/ENV/0016	REV. A
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**APPENDIX A - ACTION AND LIMIT LEVELS**

**Table A.1 Action and Limit Levels for 1-hour average TSP and 24-hour average TSP Monitoring**

Monitoring Location	24-hr TSP ( $\mu\text{g}/\text{m}^3$ )		1-hr TSP ( $\mu\text{g}/\text{m}^3$ )	
	Action Level	Limit Level	Action Level	Limit Level
AM1	183	260	440	500
AM2	181	260	500	500
AM3	194	260	500	500

**Table A.2 Action and Limit Levels for Daytime, Evening & Night-time Noise Monitoring**

Time Period	Action	Limit
0700-1900 hrs on normal weekdays	When one documented complaint is received from any one of the sensitive receivers	75 dB(A) *
1900-2300 hrs on normal weekdays; and 0700-1900 hrs on holidays		60/65/70 dB(A) **
2300-0700 hrs of next day		45/50/55 dB(A) **

\* reduce to 70dB(A) for school and 65dB(A) during school examination periods, if applicable

\*\* to be selected based on the Area Sensitivity Rating of A/B/C, and the conditions of the CNP(s) must be followed

**Table A.3 Action and Limit Levels for Subtidal Monitoring**

Parameter	Action Level Definition	Limit Level Definition
Sedimentation	If during Impact Monitoring a 15% increase in the percentage of sediment cover on hard corals occurs at more than 20% of the tagged coral at any one Impact Monitoring Site that is not recorded at the Control Site, then the Action Level is exceeded.	If during the Impact Monitoring a 25% increase in the percentage of sediment cover occurs at more than 20% of the tagged coral at any one Impact Monitoring Site that is not recorded at the Control Site, then the Limit Level is exceeded.
Bleaching	If during Impact Monitoring a 15% increase in the percentage of bleaching (bleached white) on hard corals occurs at more than 20% of the tagged coral at any one Impact Monitoring Site that is not recorded at the Control Site, then the Action Level is exceeded.	If during the Impact Monitoring a 25% increase in the percentage of bleaching (bleached white) occurs at more than 20% of the tagged coral at any one Impact Monitoring Site that is not recorded at the Control Site, then the Limit Level is exceeded.
Mortality	If during Impact Monitoring a 15% increase in the percentage of partial mortality on hard corals occurs at more than 20% of the tagged coral at any one Impact Monitoring Site that is not recorded at the Control Site, then the Action Level is exceeded.	If during the Impact Monitoring a 25% increase in the percentage of partial mortality occurs at more than 20% of the tagged coral at any one Impact Monitoring Site that is not recorded at the Control Site, then the Limit Level is exceeded.

**APPENDIX B – ENVIRONMENTAL MONITORING SCHEDULES**

**From 26 July 2007 to 25 August 2007**

Sun	Mon	Tue	Wed	Thu	Fri	Sat
				26	27 1-hr TSP	28 1-hr TSP 24-hr TSP
29	30 1-hr TSP NM (D)	31	1 1-hr TSP	2	3 1-hr TSP 24-hr TSP	4
5 SM (Site 5 and Control Station C)	6 1-hr TSP NM (D)	7	8 1-hr TSP NM (E)	9 1-hr TSP 24-hr TSP	10 1-hr TSP	11
12	13 1-hr TSP NM (D)	14	15 1-hr TSP 24-hr TSP	16	17 1-hr TSP	18 SM (Site 5 and Control Station C)
19	20 1-hr TSP NM (D)	21 1-hr TSP 24-hr TSP	22 1-hr TSP NM (E)	23	24 1-hr TSP	25
26	27 1-hr TSP 24-hr TSP NM (D)	28	29 1-hr TSP	30	31 1-hr TSP	

Notes: NM (D) denotes Daytime Noise Monitoring.

NM (E) denotes Evening Noise Monitoring if construction work is in progress.

SM denotes Subtidal Monitoring.

Any update / change in the schedule due to weather or other safety factors will be reported in the monthly EM&A report.

**APPENDIX C – AIR QUALITY MONITORING RESULTS**

**1-hr TSP Monitoring Results at Station AM1**

Monitoring Period				Filter Weight (g)		Flow Rate (m <sup>3</sup> /min)		Elapse Time (hour)		Sampling Time (hours)	Concentration (µg/m <sup>3</sup> )	Weather Condition	Particular weight (g)	Average flow (m <sup>3</sup> /min)	Total volume (m <sup>3</sup> )
From		To		Initial	Final	Initial	Final	Initial	Final						
Date	Time	Date	Time	Initial	Final	Initial	Final	Initial	Final						
27-Jun-07	09:00	27-Jun-07	10:00	2.8341	2.8394	1.0	1.0	9805.70	9806.70	1	89	Cloudy	0.0053	1.0	59
29-Jun-07	09:00	29-Jun-07	10:01	2.8357	2.8418	1.0	1.0	9806.70	9807.71	1	104	Cloudy	0.0061	1.0	59
03-Jul-07	13:00	03-Jul-07	14:00	2.8871	2.8915	1.0	1.0	9831.71	9832.71	1	72	Cloudy	0.0044	1.0	61
04-Jul-07	09:00	04-Jul-07	10:00	2.8924	2.8978	1.1	1.1	9832.71	9833.71	1	83	Cloudy	0.0054	1.1	65
05-Jul-07	13:30	05-Jul-07	14:30	2.9017	2.9079	1.1	1.1	9833.71	9834.71	1	97	Cloudy	0.0062	1.1	64
07-Jul-07	09:00	07-Jul-07	10:00	2.9009	2.9093	1.1	1.1	9858.71	9859.71	1	129	Cloudy	0.0084	1.1	65
09-Jul-07	09:00	09-Jul-07	10:00	2.8613	2.8674	1.1	1.1	9859.71	9860.71	1	96	Cloudy	0.0061	1.1	64
11-Jul-07	09:00	11-Jul-07	10:00	2.8934	2.9002	1.1	1.1	9860.71	9861.71	1	102	Cloudy	0.0068	1.1	67
13-Jul-07	09:00	13-Jul-07	10:00	2.8260	2.8328	1.1	1.1	9885.71	9886.71	1	104	Cloudy	0.0068	1.1	65
16-Jul-07	09:00	16-Jul-07	10:00	2.8258	2.8326	1.1	1.1	9886.71	9887.71	1	104	Cloudy	0.0068	1.1	65
17-Jul-07	09:00	17-Jul-07	10:00	2.8173	2.8228	1.0	1.0	9887.71	9888.71	1	88	Cloudy	0.0055	1.0	62
18-Jul-07	13:00	18-Jul-07	14:00	2.8125	2.8187	1.0	1.0	9912.72	9913.72	1	102	Cloudy	0.0062	1.0	61
20-Jul-07	09:00	20-Jul-07	10:00	2.8049	2.8092	1.0	1.0	9913.72	9914.72	1	72	Cloudy	0.0043	1.0	60
23-Jul-07	09:00	23-Jul-07	10:00	2.8412	2.8459	1.0	1.0	9914.72	9915.72	1	75	Sunny	0.0047	1.0	62
25-Jul-07	14:00	25-Jul-07	15:00	2.8042	2.8091	0.9	0.9	9939.72	9940.72	1	91	Sunny	0.0049	0.9	54

**Remarks:**    Bold value indicated an Action Level exceedance  
                     Bold & Italic value indicated an Limit Level exceedance  
                     X - denotes no measurement due to power supply failure  
                     \* - denotes measurement by using Dust Trak

**APPENDIX C – AIR QUALITY MONITORING RESULTS (CONT'D)**

**1-hr TSP Monitoring Results at Station AM2**

Monitoring Period				Filter Weight (g)		Flow Rate (m <sup>3</sup> /min)		Elapse Time (hour)		Sampling Time (hours)	Concentration (µg/m <sup>3</sup> )	Weather Condition	Particular weight (g)	Average flow (m <sup>3</sup> /min)	Total volume (m <sup>3</sup> )
From		To		Initial	Final	Initial	Final	Initial	Final						
Date	Time	Date	Time	Initial	Final	Initial	Final	Initial	Final						
27-Jun-07	09:00	27-Jun-07	10:00	2.8239	2.8295	1.0	1.0	9542.03	9543.03	1	97	Cloudy	0.0056	1.0	58
29-Jun-07	09:00	29-Jun-07	10:00	2.8217	2.8289	1.0	1.0	9543.03	9544.03	1	120	Cloudy	0.0072	1.0	60
03-Jul-07	13:00	03-Jul-07	14:00	2.8776	2.8837	1.0	1.0	9568.03	9569.03	1	102	Cloudy	0.0061	1.0	60
04-Jul-07	09:00	04-Jul-07	10:00	2.8822	2.8889	1.0	1.0	9569.03	9570.03	1	109	Cloudy	0.0067	1.0	62
05-Jul-07	13:10	05-Jul-07	14:10	2.9289	2.9353	1.1	1.1	9570.03	9571.03	1	101	Cloudy	0.0064	1.1	64
07-Jul-07	09:00	07-Jul-07	10:00	2.9079	2.9158	1.1	1.1	9595.03	9596.03	1	124	Cloudy	0.0079	1.1	64
09-Jul-07	09:00	09-Jul-07	10:00	2.8877	2.8930	1.1	1.1	9596.03	9597.03	1	83	Cloudy	0.0053	1.1	64
11-Jul-07	09:00	11-Jul-07	10:00	2.9022	2.908	1.0	1.0	9597.03	9598.03	1	94	Cloudy	0.0058	1.0	62
13-Jul-07	09:00	13-Jul-07	10:00	2.8266	2.8341	1.1	1.1	9622.03	9623.03	1	114	Cloudy	0.0075	1.1	66
16-Jul-07	09:00	16-Jul-07	10:00	2.8076	2.8190	1.1	1.1	9623.00	9624.00	1	179	Cloudy	0.0114	1.1	64
17-Jul-07	09:00	17-Jul-07	10:00	2.8256	2.8327	1.0	1.0	9624.03	9625.03	1	115	Cloudy	0.0071	1.0	62
18-Jul-07	13:00	18-Jul-07	14:00	2.8309	2.8431	1.4	1.4	9649.04	9650.04	1	148	Cloudy	0.0122	1.4	83
20-Jul-07	09:00	20-Jul-07	10:00	2.8225	2.8336	1.3	1.3	9650.04	9651.04	1	138	Cloudy	0.0111	1.3	81
23-Jul-07	09:00	23-Jul-07	10:00	2.8195	2.8267	1.0	1.0	9651.04	9652.04	1	117	Sunny	0.0072	1.0	62
25-Jul-07	13:50	25-Jul-07	14:50	2.8076	2.8147	1.0	1.0	9676.04	9677.04	1	119	Sunny	0.0071	1.0	60

**Remarks:** Bold value indicated an Action Level exceedance  
 Bold & Italic value indicated an Limit Level exceedance  
 X - denotes no measurement due to power supply failure  
 \* - denotes measurement by using Dust Trak

**APPENDIX C – AIR QUALITY MONITORING RESULTS (CONT'D)**

**1-hr TSP Monitoring Results at Station AM3**

Monitoring Period				Filter Weight (g)		Flow Rate (m <sup>3</sup> /min)		Elapse Time (hour)		Sampling Time (hours)	Concentration (µg/m <sup>3</sup> )	Weather Condition	Particular weight (g)	Average flow (m <sup>3</sup> /min)	Total volume (m <sup>3</sup> )
From		To		Initial	Final	Initial	Final	Initial	Final						
Date	Time	Date	Time	Initial	Final	Initial	Final	Initial	Final						
27-Jun-07	13:00	27-Jun-07	14:00	-	-	-	-	-	-	1	130 *	Cloudy	-	-	-
29-Jun-07	09:00	29-Jun-07	10:00	2.8253	2.8332	1.1	1.1	11990.17	11991.17	1	119	Cloudy	0.0079	1.1	66
03-Jul-07	13:00	03-Jul-07	14:00	2.8880	2.8955	1.1	1.1	12015.17	12016.15	1	116	Cloudy	0.0075	1.1	65
04-Jul-07	09:00	04-Jul-07	09:59	2.9018	2.9075	1.1	1.1	12016.15	12017.13	1	86	Cloudy	0.0057	1.1	66
05-Jul-07	13:00	05-Jul-07	14:00	2.9306	2.9382	1.0	1.0	12017.13	12018.11	1	125	Cloudy	0.0076	1.0	61
07-Jul-07	x	07-Jul-07	x	x	x	x	x	x	x	x	x	x	x	x	x
09-Jul-07	x	09-Jul-07	x	x	x	x	x	x	x	x	x	x	x	x	x
11-Jul-07	09:00	11-Jul-07	10:00	-	-	-	-	-	-	1	126 *	Cloudy	-	-	-
13-Jul-07	09:00	13-Jul-07	10:00	2.8135	2.8216	1.0	1.0	12042.11	12043.11	1	130	Cloudy	0.0081	1.0	62
16-Jul-07	09:00	16-Jul-07	10:00	2.8315	2.8426	1.1	1.1	12043.11	12044.11	1	174	Cloudy	0.0111	1.1	64
17-Jul-07	09:00	17-Jul-07	10:00	2.8223	2.8290	1.1	1.1	12044.11	12045.11	1	105	Cloudy	0.0067	1.1	64
18-Jul-07	13:00	18-Jul-07	14:00	2.8277	2.8365	1.2	1.2	12069.11	12070.11	1	124	Cloudy	0.0088	1.2	71
20-Jul-07	09:00	20-Jul-07	10:00	2.8153	2.8236	1.2	1.2	12070.11	12071.11	1	117	Cloudy	0.0083	1.2	71
23-Jul-07	09:00	23-Jul-07	10:00	2.8272	2.8339	1.2	1.2	12071.11	12072.11	1	94	Sunny	0.0067	1.2	71
25-Jul-07	13:40	25-Jul-07	14:40	2.8139	2.8205	1.2	1.2	12096.11	12097.11	1	93	Sunny	0.0066	1.2	71

**Remarks:** Bold value indicated an Action Level exceedance  
 Bold & Italic value indicated an Limit Level exceedance  
 X - denotes no measurement due to power supply failure  
 \* - denotes measurement by using Dust Trak

**APPENDIX C – AIR QUALITY MONITORING RESULTS (CONT'D)**

**24-hr TSP Monitoring Results at Station AM1**

Monitoring Period				Filter Weight (g)		Flow Rate (m <sup>3</sup> /min)		Elapse Time (hour)		Sampling Time (hours)	Concentration (µg/m <sup>3</sup> )	Weather Condition	Particular weight (g)	Average flow (m <sup>3</sup> /min)	Total volume (m <sup>3</sup> )
From		To		Initial	Final	Initial	Final	Initial	Final						
Date	Time	Date	Time												
29-Jun-07	13:00	30-Jun-07	13:00	2.8411	2.9032	1.0	1.0	9807.71	9831.71	24	44	Cloudy	0.0621	1.0	1425
05-Jul-07	14:35	06-Jul-07	14:35	2.9156	2.9618	1.0	1.0	9834.71	9858.71	24	31	Cloudy	0.0462	1.0	1498
11-Jul-07	11:30	12-Jul-07	11:30	2.8949	2.9608	1.1	1.1	9861.71	9885.71	24	42	Cloudy	0.0659	1.1	1566
17-Jul-07	12:15	18-Jul-07	12:15	2.8257	2.8838	1.0	1.0	9888.71	9912.71	24	39	Cloudy	0.0581	1.0	1499
23-Jul-07	11:10	24-Jul-07	11:10	2.8120	2.8513	1.0	1.0	9915.72	9939.72	24	26	Sunny	0.0393	1.0	1498

**24-hr TSP Monitoring Results at Station AM2**

Monitoring Period				Filter Weight (g)		Flow Rate (m <sup>3</sup> /min)		Elapse Time (hour)		Sampling Time (hours)	Concentration (µg/m <sup>3</sup> )	Weather Condition	Particular weight (g)	Average flow (m <sup>3</sup> /min)	Total volume (m <sup>3</sup> )
From		To		Initial	Final	Initial	Final	Initial	Final						
Date	Time	Date	Time												
29-Jun-07	13:00	30-Jun-07	13:00	2.8416	2.9245	1.0	1.0	9544.03	9568.03	24	56	Cloudy	0.0829	1.0	1481
05-Jul-07	14:15	06-Jul-07	14:15	2.9008	2.9603	1.0	1.0	9571.03	9595.03	24	40	Cloudy	0.0595	1.0	1481
11-Jul-07	11:10	12-Jul-07	11:10	2.8934	2.9763	1.0	1.0	9598.03	9622.03	24	56	Cloudy	0.0829	1.0	1481
17-Jul-07	11:40	18-Jul-07	11:40	2.8091	2.8799	1.3	1.3	9625.03	9649.04	24	37	Cloudy	0.0708	1.3	1938
23-Jul-07	10:55	24-Jul-07	10:55	2.8131	2.8561	1.1	1.1	9652.04	9676.04	24	28	Sunny	0.0430	1.1	1527

**Remarks:** Bold value indicated an Action Level exceedance  
 Bold & Italic value indicated an Limit Level exceedance  
 X – denotes no measurement due to power supply failure

**APPENDIX C – AIR QUALITY MONITORING RESULTS (CONT'D)**

**24-hr TSP Monitoring Results at Station AM3**

Monitoring Period				Filter Weight (g)		Flow Rate (m <sup>3</sup> /min)		Elapse Time (hour)		Sampling Time (hours)	Concentration (µg/m <sup>3</sup> )	Weather Condition	Particular weight (g)	Average flow (m <sup>3</sup> /min)	Total volume (m <sup>3</sup> )
From		To		Initial	Final	Initial	Final	Initial	Final						
Date	Time	Date	Time	Initial	Final	Initial	Final	Initial	Final						
29-Jun-07	13:00	30-Jun-07	13:00	2.8430	2.9142	1.2	1.2	11991.17	12015.17	24	41	Cloudy	0.0712	1.2	1725
05-Jul-07	14:05	06-Jul-07	14:05	2.8905	2.9538	1.2	1.2	12018.11	12042.11	24	37	Cloudy	0.0633	1.2	1702
11-Jul-07	x	12-Jul-07	x	x	x	x	x	x	x	x	x	x	x	x	x
17-Jul-07	14:01	18-Jul-07	14:01	2.8084	2.9066	1.2	1.2	12045.11	12069.11	24	56	Cloudy	0.0982	1.2	1745
23-Jul-07	10:50	24-Jul-07	10:50	2.8331	2.8931	1.2	1.2	12072.11	12096.11	24	34	Sunny	0.0600	1.2	1745

**Remarks:**    Bold value indicated an Action Level exceedance  
                   Bold & Italic value indicated an Limit Level exceedance  
                   X – denotes no measurement due to power supply failure

Figure C.1 1-hr TSP monitoring results of Monitoring Station AM1

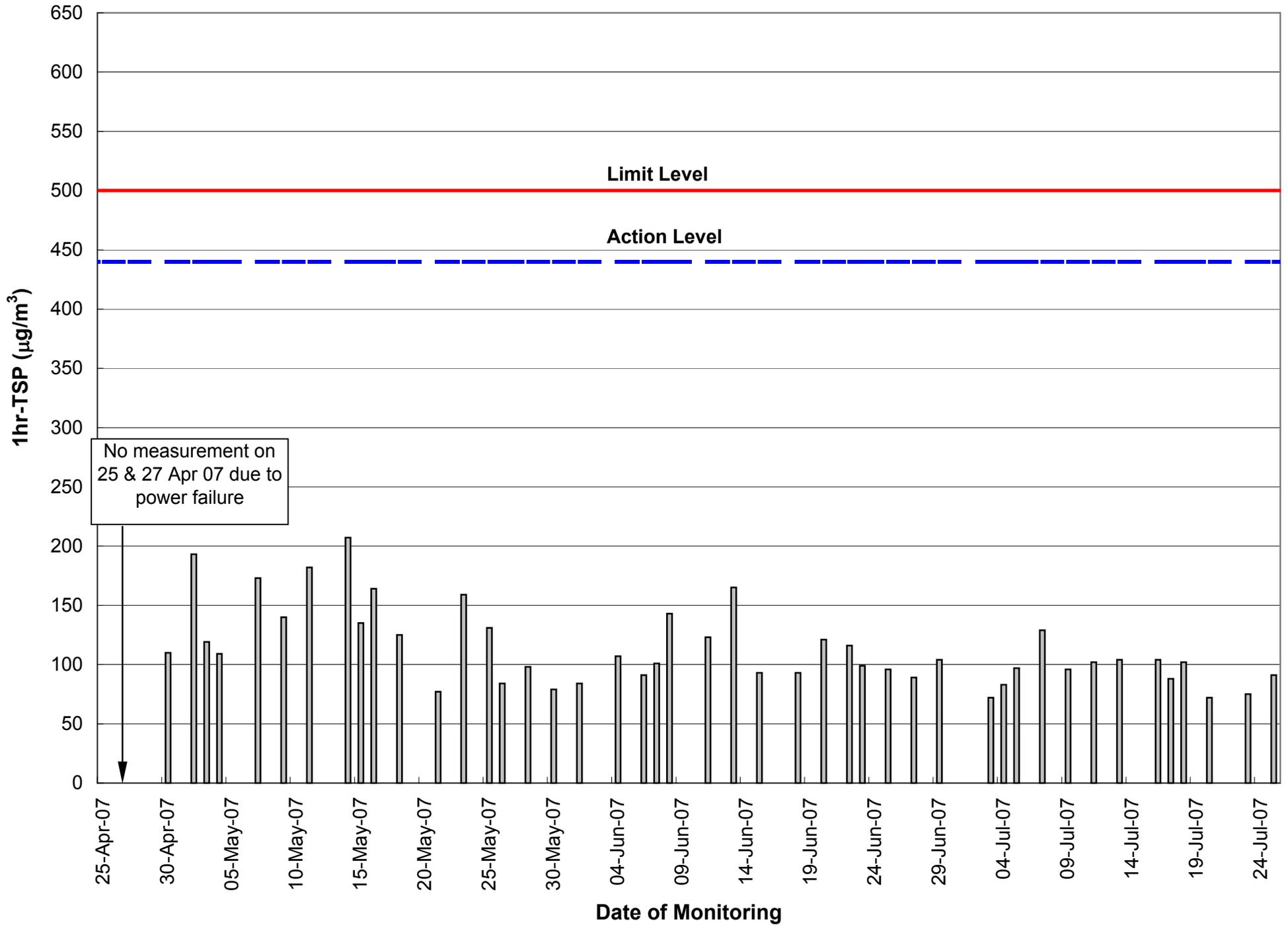


Figure C.2 1-hr TSP monitoring results of Monitoring Station AM2

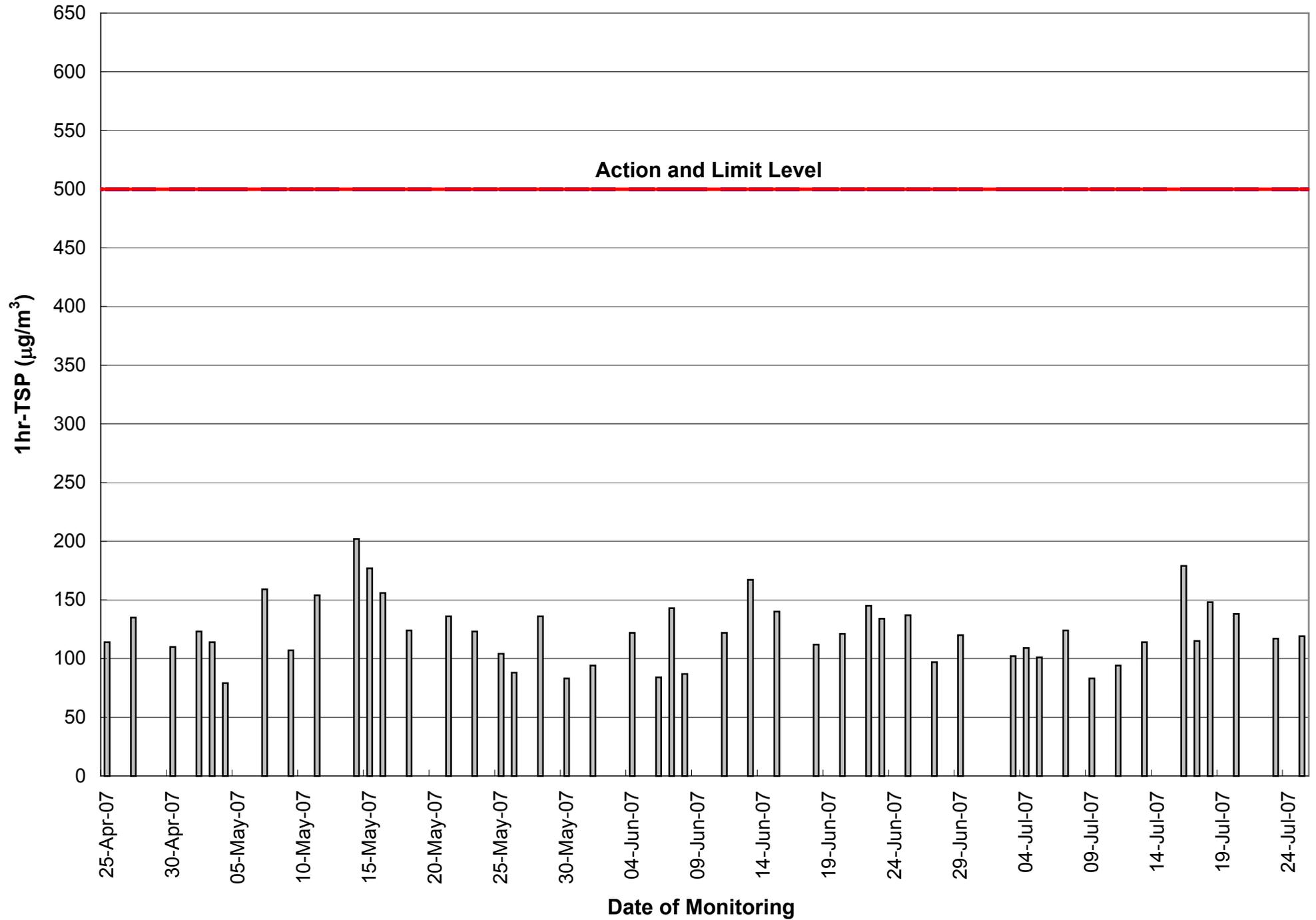


Figure C.3 1-hr TSP monitoring results of Monitoring Station AM3

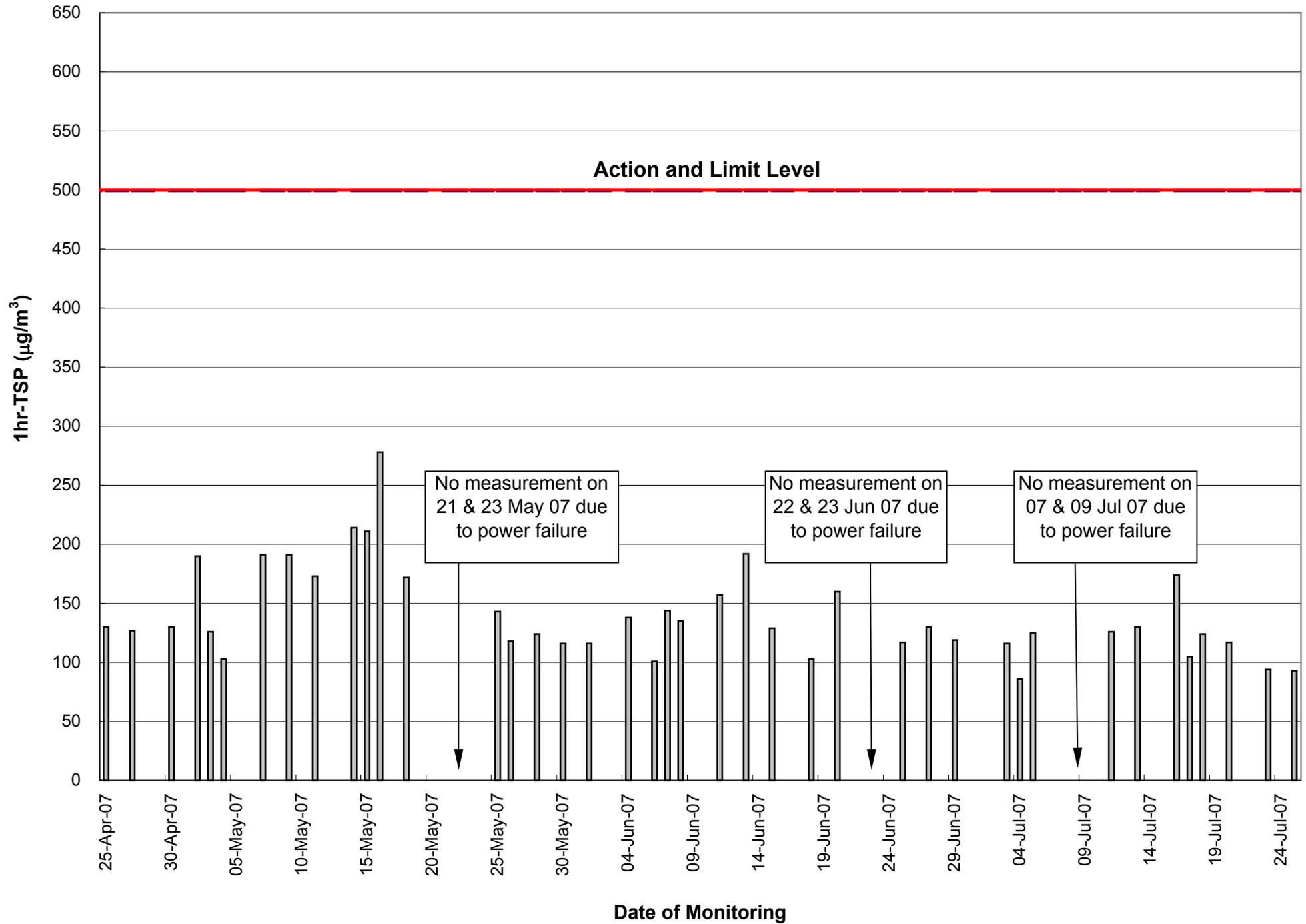
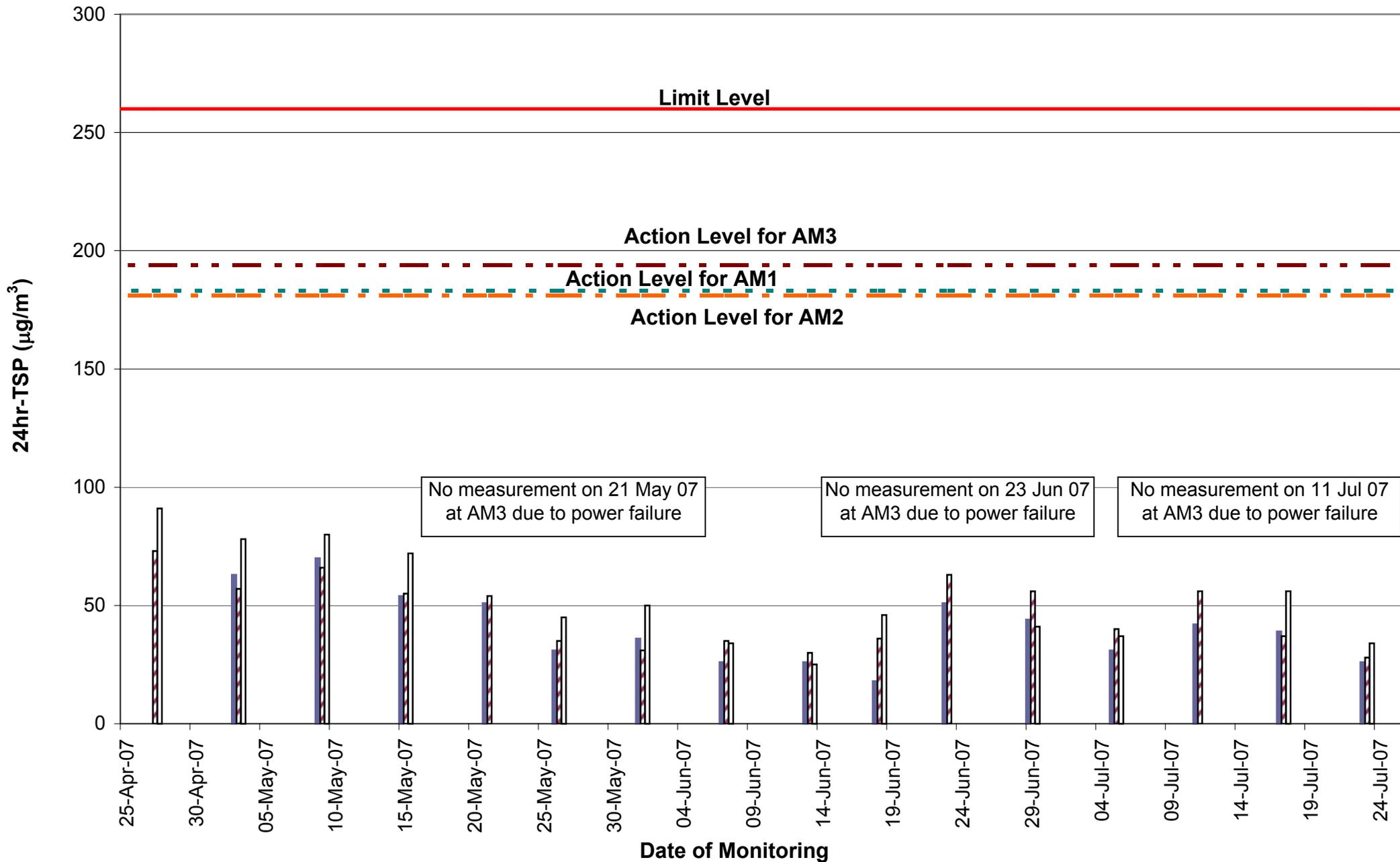


Figure C.4 24-hr TSP monitoring results of Monitoring Station AM1, AM2 & AM3



**APPENDIX D – NOISE MONITORING RESULTS**

**Daytime Noise Monitoring Results at Station CN1**

Date	Weather Condition	Measured Noise Level for 30 mins., dB(A)				Baseline Noise Level, dB(A)	Limit Level, dB(A)	Exceedance (Y/N)
		Time	Leq	L10	L90			
03-Jul-07	Cloudy	11:30	66.3	70.0	64.4	63.2	70	N
09-Jul-07	Cloudy	11:08	61.8	66.1	58.9	63.2	70	N
16-Jul-07	Sunny	16:20	68.8	71.9	64.9	63.2	70	N
23-Jul-07	Sunny	17:30	68.2	71.0	65.1	63.2	70	N

**Daytime Noise Monitoring Results at Station CN2**

Date	Weather Condition	Measured Noise Level for 30 mins., dB(A)				Baseline Noise Level, dB(A)	Limit Level, dB(A)	Exceedance (Y/N)
		Time	Leq	L10	L90			
03-Jul-07	Cloudy	09:15	65.9	68.7	62.3	64.0	75	N
09-Jul-07	Cloudy	13:09	63.7	68.3	62.1	64.0	75	N
16-Jul-07	Sunny	14:15	67.0	69.1	65.5	64.0	75	N
23-Jul-07	Sunny	15:30	66.4	68.9	64.7	64.0	75	N

**Remarks:** Bold & Italic value indicated an Limit Level exceedance

**APPENDIX D – NOISE MONITORING RESULTS (CONT'D)**

**Daytime Noise Monitoring Results at Station CN3**

Date	Weather Condition	Measured Noise Level for 30 mins., dB(A)				Baseline Noise Level, dB(A)	Limit Level, dB(A)	Exceedance (Y/N)
		Time	Leq	L10	L90			
03-Jul-07	Cloudy	09:55	67.8	71.2	65.5	59.3	75	N
09-Jul-07	Cloudy	13:45	58.0	61.2	54.6	59.3	75	N
16-Jul-07	Sunny	15:05	66.3	68.7	63.8	59.3	75	N
23-Jul-07	Sunny	16:10	65.8	68.4	63.6	59.3	75	N

**Daytime Noise Monitoring Results at Station CN4**

Date	Weather Condition	Measured Noise Level for 30 mins., dB(A)				Baseline Noise Level, dB(A)	Limit Level, dB(A)	Exceedance (Y/N)
		Time	Leq	L10	L90			
03-Jul-07	Cloudy	10:40	59.2	62.7	57.4	59.9	75	N
09-Jul-07	Cloudy	14:28	57.5	61.7	53.2	59.9	75	N
16-Jul-07	Sunny	15:50	60.4	64.4	58.8	59.9	75	N
23-Jul-07	Sunny	16:50	61.2	65.0	58.4	59.3	75	N

**Remarks:** Bold & Italic value indicated an Limit Level exceedance

**Fig D.1 - Daytime Noise Monitoring Results of Monitoring Stations NM1, NM2, NM3 & NM4**

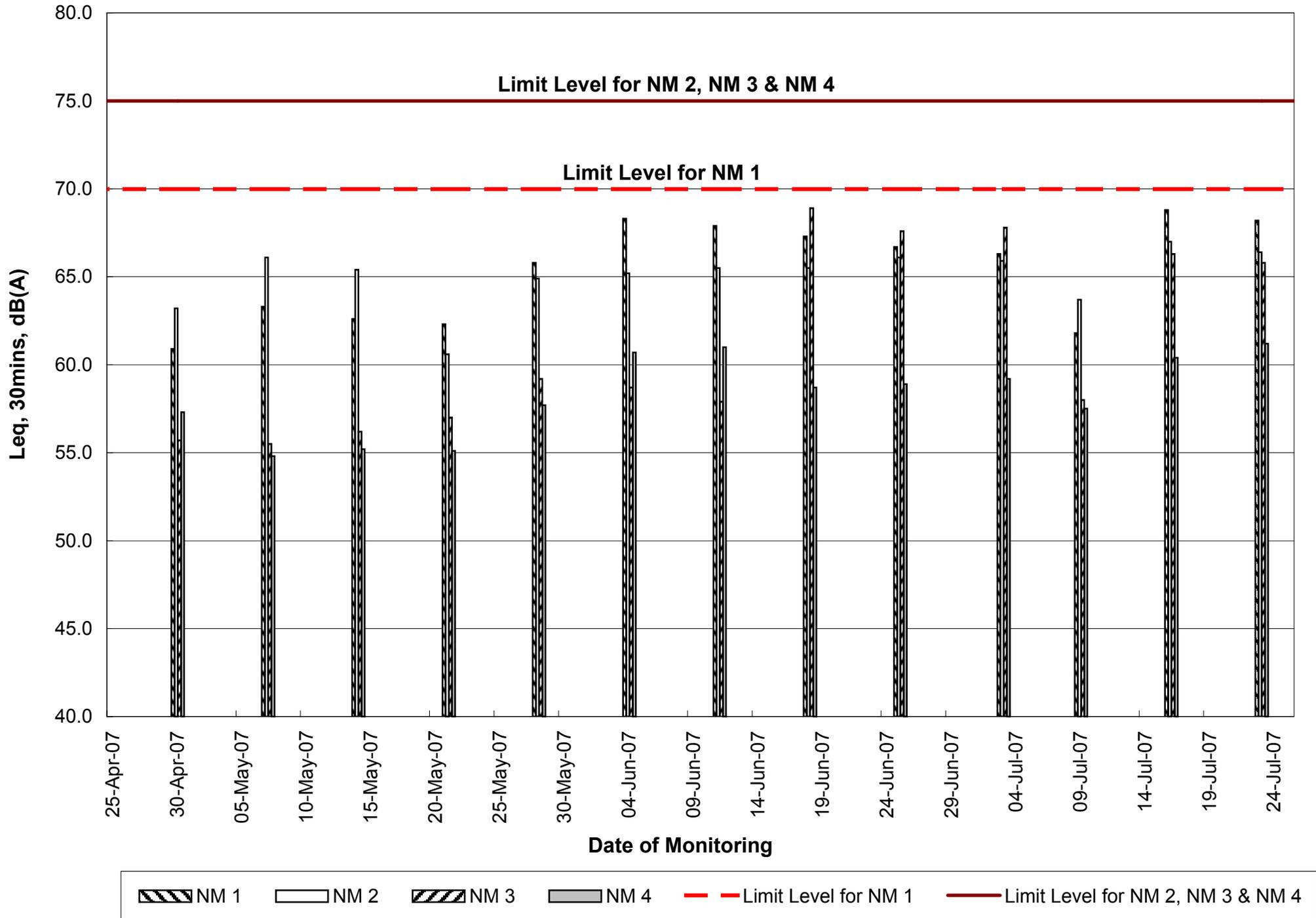


Fig D.2 - Evening Noise Monitoring Results of Monitoring Stations NM1, NM2, NM3 & NM4

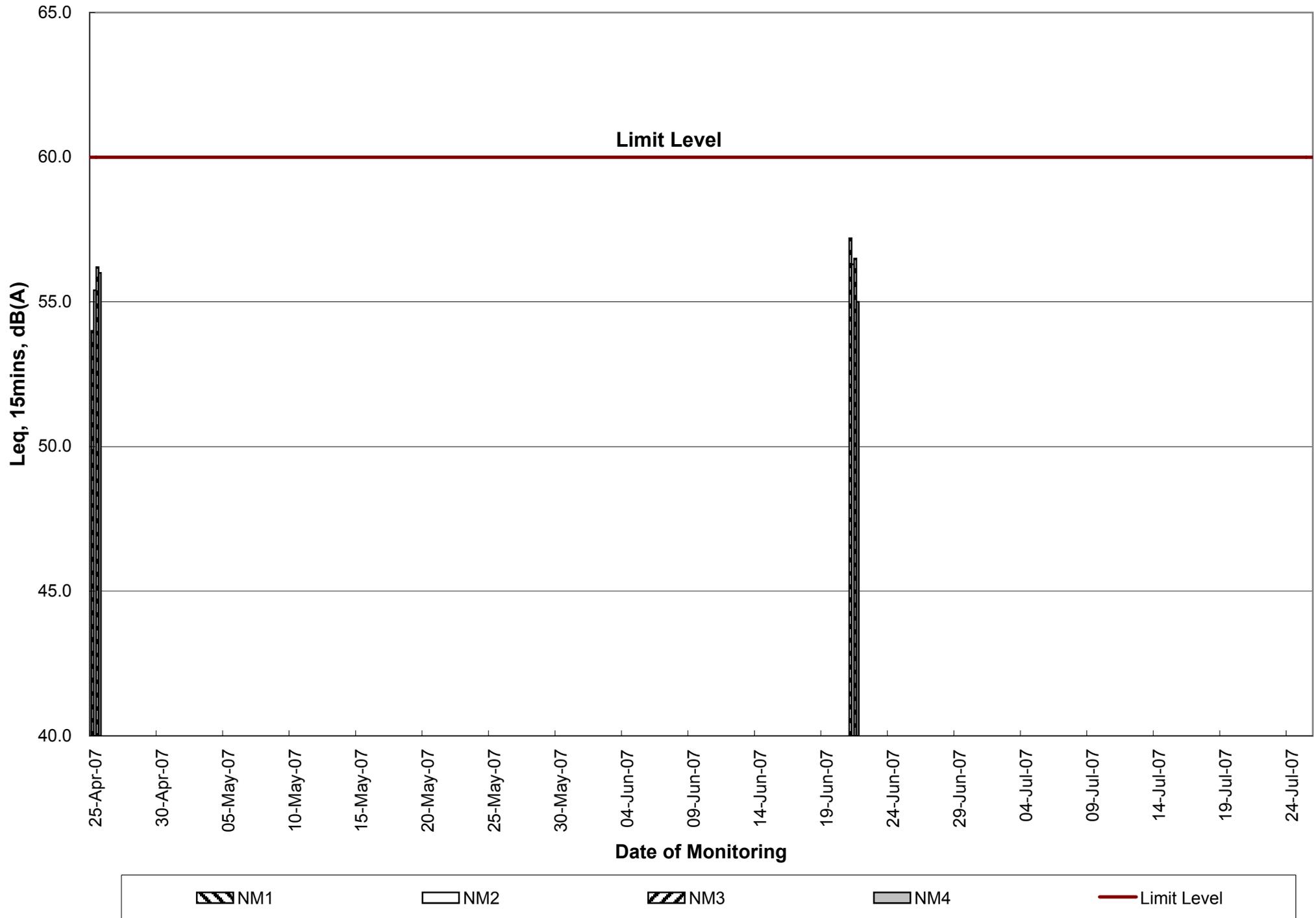
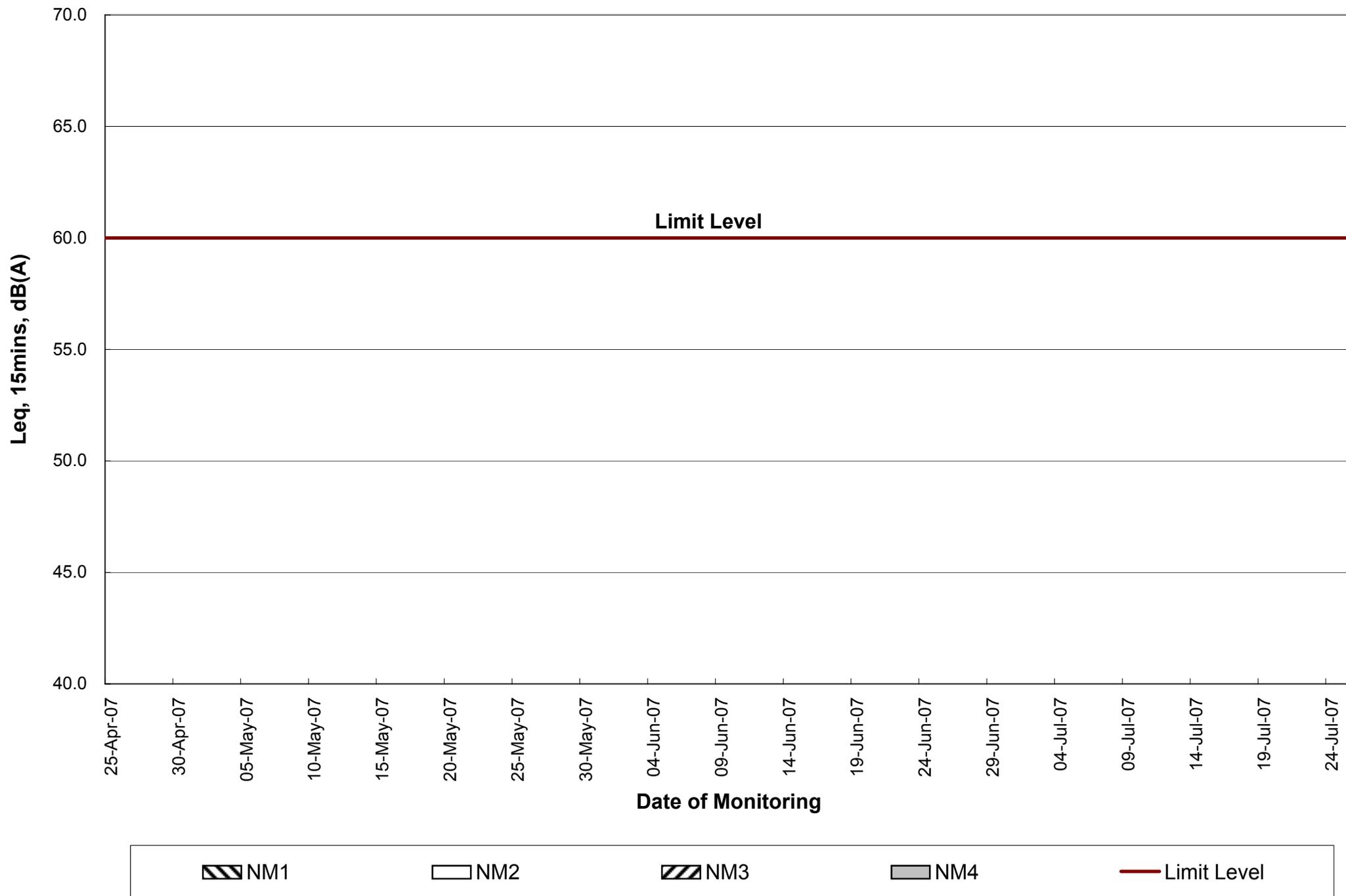


Figure D.3 - Holiday Noise Monitoring Results of Monitoring Stations NM1, NM2, NM3 & NM4



**APPENDIX E – TERRESTRIAL ECOLOGY MONITORING RESULTS**

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## **APPENDIX F – SUBTIDAL MONITORING RESULTS**



**OCEAN PARK CORPORATION MASTER  
REDEVELOPMENT PROJECT**

**CONTRACT NO. CI05**

**SITE FORMATION, FUNICULAR TUNNEL AND  
MISCELLANEOUS WORKS**

**CORAL IMPACT MONITORING  
JULY 2007**

**CLIENT:**

**Dragages-Bouygues Joint Venture**

Ocean Park  
Aberdeen  
Hong Kong

**CHECKED BY:**

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Website: <http://www.lamlab.com>

**APPROVED BY:**

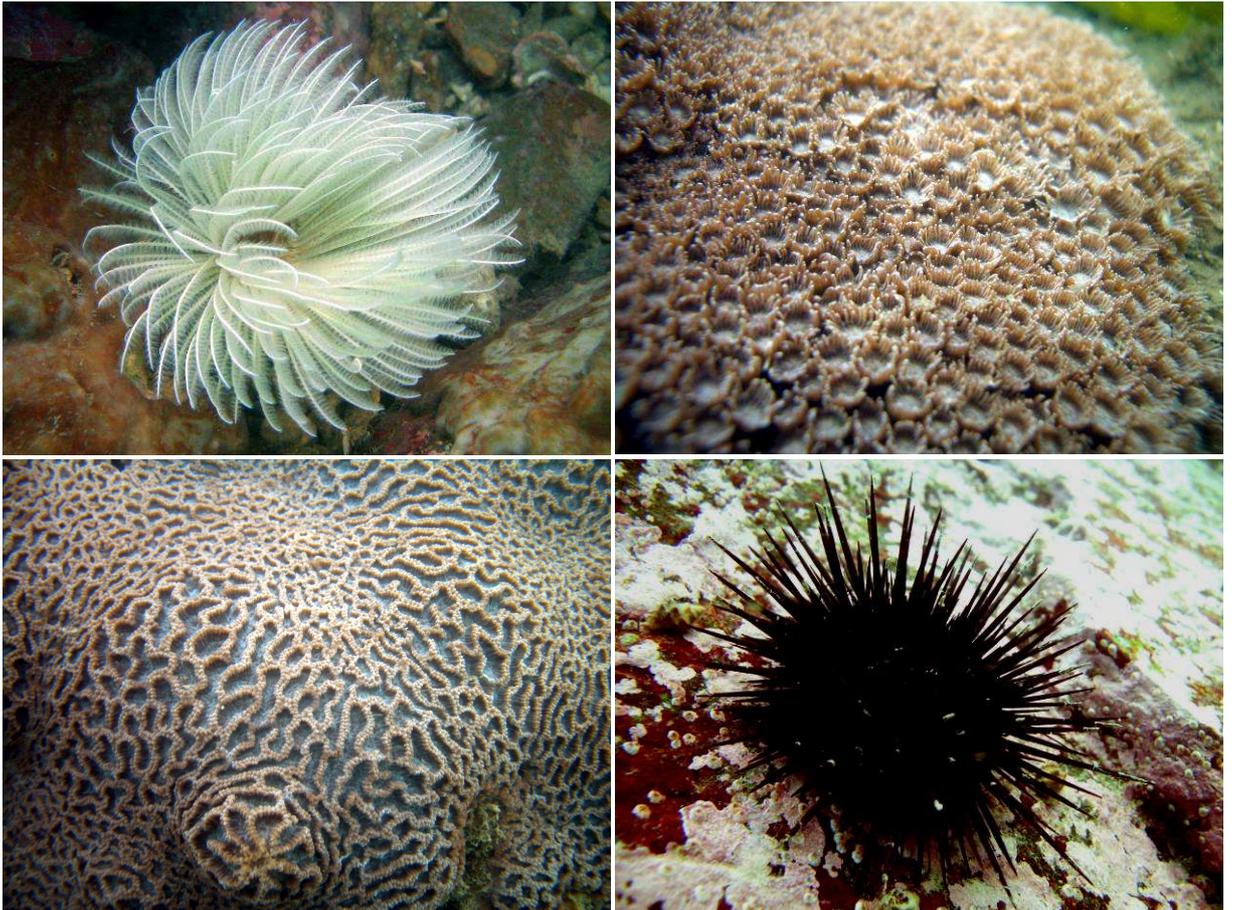
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Raymond Dai  
Project Manager

**DATE:**

27 Jul 2007

**Ocean Park Corporation Master Redevelopment Project**  
**Contract No. C105**  
**Site Formation, Funicular Tunnel and Miscellaneous Works**



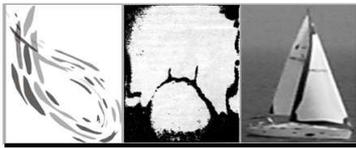
**Report for**  
**Coral Monitoring Survey**

**July 2007**



**miniprojects co. Ltd.**

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Ocean Park Corporation Master Development Project  
Contract No. C105  
Site Formation, Funicular Tunnel and Miscellaneous Works

**miniprojects co. Ltd.**

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**Ocean Park Corporation Master Redevelopment Project**  
**Contract No. C105**  
**Site Formation, Funicular Tunnel and Miscellaneous Works**

**Report for**  
**Coral Monitoring Survey**

**July 2007**

**Prepared by:**  
**miniprojects co. Ltd.**  
**Lam Laboratories Limited**

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### APPENDIX I

Appendices Ia & Ib Photographs of the tagged corals at Site 5 and Control Site C surveyed on 08 July 2007

### APPENDIX II

Appendices IIa-f Photographs of the tagged corals at Sites 1 to 5 and Control Site C surveyed on 21 July 2007

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3.3 Sites 1 to 4 & Control Site C – Physical Conditions.  
3.4 Sites 1 to 4 & Control Site C – Percentage of Sedimentation, Bleaching and Mortality of the Tagged Coral Colonies in Initial Coral Survey (07-12 April 2007) and Monitoring Surveys (16 June & 21 July 2007).  
4.1 Evaluation of Monitoring Results against Action and Limit Levels for Coral Monitoring Survey.

## **1 INTRODUCTION**

### **1.1 Project Background**

- 1.1.1 Ocean Park planned to upgrade and expand the existing area to meet the anticipated visitor demands and to position Ocean Park as a premium tourist attraction and a regional leader in the themed recreational and educational park experience.
- 1.1.2 Lam Laboratories Limited (LAM) has been appointed to formulate a Coral Survey Team to conduct the Marine Ecology Survey for Ocean Park Corporation Master Redevelopment Project Contract No. C105 – Site Formation, Funicular Tunnel and Miscellaneous Works.
- 1.1.3 miniprojects Company Limited (miniprojects co. Ltd.) have been commissioned by LAM to undertake Coral Monitoring Survey on the tagged hard coral colonies at 5 monitoring sites around the construction site and 1 control site for captioned project.
- 1.1.4 This report presents the results of the third and fourth Coral Monitoring Surveys conducted on 08 & 21 July 2007, respectively.

## 2 METHODOLOGY

### 2.1 Impact Monitoring Surveys - Locations

2.1.1 Five locations close to the potential impact areas were identified and designated as Impact Monitoring Sites (Sites 1 to 5; Fig. 2.1). In order to identify background environmental perturbations that are not associated with the construction, St. Stephen Beach, which is away from the impact areas, was designated as the Control Site (Control Site C; Fig. 2.1). Locations (GPS coordinates) of the 5 Impact Monitoring Sites and the Control Site, and conditions during the surveys are summarized in Tables 3.1 and 3.3.

### 2.2 Monitoring Requirements

2.2.1 The construction phase coral monitoring programme comprises an Initial Survey and Coral Tagging Exercise and Impact Monitoring Surveys. Initial Survey and Coral Tagging Exercise were completed on 07- 12 April 2007.

2.2.2 Impact monitoring aims to determine whether impacts are occurring on tagged corals during the period of construction works. A particular focus of the Impact Monitoring is the effects of sedimentation on corals.

2.2.3 As required in the EM&A manual, coral monitoring at Site 5 and Control Site C should be conducted twice a month at first 3 months of the construction, while Site 1 to Site 4, and Control Site C should be monitored monthly during the first 2 months of the construction works. The first two monitoring surveys were conducted in June and the schedule is summarized as follow,

	Impact Monitoring Date	
	08 Jul 07	21 Jul 07
Site 1		✓
Site 2		✓
Site 3		✓
Site 4		✓
Site 5	✓	✓
Control Site C	✓	✓

2.2.4 At each of the Impact Monitoring and Control Sites, 10 hard coral colonies were tagged for continuous monitoring over the course of construction phase. Dive surveys were conducted to record the health status of the tagged corals, including area of bleaching and partial mortality. Level of sedimentation on the tagged colonies was also recorded as percentage of sediment cover and approximate thickness of sediment on the colony and on adjacent hard substrate.

2.2.5 The condition of each tagged coral colony was recorded by taking photographs that best represents the entire colony. General physical parameters were recorded for each survey site, including visibility, weather, tidal conditions and water current.

2.2.6 The results of the impact monitoring surveys were reviewed with reference to finding of the Initial Coral Survey and the data from Control Site C collected during the Coral Monitoring.

### 2.3 Compliance / Event Action Plan

2.3.1 Coral monitoring results were evaluated against Action and Limit Levels. Evaluation were based on recorded changes in,

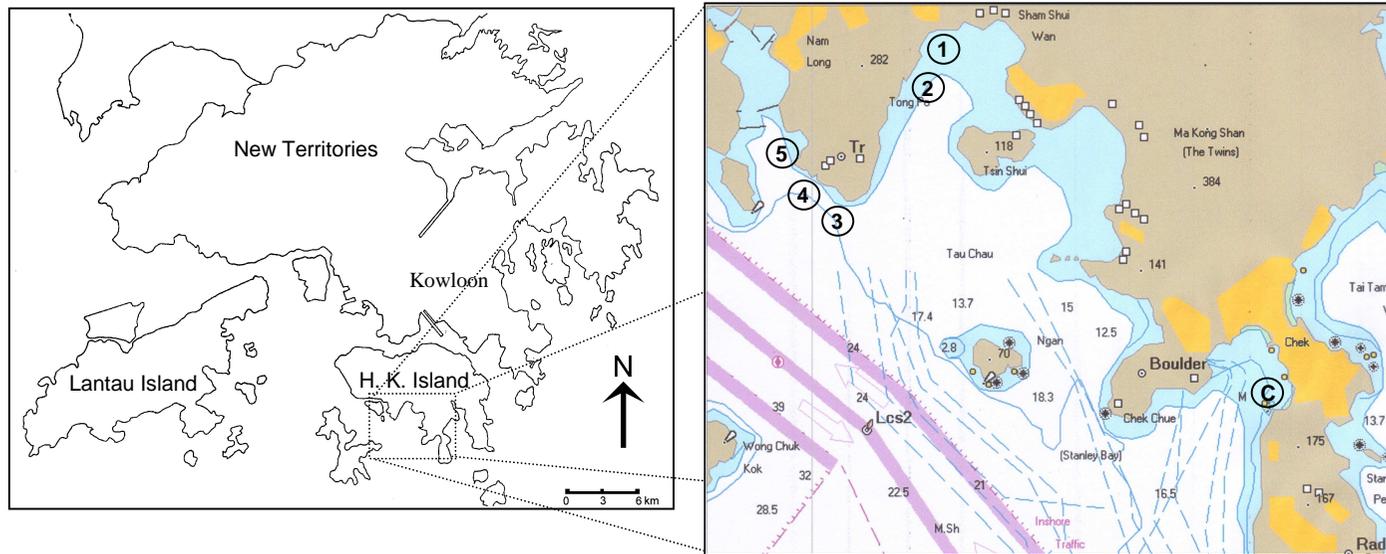
- Percentage of partial mortality
- Percentage of sediment cover
- Percentage of bleaching

2.3.2 Action and Limit Levels are defined in Table 2.1

**Table 2.1 Action and Limit Level for Coral Monitoring**

<b>Parameter</b>	<b>Action Level Definition</b>	<b>Limit Level Definition</b>
Sedimentation	If during Impact Monitoring a 15% increase in the percentage of sediment cover on hard corals occurs at more than 20% of the tagged coral at any one Impact Monitoring Site that is not recorded at the Control Site, then the Action Level is exceeded.	If during the Impact Monitoring a 25% increase in the percentage of sediment cover occurs at more than 20% of the tagged coral at any one Impact Monitoring Site that is not recorded at the Control Site, then the Limit Level is exceeded.
Bleaching	If during Impact Monitoring a 15% increase in the percentage of bleaching (bleached white) on hard corals occurs at more than 20% of the tagged coral at any one Impact Monitoring Site that is not recorded at the Control Site, then the Action Level is exceeded.	If during the Impact Monitoring a 25% increase in the percentage of bleaching (bleached white) occurs at more than 20% of the tagged coral at any one Impact Monitoring Site that is not recorded at the Control Site, then the Limit Level is exceeded.
Mortality	If during Impact Monitoring a 15% increase in the percentage of partial mortality on hard corals occurs at more than 20% of the tagged coral at any one Impact Monitoring Site that is not recorded at the Control Site, then the Action Level is exceeded.	If during the Impact Monitoring a 25% increase in the percentage of partial mortality occurs at more than 20% of the tagged coral at any one Impact Monitoring Site that is not recorded at the Control Site, then the Limit Level is exceeded.

2.3.3 If the defined Action Level or Limit Levels for coral monitoring were exceeded, the stepwise procedures should be implemented in accordance to the EM&A manual to reverse the unfavourable impact on the coral communities.



**Fig. 2.1 Map Showing the Locations of the 5 Impact Monitoring Sites (1 to 5) and the Control Site (C).**

### 3 RESULTS

#### 3.1 Site 5 & Control Site C - Survey date: 08 & 21 July 2007

- 3.1.1 Site 5 and Control Site C were monitored twice in July 2007. The survey dates and physical conditions of each site are summarized in Table 3.1.
- 3.1.2 Underwater visibilities of the Control Site C were extremely low during 08 and 21 July 2007 surveys, mainly due to the lasting hot and sunny weather in July that caused algal blooming. Sedimentation on hard substratum was relatively high at the Control Site C.

**Table 3.1 Site 5 & Control Site C – Physical Conditions.**

Site	Site 5		Control Site C	
<b>GPS Coordinates</b>	N 22°14'01.9" E 114°09'59.3"		N 22°12'48.3" E 114°12'51.2"	
<b>Date</b>	08 Jul 07	21 Jul 07	08 Jul 07	21 Jul 07
<b>Sedimentation on Rock surfaces (mm)</b>	0-2	0-2	0-3	0-3
<b>Visibility (m)</b>	2-3	2-3	0.2-0.3	0.2-0.5
<b>Weather</b>	Calm, Sunny	Calm, Sunny	Calm, Sunny	Calm, Sunny
<b>Tide</b>	Flood	Flood	Flood	Flood
<b>Current (Knot)</b>	0-0.5	0-0.5	0-0.5	0-0.5
<b>Remark</b>	-	-	-	-

- 3.1.3 Percentages of sedimentation, bleaching and mortality of each tagged colony are presented in Table 3.2. Photographs of each coral taken on 08 and 21 July 2007 were illustrated in Appendix I (a & b) and II (a-f), respectively. Low visibility resulted in difficulties in taking clear pictures at the Control Site C, the survey team had already selected photographs that best represent the conditions of the colonies.

#### Site 5

- 3.1.4 On 08 July 2007, increased sedimentation cover was recorded on 5 colonies (D03, D04, D06, D07 & D08), ranged from 1 to 6%. Increase in bleaching was recorded on 2 colonies (D05 & D06) by 3 to 4%. Partial mortality (5%) was observed on one colony (D04), and no increase in partial mortality was observed on 2 colonies (D05 & D06) (Table 3.2).
- 3.1.5 On 21 July 2007, increased sedimentation cover was recorded on 5 colonies (D03, D04, D06, D07 & D08), ranged from 2 to 9%. Increase in bleaching was recorded on 2 colonies (D05 & D06) by 3 to 4%. Partial mortality (5%) was observed on one colony (D04), and no increase in partial mortality was observed on 2 colonies (D05 & D06) (Table 3.2).

#### Control Site C

- 3.1.6 On 08 July 2007, increased sedimentation cover was recorded on 6 colonies (F01, F02, F03, F06, F08a & F08b), ranged from 1 to 6%. Increased bleaching was recorded on 3 colonies (F02, F06 & F09), ranged from 1 to 2%. Partial

mortality was recorded on 2 colonies (F02 & F09), and no increase in partial mortality was observed on 2 colonies (F04 & F05) (Table 3.2).

- 3.1.7 On 21 July 2007, increased sedimentation cover was recorded on 7 colonies (F01, F02, F03, F04, F05, F08a & F08b), ranged from 1 to 6%. Increased bleaching was recorded on 3 colonies (F02, F06 & F09), ranged from 1 to 2%. Partial mortality was recorded on 2 colonies (F02 & F09), and no increase in partial mortality was observed on 2 colonies (F04 & F05) (Table 3.2).

**Table 3.2 Site 5 & Control Site C - Percentage of Sedimentation, Bleaching and Mortality of the Tagged Coral Colonies in Initial Coral Survey (7-12 April 07) and Monitoring Surveys (16 June, 08 & 21 July 07). “▲” and “▼” indicate increased and decreased in percentage, respectively, when compared with the Initial Coral Survey.**

**Site 5**

Code	Coral Species	Area (cm <sup>2</sup> )	Sedimentation (% , mm)				Bleaching (%)				Mortality (%)			
			Apr 07	16 Jun 07	08 Jul 07	21 Jul 07	Apr 07	16 Jun 07	08 Jul 07	21 Jul 07	Apr 07	16 Jun 07	08 Jul 07	21 Jul 07
D01	<i>Psammocora</i> sp.	600	10, 1	8, 1 ▼	2, 1 ▼	5, 1 ▼	0	0	0	0	0	0	0	0
D02	<i>Montipora cf. turgescens</i>	100	6, 1	4, 1 ▼	0, 0 ▼	1, 1 ▼	0	0	0	0	0	0	0	0
D03	<i>Goniopora stutchburyi</i>	400	0, 0	0, 0	1, 1 ▲	2, 1 ▲	0	0	0	0	0	0	0	0
D04	<i>Leptastrea pruinosa</i>	500	4, 1	8, 1 ▲	10, 1 ▲	13, 1 ▲	0	0	0	0	0	0	5 ▲	5 ▲
D05	<i>Porites</i> sp.	400	5, 1	5, 1	5, 1	5, 1	1	3 ▲	5 ▲	5 ▲	4	4	4	4
D06	<i>Plesiastrea versipora</i>	1000	0, 0	0, 0	2, 1 ▲	2, 1 ▲	0	1 ▲	2 ▲	2 ▲	5	5	5	5
D07	<i>Leptastrea pruinosa</i>	800	0, 0	3, 1 ▲	1, 1 ▲	3, 1 ▲	0	0	0	0	0	0	0	0
D08	<i>Plesiastrea versipora</i>	100	0, 0	0, 0	3, 1 ▲	3, 1 ▲	0	0	0	0	0	0	0	0
D09	<i>Leptastrea pruinosa</i> *	150	5, 1	5, 1	5, 1	5, 1	0	0	0	0	0	0	0	0
D10	<i>Montipora cf. turgescens</i>	200	0, 0	0, 0	0, 0	0, 0	0	0	0	0	0	0	0	0

\*D09 was mistakenly identified as *Cyphastrea* sp..

**Control Site C**

Code	Coral Species	Area (cm <sup>2</sup> )	Sedimentation (% , mm)				Bleaching (%)				Mortality (%)			
			Apr 07	16 Jun 07	08 Jul 07	21 Jul 07	Apr 07	16 Jun 07	08 Jul 07	21 Jul 07	Apr 07	16 Jun 07	08 Jul 07	21 Jul 07
F01	<i>Favia speciosa</i>	900	0, 0	1, 1 ▲	3, 1 ▲	3, 1 ▲	0	0	0	0	0	0	0	0
F02	<i>Favites pentagona</i>	1000	4, 1	6, 1 ▲	10, 2 ▲	10, 2 ▲	0	0	2 ▲	2 ▲	0	0	1 ▲	1 ▲
F03	<i>Favites pentagona</i>	800	0, 0	0, 0	2, 1 ▲	2, 1 ▲	0	0	0	0	0	0	0	0
F04	<i>Porites</i> sp.	800	5, 1	7, 1 ▲	5, 1	8, 2 ▲	4	4	2 ▼	2 ▼	4	4	4	4
F05	<i>Cyphastrea serailia</i>	800	4, 1	3, 1 ▼	3, 1 ▼	5, 1 ▲	0	0	0	0	1	1	1	1
F06	<i>Psammocora</i> sp.	1800	0, 0	3, 1 ▲	3, 1 ▲	0, 0	0	0	1 ▲	1 ▲	0	0	0	0
F07	<i>Plesiastrea versipora</i>	3000	0, 0	0, 0	0, 0	0, 0	0	0	0	0	0	0	0	0
F08a	<i>Favia speciosa</i>	150	0, 0	3, 1 ▲	3, 1 ▲	3, 1 ▲	0	0	0	0	0	0	0	0
F08b	<i>Goniastrea favulus</i>	300	0, 0	0, 0	1, 1 ▲	1, 1 ▲	0	0	0	0	0	0	0	0
F09	<i>Favites pentagona</i>	1800	10, 1	6, 1 ▼	6, 1 ▼	6, 1 ▼	0	0	1 ▲	1 ▲	0	0	1 ▲	1 ▲
F10	<i>Platygyra carnosus</i>	2800	0, 0	0, 0	0, 0	0, 0	0	0	0	0	0	0	0	0

### 3.2 Sites 1 to 4 & Control Site C - Survey date: 21 July 2007

3.2.1 Sites 1 to 4 were monitored once on 21 July 2007. The physical conditions during the survey were shown in Table 3.3 and compared with the Control Site C on the same day survey

**Table 3.3 Site 1 to Site 4 & Control Site C – Physical Conditions.**

Site	Site 1	Site 2	Site 3	Site 4	Control Site C
<b>GPS Coordinates</b>	N 22°14'34.1" E 114°10'43.6"	N 22°14'25.39" E 114°10'37.2"	N 22°13'49.3" E 114°10'14.2"	N 22°13'53.3" E 114°10'07.3"	N 22°12'48.3" E 114°12'51.2"
<b>Date</b>	21 July 07				
<b>Sedimentation on Rock surfaces (mm)</b>	0-2	0-2	0-1	0-1	0-3
<b>Visibility (m)</b>	1-1.5	1-1.5	1-2.5	1-2.5	0.2-0.5
<b>Weather</b>	Calm, Sunny				
<b>Tide</b>	Ebb & Flood				
<b>Current (Knot)</b>	0-0.5	0-0.5	0-0.5	0.5	0-0.5

3.2.2 Percentages of sedimentation, bleaching and mortality of each tagged colony are presented in Table 3.4. Photographs of each coral are shown in Appendix II.

3.2.3 Among the 4 Monitoring sites (Sites 1 to 4), increase (1 to 5 %) in sedimentation was observed in 14 colonies.

3.2.4 Among the 4 Monitoring sites (Sites 1 to 4), decrease (1 to 8%) in sedimentation was observed in 8 colonies (Table 3.4).

3.2.5 Among the 4 Monitoring sites (Sites 1 to 4), increase (1 to 5%) in bleaching was observed in 5 colonies. Increase in bleaching was observed in 3 colonies in the Control Site C (Table 3.4).

3.2.6 Among the 4 Monitoring sites (Sites 1 to 4), no increase in partial mortality was observed (Table 3.4).

**Table 3.4 Site 1 to Site 4 & Control Site C - Percentage of Sedimentation, Bleaching and Mortality of the Tagged Coral Colonies in Initial Coral Survey (07-12 April 07) and Monitoring Surveys (16 June & 21 July 07). “▲” and “▼” indicate increased and decreased in percentage, respectively, when compared with the Initial Coral Survey.**

**Site 1**

Code	Coral Species	Area (cm <sup>2</sup> )	Sedimentation (% , mm)			Bleaching (%)			Mortality (%)		
			Apr 07	16 Jun 07	21 Jul 07	Apr 07	16 Jun 07	21 Jul 07	Apr 07	16 Jun 07	21 Jul 07
A01	<i>Platygyra carnosus</i>	1000	0, 0	0, 0	0, 0	0	0	0	0	0	0
A02	<i>Platygyra carnosus</i>	2000	0, 0	0, 0	0, 0	0	0	0	0	0	0
A03	<i>Favites pentagona</i>	200	0, 0	0, 0	2, 1▲	0	0	0	0	0	0
A04	<i>Leptastrea pruinosa</i>	400	5, 1	4, 1▼	4, 1▼	0	0	0	0	0	0
A05	<i>Platygyra carnosus</i>	1200	0, 0	0, 0	0, 0	0	0	0	5	5	5
A06	<i>Platygyra carnosus</i>	1600	0, 0	3, 1▲	0, 0	0	0	1▲	0	0	0
A07	<i>Favia rotumana</i>	800	5,1	8, 1▲	5, 1	0	0	0	0	0	0
A08	<i>Platygyra carnosus</i>	1000	0, 0	0, 0	0, 0	0	0	0	0	0	0
A09	<i>Platygyra carnosus</i>	350	0, 0	0, 0	0, 0	0	0	1▲	0	0	0
A10	<i>Platygyra carnosus</i>	700	0, 0	0, 0	2, 1▲	0	0	0	0	0	0

**Site 2**

Code	Coral Species	Area (cm <sup>2</sup> )	Sedimentation (% , mm)			Bleaching (%)			Mortality (%)		
			Apr 07	16 Jun 07	21 Jul 07	Apr 07	16 Jun 07	21 Jul 07	Apr 07	16 Jun 07	21 Jul 07
B01	<i>Platygyra carnosus</i>	450	0, 0	0, 0	0, 0	0	0	0	0	0	0
B02	<i>Plesiastrea versipora</i>	300	0, 0	0, 0	0, 0	0	0	0	0	0	0
B03	<i>Psammocora superficialis</i>	1000	5, 1	5, 1	3, 1▼	0	0	0	0	0	0
B04	<i>Favia speciosa</i>	300	4, 1	7, 1▲	2, 1▼	0	0	0	0	0	0
B05	<i>Plesiastrea versipora</i>	900	3, 1	5, 1▲	3, 1	0	0	0	0	0	0
B06	<i>Platygyra carnosus</i>	600	0, 0	0, 0	1, 1▲	0	0	0	0	0	0
B07	<i>Cyphastrea serailia</i>	700	0, 0	1, 1▲	0, 0	0	0	0	0	0	0
B08	<i>Plesiastrea versipora</i>	1200	0, 0	0, 0	1, 1▲	0	0	0	0	0	0
B09	<i>Favites pentagona</i>	600	0, 0	0, 0	1, 1▲	0	0	0	0	0	0
B10	<i>Favites pentagona</i>	400	0, 0	30, 2▲	3, 1▲	0	0	2▲	0	0	0

**Site 3**

Code	Coral Species	Area (cm <sup>2</sup> )	Sedimentation (% , mm)			Bleaching (%)			Mortality (%)		
			Apr 07	16 Jun 07	21 Jul 07	Apr 07	16 Jun 07	21 Jul 07	Apr 07	16 Jun 07	21 Jul 07
C01	<i>Platygyra acuta</i>	2000	0, 0	0, 0	0, 0	0	0	0	0	0	0
C02	<i>Platygyra carnosus</i>	1000	0, 0	0, 0	0, 0	0	0	0	0	0	0
C03	<i>Porites sp.</i>	400	5, 1	6, 1▲	10, 1▲	0	0	0	1	1	1
C04	<i>Cyphastrea serailia</i>	600	4, 1	5, 1▲	5, 1▲	0	0	0	0	0	0
C05	<i>Pavona decussata</i>	600	0, 0	0, 0	0, 0	0	0	0	0	0	0
C06	<i>Pavona decussata</i>	1200	0, 0	0, 0	0, 0	0	0	0	0	0	0
C07	<i>Montipora cf. turgescens</i>	200	2, 1	6, 1▲	1, 1▼	0	3▲	0	0	0	0
C08	<i>Favia favius</i>	600	4, 1	2, 1▼	5, 1▲	0	0	0	4	4	4
C09	<i>Favites pentagona</i>	150	1, 1	1, 1	1, 1	0	0	0	0	0	0
C10	<i>Montipora peltiformis</i>	300	0, 0	0, 0	0, 0	0	5▲	5▲	0	0	0

**Table 3.4 con't...**

**Site 4**

Code	Coral Species	Area (cm <sup>2</sup> )	Sedimentation (% , mm)			Bleaching (%)			Mortality (%)		
			Apr 07	16 Jun 07	21 Jul 07	Apr 07	16 Jun 07	21 Jul 07	Apr 07	16 Jun 07	21 Jul 07
E01	<i>Goniopora stutchburyi</i>	300	0, 0	4, 1 ▲	5, 1 ▲	0	0	0	0	0	0
E02	<i>Goniopora stutchburyi</i>	200	0, 0	2, 1 ▲	2, 1 ▲	0	0	0	0	0	0
E03	<i>Goniopora stutchburyi</i>	150	0, 0	2, 1 ▲	2, 1 ▲	0	0	0	0	0	0
E04	<i>Porites sp.</i>	400	5, 1	5, 1	2, 1 ▼	0	0	0	0	0	0
E05	<i>Goniopora stutchburyi</i>	300	0, 0	3, 1 ▲	3, 1 ▲	0	0	0	0	0	0
E06	<i>Goniopora stutchburyi</i>	450	0, 0	0, 0	0, 0	0	0	0	0	0	0
E07	<i>Favia speciosa</i>	600	10, 1	3, 1 ▼	2, 1 ▼	0	0	0	0	0	0
E08	<i>Porites sp.</i>	150	0, 0	0, 0	0, 0	0	0	0	4	4	4
E09	<i>Porites sp.</i>	200	8, 1	6, 1 ▼	4, 1 ▼	0	0	2 ▲	4	4	4
E10	<i>Porites sp.</i>	500	0, 0	0, 0	2, 1 ▲	3	3	3	0	0	0

**Control Site C**

Code	Coral Species	Area (cm <sup>2</sup> )	Sedimentation (% , mm)			Bleaching (%)			Mortality (%)		
			Apr 07	16 Jun 07	21 Jul 07	Apr 07	16 Jun 07	21 Jul 07	Apr 07	16 Jun 07	21 Jul 07
F01	<i>Favia speciosa</i>	900	0, 0	1, 1 ▲	3, 1 ▲	0	0	0	0	0	0
F02	<i>Favites pentagona</i>	1000	4, 1	6, 1 ▲	10, 2 ▲	0	0	2 ▲	0	0	1 ▲
F03	<i>Favites pentagona</i>	800	0, 0	0, 0	2, 1 ▲	0	0	0	0	0	0
F04	<i>Porites sp.</i>	800	5, 1	7, 1 ▲	8, 2 ▲	4	4	2 ▼	4	4	4
F05	<i>Cyphastrea serailia</i>	800	4, 1	3, 1 ▼	5, 1 ▲	0	0	0	1	1	1
F06	<i>Psammocora sp.</i>	1800	0, 0	3, 1 ▲	0, 0	0	0	1 ▲	0	0	0
F07	<i>Plesiastrea versipora</i>	3000	0, 0	0, 0	0, 0	0	0	0	0	0	0
F08a	<i>Favia speciosa</i>	150	0, 0	3, 1 ▲	3, 1 ▲	0	0	0	0	0	0
F08b	<i>Goniastrea favulus</i>	300	0, 0	0, 0	1, 1 ▲	0	0	0	0	0	0
F09	<i>Favites pentagona</i>	1800	10, 1	6, 1 ▼	6, 1 ▼	0	0	1 ▲	0	0	1 ▲
F10	<i>Platygyra carnosus</i>	2800	0, 0	0, 0	0, 0	0	0	0	0	0	0

## 4 SUMMARY AND CONCLUSION

### 4.1 Summary – Monitoring Surveys

4.1.1 Sediment cover, bleaching and mortality on some of the tagged colonies from all the 5 Monitoring Sites and 1 Control Site increased (1 to 9%) when compared with the Initial Survey conducted on 07 to 12 April 2007. The enhanced sedimentation was believed to be contributed by multiple environmental factors, such as the lasting hot weather and southwest wind in July.

4.1.2 The data from the two monitoring surveys (08 and 21 July 2007) showed no significant enhancement in sedimentation in Site 5 and the other 4 Monitoring Sites when compared with the Control Site C. Hence, no adverse impact by the construction activity on the coral community was evidenced.

## 4.2 Compliance / Event Action Plan

- 4.2.1 The monitoring results were evaluated against the Action and Limit Levels as defined in the EM&A manual, and is summarized in Table 4.1
- 4.2.2 Overall, the healthy status of the tagged coral colonies was normal, with low to medium levels of sedimentation. Low levels of bleaching and mortality were observed in both Monitoring and Control Sites. Neither action/limit level of sedimentation, bleaching or mortality was exceeded in the two monitoring surveys conducted in July 2007 (Table 4.1).

**Table 4.1 Evaluation of Monitoring Results against Action and Limit Level for Coral Monitoring Survey.** Note Definition of Action/Limit levels are listed in Table 2.1. “No” indicates NO exceedance.

### 08 July 2007

Exceedance Site	Sedimentation		Bleaching		Mortality	
	Action Level	Limit Level	Action Level	Limit Level	Action Level	Limit Level
Site 5	No	No	No	No	No	No
Control Site C	No	No	No	No	No	No

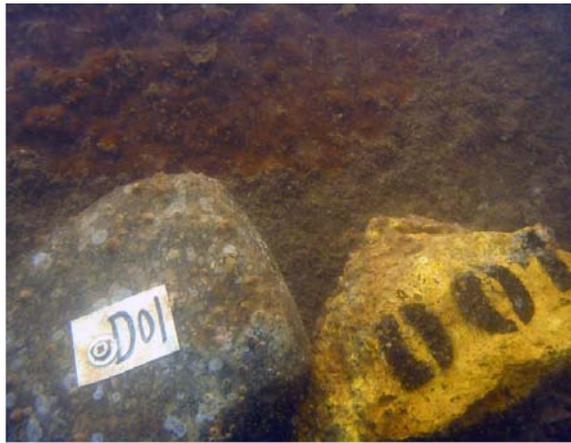
### 21 July 2007

Exceedance Site	Sedimentation		Bleaching		Mortality	
	Action Level	Limit Level	Action Level	Limit Level	Action Level	Limit Level
Site 1	No	No	No	No	No	No
Site 2	No	No	No	No	No	No
Site 3	No	No	No	No	No	No
Site 4	No	No	No	No	No	No
Site 5	No	No	No	No	No	No
Control Site C	No	No	No	No	No	No

## **APPENDIX I**

### **Photographs of the tagged corals at Site 5 and Control Site C surveyed on 08 July 2007**

Appendix Ia Tagged Coral Colonies at Site 5.



D01



*Psammocora* sp.



D02



*Montipora* cf. *turgescens*



D03



*Goniopora stutchburyi*



D04



*Leptastrea pruinosa*

Appendix Ia Tagged Coral Colonies at Site 5.....continued.



D05



*Porites* sp.



D06



*Plesiastrea versipora*



D07



*Leptastrea pruinosa*

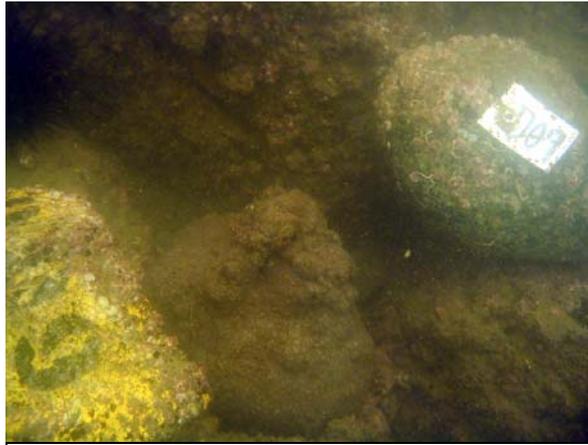


D08



*Plesiastrea versipora*

Appendix Ia Tagged Coral Colonies at Site 5.....continued.



D09



*Leptastrea pruinosa*



D10



*Montipora cf. turgescens*

Appendix Ib Tagged coral colonies at Control Site C.



F01



*Favites speciosa*



F02



*Favites pentagona*



F03



*Favites pentagona*



F04

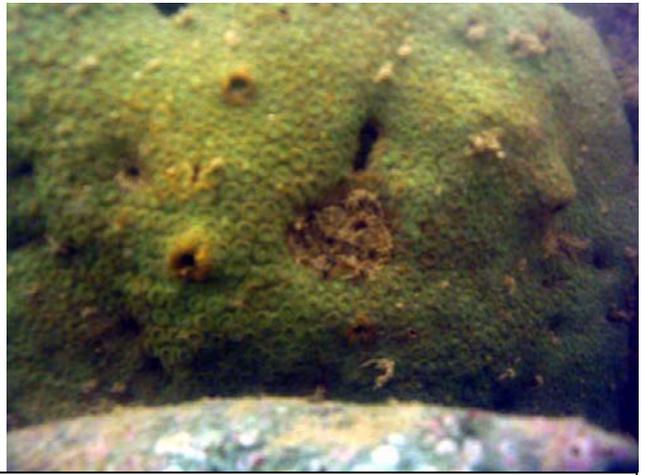


*Porites* sp.

Appendix Ib Tagged coral colonies at Control Site C.....continued.



F05



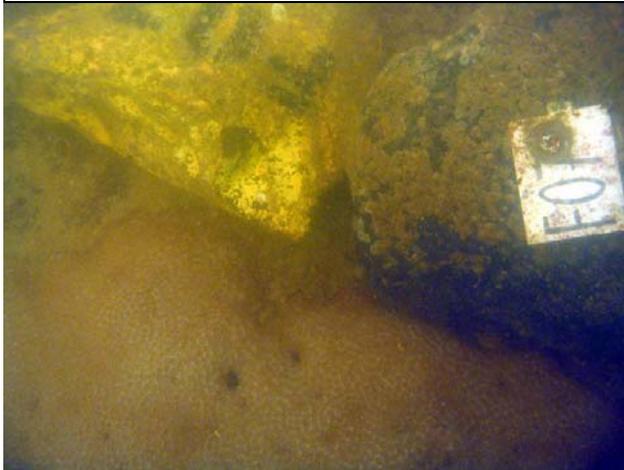
*Cyphastrea serailia*



F06



*Psammocora* sp.



F07



*Plesiastrea versipora*



F08a



*Favites speciosa* (left side)

Appendix Ib Tagged coral colonies at Control Site C.....continued.



F08b



*Goniastrea favulus* (right side)



F09



*Favites pentagona*



F10

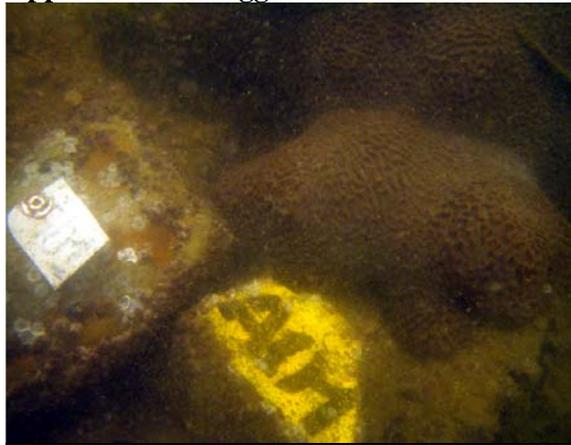


*Platygyra carnosus*

## **APPENDIX II**

### **Photographs of the tagged corals at Sites 1 to 5 and Control Site C surveyed on 21 July 2007**

Appendix IIa Tagged coral colonies at Site 1.



A01



*Platygyra carnosus*



A02



*Platygyra carnosus*



A03



*Favites pentagona*



A04



*Leptastrea pruinosa*

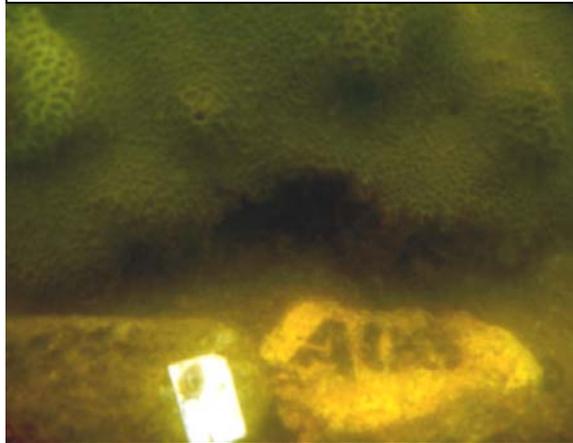
Appendix IIa Tagged coral colonies at Site 1.....continued.



A05



*Platygyra carnosus*



A06



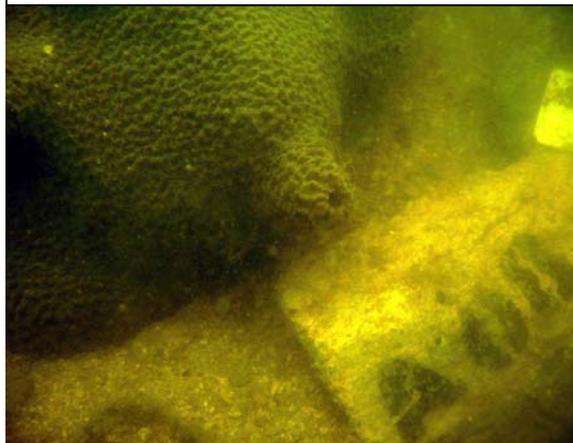
*Platygyra carnosus*



A07



*Favia rotumana*

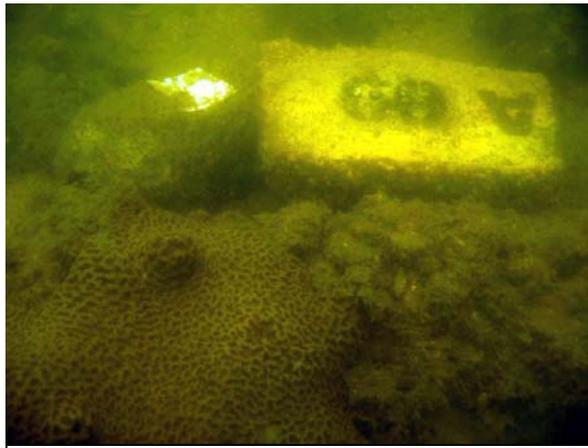


A08

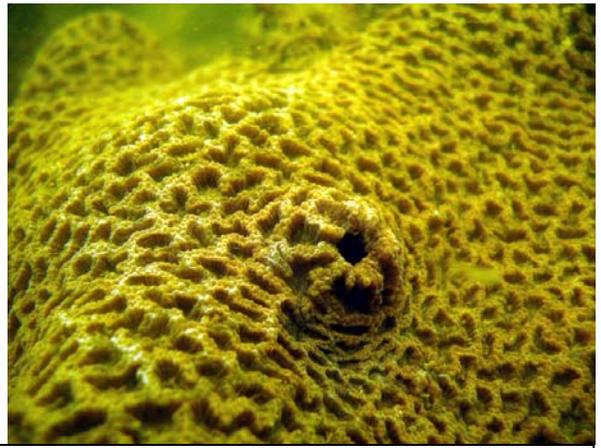


*Platygyra carnosus*

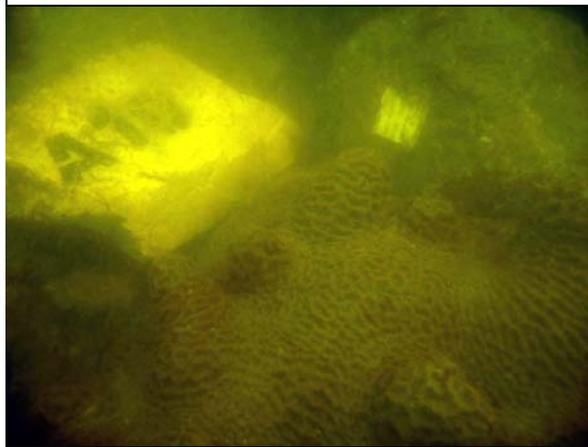
Appendix IIa Tagged coral colonies at Site 1.....continued.



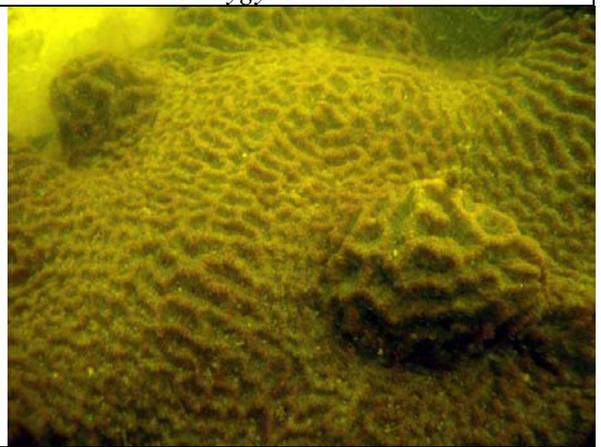
A09



*Platygyra carnosus*

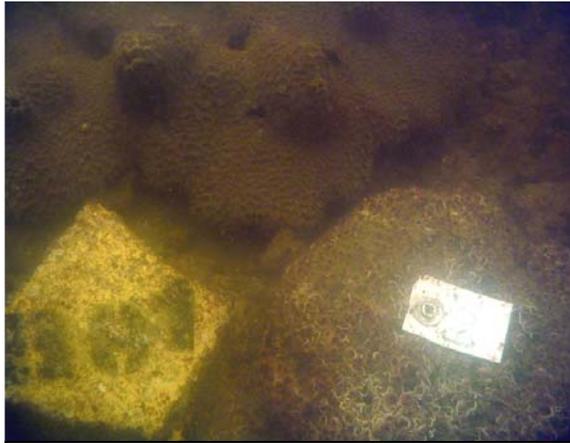


A10



*Platygyra carnosus*

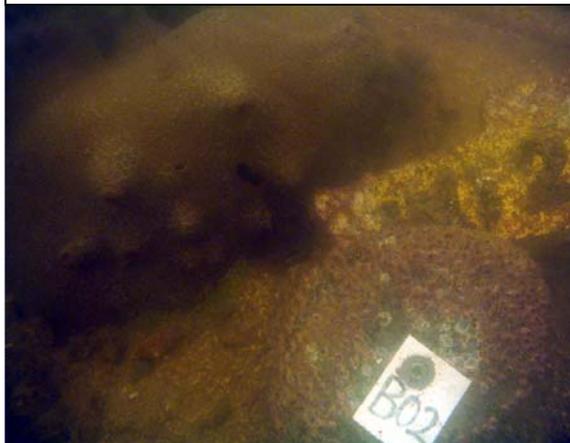
Appendix IIb Tagged coral colonies at Site 2.



B01



*Platygyra carnosus*



B02



*Plesiastrea versipora*



B03



*Psammocora superficialis*

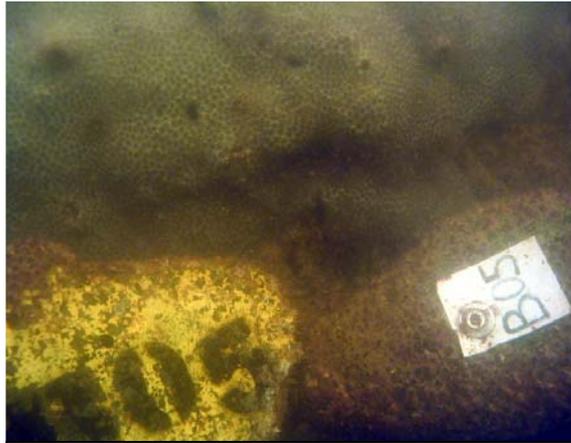


B04



*Favia speciosa*

Appendix IIb Tagged coral colonies at Site 2.....continued.



B05



*Plesiastrea versipora*



B06



*Platygyra carnosus*



B07



*Cyphastrea serailia*



B08

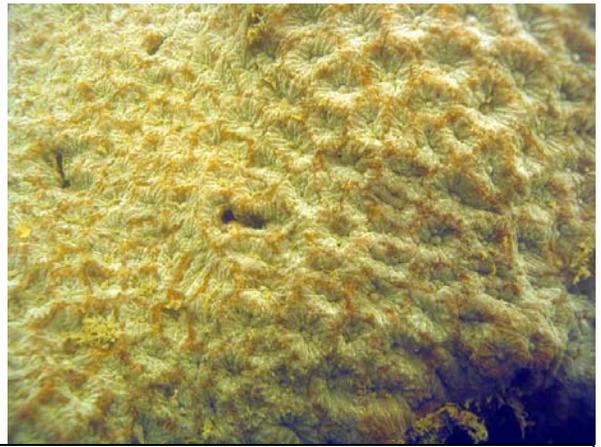


*Plesiastrea versipora*

Appendix IIb Tagged coral colonies at Site 2.....continued.



B09



*Favites pentagona*



B10

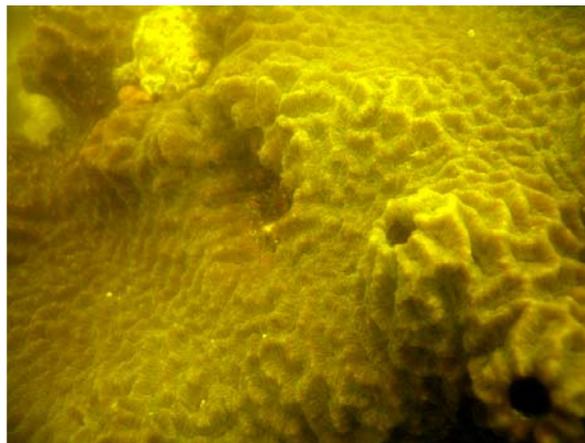


*Favites pentagona*

Appendix IIc Tagged Coral Colonies at Site 3.



C01



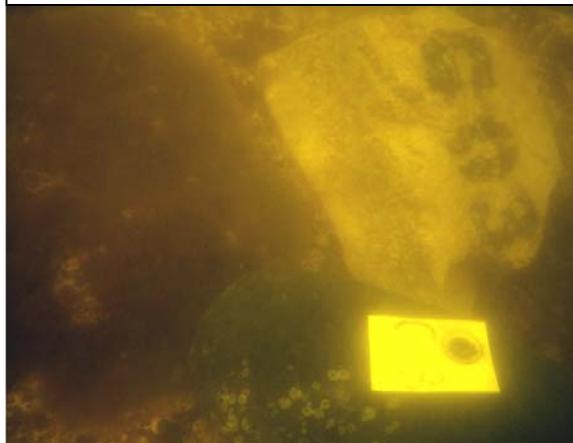
*Platygyra acuta*



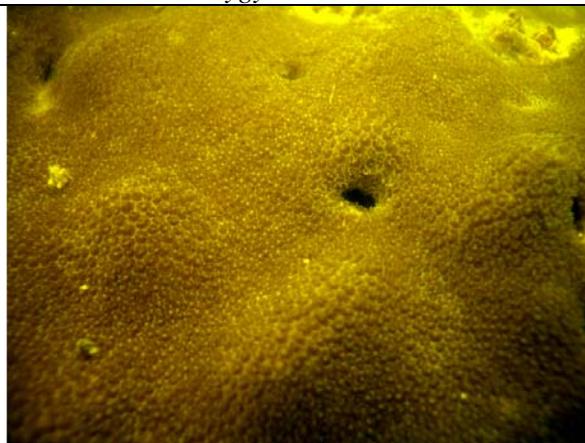
C02



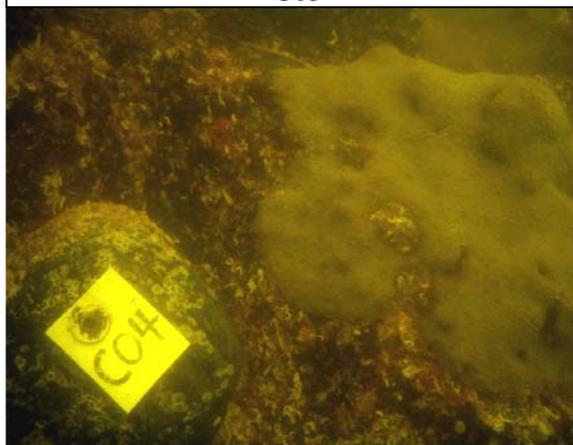
*Platygyra carnosus*



C03



*Porites* sp.



C04



*Cyphastrea serailia*

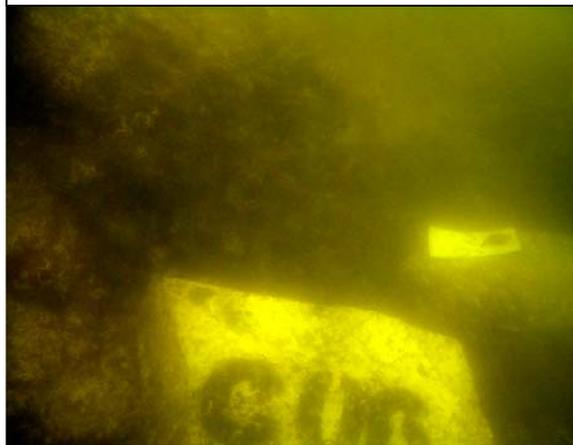
Appendix IIc Tagged Coral Colonies at Site 3.....continued.



C05



*Pavona decussata*



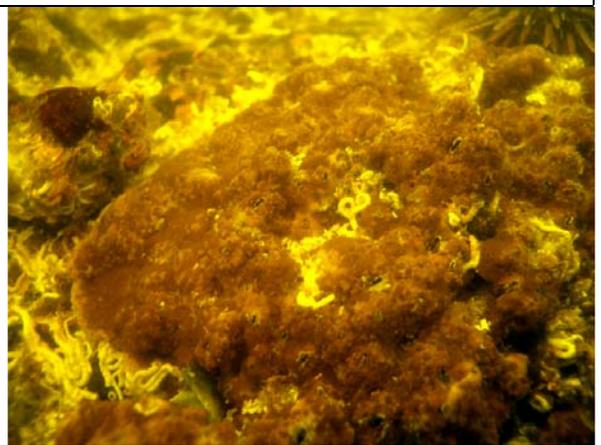
C06



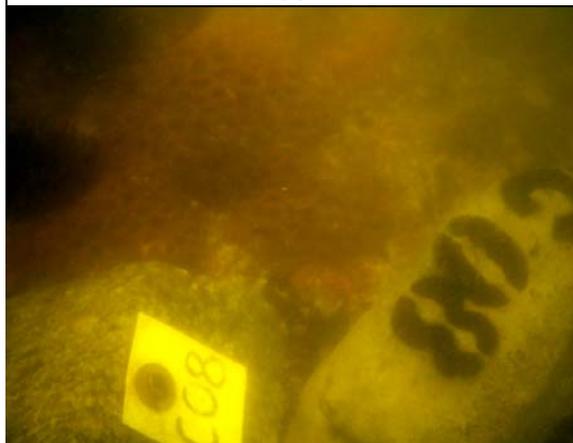
*Pavona decussata*



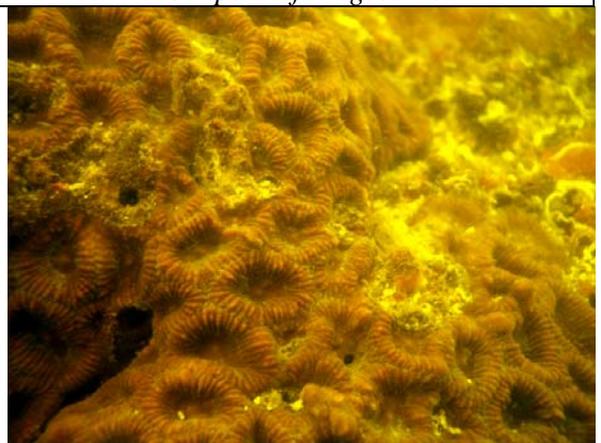
C07



*Montipora cf. turgescens*

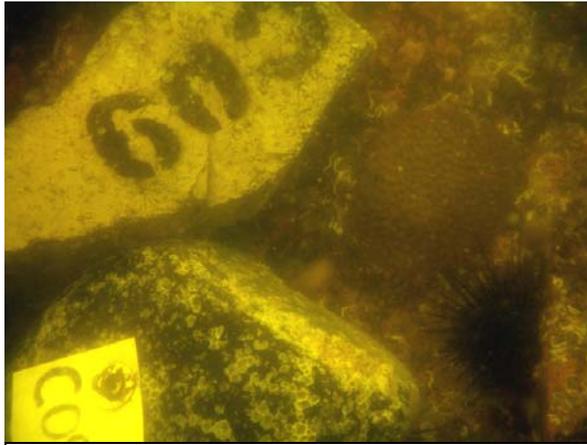


C08

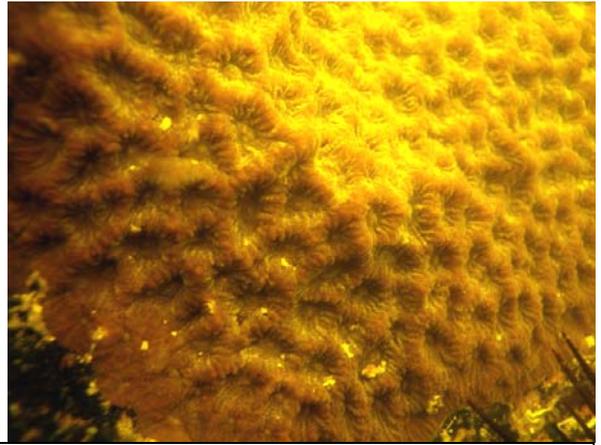


*Favia fava*

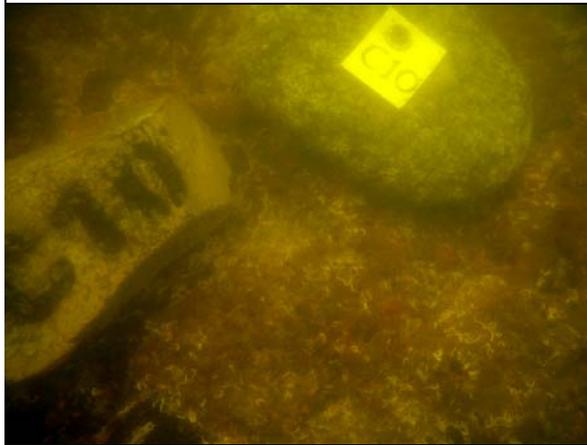
Appendix IIc Tagged Coral Colonies at Site 3.....continued.



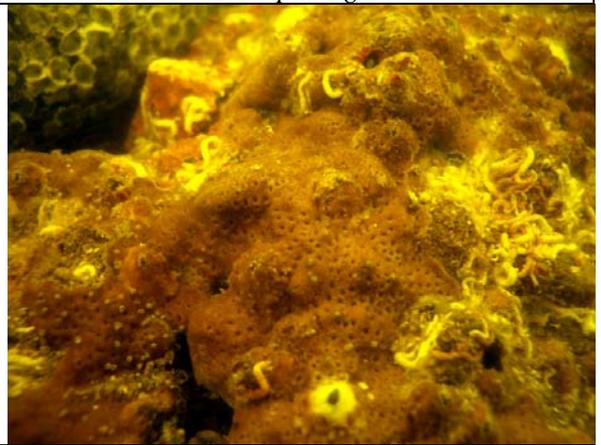
C09



*Favites pentagona*



C10



*Montipora peltiformis*

Appendix II d Tagged Coral Colonies at Site 4.



E01



*Goniopora stutchburyi*



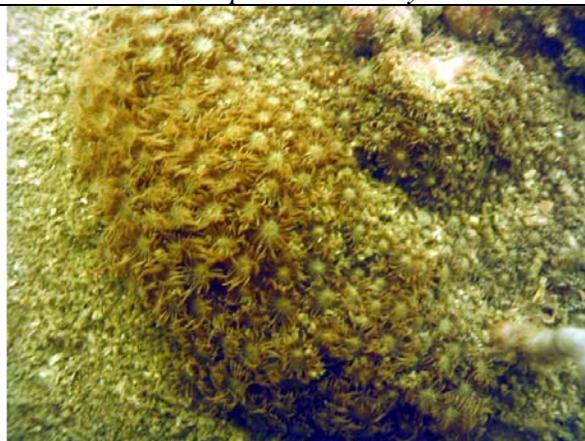
E02



*Goniopora stutchburyi*



E03



*Goniopora stutchburyi*



E04



*Porites* sp.

Appendix II d Tagged Coral Colonies at Site 4.....continued.



E05



*Goniopora stutchburyi*



E06



*Goniopora stutchburyi*



E07



*Favia speciosa*



E08



*Porites* sp.

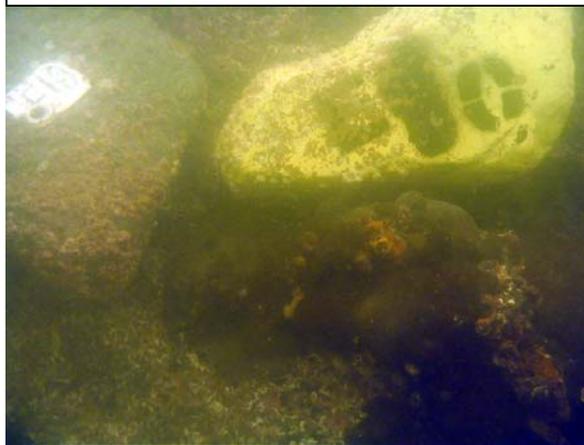
Appendix II d Tagged Coral Colonies at Site 4.....continued.



E09



*Porites* sp.

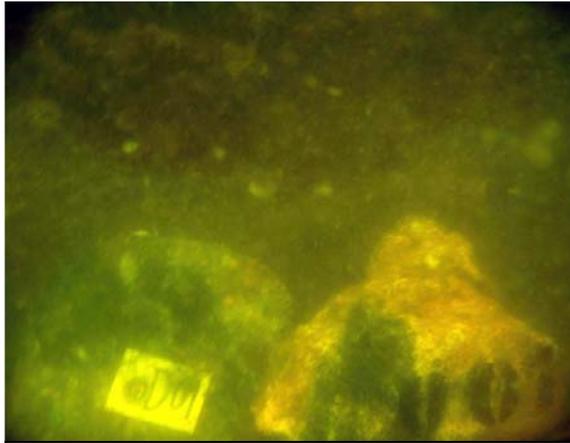


E10



*Porites* sp.

Appendix IIe Tagged Coral Colonies at Site 5.



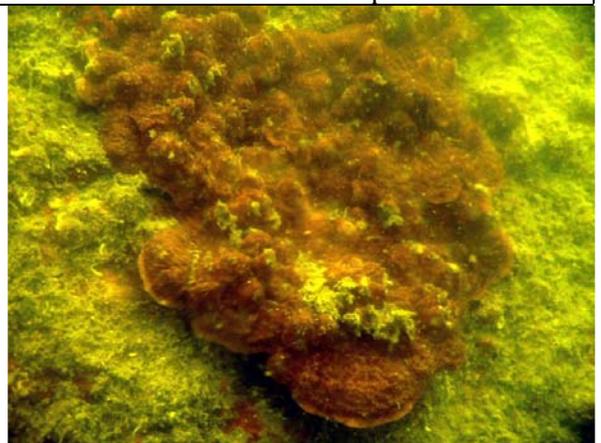
D01



*Psammocora* sp.



D02



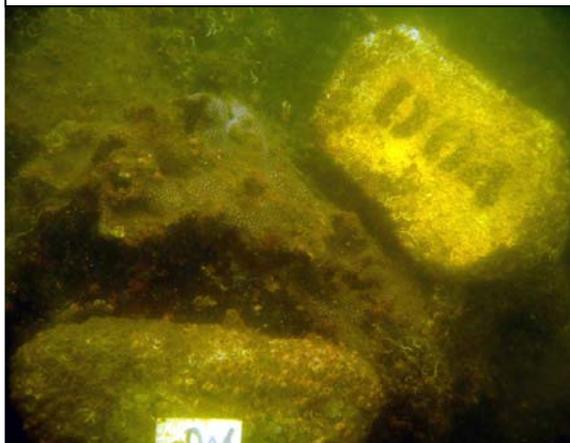
*Montipora* cf. *turgescens*



D03



*Goniopora* *stutchburyi*



D04



*Leptastrea* *pruinosa*

Appendix IIe Tagged Coral Colonies at Site 5.....continued.



D05



*Porites* sp.



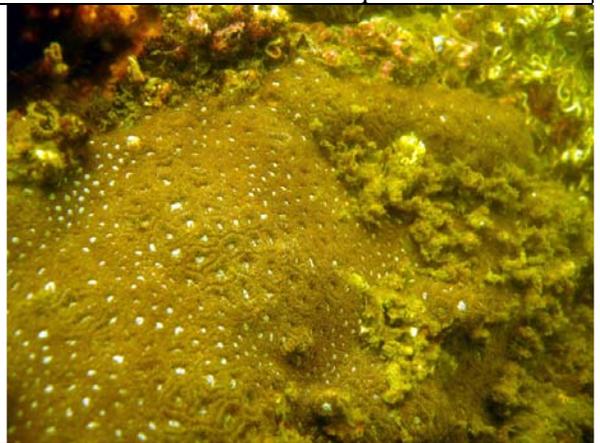
D06



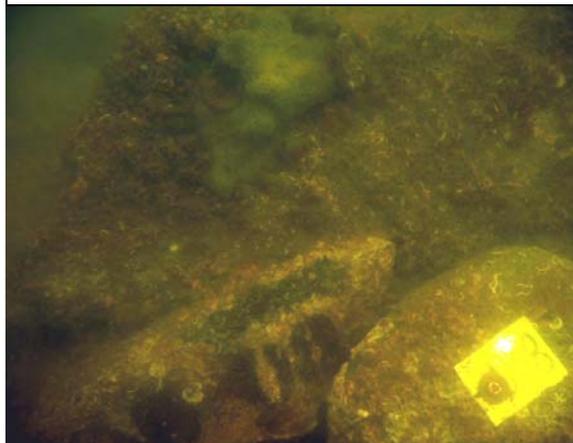
*Plesiastrea versipora*



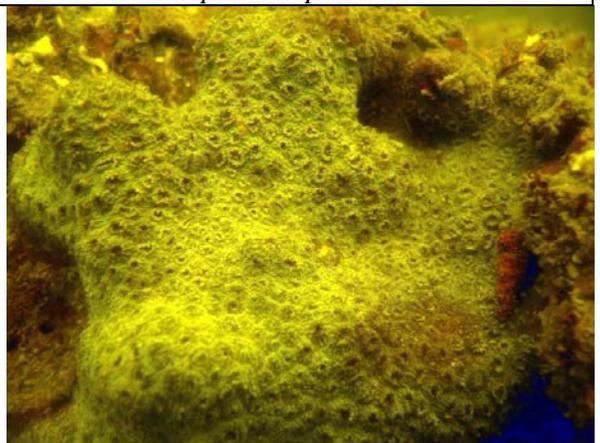
D07



*Leptastrea pruinosa*

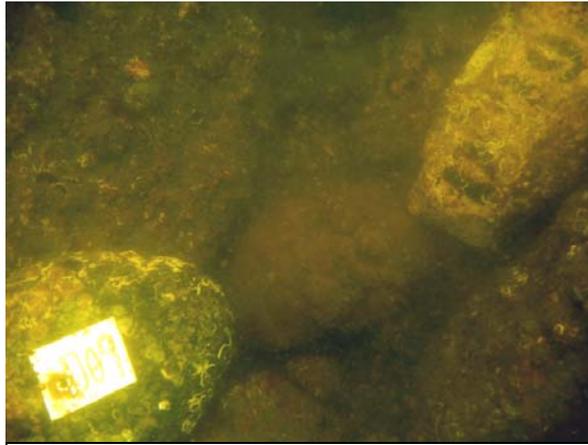


D08



*Plesiastrea versipora*

Appendix IIe Tagged Coral Colonies at Site 5.....continued.



D09



*Leptastrea pruinosa*



D10

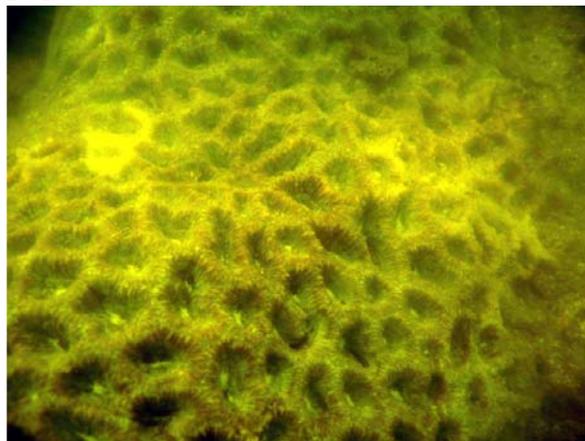


*Montipora cf. turgescens*

Appendix II f Tagged coral colonies at Control Site C.



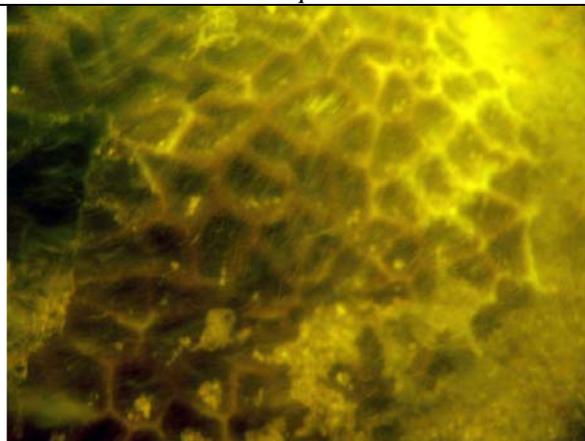
F01



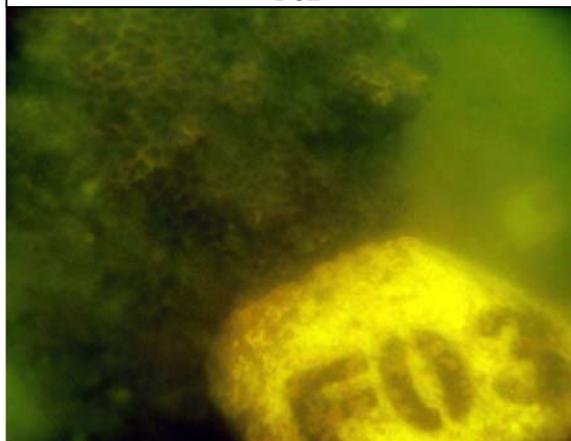
*Favites speciosa*



F02



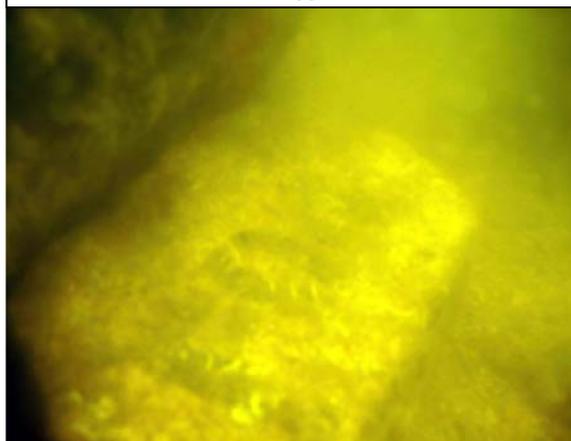
*Favites pentagona*



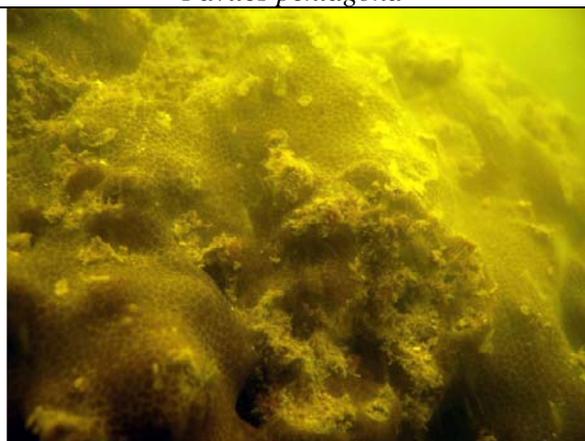
F03



*Favites pentagona*

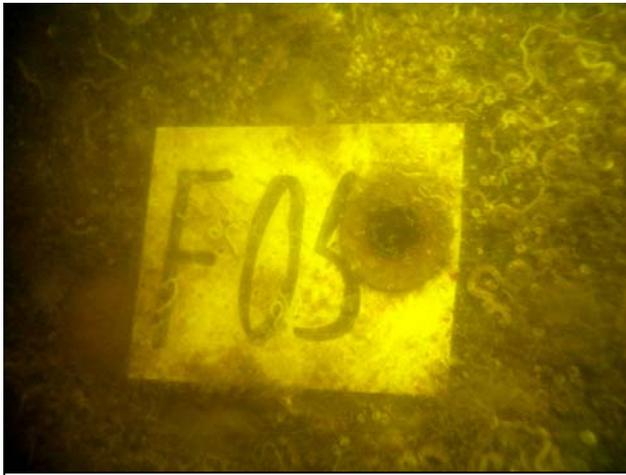


F04

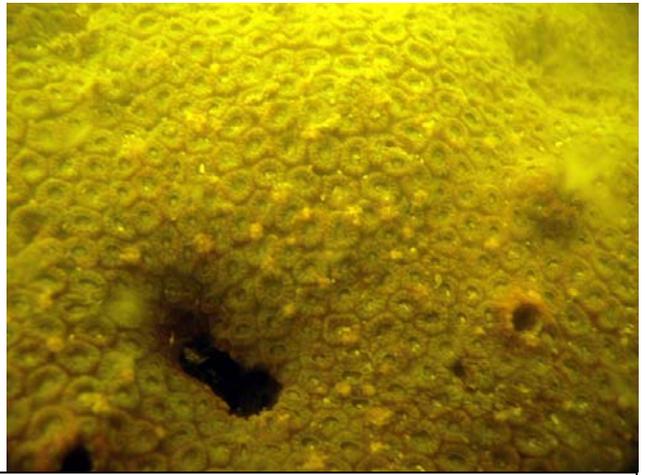


*Porites* sp.

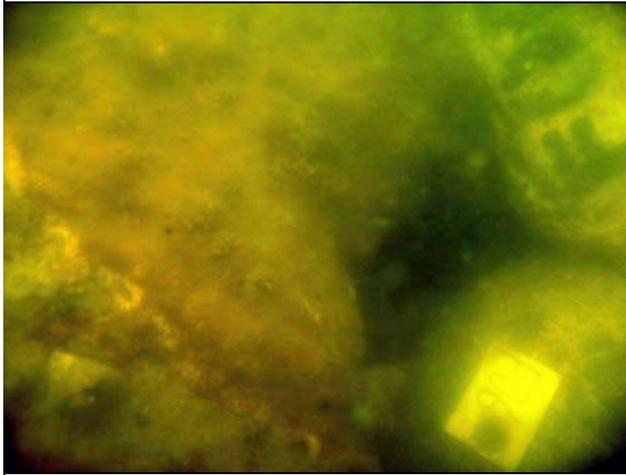
Appendix II f Tagged coral colonies at Control Site C.....continued.



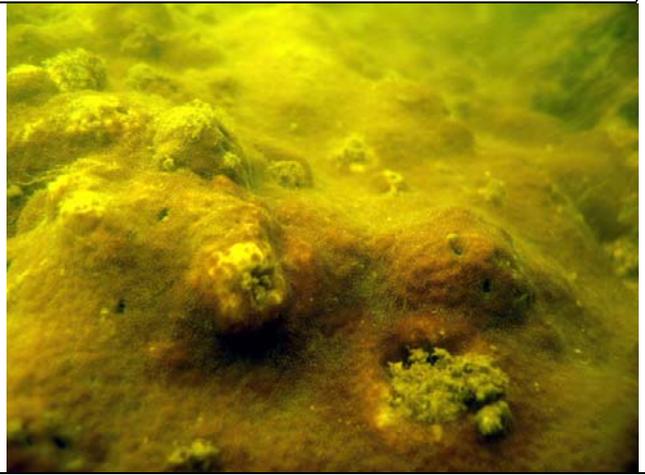
F05



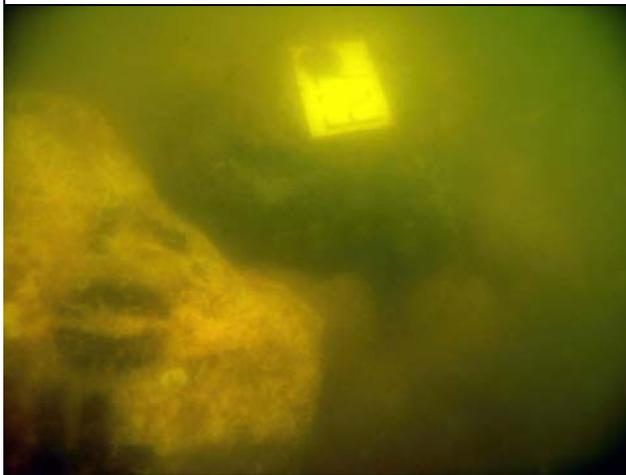
*Cyphastrea serailia*



F06



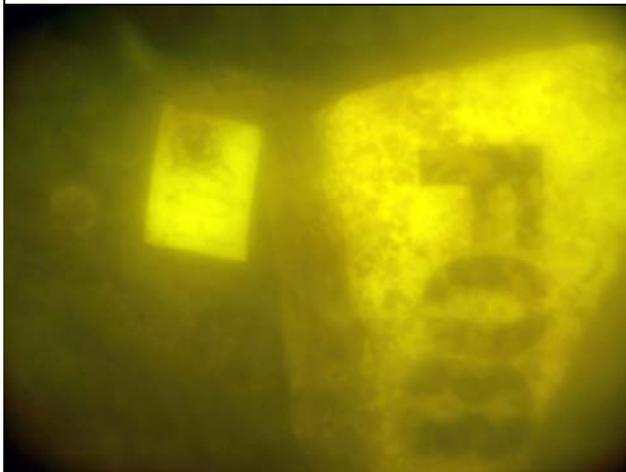
*Psammocora* sp.



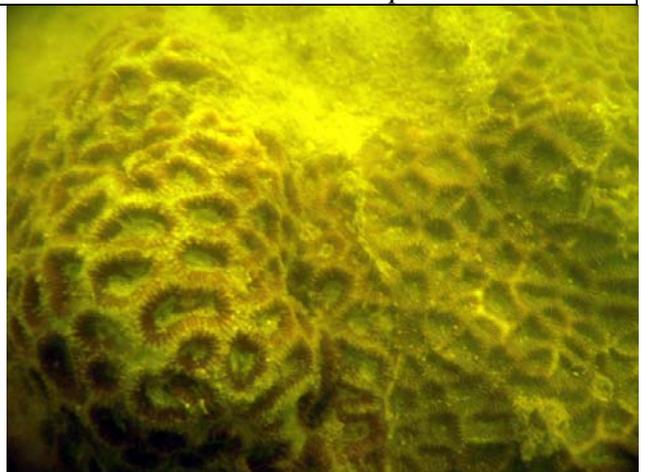
F07



*Plesiastrea versipora*

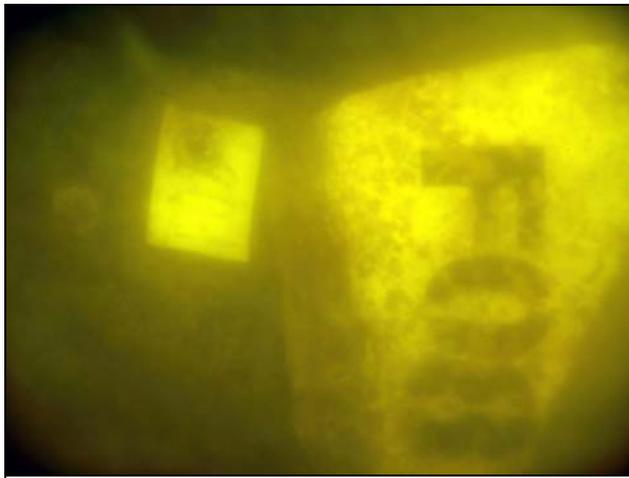


F08a

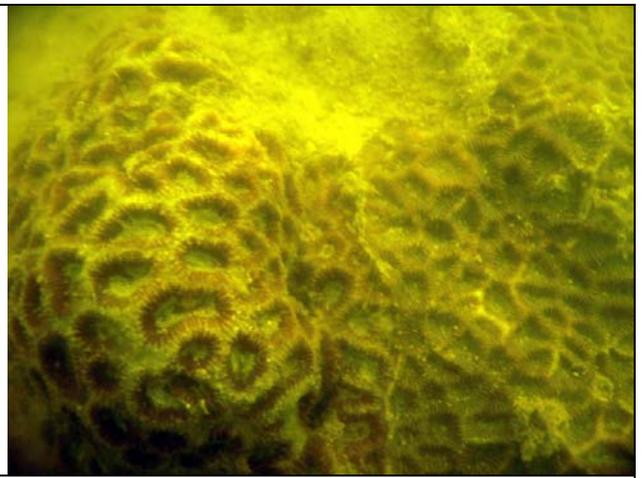


*Favites speciosa* (left side)

Appendix IIf Tagged coral colonies at Control Site C.....continued.



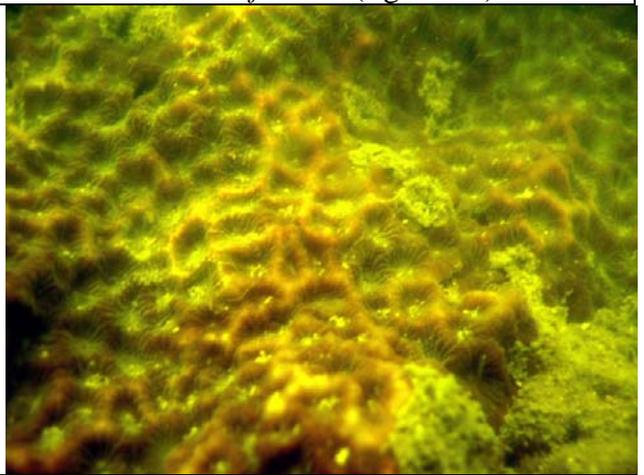
F08b



*Goniastrea favulus* (right side)



F09



*Favites pentagona*



F10



*Platygyra carnosus*

**APPENDIX G – CALIBRATION DETAILS**

**Air Quality Monitoring Equipments**

<b>Monitoring Location</b>	AM1	AM2	AM3	-
<b>High Volume Sample/Dust Trak Serial No.</b>	1174	1177	9998	14230
<b>Sampler Identification</b>	ET / EA / 003 / 08	ET / EA / 003 / 07	ET / EA / 003 / 12	ET / EA / 001 / 04
<b>Date of Calibration</b>	01 July 2007	08 June 2007	03 July 2007	20 January 2007
<b>Calibration Due Date</b>	02 September 2007	07 August 2007	02 September 2007	19 July 2007
<b>Result</b>	Good	Good	Good	Good

**Noise Monitoring Equipments**

<b>Monitoring Location</b>	CN1, CN2, CN3 & CN4
<b>Sound Level Meter Brand Name and Model</b>	Rion NL-31
<b>Serial No.</b>	01120826
<b>Date of Calibration</b>	27 December 2006
<b>Calibration Due Date</b>	26 December 2007
<b>Result</b>	Good



東業德勤測試顧問有限公司  
ETS-TESTCONSULT LIMITED

8/F, Block B, Veristrong Industrial Centre, 34-36 Au Pui Wan Street, Fotan, Hong Kong  
Tel : 2695 8318 E-mail : etl@ets-testconsult.com  
Fax : 2695 3944 Web site : www.ets-testconsult.com

**TEST REPORT**

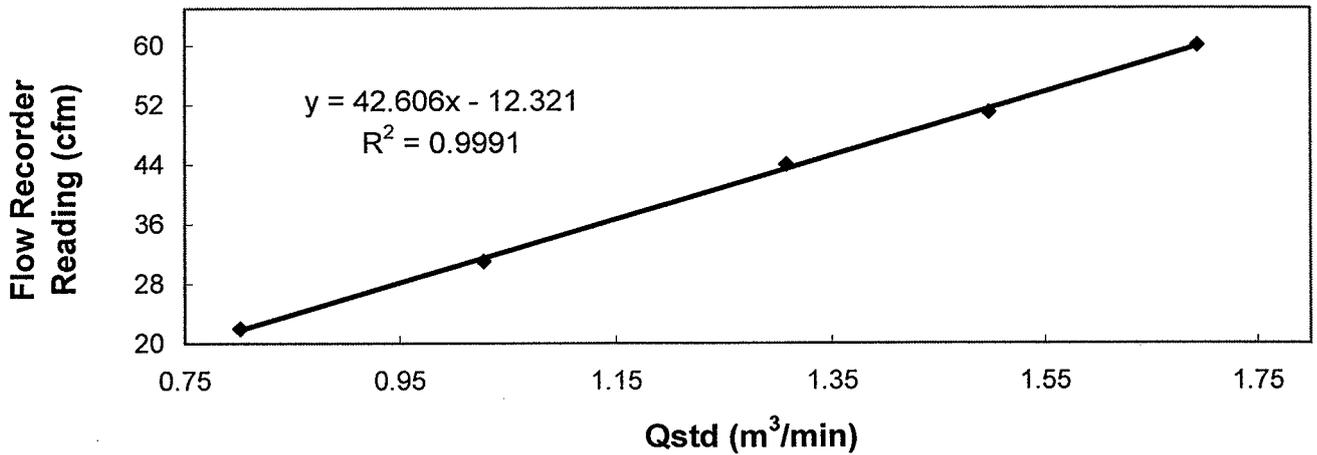
**Calibration Report  
of  
High Volume Air Sampler**

**Manufacturer** : Graseby GMW Date of Calibration : 03 July 2007  
**Serial No.** : 1174 (ET / EA / 003 / 08) Calibration Due Date : 02 September 2007  
**Method** : Based on Operations Manual for in series calibration method by TISCH  
ENVIROMENTAL Model Te-5025A calibration kit

**Results** :

Flow recorder reading (cfm)	60	51	44	31	22
Qstd (Actual flow rate, m <sup>3</sup> /min)	1.69	1.50	1.31	1.03	0.80
Pressure :	756.06 mm Hg		Temp. :	306 K	

**Sampler 1174 Calibration Curve  
Site: Ocean Park (AM-1)  
Date of Calibration: 03 July 2007**



Acceptance Criteria : Correlation coefficient (r) of the calibration curve greater than 0.990 after a 5-point calibration

The high volume sampler complies \* / ~~does not comply~~ \* with the specified requirements and is deemed acceptable \* / unacceptable \* for use.

Calibrated by : Kenneth CHIU  
(Asst. Technician)

Approved by : H. T. CHOW  
(Asst. Environmental Officer)



東業德勤測試顧問有限公司  
ETS-TESTCONSULT LIMITED

8/F., Block B, Veristrong Industrial Centre, 34-36 Au Pui Wan Street, Fotan, Hong Kong  
Tel : 2695 8318 E-mail : etl@ets-testconsult.com  
Fax : 2695 3944 Web site : www.ets-testconsult.com

**TEST REPORT**

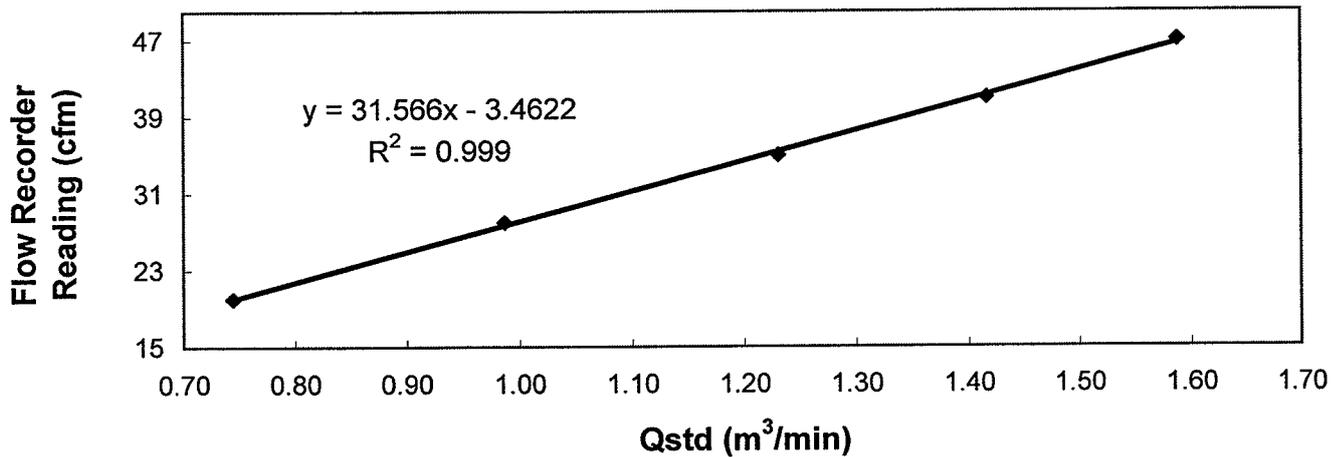
**Calibration Report**  
of  
**High Volume Air Sampler**

**Manufacturer** : Graseby GMW **Date of Calibration** : 08 June 2007  
**Serial No.** : 1177 (ET/EA/003/07) **Calibration Due Date** : 07 August 2007  
**Method** : Based on Operations Manual for the 5-point calibration using standard calibration kit manufactured by Tisch TE-5025 A

**Results** :

Flow recorder reading (cfm)	47	41	35	28	20
Qstd (Actual flow rate, m <sup>3</sup> /min)	1.59	1.42	1.23	0.99	0.74
Pressure :	755.31 mm Hg			Temp. :	301 K

**Sampler 1177 Calibration Curve**  
**Site: Ocean Park (AM-2)**  
**Date of Calibration: 08 June 2007**



Acceptance Criteria : Correlation coefficient (r) of the calibration curve greater than 0.990 after a 5-point calibration

The high volume sampler complies \* / ~~does not comply~~ \* with the specified requirements and is deemed acceptable \* / unacceptable \* for use.

Calibrated by : Kin  
Kenneth CHIU  
(Asst. Technician)

Approved by : H. T. Chow  
H. T. CHOW  
(Asst. Environmental Officer)



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**TEST REPORT**

**Calibration Report  
of  
High Volume Air Sampler**

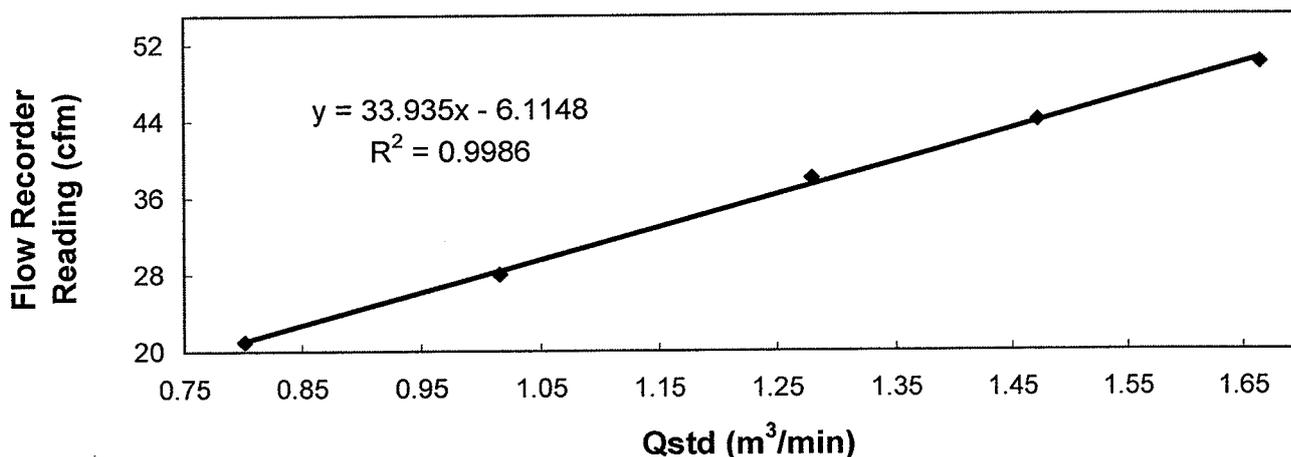
Manufacturer : Graseby GMW Date of Calibration : 03 July 2007

Serial No. : 9998 ( ET / EA / 003 / 12 ) Calibration Due Date : 02 September 2007

Method : Based on Operations Manual for the 5-point calibration using standard calibration kit manufactured by Tisch TE-5025 A

Results	Flow recorder reading (cfm)	50	44	38	28	21
	Qstd (Actual flow rate, m <sup>3</sup> /min)	1.67	1.47	1.28	1.02	0.80
	Pressure :	756.06 mm Hg			Temp. :	306 K

**Sampler 9998 Calibration Curve  
Site: Ocean Park (AM-3)  
Date of Calibration: 03 July 2007**

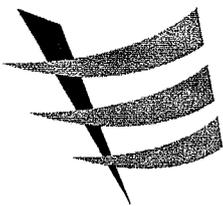


Acceptance Criteria : Correlation coefficient (r) of the calibration curve greater than 0.990 after a 5-point calibration

The high volume sampler complies \* / does not comply \* with the specified requirements and is deemed acceptable \* / unacceptable \* for use.

Calibrated by : Kin  
Kenneth CHIU  
(Assistant Technician)

Approved by : H. T. Chow  
H. T. CHOW  
(Asst. Environmental Officer)



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**TEST REPORT**

**Internal Calibration Report**  
of  
**Dust Trak Monitor**

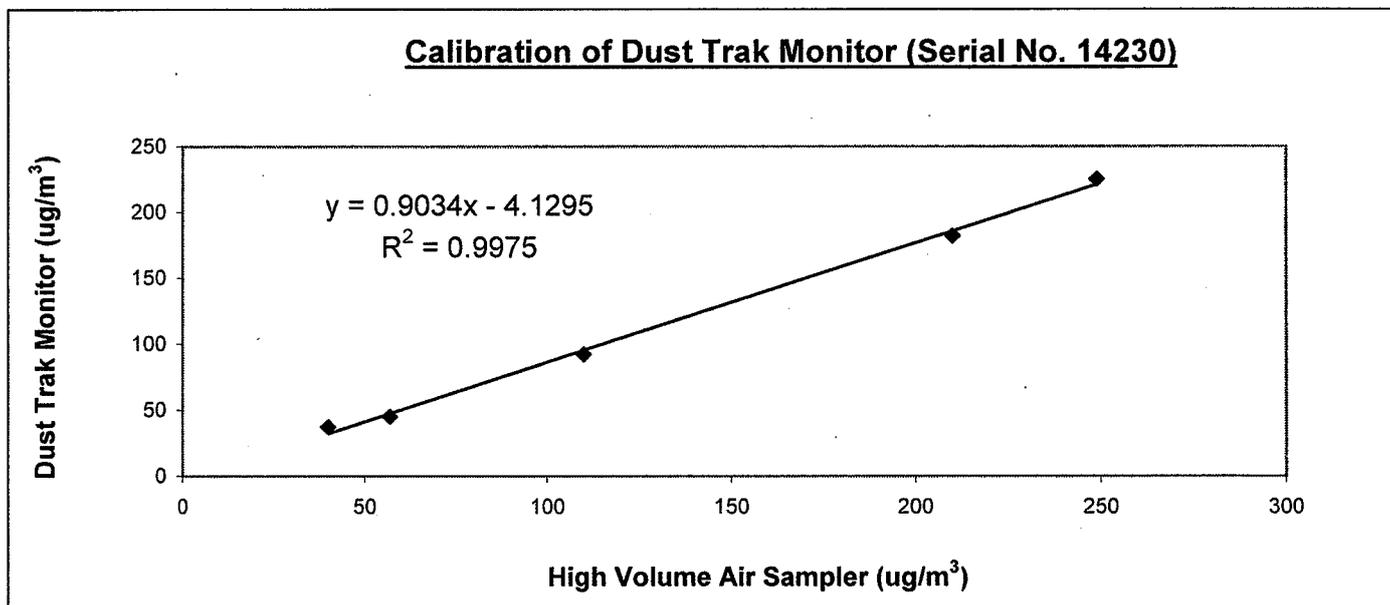
**Manufacturer** : TSI - 8520 Dust Trak **Date of Calibration** : 20 January 2007

**Serial No.** : 14230 ( ET/EA/001/04 ) **Due Date** : 19 July 2007

**Method** : Conduct parallel measurement (five-point calibration) by placing the Dust Trak Monitor and High Volume Air Sampler together under the same environmental condition

**Results** :

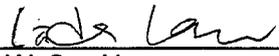
Dust Trak Monitor ( $\mu\text{g}/\text{m}^3$ )	40	57	110	210	249
High Volume Air Sampler ( $\mu\text{g}/\text{m}^3$ )	37	45	92	182	225
High Volume Air Sampler Serial No.: 1178			Calibration Date: 12 / 03 / 2007		



Acceptance Criteria : Correlation coefficient (r) of the calibration curve greater than 0.990 after a five point calibration

The Dust Trak Monitor complies \* / ~~does not comply~~ \* with the internal calibration procedures and is deemed acceptable \* / unacceptable \* for use.

Calibrated by :   
LEUNG, Ka Chun  
(Site Technician)

Approved by :   
LAW, Sau Yee  
(Senior Environmental Officer)



# Calibration Certificate

Certificate No. **65868**

Page 1 of 3 Pages

**Customer :** ETS-Testconsult Limited

**Address :** 8/F., Block B, Veristrong Industrial Centre, 34-36 Au Pui Wan St., Fotan, Hong Kong.

**Order No. :** Q62237

**Date of receipt :** 16-Dec-06

## Item Tested

**Description :** Precision Integrating Sound Level Meter

**Manufacturer :** Rion

**Model :** NL-31

**Serial No. :** 01120826

## Test Conditions

**Date of Test :** 27-Dec-06

**Supply Voltage :** --

**Ambient Temperature :** (23 ± 3)°C

**Relative Humidity :** (50 ± 25) %

## Test Specifications

Calibration check.

Calibration procedure : Z01.

## Test Results

All results were within the IEC 651 Type 1 & IEC 804 Type 1 specification.

The results are shown in the attached page(s).

Test equipment used:

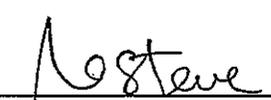
<u>Equipment No.</u>	<u>Description</u>	<u>Cert. No.</u>	<u>Due Date</u>	<u>Traceable to</u>
S017	Function Generator	C051022	21-Mar-07	SCL-HKSAR
S024	Sound Level Calibrator	62691	22-Apr-07	NIM-PRC & SCL-HKSAR

The values given in this Calibration Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Hong Kong Calibration Ltd. shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration are traceable to International System of Units (SI).

The test results apply to the above Unit-Under-Test only

**Calibrated by :**   
P.F. Wong

**Approved by :**   
Steve Kwan

**Date:** 27-Dec-06

This Certificate is issued by:

Hong Kong Calibration Ltd.

Unit 8B, 24/F., Well Fung Industrial Centre, No. 58-76, Ta Chuen Ping Street, Kwai Chung, NT, Hong Kong.

Tel: 2425 8801 Fax: 2425 8646

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# Calibration Certificate

Certificate No. 65868

Page 2 of 3 Pages

Results :

## 1. SPL Accuracy

UUT Setting			Applied Value (dB)	UUT Reading (dB)
Level Range (dB)	Weight	Response		
20 - 100	L <sub>A</sub>	Fast	94.07	93.9
		Slow		93.9
	L <sub>C</sub>	Fast		93.9
	L <sub>p</sub>	Fast		94.0
	L <sub>A</sub>	Fast		93.9
30 - 120	L <sub>A</sub>	Slow	94.07	93.9
		Fast		93.9
	L <sub>C</sub>	Fast		93.9
	L <sub>p</sub>	Fast		93.9
30 - 120	L <sub>A</sub>	Fast	113.95	113.8
		Slow		113.8
	L <sub>C</sub>	Fast		113.8
	L <sub>p</sub>	Fast		113.8

IEC 651 Type 1 Spec. : ± 0.7 dB

Uncertainty : ± 0.1 dB

## 2. Level Stability : 0.0 dB

IEC 651 Type 1 Spec. : ± 0.3 dB

Uncertainty : ± 0.01 dB

## 3. Linearity

### 3.1 Level Linearity

UUT Range	Applied Value (dB)	UUT Rdg (dB)	IEC 651 Type 1 Spec. (inside Primary)
140	114.0	114.0	± 0.7 dB
130	104.0	104.0	
120	94.0	93.9	
110	84.0	84.1	
100	74.0	74.1	
90	64.0	64.2	
80	54.0	54.1	

Uncertainty : ± 0.1 dB



# Calibration Certificate

Certificate No. 65868

Page 3 of 3 Pages

## 3.2 Differential level linearity

UUT Range	Applied Value (dB)	UUT Rdg (dB)	IEC 651 Type 1 Spec.
120	84.0	83.9	± 0.4
	94.0	93.9	
	95.0	94.9	± 0.2
	104.0	103.9	± 0.3
	105.0	104.9	± 1.0

Uncertainty : ± 0.1 dB

## 4. Frequency Weighting

A weighting

Frequency	Attenuation (dB)	IEC 651 Type 1 Spec.
31.5 Hz	- 39.6	- 39.4 dB, ± 1.5 dB
63 Hz	- 26.2	- 26.2 dB, ± 1.5 dB
125 Hz	- 16.2	- 16.1 dB, ± 1 dB
250 Hz	- 8.7	- 8.6 dB, ± 1 dB
500 Hz	- 3.2	- 3.2 dB, ± 1 dB
1 kHz	0.0 (Ref.)	0 dB, ± 1 dB
2 kHz	+ 1.3	+ 1.2 dB, ± 1 dB
4 kHz	+ 1.1	+ 1.0 dB, ± 1 dB
8 kHz	- 1.1	- 1.1 dB, + 1.5 dB ~ - 3 dB
16 kHz	- 6.7	- 6.6 dB, + 3 dB ~ ∞

Uncertainty : ± 0.1 dB

## 5. Time Averaging

Applied Burst duty Factor	Applied Leq Value (dB)	UUT Reading (dB)	IEC 804 Type 1 Spec.
continuous	40.0	40.0	--
1/10	40.0	40.0	± 0.5 dB
1/10 <sup>2</sup>	40.0	40.0	
1/10 <sup>3</sup>	40.0	40.0	± 1.0 dB
1/10 <sup>4</sup>	40.0	40.0	

Uncertainty : ± 0.1 dB

Remark : 1. UUT : Unit-Under-Test

2. The uncertainty claimed is for a confidence probability of not less than 95%.

3. Atmospheric Pressure : 1 009 hPa.

----- END -----



# Calibration Certificate

Certificate No. **65870**

Page **1** of **2** Pages

**Customer :** ETS-Testconsult Limited

**Address :** 8/F., Block B, Veristrong Industrial Centre, 34-36 Au Pui Wan St., Fotan, Hong Kong.

**Order No. :** Q62237

**Date of receipt :** 16-Dec-06

## Item Tested

**Description :** Sound Level Calibrator

**Manufacturer :** Rion

**Model :** NC-73

**Serial No. :** 10727835

## Test Conditions

**Date of Test :** 27-Dec-06

**Supply Voltage :** --

**Ambient Temperature :** (23 ± 3)°C

**Relative Humidity :** (50 ± 25) %

## Test Specifications

Calibration check.

Calibration procedure : F21, Z02.

## Test Results

All results were within the manufacturer's specification.

The results are shown in the attached page(s).

Test equipment used:

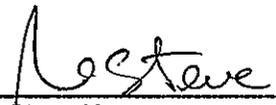
<u>Equipment No.</u>	<u>Description</u>	<u>Cert. No.</u>	<u>Due Date</u>	<u>Traceable to</u>
S014	Spectrum Analyzer	62914	7-Jul-07	NIM-PRC & SCL-HKSAR
S024	Sound Level Calibrator	62691	22-Apr-07	NIM-PRC & SCL-HKSAR
S041	Universal Counter	63839	22-Aug-07	SCL-HKSAR

The values given in this Calibration Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Hong Kong Calibration Ltd. shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration are traceable to International System of Units (SI).

The test results apply to the above Unit-Under-Test only

**Calibrated by :**   
P.F. Wong

**Approved by :**   
Steve Kwan

**Date:** 27-Dec-06



# Calibration Certificate

Certificate No. 65870

Page 2 of 2 Pages

Results :

## 1. Level Accuracy (at 1 kHz)

UUT Nominal Value	Measured Value	Mfr's Spec.
94 dB	93.73 dB	$\pm 1$ dB

Uncertainty :  $\pm 0.1$  dB

## 2. Frequency Accuracy

UUT Nominal Value	Measured Value	Mfr's Spec.
1 kHz	0.998 kHz	$\pm 2$ %

Uncertainty :  $\pm 0.1$  %

## 3. Level Stability : 0.0 dB

Uncertainty :  $\pm 0.01$  dB

## 4. Total Harmonic Distortion : $< 0.2$ %

Mfr's Spec. :  $< 3$  %

Uncertainty :  $\pm 2.3$  % of reading

Remark : 1. UUT : Unit-Under-Test

2. The uncertainty claimed is for a confidence probability of not less than 95%.

3. The above measured values are the mean of 3 measurement.

4. Atmospheric Pressure : 1 009 hPa

----- END -----

**APPENDIX H – SUMMARY OF ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE**

No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Status	Other / Remarks
				Site Installation	Method Statement	Toolbox Talk		
<b>Air Quality</b>								
AQ01	Dust emission from construction site in general	Cap 311, sub leg R Schedule III S.13	Hoardings of not less than 2.4m high from ground level should be erected along the entire length of the site boundary except for site entrance or exit.	✓			✓	
AQ02	Dust emission from construction site in general	Cap 311, sub leg R Schedule III S.13 & PS 26.10(6)(i)(e)	To minimize dust emissions, the amount of soil exposed and the dust generation potential should be kept as low as possible. This can be accomplished by water sprays, surface compaction; temporary fabric covers, minimizing the extent of exposed soil, and prompt re-vegetation of completed earthworks.	✓		✓	✓	
AQ03	Dust emission from construction site in general	Cap 311, sub leg R Schedule III S.13 & PS 26.10(6)(i)(j)	Wheel washing facilities should be provided at all vehicle site entrances/exits to prevent dusty material from being carried off-site on vehicles and deposited on public roads. The facilities shall be provided in advance of any major construction activities.	✓			Summit is under preparation while the Waterfront has installed.	
AQ04	Dust emission from site clearance	Cap 311, sub leg R Schedule IV S.26 (1), (2) & PS 26.10(6)(i)(l)	The working area for uprooting of trees, shrubs or vegetation or for the removal of boulders, poles, pillars or temporary or permanent structures shall be sprayed with water or a dust suppression agent immediately before, during and immediately after the operation so as to maintain the entire surface wet.		✓	✓	✓	
AQ05	Dust emission from excavation or earth moving	Cap 311, sub leg R Schedule III S.24	The heights from which excavated materials are dropped should be minimized to limit fugitive dust generation from loading/unloading.	✓		✓	✓	
AQ06	Dust emission from excavation or earth moving	Cap 311, sub leg R Schedule III S.24	Working areas of any excavation or earth moving operation will be sprayed with water.		✓	✓	✓	

**APPENDIX H – SUMMARY OF ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE**

No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Status	Other / Remarks
				Site Installation	Method Statement	Toolbox Talk		
<b>Air Quality</b>								
AQ07	Access Road	PS 26.10(6)(i)(g)	Effective water sprays should be used on the site to dampen potential dust emission sources such as unpaved areas used by site traffic and active construction areas.		✓	✓	✓	
AQ08	Access Road	Cap 311, sub leg R Schedule III S.14 (1) & PS 26.10 (6)(i)(a)	Areas of site with regular movement of vehicles shall have an approved hard surface and be kept clean of loose material.	✓			✓	
AQ09	Access Road	PS 26.10 (6)(i)(d)	All on-site motorized vehicles speeds shall be restricted to a max. speed of 10km/h and delivery vehicles to designated roadways inside the Site to reduce dust re-suspension and dispersion.			✓	✓	
AQ10	Access Road	Cap 311, sub leg R Schedule III S.14 (1) & PS 26.10(6)(i)(a)	The roadway between the wheel wash and the public road will be paved.	✓			Under preparation	
AQ11	Dust emission from material transporting and handling	PS 26.10(6)(i)(h) & (i)	Vehicles transporting materials with the potential to generate dust should have properly fitting side and tailboards.	✓		✓	✓	
AQ12	Dust emission from material transporting and handling	PS 1.110 (a)	The cover of the bed of dump truck shall be power operated with manual backup, so that the operator would not need to climb on the dump bed to operate the cover (both under power mode and manual mode). Operation from driver cab or with the operator standing on ground is acceptable.  After the cover to the dump bed is closed, any gap left on the system of enclosure should be less than 25mm wide measured in a direction across the gap. Any remaining gap is to be sealed up tightly with a layer of nylon bristle of sufficient length to bridge across the gap.	✓		✓	✓	

**APPENDIX H – SUMMARY OF ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE**

No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Status	Other / Remarks
				Site Installation	Method Statement	Toolbox Talk		
<b>Air Quality</b>								
AQ12	Dust emission from material transporting and handling	Cap 311, sub leg R Schedule IV S.26 (1)	Materials transported by vehicles should be covered, with the cover properly secured and extended over the edges of the side and tail boards.	✓		✓	✓	
AQ13	Dust emission from material transporting and handling	PS 26.10(6)(i)(k)	Spraying all dusty materials with water prior to any loading, unloading or transfer operation so as to maintain the dusty material wet.	✓		✓	✓	
AQ14	Dust emission from material transporting and handling	PS 26.10(6)(i)(a)	Material storage and handling areas shall be located on hard core or paved.	✓		✓	✓	
AQ15	Dust emission from material transporting and handling	Cap 311, sub leg R Schedule IV S.26	All stockpiled aggregate or spoil of more than 50 m <sup>3</sup> should be enclosed or covered and water applied twice per day during dry or windy conditions.	✓		✓	✓	
AQ16	Dust emission from materials transporting and handling	Cap 311, sub leg R Schedule III S.15 (1) & PS 26.10(6)(i)(f)	Stockpiles of dusty materials shall be covered and minimized the extent of spoil exposed at any given time.	✓		✓	✓	
AQ17	Dust emission from materials transporting and handling	Cap 311, sub leg R Schedule III S.15 (1)	Every stock of more than 20 bags of cement shall be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides.	✓		✓	✓	
AQ18	Dust emission from materials transporting and handling	Cap 311, sub leg R Schedule III S.15 (1) & PS 26.10 (6)(i)(b)	Material conveyors for the transfer of dusty materials shall be fitted with windboards and enclosed conveyor transfer points and hopper discharge areas to minimize dust emission.	✓	✓		○	
AQ19	Dust emission from materials transporting and handling	PS 26.10 (6)(i)(c)	Totally enclosing all conveyors carrying materials which have the potential to create dust and fitting them with belt cleaners.	✓	✓		○	
AQ20	Dust emission from materials transporting and handling	PS26.16 (2)(ii)	Profiled steel cladding should be provided at two sides of loading point at barge.	✓	✓		○	

**APPENDIX H – SUMMARY OF ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE**

No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Status	Other / Remarks
				Site Installation	Method Statement	Toolbox Talk		
<b>Air Quality</b>								
AQ21	Dust emission from materials transporting and handling	PS 26.16 (2)(iii)	Dust suppression sprays should be installed and operated in strategic locations at the feeding inlet and outlet.	✓	✓		○	
AQ22	Dust emission from materials transporting and handling	PS 26.16 (2)(iv)	The barging point should be placed within a totally enclosed structure incorporating an enclosed chute for material transfer to barge.	✓	✓		○	
AQ23	Dust emission from materials transporting and handling	PS 26.16 (2)(iv)	Flexible curtain should be hanged on the enclosed chute to prevent dust emission when excavated material/rocks are transported into the barge.	✓	✓		○	
AQ24	Dust emission from materials transporting and handling	Cap 311, sub leg R Schedule III S.15	Debagging of cement and similar materials to be done in a ventilated enclosure with a filtered extraction system.	✓		✓	○	
AQ25	Dust Emission from Blasting	Cap 311. sub leg R Schedule IV S.27 (1), (2)	Wet the area within 30m from the blasting area with water prior to blasting.	✓	✓	✓	○	
AQ26	Dust Emission from Blasting	Cap 311. sub leg R Schedule IV S.27 (1), (2)	Wire mesh, gunnysack and sandbag should be used on top of the blast area on each shot to prevent flying rock and reduce fugitive dust generation.	✓			○	
AQ27	Dust Emission from Blasting	Cap 311. sub leg R Schedule IV S.27 (1), (2)	Do not carry out blasting when the strong wind signal or tropical cyclone warning no. 3 is hoisted unless prior permission of the Commissioner of Mines is obtained.		✓	✓	○	
AQ28	Dust Emission from Blasting	Cap 311. sub leg R Schedule IV S.27 (1), (2)	Blasting shall not be carried out when a Hong Kong Observatory Thunderstorm Warning is in force.		✓	✓	○	
AQ29	Dust Emission from Blasting	Cap 311. sub leg R Schedule IV S.27 (1), (2)	Use of vacuum extraction drilling methods and sequenced the blasting works carefully.		✓		○	

**APPENDIX H – SUMMARY OF ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE**

No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Status	Other / Remarks
				Site Installation	Method Statement	Toolbox Talk		
<b>Air Quality</b>								
AQ30	Dust Emission from Blasting	Cap 311. sub leg R Schedule IV S.27 (1), (2); PS 26.13(4)(iv)	Firing of explosive shall be carried out in the morning prior to opening of the Park.	✓	✓	✓	O	
AQ31	Dust Emission from Tunnel		Exhausts from tunnel ventilation should face away from sensitive receivers.	✓	✓	✓	O	
AQ32	Dust Emission from Tunnel		Forced ventilation shall be maintained in the tunnel to ensure noxious or asphyxiating gases do not accumulate. At the tunnel access shaft or portal the expelled air shall be vented to the atmosphere ensuring adequate diffusion of gases. Expelled air shall be directed away from nearby buildings.	✓	✓	✓	O	
AQ33	Dust Emission from Tunnel		Tunnel ventilation containing high level of Total Suspended Particulates (TSP) shall be filtered at least to the satisfaction of the Safety and Environmental Officers prior to being vented to the atmosphere. The filters should be changed weekly to prevent blockages, which may affect the performance of the system.	✓		✓	O	
AQ34	Dust Emission from Crushing Plant	PS 26.10(2)	The crushing plant shall be operated in accordance with the specified process licence.	✓		✓	O	
AQ35	Gas Emission Smoke/fume from construction plants and equipments	Cap 311, sub leg C S.3	All plants and equipments should be well maintenance to avoid dark smoke.	✓		✓		An owner, who operates any plant in such a manner that any dark smoke is emitted for more than 6 minutes in any period of 4 hours or for more than 3 minutes continuously at any one time, commits an offence.
AQ36	Smoke/fume from construction plants and equipments	Cap 311, sub leg A S.4, 5 & 6	Prior approval should be obtained before the installation of the emergency generator.	✓			N/A	Include in the design

**APPENDIX H – SUMMARY OF ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE**

No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Status	Other / Remarks
				Site Installation	Method Statement	Toolbox Talk		
<b>Air Quality</b>								
AQ37	Smoke from open burning	Cap 311, sub leg O S.4 (1)	Open burning for the purpose of disposal of construction waste/tyres, the salvage of metal or the clearance of site in preparation for construction work is prohibited.			✓	✓	
AQ38	Smoke/fume from all site vehicles	Cap 374, sub leg A S.31(1)	Black smoke should be avoided from any vehicle whether or not mechanically propelled which is constructed or adapted for use on roads (exclude a vehicle of the North-west Railway or a tram)	✓		✓	✓	
AQ39	Smoke/fume from all site vehicles	Cap 311, sub leg L Schedule I	Ensure the correct diesel used in any vehicle whether or not mechanically propelled which is constructed or adapted for use on roads (exclude a vehicle of the North-west Railway or a tram)		✓	✓	✓	
AQ40	Emission from spraying products	Cap 403, sub. leg C s.3	Ozone depleting paint sprayers shall not be used on sites.		✓	✓	✓	
<b>Noise/Vibration</b>								
NV01	Noise from construction work other than percussive piling	Cap 400, S.6(1), PS 26.11 (2)	Work required for the use of powered mechanical equipment (PME) in restricted hours, i.e. the hours between 7pm and 7am on weekdays or at any time on Sundays or a public holiday, for carrying out construction activity shall be required a valid Construction Noise Permit (CNP).		✓	✓	✓	
NV02	Noise Emission from construction plants and equipments	PS 26.11 (9)	Relocation of noise-emitting plant, the use of silencers, mufflers, acoustic sheds or shields or acoustic sheds or screens upon the best reasonable practice.	✓		✓	✓	
NV03	Noise Emission from construction plants and equipments	PS 26.11 (10)	Maintain all plant and silencing equipment in good condition so as to minimize the noise emission during the works.			✓	✓	

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No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Status	Other / Remarks
				Site Installation	Method Statement	Toolbox Talk		
<b>Noise/Vibration</b>								
NV04	Noise Emission from construction plants and equipments	Cap 400, sub. leg. C, s17(1)	Compressors should have Noise Emission Labels (NELS).			✓	✓	
NV05	Noise Emission from construction plants and equipments	Cap 400, sub. leg. D, s17(1)	Hand held breakers should have Noise Emission Labels (NELS).			✓	✓	
NV06	Noise Emission from construction plants and equipments	PS 26.11 (13)(i)	If the work causing serious noise pollution impacts or reached the Target Limit as stated in the Contractor's EM&A Manual, the Contractor shall provide the following proposed remedial measures: <ul style="list-style-type: none"> <li>• Change of construction equipment location and scheduling of activities;</li> <li>• Change of construction equipment location and scheduling of activities;</li> <li>• Installation of construction equipment soundproofing;</li> <li>• Provision of alternative Contractor's equipment;</li> <li>• Erection of sound barriers around the part of the Site or the location of the construction noise source; or</li> <li>• Any other measures that may be effective in reducing noise.</li> </ul>		✓	✓	✓	
NV07	Noise Emission from Blasting	PS 26.13(4)(iv)	Firing of explosive shall be carried out in the morning prior to opening of the Park.	✓	✓	✓	○	

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<b>Noise/Vibration</b>								
NV08	Noise Emission from Blasting	GEP Technical Guidance Note No. 25 (TGN 25)	Blast doors on tunnels to be closed during blasting if required by the blasting period.	✓		✓	○	
NV09	Noise Emission for Vehicles	Cap 374, sub leg A S.30(1)	Every vehicle propelled by an internal combustion engine shall be fitted with a silencer, expansion chamber or other contrivance suitable and sufficient for reducing, as far as may be reasonable, the noise caused by the escape of the exhaust gases from the engine.	✓		✓	✓	
<b>Water Quality (Refer to Drainage Management Plan as stated in PS 26.17(7))</b>								
WQ01	Flooding and wastewater including surface runoff discharges from the construction site/work to inland coastal waters, communal sewers and drains	PS 26.12 (2)	Before commencing any site formation work, all sewer and drainage connection should be sealed to prevent debris, soil, sand and etc from entering public sewers/drains	✓		✓	The existing drainage system is in use and the temporary drainage system is under preparation	
WQ02		PS 26.12 (2)	The boundaries of critical areas of earthworks should be marked and surrounded by dykes or embankments for flood protection.	✓			N/A	
WQ03		PS 26.12 (2)	Wheel wash water shall be changed frequently and sediment removed regularly	✓		✓	✓	
WQ04		PS 26.12 (2)	Construction runoff related impacts associated with tunneling and above ground construction activities can be readily controlled through the use of appropriate mitigations measures which include: <ul style="list-style-type: none"> <li>• Use of sediment traps, oil interceptors; and</li> <li>• Adequate maintenance of drainage systems to prevent flooding and overflow.</li> </ul>	✓	✓	✓	○ ○	

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				Site Installation	Method Statement	Toolbox Talk		
<b>Water Quality (Refer to Drainage Management Plan as stated in PS 26.17(7))</b>								
WQ05	Flooding and wastewater including surface runoff discharges from the construction site/work to inland coastal waters, communal sewers and drains	PS 26.12 (2)	Exposed areas should be minimised to reduce the potential for increased siltation, runoff contamination, and erosion.	✓	✓	✓	✓	
WQ06		EIA Ref. S9.44 EM&A Ref. S8.3	Temporary ditches should be provided to facilitate runoff discharge into the appropriate watercourses via silt retention points.	✓	✓	✓	○	
WQ07	Flooding and wastewater including surface runoff discharges from the construction site/work to inland coastal waters, communal sewers and drains	EPD ProPECC Note No. PN1/94; PS 26.17(6)(ii)	The design of efficient silt removal facilities should be based on the guidelines in Appendix A1 of ProPECC Note PN 1/94.	✓	✓		○	
WQ08		EP Clause2.13	To improve the coagulation and sedimentation process for construction phase discharges from excavation works at Headland, sand/silt removal facilities, including sand/silt traps and sediment basins should be provided.	✓		✓	○	Drainage Proposal
WQ09	Flooding and wastewater including surface runoff discharges from the construction site/work to inland coastal waters, communal sewers and drains	PS 26.12(4)	All exposed earth areas should be completed as soon as possible after earthworks have been completed, or alternatively, within 14 days of the cessation of earthworks where practicable.		✓	✓	○	
WQ10		PS 26.12	If excavation of soil cannot be avoided during the rainy season, or at any time of year when rainstorms are likely, exposed slope surfaces should be covered by tarpaulin or other means.	✓	✓	✓	○	
WQ11	Flooding and wastewater including surface runoff discharges from the construction site/work to inland coastal waters, communal sewers and drains	PS 26.12(6)(iv)	Sediment tanks of sufficient capacity are recommended as a general mitigation measure that can be used for settling surface runoff prior to disposal. The system capacity should be flexible and able to handle multiple inputs from a variety of sources and particularly suited to applications where the influent is pumped.	✓		✓	○	
WQ12		PS 26.12(6)(ii)	All silt removal facilities will be inspected daily and cleaned whenever necessary.			✓	○	

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				Site Installation	Method Statement	Toolbox Talk		
<b>Water Quality (Refer to Drainage Management Plan as stated in PS 26.17(7))</b>								
WQ13	Flooding and wastewater including surface runoff discharges from the construction site/work to inland coastal waters, communal sewers and drains	PS 26.12(6)(iv)	Manholes (including newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris being washed into the drainage system and storm runoff being directed in to foul sewers.		✓	✓	✓	
WQ14	Flooding and wastewater including surface runoff discharges from the construction site/work to inland coastal waters, communal sewers and drains	EP Clause 2.12 & 2.14; PS 26.17(6)(iii)	Design and install a silt curtain system to enclose the existing 1000mm diameter storm water pipe outlet at Tai Shue Wan to minimize the water quality impacts on the marine environment during rainy seasons.	✓	✓		✓	Silt curtain proposal was deposited in the EIAO Register Office for public inspection.
WQ15	Flooding and wastewater including surface runoff discharges from the construction site/work to inland coastal waters, communal sewers and drains	EPD ProPECC Note No. PN1/94; PS 26.17(8)(e)	Precautions should be taken at any time of year when rainstorms are likely. Actions to be taken when a rainstorm is imminent or forecast, and actions to be taken during or after rainstorms, are summarized in Appendix A2 or ProPECC Note PN 1/94. Particular attention should be paid to the control of silty surface runoff during storm events, especially for areas located near steep slopes.			✓	○	Heavy rain procedures
WQ16	Flooding and wastewater including surface runoff discharges from the construction site/work to inland coastal waters, communal sewers and drains	PS 26.12(6)(i)	Oil interceptors should be provided in the drainage system and these should be regularly cleaned to prevent the release of oils and grease into the storm water drainage system after accidental spillages. The interceptor should have a bypass to prevent flushing during periods of heavy rain.	✓			○	
WQ17		PS 26.12(2)	All vehicles and plant should be cleaned before leaving a construction site to ensure no earth, mud, debris and the like is deposited on roads.			✓	✓	

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<b>Water Quality (Refer to Drainage Management Plan as stated in PS 26.17(7))</b>								
WQ18		PS 26.12	Measures should be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system.	✓			✓	
WQ19	Flooding and wastewater including surface runoff discharges from the construction site/work to inland coastal waters, communal sewers and drains	PS 26.12(6)(iii)	An adequately designed and located wheel washing bay should be provided at every site exit and wash-water should have sand and silt settled out and removed at least on a weekly basis to ensure the continued efficiency of the process.	✓			○	
WQ21		PS 26.12	Open stockpiles of construction materials of more than 50m <sup>3</sup> should be covered with tarpaulin or similar fabric.			✓	○	
WQ20		PS 26.12	The section of access road leading to, and exiting from, the wheel wash bay to the public road should be paved with sufficient backfall towards the wheel wash bay towards the wheel wash bay to prevent transport of soils and silty water to public roads and drains.	✓			○	
<b>Drainage and Sewage (Refer to Drainage Management Plan as stated in PS 26.17(7) and Drainage Proposals as stated in EP Clause 2.13)</b>								
DS01	Polluted water discharge from construction site or works	PS 26.17(4)	All temporary and permanent drainage pipes and culverts provided to facilitate runoff discharges should be adequately designed for the controlled release of storm flow (one in five year event).	✓			✓	Drainage Proposal
DS02	Polluted water entry stormwater system during the site activities	PS 26.17(6)	All sediment control measures should be regularly inspected and maintained to ensure proper and efficient operation at all times and particularly following rain storms.	✓		✓	○	
DS03	Polluted water from site reinstatement	PS 26.17(2)	Temporarily diverted drainage systems should be reinstated to their original condition when the construction work has finished, or the temporary diversion is no longer required.				○	Note

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				Site Installation	Method Statement	Toolbox Talk		
<b>Drainage and Sewage (Refer to Drainage Management Plan as stated in PS 26.17(7) and Drainage Proposals as stated in EP Clause 2.13)</b>								
DS04	Polluted water from concrete lorry washing	PS 26.17	Wash water from concrete trucks and pumps is to be collected in skips for treatment.	✓		✓	✓	
DS05	Polluted water from the plant yard	WMP	Plant maintenance areas to be enclosed.	✓			○	
DS06	Polluted water from excavation	PS 26.17(6)(ii)	Temporary open storage of excavated materials used for backfill on site should be covered with tarpaulin or similar fabric during rainstorms. Any washout of construction or excavated materials should be diverted through appropriate sediment traps before discharge to storm water drainage systems.			✓	○	
DS07	Polluted water entry from waste collected area	PS 26.18(2)	Debris and rubbish on site should be collected, handled and disposed of properly to avoid entering the water column to cause water quality impacts.	✓		✓	✓	
DS08	Polluted water and sewage entry the chemical toilets	PS 26.12(3)	Construction sewage may need to be handled by portable chemical toilets if construction workers are likely to be dispersed along the alignment.	✓			✓	
DS09	Polluted water and sewage entry the chemical toilets	PS 26.12(3)	Appropriate numbers of portable toilets should be provided by a licensed contractor to serve the construction workers. This contractor will also be responsible for waste disposal and maintenance practices.	✓			✓	
DS10	Polluted water from chemical storage area	PS 26.12(9)	All fuel tanks and storage areas should be provided with locks and be located on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank, to prevent spilled fuel oils from reaching WSRs.	✓			✓	
DS11	Polluted water from spillage	WMP; PS 26.12(10)	Spill action plan is to be prepared.			✓	✓	Spill procedures
DS12	Polluted water from petrol filling activity	WMP; PS 26.17(8)(l)	Petrol interception for oil filling point.	✓			○	

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				Site Installation	Method Statement	Toolbox Talk		
<b>Drainage and Sewage (Refer to Drainage Management Plan as stated in PS 26.17(7) and Drainage Proposals as stated in EP Clause 2.13)</b>								
DS13	Polluted water from tunnel pump out	PS 26.17(8)	Ground water pumped from tunnels etc., should be discharged into drainage channels that incorporate sediment traps to entrance deposition rates and to remove silt.	✓			O	
DS14	Polluted water from construction works	PS 26.17(8)(i)	Construction work force sewage discharges on site should be connected to the existing trunk sewer or sewage treatment facilities, if practicable.	✓		✓	✓	
DS15	Polluted water from pantry	PS 26.17(8)(k)	Wastewater collected from pantry including that from basins, sinks and floor drains, should be discharged into foul sewers via grease traps capable of providing at least 20 minutes retention during peak flow.	✓			O	
<b>Waste Management (Refer to Waste Management Plan as stated in EP Clause 2.21)</b>								
WM01	Disposal of waste (general)	PS 26.18	Minimize the generation of waste from Works. Avoidance and minimization of waste generation shall be achieved through changing or improving design and practices, careful planning and good site management.			✓	✓	Note
WM02	Disposal of waste (general)	PS 26.18	Different types of waste are segregated on-site and stored in different containers, skips or stockpiles to facilitate the reuse/recycling of materials, thus avoiding disposal (generally with only limited processing and reprocessing may be required).	✓		✓	✓	
WM03	Disposal of waste (general)	WMP	A trip ticket system for the disposal of Construction and Demolition (C&D) materials following the guidelines stipulated in the Environment, Transport and Works Bureau Technical Circular (Works) No. 31/2004 shall be used to prevent any illegal dumping.			✓	✓	

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<b>Waste Management (Refer to Waste Management Plan as stated in EP Clause 2.21)</b>								
WM04	Disposal of waste (general)	PS 26.18	No construction waste of more than 20% inert material by volume shall be disposed of to landfill. Inert materials like rock, sand, concrete debris should be sorted out from construction waste before disposal. Dry concrete waste or the excavated materials should be recycled for reuse or sorted for disposal at public dumps.			✓	✓	
WM05	Generation and disposal of construction and demolition waste	WMP; PS 26.18	All non-inert construction waste material deemed unsuitable for reclamation or land formation and all other waste material shall be disposed at public dumps.	✓		✓	✓	Note
WM06	Generation and disposal of construction and demolition waste	WMP; PS 26.18	The C&D materials shall be sorted into public fill (inert portion) and C&D waste (non-inert portion). The inert portion which comprises soil, rock, concrete, brick, cement plaster/mortar, inert building debris, aggregates and asphalt shall be reused in earth filling, reclamation or site formation works as far as possible. Where excavated rock is of the appropriate grade, it shall be crushed and reused as aggregate or for other surfacing uses, wherever possible.  The non-inert portion, which comprises metal, timber, paper, glass, junk and general garbage shall be reused or recycled.	✓	✓	✓	✓	
WM07	Disposal of waste (general)	WMP; PS 26.18	Record of the amount of waste generated, recycled and disposed of shall be kept on site for easy reference and checking.			✓	✓	
WM08	Disposal of waste (general)	WMP; PS 26.18	Authorized/Licensed Waste Hauliers/Collectors should be used to collect and transport different category wastes to the appropriate disposal points.			✓	✓	

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<b>Waste Management (Refer to Waste Management Plan as stated in EP Clause 2.21)</b>								
WM09	Disposal of waste (general)	WMP; PS 26.18	Handle and store wastes in a manner, which ensures that they are held securely without loss or leakage, thereby minimizing the potential for pollution.			✓	✓	Note
WM10	Disposal of waste (general)	WMP; PS 26.18	Remove wastes in a timely manner and maintain the waste storage areas clean regularly.			✓	✓	
WM11	Disposal of waste (general)	WMP; PS 26.17(8)	Regular cleaning and maintenance the drainage system, sumps, oil interceptors and grease traps. The waste from these facilities shall be collected and disposed of by a licensed Collector.	✓		✓	○	
WM12	Disposal of waste (general)	WMP	Obtain the necessary permits and licenses with regards to the waste management from the appropriate authorities wherever necessary, in accordance with <ul style="list-style-type: none"> <li>• The Waste Disposal Ordinance (Cap 354),</li> <li>• Waste Disposal (Chemical Waste)(General) Regulation (Cap 354),</li> <li>• The Crown Land Ordinance (Cap 28), and</li> <li>• Dumping at Sea Ordinance (Cap 466)</li> </ul>			✓	○	
WM13	Disposal of waste (general)	WMP	Provide training for workers about the concepts of site cleanliness and appropriate waste management procedures, including waste reduction, reuse and recycling.			✓	✓	
WM14	Generation and disposal of construction and demolition waste	WMP & WBTC 5/99 (Appendix A)	The Contractor shall produce a Construction and Demolition Material Disposal Delivery Form (the Form) for each and every vehicular trip transporting Construction and Demolition (C&D) materials off-site. The Contractor shall complete the Form and maintain records as per procedures.			✓	✓	

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<b>Waste Management (Refer to Waste Management Plan as stated in EP Clause 2.21)</b>								
WM15	Production of Chemical Waste (general)	Magnitude	For those processes that generate chemical waste, it may be possible to find alternatives that generate reduced quantities or even no chemical wastes, or less dangerous types of chemical waste	✓	✓		○	
WM16	Production of Chemical Waste (general)	Cap 354 sub. leg. C; PS 26.18 (4)	The Contractor shall be required to register with EPD as a chemical waste producer and to follow the guidelines as stated in the Code of Practice on the Packaging, Labeling and Storage of Chemical Wastes.				✓	Register as chemical waste producer has done
WM17	Storage of Chemical Waste	Cap 354 sub. leg. C s. 13, 14, 15, 16, 18 & 19; PS 26.18(4)	<p>Chemical waste that is produced, as defined by Schedule 1 of the Waste Disposal (Chemical Waste)(General) Regulation, should be handled in accordance with the Code of Practice on the Packaging, Labeling and Storage of Chemical Wastes as follows:</p> <ul style="list-style-type: none"> <li>• A suitable area (special container(s) would be proposed to use) for temporary storage of chemical waste shall be provided. The best location for the storage area shall be located close to the source of chemical waste generation.</li> <li>• The container used for the storage of chemical waste should be used for chemical waste only and kept clean and dry all the times.</li> <li>• The container shall be suitable for the substance they are holding, resistant to corrosion, maintained in a good condition, and securely closed.</li> </ul>	✓			○	
				✓		✓	○	
				✓		✓	○	

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<b>Waste Management (Refer to Waste Management Plan as stated in EP Clause 2.21)</b>								
WM17 (contd)	Storage of Chemical Waste	Cap 354 sub. leg. C s. 13, 14, 15, 16, 18 & 19; PS 26.18(4)	<ul style="list-style-type: none"> <li>The container should have a capacity of less than 450 l unless the specifications have been approved by EPD.</li> <li>If the container is not used as the storage, the storage area shall be enclosed on at least three sides by a wall, partition or fence with a height of not less than 2m or the total height in stack, whichever is less.</li> <li>Adequate ventilation shall be allowed by leaving some space between the top of the enclosure walls and ceiling, or provision of louvers on the sides of the enclosure walls.</li> <li>The storage area should have an impermeable floor and bunding of sufficient capacity to accommodate 110% of the volume of the largest container or 20% of the total volume of waste stored in that area, whichever is the greatest</li> <li>The storage area should be covered to prevent rainfall entering (water collected within the bund must be tested and disposed as chemical waste if necessary)</li> <li>Every chemical waste storage area should display a hazard-warning panel, notice or marking at or near the entrance or opening of the storage area in English and Chinese characters “CHEMICAL WASTE” and “化學廢物” clearly and boldly in red on a white background with a letter/character size of not less than 60mm high.</li> </ul>	✓			○	
				✓		✓	○	
				✓		✓	○	
				✓		✓	○	
				✓		✓	○	
				✓		✓	○	

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<b>Waste Management (Refer to Waste Management Plan as stated in EP Clause 2.21)</b>								
WM18	Disposal of Chemical Waste	WMP; PS 26.18	Disposal of chemical waste be to a facility licensed to receive chemical waste, such as the Chemical Waste Treatment Facility that also offers a chemical waste collection service and can supply the necessary storage containers, or to a re-user of the waste under approval from EPD.			✓	○	
WM19	Disposal of Chemical Waste	Cap 354, sub. leg. C s21 & 22	Disposal of chemical waste should be via a licensed waste collector.			✓	○	
WM20	Generation of general refuse	Cap 311, sub leg O S.4 (1)	Law prohibits the burning of refuse on construction sites.			✓	✓	
WM21	Generation of general refuse	Magnitude	Office wastes can be reduced through recycling of paper if volumes are large enough to warrant collection. Participation in a local collection scheme should be considered if one is available.	✓		✓	✓	
WM22	Generation of general refuse	WMP	General refuse generated on site should be stored in enclosed bins or compaction units separate from construction and chemical wastes. A reputable waste collector should be employed to remove general refuse from the site, separately from construction and chemical wastes, on a daily or every second day basis to minimize odour, pest and litter impacts.	✓		✓	✓	
WM23	Generation of general refuse	Magnitude	General refuse will be generated largely by food service activities on site, so reusable rather than disposable dishware should be used if feasible. Individual collectors often recover aluminum cans from the waste stream if they are segregated or easily accessible, so separate labeled bins for their deposit should be provided wherever feasible.	✓		✓	✓	

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<b>Ecology</b>								
EC01	Ozone Emission entry the ambient environment	PS 26.08 (3) (i)	Ozone depleting fire extinguishers shall not be used for temporary firefighting measures and ozone depleting substances shall not be used in carrying out the Works.				✓	Note restriction
EC02	Disturbance the marine ecological sensitive receivers	EP Clause 2.12; PS 26.14(5)	Divert the construction phase discharges from excavation works at Headland to an existing 1000mm diameter storm water pipe outlet at Tai Shue Wan to avoid impacts on coral communities in the marine water around the Nam Long Shan headland.	✓		✓	✓	Drainage Proposal
EC03	Disturbance the marine ecological sensitive receivers	EP Clause 2.15	No marine-based construction works shall be allowed for the Project to conserve the marine ecological resources in the vicinity of the project area.	✓	✓	✓	✓	
EC04	Disturbance the ecological sensitive receivers	EP Clause 2.17 & PS 26.14 (1)	The site clearance works before bulk excavation to the existing mountain to provide a new platform for the Summit shall commence before or outside the breeding season of Black Kites, i.e. from October to May of the next year.	✓	✓	✓	✓	
EC05	Disturbance the ecological sensitive receivers	PS 26.14 (2)	Design of temporary conveyor belt system and the location of temporary adit portals should be considered to avoid impact to potential nest sites in the tall shrubland habitat at Tai Shue Wan area where possible.	✓	✓	✓	○	
EC06	Disturbance the ecological sensitive receivers	EP Clause 2.19	No construction works and discharge from the construction site(s) shall be allowed within the existing freshwater ponds at the Tai Shue Wan area and within the enhanced Pond 35 after enhancement works.	✓		✓	○	

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<b>Ecology</b>								
EC07	Disturbance the ecological sensitive receivers	EM&A section 6.2.5	Minimize the impact due to construction on the existing surrounding vegetation by: <ul style="list-style-type: none"> <li>• Set up of temporary tree nurseries;</li> <li>• Designation of “no-intrusion zones” and to record any trespass, including the damage to the existing vegetation;</li> <li>• Hill fire prevention;</li> <li>• Dust and erosion control for exposed soil; and</li> <li>• Well-planned irrigation networks throughout the establishment period.</li> </ul>	✓    ✓   ✓	✓	✓  ✓  ✓	✓  ○  ✓  ✓	
EC08	Disturbance the ecological sensitive receivers	EM&A section 7.17 & EIA section 5.138	Minimize the impact due to construction on the uncommon plant species by: <ul style="list-style-type: none"> <li>• Vegetation survey and subsequent transplantation of locally uncommon or restricted species as far as practicable;</li> <li>• Trees located within the works areas shall be preserved as far as practicable;</li> <li>• Placement of equipment or stockpile in designated works areas and access routes selected on existing disturbed land to minimize disturbance to natural habitats;</li> <li>• Construction activities shall be restricted to the works areas that would be clearly demarcated;</li> </ul>	✓   ✓	✓	✓  ✓  ✓	Uncommon or restricted species including Long Tentacle Orchid, Sword-leaved Orchid, Green-flowered Rattlesnake-Plantain, Cycad-fern, Balloon Flower and Chinese Lily  ✓  ✓  ✓	

**APPENDIX H – SUMMARY OF ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE**

No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Status	Other / Remarks
				Site Installation	Method Statement	Toolbox Talk		
<b>Ecology</b>								
EC08 (cont'd)	Disturbance the ecological sensitive receivers	EM&A section 7.17 & EIA section 5.138	<ul style="list-style-type: none"> <li>The work areas shall be reinstated immediately after the completion of works;</li> <li>Landscaping works on newly formed land shall as far as possible make use of native plant species.</li> </ul>	✓			✓	
				✓			✓	
<b>Hazard to Life</b>								
HL01	Hazard to life due to blasting activities	EM&A section 11.3 & EIA Section 12.15	The blasting activities shall be inspected and audited at practical intervals to ensure that the assumptions and recommendations from the Quantitative Risk Assessment (QRA) study are implemented.	✓	✓	✓	○	
HL02			The recommendations from the systematic hazard identification are consistently implemented in accordance with the intent of the hazard to life assessment.	✓	✓	✓	○	
<b>Landscape and Visual</b>								
LV01	Visual and Appearance considerations	EM&A Section 6.2.5	Minimize the visual and appearance impact by: <ol style="list-style-type: none"> <li>careful choice between 'impermeable' and 'permeable' hoardings.</li> <li>control over the appearance of construction workers, construction plants/ machines.</li> <li>proper screening and careful alignment of the temporary barging point and conveyor system.</li> <li>careful selection of security floodlights to avoid light pollution.</li> </ol>	✓		✓	✓	
						✓	○	
				✓			In the design	
				✓			✓	

**APPENDIX H – SUMMARY OF ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE**

No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Status	Other / Remarks
				Site Installation	Method Statement	Toolbox Talk		
<b>Cultural and Heritage Impact</b>								
CH01	Cultural and Heritage Impact	EP clause 2.22	To preserve the grave G1, no works shall be allowed within one metre from the vicinity of such grave.	✓		✓	✓	Note requirement

Notes:

- EP denotes the Environmental Permit No. 249/2006 and its subsequent permits.
- EM&A Manual denotes the Contractor specific EM&A Manual.
- WMP denotes the Waste Management Plan.
- EIA denotes the Final EIA Report No. AEIAR-101/2006.
- PS denotes the Particular Specification of the Project.
- ✓ denotes implemented.
- denotes to be implemented.

**APPENDIX I – EVENT AND ACTION PLANS**

**Event/Action Plan for Air Quality Monitoring**

Event Action Level	Action			
	CET	Contractor	PMR	IEC
Exceedance for one sample	<ol style="list-style-type: none"> <li>1. Identify source.</li> <li>2. Notify IEC, PMR and Contractor.</li> <li>3. Conduct additional monitoring to investigate the causes.</li> <li>4. Report the investigation results and if exceedance is due to contractor's construction works to the IEC, PMR and Contractor.</li> <li>5. Increase monitoring frequency to once per 2 days for 24-hour TSP and daily for 1-hour TSP until exceedance stops if exceedances are considered related to contractor's construction works and report the results to IEC, PMR and Contractor.</li> </ol>	<ol style="list-style-type: none"> <li>1. Take immediate action to avoid further exceedance and rectify any unacceptable practice.</li> <li>2. Submit air mitigation proposal to IEC and PMR for agreement if CET indicated that exceedance is related to the construction works.</li> <li>3. Implement agreed proposal within a time scale agreed with PMR and IEC.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing.</li> <li>2. Notify Contractor.</li> <li>3. Require Contractor to submit air mitigation proposal.</li> <li>4. Ensure remedial measures are properly implemented.</li> </ol>	<ol style="list-style-type: none"> <li>1. Review monitoring data and investigation report submitted by CET.</li> <li>2. Review Contractor's air mitigation proposal and advise the PMR accordingly.</li> <li>3. Supervise and confirm in writing the implementation of remedial measures.</li> </ol>
Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> <li>5. Identify source.</li> <li>6. Notify EPD, IEC, PMR and Contractor.</li> <li>7. Conduct additional monitoring to investigate the causes.</li> <li>8. Report the investigation results and if exceedances are due to contractor's construction works to EPD, IEC, PMR and Contractor within 3 working days after additional monitoring.</li> <li>9. Increase monitoring frequency to daily for 24-hour TSP and 1-hour TSP if exceedances are considered related to contractor's construction works until exceedance stops, and report the results to EPD, IEC, PMR and Contractor.</li> <li>10. If exceedances continue after 1-week monitoring events, request PMR to arrange meeting with PMR, IEC and contractor to discuss remedial actions.</li> </ol>	<ol style="list-style-type: none"> <li>1. Take immediate action to avoid further exceedance and rectify any unacceptable practice.</li> <li>2. In consultation with the IEC, submit air mitigation proposal to IEC and PMR for agreement within 3 working days of notification if ET indicated that exceedances are related to construction works.</li> <li>3. Implement agreed proposal within a time scale agreed with PMR and IEC.</li> <li>4. Amend working methods if appropriate.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing.</li> <li>2. Notify Contractor.</li> <li>3. Require Contractor to submit air mitigation proposal.</li> <li>4. Ensure remedial measures are properly implemented.</li> </ol>	<ol style="list-style-type: none"> <li>1. Review monitoring data and investigation report submitted by CET.</li> <li>2. Discuss amongst PMR, CET and Contractor in order to formulate air mitigation proposal.</li> <li>3. Review Contractor's air mitigation proposal and advise the PMR accordingly.</li> <li>4. Supervise and confirm in writing the implementation of remedial measures.</li> </ol>

**APPENDIX I – EVENT AND ACTION PLANS (CONT'D)**

**Event/Action Plan for Air Quality Monitoring**

Event Limit Level	Action			
	CET	Contractor	PMR	IEC
Exceedance for one sample	<ol style="list-style-type: none"> <li>1. Identify source.</li> <li>2. Notify EPD, IEC, PMR and Contractor.</li> <li>3. Conduct additional monitoring to investigate the causes.</li> <li>4. Report the investigation results and if exceedances are due to contractor's construction works to EPD, IEC, PMR and Contractor within 3 working days after additional monitoring.</li> <li>5. Increase monitoring frequency to daily if exceedances are considered related to contractor's construction works until exceedance stops, and report the results to EPD, IEC, PMR and Contractor.</li> </ol>	<ol style="list-style-type: none"> <li>1. Take immediate action to avoid further exceedance and rectify any unacceptable practice</li> <li>2. In consultation with the IEC, submit air mitigation proposal to IEC and PMR for agreement within 3 working days of notification if CET indicated that exceedances are related to construction works</li> <li>3. Implement agreed proposal within a time scale agreed with PMR and IEC.</li> <li>4. Amend working methods if appropriate.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing.</li> <li>2. Notify Contractor.</li> <li>3. Require Contractor to submit air mitigation proposal.</li> <li>4. Ensure remedial measures are properly implemented.</li> </ol>	<ol style="list-style-type: none"> <li>1. Review monitoring data and investigation report submitted by CET.</li> <li>2. Discuss amongst PMR, CET and Contractor in order to formulate air mitigation proposal.</li> <li>3. Review Contractor's air mitigation proposal and advise the PMR accordingly.</li> <li>4. Supervise and confirm in writing the implementation of remedial measures.</li> </ol>
Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> <li>1. Identify source.</li> <li>2. Notify EPD, IEC, PMR and Contractor.</li> <li>3. Conduct additional monitoring to investigate the causes.</li> <li>4. Report the investigation results and if exceedances are due to contractor's construction works to EPD, IEC, PMR and Contractor within 3 working days after additional monitoring.</li> <li>5. Increase monitoring frequency to daily if exceedances are considered related to contractor's construction works until exceedance stops, and report the results to EPD, IEC, PMR and Contractor.</li> <li>6. If exceedances continue after 2 consecutive monitoring events, request PMR to arrange meeting with IEC and contractor to discuss remedial actions.</li> </ol>	<ol style="list-style-type: none"> <li>1. Take immediate action to avoid further exceedance and rectify any unacceptable practice.</li> <li>2. In consultation with the IEC, submit air mitigation proposal to IEC and PMR for agreement within 3 working days of notification if CET indicated that exceedances are related to construction works.</li> <li>3. Implement agreed proposal within a time scale agreed with PMR and IEC.</li> <li>4. Amend working methods and proposal if appropriate.</li> <li>5. Stop relevant portion(s) of works as required by PMR, CET and IEC.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing.</li> <li>2. Notify Contractor.</li> <li>3. Require Contractor to submit air mitigation proposal.</li> <li>4. Ensure remedial measures are properly implemented.</li> <li>5. If exceedances continue arrange meeting with Contractor, IEC and CET and to consider what portion(s) of works should be further mitigated or have to stop.</li> </ol>	<ol style="list-style-type: none"> <li>1. Review monitoring data and investigation report submitted by CET.</li> <li>2. Discuss amongst PMR, CET and Contractor in order to formulate air mitigation proposal.</li> <li>3. Review Contractor's air mitigation proposal and advise the PMR accordingly.</li> <li>4. Supervise and confirm in writing the implementation of remedial measures.</li> </ol>

**APPENDIX I – EVENT AND ACTION PLANS (CONT'D)**

**Event/Action Plan for Regular Construction Noise Monitoring**

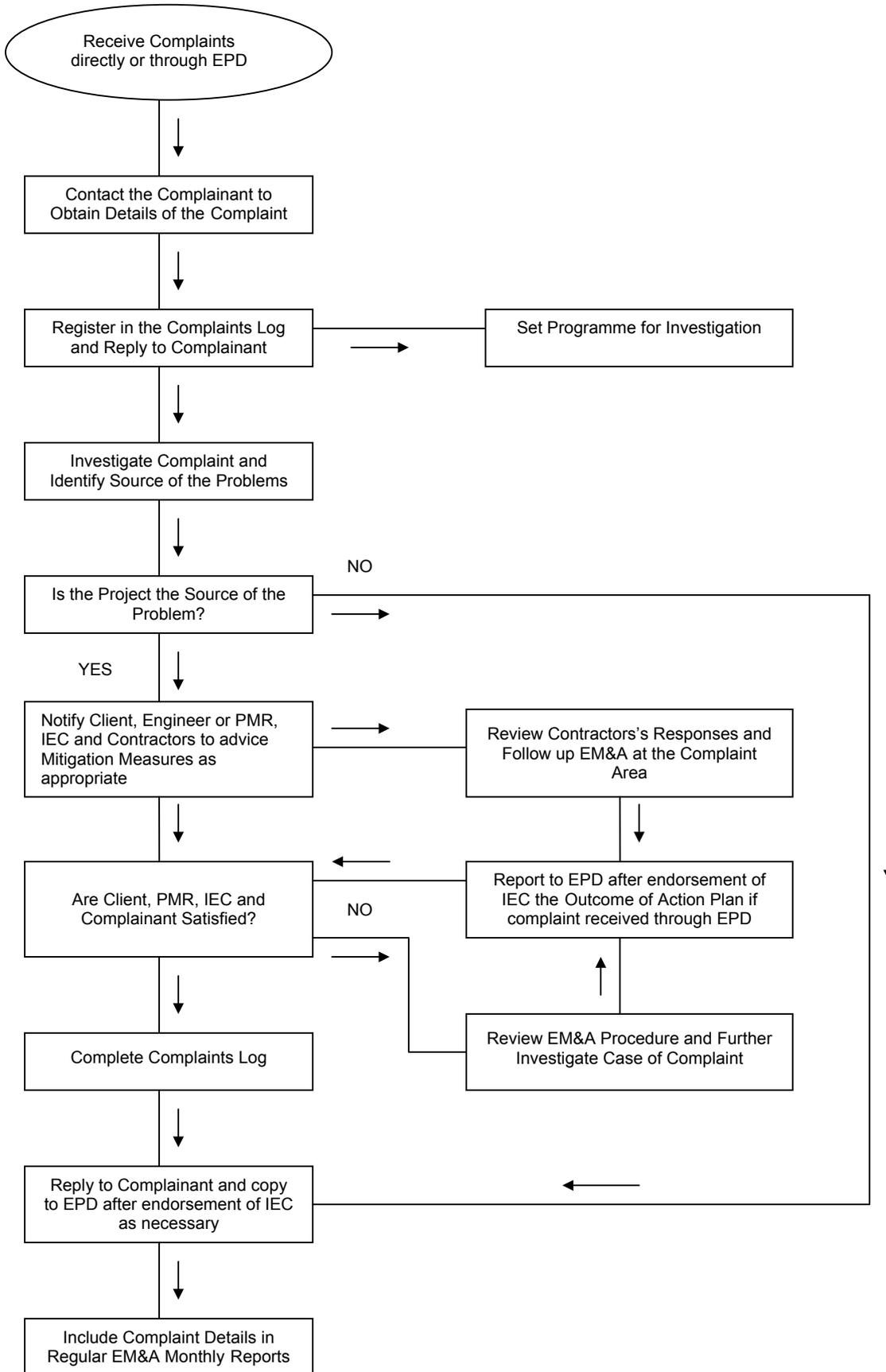
Event	Action			
	CET	Contractor	PMR	IEC
Action Level Exceedance	<ol style="list-style-type: none"> <li>1. Identify source.</li> <li>2. Notify IEC, PMR and Contractor.</li> <li>3. Conduct additional noise monitoring to investigate the causes.</li> <li>4. Report the investigation results to the IEC, PMR and Contractor.</li> <li>5. Discuss with Contractor for their formulation of remedial measures if the exceedance is related to construction works.</li> <li>6. Conduct additional monitoring to check mitigation effectiveness.</li> </ol>	<ol style="list-style-type: none"> <li>1. Take immediate action to avoid further exceedance.</li> <li>2. Submit noise mitigation proposals to ET, PMR and IEC.</li> <li>3. Implement noise mitigation proposals.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing.</li> <li>2. Notify Contractor.</li> <li>3. Require Contractor to propose remedial measures for the analysed noise problem.</li> <li>4. Ensure remedial measures are properly implemented.</li> </ol>	<ol style="list-style-type: none"> <li>1. Review the analysed results submitted by the CET.</li> <li>2. Review the proposed remedial measures by the Contractor and advise the PMR accordingly.</li> <li>3. Supervise and confirm in writing the implementation of remedial measures</li> </ol>
Limit Level Exceedance	<ol style="list-style-type: none"> <li>1. Identify source.</li> <li>2. Notify EPD, IEC, PMR and Contractor.</li> <li>3. Conduct additional noise monitoring and analyse Contractor's working procedures to determine possible cause of exceedance.</li> <li>4. Provide interim report to EPD, IEC and PMR on the causes and proposed actions to be taken for the exceedances if exceedance is related to construction works.</li> <li>5. Assess effectiveness by additional monitoring and report to EPD, IEC, PMR and Contractor the results.</li> <li>6. If exceedance stops, cease additional monitoring.</li> </ol>	<ol style="list-style-type: none"> <li>1. Take immediate action to avoid further exceedance.</li> <li>2. Submit proposals for remedial actions to CET, PMR and IEC within 3 working days of notification.</li> <li>3. Implement the agreed proposals.</li> <li>4. Resubmit proposals if problem still not under control.</li> <li>5. Stop the relevant portion of works as determined by the PMR until the exceedance is abated.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing.</li> <li>2. Notify Contractor.</li> <li>3. Require Contractor to propose remedial measures for the analysed noise problem.</li> <li>4. Ensure remedial measures are properly implemented.</li> <li>5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss amongst PMR, CET and Contractor on the potential remedial actions.</li> <li>2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the PMR accordingly.</li> <li>3. Supervise and confirm in writing the implementation of remedial measures.</li> </ol>

**APPENDIX I – EVENT AND ACTION PLANS (CONT'D)**

**Event/Action Plan for Subtidal Monitoring**

<b>Event</b>	<b>CET</b>
Action Level Exceedance	<p><b>Step 1</b> - Inform the IEC, ER, Contractor, Project Proponent, EPD, and AFCD and discuss the most appropriate method of reducing sediment in the discharge (e.g. check and increase effectiveness of construction site drainage and sediment and other site run-off removal facilities)</p> <p><b>Step 2</b> - Audit the implementation of mitigation measures on site.</p> <p><b>Step 3</b> - If non-compliance continues, check and confirm the effectiveness of mitigation measures and repeat monitoring survey measurements.</p>
Limit Level Exceedance	<p>Undertake <b>Steps 1-3</b>.</p> <p>If further exceedance of Limit Level, suspend construction works until an effective solution is identified.</p> <p>Once the solutions have been identified and agreed with all parties, construction works may commence.</p>

**APPENDIX J – COMPLAINT FLOW DIAGRAM AND COMPLAINT LOG**



## **APPENDIX K – CONSTRUCTION PROGRAMME**

Early Start	Activity Description
<b>CI05 - Tunnel, Site Formation &amp; Misc.</b>	
<b>Cost Centre B-Misc. Site Formation at Waterfront</b>	
<b>Construction</b>	
<b>Hoarding for Portion 1 &amp; 2 &amp; Tree Felling</b>	
05/FEB/07A	Tree Felling at Waterfront
<b>B4 - Access Rd to Astounding Asia at Waterfront</b>	
07/JUN/07A	Divert Existing Fresh/Saltwater&FS System Mains
31/JUL/07	Install Salt Water mains
03/AUG/07	Install New Freshwater & FS System Mains
03/AUG/07	Remove Existing Saltwater/Freshwater Mains
11/AUG/07	Access Rd from Ch. 100 - 300
15/SEP/07	Access Road Remaining Works
<b>B6 - Filling Existing Lagoon at Goldfish Pagoda</b>	
23/JUN/07A	Utilities Diversion
09/JUL/07A	Lagoon Fill
<b>Cost Centre C-Misc. Site Formation at Summit</b>	
<b>Construction</b>	
<b>Summit Hoarding &amp; Tree Felling</b>	
31/JUL/07	Tree Felling for Overbridge Construction
<b>C3 - Access Road &amp; Overbridge</b>	
07/SEP/07	Form Temp. Access Road & Divert Existing Utility
21/SEP/07	Site Formation & Erected A Temp. Bridge/Road
06/OCT/07	Substructure Construction
<b>C1/C2 - Explosive Magazine</b>	
30/JUL/07*	Explosive Magazine & Emulsion Plant Appv'd
<b>C1/C2 - Preparation Works for Temp. Conveyor Sys</b>	
25/MAY/07A	Conveyor & Barging Point Erection
31/JUL/07	Drainage Works
16/AUG/07	Conveyor Commissioning
	Completion of Conveyor & Barging Point
<b>C1 / C2 / C5 - Summit Excavation</b>	
21/JUN/07A	Soft Excavation (50,000cu.m.)
02/AUG/07	Trial Blasting-Summit Terminus Area (North Part)
02/AUG/07	Trial Blasting-Summit Terminus Area (South Part)
02/AUG/07	Form Temp Access Roads within Ph 1 & 2
15/AUG/07	Form Access for Summit Site Formation (North)
21/SEP/07	Rock Blasting Phase 1 (328,000cu.m.)
21/SEP/07	Ph. 1 Blast top to +178mPD+South+SE end+131mPD
24/OCT/07	Rock Blasting Phase 2 (425,000cu.m.)
24/OCT/07	Ph. 2 -Bench Formation at +168mPD
25/OCT/07	Ph. 1 -Bench Formation at+168mPD,+158mPD&+148mPD
<b>Cost Centre D - Funicular Tunnel and Adit Tunnel</b>	
<b>Construction</b>	
<b>D3 - Adit (Ch.935)</b>	
16/AUG/07	Adit Tunnel Excavation with Temp. Works
<b>D1 - Tunnel Ch.940 - Ch.1240</b>	
27/SEP/07	Excavation - 36 li.m./wk
<b>D2 - Tunnel Ch. 0 - Ch.940</b>	
27/SEP/07	Excavation CH940 towards CH740 - 24 li.m./wk
15/OCT/07	Forepoling for Soft Ground Tunnel from Ch21
24/OCT/07	Raking Drains Installation at Ch21
25/OCT/07	Excavation CH21 towards CH120 - 7.5m/wk
<b>Cost Centr E-Funicular Termini-Summit&amp;Waterfront</b>	
<b>Construction</b>	
<b>E2 - Hoarding / Tower Crane - Summit Terminus</b>	
24/OCT/07	Tower Crane Erection
<b>E2 - Summit Terminus Construction</b>	
24/OCT/07	Foundation Excavation with Haul Road
24/OCT/07	Erect Blast Screen Around Terminus @ +131&138mPD
<b>E1 - South Part of Waterfront Terminus</b>	
08/JUN/07A	Pressure Grout below building & above portal
17/JUN/07A	Consent + BA10 for Commencement of Works from BD
31/JUL/07	1st Stage-Waling&Strut with Soil Nail&Excavation
18/OCT/07	Starting Date of the Tunnelling Works Ch21 - 580
<b>E1 - North Part of Waterfront Terminus</b>	
23/OCT/07	Pipe Pile & Cut-off Wall Installation
<b>Cost Centre F- Reservoir at Summit with Pipework</b>	
<b>Construction</b>	
<b>F2 / F3 / F5 - Pumping Station - Mid-Level</b>	
25/SEP/07*	Pumping Station Structures & Foundation
23/OCT/07*	Foundation & Baseslab Construction
<b>Cost Centre H-Option Government Entrust Works</b>	
<b>Construction</b>	
<b>H3 - Wong Chuk Hang Road</b>	
30/JUL/07*	F2.08 to F2.07 (Q1)
31/JUL/07	Drainage& Road:Manhole F2.08-F2.07 (7.0md,115ml)
27/SEP/07	F2.07 to F2.06 (Q2)
28/SEP/07	Drainage& Road:Manhole F2.07-F2.06 (6.0md,96ml)
<b>H2 - Nam Long Shan Road</b>	
14/MAY/07A	Drainage Works:Manhole F1.70 to Connect w Road
14/MAY/07A	Existing MH to F1.73 (P1)
07/JUL/07A	Drainage Works:Manhole F1.46-F1.60 w Roadworks
07/JUL/07A	F1.63 to F1.62 (P15)
07/JUL/07A	F1.46 to 15m (P29)
07/JUL/07A	Drainage Works:Manhole F1.44-F1.46 w Roadworks
16/JUL/07A	Drainage Works:Manhole F1.41-F1.43 w Roadworks
16/JUL/07A	F1.41 to F1.40 (P35)
16/JUL/07A	Drainage Works:Manhole F1.39-F1.41 w Roadworks
23/JUL/07A	13m to F1.45 (P30)
26/JUL/07A	F1.40 to F1.39 (P36)
01/AUG/07	F1.62 to F1.61 (P16)

Start Date 02/OCT/06  
 Finish Date 03/APR/09  
 Data Date 30/JUL/07  
 Run Date 31/JUL/07 14:38

OP3A  
**Dragages - Bouygues JV**  
**Ocean Park Master Redevelopment Project**  
**Contract CI05**  
**Construction Programme Rev 2**  
**ENVIRONMENT DEPARTMENT**  
**3 Month Rolling Forecast**

Sheet 1 of 2

Date	Revision	Checked	Approved

Early Start	Activity Description
06/AUG/07*	F1.35 to F1.34 (P40)
16/AUG/07	F1.73 to F1.72 (P2)
22/AUG/07	Drainage Works:Manhole F1.20a-F1.39 w Roadworks
22/AUG/07	F1.39 to F1.38 (P37)
23/AUG/07	F1.54 to F1.52 (P24) include Watermain works
27/AUG/07*	F1.67 to F1.66 (P9)
14/SEP/07	F1.66 to F1.65 (P10)
24/SEP/07	F1.38 to F1.37 (P38)
25/SEP/07	F1.52 to 20m (P25) include Watermain works
02/OCT/07*	F1.28 to F1.27 (P45)
11/OCT/07	Drainage Works:Manhole F1.69-F1.70 w Roadworks
11/OCT/07	F1.70 to 10m (P5)
30/OCT/07	F1.27 to F1.25 (P46)
30/OCT/07	20m to F1.50 (P26) include Watermain works
31/OCT/07	F1.37 to F1.35 (P39)

**Other Works**

Complete HyD Shun Wan Rd junction work by others  
 Comp Reloc residents-Wong Chuk Hang Rd by others

**Cost Centre J - Entry Plaza Advance Works**

**Construction**

**Bus Depot (Portion 1)**

05/MAY/07A	TTA for temp Ocean Park Road
04/AUG/07*	Driving sheet pile for 1800 drainage
28/AUG/07	BA8
28/AUG/07	BA14
25/SEP/07	BA10
02/OCT/07	Waling +strutting
09/OCT/07	Excavation
24/OCT/07	Manhole for 1800 drainage, 3nos.
31/OCT/07	1800 pipe laying
31/OCT/07	Install DN200 & DN150

**Existing Bus Terminus (Portion 2)**

20/SEP/07	Driving sheet pile for 1800 drainage section 3&4
20/SEP/07	temp. road to police school
13/OCT/07	Diversion of ocean park road to temp. road
15/OCT/07	Driving of sheet pile for drainage works sec. 2

**HK School of Motoring (Portion 3)**

05/MAY/07A	Excavation for DN300 & DN450 w/ addl PMI 37
08/MAY/07A	Sheet Pile&Excav DN450, DN300, DN200, DN1650 & 11kv
12/MAY/07A	DN450 pipe laying + concrete block, 180m
14/MAY/07A	DN300 pipe laying+concrete block, 130m w/ PMI 49
26/MAY/07A	Temporary Bus Terminus construction
03/JUL/07A	Additional 150 washout & chamber
03/JUL/07A	Additional fence
04/AUG/07	Upgrade existing Utility up to carriageway req.
10/AUG/07	DN450, 300, 200, 1650 & 11kv pipe laying
11/AUG/07	Add'l entry for early handover area of carpark
20/AUG/07	Drainage for permanent road
30/AUG/07	Permanent Road and Curing
20/SEP/07	Upgrade existing Utility up to carriageway req.
27/SEP/07	DN450, 300, 200, 1650 & 11kv pipe laying
08/OCT/07	Drainage for permanent road
18/OCT/07	Permanent Road and Curing

Start Date 02/OCT/06  
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OP3A  
**Dragages - Bouygues JV**  
**Ocean Park Master Redevelopment Project**  
**Contract CI05**  
**Construction Programme Rev 2**  
**ENVIRONMENT DEPARTMENT**  
**3 Month Rolling Forecast**



Date	Revision	Checked	Approved

**APPENDIX L – CONTACTS OF KEY ENVIRONMENTAL PERSONNEL**

<b>Company</b>	<b>Contact Person</b>	<b>Position</b>	<b>Telephone No.</b>
Ocean Park Corporation	Helen LEUNG	Project Manager	2910 3106
Maunsell Consultants Asia Ltd	Joseph GABAY	Project Manager Representative (PMR)	2871 5888
	Terence KONG	Project ETL	2871 5893
Dragages-Bouygues J.V.	YT SO	Project QSE Manager	2555 4110
	Schroeder TAM	Project QSE Officer	2555 4113
Mott MacDonald Hong Kong Ltd	Dr. Anne KERR	Independent Environmental Checker	2828 5757
ETS-Testconsult Limited	CL LAU	Environmental. Monitoring Team Supervisor	2695 8318

**Part 3      CS-01 EM&A REPORTS (July 2007)**

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## **EXECUTIVE SUMMARY**

This is the 4<sup>th</sup> EM&A Monthly report prepared by Kaden – ATAL Joint Venture for the Project “Vet Hospital”. This report presents the results of EM&A works conducted in the month of July 2007.

In the reporting month, the following construction activities took place:

- Part of blinding the footings of Office Block and Pool Block;
- Blinding the Plant Block;
- Scaffolding works and formwork & fixing rebar for the tie beam;
- Concreting the columns of Pool block;
- Grouting the soil nails and take the Pull out test;
- Disposal the unsuitable material out off site;
- Breaking up the rock bedding level; and
- Installation of the water pipes and conduits laying

## **Environmental Licensing and Permitting**

Permits granted to the Project include the Environmental Permit for the Project and construction noise permit. Information of these permits is provided in Table 2.1.

## **Implementation Status of Environmental Mitigation Measures**

Sedimentation tanks at the site entrance and discharge point shall be maintained more frequently.

Exposed slopes shall be covered entirely with tarpaulin sheets.

Dust generated by plant movement was observed. KAJV was reminded to keep watering the haul road and working area surfaces once the surfaces are dry.

Buckets of chemical were observed without drip tray. KAJV was reminded to provide drip tray for the chemical.

Over accumulation of C&D waste was observed at the waste skip. KAJV was reminded to remove the C&D waste on skip in frequent basis to avoid accumulation.

## **Environmental Non-conformance**

No complaint, summons or prosecution related to environmental issues was made against the Vet Hospital Project in the reporting month.

## **Future Key Issues**

Key issues to be considered in the coming month include:

- General chemical waste management on site, in particular at site workshop.
- Construction waste management at temporary construction waste area.
- To implement dust suppression measures on dry surfaces.
- To keep well maintenance to equipment to avoid black smoke emission from machinery and vessels.
- Noise from operating equipment and machinery on-site.
- Avoid accumulation of stagnant / muddy water on-site.

## 1. INTRODUCTION

### Background

- 1.1 Under the requirements of Environmental Permit EP-249/2006/A, EM&A programme as set out in the EM&A Manual is required to be implemented.
- 1.2 This report summarises the environmental monitoring and audit works for the Project in July 2007.

### Project Organisation

- 1.3 The structure of the Project Organisation is shown in Appendix A.

### Construction Works undertaken during the Reporting Month

- 1.4 The major construction activities undertaken in July 2007 included disposal unsuitable materials out off site such as landfills, part of blinding the footings of Office Block and Pool Block, blinding the Plant Block, scaffolding works and formwork & fixing rebar for the tie beam, concreting the columns of Pool Block, grouting the soil nails and take the pull out test, breaking up the rock bedding level and installation of the water pipes and conduits laying.
- 1.5 A layout plan of the Project is provided in Appendix B.
- 1.6 The total volume of excavated material disposal at Quarry Bay is 3,027.17 tonnes. The actual amounts of different types of waste generated by the activities of the Project in the month are shown in Table 1.1.

**Table 1.1 Actual Quantity of Waste Generated in July 2007**

Waste Type	Examples	Actual quantity disposed	Disposal Locations
Excavated material	Rock and soil	3,027.17 tonnes	Quarry Bay
C&D Waste	Plastic, wood and bamboo	2.69 tonnes	WENT Landfill
		1.64 tonnes	SENT Landfill
Chemical waste	Used oil, spent solvent	--	Collected by licensed collector
General waste	Domestic waste (site) collected in garbage bins	--	SENT landfill

### Summary of EM&A Requirements

- 1.7 The environmental licensing and permits are described in Section 2.
- 1.8 The advice on the implementation status of environmental protection and pollution control/mitigation measures is summarized in Section 2 of the Report.
- 1.9 The implementation status of the environmental mitigation is attached in Appendix D.

## 2. ENVIRONMENTAL AUDIT

### Site Inspection

- 2.1 The contract commencement date is 26 Mar 07.
- 2.2 The weekly site inspection was only carried out on 4 July 07, 11 July 07, 17 July 07, 24 July 07 (IEC audit) and 31 July 07 within the reporting month.
- 2.3 The purpose is to monitor environmental issues on the construction sites to ensure that all mitigation measures were implemented timely and properly.

### Status of Environmental Licensing and Permitting

- 2.4 All permits/licences obtained as of July 2007 are summarised in Table 2.1.

**Table 2.1 Summary of Environmental Licensing and Permit Status**

Permit No.	Valid Period		Section	Status
	From	To		
<b>Environmental Permit</b>				
EP-249/2006/A	28/07/06	N/A	Expansion of existing Ocean Park and reconstruction / modification of its existing facilities.	Valid
<b>Construction Noise Permits</b>				
GW-RS0286-07	26/05/07	25/11/07	Generator, dump truck, tracked excavator, concrete pump, tower crane, poker, air compressor, concrete lorry mixer.	Valid
GW-RS0321-07	01/06/07	30/11/07	Crane Lorry, Excavator, tracked, Hand-held breaker, Air compressor	Valid
<b>Chemical Waste Producer</b>				
WPN5213-199-K2880-01	19/03/07	N/A	-	Valid
<b>Air Pollution Control (Construction Dust) Licence</b>				
001018953	16/03/07	N/A	-	Valid
<b>Water Discharge Licence</b>				
EP820/W2/XC041	31/05/07	30/06/12	Vet Hospital	Valid
<b>Billing Account for Disposal of Construction Waste and Application for Issuance of Chits</b>				
7005185	12/4/07	N/A	-	Valid

### Implementation Status of Environmental Mitigation Measures

- 2.5 During site inspections in this reporting month, the following observations and recommendations were made.

#### **Water Quality Mitigation Measures**

- 2.6 Mud deposited on the temporary channel and the sedimentation tank was observed. KAJV was reminded to clean the temporary channel and the sedimentation tank in frequent basis.

#### **Air Quality Mitigation Measures**

- 2.7 Following up the last month inspection, water spraying on the haul road was observed.
- 2.8 Dust was observed generated from soil nailing activities. KAJV was reminded to provide water spray or covered the area during this kind of dust generating activity.

**Noise**

- 2.9 No violation was observed during site inspections in the month. The noise barrier will be erected when the construction works are located near the visitors of the parks and the OPC staff.

**Ecology**

- 2.10 No violation was observed during site inspections in the month.

**Waste / Chemical Management**

- 2.11 Buckets of chemical were observed without drip tray. KAJV was reminded to provide drip tray for the chemical.
- 2.12 Over accumulation of C&D waste was observed at the waste skip. KAJV was reminded to remove the C&D waste on skip in frequent basis to avoid accumulation.

**Implementation Status of Environmental Complaint Handling Procedures**

**Summary of the Complaints and Prosecutions**

- 2.13 No complaint, summons or prosecution related to environmental issues was received or made against the Project in July 2007.

### **3. FUTURE KEY ISSUES**

#### **Key Issues for the Coming Month**

- 3.1 Key issues to be considered in the coming month include:
- Noise from operating equipment and machinery on-site.
  - Loss of sediment from filling.
  - General chemical waste management on site, in particular at site workshop.
  - Avoid accumulation of stagnant / muddy water on-site.
  - Avoid accumulation of mud at the temporary channels and the sedimentation tank.
  - To implement dust suppression measures on dry surfaces and dusty works.
  - To implement on-site cleanliness.

#### **Construction Program for the Next 3 Months**

- 3.2 The construction programme for the next 3 months is shown in Appendix C.

#### **4. CONCLUSIONS AND RECOMMENDATIONS**

##### **Conclusions**

- 4.1 No complaint, summons or prosecution related to environmental issues were made against this project in the reporting period.
- 4.2 IEC audit was carried out on 24 July 07. 3 observations and 0 non-compliances were raised.
- 4.3 Five site inspections were carried out 7 July 07, 11 July 07, 17 July 07, 24 July 07 (IEC audit) and 31 July 07 within the reporting month.

##### **Recommendations**

- 4.4 According to the environmental audit performed in the reporting month, the following recommendations are made:

##### ***Air Quality Impact***

- To implement dust suppression measures on dry surfaces and dusty works.

##### ***Noise Impact***

- To inspect the noise sources from inside and outside of the site.
- To space out noisy equipment and position as far away as possible from sensitive receivers.
- To have regular maintenance of vehicles and equipment used.

##### ***Water Quality Impact***

- To ensure open stockpiles of construction materials are covered with tarpaulin or similar fabric during rainstorm.
- To fully operate the temporary on-site drainage system and all sedimentation tank.
- To clean up the mud accumulated in the temporary drainage system and sedimentation tank in frequent basis.

##### ***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.
- To regularly and properly collect, store and dispose of all waste types.

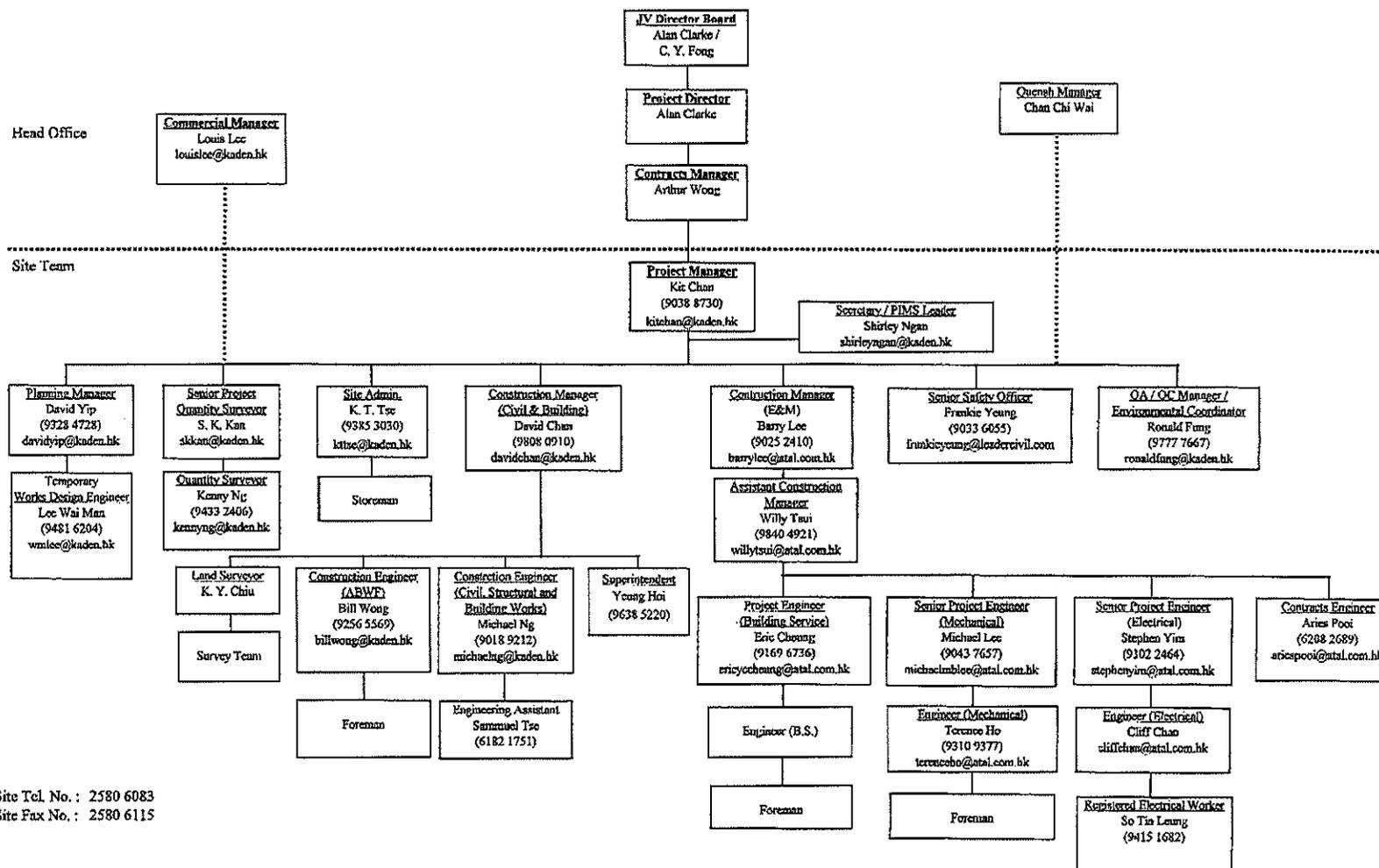
## **Appendix A**



OCEAN PARK MASTER REDEVELOPMENT PROJECT  
CONTRACT NO. CS01 - VET HOSPITAL



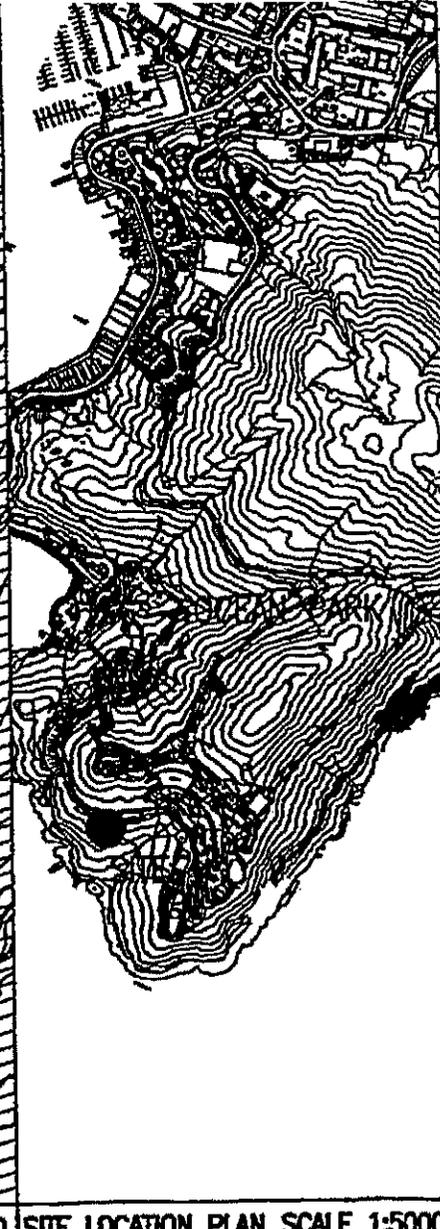
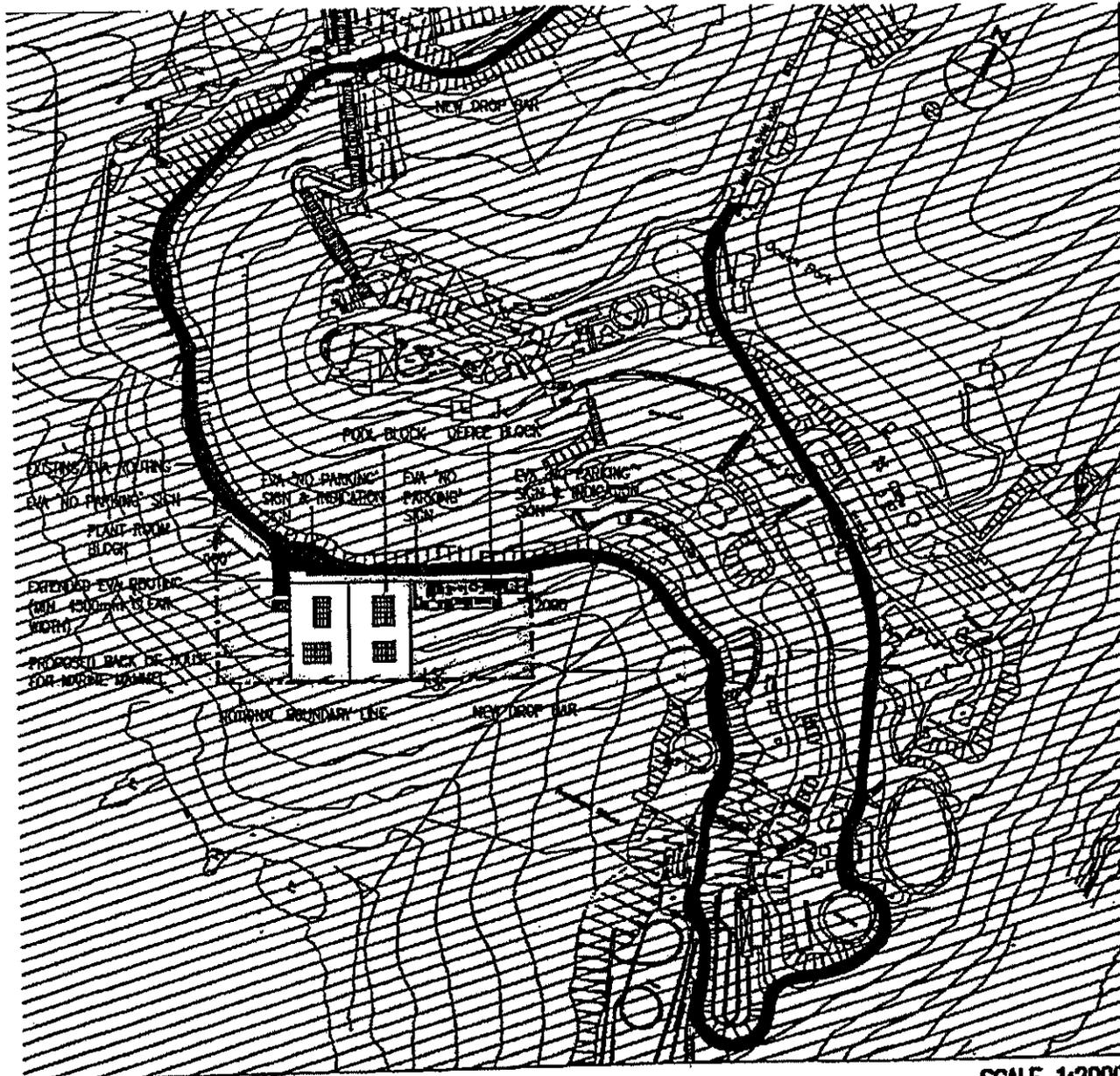
KADEN - ATAL JOINT VENTURE  
PROJECT ORGANIZATION CHART



Site Tel. No. : 2580 6083  
Site Fax No. : 2580 6115

(updated on 28 March 2007)

## **Appendix B**



BU REF. BU 2/2012/06  
 FSD REF. FP 8/7720 'P' 1

NOTE:

BLOCK PLAN / EVA PLAN

SCALE 1:2000 SITE LOCATION PLAN SCALE 1:5000

REV.	DATE	DESCRIPTION
A	24/08/08	Tender Addendum 1
-	22/08/08	Tender Briefing
REVISION ISSUE		

LEGENDS (FOR ALL BLOCK)

## **Appendix C**

Activity ID	Start Date	Early Start	Early Finish	Type	2007												2008							
					JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG
<b>General</b>																								
<b>Control Commitment &amp; Completion Date</b>																								
VHUCD01	0	28-03-2007*		0	◆ Date of Commencement																			
VHUCD09	0		28-04-2008	0													◆ Date of Completion							
<b>Activity Dates</b>																								
VHJAD01	0	28-03-2007*		0	◆ The Vet Hospital Site																			
VHJAD10	0	13-05-2007*		0	◆ To all locations for the installation of underground services for wastewater, fresh water, uPVC ducting and drainage services beyond the Vet Hospital site																			
<b>Key Dates</b>																								
VHJKD01	0		28-01-2008*	0													◆ Complete all works to the Plant Room Block							
VHJKD02	0		16-07-2007*	0	◆ Complete the installation of underground service for subwater, fresh water, uPVC ducting and drainage services beyond the Vet Hospital site																			
VHJKD03	0		05-03-2008*	0													◆ Complete all physical works and fulfill the requirements of Clause 24.3(a) of General Conditions necessary to obtain an occupation permit for the Vet Hospital							
VHJKD04	0		15-03-2008*	0													◆ Complete all interiors to the Pool Block and Office Block and allow access to the Employer for the installation of Employer supply fixtures and fittings							
VHJKD05	0		28-04-2008*	0													◆ Achieve Substantial Completion of the Works							
<b>Preliminaries</b>																								
<b>Submission of Method Statements</b>																								
VHKA01	0		31-03-2007*	0	◆ Submission of Site Safety Supervision Plan																			
VHKA02	0		30-04-2007*	0	◆ Submission of the preliminary construction programme and reviewed without objection by the Project Manager																			
VHKA03	0		31-05-2007*	0	◆ Complete substantially site establishment and mobilization																			
VHKA04	0		30-06-2007*	0	◆ All concrete footing completed																			
VHKA05	0		31-07-2007*	0	◆ Plant room concrete roof completed Achieve the Key Date KD-02																			
VHKA06	0		30-08-2007*	0	◆ Complete WED Form WW46 and FSD Form 314 submission																			
VHKA07	0		31-10-2007*	0	◆ All other rooms at Plant Block ready for M&E installation																			
VHKA08	0		30-11-2007*	0	◆ Complete Pool Block concrete to pools and ground floor slab																			
VHKA09	0		31-12-2007*	0	◆ Complete Pool Block steel roof fabrication																			

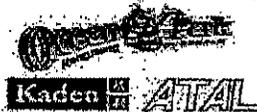
Start Date: 24-03-2007  
 Finish Date: 27-07-2008  
 Date Date: 26-05-2007  
 Run Date: 27-04-2007 15:28

Early Bar  
 Progress Bar  
 Critical Activity

CP02

KADEN - ATAL JOINT VENTURE  
 Ocken Park Master Redevelopment  
 Contract No. CS01 - Vet Hospital  
 Construction Programme

Sheet 1 of 14



Date	Author	Revision	Checked	Approved
	Issue Programme		ED	AC
	Construction Programme		ED	AC
	Construction Programme (Rev. A)		ED	AC

Activity ID	Date Due	Earliest Start	Latest Finish	Total Float	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT
VHKA10	0		31-01-2008*	0																				
VHKA11	0		29-02-2008*	0																				
VHKA12	0		31-03-2008*	0																				
VHKA13	0		30-04-2008*	0																				
<b>Safety Management</b>																								
VHTPSM01	0	31-03-2007		0																				
VHTPSM02	0	23-04-2007		0																				
VHTPSM03	0	18-04-2007		0																				
<b>Quality Management</b>																								
VHTPQM01	0	23-04-2007		0																				
VHTPQM02	0	31-03-2007		0																				
<b>Environmental Management</b>																								
VHTPEM01	0	09-04-2007		0																				
VHTPEM02	0	09-04-2007		0																				
VHTPEM03	0	02-04-2007		0																				
VHTPEM04	0	02-04-2007		0																				
VHTPEM05	0	23-04-2007		0																				
<b>Permitting / Approvals</b>																								
VHVPSS005	0	26-03-2007		0																				
VHVPSS010	0	30-04-2007		0																				
VHVPSS012	0	30-04-2007		0																				
VHVPSS013	0	01-06-2007		0																				
VHVPSS015	0	30-06-2007		0																				
VHVPSS020	0	04-07-2007		0																				
VHVPSS025	0	01-09-2007		0																				
VHVPSS030	0		01-11-2007	0																				
VHVPSS040	0	08-02-2008		39																				
VHVPSS050	0	08-03-2008		39																				
VHVPSS070	0	10-03-2008		0																				
VHVPSS071	1	24-03-2008	24-03-2008	0																				
VHVPSS072	14	25-03-2008	07-04-2008	0																				

Activity ID	Org. Code	Start Date	End Date	Cost Point	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	
VHVPSS073	1	08-04-2008	08-04-2008	0																					
VHVPSS074	7	09-04-2008	15-04-2008	0																					
VHVPSS075	0	23-04-2008		0																					
VHVPSS080	0	25-01-2008		9																					
VHVPSS090	0		25-02-2008	9																					
VHVPSS100	0	06-03-2008		0																					
VHVPSS110	1	23-03-2008	23-03-2008	0																					
VHVPSS120	15	24-03-2008	10-04-2008	0																					
VHVPSS130	1	11-04-2008	11-04-2008	0																					
VHVPSS140	0		28-04-2008	0																					
<b>General Substructure</b>																									
VHTPGS010	0	02-04-2007		0																					
VHTPGS020	0	05-04-2007		0																					
VHTPGS030	0	09-04-2007		0																					
VHTPGS040	0	30-04-2007		0																					
VHTPGS050	0	30-04-2007		0																					
<b>Design, Submission and Approval</b>																									
<b>Tower Crane</b>																									
VHTDSA010	14	20-03-2007	08-04-2007	10																					
VHTDSA015	7	09-04-2007	15-04-2007	10																					
VHTDSA020	14	18-04-2007	29-04-2007	10																					
<b>Temporary Works Design</b>																									
VHTDSA110	7	26-03-2007	01-04-2007	7																					
VHTDSA115	7	02-04-2007	08-04-2007	7																					
VHTDSA120	14	09-04-2007	22-04-2007	7																					
VHTDSA150	14	02-04-2007	15-04-2007	1																					
VHTDSA155	7	16-04-2007	22-04-2007	1																					
VHTDSA160	14	23-04-2007	08-05-2007	1																					
VHTDSA210	14	28-03-2007	08-04-2007	15																					

- ◆ Submit preliminary commencement programme
- ◆ Submit preliminary schedule of submittals
- ◆ Submit preliminary procurement programme
- ◆ Submit preliminary construction program
- ◆ Submit construction method statement

- ▲ Prepare tower crane footing design
- ▲ Design certified by Independent Design Checker
- ▲ Submit tower crane footing design for the PM's comment

- ▲ Prepare formwork & falsework design
- ▲ Design certified by Independent Design Checker
- ▲ Submit formwork & falsework design for the PM's comment
- ▲ Prepare ELS design for soil cut slope
- ▲ Design certified by Independent Design Checker
- ▲ Submit ELS designs for the PM's comment

- ▲ Submit design concrete mix data (including waterproof concrete) for the PM's approval

- ◆ Apply for IR certificate from EMSD
- ◆ Issuance of IR certificates from EMSD
- ◆ Submit BA13 for Occupation Permit
- ▲ 1st BD Inspection
- ▲ Rectify defects as per BD's comments
- ▲ 2nd BD Inspection
- ◆ Issuance of Occupation Permit by BD

▲ 2nd inspection of FS installation by FSD

▲ Rectify defects as per FSD's comments

◆ Issue FS Certificate by FSD

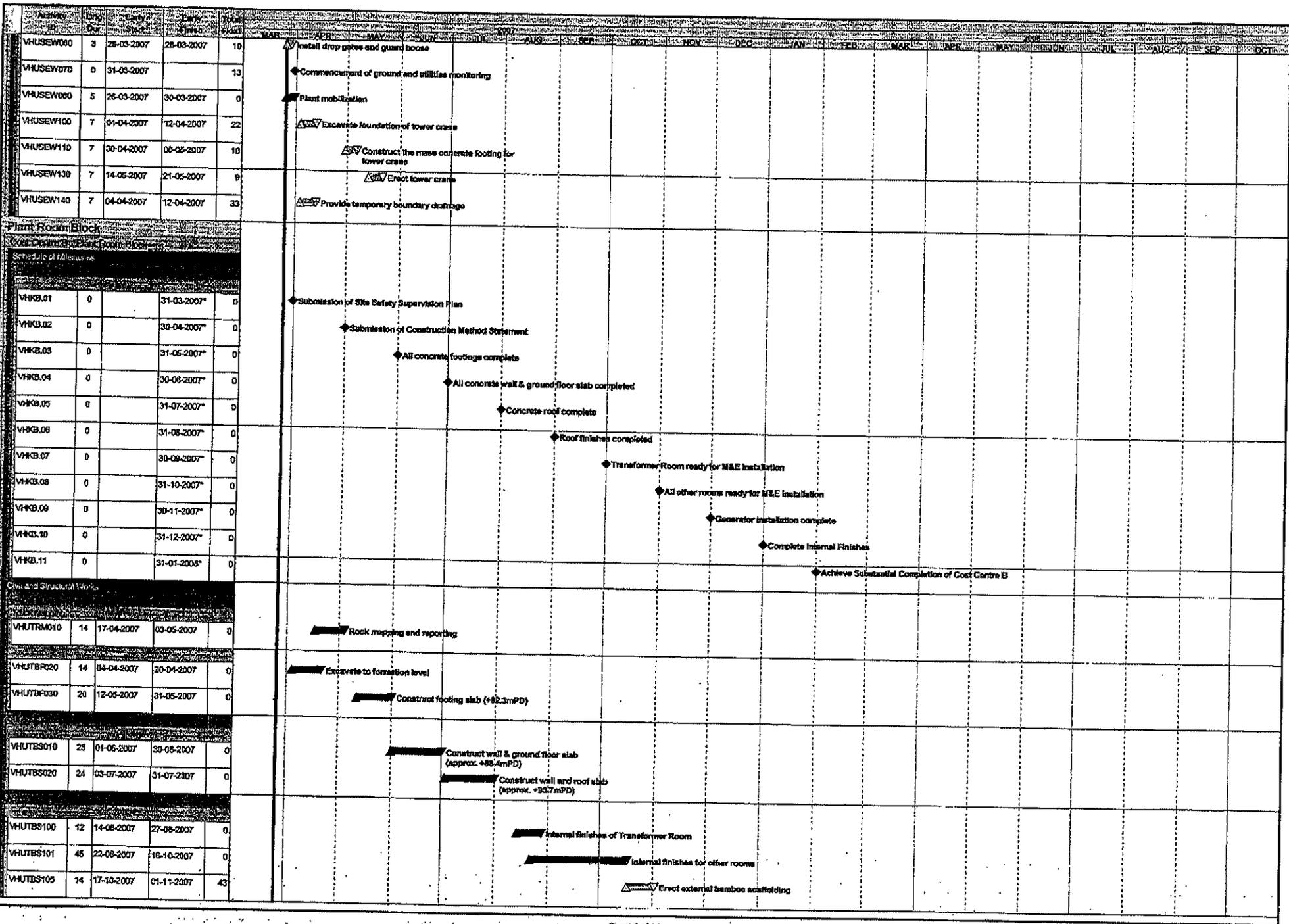
▲ Rectify defects as per BD's comments

▲ 2nd BD Inspection

◆ Issuance of Occupation Permit by BD

Activity ID	Orig. ID#	Early Start	Early Finish	Total Duration	Activity Description
VHTDSA220	7	23-04-2007	29-04-2007	15	<ul style="list-style-type: none"> <li>▲▲▲▲▲ Conduct plant and laboratory tests for waterproof concrete</li> </ul>
VHTDSA230	7	14-06-2007	20-05-2007	15	<ul style="list-style-type: none"> <li>▲▲▲▲▲ Construct trial concrete panels for waterproof concrete</li> </ul>
<b>Structural Steel Roof</b>					
VHTDSA310	0	14-06-2007		1	<ul style="list-style-type: none"> <li>◆ Submit structural steel roof erection method statement</li> </ul>
VHTDSA320	0	28-06-2007		20	<ul style="list-style-type: none"> <li>◆ Submit the relating coating material for the PM's approval</li> </ul>
VHTDSA330	0	17-07-2007		1	<ul style="list-style-type: none"> <li>◆ Submit structural steel roof shop drawings for the PM's approval</li> </ul>
<b>Roof Cladding System</b>					
VHTDSA410	0	24-07-2007		37	<ul style="list-style-type: none"> <li>◆ Submit shop drawings of roof cladding system &amp; skylights for the PM's approval</li> </ul>
VHTDSA420	0	14-08-2007		37	<ul style="list-style-type: none"> <li>◆ Submit sample of roof cladding &amp; skylights for the PM's approval</li> </ul>
VHTDSA430	14	04-09-2007	17-09-2007	37	<ul style="list-style-type: none"> <li>▲▲▲▲▲ Prepare mock-up for roof cladding &amp; skylights</li> </ul>
<b>Architectural, Sundecks, Windows and Highways</b>					
VHTDSA520	0	25-05-2007		68	<ul style="list-style-type: none"> <li>◆ Submit shop drawings and conduct mock-up for tiles</li> </ul>
VHTDSA530	0	09-08-2007		66	<ul style="list-style-type: none"> <li>◆ Conduct painting trial</li> </ul>
VHTDSA633	0	24-06-2007		51	<ul style="list-style-type: none"> <li>◆ Submit shop drawings of aluminium windows, screens, doors, roller shutters, etc for the PM's approval</li> </ul>
VHTDSA640	0	03-07-2007		56	<ul style="list-style-type: none"> <li>◆ Prepare material submission on STA-CRETE for the PM's approval</li> </ul>
VHTDSA642	14	08-08-2007	19-08-2007	55	<ul style="list-style-type: none"> <li>▲▲▲▲▲ Prepare mock panel for STA-CRETE</li> </ul>
VHTDSA645	0	22-09-2007		59	<ul style="list-style-type: none"> <li>◆ Submit sliding water gate design &amp; shop drawings for the PM's approval</li> </ul>
VHTDSA650	21	06-11-2007	28-11-2007	59	<ul style="list-style-type: none"> <li>▲▲▲▲▲ Prepare true scale mock up sliding water gate and perform a/culation test</li> </ul>
<b>M&amp;E and Building Services</b>					
<b>Schedule of Milestones</b>					
VHKF.01	0		31-03-2007*	0	<ul style="list-style-type: none"> <li>◆ Upon award of the Contract</li> </ul>
VHKF.02	0		30-04-2007*	0	<ul style="list-style-type: none"> <li>◆ Submission on LIFT Shop Drawings, Vertical Line Plumbing Diagram and Fire Services Drawings</li> </ul>
VHKF.03	0		31-05-2007*	0	<ul style="list-style-type: none"> <li>◆ Submit shop drawing for Life Support System</li> </ul>
VHKF.04	0		30-06-2007*	0	<ul style="list-style-type: none"> <li>◆ LIFT shop drawings completed and reviewed without objection by the Project Manager</li> </ul>
VHKF.05	0		31-07-2007*	0	<ul style="list-style-type: none"> <li>◆ Provision of evidence for the procurement of the major equipment of the Life Support System</li> </ul>
VHKF.06	0		31-08-2007*	0	<ul style="list-style-type: none"> <li>◆ Provision of evidence for the procurement of the major equipment of Building Services System</li> </ul>
VHKF.07	0		30-09-2007*	0	<ul style="list-style-type: none"> <li>◆ Complete the installation of underground service for wastewater, fresh water, LPVC ducting and drainage services beyond the Vet Hospital site</li> </ul>
VHKF.14	0		30-04-2008*	0	<ul style="list-style-type: none"> <li>◆ Achieve Substantial Completion of Coat Centre F</li> </ul>

BIM Shop Drawings				2007												
Item	Qty	Start	End	Days												
Site Establishment Works																
VHTEMSD010	35	28-03-2007	30-04-2007	0	Prepare fire services equipment shop drawings											
VHTEMSD020	60	25-03-2007	24-05-2007	0	Prepare electrical equipment shop drawings											
VHTEMSD030	38	28-03-2007	30-04-2007	0	Prepare lift shop drawings											
VHTEMSD040	80	28-03-2007	24-05-2007	0	Prepare MVAC shop drawings											
VHTEMSD050	38	28-03-2007	30-04-2007	0	Prepare plumbing & drainage equipment drawings											
VHTEMSD060	67	26-03-2007	31-05-2007	0	Prepare Life Support System shop drawings											
VHTEMSD070	38	01-05-2007	07-06-2007	0	Review of shop drawings by the Project Manager											
VHTEMSD080	31	15-05-2007	14-06-2007	0	Resubmission of shop drawings											
VHTEMSD090	7	16-06-2007	21-06-2007	0	Approval on submitted shop drawings											
VHUEQ010				Fire services equipment - Manufacture & Delivery												
VHUEQ020				Electrical equipments - Manufacture & Delivery												
VHUEQ030				MVAC equipments - Manufacture & Delivery												
VHUEQ040				P & D equipments - Manufacture & Delivery												
VHUEQ050				Lift - Manufacture & Delivery												
VHUEQ060				Life support system - Manufacture & Delivery												
VHUEQ100				Fire services equipment factory test												
VHUEQ110				Electrical equipment factory test												
VHUEQ120				Lift factory test												
VHUEQ130				MVAC equipment factory test												
VHUEQ140				P & D equipment factory test												
VHUEQ150				Life Support System factory test												
Site Establishment Works																
VHUSEW010	28	28-03-2007	25-04-2007	30	Contractor's storage shed and site accommodation											
VHUSEW020	5	26-03-2007	30-03-2007	36	Joint topographical survey											
VHUSEW030	6	28-03-2007	03-04-2007	0	General site clearance (including tree-felling)											
VHUSEW040	10	28-03-2007	08-04-2007	6	Erect safety fence along downhill side of excavation limit on slope											
VHUSEW050	5	28-03-2007	30-03-2007	13	Condition survey for adjacent structures											



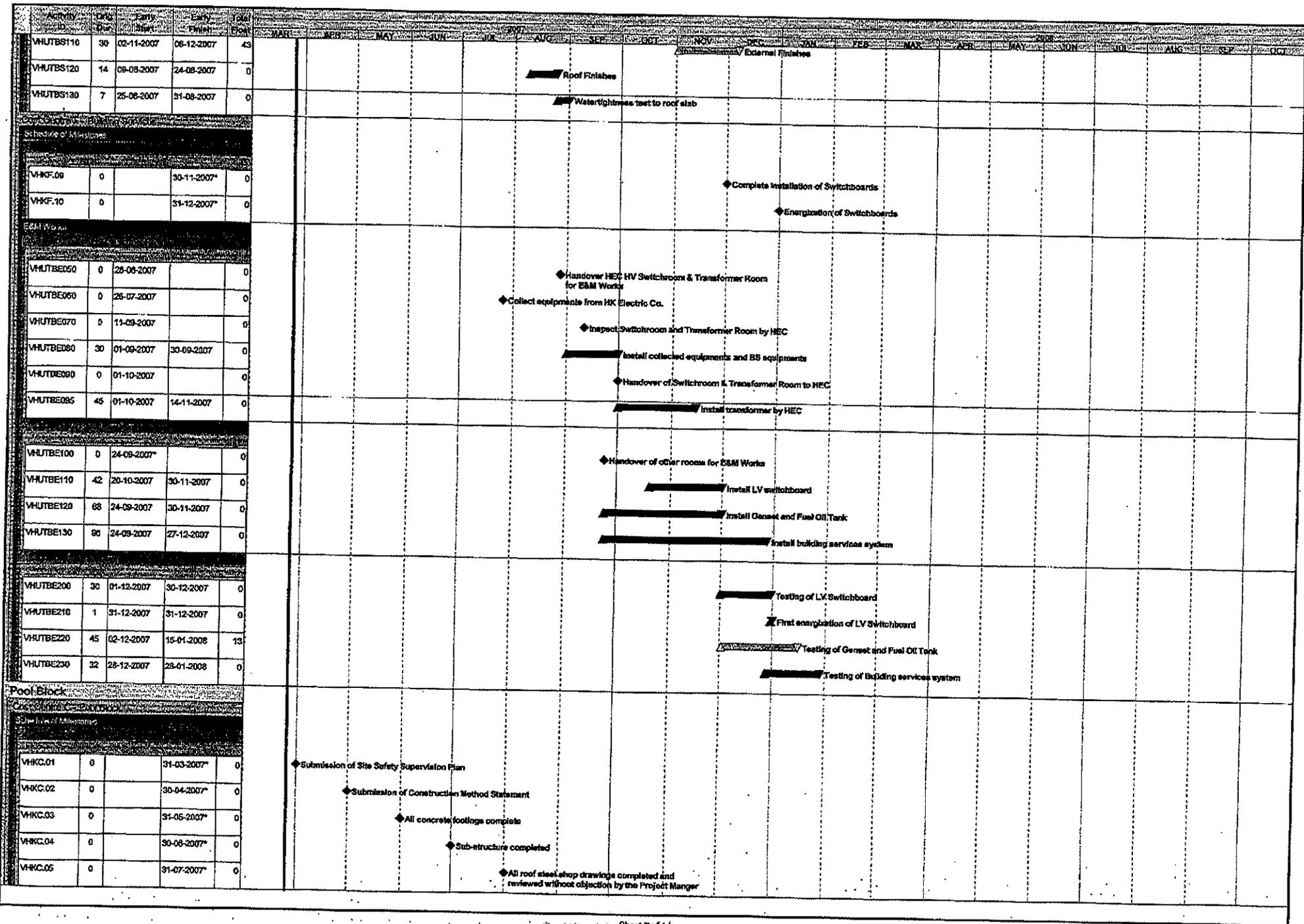
**Plant Room Block**

Schedule of Milestones

ID	Start	End	Duration
VHKB.01	31-03-2007*	0	
VHKB.02	30-04-2007*	0	
VHKB.03	31-05-2007*	0	
VHKB.04	30-06-2007*	0	
VHKB.05	31-07-2007*	0	
VHKB.06	31-08-2007*	0	
VHKB.07	30-09-2007*	0	
VHKB.08	31-10-2007*	0	
VHKB.09	30-11-2007*	0	
VHKB.10	31-12-2007*	0	
VHKB.11	31-01-2008*	0	

**Civil and Structural Works**

ID	Start	End	Duration
VHUTRM010	17-04-2007	03-05-2007	0
VHUTBR020	04-04-2007	20-04-2007	0
VHUTBF030	12-06-2007	31-05-2007	0
VHUTBS010	01-06-2007	30-06-2007	0
VHUTBS020	03-07-2007	31-07-2007	0
VHUTBS100	14-08-2007	27-08-2007	0
VHUTBS101	22-08-2007	16-10-2007	0
VHUTBS105	17-10-2007	01-11-2007	43



Activity	Start	Finish	Days
VHUTBS110	02-11-2007	08-12-2007	43
VHUTBS120	08-08-2007	24-08-2007	0
VHUTBS130	25-08-2007	31-08-2007	0

Schedule of Milestones

Activity	Start	Finish	Days
VHKF.09		30-11-2007*	0
VHKF.10		31-12-2007*	0

ESM Works

Activity	Start	Finish	Days
VHUTBE050	28-06-2007		0
VHUTBE060	28-07-2007		0
VHUTBE070	13-09-2007		0
VHUTBE080	01-09-2007	30-09-2007	0
VHUTBE090	01-10-2007		0
VHUTBE095	01-10-2007	14-11-2007	0

Activity	Start	Finish	Days
VHUTBE100	24-09-2007*		0
VHUTBE110	20-10-2007	30-11-2007	0
VHUTBE120	24-09-2007	30-11-2007	0
VHUTBE130	24-09-2007	27-12-2007	0

Activity	Start	Finish	Days
VHUTBE200	01-12-2007	30-12-2007	0
VHUTBE210	31-12-2007	31-12-2007	0
VHUTBE220	02-12-2007	15-01-2008	13
VHUTBE230	28-12-2007	28-01-2008	0

Pool Block

Schedule of Milestones

Activity	Start	Finish	Days
VHKC.01		31-03-2007*	0
VHKC.02		30-04-2007*	0
VHKC.03		31-05-2007*	0
VHKC.04		30-06-2007*	0
VHKC.05		31-07-2007*	0

Activity ID	Orig. Dur.	Early Start	Early Finish	On	Activity Description	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT
VHKC.05	0		31-08-2007*	0								◆ Complete concrete work to Backwash Tank and LSS plant room slab													
VHKC.07	0		30-09-2007*	0								◆ Complete concrete work to Balance Tank													
VHKC.08	0		31-10-2007*	0																					
VHKC.09	0		30-11-2007*	0																					
VHKC.10	0		31-12-2007*	0																					
VHKC.11	0		31-01-2008*	0																					
VHKC.12	0		28-02-2008*	0																					
VHKC.13	0		31-03-2008*	0																					
VHKC.14	0		30-04-2008*	0																					
<b>Civil and Structural Works</b>																									
VHUEVAC10	14	17-04-2007	03-06-2007	0	Excavate to benching for falsework																				
VHUEVAC20	14	04-05-2007	19-05-2007	0	Erect falsework and formwork for EVA slab																				
VHUEVAC30	28	28-05-2007	30-06-2007	0	Construct EVA slab																				
VHUPBFF20	14	08-06-2007	23-06-2007	0	Excavate to footing formation level at Grid "F"																				
VHUPBFF30	15	15-05-2007	31-05-2007	0	Construct pad footing at Grid "F"																				
VHUPBFF40	16	07-06-2007	25-06-2007	0	Construct columns and bearing walls at Grid "F"																				
VHUPBFC20	14	02-05-2007	17-05-2007	0	Excavate to footing & screen wall formation level at Grid "G"																				
VHUPBFC30	15	10-05-2007	26-05-2007	0	Construct pad footing at Grid "G"																				
VHUPBFC40	20	28-05-2007	20-06-2007	0	Construct screen wall & columns at Grid "G"																				
VHUPBFG60	9	21-06-2007	30-06-2007	0	Lay subsoil drain and mass concrete behind screen wall																				
VHUPBFH20	14	23-04-2007	09-05-2007	0	Excavate to footing & screen wall formation level at Grid "H"																				
VHUPBFH30	16	09-05-2007	25-05-2007	0	Construct pad footing at Grid "H"																				
VHUPBFH40	20	26-05-2007	18-06-2007	0	Construct screen wall & columns at Grid "H"																				
VHUPBFH60	9	21-05-2007	30-06-2007	0	Lay subsoil drain and mass concrete behind screen wall																				
VHUPBFJ20	10	17-04-2007	27-04-2007	0	Excavate to footing formation level at Grid "J"																				
VHUPBFJ30	10	10-05-2007	21-05-2007	0	Construct pad footing at Grid "J"																				
VHUPBFJ40	12	19-05-2007	01-06-2007	0	Construct columns at Grid "J"																				
VHUPBFK20	10	11-04-2007	21-04-2007	0	Excavate to footing formation level at Grid "K"																				
VHUPBFK30	10	05-05-2007	16-05-2007	0	Construct pad footing at Grid "K"																				



Activity ID	Qty	Start	End	Days	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT
VHUPBS300	90	14-08-2007	29-11-2007	13																				
VHUPBS310	0	28-10-2007		15																				
VHUPBS320	30	10-11-2007	14-12-2007	0																				
VHUPBS330	30	22-11-2007	27-12-2007	0																				
VHUPBS340	12	18-12-2007	03-01-2008	0																				
VHUPBS380	21	04-01-2008	28-01-2008	0																				
VHUPBS390	30	23-01-2008	29-02-2008	0																				
VHUPBS511	10	19-09-2007	02-10-2007	45																				
VHUPBS512	10	18-08-2007	27-08-2007	85																				
VHUPBS513	18	10-10-2007	27-10-2007	80																				
VHUPBS515	30	11-10-2007	14-11-2007	28																				
VHUPBS520	60	19-11-2007	29-01-2008	23																				
VHUPBS540	16	13-11-2007	05-12-2007	58																				
VHUPBS550	80	06-12-2007	18-02-2008	58																				
Schedule of Milestones																								
VHUPF.11	0		31-01-2008*	0																				
VHUPF.13	0		31-03-2008*	0																				
VHUPBE060	0	28-09-2007		0																				
VHUPBE065	0		19-10-2007	0																				
VHUPBE070	126	28-09-2007	31-01-2008	0																				
VHUPBE079	90	20-10-2007	17-01-2008	36																				
VHUPBE080	40	24-11-2007	02-01-2008	37																				
VHUPBE082	40	24-11-2007	02-01-2008	51																				
VHUPBE083	68	24-11-2007	31-01-2008	22																				
VHUPBE090	0	10-01-2008		0																				
VHUPBE100	30	10-01-2008	08-02-2008	35																				
VHUPBE109	30	10-01-2008	08-02-2008	14																				

Offsite fabricate structural steel roof segments

1st delivery of structural steel roof segments

Connect up the structural roof truss segments on-site (by bolted connection method)

Erect structural roof truss segments

Erect temporary working platform under structural roof truss

Apply fire-proof cementitious coating on structural steel truss

Install roof cladding, skylights and fall arrest system

Epoxy lining on internal face of Backwash Tank

Epoxy lining on internal face of Transfer Tank, Break Tank and Degass Tank

Epoxy lining on internal face of Dolphin Holding Pools and Quarantine Pool

Internal finishes for Lower G/F

Internal finishes for Ground Floor

Erect internal bamboo scaffolding

External finishes

Complete installation of Life Support System

Life Support Systems tested and commissioned and lift installation tested and commissioned

Starting handover of Lower-G/F for E&M Works (in 4 Phases Handover)

Completely handover of Lower G/F for E&M Works

Install Life Support System

Install electrical service system

Install fire services system

Install MVAC services system

Install P&D services system

Handover of G/F for E&M Works

Install raised platform system & FR2 water gate

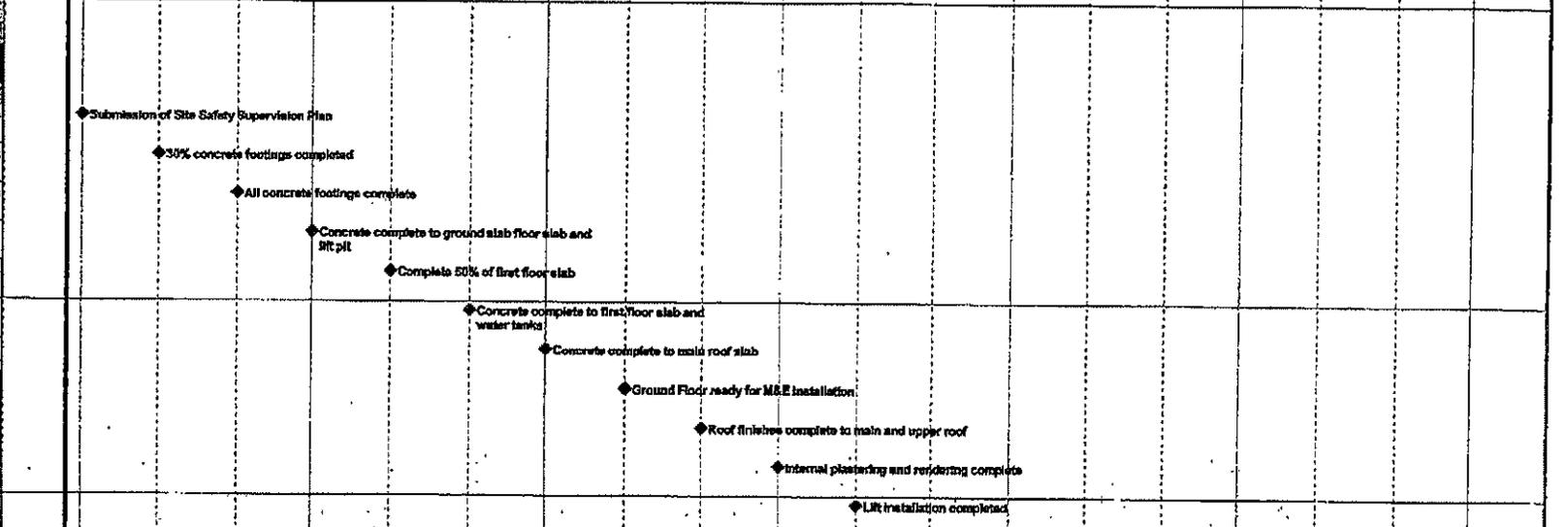
Install electrical services system

Activity ID	Duration (Days)	Start Date	End Date	Finish	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT
VHUPBE110	30	10-01-2008	08-02-2008	0																				
VHUPBE111	30	10-01-2008	08-02-2008	14																				
VHUPBE112	30	10-01-2008	08-02-2008	14																				
VHUPBE200	60	01-02-2008	31-03-2008	0																				
VHUPBE209	30	09-02-2008	09-03-2008	14																				
VHUPBE210	30	09-02-2008	09-03-2008	0																				
VHUPBE211	30	09-02-2008	09-03-2008	14																				
VHUPBE212	30	09-02-2008	09-03-2008	14																				
VHUPBE217	25	01-04-2008	28-04-2008	0																				
VHUPBE300	90	29-04-2008	27-07-2008	0																				
VHUPBE350	90	01-08-2007	29-10-2007	59																				
VHUPBE400	45	01-12-2007	14-01-2008	2																				
VHUPBE450	30	01-10-2007	30-10-2007	83																				
VHUPBE500	60	31-10-2007	28-12-2007	83																				
VHUPBE550	5	01-02-2008	05-02-2008	83																				
VHUPBE600	60	01-01-2008	29-02-2008	59																				
VHUPBE650	30	01-03-2008	30-03-2008	2																				
VHUPBE700	30	28-03-2008	28-04-2008	2																				

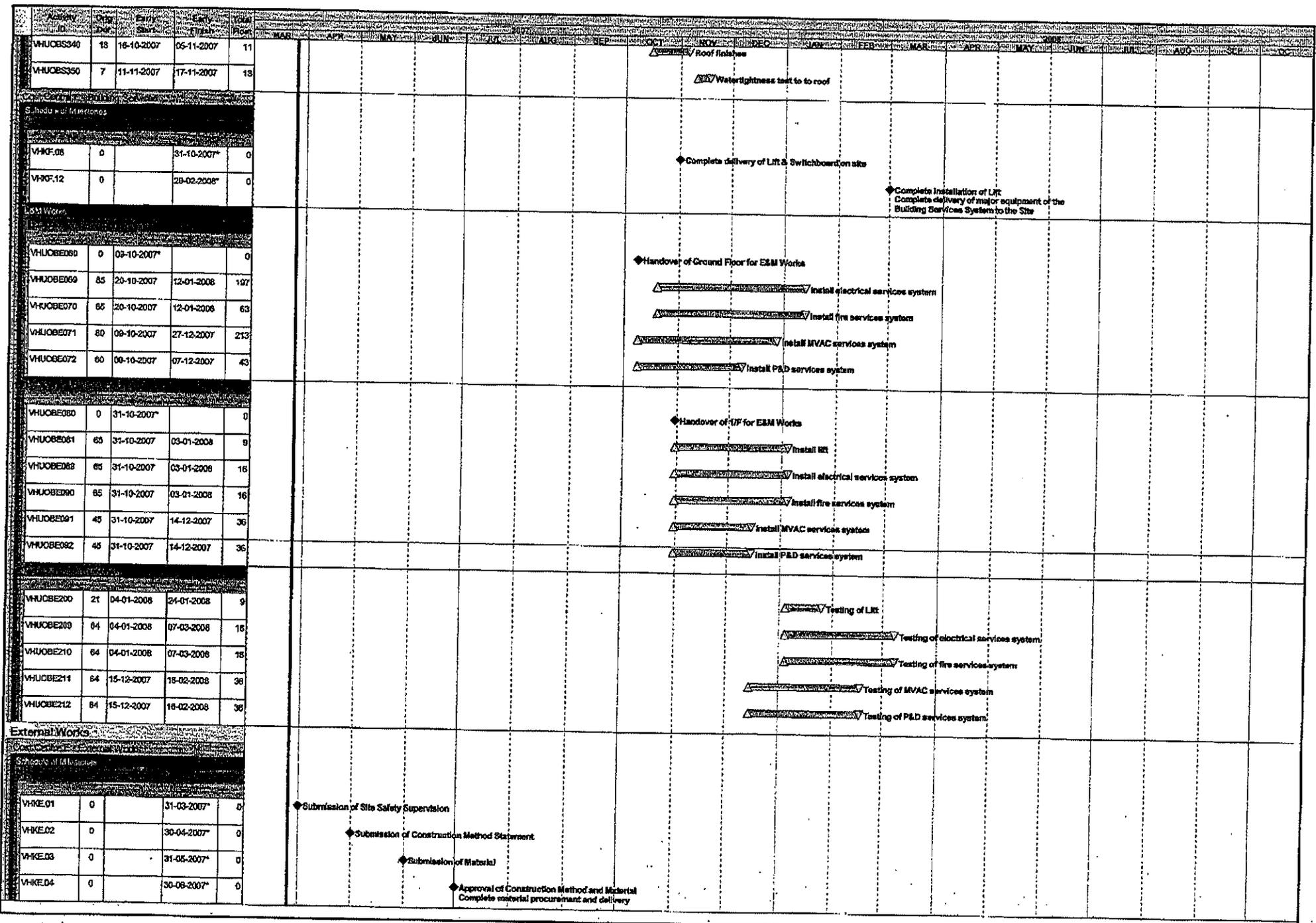
**Office Backup**

**Schedule of Milestones**

Activity ID	Duration (Days)	Start Date	End Date	Finish
VHKD.01	0		31-03-2007*	0
VHKD.02	0		30-04-2007*	0
VHKD.03	0		31-05-2007*	0
VHKD.04	0		30-06-2007*	0
VHKD.05	0		31-07-2007*	0
VHKD.06	0		31-08-2007*	0
VHKD.07	0		30-09-2007*	0
VHKD.08	0		31-10-2007*	0
VHKD.09	0		30-11-2007*	0
VHKD.10	0		31-12-2007*	0
VHKD.11	0		31-01-2008*	0



Activity ID	Orig. ID	Start	Early Finish	Total Float	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	
VHKD.12	0		29-02-2008*	0																	
VHKD.13	0		31-03-2008*	0																	
VHKD.14	0		30-04-2008*	0																	
Civil and Structural Works																					
VHUOBFA15	12	07-05-2007	19-05-2007	3																	
					Excavate to footing formation level at Grid "A"																
VHUOBFA20	12	15-05-2007	28-05-2007	3																	
					Construct pad footing at Grid "A"																
VHUOBFA30	13	24-05-2007	09-06-2007	12																	
					Construct columns & bearing wall at Grid "A"																
VHUOBFB15	12	17-04-2007	30-04-2007	7																	
					Excavate to footing formation level at Grid "B"																
VHUOBFB20	12	10-05-2007	23-05-2007	1																	
					Construct pad footing at Grid "B"																
VHUOBFB30	15	19-05-2007	06-06-2007	1																	
					Construct columns & bearing wall at Grid "B"																
VHUOBFC16	10	04-04-2007	16-04-2007	0																	
					Excavate to footing formation level at Grid "C"																
VHUOBFC20	10	19-04-2007	30-04-2007	0																	
					Construct pad footing at Grid "C"																
VHUOBFC30	15	02-05-2007	19-05-2007	12																	
					Construct columns & bearing wall at Grid "C"																
VHUORMD010	14	17-04-2007	30-04-2007	0																	
					Rock mapping and reporting for Grid C																
VHUORMD020	14	10-05-2007	23-05-2007	1																	
					Rock mapping and reporting for Grid A & B																
VHUOBT10	10	29-05-2007	06-06-2007	4																	
					Construct tie beam at Grid "B" & "C" (#80.27mPD)																
VHUOBS010	5	06-06-2007	11-06-2007	1																	
					Erect falsework & formwork for ground floor slab and R/R pit																
VHUOBS020	18	06-06-2007	29-08-2007	1																	
					Construct LR, PR and Ground Floor - slab																
VHUOBS030	28	20-06-2007	23-07-2007	6																	
					Construct First Floor - slab and wall																
VHUOBS040	28	14-07-2007	16-08-2007	11																	
					Construct Main Roof Floor - slab and wall and F.S. water tank - base slab																
VHUOBS050	28	08-08-2007	08-09-2007	11																	
					Construct Upper Roof - slab and wall and F.S. water tank - wall and soffit slab																
VHUOBS051	10	26-09-2007	10-10-2007	16																	
					Epoxy lining on internal face of F.S. water tank																
VHUOBS060	14	17-10-2007	30-10-2007	19																	
					Watertightness test for F.S. Water Tank																
VHUOSS300	60	10-08-2007	22-10-2007	17																	
					Internal finishes for Ground Floor																
VHUOSS301	60	11-09-2007	21-11-2007	13																	
					Internal finishes for First Floor																
VHUOSS310	90	23-10-2007	06-02-2008	17																	
					Laboratory fittings and benches																
VHUOSS320	14	28-09-2007	15-10-2007	11																	
					Erect external bamboo scaffolding																
VHUOSS330	60	18-10-2007	25-12-2007	37																	
					External finishes																



Activity ID	Qty	Start	End	Peak	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
VHKE05	0		31-07-2007*	0						◆ Complete all underground services installation across beyond the boundary of Vet Hospital site																
VHKE06	0		30-09-2007*	0																						
VHKE13	0		30-04-2008*	0																						
<b>External Works</b>																										
VHUEW005	12	02-04-2007	16-04-2007	75						Remove and cap of existing irrigation pipe																
VHUEW010	21	13-06-2007	09-07-2007	0						Install fresh water intake (80mm dia. D.I. pipe)																
VHUEW020	21	13-06-2007	09-07-2007	0						Install sewer & flushing water intake (200mm dia. uPVC pipe)																
VHUEW030	21	13-06-2007	09-07-2007	0						Relocate existing fire hydrant and install fire service water intake (100mm dia. M.S. pipe)																
VHUEW040	21	13-06-2007	09-07-2007	0						Install foul water drains (100mm dia. D.I. pipe)																
VHUEW080	21	13-06-2007	09-07-2007	0						Lay fire service signal & electrical cable ducts and drawpits																
VHUEW080	12	03-07-2007	10-07-2007	0						Reinstate concrete pavement for Ocean Panorama																
VHUEW090	45	26-10-2007	17-12-2007	63																						
VHUEW100	30	26-12-2007	30-01-2008	37																						
VHUEW110	45	18-01-2008	14-03-2008	37																						
VHUEW120	0	29-09-2007*		0																						

## **Appendix D**

Summary of Environmental Mitigation Implementation Schedule

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stages**			Relevant Legislation & Guidelines
					D	C	O	
		<b>Noise Mitigation Measures</b>	Work Site / during construction	Contractor		X		PN 2/93 & EIAO
5.4.15		a) Use of Powered Mechanical Equipment in restricted hours without a valid Construction Noise Permit (CNP) in restricted hours is prohibited, i.e. 7pm and 7am or at any time on general holiday including Sunday						
		b) If CNP is grant, construction works shall accord with conditions of CNP						
		c) Every air compressor shall be fitted with a noise emission label issued in respect of that air compressor.						
		d) Every hand held percussive breaker shall be fitted with a noise emission label issued in respect of that hand held percussive breaker.						
		e) Noise barrier should be provided for site which have sufficient space for installation.						
		f) Idle equipment should be turned-off or throttled down. Noisy equipment should be properly maintained and used no more often than is necessary.						
		g) Noisy equipment and activities should be sited by the Contractor as far from close-proximity sensitive receivers as practical.						
		h) Idle equipment should be turned-off or throttled down. Noisy equipment should be properly maintained and used no more often than is necessary.						
		i) Construction plant should be properly maintained and operated.						
6.5.9		<b>Air Mitigation Measures</b>	Work Site / during construction	Contractor		X		Air Pollution Control Ordinance, Air Pollution Control (Construction Dust) Regulation,
		a) For Breaking, Excavation or earth moving, the working area shall be sprayed with water to maintain the entire surface wet.						
		b) Any debris shall be covered or stored in sheltered area and before debris is dumped into a chute, it is to be sprayed with water.						
		c) For use of vehicles, load of dusty materials shall be covered entirely						
		d) Open burning is prohibited.						
		e) A stockpile of dusty materials shall not extend beyond the pedestrian barriers, fencing or traffic cones.						
		f) Vehicle washing facilities shall be provided at every exit point.						
		g) Main haul road shall be sprayed with water.						

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stages**			Relevant Legislation & Guidelines
					D	C	O	
7.11.1 - 7.11.2		<b>Water Mitigation Measures</b>	Work Site / during construction	Contractor		X		ETWB TCW No. 5/2005 and DSD TC No. 2/2004
		a) Temporary drainage system (U-channel) and the sedimentation tank should be installed and maintained frequently to prevent adverse impacts on the stream water						
		b) The slope should be covered up to avoid being washed into nearby stream by rain and local runoff.						
		c) Any discharges into drainage or sewage systems, inland or coastal waters, or into the ground (e.g. from septic tanks) are required a valid discharge licence, except the discharge of domestic sewage into foul sewers or the discharge of unpolluted water.						
		d) The terms and conditions of a discharge licence shall be complied						
		e) Manholes should always be adequately covered and temporarily sealed						
8.7.9-8.7.12		<b>Chemical Mitigation Measures</b>	Work Site / during construction	Contractor		X		Waste Disposal (Chemical Waste) (General) Regulation Code of Practice on the Packaging Labelling and Storage of Chemical
		a) Chemical waste should be packed and stored in suitable containers in the Chemical Waste Store						
		b) There is displayed on every container of chemical waste a label						
		c) Chemical waste store shall not be used for any purpose other than the storage of chemical waste						
		d) Chemical waste store shall be enclosed on at least 3 sides by a wall, partition fence or a similar device, which shall not be less than the height of the tallest container						
		e) Chemical waste store shall not have any connection to any surface water drains or foul sewers						
		f) Chemical waste store shall be kept clean and dry						
		covering						
		accommodate						
		i) Every storage area where chemical waste is stored displays a warning panel, notice or marking at or near the entrance or the opening, indicate in bold legible red English words and Chinese characters not less than 6 cm in height on a white background						
		j) Chemical waste stored shall be properly located and easily accessed						
		k) Chemical should be properly stored in suitable containers						
		l) Chemical should be properly stored and sited on sealed areas to prevent leakage						
		leakage						

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stages**			Relevant Legislation & Guidelines
					D	C	O	
8.7.5		<b>Waste Mitigation Measures</b>	Work Site / during construction	Contractor		X		Waste Disposal Ordinance ETWB TCW No. 31/2004
		a) The proposals in the waste management plan are able to meet the target of avoidance, minimization, recycling and reuse of C&D material with particular reference to the nature of the Contract						
		b) Trip-ticket system shall be properly implemented						
		c) Waste disposal points shall be provided and regular collection for disposal to keep the site tidy						
		d) Adequate and proper records with respect to waste management shall be kept						
		<b>General Mitigation Measures</b>						
		a) Trees adjacent to or within the construction site area shall be protected						