Ocean Park Master Redevelopment Project

Monthly Environmental Monitoring & Audit Report – June 2009

Table of Content

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", CW02 "The Astounding Asia" and CI07 "Entry Plaza, Aqua City and Grand Aquarium". This report presents the results of EM&A works conducted in the reporting month of June 2009 (from 26 May 2009 to 25 June 2009).

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

1-hour TSP monitoring	15 sessions for all air quality monitoring stations,
24-hour TSP monitoring	5 sessions for air quality monitoring stations,
Daytime noise monitoring	4 sessions for all noise monitoring stations,
Evening or night time noise monitoring	4 sessions for all noise monitoring stations,
Holiday time noise monitoring	0 session,
Coral monitoring	0 session, and
Environmental Site Inspection	5 sessions (including IEC audit)

No exceedance was recorded on the 1-hour TSP monitoring, 24-hour TSP monitoring, Day-time noise monitoring and Evening-time noise monitoring.

One complaint, no non-compliance from IEC, summons or prosecution related to environmental issues was made against the Ocean Park Master Redevelopment Project in the reporting period of June 2009.

The detail of complaint is as follow:

On 17/6/2009, a complaint was received from Police College through EPD regarding noise nuisance from CI07. Inspectors from EPD came on site on 30/6/2009 for investigation and no significant observation was made, hence, the complaint was closed.

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.

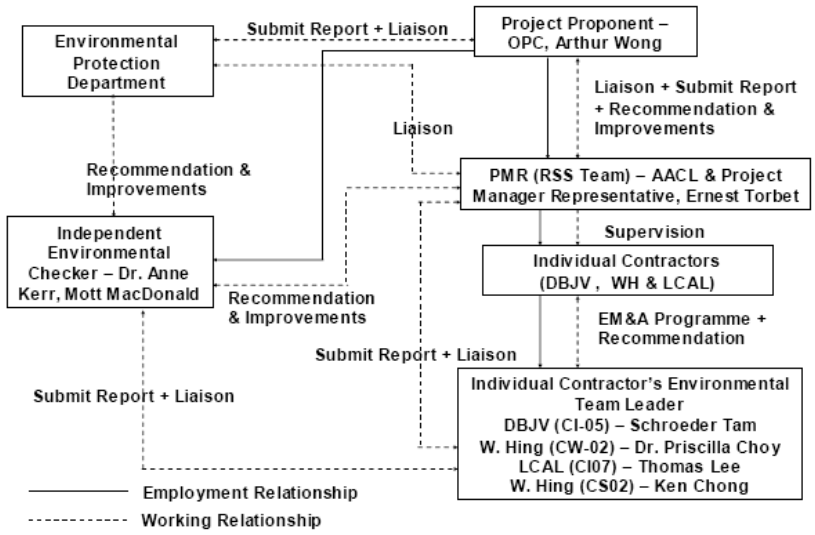
Contract No.	Contract Title	Contractor	Construction Commencement
CI-05	Site Formation, Funicular Tunnel and Miscellaneous Works	Dragages-Bouygues JV	12 March 2007 and Construction phase has ceased in early June 2009
CS-01	Back of House for Marine Mammal Veterinary Hospital	Kaden – ATAL JV	26 March 2007 and Construction phase has ceased in mid-October 2008.
CW-02	Astounding Asia	W. Hing Construction Co. Ltd.	1 August 2007
CI-07	Entry Plaza, Aqua City and Grand Aquarium	Leighton Contractors (Asia) Ltd.	15 August 2008
CS-02	Rainforest	W. Hing Construction Co. Ltd.	11 May 2009

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, CW02, CI07 and CS02 Monthly EM&A Report. This report presents the results of EM&A works conducted in the reporting month of June 2009 (from 26 May 2009 to 25 June 2009).

2. Project Organisation

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

Figure 1.1 Management Organization



3. Construction Works Undertaken during the Reporting Month

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

CI-05

- Construction phase has ceased in early June 2009

CW-02

- Excavation works at Main (Emerald) Aviary.
- Builder's work, Finishing works, E&M works and Steelworks for cages at New Bird Theatre
- Reinstatement works at External Area.

CS-02

- Soil Nail Works, Diversion of existing utilities, U/G utilities installation and finishing works & excavation works at the Funicular Plaza.
- RC Structure, U/G utilities installation at the Exhibition House
- Drainage works & retaining wall construction at the External Area.

CS-01

- Construction phase has ceased in mid-October 2008.

CI-07

- Beam & Slab (1/F) construction at Grand Aquarium
- Rock-filling, excavation and backfilling at Entry Plaza
- Footing, column, slab and wall construction at Entry Plaza
- Access Road construction along East Boundary
- U/G drainage stone paving at Funicular Plaza

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	• 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. • Filling of Pond 37 at the Lowland Area. • Submission of the as-built drawings showing the enhancement works of Pond 35.

4.2. CNP

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

Permit No.	Starting Date	Expired Date	Valid Time	Location	Contract No.	Status
CI-05 (DBJV)						
GW-RS0001-09	2-Jan-09	1-Jun-09	Light Tower; Excavator, tracked; Dump truck, 5.5 tonnes < gross vehicle weight less than 38 tonne	EVA Road, Summit	CI-05	Expired
GW-RS0103-09	28-Feb-09	27-Aug-09	Breaker, mini-robot mounted; Excavator, tracked; Light goods vehicle, gross vehicle weight < 5.5 tonnes; Breaker, hand-held, mass > 10kg and < 20kg; Road miller; Asphalt pave; Road Roller; Dump truck; 5.5 tonne < gross vehicle weight < 38 tonne	Nam Long Shan Road from DBJV security gate to OPC green gate	CI-05	Valid
CW-02 (W. Hing)						
GW-RS0163-08	2-Mar-09	31-Aug-09	*Crane, tower (electric), hand-held drill (electric), super silenced generator (70 dBA at 7m) and submersible water pump (electric)*	Wong Chuk Hang Road	CW-02	Valid
CI-07 (Leighton)						
GW-RS0245-09	10-Apr-09	9-Oct-09	*For water pumps, generator and wastewater treatment plant operation from 19:00-23:00 (general holiday including Sunday*	Ocean Park Road	CI-07	Valid
GW-RS0906-08	17-Dec-08	14-Jun-09	*For water pump and wastewater treatment plant operation for any day 23:00-07:00 on next day*	Ocean Park Road	CI-07	Expired
PP-RS0035-08	12-Dec-08	11-Jun-09	*For drop hammer driving steel sheet piling from 07:00-19:00 hours on all days except general holidays (including Sunday)*	Ocean Park Road	CI-07	Expired
GW-RS0422-09	15-Jun-09	14-Dec-09	*For water pump and wastewater treatment plant operation for any day 23:00 to 07:00 on next day*	Ocean Park Road	CI-07	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
Notification of Construction Work under APCO				
001017998	-	-	Waterfront	Notified
001018054	-	-	Summit	Notified
Effluent Discharge License				
EP820/W9/XW232	20-Jun -07	30-Jun-12	Summit	Valid
EP820/W9/XW234	13-Jul-07	31-Jul-12	Waterfront	Under variation
Specific Process License				
L-11-044 (1)	20-Sep-07	19-Sep-12	Conduct Specified Process in the premises at Ocean Park MRP Contract CI-05 (at top of NLSR)	Surrendered
Registration as Chemical Waste Producer				
WPN5213-199-D2373-01	7-May-07	-	For disposal of chemical wastes, mainly spent lubricants	Registered
Construction Waste Disposal Charging Scheme				
7004888	-	-	Waterfront + Summit	Issued

CS-01

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

CW-02

Permit/Ref/No	Valid Period		Section	Status
Notification of Construction Work under APCO				
001022480	11-July-07	-	Astounding Asia	Notified
Effluent Discharge License				
EP820/W9/XW240	12-Oct-07	31-Oct-12	Astounding Asia	Valid
Registration as Chemical Waste Producer				
5213-199-W2894-18	20-Aug-07	-	Form Oil, Lubricant oil, paint, solvent and diesel.	Registered
Construction Waste Disposal Charging Scheme				
7005864	-	-	Astounding Asia	Issued

CI-07

Permit/Ref/No	Valid Period		Section	Status
Notification of Construction Work under APCO				
001032366	15-Aug-08	-	Entry Plaza, Aqua City & Grand Aquarium	Notified
Effluent Discharge License				
EP820/W2/XW246	05-Sep-2008	30-Sep-13	Entry Plaza, Aqua City & Grand Aquarium	Valid
Construction Waste Disposal Charging Scheme				

700757619	-	-	Entry Plaza, Aqua City & Grand Aquarium	Issued

CS-02

Permit/Ref/No	Valid Period		Section	Status
Notification of Construction Work under APCO				
305349	N/A	N/A	Rainforest	Notified
Water Discharge License				
WT00004136-2009	19-Jun-09	30-Jun-14	Discharge of industrial trade effluent arising from the Sedimentation tank at the Construction Site (CS02 Rainforest, Ocean Park Redevelopment Project) to communal storm water drain	Valid
Registration as Chemical Waste Producer				
WPN5214-176-W1150-03	13-May-09	N/A	Form Oil, Lubricant oil, paint, solvent and diesel.	Registered
Construction Waste Disposal Billing Account with EPD				
WFG07578	N/A	N/A	Rainforest	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 June 2009 are as below,

Contract	Submissions
CI-05	• Notification of Commencement Date • Management Organisation Chart • Construction Programme • Drainage Proposal • Silt Curtain Proposal • Waste Management Plan • Baseline Air Quality and Noise Monitoring Report • Transplantation Proposal for Uncommon Species • Baseline Coral Survey Report • As-built Drawings of Pond 35 • Detailed Compensatory Planting As-built Drawing
CI-05, CW-02 & CI07	• Combined Monthly EM&A Report (May 2009)
City Bus Limited	• Written Notice on Completion of TPH Contaminated Soil Disposal • Written Notice on Completion of Solidification Treatment of Heavy Metals Contaminated • As-built Remediation Plan
Hong Kong School of Motoring Ltd.	• Confirmation Letter to confirm that Land Contamination remediation Works within HKSM has been completed

6. Materials Management

Section 6.17 in the EIA report specified the disposal of materials to the public fill reception facilities should be considered as last resorts with the preferred approach to reuse the material within the project and/or other projects.

The amounts of different types of materials generated by the activities of the Project in the month are shown in following table. The total materials quantities of the project showed that the reuse of materials was maximized and the disposal to the public filling facilities was minimized. Mitigation measures under the Waste Management Plan (WMP) revision D have been implemented during the reporting period.

Materials Type	Disposal Locations	CI-05	CW-02	CI-07	CS-02	Total
C& D Waste	SENT	28.25 tonnes	36.72 tonnes	84.25 tonnes	--	149.22 tonnes
	TKOSF	176.41 tonnes	93.42 tonnes	--	--	269.83 tonnes
	TMSF	7.09 tonnes	--	--	--	7.09 tonne
C&D Material	QBBP/ CWPFBP	66.67 tonnes	341.72 tonnes	14,178.00 tonnes	--	14,586.39 tonnes
	TKOFB	42.48 tonnes	554.47 tonnes	--	--	596.95 tonnes
Chemical Waste	Collected by licensed collector	--	--	--	--	0.00 L
General Waste	Collected by licensed collector	--	--	--	--	0.00 m^3

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 and noise were conducted by the Contract of CI-07 within the reporting period.

The items below would not be described in Part 1 report and would be described in CI-07 monthly EM&A 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-07 Monthly EM&A Report.

Air Quality Monitoring Stations	Identity/Description
AM1	Whisker's Theatre, Ocean Park
AM2	San Wai Village, Wong Chuk Hang
AM3A	Open Area of PMR & OPC temporary Site Offices (from 14 September 2007)

Construction Noise

The locations of the noise monitoring stations are presented in the table below. The figure was shown in the CI-07 Monthly EM&A Report.

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

Terrestrial Ecology

Monitoring of the health and condition of the transplanted plant species of conservation interest should be conducted 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.

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	Identity/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-07 Contractor's Environmental Team Coordinator.

Monitoring Period	1-hr TSP (μg/m^3)		
	AM1	AM2	AM3A
26 May 09 to 25 June 09	19-98	28-117	49-208

Monitoring Period	24-hr TSP (μg/m^3)		
	AM1	AM2	AM3A
26 May 09 to 25 June 09	17-60	33-79	40-118

Construction Noise

The monitoring data reported below was provided by the CI-07 Contractor's Environmental Team Coordinator.

Monitoring Period	Daytime Noise Level, Leq (30min), dB(A)			
	CN1	CN2	CN3	CN4
26 May 09 to 25 June 09	58.9-62.5	54.6-59.5	52.3-59.0	53.9-62.2

Monitoring Period	Evening time Noise Level, Leq (15min), dB(A)			
	CN1	CN2	CN3	CN4
26 May 09 to 25 June 09	53.5-57.5	50.8-52.6	48.7-53.6	50.6-54.3

Terrestrial Ecology

According to the requirement in the EM&A Manual, the monitoring of transplanted plants at the receptor has been completed in August 2008. No further monitoring is recommended and regular inspection would be carried out.

Coral

No impact subtidal ecology monitoring was conducted in the reporting period of June 2009 since there was no exceedance recorded at all monitoring stations and control site and the monitoring frequency has been revised to once in every quarter until the end of construction period. The next scheduled monitoring would be in August 2009.

7.4. Exceedances

No exceedance was recorded on the 1-hour TSP monitoring, 24-hour TSP monitoring Day-time noise monitoring and Evening-time noise monitoring.

8. Site Audit

8.1. IEC Site Audit

IEC conducted monthly site audit on CW-02, CI-07 and CS02 on 19 June 2009. Audit checklists are attached in Appendix A of Part I.

CW-02 Observations:

- Water was accumulated on site due to heavy rain during the inspection. The Contractor shall remove them by pumps as soon as possible.

CI-07 Observations:

- A stockpile of construction materials was not covered with tarpaulin sheet or other means.
- Water was accumulated on site due to heavy rain.
- Oil stain was observed.

CS-02 Observations:

- Stockpile of construction material was not covered in any means
- Wheel washing facilities is yet to be installed.
- Environmental Permit is yet to be posted at site entrance.
- Wastewater treatment system is yet to be installed.

8.2. Non-Compliance

No non-compliances were recorded in June 2009.

9. Implementation status of Environmental Mitigation Measures

Please see Part 2, Part 3 and Part 4 of the individual contractual reports for the details of the implementation of environmental mitigation measures.

10. Summary of Complaint, Summon or Prosecution

One complaint, but no summon or prosecution in the reporting month.

The detail of the complaint is as follow:

On 17/6/2009, a complaint was received from Police College through EPD regarding noise nuisance from CI07. Inspectors from EPD came on site on 30/6/2009 for investigation and no significant observation was made, hence, the complaint was closed.

11. Future Issues

Key Issues to be considered in the coming month include:

CI-05

- Construction phase had ceased in early June 2009.

CW-02

- Dust generation from stockpiles.
- Noise generated from operation equipment and machinery on-site.
- Storage of chemicals / fuel and chemical waste / waste oil on site.
- Sorting of C&D materials at source.
- Ensure proper collection and disposal of rubbish generated on site.
- Larviciding against mosquito breeding in stagnant water should be carried out at least on a weekly basis.

CS-02

- Dust generation from stockpiles.
- Noise generated from operation equipment and machinery on-site.
- Storage of chemicals / fuel and chemical waste / waste oil on site.
- Sorting of C&D materials at source.
- Ensure proper collection and disposal of rubbish generated on site.
- Larviciding against mosquito breeding in stagnant water should be carried out at least on a weekly basis.
- Treatment of wastewater before discharge.
- Carryout wheel wash for all vehicles leaving the site.

CS-01

- Construction phase had ceased in mid-October 2008.

CI-07

- Dust generating from breaking existing concrete / bitumen paving and excavation work
- Dust generating from temporary stockpile, unpaved areas, loading / unloading dusty materials and haul road
- Noise generating form operation of construction plants and sheet piling by drop hammer
- Water generating from wheel washing, underground water and surface run-off
- Storage of diesel drums on site
- Sorting C&D materials on site.

12. Conclusion and Recommendation

12.1. Conclusion

Environmental impact monitoring was performed in June 2009. 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, Day-time noise monitoring and Evening-time monitoring.

One complaint, no non-compliance from IEC, summons or prosecution related to environmental issues was made against the Ocean Park Master Redevelopment Project in the reporting period of June 2009.

On 17/6/2009, a complaint was received from Police College through EPD regarding noise nuisance from CI07. Inspectors from EPD came on site on 30/6/2009 for investigation and no significant observation was made, hence, the complaint was closed.

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 regular 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.

Water Quality Impact

- To minimize water discharge runoff into nearby water body.
- 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.

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

Part 1 Independent Environmental Checker's Site Inspection Records

Ocean Park Master Redevelopment Project
Contract P007
Independent Environmental Checker

MONTHLY SITE INSPECTION CHECKLIST

Inspection Date	19/06/2009	Time	09:30	Inspected By	EM: A Leung IEC: Florence Yuen Contractor: CW02: W Lo CI07: T Lee CS02: K Chong
Site Location	CW02 CI07 CS02				

Weather

Condition		Sunny		Fine		Overcast		Drizzle	✓	Rain		Storm		Hazy
Temperature	30°C				Humidity	✓	High		Moderate		Low		
Wind	✓	Calm		Light		Breeze		Strong		Direction			

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

• 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?			✓	
	• 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?			✓		

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

• 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 (contrainerisation)?		✓			
• 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?				✓	CS-2 ①6/9/2012
• 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?				✓	CS02
• 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)?			✓		

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?		✓			
• Is the firing of explosive carried out in the morning prior to opening of the Park?		✓			
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?				✓	CS02
• 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?			✓		

	• 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?				✓	CI07 ② P619020 CW02 ① P619019 2
	• Are open stockpiles of construction materials or construction wastes of more than 50m^3 covered with tarpaulin during rainstorm?				✓	CI07 ① P619020 9
	In case of an excavation in rainy seasons: • Is temporary exposed slope/soil surfaces covered by tarpaulin as far as practicable?				✓	Same as Above
	• 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?				✓	CI07 ③ P619020 5
	Coral Sites					
S8.4	• 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?				✓	CS02 ① P619021 2
	• 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.		✓			
- Requiring the Contractor to plan and make emergency arrangements.		✓			
• Is spare/redundant fire fighting equipment provided?		✓			
• 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?		✓			
• Are the processes of checking of condition of drivers to suspend any driver of concern carried out?		✓			
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?		✓			
• Is other contractors' use of the Ocean Park Internal service road restricted during delivery of explosives, i.e. 6 to 7 a.m?		✓			
• Is the Ocean Park guard required to call to the magazine guard on an hourly basis when explosives are stored in magazines?		✓			
• Is the evacuation of part or all of Ocean Park Headland Area arranged in case of the explosive magazine being engulfed in fire?		✓			
• Is the risk to the public from accidental initation during charging and blasting limited by the following means?					
- Closing the Ocean Park from commencement of charging holes until completion of blasting each day.		✓			
- 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).		✓			
- Not operating amusement rides in the event of accidental explosion until confirmed free of critical damage.		✓			
• 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?		✓			
• Is the opportunity for arson/deliberate initiation of explosive reduced with the following means?					
- Paying attention to the security alert status from the Government.		✓			
- Developing a security plan to address high alert level.		✓			
• Is an emergency plan developed to address uncontrolled fire in magazine area?		✓			
• Is the transfer of explosives between 5 to 6 a.m agreed by Mines Division?		✓			
• Is the road surface along the explosive transportation route maintained?		✓			
• 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?		✓			
• Is adequate space provided for the explosive vehicle to manoeuvre without reversing close to the magazine to limit		✓			

	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?					

Observation for last month

Item ① is outstanding

Observation for this month

① Water was accumulated on-site due to heavy rain during the inspection. The Contractor shall remove them by pumps as soon as possible.

IEC Representative	Environmental Manager	Contractor's Representative CW02
Florence Yuen	pp	
(Florence Yuen)	(ANDY LEUNG)	(Wesley Ho)

Observations for last month

Items 3 and 2 were closed. Items 1 and 4 were outstanding

Observations for this month.

① A stockpile of construction material was not covered with tarpaulin sheet or other means.

② Water was accumulated on site due to heavy rain

③ Oil stain was observed.

IEC Representative	Environmental Manager	Contractor's Representative CI07
Florence Yuen		
(Florence Yuen)	([illegible])	(Thomas Lee - LCHL)

Observations for last month

Items ① and ② were outstanding.

Observations for this month

① Stockpile of construction material was not covered in any mean.

② Wheel washing facilities is yet to be installed.

③ Environmental Permit is yet to be posted at site entrance.

④ Wastewater treatment system is yet to be installed.

IEC Representative	Environmental Manager	Contractor's Representative CS02
Florence Yuen		
(Florence Yuen)	(KC Chan)	(Ken Chong)

Part 2 CI-07 EM&A REPORT (June 2009)

OCEAN PARK REDEVELOPMENT PROJECT

CONTRACT NO. CI07

ENTRY PLAZA, AQUA CITY AND GRAND AQUARIUM

Monthly EM&A Report – June 2009

Prepared by:	Reviewed by:	Authorised by:
Thomas Lee Project Environmental Coordinator	Jerry Wong Construction Manager	Darren Beasley Project Director

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

EXECUTIVE SUMMARY

Introduction

This is the eleventh Monthly Environmental Monitoring and Audit (EM&A) Report prepared by Leighton Contractors (Asia) Limited for the Ocean Park Redevelopment Project Contract No. CI07 – Entry Plaza, Aqua City and Grand Aquarium (hereinafter called the Project). The Project was commenced on 15 August 2008. Leighton Contractors (Asia) Limited was instructed by the Project Manager Representative to takeover the contract CI05 noise and air quality monitoring works at the Waterfront effective from 1 March 2009. This document reports the results of the EM&A works conducted in June 2009 (26 May 2009 to 25 June 2009).

The major site activities undertaken in the reporting month included:

- Beam & Slab (1/F) construction at Grand Aquarium;
- Rockfilling, excavation, and backfilling at Entry Plaza;
- Footing, column, slab and wall construction at Entry Plaza; and
- U/G drainage and stone paving at Funicular Plaza.

Environmental Audit and Monitoring Works

Environmental monitoring and audit works for the Project was performed as stipulated in the Contractor's EM&A Manual. Site audits were conducted once per week. The implementation of the environmental mitigation measures, Event Action Plans and environmental complaint handling procedures were also checked. No non-compliance was observed during the site audits.

Monitoring of 1-hour & 24-hour Total Suspended Particulates (TSP) and noise were performed and the results were checked and reviewed. No exceedance was recorded. Summary of monitoring and audit activities conducted and the events and action taken in the reporting month are tabulated in the below tables.

A summary of monitoring and audit activities conducted in the reporting period

Parameter	Frequency
1-hour TSP monitoring	15 sessions for all air quality monitoring stations
24-hour TSP monitoring	5 sessions for all air quality monitoring stations
Daytime noise monitoring	4 sessions for all noise monitoring stations
Evening and night time noise monitoring	4 sessions for all noise monitoring stations
Holiday time noise monitoring	0 session for all noise monitoring stations
Joint environmental site inspection	4 sessions (include the IEC audit)

Summary table for events recorded in the reporting period

Parameter	No. of Events		No. of Events Due to the Project	Action Taken
	Action Level	Limit Level		
1-hr TSP	0	0	0	N.A.
24-hr TSP	0	0	0	N.A.
Noise	0	0	0	N.A.

Environmental Licenses and Permits

Construction Waste Disposal Billing Account was opened and total 18421 Chits were obtained for construction waste disposal.

Site Effluent Discharge Licence was issued for site effluent via sedimentation tank discharged into communal storm water drain.

A notification pursuant to Section 3(1) of the Air Pollution Control (Construction Dust) Regulation was made to EPD prior the commencement of the Project.

Chemical Waste Producer Registration was issued for chemical waste disposal by the licenced collector.

Construction Noise Permits for water pumps, generator and wastewater treatment plant operation during restricted hours and sheet piling by drop hammer were issued.

Complaints and Prosecutions

One complaint, no prosecution related to the project was received during the reporting month.

Future Key Issues

Key issues to be considered in July or coming months include:

- Column footing, wall & slab construction at Entry Plaza;
- U/G drainage, pipe works at Entry Plaza
- Retaining wall construction at Grand Aquarium
- Wall, beam, slab and T20 water tank construction at Grand Aquarium;
- U/G drainage, pipe works and backfilling at Grand Aquarium; and
- Stone paving and excavation work at Funicular Plaza.

1. INTRODUCTION

1.1 Background

The "Repositioning and Long Term Operation Plan of Ocean Park" is being implemented by the Ocean Park Corporation at the existing site of Ocean Park and Nam Long Shan, Aberdeen. The purpose of this project is to upgrade and expand the existing Ocean Park to meet anticipated visitor demands and to position Ocean Park as a premium tourist attraction and a regional leader in themed recreational and educational park experience. The site layout plan is illustrated in Figure 1.1.

An environmental impact assessment (EIA) report for "Repositioning and Long Term Operation Plan of Ocean Park" (Report No. 121/2006 and Register No. AEIAR-101/2006) has been prepared in 2006 and the Environmental Monitoring and Audit Manual (EM&A Manual) was also included as part of the EIA report in the register. An Environmental Permit (EP) No. EP-249/2006 was issued on 28 July 2006 for the above project to Ocean Park Corporation as Permit Holder and a varied EP No. EP-249/2006/A was subsequently issued on 23 October 2006 for the above project to Ocean Park Corporation as Permit Holder.

Leighton Contractors (Asia) Limited (the Contractor) was commissioned by the Ocean Park Corporation to undertake the construction of the Ocean Park Redevelopment Project Contract No. CI07 – Entry Plaza, Aqua City and Grand Aquarium (hereinafter call the Project).

The works to be executed under Contract CI07 include the following major items:

- **Entry Plaza Phase 1 and Aqua City**

  – demolition of existing structures, site formation and slope works for roadwork new building structures and car park;

  – construction of the Entry Plaza and Aqua City building structures and foundation, and installation of builders' works and architectural finishes;

  – construction of one- to three-storey buildings on the Entry Plaza podium, including animal habitats and back of house, ticketing, turnstiles, guest relations, security, banking and other offices, back of house, food and beverage and retail functions;

  – construction of back-of-house facilities on the ground floor and mezzanine floor of the Entry Plaza;

  – construction of at-grade drop-off and pick-up for cars, taxis, coaches and buses, parking for coaches and private cars, including meter-gate system, shelters, street furniture and amenities;

– installation of building services, including mechanical ventilation and air-conditioning installation, electrical installation, extra low-voltage installation (such as closed-circuit television, security alarm and public address system), control and monitoring installation, plumbing and drainage installation, fire-services installation, irrigation system installation, gas-supply installation, lift and escalator installation and miscellaneous works;

– construction of a section of Ocean Park Road and associated footpaths; provision of road drainage, utilities, street furniture, street lightings, and soft and hard landscape works;

– light-emitting-diode screen and its support to be integrated with the tensile-membrane long-span metallic structure;

– construction of Aqua City Lagoon and associated site formation, hardscape, waterproofing and water circulation facilities, including pipe works, pump system, filtration and aeration system;

– construction of guest-route paving and railing, utilities and services works and associated civil-engineering works;

– soft and hard landscape works (including water features, fountains, external seating, on-grade as well as podium planter areas, artificial rockworks, street appurtenances, lighting, irrigation, themed elements, including statues, murals and other objects);

– balustrade, skylight, glass wall, window, louver, cladding and canopy, retail/food carts and kiosks, timber trellis and structures; facilitating works for the special features, including power supply, foundation works, civil and structural works, electrical and mechanical works, architectural finishes works and miscellaneous works;

– provision of new and diversion/decommissioning of existing drainage, sewerage, water mains and underground utilities necessary for the operation of Ocean Park;

– provision of temporary toilet facilities and relocation of the Guest Relations Office in Portion EP2, the temporary toilet and Guest Relation Office must be operational prior to removal of the existing facilities;

– construction of all ancillary works, including civil, geotechnical and utilities works;

– installation of the Carousel ride, and

– coordination of the works with the installation of 13 sculptures to be supplied and

installed by other contractors; provision of all attendance, labour, plant and equipment necessary in relation to the installation of the sculptures;

– maintenance of a fixed number of temporary car-park spaces for guests' use during different construction stages;

– construction of ramp structures connecting from Wong Chuk Hang Road to the Entry Plaza building structure and to the Cable Car Plaza, and

– soft and hard landscape works (including on-grade planter areas, street appurtenances, lighting, irrigation and themed elements).

- **Grand Aquarium:**

  – construction of the Grand Aquarium, including life support systems, building structures and foundation, installation of builders' works and architectural finishes;

  – fitting-out packages, including finishes, fixed furniture, decorations, lighting, audio/visual equipment, artworks and building services;

  – coordination of the works with the installation and joint sealing of the acrylic viewing panels to be supplied and installed by other contractors; provision of all attendance, labour, plant and equipment necessary in relation to the installation of the acrylic viewing panels, and

  – construction of the Transformer Room Building, including coordination works with Hong Kong Electric Company Limited for installation.

- **Entry Plaza Phase 2:**

  – demolition of the temporary entrance, transformer building, existing staff canteen and associated structures and road works within Portion EP3;

  – modification of the existing car park, access road and roundabout to the temporary entrance to form a new coach parking and car park within Portions EP3;

- **General**

  – erection of hoardings with graphics;

  – tree transplanting and felling and protection to remaining trees;

  – management and maintenance of temporary holding nursery;

– installation of civil provisions for parkwide information-technology systems and all operational equipment, such as background music system, public-address system, closed-circuit television, management information system, building information system, security and turnstiles;

– construction of parkwide irrigation and drainage system for planting area;

– supply and installation of all escalators and elevators;

– design and built all temporary works with necessary statutory submissions, including:
  - temporary support to excavations greater than 2 metres in depth;
  - temporary cut or fill slopes greater than 2 metres high;
  - falsework and temporary platforms, structures and the like required;
  - temporary platforms, structures and the like required for supporting drilling equipment and construction plant; and
  - excavation and lateral supports for all Entry Plaza Phase 2 and Aqua City Phase 2 works; and

– design and built works as specified in Contract CI07, with necessary statutory submissions, including:
  - artificial rockwork, including concrete foundations, internal structural supporting systems and fixing details for the lagoon and Otter Exhibit;
  - glass-reinforced concrete/glass-reinforced gypsum/glass-reinforced plastic/shotcrete works and associated supporting structures;
  - tensile-membrane long-span metallic canopy structure, including the metal frame, marquee supporting light-emitting-diode screen and walkway at the Entry Plaza;
  - Ocean Park super logo and associated support structure over the tensile-membrane canopy and lift L-1 cone structure;
  - themed metalwork, entrance gates and balustrades;
  - exhibit glazing at the River Otter viewing;
  - glass canopy, metal canopy over escalators;
  - vertical green-wall system;
  - water features circulations, filtration, control and water dynamic;
  - lagoon and waterfall filtration and circulation systems;
  - metal modular shelving and associated stairway and platforms;
  - glass curtain wall for the Grand Aquarium shell;
  - Grand Aquarium fibre-glass tank and working platform;
  - Grand Aquarium movable gantry and hoisting system;
  - Grand Aquarium hydraulic platform;
  - queue display indicating system for the Ticketing Office; and
  - other items as specified in the Particular Specification and/or Drawings.

1.2 Project Organizations

Different parties with different levels of involvement in the project organization include:

- The Project Manager and Project Environmental Team - Maunsell Consultants Asia Ltd.
- Contractor - Leighton Contractors (Asia) Ltd.
- Contractor's Environmental Team (CET)
- Independent Environmental Checker (IEC) - Mott MacDonald HK Ltd.

The responsibilities of respective parties are provided in the Contractor's EM&A Manual.

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

Table 1.1 Key Project Contacts

Party	Name	Role	Phone No.	Fax No.
Project ET	Mr. Ernest Torbet	Project Manager Representative (PMR)	2871 5888	2552 1256
	Mr. K C Chan	RSS (Safety & Environment)	2910 3155	2552 1256
Contractor	Darren Beasley	Project Director	3665 2688	2580 6600
	Jerry Wong	Construction Manager	3665 2638	2580 6600
Contractor's ET	Thomas Lee	Project Environmental Coordinator	3665 2609	2580 6600
	Kelven Yip	Environmental Engineer	3665 2620	2580 6600
IEC	Miss Florence Yuen	Independent Environmental Checker (IEC) Representative	2828 5757	2827 1823

1.3 Construction Programme

The site activities undertaken in the reporting month were:

- Beam & Slab (1/F) construction at Grand Aquarium;
- Rockfilling, excavation, and backfilling at Entry Plaza;
- Footing, column, slab and wall construction at Entry Plaza; and
- U/G drainage and stone paving at Funicular Plaza.

1.4 Summary of EM&A Requirements

The EM&A programme requires construction phase environmental site audit. The duties and responsibilities comprise the following:

- monitor various environmental parameters, if necessary, as specified in the EM&A Manual;
- analyze the environmental monitoring and audit data;
- review the EM&A programme to confirm the adequacy of mitigation measures implemented and the validity of the EIA predictions and to identify any adverse environmental impacts arising;
- carry out site inspection to investigate and audit the Contractor's site practice, equipment and work methodologies with respect to pollution control and environmental mitigation, and effect proactive action to pre-empt problems;
- audit and prepare EM&A reports on the site environmental conditions;
- report the environmental audit results to the Contractor;
- recommend appropriate mitigation measures to the Contractor in case of exceedance of Action and Limit Levels in accordance with the Event and Action Plans; and
- adhere to the procedures for carrying out complaint investigation in accordance with the EM&A Manual.

This report presents the environmental monitoring and audit works for the Project in June 2009.

2. AIR QUALITY MONITORING

2.1 Monitoring Requirements

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

2.2 Monitoring Equipment

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

2.3 Monitoring Parameters, Frequency and Duration

The monitoring parameters and frequency are summarised in Table 2.2. The monitoring schedule for the coming 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
AM3A	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.*

2.4 Monitoring Locations

In accordance with the EM&A Manual, three air quality monitoring stations, as shown in Figure 1.2, were selected for 1-hour and 24-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
AM3A	Open areas of PMR & OPC temporary site offices

2.5 Monitoring Methodology

24-hour / 1-hour TSP Monitoring

Installation

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 ±3 °C; the relative humidity (RH) was < 50% and not variable by more than ±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 flow rate record sheet was set into the flow recorder.
- The flow rate of the HVS was checked and adjusted at around 1.1 m^3/min. The range specified in the EM&A Manual was between 0.6-1.7 m^3/min.
- The programmable timer was set for a sampling period of 24 hrs $\pm$ 1 hr 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 E.

2.6 Results and Observations

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.

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 (μg/m^3)		
	AM1	AM2	AM3A
27-May-09	47	61	49
29-May-09	80	62	91
1-Jun-09	43	78	168
3-Jun-09	47	74	162
4-Jun-09	59	72	104
5-Jun-09	56	68	104
8-Jun-09	98	117	208
10-Jun-09	70	77	193
12-Jun-09	59	38	67
15-Jun-09	30	53	67
16-Jun-09	65	81	115
17-Jun-09	38	28	94
19-Jun-09	19	50	118
22-Jun-09	47	70	196
24-Jun-09	70	62	103

*Notes: * Exceedance of Limit Level*
 # Exceedance of Action Level
- No monitoring due to bad weather

Table 2.5 Monitoring Results of 24-hr TSP

Date of Monitoring	24-hr TSP (μg/m^3)		
	AM1	AM2	AM3A
29-May-09	36	37	54
04-Jun-09	60	79	118
10-Jun-09	25	34	45
16-Jun-09	17	35	40
22-Jun-09	29	33	45

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

3. NOISE MONITORING

3.1 Monitoring Requirements

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.

3.2 Monitoring Equipment

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 (L_{eq}) and percentile sound pressure level (L_x). 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

3.3 Monitoring Parameters, Frequency and Duration

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 coming 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	L_{eq}	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.

3.4 Monitoring Locations

In accordance with the EM&A Manual, noise monitoring was conducted at four designated

monitoring stations as shown in Figure 1.2. 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

3.5 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 E.

3.6 Results and Observations

Noise monitoring was conducted at the 4 designated monitoring stations during daytime and evening in the reporting month. The monitoring was carried out as scheduled in the reporting month and the monitoring results are summarized in Table 3.4 and 3.5. All monitoring data and graphical presentation of the monitoring results are provided in Appendix D.

No exceedance of limit level during daytime and evening recorded in the reporting month.

Table 3.4 Monitoring Results of Daytime Noise

Date of Monitoring	Noise Level, L_{eq} (30-min), dB(A)			
	CN1	CN2	CN3	CN4
1-Jun-09	58.9	57.1	56.3	60.2
8-Jun-09	59.8	54.6	52.3	55.7
15-Jun-09	60.2	55.9	54.6	53.9
22-Jun-09	62.5	59.5	59.0	62.2

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

Table 3.5 Monitoring Results of Evening Noise

Date of Monitoring	Noise Level, L_{eq} (15-min), dB(A)			
	CN1	CN2	CN3	CN4
1-Jun-09	57.5	52.6	53.6	54.3
8-Jun-09	55.9	50.8	48.7	51.8
15-Jun-09	55.3	51.3	51.3	50.6
22-Jun-09	53.5	52.6	52.0	53.1

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

4 ENVIRONMENTAL AUDIT

4.1 Environmental Site Audit

Environmental site audits were carried out on weekly basis to monitor the timely implementation of proper environmental management practices and mitigation measures in the Project site.

Site audits for the Project in the reporting month were conducted on 5, 12, 19, 26 June 2009. No non-compliance was observed during the site audits. The summaries of site audits are attached in Appendix J.

During site inspections in the reporting month, no non-conformance was identified. The observations and recommendations are summarized in Table 4.1.

Table 4.1 Observations and Recommendations of Site Audits

Parameter	Date	Observations/Recommendations	Remediation / Follow up
Air	12/06/09	Rock transportation by excavator was observed without watering	Water on the rock during operation of excavator (completed)
	19/06/09	Stockpile of construction material was not covered with tarpaulin sheet or other means	Provided tarpaulin sheet to cover non-active stockpile (completed)
Waste	26/06/09	Litter was scattered at the first floor of Entry Plaza	Provided plastic bag to collect the general refuse (completed)
Water	05/06/09 & 19/06/09 & 26/06/09	Stagnant water was found resulting from the heavy rain	Pumped the water and sprayed mosquito-killing oil to where water cannot be pumped out (completed)
Land Contamination	19/06/09	Minor oil stains were observed on the accumulated storm water resulting from washing the grease on the steel scaffolding materials during heavy rain	Removed oil stains and provided covers for scaffolding materials stored at open area (completed)
	26/06/09	Mould oil drum was not placed with a drip tray underneath.	Provided drip tray underneath (completed)

4.2 Status of Environmental Licensing and Permitting

All valid permits/licenses obtained for the Project are summarized in Table 4.2.

Table 4.2 Summary of Environmental Licensing and Permit Status

Permit No,	Valid Period		Details	Status
	From	To		
Environmental Permit				
EP-249/2006/A	23/10/2006	N.A.	Expansion of the existing Ocean Park and reconstruction / modification of its existing facilities.	Valid
Site Effluent Discharge Licence				
EP820/W2/XW246	05/09/2008	30/09/2013	Discharge of site effluent arising from construction site (Contract CI07) at sedimentation tank into communal storm water drain	Valid
Chemical Waste Producer Registration				
5213-199-L2174-28	22/09/2008	N.A.	Waste Disposal (Chemical Waste) (General) Regulation – Registration of Waste Producer	Valid
Construction Noise Permit				
GW-RS0245-09	10/4/2009	09/10/2009	For water pumps, generator and wastewater treatment plant operation from 19:00 to 23:00 (any day not being a general holiday) and 07:00 to 23:00 (general holiday including Sunday)	Valid
GW-RS0906-08	17/12/2008	14/06/2009	For water pump and wastewater treatment plant operation for any day 23:00 to 07:00 on next day	Expired
GW-RS0422-09	15/06/2009	14/12/2009	For water pump and wastewater treatment plant operation for any day 23:00 to 07:00 on next day	Valid
PP-RS0035-08	12/12/2008	11/06/2009	For drop hammer driving steel sheet pile from 07:00 to 19:00 hours on all days except general holidays (including Sundays)	Expired
Other				
Ref. no. 001032366	N.A.	N.A.	Notification Pursuant to Section 3(1) of the Air Pollution Control (Construction Dust) Regulation	Valid
Account No. 7007576	N.A.	N.A.	Construction Waste Disposal Billing Account with EPD	Valid

4.3 Status of Waste Management

The amount of waste generated by the construction activities of the Project in the reporting month is attached in Appendix K.

The following materials are recycled/reused on site:

- Existing steel parapets at carpark area are modified and reused as safety fencing for excavation work;
- Broken concrete and bitumen are reused for hard paving for temporary access road;
- Reinforcement in the broken concrete are cut and recycled, and
- Treated waste waster/underground/stream water is reused for watering dry area/wetting rockfill material to minimize discharge.

4.4 Implementation Status of Environmental Mitigation Measures

According to the Environmental Permit and the EM&A Manual, the mitigation measures detailed in the documents are required to be implemented. An updated summary of the EMIS is provided in Appendix F.

4.5 Summary of Exceedances

No Action/Limit Level exceedance was reported in the reporting month.

4.6 Implementation Status of Event Action Plans

The Event Action Plans for air quality and construction noise are presented in Appendix G.

4.7 Summary of Complaints and Prosecutions

One complaint, no prosecution related to the project was received during the reporting month.

The environmental complaint flow diagram and complaint log of the project are presented in Appendix H.

5 FUTURE KEY ISSUES

5.1 Key Issues for the Coming Month

Key issues to be considered in the coming month include:

- Dust generating from breaking existing concrete/bitumen paving and excavation work;

- Dust generating from temporary stockpile, unpaved areas, loading/unloading dusty materials and haul road;
- Noise generating from operation of construction plants;
- Water accumulation due to heavy rain;
- Rainstorm surface run-off;
- Storage of diesel drums/chemicals on site; and
- Sorting C&D materials on site.

5.2 Construction Programme for the Next Month

The tentative construction programme for the Project is provided in Appendix I.

6 CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

Four environmental site audits were performed in June 2009. No non-compliance was observed during the site audits.

No exceedance of environmental monitoring was reported in the reporting month.

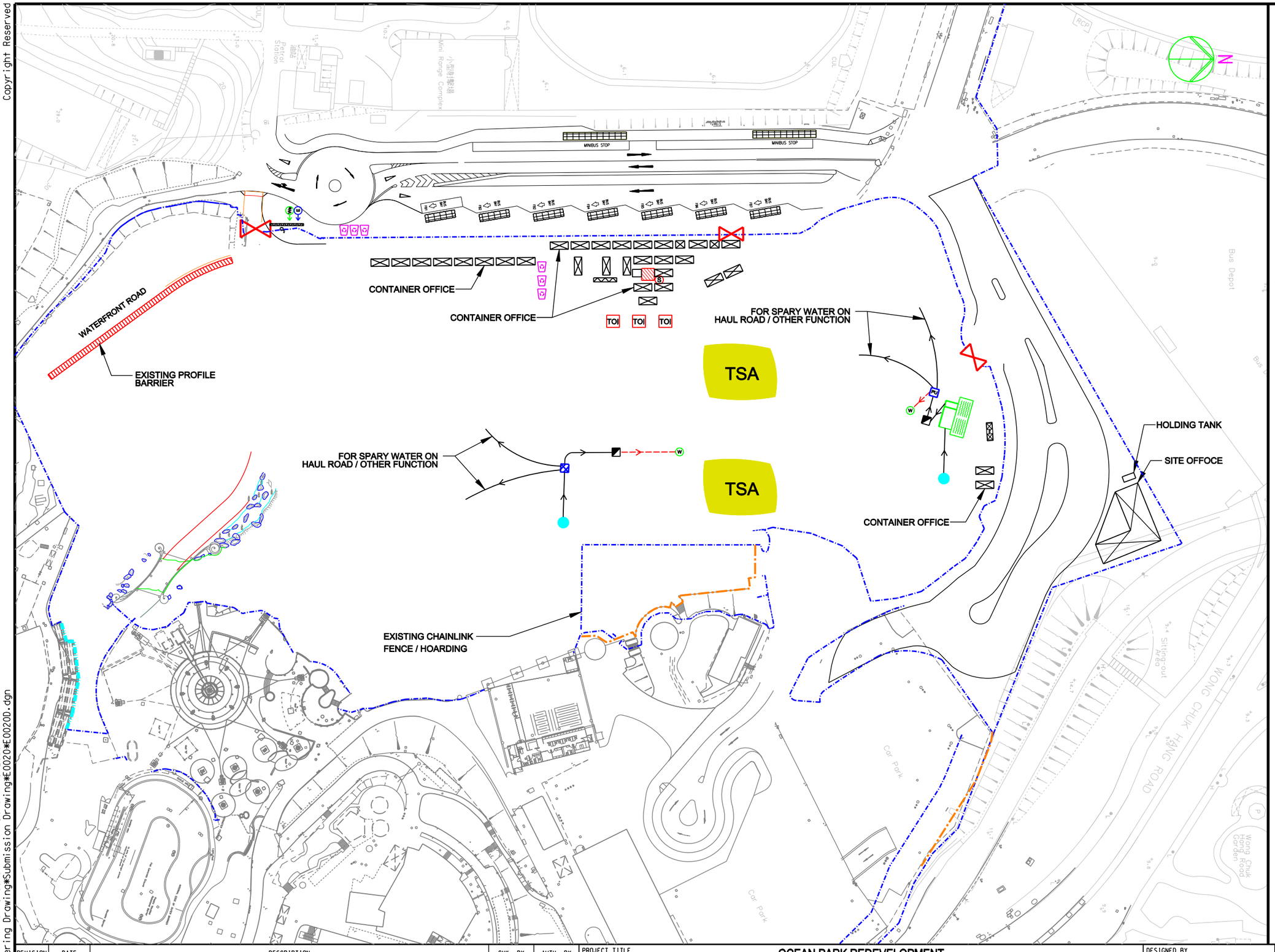
One complaint, no prosecution related to the project was received in the reporting month.

6.2 Recommendations

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

- Watering on rock during operation of excavator breaking concrete
- Watering or provide cover for non-active stockpile;
- Appropriate disposal of waste and collecting frequently;
- Pump away any stagnant water immediately; and
- Provide drip tray to the chemical/diesel drums when placed on the ground.

Figure 1.1 – Site Layout Plan



LEGENDS :

- EXISTING CHAINLINK FENCE / HOARDING
- WHEEL WASHING BASIN
- SUMP PIT
- SILT TRAP
- SITE ENTRANCE
- (S) SPILL KIT
- NOTICE BOARD (INCLUDING EMERGENCY TELEPHONE LIST)
- (W) WASTE WATER DISCHARGE POINT
- WASTE WATER TREATMENT POINT (AQUASED)
- TEMPORARY DRAIN FOR WASTE / GROUND WATER
- TEMPORARY DRAIN WITH TREATMENT
- (Wa) TEMPORARY WATER SUPPLY
- (E) TEMPORARY ELECTRICITY SUPPLY
- (F) FLAGMAN LOCATION
- TOI CHEMICAL TOILET
- ACCESS GIVEN
- ACCESS DENIED
- CHEMICAL WASTE STORE
- TSA TEMPORARY SORTING AREA
- TS TEMPORARY STOCKPILE & STORAGE AREA
- RECYCLE BINS
- WASTE SKIP
- SEDIMENTATION TANK
- GROUND WATER SOURCE
- D.G. STORE
- PU PUMP TANK

UPDATED TO APR 09

REVISION	DATE	DESCRIPTION	CHK. BY	AUTH. BY
D	03/04/09	MINOR REVISED		
C	18/02/09	MINOR REVISED		
B	20/01/09	MINOR REVISED		
A	10/12/08	MINOR REVISED		

PROJECT TITLE
OCEAN PARK REDEVELOPMENT
CONTRACT No. CI07
ENTRY PLAZA, AQUA CITY & GRAND AQUARIUM

DRAWING TITLE
ENVIRONMENTAL FACILITIES LAYOUT PLAN

DESIGNED BY	W.C. LAM
DRAWN BY	F. LO
CHECKED BY	W.C. LAM
SCALE @ A3	N.T.S.

LEIGHTON 禮頓

DRAWING NO. H2458/E/0020

DATE 01/11/2008

REVISION D

A3 420mm x 297mm

Print By :FrankyL Time :3:09:57 PM Date :4/3/2009
Filename :I:*Engineering Drawing*Submission Drawing*E0020*E0020D.dgn

Figure 1.2 – Locations of Air Quality and Noise Monitoring Stations

REV.	DESCRIPTION	DATE

海洋公園 OCEAN PARK HONG KONG

OCEAN PARK REDEVELOPMENT

CONTRACT NO.C107
ENTRY PLAZA,AQUA CITY & GRAND AQUARIUM

AIR QUALITY AND NOISE MONITORING STATIONS LOCATION PLAN

CONSULTANT

MAUNSELL | AECOM

Maunsell Consultants Asia Ltd.
茂盛(亞洲)工程顧問有限公司
In association with :
AEDAS EDAW LEVETT & BAILEY

LEIGHTON CONTRACTORS (ASIA) LTD.

SCALE	DATE
N.T.S.	27/03/2009
DRAWN BY	CHECKED BY
F. LO	T. LEE
DWG NO.	REV.
H2458/E/0172	0

Date : 3/27/2009 Time : 5:33:19 PM

Filename : I:\Engineering Drawing\Submission Drawing\E0172\E0172.dgn

Appendix A – Action and Limit Levels

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

Monitoring Location	24-hr TSP ($\mu g/m^3$)		1-hr TSP ($\mu g/m^3$)	
	Action Level	Limit Level	Action Level	Limit Level
AM1	183	260	440	500
AM2	181	260	500	500
AM3/AM3A	194	260	500	500

Table B.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

Appendix B – Environmental Monitoring Schedules

Contract No.: C107
Ocean Park Redevelopment Project – Entry Plaza, Aqua City & Grand Aquarium – Environmental Monitoring

Time Schedule for Impact 1-hour TSP Monitoring (1-TSP), Impact 24-hour TSP Monitoring (24-TSP) and Impact Daytime Noise Monitoring (NM-Daytime)

July 2009

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1 Holiday	2	3 1-TSP 24-TSP	4
5	6 1-TSP NM - Daytime	7	8 1-TSP	9 1-TSP 24-TSP	10 1-TSP	11
12	13 1-TSP NM - Daytime	14	15 1-TSP 24-TSP	16	17 1-TSP	18
19	20 1-TSP NM - Daytime	21 1-TSP 24-TSP	22 1-TSP	23	24 1-TSP	25
26	27 1-TSP 24-TSP NM - Daytime	28	29 1-TSP	30	31 1-TSP	1/8 1-TSP 24-TSP

東業德勤測試顧問有限公司
ETS-TESTCONSULT LIMITED

Contract No.: C107
Ocean Park Redevelopment Project – Entry Plaza, Aqua City & Grand Aquarium – Environmental Monitoring

Preliminary Time Schedule for Impact Evening Noise Monitoring (NM- Evening)

July 2009

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1 Holiday	2	3	4
5	6 NM - Evening	7	8	9	10	11
12	13 NM - Evening	14	15	16	17	18
19	20 NM - Evening	21	22	23	24	25
26	27 NM - Evening	28	29	30	31	

Appendix C – Air Quality Monitoring Results

Annex E1 Air Quality Monitoring Data (1-hr TSP)

1-hr TSP Monitoring Results at Station AM1

Monitoring Period				Filter Weight (g)		Flow Rate (m^3/min)		Elapse Time (hour)		Sampling Time (hours)	Concentration (μg/m^3)	Weather Condition	Particulate weight (g)	Average flow (m^3/min)	Total volume (m^3)
From		To													
Date	Time	Date	Time	Initial	Final	Initial	Final	Initial	Final						
27-May-09	09:00	27-May-09	10:00	2.8368	2.8396	1.0	1.0	13000.55	13001.55	1	47	cloudy	0.0028	1.0	61
29-May-09	09:00	29-May-09	10:00	2.7944	2.7992	1.0	1.0	13001.55	13002.55	1	80	cloudy	0.0048	1.0	60
01-Jun-09	11:00	01-Jun-09	12:00	2.8776	2.8802	1.0	1.0	13026.56	13027.56	1	43	fine	0.0026	1.0	61
03-Jun-09	09:00	03-Jun-09	10:00	2.8596	2.8624	1.0	1.0	13027.56	13028.56	1	47	cloudy	0.0028	1.0	60
04-Jun-09	08:00	04-Jun-09	09:00	2.8342	2.8378	1.0	1.0	13028.56	13029.56	1	59	fine	0.0036	1.0	61
05-Jun-09	11:00	05-Jun-09	12:00	2.8941	2.8976	1.0	1.0	13053.56	13054.56	1	56	fine	0.0035	1.0	62
08-Jun-09	09:00	08-Jun-09	10:00	2.8820	2.888	1.0	1.0	13054.56	13055.56	1	98	rainy	0.0060	1.0	61
10-Jun-09	09:00	10-Jun-09	10:00	2.876	2.8803	1.0	1.0	13055.56	13056.56	1	70	cloudy	0.0043	1.0	61
12-Jun-09	13:00	12-Jun-09	14:00	2.8606	2.8643	1.0	1.0	13080.56	13081.56	1	59	cloudy	0.0037	1.0	63
15-Jun-09	09:00	15-Jun-09	10:00	2.7467	2.7486	1.0	1.0	13081.56	13082.56	1	30	cloudy	0.0019	1.0	63
16-Jun-09	09:00	16-Jun-09	10:00	2.7439	2.7480	1.0	1.0	13082.56	13083.56	1	65	cloudy	0.0041	1.0	63
17-Jun-09	13:00	17-Jun-09	14:00	2.7268	2.7291	1.0	1.0	13107.56	13108.56	1	38	fine	0.0023	1.0	61
19-Jun-09	09:00	19-Jun-09	10:00	2.7548	2.7560	1.1	1.1	13108.56	13109.56	1	19	rainy	0.0012	1.1	64
22-Jun-09	09:00	22-Jun-09	10:00	2.7393	2.7423	1.1	1.1	13109.56	13110.56	1	47	cloudy	0.0030	1.1	64
24-Jun-09	13:00	24-Jun-09	14:00	2.7529	2.7573	1.0	1.0	13134.56	13135.56	1	70	cloudy	0.0044	1.0	63

1-hr TSP Monitoring Results at Station AM2

Monitoring Period				Filter Weight (g)		Flow Rate (m^3/min)		Elapse Time (hour)		Sampling Time (hours)	Concentration (μg/m^3)	Weather Condition	Particulate weight (g)	Average flow (m^3/min)	Total volume (m^3)
From		To													
Date	Time	Date	Time	Initial	Final	Initial	Final	Initial	Final						
27-May-09	09:00	27-May-09	10:00	2.8500	2.8540	1.1	1.1	12783.02	12784.02	1	61	cloudy	0.0040	1.1	66
29-May-09	09:00	29-May-09	10:00	2.8387	2.8427	1.1	1.1	12784.02	12785.02	1	62	cloudy	0.0040	1.1	64
01-Jun-09	11:00	01-Jun-09	12:00	2.8222	2.8272	1.1	1.1	12809.03	12810.03	1	78	fine	0.0050	1.1	64
03-Jun-09	09:00	03-Jun-09	10:00	2.8682	2.8731	1.1	1.1	12810.03	12811.03	1	74	cloudy	0.0049	1.1	66
04-Jun-09	08:00	04-Jun-09	09:00	2.9005	2.9051	1.1	1.1	12811.03	12812.03	1	72	fine	0.0046	1.1	64
05-Jun-09	11:00	05-Jun-09	12:00	2.8720	2.8766	1.1	1.1	12836.03	12837.03	1	68	fine	0.0046	1.1	68
08-Jun-09	09:00	08-Jun-09	10:00	2.8709	2.8788	1.1	1.1	12837.03	12838.03	1	117	rainy	0.0079	1.1	68
10-Jun-09	09:00	10-Jun-09	10:00	2.8637	2.8689	1.1	1.1	12838.03	12839.03	1	77	cloudy	0.0052	1.1	68
12-Jun-09	13:00	12-Jun-09	14:00	2.8629	2.8655	1.1	1.1	12863.03	12864.03	1	38	cloudy	0.0026	1.1	68
15-Jun-09	09:00	15-Jun-09	10:00	2.7486	2.7522	1.1	1.1	12864.03	12865.03	1	53	cloudy	0.0036	1.1	67

Remarks: 1. Bold value indicated an Action Level exceedance

2. Bold & Italic value indicated an Limit Level exceedance

3. x - denotes no measurement due to power supply failure

Annex E1 Air Quality Monitoring Data (1-hr TSP)

4. * - denotes measurement by using Dust Trak

1-hr TSP Monitoring Results at Station AM2

Monitoring Period				Filter Weight (g)		Flow Rate (m^3/min)		Elapse Time (hour)		Sampling Time (hours)	Concentration ($\mu g/m^3$)	Weather Condition	Particulate weight (g)	Average flow (m^3/min)	Total volume (m^3)
From		To													
Date	Time	Date	Time	Initial	Final	Initial	Final	Initial	Final						
16-Jun-09	09:00	16-Jun-09	10:00	2.7432	2.7484	1.1	1.1	12865.03	12866.03	1	81	cloudy	0.0052	1.1	64
17-Jun-09	13:00	17-Jun-09	14:00	2.7388	2.7407	1.1	1.1	12890.03	12891.03	1	28	fine	0.0019	1.1	68
19-Jun-09	09:00	19-Jun-09	10:00	2.7573	2.7607	1.1	1.1	12891.03	12892.03	1	50	rainy	0.0034	1.1	68
22-Jun-09	09:00	22-Jun-09	10:00	2.7456	2.7503	1.1	1.1	12892.03	12893.03	1	70	cloudy	0.0047	1.1	68
24-Jun-09	13:00	24-Jun-09	14:00	2.8175	2.8217	1.1	1.1	12917.03	12918.03	1	62	cloudy	0.0042	1.1	68

1-hr TSP Monitoring Results at Station AM3A

Monitoring Period				Filter Weight (g)		Flow Rate (m^3/min)		Elapse Time (hour)		Sampling Time (hours)	Concentration ($\mu g/m^3$)	Weather Condition	Particulate weight (g)	Average flow (m^3/min)	Total volume (m^3)
From		To													
Date	Time	Date	Time	Initial	Final	Initial	Final	Initial	Final						
27-May-09	09:00	27-May-09	10:00	2.8119	2.8150	1.1	1.1	15100.21	15101.21	1	49	cloudy	0.0031	1.1	64
29-May-09	09:00	29-May-09	10:00	2.8417	2.8480	1.2	1.2	15101.21	15102.21	1	91	cloudy	0.0063	1.2	69
01-Jun-09	11:00	01-Jun-09	12:00	2.7808	2.7915	1.1	1.1	15126.21	15127.21	1	168	fine	0.0107	1.1	64
03-Jun-09	09:00	03-Jun-09	10:00	2.8707	2.8813	1.1	1.1	15127.21	15128.21	1	162	cloudy	0.0106	1.1	65
04-Jun-09	08:00	04-Jun-09	09:00	2.8972	2.9036	1.0	1.0	15128.21	15129.21	1	104	fine	0.0064	1.0	62
05-Jun-09	11:00	05-Jun-09	12:00	2.8789	2.8857	1.1	1.1	15153.21	15154.21	1	104	fine	0.0068	1.1	65
08-Jun-09	09:00	08-Jun-09	10:00	2.8844	2.8984	1.1	1.1	15154.21	15155.21	1	208	rainy	0.0140	1.1	67
10-Jun-09	09:00	10-Jun-09	10:00	2.8732	2.8873	1.2	1.2	15155.21	15156.21	1	193	cloudy	0.0141	1.2	73
12-Jun-09	13:00	12-Jun-09	14:00	2.8767	2.8812	1.1	1.1	15189.22	15190.22	1	67	cloudy	0.0045	1.1	67
15-Jun-09	09:00	15-Jun-09	10:00	2.7590	2.7635	1.1	1.1	15190.22	15191.22	1	67	cloudy	0.0045	1.1	67
16-Jun-09	09:00	16-Jun-09	10:00	2.7311	2.7386	1.1	1.1	15191.22	15192.22	1	115	cloudy	0.0075	1.1	65
17-Jun-09	13:00	17-Jun-09	14:00	2.7429	2.7492	1.1	1.1	15216.22	15217.22	1	94	fine	0.0063	1.1	67
19-Jun-09	09:00	19-Jun-09	10:00	2.7565	2.7642	1.1	1.1	15217.22	15218.22	1	118	rainy	0.0077	1.1	65
22-Jun-09	09:00	22-Jun-09	10:00	2.7270	2.7409	1.2	1.2	15218.22	15219.22	1	196	cloudy	0.0139	1.2	71
24-Jun-09	13:00	24-Jun-09	14:00	2.8151	2.8222	1.2	1.2	15243.22	15244.22	1	103	cloudy	0.0071	1.2	69

Remarks: 1. Bold value indicated an Action Level exceedance

2. Bold & Italic value indicated an Limit Level exceedance

3. x - denotes no measurement due to power supply failure

4. * - denotes measurement by using Dust Trak

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

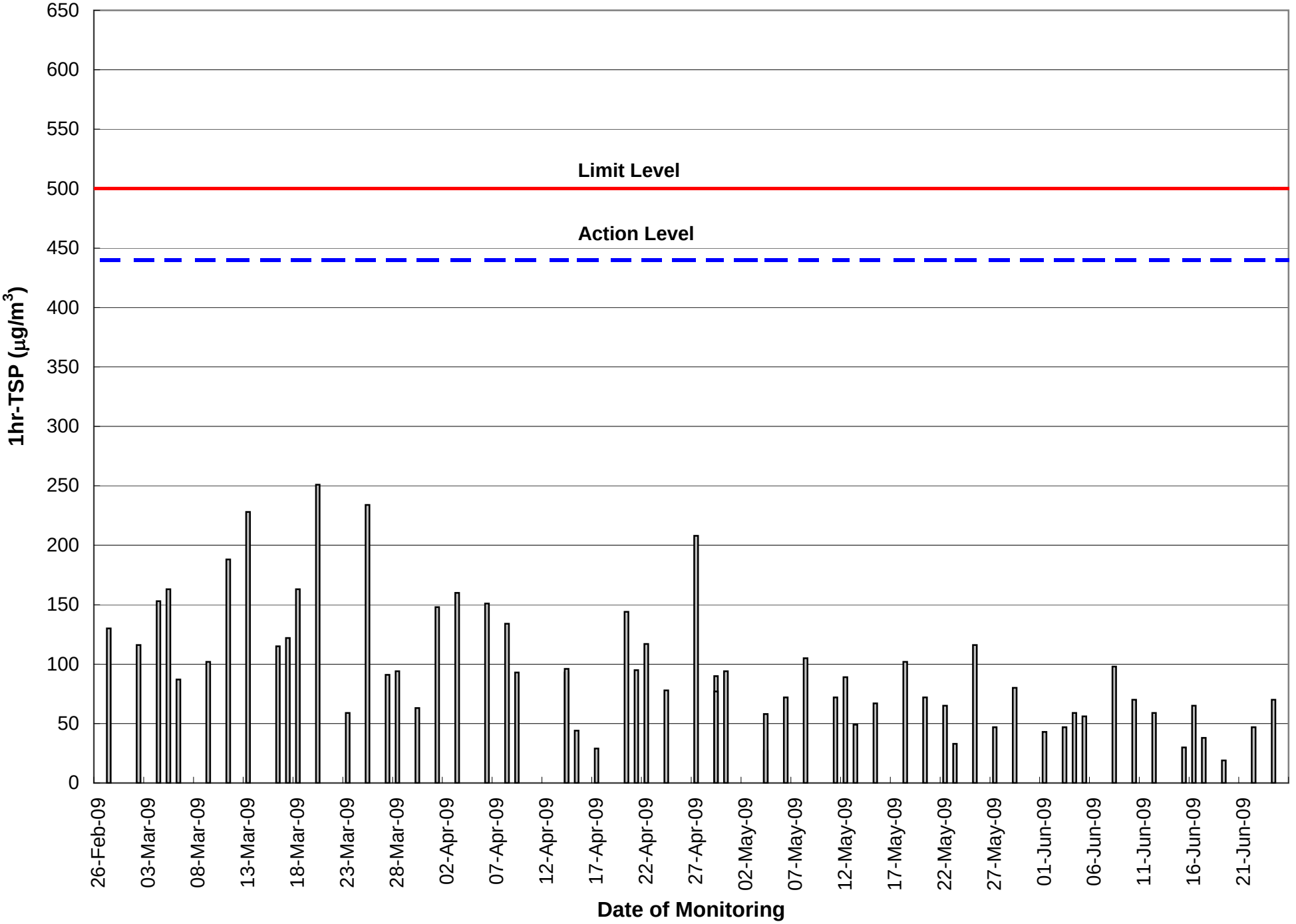


Figure C.2 1-hr TSP monitoring results of Monitoring Station AM2

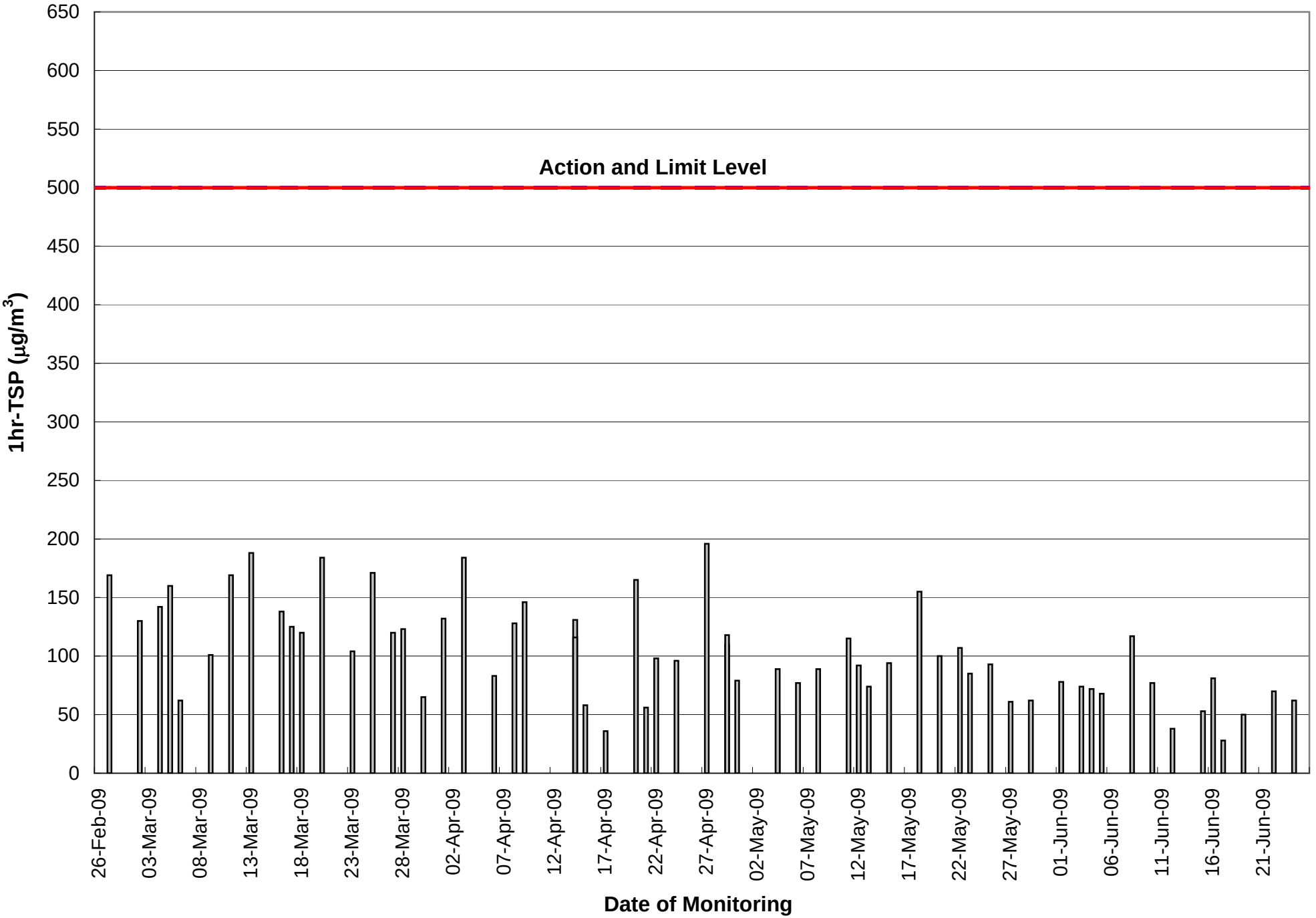
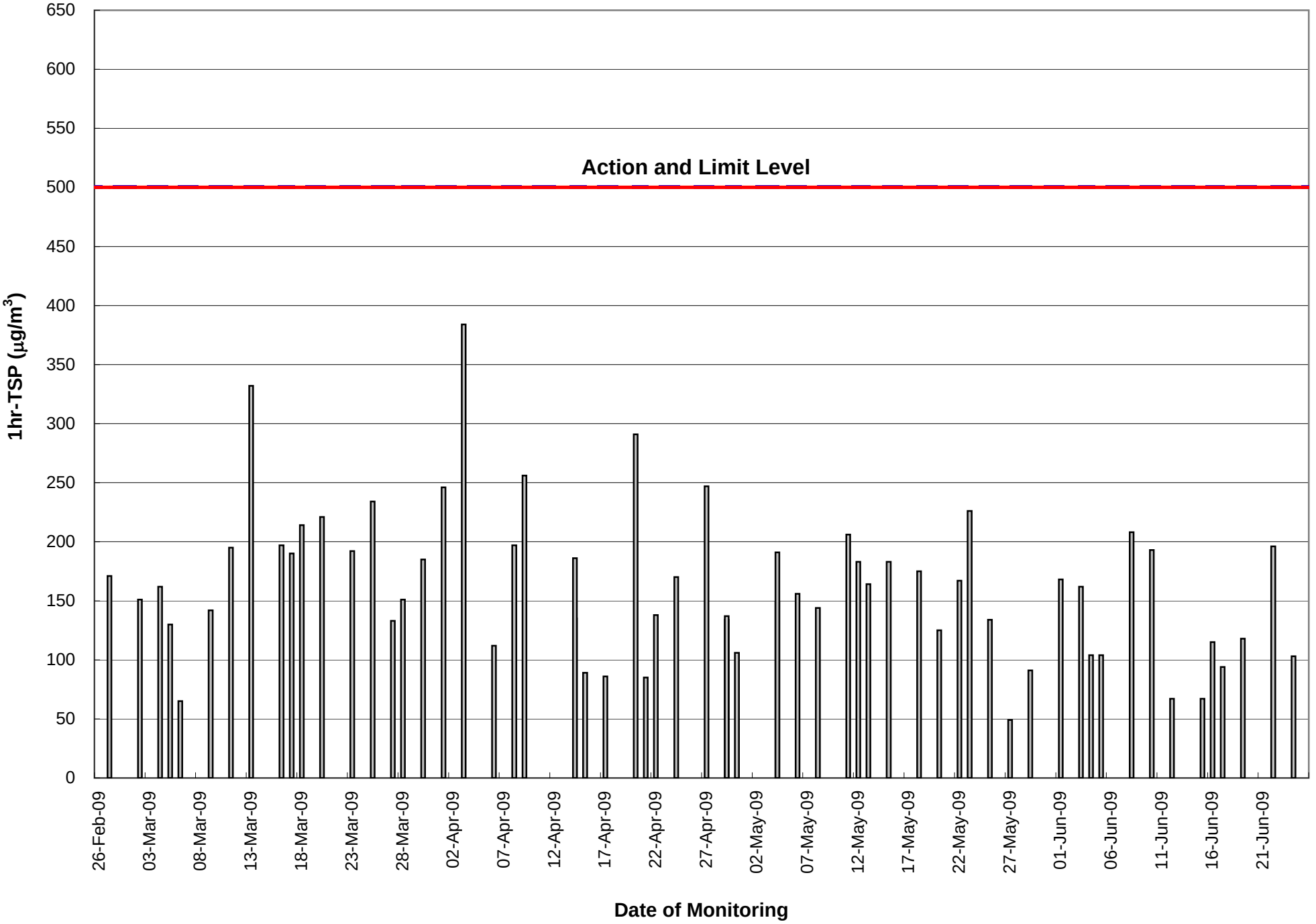


Figure C.3 1-hr TSP monitoring results of Monitoring Station AM3A



Annex D2 Air Quality Monitoring Data (24-hr TSP)

24-hr TSP Monitoring Results at Station AM1

Monitoring Period				Filter Weight (g)		Flow Rate (m^3/min)		Elapse Time (hour)		Sampling Time (hours)	Concentration (µg/m^3)	Weather Condition	Particulate weight (g)	Average flow (m^3/min)	Total volume (m^3)
From		To													
Date	Time	Date	Time	Initial	Final	Initial	Final	Initial	Final						
29-May-09	11:25	30-May-09	11:25	2.8054	2.8553	1.0	1.0	13002.55	13026.55	24	36	Cloudy	0.0499	1.0	1397
4-Jun-09	10:47	5-Jun-09	10:47	2.9038	2.9895	1.0	1.0	13029.56	13053.56	24	60	fine	0.0857	1.0	1432
10-Jun-09	11:45	11-Jun-09	11:45	2.8574	2.8935	1.0	1.0	13056.56	13080.56	24	25	Cloudy	0.0361	1.0	1432
16-Jun-09	11:50	17-Jun-09	11:50	2.7377	2.7625	1.0	1.0	13083.56	13107.56	24	17	fine	0.0248	1.0	1432
22-Jun-09	12:01	23-Jun-09	12:01	2.7510	2.7934	1.0	1.0	13110.56	13134.56	24	29	Cloudy	0.0424	1.0	1467

24-hr TSP Monitoring Results at Station AM2

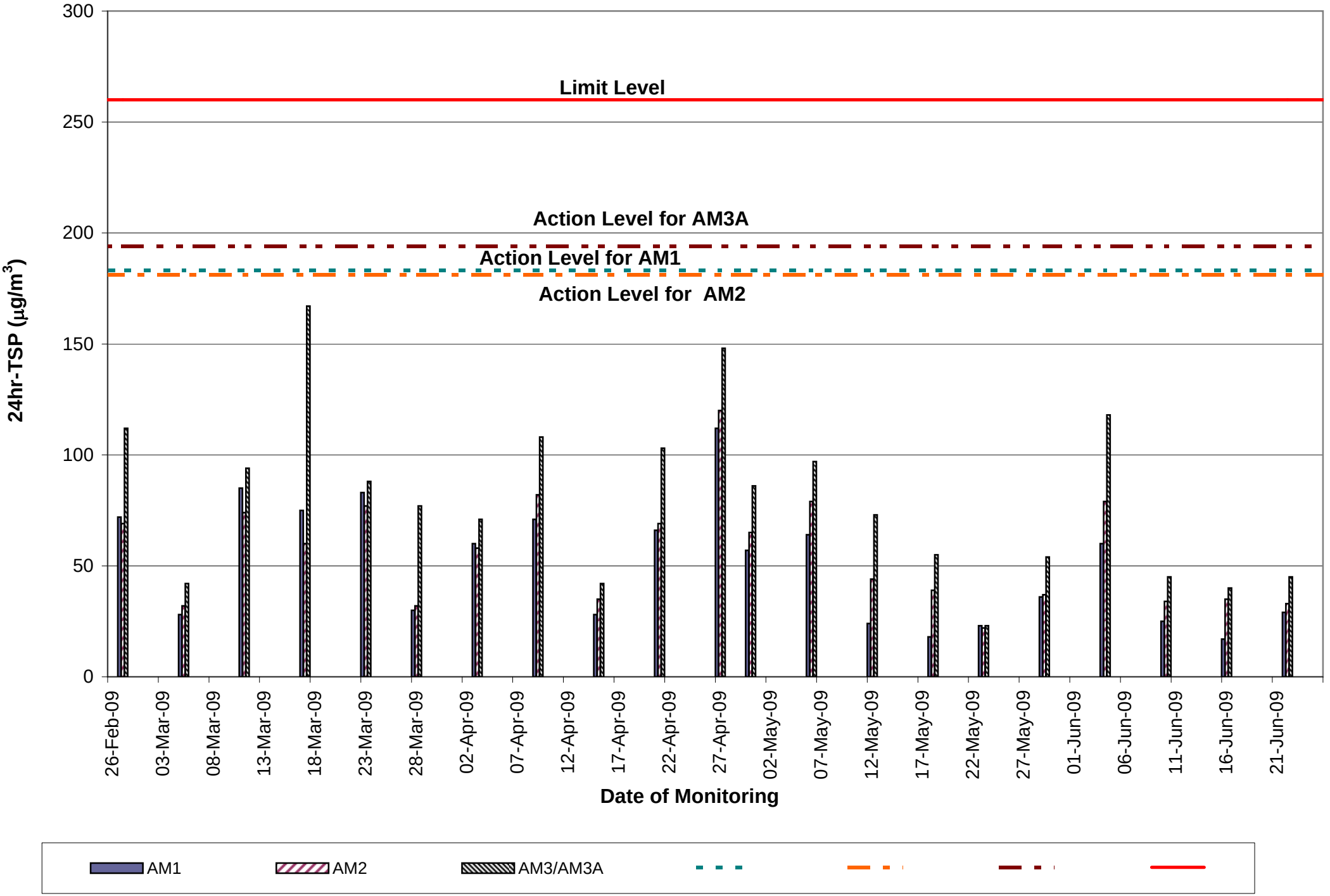
Monitoring Period				Filter Weight (g)		Flow Rate (m^3/min)		Elapse Time (hour)		Sampling Time (hours)	Concentration (µg/m^3)	Weather Condition	Particulate weight (g)	Average flow (m^3/min)	Total volume (m^3)
From		To													
Date	Time	Date	Time	Initial	Final	Initial	Final	Initial	Final						
29-May-09	11:36	30-May-09	11:36	2.7963	2.8536	1.1	1.1	12785.02	12809.02	24	37	Cloudy	0.0573	1.1	1543
4-Jun-09	10:55	5-Jun-09	10:55	2.8775	3.0022	1.1	1.1	12812.03	12836.03	24	79	fine	0.1247	1.1	1583
10-Jun-09	11:45	11-Jun-09	11:45	2.8715	2.9283	1.2	1.2	12839.03	12863.03	24	34	Cloudy	0.0568	1.2	1663
16-Jun-09	11:25	17-Jun-09	11:25	2.7412	2.7984	1.1	1.1	12866.03	12890.03	24	35	fine	0.0572	1.1	1623
22-Jun-09	12:00	23-Jun-09	12:00	2.7489	2.8020	1.1	1.1	12893.03	12917.03	24	33	Cloudy	0.0531	1.1	1623

24-hr TSP Monitoring Results at Station AM3A

Monitoring Period				Filter Weight (g)		Flow Rate (m^3/min)		Elapse Time (hour)		Sampling Time (hours)	Concentration (µg/m^3)	Weather Condition	Particulate weight (g)	Average flow (m^3/min)	Total volume (m^3)
From		To													
Date	Time	Date	Time	Initial	Final	Initial	Final	Initial	Final						
29-May-09	11:48	30-May-09	11:48	2.8114	2.8993	1.1	1.1	15102.21	15126.21	24	54	Cloudy	0.0879	1.1	1615
4-Jun-09	10:32	5-Jun-09	10:32	2.8697	3.0595	1.1	1.1	15129.21	15153.21	24	118	fine	0.1898	1.1	1615
10-Jun-09	11:50	11-Jun-09	11:50	2.8753	2.9542	1.2	1.2	15156.21	15180.22	24	45	Cloudy	0.0789	1.2	1753
16-Jun-09	11:20	17-Jun-09	11:20	2.7479	2.8154	1.2	1.2	15192.22	15216.22	24	40	fine	0.0675	1.2	1706
22-Jun-09	12:00	23-Jun-09	12:00	2.7510	2.8259	1.2	1.2	15219.22	15243.22	24	45	Cloudy	0.0749	1.2	1661

Remarks: 1. Bold value indicated an Action Level exceedance
2. Bold & Italic value indicated an Limit Level exceedance
3. * - not 24 hrs due to power supply failure

Figure C.4 24-hr TSP monitoring results of Monitoring Station AM1, AM2 & AM3A



Appendix D – Noise Monitoring Results

Annex F1 Noise Monitoring Data (Daytime Noise)

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			
01-Jun-09	Fine	09:20	58.9	64.3	55.9	60.2	70	N
08-Jun-09	Cloudy	14:00	59.8	63.2	56.3	60.2	70	N
15-Jun-09	Cloudy	14:55	60.2	64.0	57.3	60.2	70	N
22-Jun-09	Cloudy	13:00	62.5	68.4	57.3	60.2	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			
01-Jun-09	Fine	11:04	57.1	63.0	55.0	61.0	75	N
08-Jun-09	Cloudy	09:53	54.6	59.2	51.4	61.0	75	N
15-Jun-09	Cloudy	13:00	55.9	59.8	50.2	61.0	75	N
22-Jun-09	Cloudy	14:32	59.5	63.4	56.2	61.0	75	N

Daytime Noise Monitoring Results at Station CN3

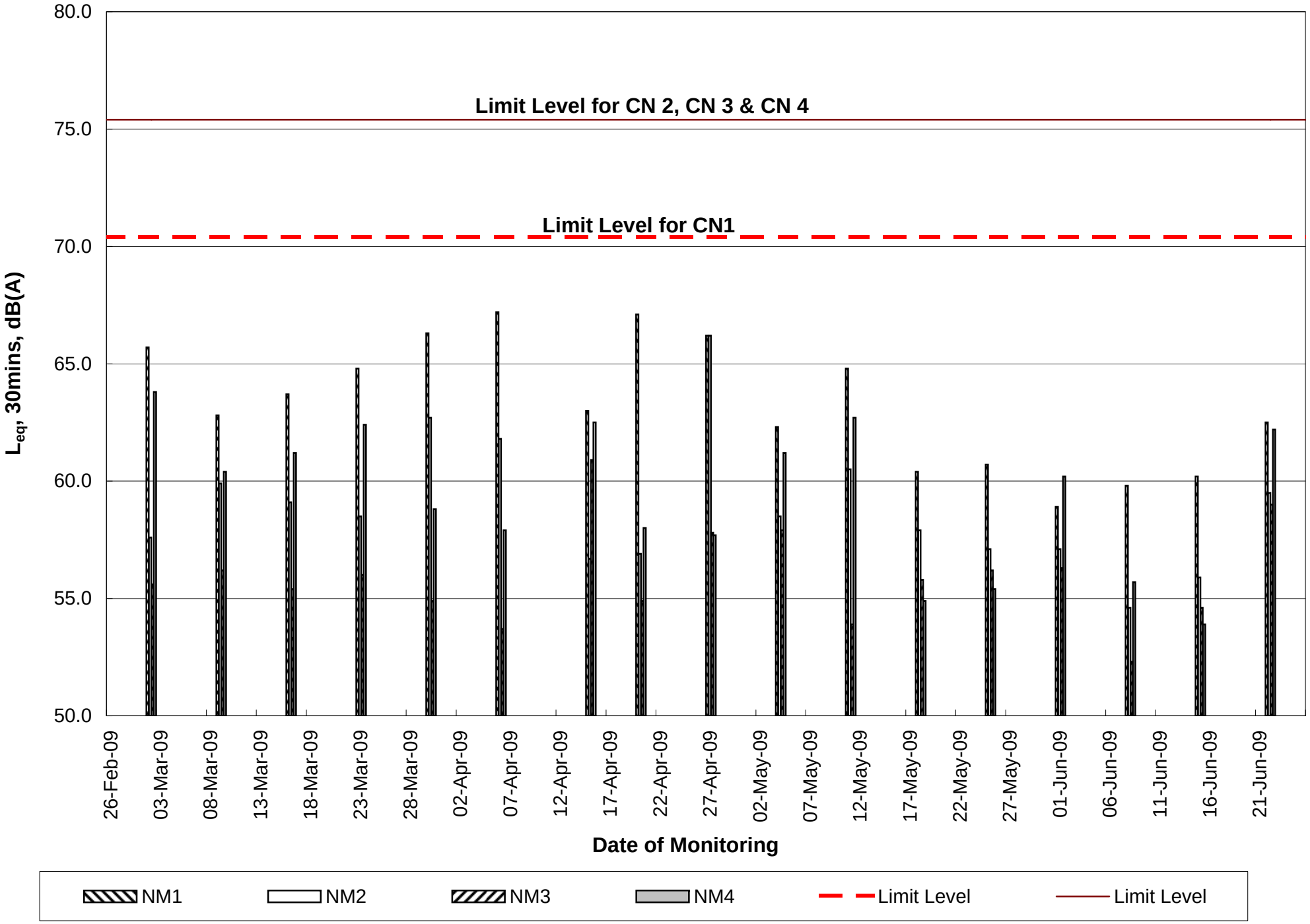
Date	Weather Condition	Measured Noise Level for 30 mins., dB(A)				Baseline Noise Level, dB(A)	Limit Level, dB(A)	Exceedance (Y/N)
		Time	Leq	L10	L90			
01-Jun-09	Fine	11:44	56.3	62.8	54.6	56.3	75	N
08-Jun-09	Cloudy	09:12	52.3	58.0	50.1	56.3	75	N
15-Jun-09	Cloudy	13:38	54.6	58.7	50.5	56.3	75	N
22-Jun-09	Cloudy	13:45	59.0	64.0	55.7	56.3	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			
01-Jun-09	Fine	04:48	60.2	65.8	55.5	56.9	75	N
08-Jun-09	Cloudy	10:50	55.7	58.4	51.3	56.9	75	N
15-Jun-09	Cloudy	14:18	53.9	58.0	49.2	56.9	75	N
22-Jun-09	Cloudy	13:45	62.2	67.7	56.9	56.9	75	N

Remarks: Bold & Italic value indicated an Limit Level exceedance

Fig D.1 - Daytime Noise Monitoring Results of Monitoring Stations CN1, CN2, CN3 & CN4



Annex F2 Noise Monitoring Data (Evening Noise)

Evening Noise Monitoring Results at Station CN1

Date	Weather Condition	Measured Noise Level for 15 mins., dB(A)				Baseline Noise Level, dB(A)	Limit Level, dB(A)	Exceedance (Y/N)
		Time	Leq	L10	L90			
01-Jun-09	Fine	19:10	57.5	60.5	54.5	54.0	60	N
08-Jun-09	Cloudy	20:48	55.9	58.7	52.8	54.0	60	N
15-Jun-09	Cloudy	20:25	55.3	57.6	52.1	54.0	60	N
22-Jun-09	Cloudy	19:13	53.5	58.5	53.0	54.0	60	N

Evening Noise Monitoring Results at Station CN2

Date	Weather Condition	Measured Noise Level for 15 mins., dB(A)				Baseline Noise Level, dB(A)	Limit Level, dB(A)	Exceedance (Y/N)
		Time	Leq	L10	L90			
01-Jun-09	Fine	20:20	52.6	55.6	50.1	55.5	60	N
08-Jun-09	Cloudy	19:29	50.8	53.6	48.3	55.5	60	N
15-Jun-09	Cloudy	19:38	51.3	54.5	47.8	55.5	60	N
22-Jun-09	Cloudy	20:20	52.6	57.4	50.9	55.5	60	N

Evening Noise Monitoring Results at Station CN3

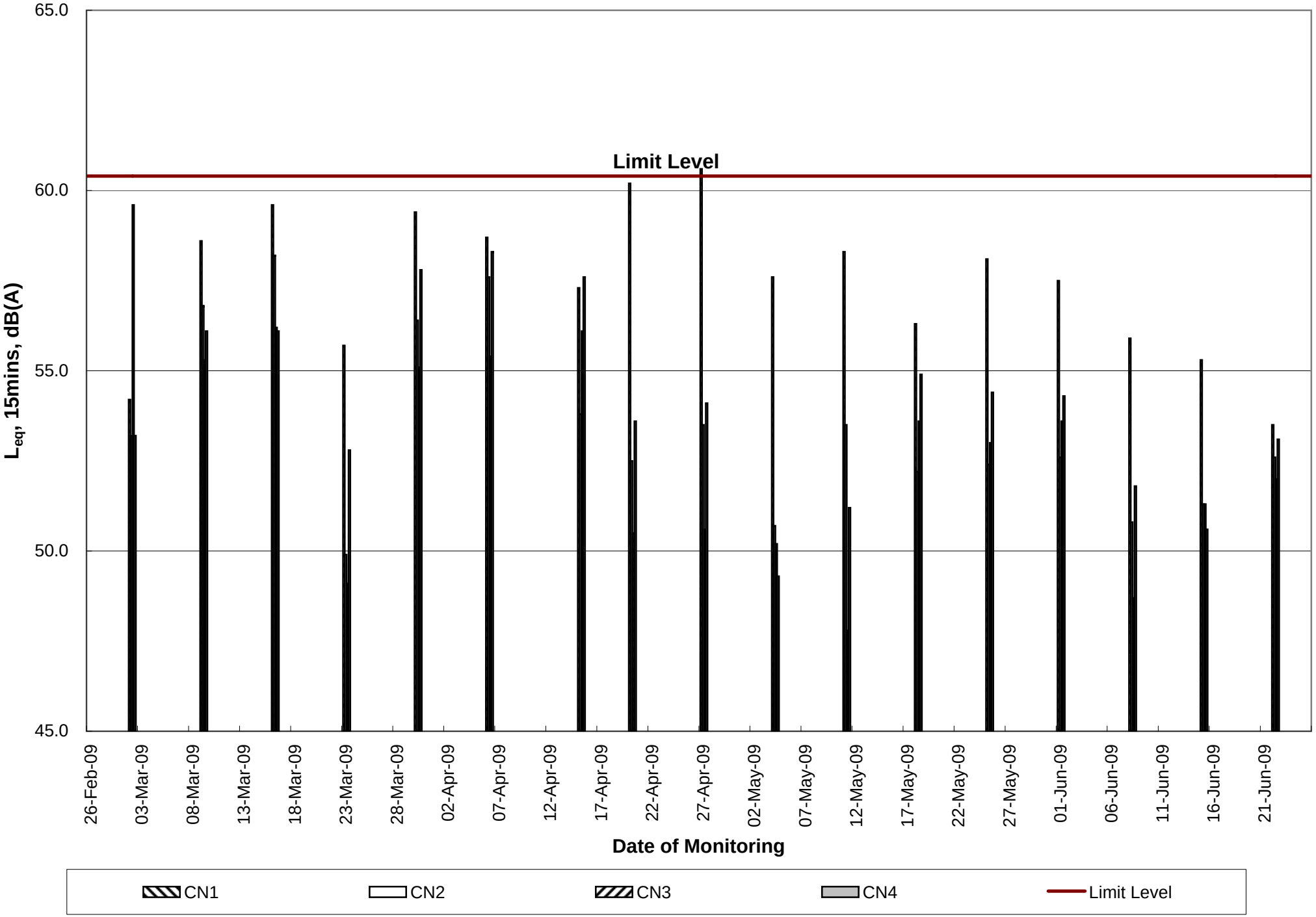
Date	Weather Condition	Measured Noise Level for 15 mins., dB(A)				Baseline Noise Level, dB(A)	Limit Level, dB(A)	Exceedance (Y/N)
		Time	Leq	L10	L90			
01-Jun-09	Fine	20:58	53.6	57.5	51.2	53.1	60	N
08-Jun-09	Cloudy	19:05	48.7	52.3	46.7	53.1	60	N
15-Jun-09	Cloudy	19:15	51.3	54.3	46.3	53.1	60	N
22-Jun-09	Cloudy	20:52	52.0	56.7	50.4	53.1	60	N

Evening Noise Monitoring Results at Station CN4

Date	Weather Condition	Measured Noise Level for 15 mins., dB(A)				Baseline Noise Level, dB(A)	Limit Level, dB(A)	Exceedance (Y/N)
		Time	Leq	L10	L90			
01-Jun-09	Fine	19:42	54.3	60.7	51.5	52.8	60	N
08-Jun-09	Cloudy	20:20	51.8	53.4	48.3	52.8	60	N
15-Jun-09	Cloudy	20:03	50.6	53.6	45.0	52.8	60	N
22-Jun-09	Cloudy	19:46	53.1	57.0	52.2	52.8	60	N

Remarks: Bold & Italic value indicated an Limit Level exceedance

Fig D.2 - Evening Noise Monitoring Results of Monitoring Stations CN1, CN2, CN3 & CN4



Appendix E – Calibration Details

CALIBRATION DETAILS

Air Quality Monitoring Equipments

Monitoring Location	AM1	AM2	AM3A
High Volume Sample/Dust Trak Serial No.	1174	1177	9998
Sampler Identification	ET / EA / 003 / 08	ET / EA / 003 / 07	ET / EA / 003 / 12
Date of Calibration	06 May 2009	06 May 2009	06 May 2009
Calibration Due Date	05 July 2009	05 July 2009	05 July 2009
Result	Good	Good	Good

Noise Monitoring Equipments

Monitoring Location	CN1, CN2, CN3 & CN4
Sound Level Meter Brand Name and Model	Rion NL-31
Serial No.	00773032
Date of Calibration	26 November 2007
Calibration Due Date	25 November 2009
Result	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 : 06 May 2009

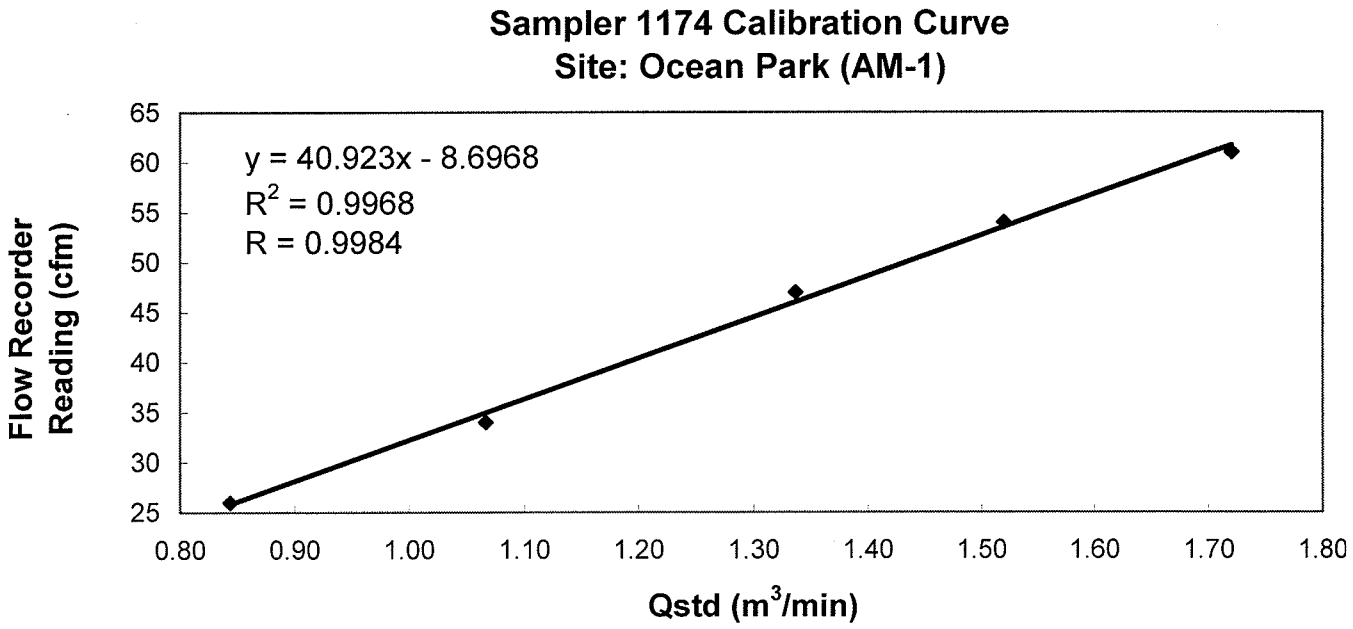
Serial No. : 1174 (ET / EA / 003 / 08)

Calibration Due Date : 05 July 2009

Method : Five-point calibration by using standard calibration kit Tisch TE-5025A refer to the Operations Manual

Results :

Flow recorder reading (cfm)	61	54	47	34	26
Qstd (Actual flow rate, m^3/min)	1.72	1.52	1.34	1.07	0.84
Pressure : 759 mm Hg		Temp. : 298 K			



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 : Mak Kei Wai
MAK, Kei Wai
(Senior Environmental Technician)

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

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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 : 06 May 2009

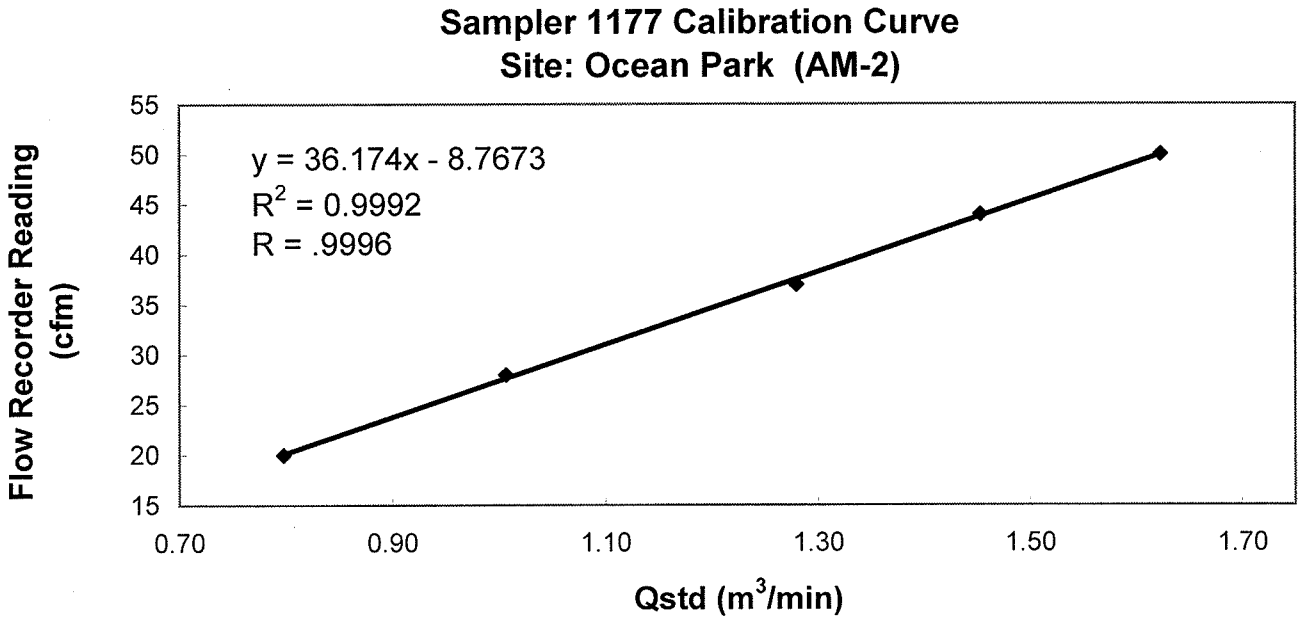
Serial No. : 1177 (ET / EA / 003 / 07)

Calibration Due Date : 05 July 2009

Method : Five-point calibration by using standard calibration kit Tisch TE-5025A refer to the Operations Manual

Results :

Flow recorder reading (cfm)	50	44	37	28	20
Qstd (Actual flow rate, m^3/min)	1.62	1.45	1.28	1.01	0.80
Pressure : 760 mm Hg		Temp. : 298 K			



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 : Mak Kei Wai
MAK, Kei Wai
(Senior Environmental Technician)

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

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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 : 06 May 2009

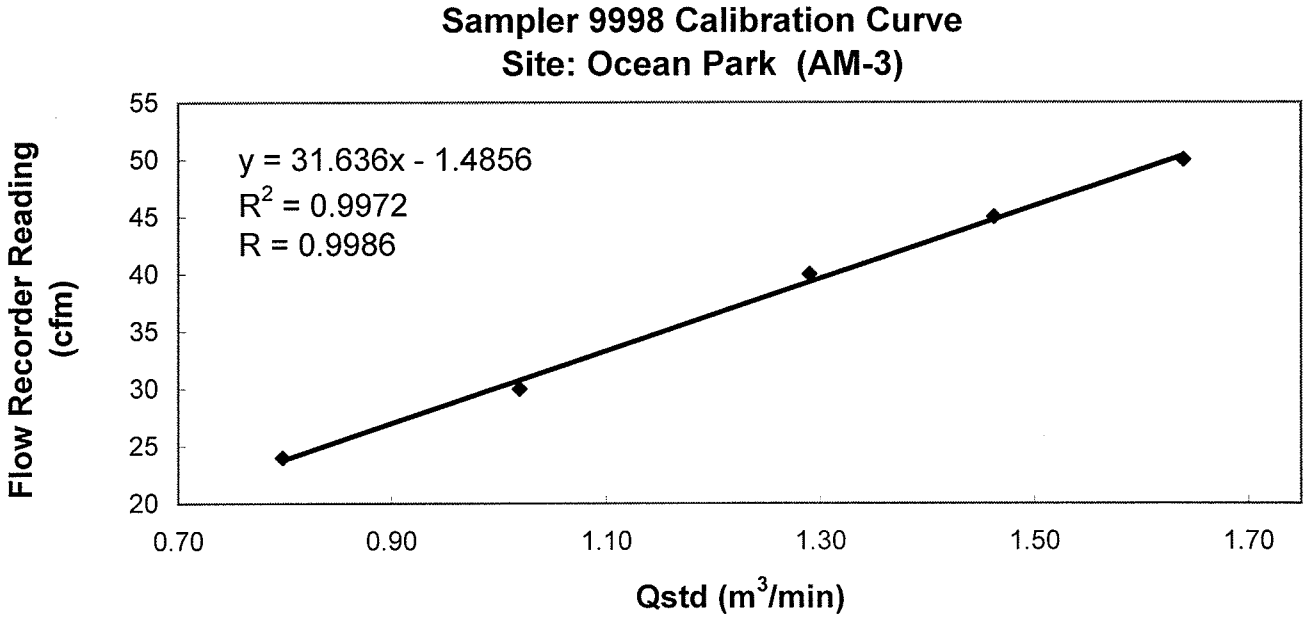
Serial No. : 9998 (ET / EA / 003 / 12)

Calibration Due Date : 05 July 2009

Method : Five-point calibration by using standard calibration kit Tisch TE-5025A refer to the Operations Manual

Results :

Flow recorder reading (cfm)	50	45	40	30	24
Qstd (Actual flow rate, m^3/min)	1.64	1.46	1.29	1.02	0.80
Pressure : 760 mm Hg		Temp. : 298 K			



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 : Mak Kei Wai
MAK, Kei Wai
(Senior Environmental Technician)

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

Hong Kong Calibration Ltd.
香 港 校 正 有限公司

Calibration Certificate

Certificate No. **85826** Page 1 of 4 Pages

Customer : ETS-Testconsult Limited

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

Order No. : Q82237 **Date of receipt :** 21-Nov-08

Item Tested

Description : Precision Integrating Sound Level Meter (ET/EN/003/12)

Manufacturer : Rion

Model : NL-31 **Serial No. :** 00773032

Test Conditions

Date of Test : 26-Nov-08 **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).

Main Test equipment used:

Equipment No.	Description	Cert. No.	Due Date	Traceable to
S017A	Multi-Function Generator	75932	6-Dec-08	SCL-HKSAR
S024	Sound Level Calibrator	82926	16-Jul-09	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 : Dorothy Cheuk

Date: 28-Nov-08

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

Calibration Certificate

Results :

1. SPL Accuracy

UUT Setting			Applied Value (dB)	UUT Reading (dB)
Level Range (dB)	Weight	Response		
20 – 100	L_A	Fast	94.03	94.0
		Slow		94.0
	L_C	Fast		94.0
	Lp	Fast		94.0
30 – 120	L_A	Fast	94.03	93.9
		Slow		93.9
	L_C	Fast		93.9
	Lp	Fast		93.9
30 – 120	L_A	Fast	113.97	113.7
		Slow		113.7
	L_C	Fast		113.7
	Lp	Fast		113.7

IEC 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

Calibration Certificate

3. Linearity

3.1 Level Linearity

UUT Range (dB)	Applied Value (dB)	UUT Reading (dB)	Variation (dB)	IEC 651 Type 1 Spec. (Primary Indicator Range)
130	114.0	114.0	- 0.1	± 0.7 dB
130	104.0	103.9	0.0	
120	94.0	93.9 (Ref.)	- -	
110	84.0	84.0	- 0.1	
100	74.0	74.1	- 0.2	
90	64.0	64.1	- 0.2	
80	54.0	54.2	- 0.3	

Uncertainty : ± 0.1 dB

3.2 Differential level linearity

UUT Range (dB)	Applied Value (dB)	UUT Reading (dB)	Variation (dB)	IEC 651 Type 1 Spec.
120	84.0	83.9	0.0	± 0.4 dB
	94.0	93.9 (Ref.)	- -	
	95.0	94.9	0.0	± 0.2 dB
	104.0	103.8	+ 0.1	± 0.3 dB
	105.0	104.8	+ 0.1	± 1.0 dB

Uncertainty : ± 0.1 dB

4. Frequency Weighting

A weighting

Frequency	Attenuation (dB)	IEC 651 Type 1 Spec.
31.5 Hz	- 40.2	- 39.4 dB, ± 1.5 dB
63 Hz	- 26.8	- 26.2 dB, ± 1.5 dB
125 Hz	- 16.7	- 16.1 dB, ± 1 dB
250 Hz	- 9.2	- 8.6 dB, ± 1 dB
500 Hz	- 3.5	- 3.2 dB, ± 1 dB
1 kHz	0.0 (Ref.)	0 dB, ± 1 dB
2 kHz	+ 1.5	+ 1.2 dB, ± 1 dB
4 kHz	+ 1.4	+ 1.0 dB ,± 1 dB
8 kHz	- 0.7	- 1.1 dB, + 1.5 dB ~ - 3 dB
16 kHz	- 6.3	- 6.6 dB, + 3 dB ~- ∞

Uncertainty : ± 0.1 dB

Calibration Certificate

4. 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	40.1	± 0.5 dB
$1/10^2$	40.0	40.2	
$1/10^3$	40.0	40.4	± 1.0 dB
$1/10^4$	40.0	40.5	

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 : 1 010 hPa.

---------- END ----------

Appendix F – Environmental Mitigation Implementation Schedule

Environmental Mitigation Implementation Schedule - Air Emission

ID No	Environmental Aspect (not required for actions specifically recommended in Environmental Impact Assessment)	Specifically Recommeded in Environmental Impact Assessment?	Actions Required These actions can be amended if necessary to suit particular needs unless they are in response to a specified legal requirements	Action party(s)	Additional Control/monitoring and measurement procedures/ methods (if necessary)	Scheduled months	Status
1		yes	Use of regular watering, with complete coverage, to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather.	Superintendent/ Supervisor/Foremen	Weekly Environmental Inspection Checklist	08/08 - 11/10	OK
2		yes	Side enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering shall be applied to aggregate fines.	Superintendent/ Supervisor/Foremen	Weekly Environmental Inspection Checklist	08/08 - 11/10	OK
3		yes	Use of frequent watering for particularly dusty construction areas, temporary stockpiles and areas close to ASRs.	Superintendent/ Supervisor/Foremen	Weekly Environmental Inspection Checklist	08/08 - 11/10	OK
4		yes	Open stockpiles shall be avoided or covered. Where possible, prevent placing dusty material storage piles near ASRs.	Superintendent/ Supervisor/Foremen Subcontractor	Weekly Environmental Inspection Checklist	08/08 - 11/10	OK
5		yes	Restricting heights from which materials are dropped, as far as practicable to minimise the fugitive dust arising from unloading/loading.	Superintendent/ Supervisor/Foremen Subcontractor		08/08 - 11/10	OK
6		yes	Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations.	Superintendent/ Supervisor/Foremen Subcontractor	Weekly Environmental Inspection Checklist	08/08 - 11/10	OK
7		yes	Use of vehicle wheel and body washing facilities at the exit points of the site.	Superintendent/ Supervisor/Foremen Project Environmental Co-ordinator Subcontractor	Weekly Environmental Inspection Checklist	08/08 - 11/10	OK
8		yes	Imposition of speed controls for vehicles on unpaved site roads. Ten kilometers per hour is the recommended limit.	Superintendent/ Supervisor/Foremen Project Environmental Co-ordinator		08/08 - 11/10	OK

Environmental Mitigation Implementation Schedule - Air Emission

ID No	Environmental Aspect (not required for actions specifically recommended in Environmental Impact Assessment)	Specifically Recommeded in Environmental Impact Assessment?	Actions Required These actions can be amended if necessary to suit particular needs unless they are in response to a specified legal requirements	Action party(s)	Additional Control/monitoring and measurement procedures/ methods (if necessary)	Scheduled months	Status
9		yes	Dusty activities should be re-scheduled if high-wind conditions are encountered.	Superintendent/ Supervisor/Foremen Project Environmental Co-ordinator		08/08 - 11/10	OK
10		yes	Where possible, routing of vehicles and positioning of construction plant should be at the maximum possible distance from ASRs.	Superintendent/ Supervisor/Foremen Project Environmental Co-ordinator		08/08 - 11/10	OK
11		yes	Implementation of an environmental monitoring and auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise.	Project Environmental Co-ordinator		08/08 - 11/10	N.A.
12		yes	The works areas shall be fenced off with hoarding. The height of hoarding should not be less than 2.4 m from ground level	Superintendent/ Supervisor/Foremen	Weekly Environmental Inspection Checklist	08/08 - 11/10	OK

Environmental Mitigation Implementation Schedule - Noise

ID No	Environmental Aspect (not required for actions specifically recommended in Environmental Impact Assessment)	Specifically Recommeded in Environmental Impact Assessment?	Actions Required These actions can be amended if necessary to suit particular needs unless they are in response to a specified legal requirements	Action party(s)	Additional Control/monitoring and measurement procedures/ methods (if necessary)	Scheduled months	Status
1		yes	Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program	Superintendent/ Supervisor/Foremen Project Environmental Coordinator Subcontractor	Weekly Environmental Inspection Checklist	08/08-11/10	OK
2		yes	Silencers or mufflers on construction equipment should be utilized and should be properly maintained during the construction program	Superintendent/ Supervisor/Foremen Subcontractor	Weekly Environmental Inspection Checklist	08/08-11/10	N.A.
3		yes	Mobile plant, if any, should be sited as far from NSRs as possible	Superintendent/ Supervisor/Foremen Subcontractor	Weekly Environmental Inspection Checklist	08/08-11/10	OK
4		yes	Machines and plant (such as trucks) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum	Superintendent/ Supervisor/Foremen Subcontractor	Weekly Environmental Inspection Checklist	08/08-11/10	OK
5		yes	Plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs	Superintendent/ Supervisor/Foremen Subcontractor	Weekly Environmental Inspection Checklist	08/08-11/10	OK
6		yes	Quiet Plant considered for at Entry Plaza construction for Site Clearance, Demolition, Realignment of Ocean Park Road, Drainage Diversion, Sewerage Diversion, Site Formation & Excavation, Piling Works and Superstructure Construction where calculated noise levels exceed limits	Superintendent/ Supervisor/Foremen Subcontractor	Weekly Environmental Inspection Checklist	08/08-11/10	OK
7		yes	Quiet Plant considered for Aqua City construction during - Site Clearance, Demolition, Slopeworks, Site Formation & Excavation, Piling Works and Superstructure Construction where calculated noise levels exceed limits	Superintendent/ Supervisor/Foremen Subcontractor	Weekly Environmental Inspection Checklist	08/08-11/10	OK
8		yes	Moveable noise barriers considered for at Entry Plaza construction for Site Clearance, Demolition, Realignment of Ocean Park Road, Drainage Diversion, Sewerage Diversion, Site Formation & Excavation, Piling Works and Superstructure Construction where calculated noise levels exceed limits	Superintendent/ Supervisor/Foremen Subcontractor	Weekly Environmental Inspection Checklist	08/08-11/10	N.A.
9		yes	Moveable barriers considered for Aqua City construction during - Site Clearance, Demolition, Slopeworks, Site Formation & Excavation, Piling Works and Superstructure Construction where calculated noise levels exceed limits	Superintendent/ Supervisor/Foremen Subcontractor	Weekly Environmental Inspection Checklist	08/08-11/10	N.A.

Environmental Mitigation Implementation Schedule - Water

ID No	Environmental Aspect (not required for actions specifically recommended in Environmental Impact Assessment)	Specifically Recommeded in Environmental Impact Assessment?	Actions Required These actions can be amended if necessary to suit particular needs unless they are in response to a specified legal requirements	Action party(s)	Additional Control/monitoring and measurement procedures/ methods (if necessary)	Scheduled months	Status
1		Yes	Before commencing any site formation work, all sewer and drainage connections should be sealed to prevent debris, soil, sand etc. from entering public sewers/drains.	Superintendent/ Supervisor/Foremen Subcontractor	Weekly Environmental Inspection Checklist	08/08 to 09/08	OK
2		Yes	Temporary ditches should be provided to facilitate run-off discharge into appropriate watercourses, via appropriately sized/ designed silt retention pond or similar structure. No site run-off should enter artificial ponds. Cut-off ditches should be provided for all major site clearance/ excavation works where soils would be exposed so that instances of uncontrolled run-off from exposed areas would be minimized. As well as channels, earth/ concrete bunds and/ or sand bags, as appropriate, should be deployed to direct surface run-off towards channels. Catchpits and perimeter channels should be constructed in advance of relevant site formation works.	Superintendent/ Supervisor/Foremen Subcontractor	Weekly Environmental Inspection Checklist	08/08 to 11/10	OK
3		Yes	Boundaries of earthworks should be marked and surrounded by dykes or embankments for flood protection, as necessary.	Superintendent/ Supervisor/Foremen land surveyor		08/08 to 11/10	OK
4		Yes	Sand/silt removal facilities such as sand/silt traps and sediment basins should be provided to remove sand/silt particles from runoff to meet the requirements of the Technical Memorandum standard under the Water Pollution Control Ordinance. The design of silt removal facilities should be based on the guidelines provided in ProPECC PN 1/94. All drainage facilities and erosion and sediment control structures should be inspected monthly and maintained to ensure proper and efficient operation at all times and particularly during rainstorms.	Superintendent/ Supervisor/Foremen project environmental co-ordinator	Weekly Environmental Inspection Checklist	08/08 to 11/10	OK
5		Yes	Silt removal facilities, channels and manholes should be maintained and the deposited silt and grit should be regularly removed, at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times.	Superintendent/ Supervisor/Foremen Subcontractor	Weekly Environmental Inspection Checklist	08/08 to 11/10	OK
6		Yes	Exposed soil surfaces should be covered,	Superintendent/ Supervisor/Foremen Subcontractor	Weekly Environmental Inspection Checklist	08/08 to 11/10	OK
7		Yes	Water pumped out from foundation excavations should be discharged into silt removal facilities.	Superintendent/ Supervisor/Foremen Subcontractor	Weekly Environmental Inspection Checklist	08/08 to 11/10	OK

Environmental Mitigation Implementation Schedule - Water

ID No	Environmental Aspect (not required for actions specifically recommended in Environmental Impact Assessment)	Specifically Recommeded in Environmental Impact Assessment?	Actions Required These actions can be amended if necessary to suit particular needs unless they are in response to a specified legal requirements	Action party(s)	Additional Control/monitoring and measurement procedures/ methods (if necessary)	Scheduled months	Status
8		Yes	If excavation cannot be avoided during rainy seasons, temporarily exposed slope/soil surfaces should be covered by a tarpaulin or other means, as far as practicable, and temporary access roads should be protected by crushed stone or gravel, as excavation proceeds. Interceptiong channels should be provided (e.g. along the crest/ edge of the excavation) to prevent storm runoff from washing across exposed soil surfaces. Arrangements should always be inplace to ensure that adequate surface protection measures can be safely carried out well before the arrival of a rainstorm. Other measures that need to be implemented before, during and after rainstorms are summarized in ProPECC PN 1/94.	Superintendent/ Supervisor/Foremen project environmental co-ordiantor Subcontractor	Weekly Environmental Inspection Checklist	08/08 to 11/10	N.A.
9		Yes	Exposed soil areas should be minimized to reduce potential for increased siltation and contamination of runoff.	Superintendent/ Supervisor/Foremen Subcontractor	Weekly Environmental Inspection Checklist	08/08 to 11/10	OK
10		Yes	Earthwork final surfaces should be well compacted and subsequent permanent work or surface protection should be immediately performed. Appropriate intercepting channels should be provided where necessary. Rainwater pumped out from trenches or excavations should be directed to silt removal facilities before discharge.	Superintendent/ Supervisor/Foremen Subcontractor	Weekly Environmental Inspection Checklist	08/08 to 11/10	OK
11		Yes	Open stockpiles of construction materials or construction wastes on-site of more than $50m^3$ should be covered with tarpaulin or similar fabric during rainstorms	Superintendent/ Supervisor/Foremen Subcontractor		08/08 to 11/10	OK
12		Yes	Debris and refuse generated on-site should be collected, handled and disposed of properly to avoid entering any nearby water bodies and public drainage system. Stockpiles of cement and other construction materials should be kept covered when not being used.	Superintendent/ Supervisor/Foremen Subcontractor	Weekly Environmental Inspection Checklist	08/08 to 11/10	OK
13		Yes	Temporary sanitary facilities, such as portable chemical toilets, should be employed on-site where necessary to handle sewage from the workforce. A licensed contractor would be responsible for appropriate disposal of waste matter and maintenance of these facilities.	Superintendent/ Supervisor/Foremen project environmental co-ordinator Subcontractor	Weekly Environmental Inspection Checklist	08/08 to 11/10	OK

Environmental Mitigation Implementation Schedule - Ecological Resources

ID No	Environmental Aspect (not required for actions specifically recommended in Environmental Impact Assessment)	Specifically Recommeded in Environmental Impact Assessment?	Actions Required These actions can be amended if necessary to suit particular needs unless they are in response to a specified legal requirements	Action party(s)	Additional Control/monitoring and measurement procedures/ methods (if necessary)	Scheduled months	Status
1		Yes	All excavation works carried out close to water bodies shall be carefully controlled to avoid runoff entering watercourses, especially during periods of heavy rain.	Superintendent/ Supervisor/Foremen Subcontractor	Weekly Environmental Inspection Checklist	08/08-11/10	N.A.
2		Yes	Site runoff shall be directed towards regularly cleaned and maintained silt traps and where appropriate, oil/grease separators to minimise risk of sedimentation and pollution.	Superintendent/ Supervisor/Foremen Subcontractor	Weekly Environmental Inspection Checklist	08/08-11/10	OK
3		Yes	Suitable size / capacity silt traps and oil/grease interceptors shall be used.	Superintendent/ Supervisor/Foremen Subcontractor	Weekly Environmental Inspection Checklist	08/08-11/10	N.A.
4		Yes	Coral monitoring shall be implemented (by others)	Project Environmental Coordinator		08/08-11/10	N.A.
5		Yes	Noise mitigation measures including the use of quiet excavation methods, quiet construction plant and temporary noise barriers shall be implemented to minimise disturbance to habitats adjacent to the works areas	Superintendent/ Supervisor/Foremen Project Environmental Coordinator/ Engineer Subcontractor	Weekly Environmental Inspection Checklist	08/08-11/10	OK
6		Yes	Vegetation survey and subsequent transplantation of locally uncommon or restricted species (i.e. Long Tentacle Orchid, Sword-leaved Orchid, Green-flowered Rattlesnake-Plantain, Cycad-fern Balloon Flower and Chinese Lily) shall be carried out to determine the feasibility and suitability of individual plants for transplantation to protect plant species of conservation interest	Project Environmental Coordinator/ Engineer		08/08-11/10	OK
7		Yes	Receptor sites shall be identified.	Superintendent/ Supervisor/Foremen Project Environmental Coordinator		08/08-11/10	OK
8		Yes	Transplantation shall be supervised by a suitably qualified botanist/ horticulturist to protect plant species of conservation interest	Project Environmental Coordinator		08/08-11/10	OK
9		Yes	A detailed transplantation methodology shall be formulated during the detailed design stage based on the information collected during the detailed vegetation survey to protect plant species of conservation interest				N.A.

Environmental Mitigation Implementation Schedule - Ecological Resources

ID No	Environmental Aspect (not required for actions specifically recommended in Environmental Impact Assessment)	Specifically Recommeded in Environmental Impact Assessment?	Actions Required These actions can be amended if necessary to suit particular needs unless they are in response to a specified legal requirements	Action party(s)	Additional Control/monitoring and measurement procedures/ methods (if necessary)	Scheduled months	Status
10		Yes	Equipment or stockpile shall only be in designated works areas wherever practicable.	Superintendent/ Supervisor/Foremen		08/08-11/10	OK
11		Yes	Access routes shall be selected as far as practicable on existing disturbed land.	Superintendent/ Supervisor/Foremen Project Environmental Coordinator Subcontractor		08/08-11/10	N.A.
12		Yes	Construction activities shall be restricted to designated works areas.	Superintendent/ Supervisor/Foremen	Weekly Environmental Inspection Checklist	08/08-11/10	OK
13		Yes	The works areas shall be reinstated immediately after completion of works.	Superintendent/ Supervisor/Foremen Subcontractor		08/08-11/10	OK
14		Yes	Waste skips shall be provided to collect general refuse and construction wastes.	Superintendent/ Supervisor/Foremen Project Environmental Coordinator	Weekly Environmental Inspection Checklist	08/08-11/10	OK
15		Yes	The wastes shall be disposed of timely and properly off-site.	Superintendent/ Supervisor/Foremen Subcontractor	Weekly Environmental Inspection Checklist	08/08-11/10	OK
16		Yes	Drainage arrangements shall include sediment traps to collect and control construction run-off	Superintendent/ Supervisor/Foremen Engineer	Weekly Environmental Inspection Checklist	08/08-11/10	OK
17		Yes	Open burning on works sites is illegal, and shall be strictly enforced.	Superintendent/ Supervisor/Foremen Subcontractor	Weekly Environmental Inspection Checklist	08/08-11/10	OK

Environmental Mitigation Implementation Schedule - Archaeological and Historical Resources

ID No	Environmental Aspect (not required for actions specifically recommended in Environmental Impact Assessment)	Specifically Recommeded in Environmental Impact Assessment?	Actions Required These actions can be amended if necessary to suit particular needs unless they are in response to a specified legal requirements	Action party(s)	Additional Control/monitoring and measurement procedures/ methods (if necessary)	Scheduled months	Status
1		Yes	If any works are planned within one metre of the grave, a one metre buffer zone will be provided around the grave, demarcated by a temporary fence.	Superintendent/ Supervisor/Foremen		08/08-11/10	N.A.

Environmental Mitigation Implementation Schedule - Waste Management

ID No	Environmental Aspect (not required for actions specifically recommended in Environmental Impact Assessment)	Specifically Recommeded in Environmental Impact Assessment?	Actions Required These actions can be amended if necessary to suit particular needs unless they are in response to a specified legal requirements	Action party(s)	Additional Control/monitoring and measurement procedures/ methods (if necessary)	Scheduled months	Status
1		Yes	Nomination of an approved person, such as a site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site (Good site practices)	Superintendent/ project environmental coordinator		08/08-11/10	OK
2		Yes	Training of site personnel in proper waste management and chemical handling procedures	project environmental coordinator		08/08-11/10	OK
3		Yes	Provision of sufficient waste disposal points and regular collection of waste	Site supervisor	Weekly Environmental Inspection Checklist	08/08-11/10	OK
4		Yes	Appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers	Superintendent/ Supervisor/Foremen Subcontractor	Weekly Environmental Inspection Checklist	08/08-11/10	OK
5		Yes	Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors.	project environmental coordinator	EMP	08/08-11/10	OK
6		Yes	Waste reduction measures: Sort C&D waste from demolition and decommissioning of the existing facilities to recover recyclable portions such as metals	Superintendent/ Supervisor/Foremen project environmental coordinator Subcontractor	Weekly Environmental Inspection Checklist	08/08-11/10	OK
7		Yes	Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal	Superintendent/ Supervisor/Foremen Subcontractor	Weekly Environmental Inspection Checklist	08/08-11/10	OK
8		Yes	Encourage collection of aluminium cans by providing separate labelled bins to enable this waste to be segregated from other general refuse generated by the work force	Superintendent/ Supervisor/Foremen project environmental coordinator Subcontractor		08/08-11/10	OK
9		Yes	Proper storage and site practices to minimise the potential for damage or contamination of construction materials	Superintendent/ Supervisor/Foremen Subcontractor	Weekly Environmental Inspection Checklist	08/08-11/10	OK
10		Yes	Plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste.	Superintendent/ Supervisor/Foremen Subcontractor		08/08-11/10	OK

Environmental Mitigation Implementation Schedule - Waste Management

ID No	Environmental Aspect (not required for actions specifically recommended in Environmental Impact Assessment)	Specifically Recommeded in Environmental Impact Assessment?	Actions Required These actions can be amended if necessary to suit particular needs unless they are in response to a specified legal requirements	Action party(s)	Additional Control/monitoring and measurement procedures/ methods (if necessary)	Scheduled months	Status
11		Yes	General refuse should be stored in enclosed bins or compaction units separate from C&D material. A reputable waste collector should be employed by the contractor to remove general refuse from the site, separately from C&D material. Preferably an enclosed and covered area should be provided to reduce the occurrence of 'wind blown' light material	Superintendent/ Supervisor/Foremen project environmental coordinator Subcontractor		08/08-11/10	OK
12		Yes	In order to minimise impacts resulting from collection and transportation of C&D material for off-site disposal, the excavated materials arising from site formation should be reused on-site as backfilling material and for landscaping works as far as practicable. In addition, volcanic rock generated from the tunnelling works should be subject to beneficial re-use. Other mitigation requirements are listed below: - A Waste Management Plan should be prepared - A recording system for the amount of wastes generated, recycled and disposed (including the disposal sites) should be used - In order to monitor the disposal of C&D and solid wastes at public filling facilities and landfills, and to control fly-tipping, trip ticket systems will be adopted.	Engineer project environmental coordinator	Weekly Environmental Inspection Checklist	08/08-11/10	OK
13		Yes	Chemical waste: Contractor would be required to register with the EPD as a chemical waste producer and to follow the guidelines stated in the *Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes* .	project environmental coordinator	Weekly Environmental Inspection Checklist	08/08-11/10	OK
14		Yes	Chemical waste: Good quality containers compatible with the chemical wastes should be used, and incompatible chemicals should be stored separately. Appropriate labels should be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the waste, such as explosive, flammable, oxidizing, irritant, toxic, harmful, corrosive, etc.	Superintendent/ Supervisor/Foremen Subcontractor	Weekly Environmental Inspection Checklist	08/08-11/10	OK
15		Yes	Chemical waste:The Contractor shall use a licensed collector to transport and dispose of the chemical wastes, either to the approved Chemical Waste Treatment Centre, or another licensed facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation	Superintendent/ Supervisor/Foremen		08/08-11/10	OK

Appendix G – Event and Action Plans

Event/Action Plan for Air Quality Monitoring

Event Action Level	Action			
	CET	Contractor	PMR	IEC
Exceedance for one sample	1. Identify source. 2. Notify IEC, PMR and Contractor. 3. Conduct additional monitoring to investigate the causes. 4. Report the investigation results and if exceedance is due to contractor's construction works to the IEC, PMR and Contractor. 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.	1. Take immediate action to avoid further exceedance and rectify any unacceptable practice. 2. Submit air mitigation proposal to IEC and PMR for agreement if CET indicated that exceedance is related to the construction works. 3. Implement agreed proposal within a time scale agreed with PMR and IEC.	1. Confirm receipt of notification of failure in writing. 2. Notify Contractor. 3. Require Contractor to submit air mitigation proposal. 4. Ensure remedial measures are properly implemented.	1. Review monitoring data and investigation report submitted by CET. 2. Review Contractor's air mitigation proposal and advise the PMR accordingly. 3. Supervise and confirm in writing the implementation of remedial measures.
Exceedance for two or more consecutive samples	1. Identify source. 2. Notify EPD, IEC, PMR and Contractor. 3. Conduct additional monitoring to investigate the causes. 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. 5. 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. 6. If exceedances continue after 1-week monitoring events, request PMR to arrange meeting with PMR, IEC and contractor to discuss remedial actions.	1. Take immediate action to avoid further exceedance and rectify any unacceptable practice. 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. 3. Implement agreed proposal within a time scale agreed with PMR and IEC. 4. Amend working methods if appropriate.	1. Confirm receipt of notification of failure in writing. 2. Notify Contractor. 3. Require Contractor to submit air mitigation proposal. 4. Ensure remedial measures are properly implemented.	1. Review monitoring data and investigation report submitted by CET. 2. Discuss amongst PMR, CET and Contractor in order to formulate air mitigation proposal. 3. Review Contractor's air mitigation proposal and advise the PMR accordingly. 4. Supervise and confirm in writing the implementation of remedial measures.

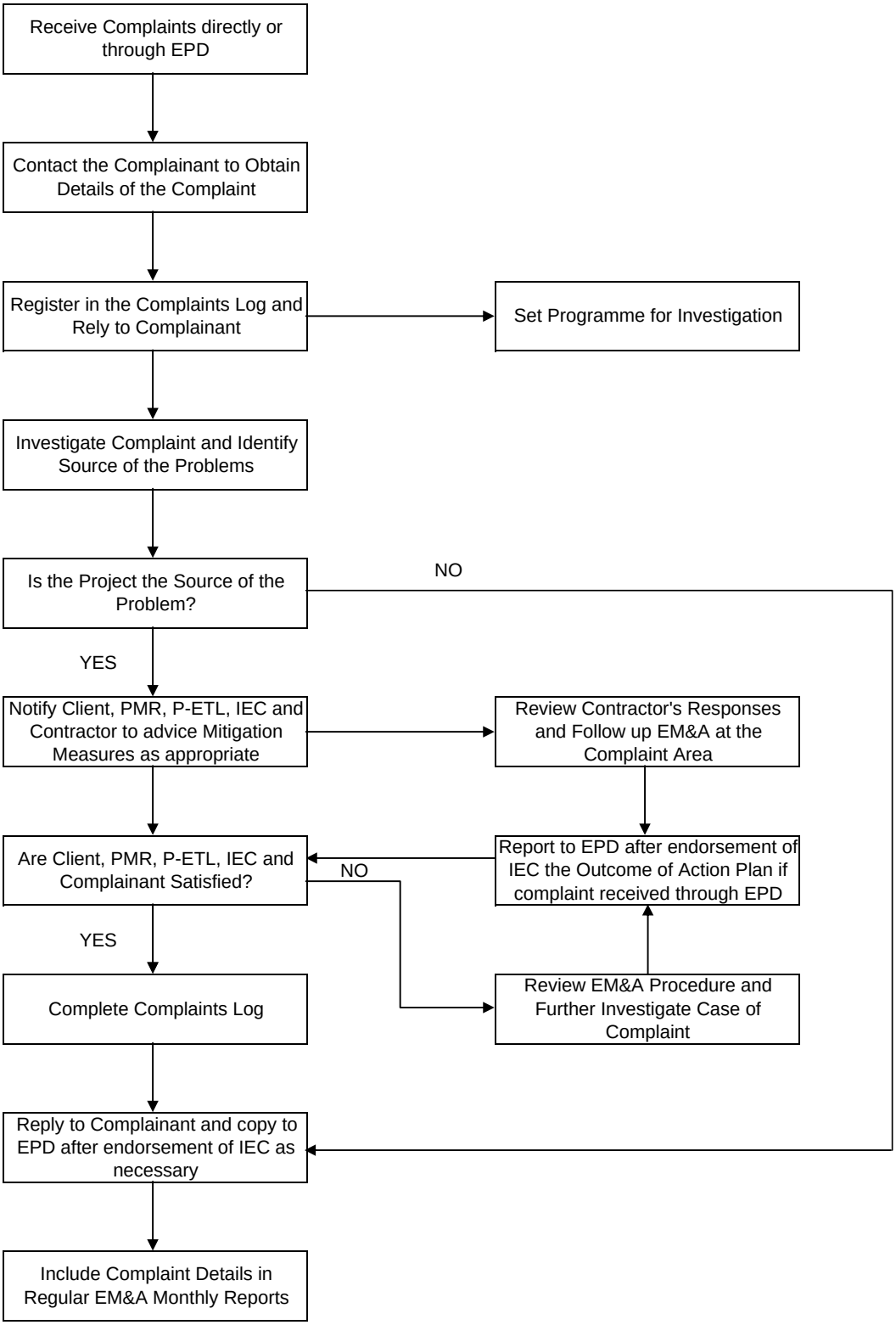
Event/Action Plan for Air Quality Monitoring

Event Limit Level	Action			
	CET	Contractor	PMR	IEC
Exceedance for one sample	1. Identify source. 2. Notify EPD, IEC, PMR and Contractor. 3. Conduct additional monitoring to investigate the causes. 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. 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.	1. Take immediate action to avoid further exceedance and rectify any unacceptable practice 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 3. Implement agreed proposal within a time scale agreed with PMR and IEC. 4. Amend working methods if appropriate.	1. Confirm receipt of notification of failure in writing. 2. Notify Contractor. 3. Require Contractor to submit air mitigation proposal. 4. Ensure remedial measures are properly implemented.	1. Review monitoring data and investigation report submitted by CET. 2. Discuss amongst PMR, CET and Contractor in order to formulate air mitigation proposal. 3. Review Contractor's air mitigation proposal and advise the PMR accordingly. 4. Supervise and confirm in writing the implementation of remedial measures.
Exceedance for two or more consecutive samples	1. Identify source. 2. Notify EPD, IEC, PMR and Contractor. 3. Conduct additional monitoring to investigate the causes. 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. 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. 6. If exceedances continue after 2 consecutive monitoring events, request PMR to arrange meeting with IEC and contractor to discuss remedial actions.	1. Take immediate action to avoid further exceedance and rectify any unacceptable practice. 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. 3. Implement agreed proposal within a time scale agreed with PMR and IEC. 4. Amend working methods and proposal if appropriate. 5. Stop relevant portion(s) of works as required by PMR, CET and IEC.	1. Confirm receipt of notification of failure in writing. 2. Notify Contractor. 3. Require Contractor to submit air mitigation proposal. 4. Ensure remedial measures are properly implemented. 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.	1. Review monitoring data and investigation report submitted by CET. 2. Discuss amongst PMR, CET and Contractor in order to formulate air mitigation proposal. 3. Review Contractor's air mitigation proposal and advise the PMR accordingly. 4. Supervise and confirm in writing the implementation of remedial measures.

Event/Action Plan for Regular Construction Noise Monitoring

Event	Action			
	CET	Contractor	PMR	IEC
Action Level Exceedance	1. Identify source. 2. Notify IEC, PMR and Contractor. 3. Conduct additional noise monitoring to investigate the causes. 4. Report the investigation results to the IEC, PMR and Contractor. 5. Discuss with Contractor for their formulation of remedial measures if the exceedance is related to construction works. 6. Conduct additional monitoring to check mitigation effectiveness.	1. Take immediate action to avoid further exceedance. 2. Submit noise mitigation proposals to ET, PMR and IEC. 3. Implement noise mitigation proposals.	1. Confirm receipt of notification of failure in writing. 2. Notify Contractor. 3. Require Contractor to propose remedial measures for the analysed noise problem. 4. Ensure remedial measures are properly implemented.	1. Review the analysed results submitted by the CET. 2. Review the proposed remedial measures by the Contractor and advise the PMR accordingly. 3. Supervise and confirm in writing the implementation of remedial measures
Limit Level Exceedance	1. Identify source. 2. Notify EPD, IEC, PMR and Contractor. 3. Conduct additional noise monitoring and analyse Contractor's working procedures to determine possible cause of exceedance. 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. 5. Assess effectiveness by additional monitoring and report to EPD, IEC, PMR and Contractor the results. 6. If exceedance stops, cease additional monitoring.	1. Take immediate action to avoid further exceedance. 2. Submit proposals for remedial actions to CET, PMR and IEC within 3 working days of notification. 3. Implement the agreed proposals. 4. Resubmit proposals if problem still not under control. 5. Stop the relevant portion of works as determined by the PMR until the exceedance is abated.	1. Confirm receipt of notification of failure in writing. 2. Notify Contractor. 3. Require Contractor to propose remedial measures for the analysed noise problem. 4. Ensure remedial measures are properly implemented. 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.	1. Discuss amongst PMR, CET and Contractor on the potential remedial actions. 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the PMR accordingly. 3. Supervise and confirm in writing the implementation of remedial measures.

Appendix H – Compliant Flow Diagram and Complaint Log

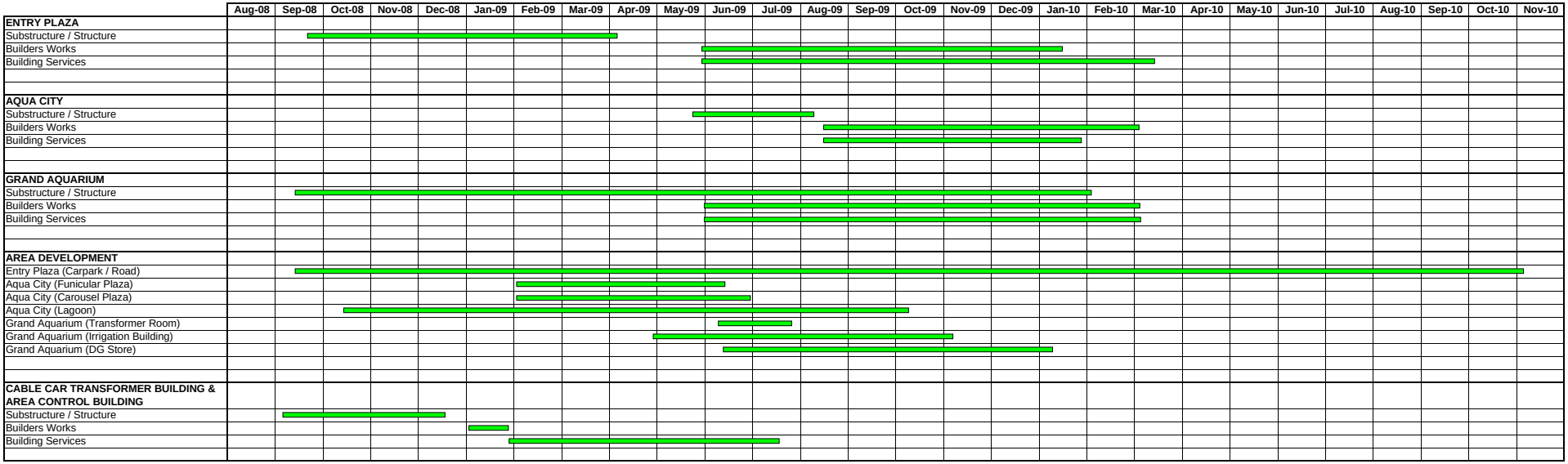

Receive Complaints directly or through EPD
Contact the Complainant to Obtain Details of the Complaint
Register in the Complaints Log and Rely to Complainant
Set Programme for Investigation
Investigate Complaint and Identify Source of the Problems
Is the Project the Source of the Problem?
NO
YES
Notify Client, PMR, P-ETL, IEC and Contractor to advice Mitigation Measures as appropriate
Review Contractor's Responses and Follow up EM&A at the Complaint Area
Are Client, PMR, P-ETL, IEC and Complainant Satisfied?
Report to EPD after endorsement of IEC the Outcome of Action Plan if complaint received through EPD
NO
YES
Complete Complaints Log
Review EM&A Procedure and Further Investigate Case of Complaint
Reply to Complainant and copy to EPD after endorsement of IEC as necessary
Include Complaint Details in Regular EM&A Monthly Reports

Complaint Record Register

Record ID	Data Received	Type (PMR / EPD / Public / Others)	Description	Project	Justified compliant?	Status (Open / Closed)
EC/CI07/001	17-Jun-09	Public thru EPD	Police Training School claimed that noise nuisance from CI07	CI07	N/A	The inspector of EPD came to the site and no significant observation was made, hence the complaint was closed.

Appendix I – Tentative Work Programme

CONTRACT CI07 - Entry Plaza, Aqua City & Grand Aquarium
Outline Programme
Updated to: 01-Sep-2008



Appendix J – Site Audit Summary

Remarks

Location – Grand Aquarium

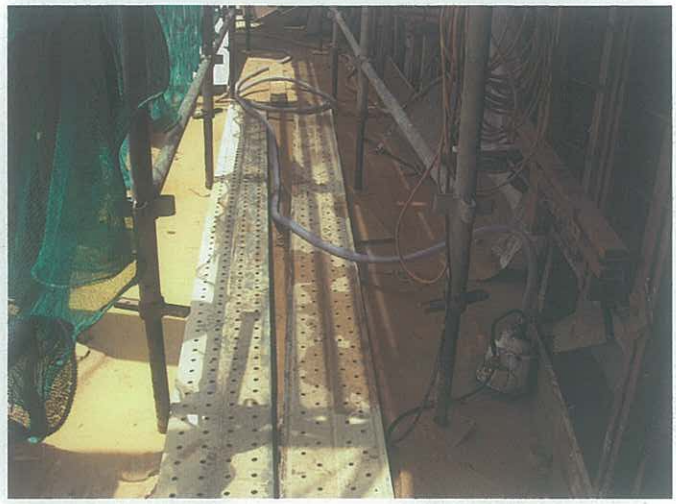
1.) Stagnant water was found with larvae. Pump the water away immediately and spray mosquito-killing oil to the locations where the water cannot be pumped out.

Inspected by :

ET Inspector	RSS's Representative	Contractor's Representative	IEC Representative
Signatures:	Signatures:	Signatures:	Signatures:
Name:	Name: KC Chan	Name: Chan Chi Wai	Name:
Date:	Date: 5/6/09	Date: 05 Jun 2009	Date:

Inspection / Follow up Report No 035.

Date of Inspection: 05 Jun 09 Time of Inspection: 10:00



1.) Stagnant water was found with larvae. Pump the water away immediately and spray mosquito-killing oil to the locations where the water cannot be pumped out.

Inspected By: Chan Chi Wai Position: Engineer Date: 05 Jun 2009 Signature:

Approved By: KC Chan Position: RSS/SM Date: 5/6/09 Signature:

Remarks

Location – Entry Plaza

1. Rock transportation by excavator was observed without watering. The contractor was reminded to water on the rock during operation of excavator.

Inspected by :			
ET Inspector	RSS's Representative	Contractor's Representative	IEC Representative
Signatures:	Signatures:	Signatures:	Signatures:
Name:	Name: ANDY LEUNG	Name: Chan Chi Wai	Name:
Date:	Date: 12/6/09	Date: 12 Jun 2009	Date:

Inspection / Follow up Report No 036.

Date of Inspection: 12 Jun 09 Time of Inspection: 10:00

1.) Rock transportation by excavator was observed without watering. The contractor was reminded to water on the rock during operation of excavator.

Inspected By: Chan Chi Wai Position: Engineer Date: 12 Jun 2009 Signature:

Approved By: ANDY CHEUNG Position: AGM (SEM) Date: 12/6/09 Signature:

Observations for last month

Items 3 and 2 were closed. Items 1 and 4 were outstanding

Observations for this month.

① A stockpile of construction material was not covered with tarpaulin sheet or other means.

② Water was accumulated on site due to heavy rain

③ Oil stain was observed.

IEC Representative	Environmental Manager	Contractor's Representative CI07
Florence Yuen		
(Florence Yuen)	([illegible])	(Thomas Lee - LCHL)

Remarks

Location – Entry Plaza

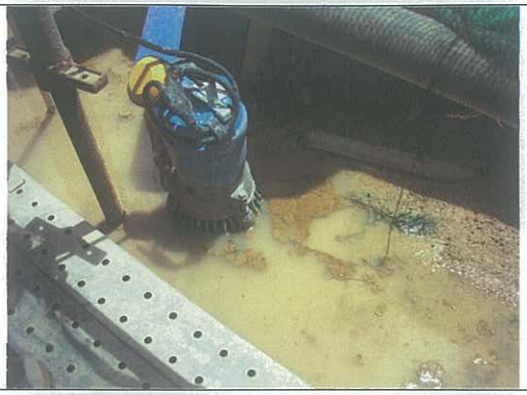
1. Stagnant water was observed and the water pump was not operating. The contractor was reminded to pump the water away immediately.
2. Litter was scattered at the first floor of the entry plaza.
3. Chemical drum was not placed with a drip tray underneath.

Inspected by :

RSS's Representative	Contractor's Representative	IEC Representative
Signatures:	Signatures:	Signatures:
Name: ANDY CHENG	Name: Thomas Lee	Name:
Date: 26/6/09	Date: 26 Jun 2009	Date:

Inspection / Follow up Report No 038.

Date of Inspection: 26 Jun 09 Time of Inspection: 10:00

	
1. Stagnant water was observed and the water pump was not operating.	1. The contractor was reminded to pump the water away immediately.
	
2. Litter was scattered at the first floor of the entry plaza.	2. Litter has been collected.
	
3. Chemical drum was not placed with a drip tray underneath.	3. Drip tray has been provided.

Inspected By: Yip K. F., Kelven Position: Envm. Engineer Date: 26 Jun 2009 Signature: K.Y.

Approved By: ANDY LEUNG Position: AIOW (SEM) Date: 26/6/09 Signature:

Appendix K – Summary of Amount of Waste Generated

Leighton Contractors (Asia) Limited

LEIGHTON 禮頓

Monthly Waste Flow Table

Contract: **Entry Plaza, Aqua City and Grand Aquarium** Contract No: **CI07 (H2458)** **Year: 2009**

Month	Actual Quantities of Inert Construction Waste Reused/Recycled			Actual Quantities of Construction Waste Recycled[1]						Actual Quantities of Disposed Material			
	Broken Concrete[2] Recycled	Re-used in Project	Re-used in Other Projects[3]	Metals Recycled	Paper Recycled	Cardboard Packaging Recycled	Plastic[4] Recycled	Timber	Toner Cartridge	Chemical Waste[6] to Licensed Facilities		Inert Construction Waste[7] to Public Fill	Construction Waste to Landfill
										Liquid	Solid		
	(tonnes)	(tonnes)	(tonnes)	(tonnnes)	(kg)	(kg)	(kg)	(Kg)	(Box)	(litres)	(kg)	(tonnes)	(tonnes)
Jan	0	0	0	27.94	0	0	0	0	0	0	0	30680	23.88
Feb	0	0	0	21.72	180	0	0	0	0	0	0	7885	27.29
Mar	0	0	0	13.82	240	0	0	0	0	0	0	26778	76.22
Q1 total	0	0	0	63.48	420	0	0	0	0	0	0	65343	127.39
Apr	0	0	0	74.84	126	0	0	0	0	0	0	48628	44.17
May	0	0	0	23.81	80	0	0	0	42	0	0	13195	51.5
Jun	0	0	0	18.31	158	0	0	0	0	0	0	14178	84.25
Q2 total	0	0	0	116.96	364	0	0	0	42	0	0	76001	179.92
Jul													
Aug													
Sep													
Q3 total	0	0	0	0	0	0	0	0	0	0	0	0	0
Oct													
Nov													
Dec													
Q4 total	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand total	0	0	0	180.44	784	0	0	0	42	0	0	141344	307.31

Note / Definition:

1. Provide further breakdown in Part D2 of Monthly Environmental Report.
2. Broken concrete for recycling into aggregates (eg Tuen Mun Area 38).
3. Other projects include third-parties (eg quarries).
4. Plastic refers to plastic bottles/containers, plastic sheets/foam from packaging material.
5. Examples of other waste recycled may include tyres and computer equipment
6. Chemical waste is split into 2 components: liquid waste (eg spent lubricating oil) and solid waste (eg spent batteries). Provide further breakdown in Part D1 of Monthly Environmental Report.
7. Inert construction waste is also known as public fill. It includes, for example, concrete, rubble, earth, boulder, sand, tile, masonry and used bentonite.

Part 3 CW-02 EM&A REPORT (June 2009)

W. Hing Construction Co., Ltd

Contract No. CW02

Ocean Park Redevelopment Project - Astounding Asia

Monthly EM&A Report
(Version 1.0)

June 2009

Certified By _____
(Environmental Team Leader)

REMARKS:

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

CINOTECH accepts no responsibility for changes made to this report by third parties.

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TABLE OF CONTENTS

LIST OF FIGURE

LIST OF APPENDICES

LIST OF TABLES

EXECUTIVE SUMMARY

Introduction

This is the 23rd monthly Environmental Monitoring and Audit (EM&A) Report prepared by Cinotech Consultants Limited (Cinotech) for the Contract No. CW02 "Ocean Park Redevelopment Project – Astounding Asia" (hereinafter called "the Project"). The Project was commenced on 1st August 2007. This document reports the findings of the environmental auditing works conducted in June 2009.

The major site activities undertaken in the reporting month included:

- Excavation Works at Main (Emerald) Aviary;
- Builder's Works, Finishing Works, E&M Works and Steelworks for cages at New Bird Theatre; and
- Reinstatement Works at External Area.

Environmental Monitoring and Audit Works

Environmental monitoring and audit works for the Project was performed as stipulated in the updated EM&A Manual. Site audits were conducted once per week. Environmental site audits were conducted on 2nd, 9th, 19th, 26th and 30th June 2009. No non-compliance was observed during the site audits.

The implementation of the environmental mitigation measures, Event Action Plans and environmental complaint handling procedures were also checked.

No notification of exceedance was received from the Project Environmental Team Leader (ETL) in the reporting month. Summary of the events and action taken in the reporting month is tabulated in **Table I**.

Table I Summary Table for Events Recorded in the Reporting Month

Parameter	No. of Events		No. of Events Due to the Project	Action Taken
	Action Level	Limit Level		
1-hr TSP	0	0	0	N/A
24-hr TSP	0	0	0	N/A
Noise	0	0	0	N/A

Environmental Licenses and Permits

Licenses/Permits granted to the Project include the Environmental Permit (EP) for the Redevelopment Project, Registration of Waste Producer, Water Discharge License and one Construction Noise Permit (CNP).

A notification pursuant to Section 3(1) of the Air Pollution Control (Construction Dust) Regulation was received prior the commencement of the Project.

Complaints and Prosecutions

No environmental complaint and prosecution was received in the reporting month.

Future Key Issues

Key issues to be considered in the coming month include:

- Excavation Works, RC Works for Footings & Superstructure and Underground Drainage Works at Main (Emerald) Aviary;
- Finishing Works and E&M Works at New Bird Theatre.

1. INTRODUCTION

Background

1.1 The "Repositioning and Long Term Operation Plan of Ocean Park" has been implementing by the Ocean Park Corporation at its existing site of Ocean Park and Nam Long Shan, Aberdeen. The purpose of this project is to upgrade and expand the existing Ocean Park to meet anticipated visitor demands and to position Ocean Park as a premium tourist attraction and a regional leader in themed recreational and educational park experience. The site layout plan is illustrated in Figure 1.1.

1.2 An environmental impact assessment (EIA) report for "Repositioning and Long Term Operation Plan of Ocean Park" (Report No. 121/2006 and Register No. AEIAR-101/2006) has been prepared in 2006 and the Environmental Monitoring and Audit Manual (Project's EM&A Manual) was also included as part of the EIA report in the register. An Environmental Permit (EP) No. EP-249/2006 was issued on 28 July 2006 for the above project to Ocean Park Corporation as Permit Holder and a varied EP No. EP-249/2006/A was subsequently issued on 23 October 2006 for the above project to Ocean Park Corporation as Permit Holder.

1.3 W. Hing Construction Co., Ltd. (the Contractor) was commissioned by the Employer to undertake the design and construction of the Contract No. CW02 "Ocean Park Redevelopment Project – Astounding Asia" (hereinafter call "the Project").

1.4 The Project includes design and construction of:

(a) ETFE roof membrane system including the membrane, mullion, supporting frame, fixing to main structure, openings and all associated elements
(b) Aviary netting including mesh and supporting wire and fixing to main structures
(c) Artificial Rockwork including concrete foundations, internal structural supporting systems and fixing details
(d) All GRC works
(e) Skylight at back of house of Panda Habitat
(f) Nest box of Red Panda
(g) E&M supporting structures
(h) Balustrade
(i) Mural
(j) Exhibit glazing at the alligator, panda mountain viewing shelter, otter viewing, and goldfish exhibit
(k) Bamboo Rail including foundation
(l) Bamboo and Reed Barriers including foundation
(m) Planter Wall
(n) Fog system within Panda Habitat
(o) Glass Guard Rails
(p) Snow Production System
(q) Chilled rock system
(r) Fire Services
(s) "Rock Delta" Stone Wool Intensive Medium for the rice paddy wall
(t) Woven willow cladding for fence wall/gate

(u) Foundation for shelter support pole for panda mountain viewing shelter
(v) Kid's climbing tree & giant panda climbing structure

1.5 Cinotech Consultants Ltd. (Cinotech) was commissioned by the Contractor to undertake the Environmental Team (ET) services for the Project. This is the 23rd monthly EM&A Report summarizing the EM&A works for the Project in June 2009.

Project Organizations

1.6 Different parties with different levels of involvement in the project organization include:

- The Engineer and Project Environmental Team Leader (ETL) – Maunsell Consultants Asia Ltd.
- Contractor – W. Hing Construction Co. Ltd.
- Contractor Environmental Team (CET) – Cinotech Consultants Ltd.
- Independent Environmental Checker (IEC) – Mott MacDonald HK Ltd.

1.7 The responsibilities of respective parties are provided in Section the Contractor's EM&A Manual of the Project.

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

Table 1.1 Key Project Contacts

Party	Name	Role	Phone No.	Fax No.
Project ET	Mr. Benny Chan	Safety Manager	2910 3155	2552 1256
	Mr. Andy Leung	Assistant Inspector of Works	2910 3156	
Contractor	Mr. Billy Lee	Project Manager	6193 4096	8343 9188
	Mr. Eddie Chiu	Environmental & Safety Manager	6105 4075	
Contractor's ET	Dr. Priscilla Choy	Contractor's Environmental Team Leader (CETL)	2151 2089	3107 1388
	Ms. Natalie Lai	ET Coordinator & Audit Team Leader	2151 2072	
	Mr. Henry Leung	Monitoring Team Leader	9779 7340	
IEC	Miss Florence Yuen	Independent Environmental Checker (IEC) Representative	2828 5757	28271823

Construction Programme

1.9 The site activities undertaken in the reporting month were:

- Excavation Works at Main (Emerald) Aviary;
- Builder's Works, Finishing Works, E&M Works and Steelworks for cages at New Bird Theatre; and
- Reinstatement Works at External Area.

Summary of EM&A Requirements

1.10 The EM&A programme requires construction phase environmental site audit. The duties and responsibilities comprise the following:

- monitor various environmental parameters, if necessary, as specified in the Contractor's EM&A Manual;
- analyze the environmental monitoring and audit data;
- review the EM&A programme to confirm the adequacy of mitigation measures implemented and the validity of the EIA predictions and to identify and adverse environmental impacts arising;
- carry out site inspection to investigate and audit the Contractor's site practice, equipment and work methodologies with respect to pollution control and environmental mitigation, and effect proactive action to pre-empt problems;
- audit and prepare EM&A reports on the site environmental conditions;
- report the environmental audit results to the Contractor;
- recommend appropriate mitigation measures to the Contractor in case of exceedance of Action and Limit Levels in accordance with the Event and Action Plans; and
- adhere to the procedures for carrying out complaint investigation in accordance with Sections 7.11 to 7.14 of the Contractor's EM&A Manual.

1.11 This report presents the environmental monitoring and audit works for the Project in June 2009.

2. ENVIRONMENTAL AUDIT

Environmental Site Audits

2.1 Environmental site audits were carried out on weekly basis to monitor the timely implementation of proper environmental management practices and mitigation measures in the Project site.

2.2 Site audits for the Project in the reporting month were conducted on 2nd, 9th, 19th, 23th and 30th June 2009. No non-compliance was observed during the site audits. The summaries of site audits are attached in **Appendix A**.

2.3 During site inspections in the reporting month, no non-conformance was identified. The observations and recommendations are summarized in **Table 2.1**.

Table 2.1 Observations and Recommendations of Site Audits

Parameters	Date	Observations / Recommendations	Remediation/ Follow up
Water Quality	09/06/09	Ponding water was observed at indoor area of Bird Theatre and Rooftop of Bird Theatre. The Contractor was reminded to pump it out.	Follow-up is needed at the next audit session
	19/06/09	Stagnant water was observed at indoor area of Bird Theatre and Rooftop of Bird Theatre. The Contractor was reminded to pump the water out.	This item was rectified on 23/06/09
	30/06/09	Ponding water observed at Bird Theatre. The Contractor was reminded to remove it.	Follow-up is needed at the next audit session
Waste/ Chemical Management	02/06/09	Styrofoam waste was observed on rooftop of Bird Theatre. The Contractor was reminded to dispose of regularly.	This item was rectified on 09/06/09
	09/06/09	Construction waste was observed on Rooftop of Bird Theatre. The Contractor was reminded to clear it.	This item was rectified on 19/06/09
	23/06/09	Oil container without dip tray was observed at kid's world. Contractor was reminded to provide drip tray underneath the container.	This item was rectified on 30/06/09
Noise	02/06/09	Air compressor with expired label was observed near Bird Theatre. The Contractor was reminded to post an updated label on the compressor.	This item was rectified on 09/06/09

Status of Environmental Licensing and Permitting

2.4 All valid permits/licenses obtained for the Project are summarized in **Table 2.2**.

Table 2.2 Summary of Environmental Licensing and Permit Status

Permit No.	Valid Period		Details	Status
	From	To		
Environmental Permit				
EP-249/2006/A	23/10/2006	N/A	Expansion of the existing Ocean Park and reconstruction / modification of its existing facilities.	Valid
Registration of Chemical Waste Producer				
WPN5213-199-W2894-18	20/08/2007	N/A	Waste Disposal (Chemical Waste) (General) Regulation -- Registration of Waste Producer	Valid
Construction Noise Permit				
GW-RS0163-09	01/03/2009	31/08/2009	Construction Noise Permit for Ocean Park, Wong Chuk Hang, Hong Kong	Valid
Water Discharge License				
EP820/W9/XW240	12/10/2007	31/10/2012	Discharge of industrial trade effluent arising from the Sedimentation tank at the construction site (CW02 Astounding Asia, Ocean Park Redevelopment Project) to communal storm water drain.	Valid
Others				
001022180	N/A	N/A	Notification Pursuant to Section 3(1) of the Air Pollution Control (Construction Dust) Regulation	Valid
7005864	N/A	N/A	Construction Waste Disposal Billing Account with EPD	Valid

Status of Waste Management

2.5 The amount of waste generated by the construction activities of the Project in the reporting month is attached in **Appendix B**.

Implementation Status of Environmental Mitigation Measures

2.6 According to the Environmental Permit and the Contractor's EM&A Manual, the mitigation measures detailed in the documents are required to be implemented. An updated summary of the EMIS is provided in **Appendix C**.

Summary of Exceedances

2.7 No Action/Limit Level exceedance was reported in the reporting month.

Implementation Status of Event Action Plans

2.8 The Event Action Plans for air quality and construction noise are presented in **Appendix D**.

Summary of Complaints and Prosecutions

2.9 No environmental complaint and prosecution related to the Project works was received during the reporting month.

3. FUTURE KEY ISSUES

Key Issues for the Coming Month

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

- Excavation Works, RC Works for Footings & Superstructure and Underground Drainage Works at Main (Emerald) Aviary;
- Finishing Works and E&M Works at New Bird Theatre; and

Construction Program for the Next Month

3.2 The tentative construction program for the Project is provided in **Appendix E**.

4. CONCLUSIONS AND RECOMMENDATIONS

Conclusions

4.1 Five environmental site audits were performed in June 2009. No non-compliance was observed during the site audits.

4.2 No exceedance of environmental monitoring was reported in the reporting month.

4.3 No environmental complaint and prosecution related to the project was received in the reporting month.

Recommendations

4.4 According to the environmental audits performed in the reporting month, the following recommendations are suggested:

Dust Impact

- To cover cement bags (more than 20 bags) by impervious sheeting or placed in an area sheltered on the top and the three sided.

Water Quality Impact

- To avoid water from accumulation on site and carry out larviciding against mosquito breeding for stagnant water when mosquito larvae are observed.

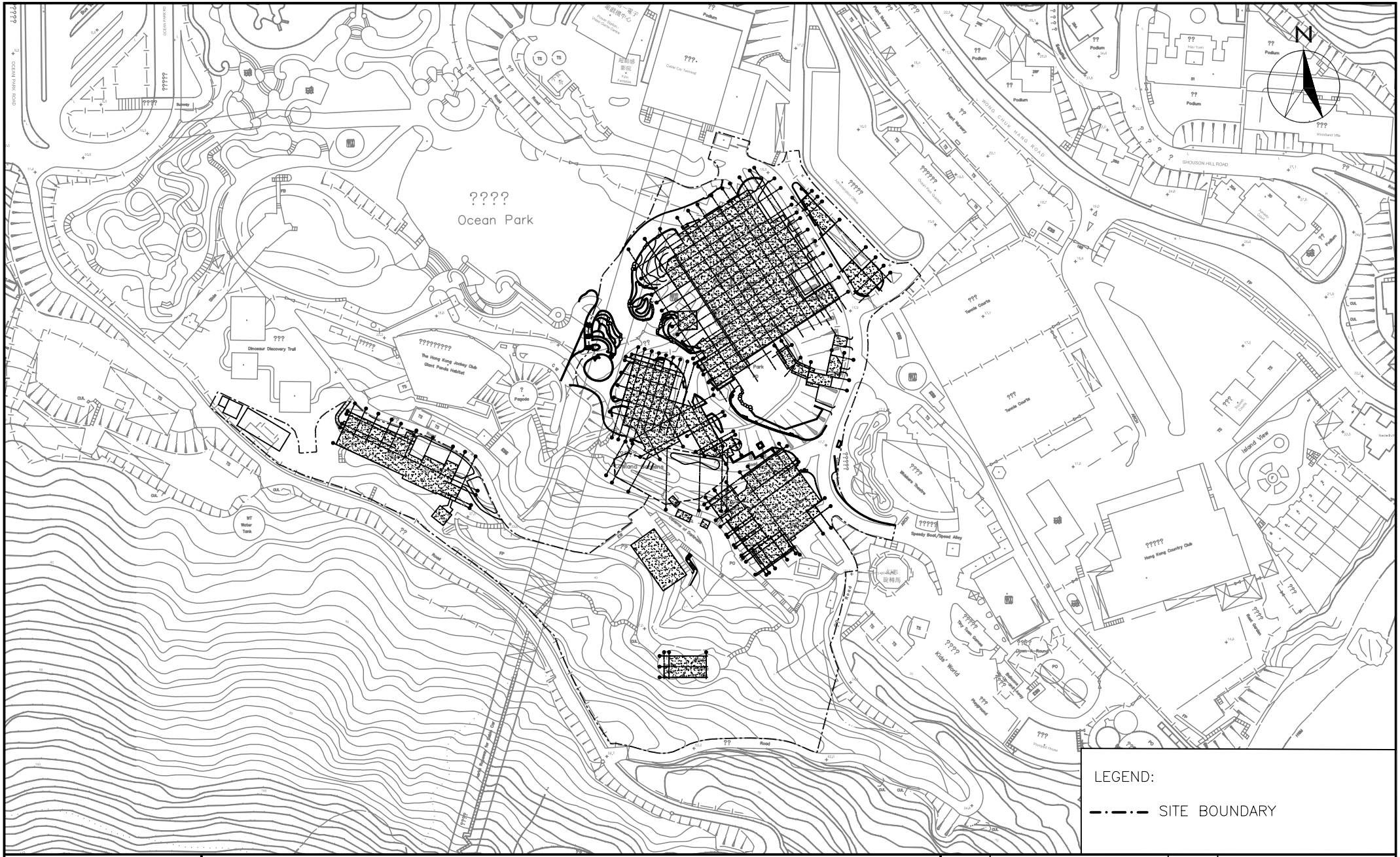
Waste/Chemical Management

- To check for any accumulation of waste materials or refuse on site.
- To dispose the waste regularly and properly.

Noise Impact

- to post an updated label on the compressor

FIGURE



CINOTECH
Cinotech Consultants Limited

CONTRACT NO. CW02
OCEAN PARK REDEVELOPMENT PROJECT – ASTOUNDING ASIA

SITE LAYOUT PLAN

SCALE	A4 1:2000	DATE	AUG 2007
CHECK	EW	DRAWN	TL
JOB No.	MA7025	DRAWING No. 1.1	REV –

F:\PROJECT_DRAWINGS\MA7025\EM&A MANUAL\FIGURE_1.DWG

APPENDIX A
SITE AUDIT SUMMARY

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	90602
Date	2 June 2009 (Tuesday)
Time	10:00-11:00

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-

Ref. No.	Remarks/Observations	Related Item No.
	A. Water Quality • No environmental deficiency was identified during the site inspection. ***B. Air Quality*** • No environmental deficiency was identified during the site inspection. ***C. Noise***	
90602-O01	• Air compressor with expired label was observed near Bird Theatre. The Contractor was reminded to post an updated label on the compressor.	4.9
	D. Waste / Chemical Management	
90602-O02	• Styrofoam waste was observed on rooftop of Bird Theatre. The Contractor was reminded to dispose of regularly.	5.4.3
	E. Permit / Licenses • No environmental deficiency was identified during the site inspection. ***F. Others*** • Follow-up on previous audit (Ref. No.:90522), all environmental deficiencies have been rectified.	

	Name	Signature	Date
Recorded by	To Wong		4 June 2009
Checked by	Dr. Priscilla Choy		4 June 2009

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	90609
Date	9 June 2009 (Tuesday)
Time	10:00-10:45

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-

Ref. No.	Remarks/Observations	Related Item No.
90609-O01	***A. Water Quality*** • Ponding water was observed at indoor area of Bird Theatre and rooftop of Bird Theatre. The Contractor was reminded to pump it out. ***B. Air Quality*** • No environmental deficiency was identified during the site inspection. ***C. Noise*** • No environmental deficiency was identified during the site inspection.	2.18
90609-O02	***D. Waste / Chemical Management*** • Construction waste was observed on rooftop of Bird Theatre. The Contractor was reminded to clear it. ***E. Permit / Licenses*** • No environmental deficiency was identified during the site inspection. ***F. Others*** • Follow-up on previous audit (Ref. No.:90602), all environmental deficiencies have been rectified.	5.4.3

	Name	Signature	Date
Recorded by	To Wong		10 June 2009
Checked by	Dr. Priscilla Choy		10 June 2009

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	90619
Date	19 June 2009 (Friday)
Time	10:00-10:45

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-

Ref. No.	Remarks/Observations	Related Item No.
90619-R01	***A. Water Quality*** • Stagnant water was observed at Bird Theatre. The Contractor was reminded to pump the water out. ***B. Air Quality*** • No environmental deficiency was identified during the site inspection. ***C. Noise*** • No environmental deficiency was identified during the site inspection. ***D. Waste / Chemical Management*** • No environmental deficiency was identified during the site inspection. ***E. Permit / Licenses*** • No environmental deficiency was identified during the site inspection. ***F. Others*** • Follow-up on previous audit (Ref. No.:90609), item 90609-O02 has been rectified but item 90609-O01 is still outstanding so was remarked as item 90619-R01 in this site inspection.	2.18

	Name	Signature	Date
Recorded by	Natalie Lai		19 June 2009
Checked by	Dr. Priscilla Choy		19 June 2009

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	90623
Date	23 June 2009 (Tuesday)
Time	10:00-10:45

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-

Ref. No.	Remarks/Observations	Related Item No.
90623-O01	***A. Water Quality*** • No environmental deficiency was identified during the site inspection. ***B. Air Quality*** • No environmental deficiency was identified during the site inspection. ***C. Noise*** • No environmental deficiency was identified during the site inspection. ***D. Waste / Chemical Management*** Oil container without dip tray was observed at kid's world. Contractor was reminded to provide drip tray underneath the container. ***E. Permit / Licenses*** • No environmental deficiency was identified during the site inspection. ***F. Others*** • Follow-up on previous audit (Ref. No.:90619), Items (90619-R01) was rectified in that site inspection.	5.3.4

	Name	Signature	Date
Recorded by	Natalie Lai		24 June 2009
Checked by	Dr. Priscilla Choy		24 June 2009

Weekly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	90630
Date	30 June 2009 (Tuesday)
Time	10:00-10:45

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-

Ref. No.	Remarks/Observations	Related Item No.
90630-O01	***A. Water Quality*** • ponding water was observed at bird theatre. Contractor was reminded to remove it. ***B. Air Quality*** • No environmental deficiency was identified during the site inspection. ***C. Noise*** • No environmental deficiency was identified during the site inspection. ***D. Waste / Chemical Management*** • No environmental deficiency was identified during the site inspection. ***E. Permit / Licenses*** • No environmental deficiency was identified during the site inspection. ***F. Others*** • Follow-up on previous audit (Ref. No.:90623), Items (90623-O01) was rectified in that site inspection.	2.18

	Name	Signature	Date
Recorded by	Natalie Lai		03 July 2009
Checked by	Dr. Priscilla Choy		03 July 2009

APPENDIX B
SUMMARY OF AMOUNT OF WASTE GENERATED

Appendix B

Name of Department: W. Hing Construction Co., Ltd

Contract No.: CW-02

Monthly Summary Waste Flow Table For June 2009

Month	Actual Quantities of Inert C&D Materials Generated		Non-inert C&D Waste disposed to Tseung Kwan O Sorting Facility	Non-inert C&D Waste disposed to SENT Landfill	Chemical Waste disposed to Chemical Waste Treatment Facility at Tsing Yi	Recycle Metals	Packaging (e.g. Plastic, paper wrapping etc.) and other general refuse
	Disposed to Public filling area at Tseung Kwan O	Disposed to Public Barging area at Quarry Bay / Chai Wan *					
	(in tonnes)	(in tonnes)	(in tonnes)	(in tonnes)	(in litres)	(in tonnes)	(in tonnes)
Sep-07	100.49	28.75	8.61	1.94	N/A	N/A	N/A
Oct-07	16.42	19.61	8.47	16.06	N/A	N/A	N/A
Nov-07	N/A	95.29	N/A	4.95	N/A	N/A	N/A
Dec-07	N/A	15.63	10.68	3.83	N/A	N/A	N/A
Jan-08	N/A	158.91	13.18	16.37	N/A	N/A	N/A
Feb-08	N/A	708.19	4.58	15.01	N/A	N/A	N/A
Sub-total	**116.91**	**1026.38**	**45.52**	**58.16**	**0.00**	**0.00**	**0.00**
Mar-08	N/A	857.78	25.17	36.22	N/A	N/A	N/A
Apr-08	N/A	1,309.35	N/A	52.10	N/A	N/A	N/A
May-08	N/A	334.03	11.44	40.86	N/A	N/A	N/A
Jun-08	N/A	528.74	18.19	9.15	N/A	N/A	N/A
Jul-08	9.87	832.48	24.00	26.89	N/A	N/A	N/A
Aug-08	37.88	1682.03	60.62	76.08	N/A	N/A	N/A
Sep-08	N/A	101.29	40.47	58.92	N/A	N/A	N/A
Oct-08	N/A	2230.36	18.22	98.98	N/A	N/A	N/A
Nov-08	N/A	732.82	20.61	91.11	N/A	N/A	N/A
Dec-08	54.24	7.62	11.78	92.82	N/A	N/A	N/A
Jan-09	N/A	2019.85	29.99	142.90	N/A	N/A	N/A
Feb-09	N/A	1898.85	21.41	62.12	N/A	N/A	N/A
Mar-09	33.54	535.70	249.55	98.87	N/A	N/A	N/A
Apr-09	92.38	232.51	328.14	110.54	N/A	N/A	N/A
May-09	53.10	304.10	71.57	23.98	N/A	N/A	N/A
Jun-09	554.47	341.72	93.42	36.72	N/A	N/A	N/A
Jul-09							
Total	**952.39**	**14975.61**	**1070.10**	**1116.42**	**0.00**	**0.00**	**0.00**

* CW-FB was commenced on 22 Dec 08 in replace of QB-FB

APPENDIX C
ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

Appendix C - Summary of Environmental Mitigation Implementation Schedule

Types of Impacts	Mitigation Measures	Status
Construction Dust	• Use of regular watering, with complete coverage, to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather.	^
	• Use of frequent watering for particularly dusty construction areas, temporary stockpiles and areas close to ASRs.	^
	• Side enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering shall be applied to aggregate fines.	N/A
	• Open stockpiles shall be avoided or covered. Where possible, prevent placing dusty material storage piles near ASRs.	*
	• Restricting heights from which materials are dropped, as far as practicable to minimise the fugitive dust arising from unloading/ loading.	^
	• Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations.	^
	• Use of vehicle wheel and body washing facilities at the exit points of the site.	^
	• Provision of wind shield and dust extraction units or similar dust mitigation measures at the loading points, and use of water sprinklers at the loading area where dust generation is likely during the loading process of loose material, particularly in dry seasons/ periods.	N/A
	• Imposition of speed controls for vehicles on unpaved site roads. Ten kilometers per hour is the recommended limit.	^
	• Dusty activities should be re-scheduled if high-wind conditions are encountered.	N/A
	• Where possible, routing of vehicles and positioning of construction plant should be at the maximum possible distance from ASRs.	N/A
	• Suitable buffer zone should be provided and the works areas should be fenced off with hoarding. The height of hoarding should not be less than 2.4m from ground level.	N/A
	Crushing Plant • Water sprays on the crusher. • Fabric filters installed for the crushing plant. • When transferring materials from crusher to the conveyors, chutes or dust curtains would be used for controlling dust.	 N/A N/A N/A

Types of Impacts	Mitigation Measures	Status
	Barging Point & Conveyor Belt System	
	• The conveyors would be placed within a totally enclosed structure	N/A
	• Profiled steel cladding would be provided at two sides of loading point.	N/A
	• Dust suppression sprays would be installed and operated in strategic locations at the feeding inlet and outlet.	N/A
	• The barging point would be placed within a totally enclosed structure incorporating an enclosed chute for material transfer to the barge. Flexible curtain would be hanged on the enclosed chute prevent dust emission when excavated materials/rocks transported into the barge.	N/A
	• Some areas of the Park would remain open for visitors during the construction period. Therefore, suitable buffer zones from major construction activities should be provided where practical and the works areas should be fenced off with hoarding during the construction phase. It is recommended to erect hoarding of a height not less than 2.4m from ground level.	^
Construction Noise	*Construction Phase*	
	• Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction programme	^
	• Silencers or mufflers on construction equipment should be utilized and should be properly maintained during the construction programme	N/A
	• Mobile plant, if any, should be sited as far from NSRs as possible.	N/A
	• Machines and plant (such as trucks) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum	^
	• Plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs	^
	• Material stockpiles and other structures should be effectively utilized, wherever practicable, in screening noise from on-site construction activities	N/A
	Adoption of Quieter Plant	
	• In order to reduce the excessive noise impacts at the affected NSRs at the Waterfront during normal daytime working hours, quieter plants are recommended. The Contractors do not have to use specific items of quiet plant adopted in this assessment. The Contractors may use other type of quiet plant, which have the same total SWL, to meet their needs	^

Types of Impacts	Mitigation Measures	Status
	Use of Movable Noise Barrier	
	• The use of movable barrier for certain PME could further alleviate the construction noise impacts. In general, 5dB (A) reduction for movable PME and 10dB (A) for stationary PME can be achieved depending on the actual design of movable noise barrier.	N/A
	• The Contractor should be responsible for designing of the movable noise barrier with due consideration given to the size of the PME and the requirement of intercepting the line of sight between the NSRs and PME. Barrier material of surface mass in excess of 7kg/m2 is recommended to achieve the predicted screening effect.	N/A
	• Exceedance of up to 5dB (A) would be predicted at the Police Training School (NSR PTS) during the examination periods. Early liaison with the principal of this impacted school is recommended to plan for the construction programme. Noisy construction activities should be avoided during the examination period as far as practicable so as to reduce the potential noise impact at the school to comply with the noise criterion of 65dB(A).	N/A
Ecology	*Construction Phase*	
	• All excavation works carried out close to water bodies shall be carefully controlled to avoid runoff entering watercourses, especially during periods of heavy rain.	^
	• Site runoff shall be directed towards regularly cleaned and maintained silt traps and where appropriate, oil/grease separators to minimize risk of sedimentation and pollution.	N/A
	• Suitable size / capacity silt traps and oil/grease interceptors shall be used.	N/A
	• Noise mitigation measures including the use of quiet construction plant and movable noise barriers shall be implemented to minimize disturbance to habitats adjacent to the work areas.	N/A
	• Trees located within the works areas shall be preserved as far as practicable.	^
	• Placement of equipment or stockpile in designated works areas and access routes selected on existing disturbed land to minimise disturbance to natural habitats	^
	• Construction activities shall be restricted to the work areas that would be clearly demarcated	^
	• The work areas shall be reinstated immediately after completion of the works	^
	• Waste skips shall be provided to collect general refuse and construction wastes. The wastes would be disposed of timely and properly off-site.	N/A
	• Drainage arrangements shall include sediment traps to collect and control construction run-off	^
	• Open burning on works sites is illegal, and shall be strictly enforced	^
	• Landscaping works on newly formed land shall as far as possible make use of native plant species	^

Types of Impacts	Mitigation Measures	Status
Water Quality	*Construction Runoff and Drainage* • Before commencing any site formation work, all sewer and drainage connections should be sealed to prevent debris, soil, sand etc. from entering public sewers/drains. • Temporary ditches should be provided to facilitate run-off discharge into appropriate watercourses, via appropriately sized/ designed silt retention pond or similar structure. No site run-off should enter artificial ponds. Cut-off ditches should be provided for all major site clearance/ excavation works where soils would be exposed so that instances of uncontrolled run-off from exposed areas would be minimized. As well as channels, earth/ concrete bunds and/ or sand bags, as appropriate, should be deployed to direct surface run-off towards channels. Catchpits and perimeter channels should be constructed in advance of relevant site formation works. • Boundaries of earthworks should be marked and surrounded by dykes or embankments for flood protection, as necessary. • Sand/silt removal facilities such as sand/silt traps and sediment basins should be provided to remove sand/silt particles from runoff to meet the requirements of the Technical Memorandum standard under the Water Pollution Control Ordinance. The design of silt removal facilities should be based on the guidelines provided in ProPECC PN 1/94. All drainage facilities and erosion and sediment control structures should be inspected monthly and maintained to ensure proper and efficient operation at all times and particularly during rainstorms. • Silt removal facilities, channels and manholes should be maintained and the deposited silt and grit should be regularly removed, at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times. • Exposed soil surfaces should be covered. • Water pumped out from foundation excavations should be discharged into silt removal facilities. • If excavation cannot be avoided during rainy seasons, temporarily exposed slope/soil surfaces should be covered by a tarpaulin or other means, as far as practicable, and temporary access roads should be protected by crushed stone or gravel, as excavation proceeds. Interceptiong channels should be provided (e.g. along the crest/ edge of the excavation) to prevent storm runoff from washing across exposed soil surfaces. Arrangements should always be in place to ensure that adequate surface protection measures can be safely carried out well before the arrival of a rainstorm.. Other measures that need to be implemented before, during and after rainstorms are summarized in ProPECC PN 1/94. • Exposed soil areas should be minimized to reduce potential for increased siltation and contamination of runoff. • Earthwork final surfaces should be well compacted and subsequent permanent work or surface protection should be immediately performed. Appropriate intercepting channels should be provided where necessary. Rainwater pumped out from trenches or excavations should be directed to silt removal facilities before discharge.	^ ^ ^ ^ ^ ^ ^ ^ ^

Types of Impacts	Mitigation Measures	Status
	• Open stockpiles of construction materials or construction wastes on-site of more than $50m^3$ should be covered with tarpaulin or similar fabric during rainstorms	^
	General Construction Activities • Debris and refuse generated on-site should be collected • Oils and fuels should only be used and stored in designated areas which have pollution prevention facilities. To prevent spillage of fuels and solvents to nearby water bodies and public drains	* ^
	Sewage from Construction Workforce • Temporary sanitary facilities, such as portable chemical toilets, should be employed on-site where necessary to handle sewage from the workforce. A licensed contractor would be responsible for appropriate disposal of waste matter and maintenance of these facilities	^
Waste / Chemical	*Good Site Practice* • nomination of an approved personnel, such as a site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site • regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors • training of site personnel in proper waste management and chemical handling procedures • provision of sufficient waste disposal points and regular collection for disposal • appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers	^ N/A ^ * ^
	Waste Reduction Measures • sort C&D waste from demolition and decommissioning of the existing facilities to recover recyclable portions such as metals • segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal. • proper storage and site practices to minimise the potential for damage or contamination of construction materials • to encourage collection of aluminium cans by individual collectors, separate labelled bins shall be provided to segregate this waste from other general refuse generated by the work force. • plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste.	^ ^ ^ ^ ^

Types of Impacts	Mitigation Measures	Status
	General Refuse • General refuse should be stored in enclosed bins or compaction units separate from C&D material. A reputable waste collector should be employed by the contractor to remove general refuse from the site, separately from C&D material. Preferably an enclosed and covered area should be provided to reduce the occurrence of 'wind blown' light material.	*
	Construction and Demolition Material • A Waste Management Plan should be prepared. • In order to monitor the disposal of C&D and solid wastes at public filling facilities and landfills and to control fly-tipping, a trip-ticket system should be included. One may make reference to ETWB TCW No.31/2004 for details. • A recording system for the amount of wastes generated, recycled and disposed (including the disposal sites) should be proposed.	^ ^ ^
	Chemical Waste • If chemical wastes are produced at the construction site, the Contractor would be required to register with the EPD as a Chemical Waste Producer and to follow the guidelines stated in the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Good quality containers compatible with the chemical wastes should be used, and incompatible chemicals should be stored separately. Appropriate labels should be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the chemical waste, such as explosive, flammable, oxidizing, irritant, toxic, harmful, corrosive, etc. The Contractor shall use a licensed collector to transport and dispose of the chemical wastes, to either the Chemical Waste Treatment Centre at Tsing Yi, or another licensed facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation	^

Remarks:	^ Compliance of mitigation measure;	X Non-compliance of mitigation measure;
	N/A Not Applicable;	• Non-compliance but rectified by the contractor;
	* Recommendation was made during site audit but improved/rectified by the contractor.	

APPENDIX D
EVENT ACTION PLANS

Appendix D: Event and Action Plan for Construction Noise

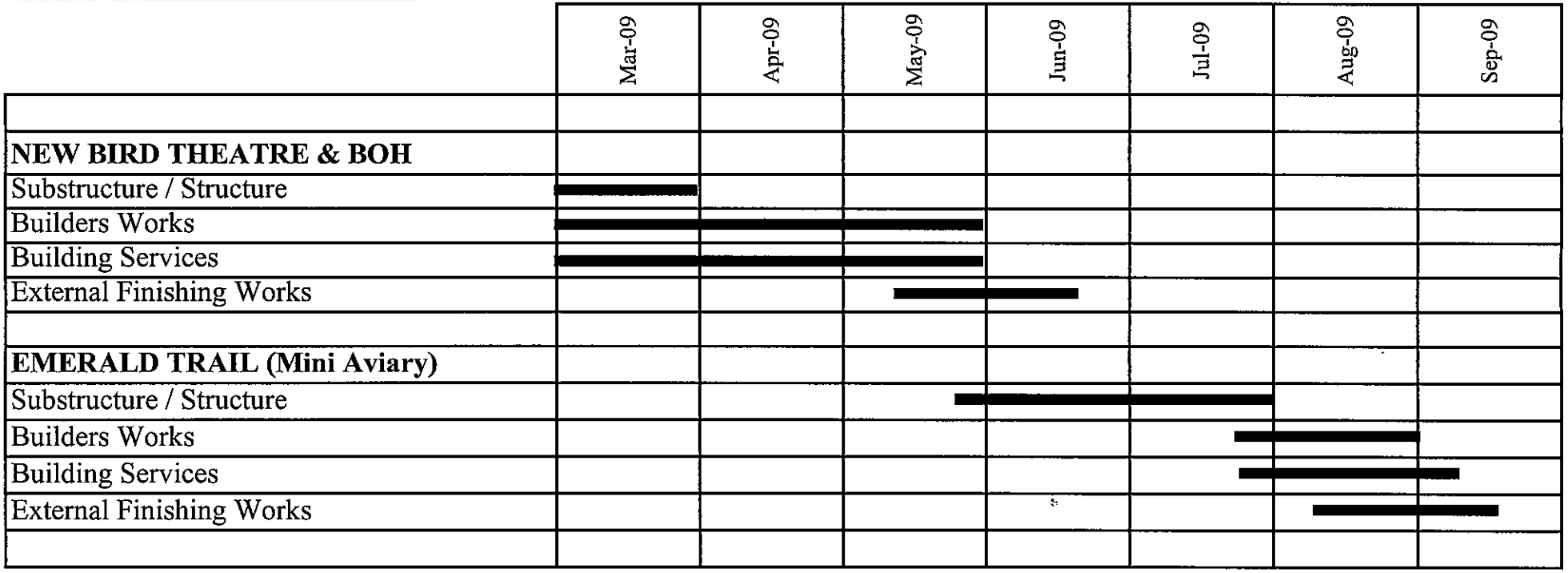
Event	Action		
	Contractor's ET	**Contractor**	**PM**
Action Level	1. Identify source 2. Notify Contractor and PM 3. Conduct additional noise monitoring to investigate the causes, if necessary 4. Report the investigation results to Contractor and PM 5. Discuss with Contractor for their formulation of remedial measures if the exceedance is related to construction works 6. Conduct additional monitoring to check mitigation effectiveness, if necessary	1. Take immediate action to avoid further exceedance 2. Submit noise mitigation proposals to Contractor's ET and PM 3. Implement noise mitigation proposals	1. Confirm receipt of notification of failure in writing 2. Notify Contractor 3. Require Contractor to propose remedial measures for the analysed noise problem 4. Ensure remedial measures are properly implemented
Limit Level	1. Identify source 2. Notify Contractor and PM 3. Conduct additional noise monitoring and analyse Contractor's working procedures to determine possible cause of exceedance, if necessary 4. Provide interim report to Contractor and PM on the causes and proposed action to be taken for the exceedances if exceedance is related to construction works 5. Assess effectiveness by additional monitoring and report Contractor and PM, if necessary 6. If exceedance stops, cease additional monitoring, if any	1. Take immediate action to avoid further exceedance 2. Submit proposals for remedial actions to Contractr's ET, and Pm within 3 working days of notification 3. Implement the agreed proposals 4. Resubmit proposals if problem still not under control 5. Stop the relevant portion of works as determined by the PM until the exceedance is abated	1. Confirm receipt of notification of failure in writing 2. Notify Contractor 3. Require Contractor to propose remedial measures for the analysed noise problem 4. Ensure remedial measures are properly implemented 5. If exceedance continues, consider what protion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated

Appendix D: Event and Action Plan for Air Quality

Event	Action		
	Contractor's ET	Contractor	PM
Action Level	1. Identify source 2. Notify Contractor and PM 3. Conduct additional monitoring to investigate the causes, if necessary 4. Report the investigation results and if exceedance to Contractor and PM	1. Take immediate action to avoid further exceedance and rectify any unacceptable practice. 2. Submit air mitigation proposal and PM for agreement if Contractor's ET indicated that exceedance is related to the construction works 3. Implement agreed proposal within a time scale agreed with PM	1. Confirm receipt of notification of failure in writing 2. Notify Contractor 3. Require Contractor to submit air mitigation proposal 4. Ensure remedial measures are properly implemented
Limit Level	1. Identify source 2. Notify Contractor and PM 3. Conduct additional monitoring and investigate the causes, if necessary	1. Take immediate action to avoid further exceedance and rectify any unacceptable practice 2. In consultation with the PM, submit air mitigation proposal to PM for agreement within 3 working days of notification if Contractor's ET indicated that exceedances are related to construction works 3. Implement agreed proposal within a time scale agreed with PM 4. Amend working methods if appropriate.	1. Confirm receipt of notification of failure in writing 2. Notify Contractor 3. Require Contractor to submit air mitigation proposal 4. Ensure remedial measures are properly implemented

APPENDIX E
TENTATIVE WORKS PROGRAMME

CONTRACT CW02 - ASTOUNDING ASIA
OUTLINE PROGRAMME



Part 4 CS-02 EM&A REPORT (June 2009)

W. Hing Construction Co., Ltd

Ocean Park Redevelopment Project
Contract No. CS02 - Rainforest

Monthly EM&A Report
(Version 1.0)

June 2009

Issued By: _____

Tony Lai
Construction Manager

REMARKS:

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

TABLE OF CONTENTS

LIST OF TABLES

LIST OF APPENDICES

EXECUTIVE SUMMARY

Introduction

This is the 1st monthly Environmental Monitoring and Audit (EM&A) Report prepared by W. Hing Construction Co., Ltd. for the Contract No. CS02 "Ocean Park Redevelopment Project – Rainforest" (hereinafter called "the Project"). The Project was commenced on 11th May 2009. This document reports the findings of the environmental auditing works conducted from 11th May 2009 to 30th June 2009.

The major site activities undertaken in the reporting month included:

- Soil Nail Works, Diversion of Existing Utilities, U/G Utilities Installation and Finishing Works & Excavation works at the Funicular Plaza
- R.C. Structure, U/G Utilities Installation at the Exhibition House
- Drainage Works & Retaining Wall Construction at the External Area

Environmental Monitoring and Audit Works

Environmental monitoring and audit works for the Project was performed as stipulated in the updated EM&A Manual. Site audits were conducted once per week. Environmental site audits were conducted on 2nd, 9th, 19th, 23rd and 30th June 2009. No non-compliance was observed during the site audits.

The implementation of the environmental mitigation measures, Event Action Plans and environmental complaint handling procedures were also checked.

No notification of exceedance was received from the Project Environmental Team Leader (ETL) in the reporting month. Summary of the events and action taken in the reporting month is tabulated in **Table I**.

Table I Summary Table for Events Recorded in the Reporting Month

Parameter	No. of Events		No. of Events Due to the Project	Action Taken
	Action Level	Limit Level		
1-hr TSP	0	0	0	N/A
24-hr TSP	0	0	0	N/A
Noise	0	0	0	N/A

Environmental Licenses and Permits

Licenses/Permits granted to the Project include the Environmental Permit (EP) for the Redevelopment Project, Registration of Waste Producer, Registration of Chemical Waste Producer and Water Discharge License.

A notification pursuant to Section 3(1) of the Air Pollution Control (Construction Dust) Regulation was received prior the commencement of the Project.

Complaints and Prosecutions

No environmental complaint and prosecution was received in the reporting month.

Future Key Issues

Key issues to be considered in the coming month include:

- Soil Nail Works, Diversion of Existing Utilities, U/G Utilities Installation, and Tree Planting, Finishing Works & Excavation works at the Funicular Plaza
- R.C. Structure, U/G Utilities Installation at the Exhibition House
- Drainage Works, Erection of Site Office, Retaining Wall Construction & Rock Dowel Installation at the External Area

1. INTRODUCTION

1.1 Background

1.11 The "Repositioning and Long Term Operation Plan of Ocean Park" has been implementing by the Ocean Park Corporation at its existing site of Ocean Park and Nam Long Shan, Aberdeen. The purpose of this project is to upgrade and expand the existing Ocean Park to meet anticipated visitor demands and to position Ocean Park as a premium tourist attraction and a regional leader in themed recreational and educational park experience. The site layout plan is illustrated in APPENDIX A.

1.12 An environmental impact assessment (EIA) report for "Repositioning and Long Term Operation Plan of Ocean Park" (Report No. 121/2006 and Register No. AEIAR-101/2006) has been prepared in 2006 and the Environmental Monitoring and Audit Manual (Project's EM&A Manual) was also included as part of the EIA report in the register. An Environmental Permit (EP) No. EP-249/2006 was issued on 28 July 2006 for the above project to Ocean Park Corporation as Permit Holder and a varied EP No. EP-249/2006/A was subsequently issued on 23 October 2006 for the above project to Ocean Park Corporation as Permit Holder.

1.13 W. Hing Construction Co., Ltd. (the Contractor) was commissioned by the Employer to undertake the design and construction of the Contract No. CS02 "Ocean Park Redevelopment Project –Rainforest" (hereinafter call "the Project").

1.14 The Project includes design and construction of:

Rainforest Land (may also be referred to as Expedition River).

1. New roadwork and infrastructure support;
2. Open seatin;
3. Construction of elevated walkway;
4. Construction of one to three storey buildings (exhibit building);
5. Construction of back of house facilities;
6. Installation of building services;
7. Construction of associated footpaths;
8. Construction of ride lagoon;
9. Construction of guest route paving and railing, utilities & services works and associated civil engineering works;
10. Soft and hard landscape works;
11. Balustrade, skylight, window, lourve, cladding and canopy, retail/food carts and kiosks, vertical green walls and structure;
12. Provision of new and diversion/decommissioning of existing drainage, sewerage, water mains and underground utilities as necessary for the operation of the Ocean Park;
13. Construction of all ancillary works;
14. Installation of the water rapids ride (also known as raft ride) and associated services;
15. Co-ordination of the works with the Works for the installation of props to be supplied and installed by OTHER Contractors;
16. Construction of underground utilities and services;
17. Construction of earth retaining structures;

18. Take over the completed filtration plant room structure by previous contractor and complete all outstanding works, finishes, waterproofing, E&M installations, etc.
19. Take over and verify completed foundation by previous contractor for the Rainforest Exhibition Building and Rapids Ride elevated structure;

General

20. Take over of existing hoardings with graphics;
21. Tree transplanting and protection to remaining trees if any;
22. Installation of civil provisions for IT system and all operational equipment ;
23. Construction of irrigation and drainage system for planting area;
24. Supply and installation of all elevator(s);
25. Design and build all temporary works with necessary statutory submissions including, but not limited to:
    (a) Temporary support to excavations greater than 2m in depth;
    (b) Temporary cut or fill slopes greater than 2m high;
    (c) Falsework and temporary platforms, structures and the like required;
    (d) Temporary platforms, structures and the like required for supporting construction plant; and
    (e) Excavation and lateral supports for all Rainforest works; and
26. Design and build works as specified in the Contract, but not necessary limited to, with necessary statutory submissions, including the following:
    (a) Artificial Rockwork.
    (b) GRC/GRG/GRP/shotcrete works and associated supporting structures.
    (c) Artificial trees and plants.
    (d) Mesh long span cover structure for Rainforest Exhibit building (also known as exhibition building or Rainforest box) including the metal structural frame.
    (e) Animal exhibits:

    Building Services as further specified in Sections 30 to 37 and Sections 45 to 49
    (g) Water features
    (h) Interpretives, interactive interpretives, and building marquee signs.
    (i) Life support systems.
    (j) Maintenance and delivery machinery including hoist(s).
    (k) Special Effects including lighting and sound effects.
    (l) Rope suspension cross bridge at exhibit exit (cargo crawl bridge).

1.15 This is the 1st monthly EM&A Report summarizing the EM&A works for the Project in June 2009.

1.2 Project Organizations

1.2.1 Different parties with different levels of involvement in the project organization include:

- The Engineer and Project Environmental Team Leader (ETL) – Aecom Asia Consultant Ltd. (AACL)
- Contractor Environmental Team – W. Hing Construction Co. Ltd.
- Independent Environmental Checker (IEC) – Mott MacDonald HK Ltd.

1.2.2 The responsibilities of respective parties are provided in Section the Contractor's EM&A Manual of the Project.

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

Table 1.1 Key Project Contacts

Party	Name	Role	Phone No.	Fax No.
Project ET	Mr. Benny Chan	Safety Manager	2910 3155	2552 1256
	Mr. Andy Leung	Assistant Inspector of Works	2910 3156	
Contractor ET	Mr. Tony Lai	Project Manager	6105 4080	2518 4883
	Mr. Eddie Chiu	Environmental & Safety Manager	6105 4075	
	Mr. Ken Chong	Environmental Officer	6276 1192	
	Mr. Kan Kwok	ET member (Safety Officer)	6277 1747	
IEC	Miss Florence Yuen	Independent Environmental Checker (IEC) Representative	2828 5757	28271823

1.3 Construction Programme

1.3.1 The site activities undertaken in the reporting month were:

- Soil Nail Works, Diversion of Existing Utilities, U/G Utilities Installation and Finishing Works & Excavation works at the Funicular Plaza
- R.C. Structure, U/G Utilities Installation at the Exhibition House
- Drainage Works & Retaining Wall Construction at the External Area

1.4 Summary of EM&A Requirements

1.4.1 The EM&A program requires construction phase environmental site audit. The duties and responsibilities comprise the following:

- monitor various environmental parameters, if necessary, as specified in the Contractor's EM&A Manual;
- analyze the environmental monitoring and audit data;
- review the EM&A programme to confirm the adequacy of mitigation

measures implemented and the validity of the EIA predictions and to identify and adverse environmental impacts arising;

- carry out site inspection to investigate and audit the Contractor's site practice, equipment and work methodologies with respect to pollution control and environmental mitigation, and effect proactive action to pre-empt problems;
- audit and prepare EM&A reports on the site environmental conditions;
- report the environmental audit results to the Contractor;
- recommend appropriate mitigation measures to the Contractor in case of exceedance of Action and Limit Levels in accordance with the Event and Action Plans; and
- adhere to the procedures for carrying out complaint investigation

1.4.2 This report presents the environmental monitoring and audit works for the Project in June 2009.

2. ENVIRONMENTAL AUDIT

2.1 Environmental Site Audits

2.1.1 Environmental site audits were carried out on weekly basis to monitor the timely implementation of proper environmental management practices and mitigation measures in the Project site.

2.1.2 Site audits for the Project in the reporting month were conducted on 2nd, 9th, 19th, 23th and 30th June 2009. No non-compliance was observed during the site audits. The monthly site audits conducted by the IEC are attached in APPENDIX B.

2.1.3 During site inspections in the reporting month, no non-conformance was identified. The observations and recommendations are summarized in Table 2.1.

Table 2.1 Observations and Recommendations of Site Audits

Parameters	Date	Observations / Recommendations	Remediation/ Follow up
Water Quality	09/06/09	Ponding water was observed at footing area of Exhibition House. The Contractor was reminded to pump it out.	This item was rectified on 16/06/09
	19/06/09	Silt removal facilities was observed inadequate and not functioning properly.	This item was rectified on 23/06/09
	30/06/09	Ponding water observed at the excavation trench. The Contractor was reminded to remove it.	Follow-up is needed at the next audit session
Waste/ Chemical Management	02/06/09	Oil container without dip tray was observed. Contractor was reminded to provide drip tray underneath the container.	This item was rectified on 09/06/09
	19/06/09	Stockpile of construction material was observed not covered.	This item was rectified on 23/06/09
	23/06/09	Oil stain was observed underneath the Generator.	This item was rectified on 30/06/09
Air	19/06/09	Wheel washing facilities was observed not installed.	Follow-up is needed at the next audit session

2.2 Status of Environmental Licensing and Permitting

2.2.1 All valid permits/licenses obtained for the Project are summarized in Table 2.2.

Table 2.2 Summary of Environmental Licensing and Permit Status

Permit No.	Valid Period		Details	Status
	From	To		
Environmental Permit				
EP-249/2006/A	23/10/2006	N/A	Expansion of the existing Ocean Park and reconstruction / modification of its existing facilities.	Valid
Registration of Chemical Waste Producer				
WPN5214-176-W1150-03	13/05/2009	N/A	Waste Disposal (Chemical Waste) (General) Regulation -- Registration of Waste Producer	Valid
Construction Noise Permit				
N/A	N/A	N/A	N/A	N/A
Water Discharge License				
WT00004136-2009	12/10/2007	30/06/2014	Discharge of industrial trade effluent arising from the Sedimentation tank at the construction site (CS02 Rainforest, Ocean Park Redevelopment Project) to communal storm water drain.	Valid
Others				
305349	N/A	N/A	Notification Pursuant to Section 3(1) of the Air Pollution Control (Construction Dust) Regulation	Valid
WFG07578	N/A	N/A	Construction Waste Disposal Billing Account with EPD	Valid

2.3 Status of Waste Management

2.3.1 The amount of waste generated by the construction activities of the Project in the reporting month is attached in APPENDIX C.

2.4 Implementation Status of Environmental Mitigation Measures

2.4.1 According to the Environmental Permit and the Contractor's EM&A Manual, the mitigation measures detailed in the documents are required to be implemented. An updated summary of the EMIS is provided in APPENDIX D.

2.5 Summary of Exceedances

2.5.1 No Action/Limit Level exceedance was reported in the reporting month.

2.6 Implementation Status of Event Action Plan

2.6.1 The Event Action Plans for air quality and construction noise are presented in APPENDIX E.

2.7 Summary of Complaints and Prosecutions

2.7.1 No environmental complaint and prosecution related to the Project works was received during the reporting month.

3. FUTURE KEY ISSUES

3.1 Key Issues for the Coming Month

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

- Soil Nail Works, Diversion of Existing Utilities, U/G Utilities Installation, and Tree Planting, Finishing Works & Excavation works at the Funicular Plaza
- R.C. Structure, U/G Utilities Installation at the Exhibition House
- Drainage Works, Erection of Site Office, Retaining Wall Construction & Rock Dowel Installation at the External Area

3.2 Construction Program for the Next Month

3.2.1 The tentative construction program for the Project is provided in APPENDIX F.

4. CONCLUSIONS AND RECOMMENDATIONS

4.1 Conclusions

4.1.1 Five environmental site audits were performed in June 2009. No non-compliance was observed during the site audits.

4.1.2 No exceeedance of environmental monitoring was reported in the reporting month.

4.1.3 No environmental complaint and prosecution related to the project was received in the reporting month.

4.2 Recommendations

4.2.1 According to the environmental audits performed in the reporting month, the following recommendations are suggested:

Dust Impact

- Construction material shall be covered up by tarpaulin or impervious sheeting.

Water Quality Impact

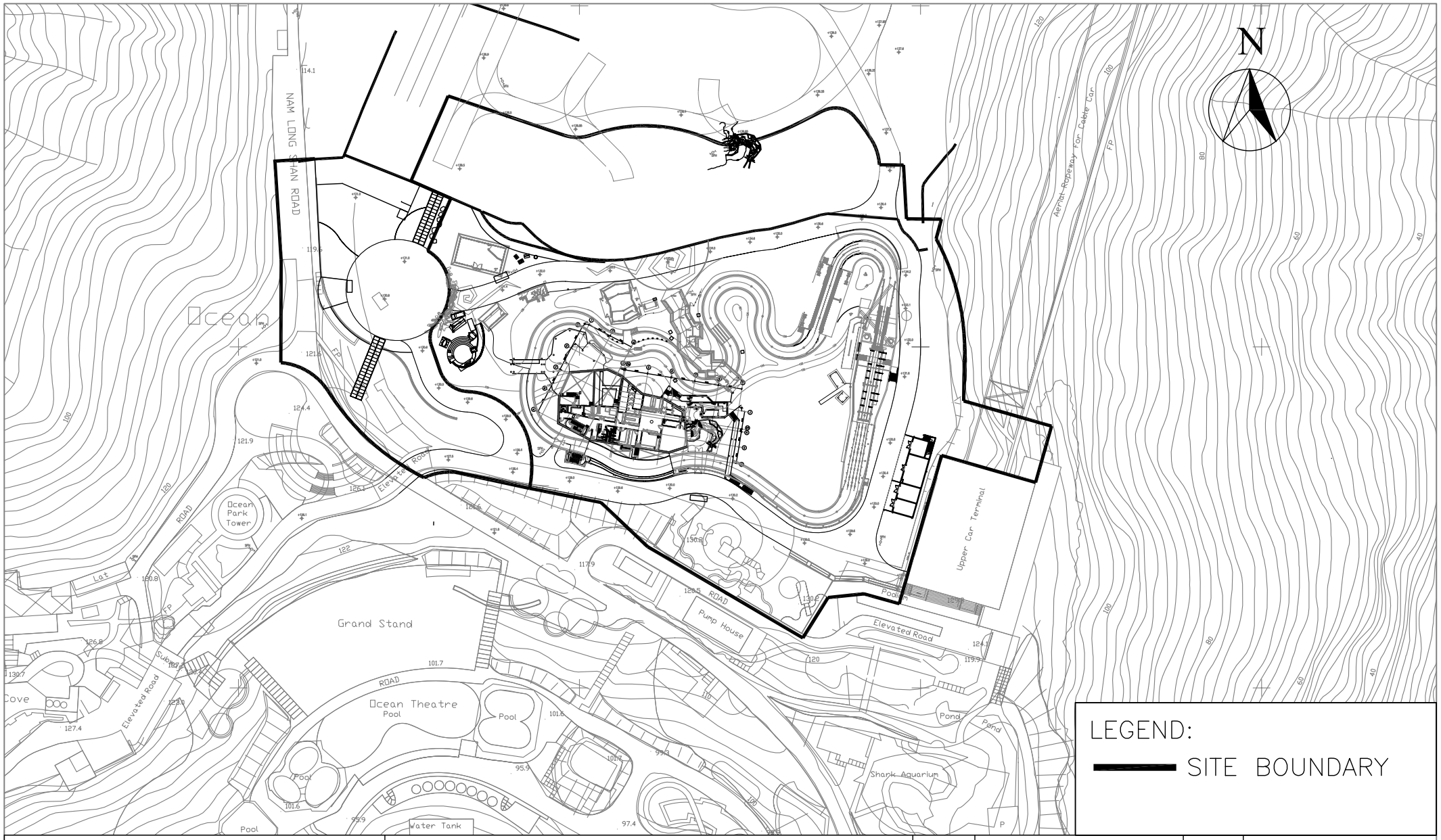
- Sedimentation tanks or silt removal facilities shall be installed and properly functioned.

Air Impact

- Wheel washing facilities shall be installed.

APPENDIX A

SITE LAYOUT PLAN



永興聯合建築有限公司
W. HING CONSTRUCTION CO. LTD.

CONTRACT NO. CS02

OCEAN PARK REDEVELOPMENT PROJECT – RAINFOREST

SITE LAYOUT PLAN

SCALE	A4 1:1500	DATE	JULY 2009
CHECK	Kan Kwok	DRAWN	HC LAU
JOB NO.	CS02	DRAWING NO.	CS02/SL/01
		REV	–

APPENDIX B
SITE AUDIT SUMMARY

Ocean Park Master Redevelopment Project
Contract P007
Independent Environmental Checker

MONTHLY SITE INSPECTION CHECKLIST

Inspection Date	19/06/2009	Time	09:30	Inspected By	EM: A Leung IEC: Florence Yuen Contractor: CW02: W Lo CI07: T Lee CS02: K Chang
Site Location	CW02 CI07 CS02				

Weather

Condition		Sunny		Fine		Overcast		Drizzle	✓	Rain		Storm		Hazy
Temperature	30°C				Humidity	✓	High		Moderate		Low			
Wind	✓	Calm		Light		Breeze		Strong		Direction				

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

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

• 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 (containerisation)?		✓			
• 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?				✓	CS-2 ①6/9/02/12
• 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?				✓	CS02
• 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)?			✓		

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?		✓			
• Is the firing of explosive carried out in the morning prior to opening of the Park?		✓			
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?				✓	CS02
• 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?			✓		

	• 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?				✓	CI07 ② P619020 CW02 ① P619019
	• Are open stockpiles of construction materials or construction wastes of more than 50m³ covered with tarpaulin during rainstorm?				✓	CI07 ① P619020
	In case of an excavation in rainy seasons: • Is temporary exposed slope/soil surfaces covered by tarpaulin as far as practicable?				✓	Same as Above
	• 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?				✓	CI07 ③ P619020
	Coral Sites					
S8.4	• 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?				✓	CS02 ① P619021
	• 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.		✓			
- Requiring the Contractor to plan and make emergency arrangements.		✓			
• Is spare/redundant fire fighting equipment provided?		✓			
• 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?		✓			
• Are the processes of checking of condition of drivers to suspend any driver of concern carried out?		✓			
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?		✓			
• Is other contractors' use of the Ocean Park Internal service road restricted during delivery of explosives, i.e. 6 to 7 a.m?		✓			
• Is the Ocean Park guard required to call to the magazine guard on an hourly basis when explosives are stored in magazines?		✓			
• Is the evacuation of part or all of Ocean Park Headland Area arranged in case of the explosive magazine being engulfed in fire?		✓			
• Is the risk to the public from accidental initation during charging and blasting limited by the following means?					
- Closing the Ocean Park from commencement of charging holes until completion of blasting each day.		✓			
- 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).		✓			
- Not operating amusement rides in the event of accidental explosion until confirmed free of critical damage.		✓			
• 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?		✓			
• Is the opportunity for arson/deliberate initiation of explosive reduced with the following means?					
- Paying attention to the security alert status from the Government.		✓			
- Developing a security plan to address high alert level.		✓			
• Is an emergency plan developed to address uncontrolled fire in magazine area?		✓			
• Is the transfer of explosives between 5 to 6 a.m agreed by Mines Division?		✓			
• Is the road surface along the explosive transportation route maintained?		✓			
• 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?		✓			
• Is adequate space provided for the explosive vehicle to manoeuvre without reversing close to the magazine to limit		✓			

	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?					

Observation for last month

Item ① is outstanding

Observation for this month

① Water was accumulated on-site due to heavy rain during the inspection. The Contractor shall remove them by pumps as soon as possible.

IEC Representative	Environmental Manager	Contractor's Representative CW02
Florence Yuen		
(Florence Yuen)	(ANDY LEUNG)	(Wesley Lo)

Observations for last month

Items 3 and 2 were closed. Items 1 and 4 were outstanding

Observations for this month.

① A stockpile of construction material was not covered with tarpaulin sheet or other means.

② Water was accumulated on site due to heavy rain

③ Oil stain was observed.

IEC Representative	Environmental Manager	Contractor's Representative CI07
Florence Yuen	pp	
(Florence Yuen)	(Tony Cheng)	(Thomas Lee - LCHL)

Observations for last month

Items ① and ② were outstanding.

Observations for this month

① Stockpile of construction material was not covered in any mean.

② Wheel washing facilities is yet to be installed.

③ Environmental Permit is yet to be posted at site entrance.

④ Wastewater treatment system is yet to be installed.

IEC Representative	Environmental Manager	Contractor's Representative CS02
Florence Yuen		
(Florence Yuen)	(KC Chan)	(Ken Chong)

APPENDIX C
SUMMARY OF WASTE GENERATED

W. Hing Construction Co., Ltd.
Ocean Park Redevelopment Project Contract No. CS02 - Rainforest

Monthly Summary Waste Flow Table For May and June 2009

Month	Actual Quantities of Inert C&D Materials Generated		Non-inert C&D Waste disposed to Tseung Kwan O Sorting Facility	Non-inert C&D Waste disposed to SENT Landfill	Chemical Waste disposed to Chemical Waste Treatment Facility at Tsing Yi	Recycle Metals	Packaging and other general refuse (e.g. Plastic, paper wrapping etc.)
	Disposed to Public filling area at Tseung Kwan O	Disposed to Public Barging area at Quarry Bay / Chai Wan *					
	(in tonnes)	(in tonnes)	(in tonnes)	(in tonnes)	(in tonnes)	(in tonnes)	(in tonnes)
May-09	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Jun-09	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Jul-09	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Aug-09	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sep-09	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Oct-09	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Nov-09	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dec-09	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sub-total:	N/A	N/A	N/A	N/A	N/A	N/A	N/A

APPENDIX D

ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE (EMIS)

APPENDIX D - Summary of Environmental Mitigation Implementation Schedule

Types of Impacts	Mitigation Measures	Status
Construction Dust	♦ Use of regular watering, with complete coverage, to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather.	^
	♦ Use of frequent watering for particularly dusty construction areas, temporary stockpiles and areas close to ASRs.	^
	♦ Side enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering shall be applied to aggregate fines.	N/A
	♦ Open stockpiles shall be avoided or covered. Where possible, prevent placing dusty material storage piles near ASRs.	*
	♦ Restricting heights from which materials are dropped, as far as practicable to minimise the fugitive dust arising from unloading/ loading.	^
	♦ Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations.	^
	♦ Use of vehicle wheel and body washing facilities at the exit points of the site.	^
	♦ Provision of wind shield and dust extraction units or similar dust mitigation measures at the loading points, and use of water sprinklers at the loading area where dust generation is likely during the loading process of loose material, particularly in dry seasons/ periods.	N/A
	♦ Imposition of speed controls for vehicles on unpaved site roads. Ten kilometers per hour is the recommended limit.	
	♦ Dusty activities should be re-scheduled if high-wind conditions are encountered.	^
	♦ Where possible, routing of vehicles and positioning of construction plant should be at the maximum possible distance from ASRs.	N/A N/A
	♦ Suitable buffer zone should be provided and the works areas should be fenced off with hoarding. The height of hoarding should not be less than 2.4m from ground level.	N/A
	Crushing Plant	
	♦ Water sprays on the crusher. •	N/A
	♦ Fabric filters installed for the crushing plant. •	N/A
	♦ When transferring materials from crusher to the conveyors, chutes or dust curtains would be used for controlling dust.	N/A

Types of Impacts	Mitigation Measures	Status
	Barging Point & Conveyor Belt System ♦ The conveyors would be placed within a totally enclosed structure • ♦ Profiled steel cladding would be provided at two sides of loading point. • ♦ Dust suppression sprays would be installed and operated in strategic locations at the feeding inlet and outlet. ♦ The barging point would be placed within a totally enclosed structure incorporating an enclosed chute for material transfer to the barge. Flexible curtain would be hanged on the enclosed chute prevent dust emission when excavated materials/rocks transported into the barge. ♦ Some areas of the Park would remain open for visitors during the construction period. Therefore, suitable buffer zones from major construction activities should be provided where practical and the works areas should be fenced off with hoarding during the construction phase. It is recommended to erect hoarding of a height not less than 2.4m from ground level.	N/A N/A N/A N/A ^
Construction Noise	*Construction Phase* ♦ Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction programme ♦ Silencers or mufflers on construction equipment should be utilized and should be properly maintained during the construction programme ♦ Mobile plant, if any, should be sited as far from NSRs as possible. ♦ Machines and plant (such as trucks) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum ♦ Plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs ♦ Material stockpiles and other structures should be effectively utilized, wherever practicable, in screening noise from on-site construction activities	^ N/A N/A ^ ^ N/A
	Adoption of Quieter Plant ♦ In order to reduce the excessive noise impacts at the affected NSRs at the Waterfront during normal daytime working hours, quieter plants are recommended. The Contractors do not have to use specific items of quiet plant adopted in this assessment. The Contractors may use other type of quiet plant, which have the same total SWL, to meet their needs	^

Types of Impacts	Mitigation Measures	Status
	Use of Movable Noise Barrier ♦ The use of movable barrier for certain PME could further alleviate the construction noise impacts. In general, 5dB (A) reduction for movable PME and 10dB (A) for stationary PME can be achieved depending on the actual design of movable noise barrier. ♦ The Contractor should be responsible for designing of the movable noise barrier with due consideration given to the size of the PME and the requirement of intercepting the line of sight between the NSRs and PME. Barrier material of surface mass in excess of 7kg/m2 is recommended to achieve the predicted screening effect. ♦ Exceedance of up to 5dB (A) would be predicted at the Police Training School (NSR PTS) during the examination periods. Early liaison with the principal of this impacted school is recommended to plan for the construction programme. Noisy construction activities should be avoided during the examination period as far as practicable so as to reduce the potential noise impact at the school to comply with the noise criterion of 65dB(A).	N/A N/A N/A
Ecology	*Construction Phase* ♦ All excavation works carried out close to water bodies shall be carefully controlled to avoid runoff entering watercourses, especially during periods of heavy rain. ♦ Site runoff shall be directed towards regularly cleaned and maintained silt traps and where appropriate, oil/grease separators to minimize risk of sedimentation and pollution. ♦ Suitable size / capacity silt traps and oil/grease interceptors shall be used. ♦ Noise mitigation measures including the use of quiet construction plant and movable noise barriers shall be implemented to minimize disturbance to habitats adjacent to the work areas. ♦ Trees located within the works areas shall be preserved as far as practicable. ♦ Placement of equipment or stockpile in designated works areas and access routes selected on existing disturbed land to minimise disturbance to natural habitats ♦ Construction activities shall be restricted to the work areas that would be clearly demarcated ♦ The work areas shall be reinstated immediately after completion of the works ♦ Waste skips shall be provided to collect general refuse and construction wastes. The wastes would be disposed of timely and properly off-site. ♦ Drainage arrangements shall include sediment traps to collect and control construction run-off ♦ Open burning on works sites is illegal, and shall be strictly enforced ♦ Landscaping works on newly formed land shall as far as possible make use of native plant species	^ N/A N/A N/A ^ ^ ^ ^ N/A ^ ^ ^

Types of Impacts	Mitigation Measures	Status
Water Quality	*Construction Runoff and Drainage*	
	♦ Before commencing any site formation work, all sewer and drainage connections should be sealed to prevent debris, soil, sand etc. from entering public sewers/drains	^
	♦ Temporary ditches should be provided to facilitate run-off discharge into appropriate watercourses, via appropriately sized/ designed silt retention pond or similar structure. No site run-off should enter artificial ponds. Cut-off ditches should be provided for all major site clearance/ excavation works where soils would be exposed so that instances of uncontrolled run-off from exposed areas would be minimized. As well as channels, earth/ concrete bunds and/ or sand bags, as appropriate, should be deployed to direct surface run-off towards channels. Catchpits and perimeter channels should be constructed in advance of relevant site formation works.	^
	♦ Boundaries of earthworks should be marked and surrounded by dykes or embankments for flood protection, as necessary.	^
	♦ Sand/silt removal facilities such as sand/silt traps and sediment basins should be provided to remove sand/silt particles from runoff to meet the requirements of the Technical Memorandum standard under the Water Pollution Control Ordinance. The design of silt removal facilities should be based on the guidelines provided in ProPECC PN 1/94. All drainage facilities and erosion and sediment control structures should be inspected monthly and maintained to ensure proper and efficient operation at all times and particularly during rainstorms.	^
	♦ Silt removal facilities, channels and manholes should be maintained and the deposited silt and grit should be regularly removed, at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times.	^
	♦ Exposed soil surfaces should be covered.	^
	♦ Water pumped out from foundation excavations should be discharged into silt removal facilities.	^
	♦ If excavation cannot be avoided during rainy seasons, temporarily exposed slope/soil surfaces should be covered by a tarpaulin or other means, as far as practicable, and temporary access roads should be protected by crushed stone or gravel, as excavation proceeds. Interceptiong channels should be provided (e.g. along the crest/ edge of the excavation) to prevent storm runoff from washing across exposed soil surfaces. Arrangements should always be in place to ensure that adequate surface protection measures can be safely carried out well before the arrival of a rainstorm.. Other measures that need to be implemented before, during and after rainstorms are summarized in ProPECC PN 1/94.	^
	♦ Exposed soil areas should be minimized to reduce potential for increased siltation and contamination of runoff.	^
	♦ Earthwork final surfaces should be well compacted and subsequent permanent work or surface protection should be immediately performed. Appropriate intercepting channels should be provided where necessary. Rainwater pumped out from trenches or excavations should be directed to silt removal facilities before discharge	^
	♦ Open stockpiles of construction materials or construction wastes on-site of more than 50m3 should be covered with tarpaulin or similar fabric during rainstorms	^

Types of Impacts	Mitigation Measures	Status
	General Construction Activities	
	♦ Debris and refuse generated on-site should be collected	*
	♦ Oils and fuels should only be used and stored in designated areas which have pollution prevention facilities. To prevent spillage of fuels and solvents to nearby water bodies and public drains	^
	Sewage from Construction Workforce	
	♦ Temporary sanitary facilities, such as portable chemical toilets, should be employed on-site where necessary to handle sewage from the workforce. A licensed contractor would be responsible for appropriate disposal of waste matter and maintenance of these facilities	^
Waste / Chemical	*Good Site Practice*	
	♦ nomination of an approved personnel, such as a site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site	^
	♦ regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors	N/A
	♦ training of site personnel in proper waste management and chemical handling procedures	^
	♦ provision of sufficient waste disposal points and regular collection for disposal	*
	♦ appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers	^
	Waste Reduction Measures	
	♦ sort C&D waste from demolition and decommissioning of the existing facilities to recover recyclable portions such as metals	^
	♦ segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal.	^
	♦ proper storage and site practices to minimise the potential for damage or contamination of construction materials	^
	♦ to encourage collection of aluminium cans by individual collectors, separate labelled bins shall be provided to segregate this waste from other general refuse generated by the work force.	^
	♦ plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste.	^

Types of Impacts	Mitigation Measures		Status
	General Refuse ♦ General refuse should be stored in enclosed bins or compaction units separate from C&D material. A reputable waste collector should be employed by the contractor to remove general refuse from the site, separately from C&D material. Preferably an enclosed and covered area should be provided to reduce the occurrence of 'wind blown' light material.		*
	Construction and Demolition Material ♦ A Waste Management Plan should be prepared. ♦ In order to monitor the disposal of C&D and solid wastes at public filling facilities and landfills and to control fly-tipping, a trip-ticket system should be included. One may make reference to ETWB TCW No.31/2004 for details. ♦ A recording system for the amount of wastes generated, recycled and disposed (including the disposal sites) should be proposed.		^ ^ ^
	Chemical Waste ♦ If chemical wastes are produced at the construction site, the Contractor would be required to register with the EPD as a Chemical Waste Producer and to follow the guidelines stated in the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Good quality containers compatible with the chemical wastes should be used, and incompatible chemicals should be stored separately. Appropriate labels should be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the chemical waste, such as explosive, flammable, oxidizing, irritant, toxic, harmful, corrosive, etc. The Contractor shall use a licensed collector to transport and dispose of the chemical wastes, to either the Chemical Waste Treatment Centre at Tsing Yi, or another licensed facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation		^
Remarks:	^ Compliance of mitigation measure; N/A Not Applicable; * Recommendation was made during site audit but improved/rectified by the contractor.	X Non-compliance of mitigation measure; ♦ Non-compliance but rectified by the contractor;	

APPENDIX E
EVENT ACTION PLANS

APPENDIX E - Event and Action Plan for Construction Noise

Event	Action		
	Contractor's ET	**Contractor**	**PM**
Action Level	1. Identify source 2. Notify Contractor and PM 3. Conduct additional noise monitoring to investigate the causes, if necessary 4. Report the investigation results to Contractor and PM 5. Discuss with Contractor for their formulation of remedial measures if the exceedance is related to construction works 6. Conduct additional monitoring to check mitigation effectiveness, if necessary	1. Take immediate action to avoid further exceedance 2. Submit noise mitigation proposals to Contractor's ET and PM. 3. Implement noise mitigation proposals	1. Confirm receipt of notification of failure in writing 2. Notify Contractor 3. Require Contractor to propose remedial measures for the analysed noise problem 4. Ensure remedial measures are properly implemented
Limit Level	1. Identify source 2. Notify Contractor and PM 3. Conduct additional noise monitoring and analyse Contractor's working procedures to determine possible cause of exceedance, if necessary 4. Provide interim report to Contractor and PM on the causes and proposed action to be taken for the exceedances if exceedance is related to construction works 5. Assess effectiveness by additional monitoring and report Contractor and PM, if necessary 6. If exceedance stops, cease additional monitoring, if any	1. Take immediate action to avoid further exceedance 2. Submit proposals for remedial actions to Contractr's ET, and Pm within 3 working days of notification 3. Implement the agreed proposals 4. Resubmit proposals if problem still not under control. 5. Stop the relevant portion of works as determined by the PM until the exceedance is abated	1. Confirm receipt of notification of failure in writing 2. Notify Contractor 3. Require Contractor to propose remedial measures for the analysed noise problem 4. Ensure remedial measures are properly implemented 5. If exceedance continues, consider what protion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.

APPENDIX E - Event and Action Plan for Air Quality

Event	Action		
	Contractor's ET	**Contractor**	**PM**
Action Level	1. Identify source 2. Notify Contractor and PM 3. Conduct additional monitoring to investigate the causes, if necessary 4. Report the investigation results and if exceedance to Contractor and PM	1. Take immediate action to avoid further exceedance and rectify any unacceptable practice. 2. Submit air mitigation proposal and PM for agreement if Contractor's ET indicated that exceedance is related to the construction works 3. Implement agreed proposal within a time scale agreed with PM	1. Confirm receipt of notification of failure in writing 2. Notify Contractor 3. Require Contractor to submit air mitigation proposal 4. Ensure remedial measures are properly implemented
Limit Level	1. Identify source 2. Notify Contractor and PM 3. Conduct additional monitoring and investigate the causes, if necessary	1. Take immediate action to avoid further exceedance and rectify any unacceptable practice 2. In consultation with the PM, submit air mitigation proposal to PM for agreement within 3 working days of notification if Contractor's ET indicated that exceedances are related to construction works 3. Implement agreed proposal within a time scale agreed with PM 4. Amend working methods if appropriate.	1. Confirm receipt of notification of failure in writing 2. Notify Contractor 3. Require Contractor to submit air mitigation proposal 4. Ensure remedial measures are properly implemented

APPENDIX F
TENTATIVE WORKS PROGRAMME

W. Hing Construction Co., Ltd.

Ocean Park Redevelopment Project Contract No.: CS02 – Rainforest

Outline Program

	2009							
	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Funicular Plaza								
Substructure								
E&M works								
External Finishing works								
Exhibition House								
Substructure								
Superstructure								
E&M works								
Finishing Works								
External Area								
Substructure								
E&M works								
External Finishing works								

Part 5 CI-05 EM&A REPORT (June 2009)

OCEAN PARK MASTER REDEVELOPMENMT PROJECT

CONTRACT NO. CI05

SITE FORMATION, FUNICULAR TUNNEL AND MISCELLANEOUS WORKS

Final Monthly EM&A Report - June 2009

CLIENT:

Ocean Park Corporation

OCEAN PARK, Aberdeen,
Hong Kong

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07 Jul 2009

TABLE OF CONTENTS

List of Tables

List of Figures

List of Appendices

EXECUTIVE SUMMARY

This is the final Environmental Monitoring and Audit (EM&A) report (i.e. the twentieth monthly 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 under the contract throughout the whole project period from 12 March 2007 to 30 June 2009.

Throughout the whole contract period, various kind of construction activities have been took place. They are:

Waterfront

- Demolition of ex-Waterworld, Dinosaur House, Butterfly House, Around Giant Panda Habitat + ex-Astounding Asia
- Demolition of Goldfish Pagoda and the adjacent toilets
- Demolition of the Main Entrance and McDonalds
- Site Formation for the New Bird House and Advance Entry Plaza
- Filling Existing Lagoon at Goldfish Pagoda
- Underground Fire Services Tanks and Associated Fire Services

Summit

- Temporary Access Road for transportation of excavated materials
- Preparation, Drill and Blast, and Excavation Works for Summit Formation
- Explosive Magazine
- Temporary Conveyor System, including the Crushing Plant, Conveyor Belts and Barging Point
- Soil nailing for permanent haul road to Summit Terminus
- Emergency Access Road and Associated Road Facilities

Tunnel

- Formation and Construction of Adit Tunnel
- Drill and Blast works for the construction of Main Tunnel
- Tunnel Permanent Lining Construction

Waterfront & Summit Terminus

- Construction of Waterfront Terminus, including Substructures, Superstructures, Finishing Works and Facilities Installations
- Summit Terminus & FS Tank Building Construction, including Foundation, Superstructures, Utilities Installation and Internal and External Finishing Works

Tai Shue Wan

- Construction of Conveyor Belts and Barging Point
- Operation of Conveyor Belts and Barging Point

Government Entrusted Works

- Drainage pipe laying and Roadworks at Nam Long Shan Road
- Drainage pipe laying, Watermain and Roadworks at Wong Chuk Hang Road.

During the whole construction period, the total disposal volume to the Government facilities, including the barging point, public fill and the sorting facilities was 104,807.18 tonnes, 1,565.08 tonnes and 6,393.70 tonnes

while the volume to the landfills was 8,714.92 tonnes. Besides the total disposal volume to the alternative approved dumpsites, mainly by barge was 2,671,176.39 tonnes and the total volume of the internal transfer or use was 27,639.14 tonnes.

Monitoring of 1-hour & 24-hour Total Suspended Particulates (TSP) and noise were performed from 12 March 2007 to 25 February 2009 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 throughout the whole project period was listed below:

1-hour TSP monitoring	356 sessions for air quality monitoring station AM1; 366 sessions for air quality monitoring station AM2; and 359 sessions for air quality monitoring station AM3/AM3A
24-hour TSP monitoring	118 sessions for air quality monitoring station AM1; 121 sessions for air quality monitoring station AM2; and 118 sessions for air quality monitoring station AM3/AM3A
Daytime noise monitoring	113 sessions for all noise monitoring stations
Evening and night time noise monitoring	53 sessions for all noise monitoring stations
Holiday time noise monitoring	0 session
Terrestrial ecology monitoring	16 sessions
Subtidal monitoring	9 sessions for Sites 1, 2, 3 and 4; 15 sessions for Site 5 and Control Station
Joint environmental site inspection	116 sessions (include the IEC audit)

Air Quality

The air quality monitoring results obtained in the whole reporting period 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 March 2007 and the audit finding showed no exceedance was recorded.

Noise

The noise monitoring results obtained in the whole reporting period 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 March 2007 and the audit finding showed that no exceedance was recorded.

Terrestrial Ecology

According to the requirement under the Projectwide EM&A Manual, the terrestrial monitoring was conducted in the first twelve months after the transplantation to the permanent receptor. The terrestrial monitoring commenced in reporting period of September 2007 and completed in August 2008 and the finding showed that the transplanted plants were in good condition.

Subtidal Monitoring

The impact subtidal ecology monitoring conducted in the whole project period were audited for the compliance of Action and Limit Levels proposed in the Project Baseline Coral Survey Report (rev. A), which was issued in June 2007 and the monitoring results 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. Summary of these permits was provided in Table 6.1.

Implementation Status of Environmental Mitigation Measures

Dust generated by vehicle movement was observed occasionally throughout the construction period, water hoses and water truck were deployed for the haul road watering and spraying at summit areas; water sprinklers were in operation in the necessary working areas. Watering the haul road and working area surfaces once the surfaces are dry, especially during the dry weather.

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.

The temporary drainage system, including the drainage channels, treatment facilities and wheel washing bay for both Summit and Waterfront have been installed and in use. The vehicle drivers were reminded to wash the vehicles before leaving the site.

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

Chemical waste store was set and the disposal of chemical waste would be followed the procedures in WMP.

The disposal of C&D wastes by using both the Chits and trip tickets have been implemented throughout the whole project period. Most of the C&D materials were disposed of to the approved alternative dumpsites. Disposal to the 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

In total, there were 17 public complaints, 1 warning, no summons or prosecution related to environmental issues was made against the Ocean Park Master Redevelopment Project Contract CI05 in the whole reporting period. Details of the complaint records were presented in Appendix F.

1. INTRODUCTION

Purpose

1.1 The purpose of this report is to present the EM&A work carried out throughout the whole contract period from 12 March 2007 to 25 June 2009) 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 G.

Construction Works undertaken throughout the whole project period

1.6 The major construction activities undertaken throughout the whole project period included Demolition of ex-Waterworld, Dinosaur House, Butterfly House, Around Giant Panda Habitat + ex-Astounding Asia; Demolition of Goldfish Pagoda and the adjacent toilets; Demolition of the Main Entrance and McDonalds; Site Formation for the New Bird House and Advance Entry Plaza; Filling Existing Lagoon at Goldfish Pagoda; and Underground Fire Services Tanks and Associated Fire Services

1.7 At Summit, Temporary Access Road for transportation of excavated materials; Preparation, Drill and Blast, and Excavation Works for Summit Formation; Explosive Magazine; Temporary Conveyor System, including the Crushing Plant, Conveyor Belts and Barging Point; Soil nailing for permanent haul road to Summit Terminus; and Emergency Access Road and Associated Road Facilities.

1.8 For Tunnel, Formation and Construction of Adit Tunnel; Drill and Blast works for the construction of Main Tunnel; and Tunnel Permanent Lining Construction.

1.9 At Tai Shue Wan, Construction and Operation of Conveyor Belts and Barging Point.

1.10 The Government Entrusted Works at Wong Chuk Hang Road and Nam Long Shan Road, including Draining pipe laying, Watermains and Roadworks.

1.11 Layout plan of the Project is provided in Figures 1.2 and 1.3.

1.12 The amounts of different types of material generated by the activities of the Project in the reporting month are shown in Table 1.1.

Table 1.1 Amounts of Material Generated in the whole project periods

Material Type	Delivery / Disposal Location	Estimated Amount (tonnes unless specified)
C&D waste	SENT	2,379.07
	NENT	44.43
	WENT	6,291.42
	TKOSF	6,029.43
	TMSF	364.27
C&D material	QBBP	96,365.73
	CWPFBP	8,441.45
	TKOFB	1,553.81
	TMFB	11.27
	Green Valley *	35,426.00
	Swire Sita *	563,052.22
	Shenzhen Airport Ext. Project	4,157.00
	Central Reclamation Phase III *	1,715,290.11
	Ma On Shan Waterfront Promenade	6,042.08
	Yuen Long DSD Project	9,434.00
	DSD-HKWDT	14,288.00
	Hung Wan Quarry	98,406.98

Material Type	Delivery / Disposal Location	Estimated Amount (tonnes unless specified)
	Tai Shing Quarry (Jiangmen) * #	192,314.00
	Tin Sang Quarry	32,766.00
Chemical waste	Collected by licensed collector	600L
General waste	Collected by licensed collector	1,684.00m^3

Notes: * *denotes alternative dumpsite as disposal location.*
denotes the main portion of excavated material to Mainland China was rock materials.

Compliance with EP conditions

1.13 A summary of the reporting requirement of compliance with EP conditions of Contract CI05 of the Project of the whole project period was listed in Table 1.2.

Table 1.2 Environmental Permit Submission

Environmental Permit Submission	EP-249/2006/A Condition No.	Status
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 (a)	Deposited in the EIAO Register Office for public inspection on 25 September 2007.
As-built drawing of transplantation	2.20 (b)	Deposited in the EIAO Register Office for public inspection on 31 October 2007.
Waste Management Plan	2.21	Deposited in the EIAO Register Office for public inspection on 25 September 2007.
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 Mar '07	4.2	Submitted on 12 April 2007.
Monthly EM&A Report for Apr '07	4.2	Submitted on 12 May 2007.
Monthly EM&A Report for May '07	4.2	Submitted on 8 June 2007.
Monthly EM&A Report for Jun '07	4.2	Submitted on 10 July 2007.
Monthly EM&A Report for Jul '07	4.2	Submitted on 13 August 2007.
Monthly EM&A Report for Aug '07	4.2	Submitted on 10 September 2007.
Monthly EM&A Report for Sept '07	4.2	Submitted on 15 October 2007.
Monthly EM&A Report for Oct '07	4.2	Submitted on 10 November 2007.
Monthly EM&A Report for Nov '07	4.2	Submitted on 10 December 2007.
Monthly EM&A Report for Dec '07	4.2	Submitted on 8 January 2008.
Monthly EM&A Report for Jan '08	4.2	Submitted on 12 February 2008.
Monthly EM&A Report for Feb '08	4.2	Submitted on 13 March 2008.
Monthly EM&A Report for Mar '08	4.2	Submitted on 8 April 2008.
Monthly EM&A Report for Apr '08	4.2	Submitted on 8 May 2008.

Table 1.2 Environmental Permit Submission

Environmental Permit Submission	EP-249/2006/A Condition No.	Status
Monthly EM&A Report for May '08	4.2	Submitted on 13 June 2008.
Monthly EM&A Report for Jun '08	4.2	Submitted on 11 July 2008.
Monthly EM&A Report for Jul '08	4.2	Submitted on 12 August 2008.
Monthly EM&A Report for Aug '08	4.2	Submitted on 5 September 2008.
Monthly EM&A Report for Sept '08	4.2	Submitted on 14 October 2008.
Monthly EM&A Report for Oct '08	4.2	Submitted on 12 November 2008.
Monthly EM&A Report for Nov '08	4.2	Submitted on 10 December 2008.
Monthly EM&A Report for Dec '08	4.2	Submitted on 15 January 2009.
Monthly EM&A Report for Jan '09	4.2	Submitted on 12 February 2009.
Monthly EM&A Report for Feb '09	4.2	Submitted on 12 March 2009.
Monthly EM&A Report for Mar '09	4.2	Submitted on 14 April 2009.
Monthly EM&A Report for Apr '09	4.2	Submitted on 12 May 2009.
Monthly EM&A Report for May '09	4.2	Submitted on 13 June 2009.

Summary of EM&A Requirements

1.14 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.

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

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

2. AIR QUALITY MONITORING

Monitoring Requirements

2.1 24-hour & 1-hour TSP monitoring was 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.

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/AM3A	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 1-hour and 24-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/AM3A	Ocean Park Road, 50m adjacent to Police Training School / Open areas of PMR & OPC temporary site offices

Monitoring Methodology

24-hour / 1-hour TSP Monitoring

Installation

2.5 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 ±3 °C; the relative humidity (RH) was < 50% and not variable by more than ±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^3/min. The range specified in the EM&A Manual was between 0.6-1.7 m^3/min.
- The programmable timer was set for a sampling period of 24 hrs $\pm$ 1 hr 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.

Results and Observations

2.6 The air quality monitoring results and graphical presentation of 1-hr TSP and 24-hr TSP of the whole project period were summarized in Appendix B.

2.7 All measured 1-hour & 24-hour TSP concentrations were below the Action and Limit (AL) Levels throughout the whole construction period.

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.

Table 3.2 Noise Monitoring Parameters, Period and Frequency

Time Period	Duration (min)	Parameters	Frequency
Daytime (0700 to 1900)	30	L_{eq}	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.

Results and Observations

3.5 Noise monitoring was conducted at the 4 designated monitoring stations during daytime, evening/nighttime and holiday throughout the whole construction period. All monitoring data and graphical presentation of the monitoring results are provided in Appendix C.

3.6 No exceedance of limit level during daytime and evening records throughout the whole construction period.

4. TERRESTRIAL ECOLOGY

Monitoring Requirements

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

Monitoring Parameters, Frequency and Duration

4.2. The health condition of the transplanted plant has been investigated within the reporting month of June 2008.

Monitoring Locations

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

Monitoring Methodology

4.4. The monitoring methodology would be as follows:

- Check and control pests;
- Check and control exotic plants;
- Adding soil to compensate soil erosion by rain and run off; and
- Provide fertiliser.

Results and Observations

4.5. The monitoring results showed that all transplanted plants were in good condition. Most of the transplanted Balloon Flowers and Chinese Lily at the receptor site were experience seasonal shrunken in dry season and were re-generated in the growing season.

4.6. Most of the transplanted Sword-leaved Orchid was healthy except two were not in health condition. The potential cause were

- The plant are naturally growing among shrubland and the plants are adopted to the soil condition and shading environment. While, the soil and shading condition at the plant nursery is different.

- The soil at the plant nursery is quite dry and frequency of watering was found not enough. Some big trees are growing around the plant nursery and they consume groundwater and also contribute to dry soil condition

4.7. Regular maintenance including watering, weeding and pest checking to be applied throughout the whole nursing period at the receptor site in order to achieve higher survival rate. Apart from the above, some fertile and fertilizer have been proposed to add into the soil to improve the soil fertility. Besides, watering the plants has been implemented in order to keep the soil moisture.

4.8. The terrestrial ecology monitoring of transplanted plants at the receptor has been completed in August 2008. Even though the survival rate of Balloon Flower, Sword-leaved Orchid and Chinese Lily was decreased from 100% to 93.3%, 95.6% and 100% respectively, but the overall monitoring results could be concluded as good.

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 monitoring findings in the first three months showed that there was no exceedance at all monitoring stations, hence the monitoring frequency has been changed to once in every quarter until the end of the construction period of CI05.

5.10 Even though there was sedimentation on some of the tagged colonies and partial mortality, however the level of sedimentation was insignificant. The variation was believed to be resulted from combined environmental factors such as monsoonal wind, tidal current, peripheral transports, substratum type etc. The low level of increment in partial mortality suggested minor adverse effect was caused by the observed sedimentation.

5.11 No bleaching was recorded in the monitoring throughout the whole contract period. Hence, no adverse impact by the construction activities under the Contract No. CI05 on the coral community was evidenced.

5.12 As the redevelopment is still on-going, the monitoring works of the subtidal ecology has been transferred back to Ocean Park Master Redevelopment Project Team.

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

- Monitoring has been conducted in the first twelve months after transplantation to check the health condition of the transplanted plants.

Subtidal Monitoring

- Impact subtidal ecology monitoring was conducted throughout the whole project period and there was no exceedance recorded at all monitoring stations and control site throughout the whole construction period.

Status of Environmental Licensing and Permits

6.3 All permits/licences obtained for the contract were summarised in Table 6.1.

Table 6.1 Summary of Environmental Licensing and Permit

Permit No.	Valid Period		Section/Description
	From	To	
Environmental Permit			
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.
Construction Noise Permits			
GW-RS0014-07	19/01/07	19/03/07	Crane lorry and Generator, standard
GW-RS0015-07	19/01/07	19/03/07	Crane lorry, Concrete lorry mixer, Poker, vibratory, hand-held (electric) and Generator, silenced, 75dB(A) at 7m
GW-RS0179-07	23/03/07	30/06/07	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
GW-RS-0196-07	10-Apr-07	02-May-07	Lorry with crane; Air compressor with noise emission label showing the SWL of ≤102dB(A); Rock drill, hand-held (pneumatic); Crane, mobile (diesel); Generator, silenced, 75dB(A) at 7m; Concrete mixer (electric); Grout pump; Concrete lorry mixer; Drill, percussive, hand-held (electric); Poker, vibrating, hand-held (electric); Saw, circular, wood; Breaker, hand-held, mass ≤10kg; Breaker, excavator mounted (hydraulic); Drill rig, rotary type (diesel)
GW-RS-0200-07	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
GW-RS-0240-07	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)
GW-RS-0269-07	09-May-07	30-Jun-07	Aerial platform, mobliized; Trailer; Crane, mobile (diesel); and Lorry with crane
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)
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
GW-RS0440-07	18-Jul-07	30-Aug-07	Aerial platform, mobliized; Trailer; Crane, mobile (diesel); and Lorry with crane
GW-RS0448-07	20-Jul-07	20-Jan-08	Generator, silenced, 75 dB(A) at 7m

Table 6.1 Summary of Environmental Licensing and Permit

Permit No.	Valid Period		Section/Description
	From	To	
Construction Noise Permits			
GW-RS0530-07	23-Aug-07	21-Oct-07	Crane, mobile (350 tonnes); Lorry with crane x 2; Crane, mobile (90 tonnes)
GW-RS0542-07	01-Sep-07	30-Nov-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)
GW-RS0548-07	04-Sep-07	20-Feb-08	Generator, silenced, 75dB(A) at 7m; Excavator, tracked; Dump truck; Emulsion pump truck; Light tower; and Crawler crane.
GW-RS0666-07	18-Oct-07	17-Apr-08	Ventilation fan; Excavator, tracked; Dump truck; Rock splitter; Shotcrete machine; Concrete lorry mixer; Hydraulic drill; Cherry picker; Welding set; Loader, wheeled.
GW-RS0768-07	30 Nov 07	29 May 08	Breaker, min-robot mounted; Excavator, mini-robot mounted; Light goods vehicle, GVW ≤ 5.5 tonnes; Air compressor, with noise emission label showing SWL ≤ 100dB(A); Breaker, hand-held (electric), mass ≤ 10kg; Concrete lorry mixer; Compactor, vibratory; Mini-compacting roller; Welding generator and Lorry with crane.
GW-RS0780-07	11 Dec 07	06 Jun 08	Crushing Plant; Dump trucks; Conveyor belt and Excavator, tracked.
GW-RS0786-07	11 Dec 07	10 Jun 08	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.
GW-RS0787-07	11 Dec 07	10 Jun 08	Ventilation fan; Excavator, tracked; Shotcrete machine; Concrete lorry mixer; Hydraulic drill; Cherry picker; Welding set; Air compressor, with noise emission label showing SWL ≤ 102dB(A); Loader, wheeled.
GW-RS-0037-08	04 Feb 08	01 Mar 08	Crushing Plant; Dump trucks; Conveyor belt and Excavator, tracked.
GW-RS0061-08	13 Feb 08	20 Aug 08	Generator, silenced, 75dB(A) at 7m; Excavator, tracked; Dump truck; Emulsion pump truck; Light tower; and Crawler crane.
GW-RS0063-08	15 Feb 08	14 Jul 08	Breaker, min-robot mounted; Excavator, mini-robot mounted; Light goods vehicle, GVW ≤ 5.5 tonnes; Air compressor, with noise emission label showing SWL ≤ 100dB(A); Breaker, hand-held (electric), mass ≤ 10kg; Concrete lorry mixer; Compactor, vibratory; Mini-compacting roller; Welding generator and Lorry with crane.
GW-RS0092-08	02 Mar 08	01 Sep 08	Crushing Plant; Dump trucks; Conveyor belt and Excavator, tracked.
GW-RS0144-08	19 Mar 08	16 Sep 08	Breaker, mini-robot mounted; Excavator, mini-robot mounted; Light goods vehicle, gross vehicle weight ≤ 5.5 tonnes; Air compressor, with noise emission label showing a sound power level of ≤ 100dB(A); Breaker, hand-held (electric), mass ≤ 10kg; Compactor, vibratory; Mini-compacting roller; Welding generator; and Lorry with crane.
GW-RS0151-08	18 Mar 08	17 Apr 08	Crushing Plant; Dump trucks; Conveyor belt and Excavator, tracked.

Table 6.1 Summary of Environmental Licensing and Permit

Permit No.	Valid Period		Section/Description
	From	To	
Construction Noise Permits			
GW-RS0224-08	18 Apr 08	17 Jun 08	Crushing Plant; Dump trucks; Conveyor belt and Excavator, tracked.
GW-RS0234-08	15 Apr 08	14 Oct 08	Concrete lorry mixer; Poker, vibrating, hand-held (electric); and Crane, tower.
GW-RS0242-08	21 Apr 08	09 Jun 08	Hydraulic drill; Loader, wheeled; Excavator, tracked; Shotcrete machine; and Air compressor, with noise emission label showing a sound power level of ≤ 102dB(A)
GW-RS0283-08	06 May 08	05 Jul 08	Crushing Plant; Dump trucks; Conveyor belt and Excavator, tracked.
GW-RS0339-08	11 Jun 08	10 Dec 08	Concrete pump, lorry mounted; Concrete lorry mixer; Poker, vibrating, hand-held (electric) and Generator, silenced, 75dB(A) at 7m
GW-RS0340-08	11 Jun 08	10 Dec 08	Concrete lorry mixer; Concrete pump, lorry mounted; Poker, vibrating, hand-held (electric) and Generator, silenced, 75dB(A) at 7m
GW-RS0387-08	11 Jun 08	09 Dec 08	Crushing Plant; Dump trucks; Conveyor belt and Excavator, tracked.
GW-RS0453-08	15 Jul 08	14 Dec 08	Breaker, min-robot mounted; Excavator, mini-robot mounted; Light goods vehicle, GVW ≤ 5.5 tonnes; Air compressor, with noise emission label showing SWL ≤ 100dB(A); Breaker, hand-held (electric), mass ≤ 10kg; Concrete lorry mixer; Compactor, vibratory; Mini-compacting roller; Welding generator and Lorry with crane.
GW-RS0584-08	21 Aug 08	20 Feb 09	Generator, silenced, 75dB(A) at 7m; Excavator, tracked; Dump truck; Emulsion pump truck; Light tower; and Crawler crane.
GW-RS0618-08	17 Sep 08	16 Feb 09	Breaker, mini-robot mounted; Excavator, mini-robot mounted; Light goods vehicle, gross vehicle weight ≤ 5.5 tonnes; Air compressor, with noise emission label showing a sound power level of ≤ 100dB(A); Breaker, hand-held (electric), mass ≤ 10kg; Compactor, vibratory; Mini-compacting roller; Welding generator; and Lorry with crane.
GW-RS0657-08	19 Sep 08	04 Feb 09	Crane, mobile (diesel); Lorry with crane, 5.5 tonne < GVW ≤ 38 tonnes; and Excavator, tracked
GW-RS0682-08	15 Oct 08	14 Apr 09	Concrete lorry mixer; Poker, vibrating, hand-held (electric); and Crane, tower.
GW-RS0750-08	01 Nov 08	30 Apr 08	Crane, mobile (500 tonnes); Crane mobile (300 tonnes); Crane, mobile (90 tonnes); Crane, mobile (50 tonnes); and Lorry, with crane, 5.5 tonnes < gross vehicle weight ≤ 38 tonnes
GW-RS0751-08	28-Oct-08	27-Jan-09	Crane, mobile (500 tonnes); Crane mobile (300 tonnes); Crane, mobile (90 tonnes); Crane, mobile (50 tonnes); and Lorry, with crane, 5.5 tonnes < gross vehicle weight ≤ 38 tonnes
GW-RS0001-09	02 Jan 09	01 Jun 09	Light Tower; Excavator, tracked; Dump truck, 5.5 tonne < gross vehicle weight ≤ 38 tonne
GW-RS0103-09	28 Feb 09	27 Aug 09	Breaker, mini-robot mounted; Excavator, tracked; Light goods vehicle, gross vehicle weight ≤ 5.5 tonnes; Breaker, hand-held, mass > 10 kg and < 20 kg; Road miller; Asphalt paver; Road roller; Dump truck, 5.5 tonne < gross vehicle weight ≤ 38 tonne

Table 6.1 Summary of Environmental Licensing and Permit

Permit No.	Valid Period		Section/Description	
	From	To		
Chemical Waste Producer Registration				
WPN5213-199-D2373-01	07-May-07	N/A	For disposal of chemical wastes, mainly spent lubricants	
Effluent Discharge License				
EP820/W9/XW232	20-Jun-07	30-Jun-12	For discharge of industrial trade effluent arising from construction site at Summit and Tunnel	
EP820/W9/XW234	13-Jul-07	31-Jul-12	For discharge of industrial trade effluent arising from construction site at Waterfront	
WT00003198-2009	15-Mar-09	31-Mar-14	For discharge of industrial trade effluent arising from construction site at Waterfront	
Specific Process License				
L-11-044 (1)	20-Sep-07	19-Sep-12	Conduct Specified Process, viz., Mineral Works, in the premises at "Ocean Park Master Redevelopment Project Contract CI05 – Site Formation, Funicular Tunnel and Miscellaneous Works, Ocean Park, Aberdeen, Hong Kong (at top of Nam Long Shan Road)"	
Notification of Construction Works under APCO				
Waterfront sent on 31-Jan-07 (ref. 001017998)				
Summit sent on 05-Feb-07 (ref. 001018054)				
Billing Account under Construction Waste Disposal Charging Scheme				
7004888	03-Jan-07	18-Dec-08	For disposal of C&D waste to public fills, sorting facilities and landfills	

Implementation Status of Environmental Mitigation Measures

6.4 The weekly joint site inspections have conducted in weekly basis throughout the whole construction period of CI05. The IEC has undertaken the monthly audit and the observations and recommendations that were made have summarized in the following paragraphs.

Land Based Water Quality Mitigation Measures

6.5 Stagnant water pond was observed after heavy rainfall. The Contractor was reminded to remove the stagnant water as soon as possible in order to minimize the potential mosquito breeding problems.

6.6 The sediment at the surface channel should be removed and maintained free flow in all of the times.

6.7 The treatment facilities and wheel washing bay should be maintained well and in good condition all the times.

Air Quality Mitigation Measures

6.8 Access roads should be watered frequently to suppress the dust nuisance, especially in the dry weather days.

6.9 Stockpile and exposed slope surface should be covered entirely and properly with tarpaulin.

6.10 Frequently water the exposed surface especially the crushing plant and conveyor system at Summit especially in the dry seasons.

6.11 The Contractor shall ensure watering during rock/concrete breaking especially at the areas closed to the Park in order to minimize the dust nuisance.

Noise

6.12 No violation was observed during site inspections throughout the whole construction period.

Ecology

6.13 No violation was observed during site inspections throughout the whole construction period.

Waste / Chemical Management

6.14 Avoidance of accumulation of waste on site. The waste should be collected by licensed haulers and disposed of properly in regular basis.

6.15 The Contractor and relevant party were reminded to provide a drip tray or tarpaulin when storing the oil drums on site.

Landscape and Visual

6.16 No violation was observed during site inspections throughout the whole construction period.

Environmental Mitigation Implementation Schedule (EMIS)

6.17 According to the Environmental Permit, the mitigation measures detailed in the permits are required to be implemented. A summary of the EMIS was presented in Appendix D.

Implementation Status of Event/Action Plans

6.18 The Event and Action Plans for air quality, noise and subtidal monitoring are presented in Appendix E.

6.19 No exceedance of air quality (i.e. 1 hour & 24-hour TSP) was recorded throughout the whole construction period.

6.20 No exceedance of noise limit level during daytime and evening was recorded throughout the whole construction period.

Implementation Status of Environmental Complaint Handling Procedures

Summary of the Complaints and Prosecutions

6.21 Appendix F presents the environmental complaint flow diagram of the Project.

6.22 In total, there were 17 public complaints, 1 warning, no summons or prosecution related to environmental issues was made against the Ocean Park Master Redevelopment Project Contract CI05 in the whole reporting period.

7. CONCLUSIONS AND RECOMMENDATIONS

Conclusions

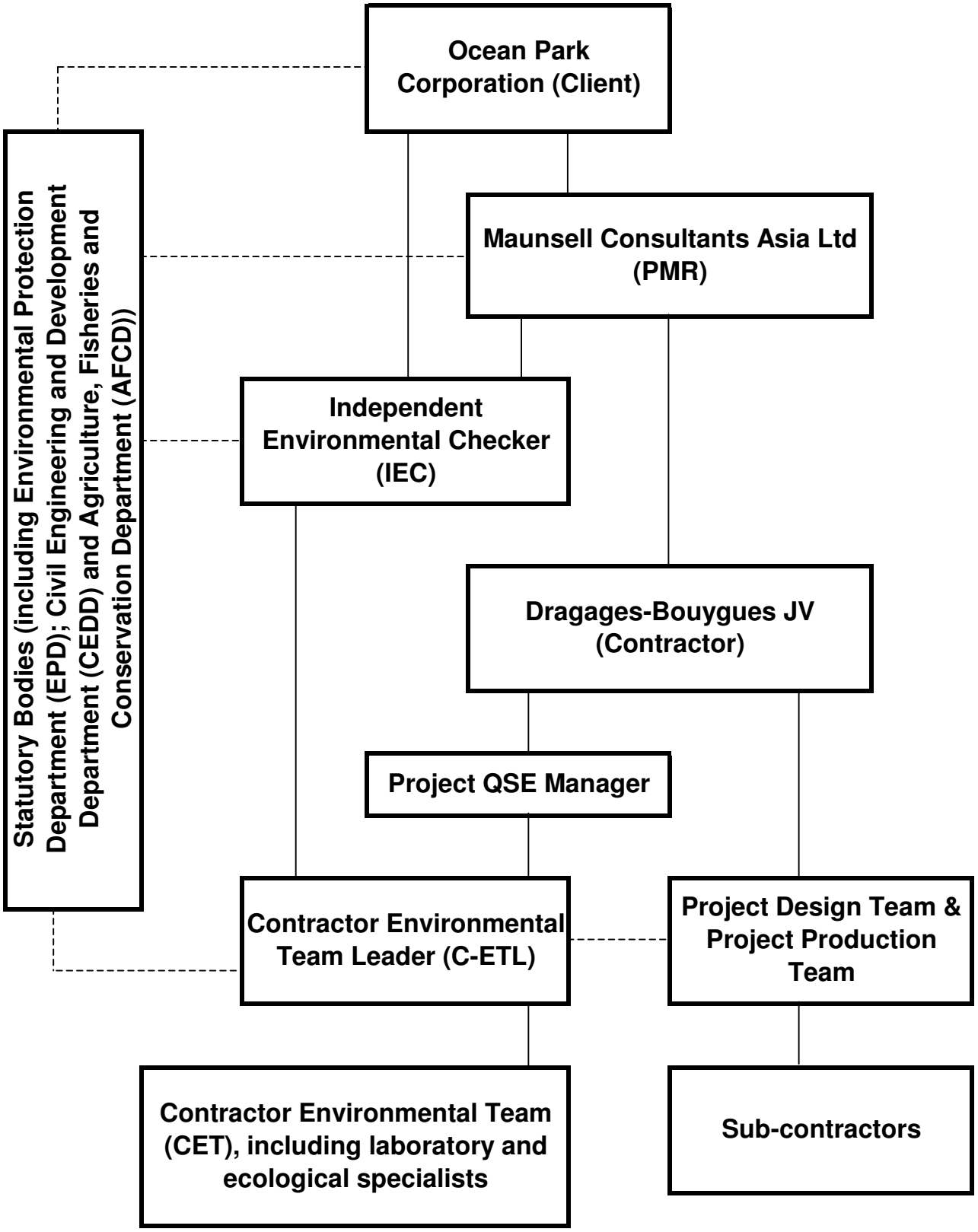
7.1 Environmental impact monitoring was performed from 12 March 2007 to 25 February 2009. All monitoring results in the contract period were checked and reviewed.

7.2 No exceedances of Action and Limit Level for daytime noise, evening noise, 24-hour TSP and 1-hour TSP were recorded throughout the whole construction period.

7.3 The impact subtidal ecology monitoring conducted in the whole project period were audited for the compliance of Action and Limit Levels proposed in the Project Baseline Coral Survey Report (rev. A), which was issued in June 2007 and the monitoring results showed no exceedance was recorded.

7.4 The terrestrial ecology monitoring of transplanted plants at the receptor has been commenced in September 2007 and completed in August 2008. Even though the survival rate of Balloon Flower, Sword-leaved Orchid and Chinese Lily was decreased from 100% to 93.3%, 95.6% and 100% respectively, but the overall monitoring results could be concluded as good.

7.5 There were 17 public complaints, 1 warning, no summons or prosecution related to environmental issues was made against the Ocean Park Master Redevelopment Project Contract CI05 in the whole reporting period.



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	MAIN CONTRACTOR :	CLIENT :
				DRAWN BY	BLo	Dragages-Bouygues JV 寶嘉-布依格聯營	香港海洋公園 OCEAN PARK HONG KONG
				CHECKED BY	GCh		
				IN CHARGE	DNg		
A	02APR2007	GCh	FIRST ISSUE	DATE	02APR2007		
REV.	DATE	BY	DESCRIPTION				

PROJECT TITLE :

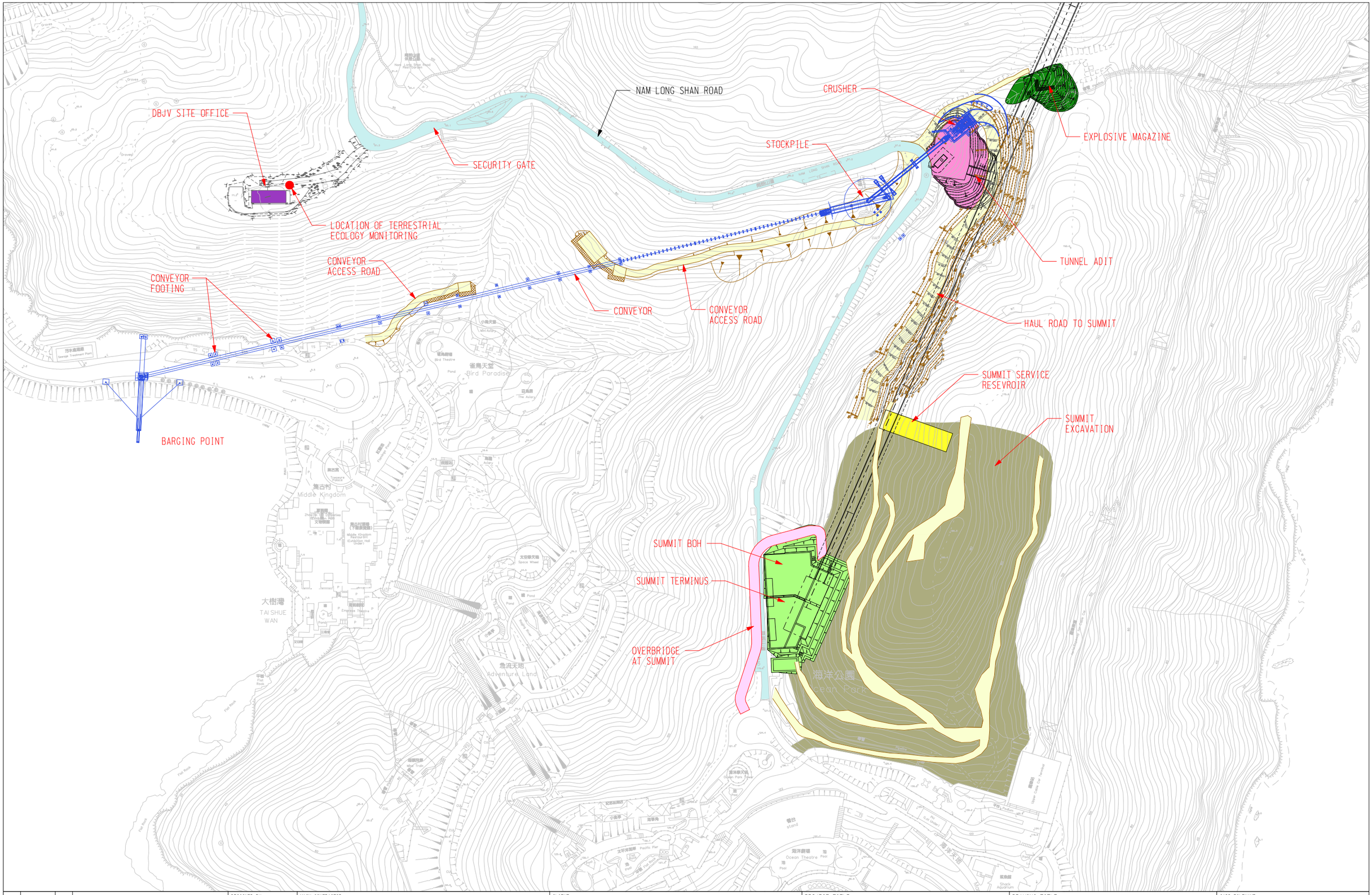
OCEAN PARK REDEVELOPMENT

Contract No. CI05
Site Formation, Funicular Tunnel and Miscellaneous Works

DRAWING TITLE :

FIGURE 1.2
LAYOUT OF WORK SITE
(WATERFRONT)

CADD FILENAME :	01ENV0013A.DGN
DATE :	02APR2007
SCALE :	1 : 1500 @ A3
DRAWING NUMBER :	DBJV/CI05/01/ENV/0013
REV.	A



REV.	DATE	BY	DESCRIPTION
B	10AUG2007	GCb	FIRST ISSUE
A	02APR2007	GCb	FIRST ISSUE

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

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. CI05
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 : 01ENV0014B.DGN
DATE : 10AUG2007
SCALE : 1 : 2500 @ A3
DRAWING NUMBER : DBJV/CI05/Q1/ENV/0014
REV. B

REV.	DATE	BY	DESCRIPTION
D	07NOV2007	STa	AM3 DELETED
C	31JUL2007	STa	PROPOSED AM3 RELOCATED
B	25JUN2007	STa	PROPOSED AM3 ADDED
A	02APR2007	STa	FIRST ISSUE

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

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. CI05
Site Formation, Funicular Tunnel and Miscellaneous Works

DRAWING TITLE :

FIGURE 1.4
AIR QUALITY AND NOISE MONITORING STATIONS LOCATION PLAN

CADD FILENAME :	01ENV0015D.DGN
DATE :	07NOV2007
SCALE :	1 : 3000 @ A3
DRAWING NUMBER :	DBJV/CI05/01/ENV/0015
REV.	D

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 :

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. CI05
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/CI05/01/ENV/0016
REV.	A

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 (μg/m^3)		1-hr TSP (μg/m^3)	
	Action Level	Limit Level	Action Level	Limit Level
AM1	183	260	440	500
AM2	181	260	500	500
AM3/AM3A	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 – AIR QUALITY MONITORING RESULTS

Table B.1 Monitoring Results of 1-hr TSP

Date of Monitoring	1-hr TSP (μg/m^3)			Date of Monitoring	1-hr TSP (μg/m^3)			Date of Monitoring	1-hr TSP (μg/m^3)		
	AM1	AM2	AM3/AM3A		AM1	AM2	AM3/AM3A		AM1	AM2	AM3/AM3A
02-Mar-07	226	189	247	10-Apr-07	127	132	99	18-May-07	125	124	172
05-Mar-07	203	161	119	11-Apr-07	102	106	113	21-May-07	77	136	-
06-Mar-07	76	125	118	13-Apr-07	121	136	114	23-May-07	159	123	-
07-Mar-07	116	109	90	16-Apr-07	169	178	205	25-May-07	131	104	143
09-Mar-07	313	367	410	18-Apr-07	-	109	140	26-May-07	84	88	118
12-Mar-07	137	87	181	20-Apr-07	-	135	156	28-May-07	98	136	124
14-Mar-07	357	231	443	21-Apr-07	-	112	154	30-May-07	79	83	116
16-Mar-07	157	144	148	23-Apr-07	-	83	85	01-Jun-07	84	94	116
17-Mar-07	94	82	130	25-Apr-07	-	114	130	04-Jun-07	107	122	138
19-Mar-07	139	238	139	27-Apr-07	-	135	127	06-Jun-07	91	84	101
21-Mar-07	108	139	125	30-Apr-07	110	110	130	07-Jun-07	101	143	144
23-Mar-07	133	118	118	02-May-07	193	123	190	08-Jun-07	143	87	135
26-Mar-07	241	315	324	03-May-07	119	114	126	11-Jun-07	123	122	157
28-Mar-07	190	210	218	04-May-07	109	79	103	13-Jun-07	165	167	192
29-Mar-07	98	125	86	07-May-07	173	159	191	15-Jun-07	93	140	129
30-Mar-07	87	75	62	09-May-07	140	107	191	18-Jun-07	93	112	103
02-Apr-07	72	91	60	11-May-07	182	154	173	20-Jun-07	121	121	160
04-Apr-07	100	133	102	14-May-07	207	202	214	22-Jun-07	116	145	-
06-Apr-07	69	98	79	15-May-07	135	177	211	23-Jun-07	99	134	-
09-Apr-07	172	127	128	16-May-07	164	156	278	25-Jun-07	96	137	117

Notes: * Exceedance of Limit Level
Exceedance of Action Level
- No monitoring due to bad weather

APPENDIX B – AIR QUALITY MONITORING RESULTS (CONT'D)

Table B.1 Monitoring Results of 1-hr TSP

Date of Monitoring	1-hr TSP (μg/m^3)			Date of Monitoring	1-hr TSP (μg/m^3)			Date of Monitoring	1-hr TSP (μg/m^3)		
	AM1	AM2	AM3/AM3A		AM1	AM2	AM3/AM3A		AM1	AM2	AM3/AM3A
27-Jun-07	89	97	130	06-Aug-07	113	107	116	13-Sep-07	93	103	140
29-Jun-07	104	120	119	08-Aug-07	103	148	169	14-Sep-07	84	110	273
03-Jul-07	72	102	116	09-Aug-07	69	128	107	17-Sep-07	103	144	365
04-Jul-07	83	109	86	10-Aug-07	119	103	111	19-Sep-07	216	271	429
05-Jul-07	97	101	125	13-Aug-07	78	180	175	21-Sep-07	124	148	310
07-Jul-07	129	124	-	15-Aug-07	86	92	112	24-Sep-07	172	292	439
09-Jul-07	96	83	-	17-Aug-07	72	106	82	25-Sep-07	113	123	267
11-Jul-07	102	94	126	20-Aug-07	97	137	157	25-Sep-07	155	164	288
13-Jul-07	104	114	130	21-Aug-07	122	150	120	28-Sep-07	53	70	162
16-Jul-07	104	179	174	22-Aug-07	110	121	121	02-Oct-07	150	150	290
17-Jul-07	88	115	105	24-Aug-07	72	120	145	04-Oct-07	54	76	131
18-Jul-07	102	148	124	27-Aug-07	66	75	84	06-Oct-07	177	159	323
20-Jul-07	72	138	117	29-Aug-07	63	63	81	08-Oct-07	186	290	362
23-Jul-07	75	117	94	31-Aug-07	50	51	79	10-Oct-07	99	140	229
25-Jul-07	91	119	93	01-Sep-07	53	62	56	12-Oct-07	116	123	262
27-Jul-07	83	110	128	03-Sep-07	42	35	51	13-Oct-07	77	119	207
28-Jul-07	64	105	85	05-Sep-07	97	108	99	15-Oct-07	150	144	190
30-Jul-07	69	86	114	07-Sep-07	86	108	149	17-Oct-07	140	142	224
01-Aug-07	63	82	119	10-Sep-07	114	90	124	18-Oct-07	87	108	221
03-Aug-07	44	75	130	12-Sep-07	84	115	119	20-Oct-07	103	109	190

Notes: * Exceedance of Limit Level
Exceedance of Action Level
- No monitoring due to bad weather

APPENDIX B – AIR QUALITY MONITORING RESULTS (CONT'D)

Table B.1 Monitoring Results of 1-hr TSP

Date of Monitoring	1-hr TSP (μg/m^3)			Date of Monitoring	1-hr TSP (μg/m^3)			Date of Monitoring	1-hr TSP (μg/m^3)		
	AM1	AM2	AM3/AM3A		AM1	AM2	AM3/AM3A		AM1	AM2	AM3/AM3A
22-Oct-07	68	111	285	30-Nov-07	92	123	152	08-Jan-08	83	114	195
24-Oct-07	87	143	348	03-Dec-07	132	157	276	09-Jan-08	75	118	163
26-Oct-07	85	106	146	04-Dec-07	210	239	272	11-Jan-08	56	85	197
29-Oct-07	109	121	370	05-Dec-07	170	148	170	14-Jan-08	98	118	330
30-Oct-07	145	152	198	07-Dec-07	196	266	402	16-Jan-08	107	105	141
31-Oct-07	103	118	213	10-Dec-07	100	98	335	18-Jan-08	133	121	295
02-Nov-07	88	99	198	12-Dec-07	73	103	382	19-Jan-08	90	120	312
05-Nov-07	134	165	372	14-Dec-07	182	129	177	21-Jan-08	114	147	185
07-Nov-07	93	123	152	15-Dec-07	76	112	248	23-Jan-08	125	174	289
09-Nov-07	78	98	184	17-Dec-07	100	101	99	25-Jan-08	122	166	199
10-Nov-07	82	92	181	19-Dec-07	129	108	288	28-Jan-08	91	71	176
12-Nov-07	100	108	268	21-Dec-07	91	97	309	30-Jan-08	110	73	206
14-Nov-07	119	134	281	24-Dec-07	62	74	119	31-Jan-08	148	126	221
16-Nov-07	65	41	194	24-Dec-07	103	142	419	01-Feb-08	111	73	118
19-Nov-07	101	129	125	27-Dec-07	42	120	208	04-Feb-08	138	141	278
21-Nov-07	75	142	277	28-Dec-07	116	131	205	06-Feb-08	49	81	172
22-Nov-07	118	151	234	31-Dec-07	195	194	332	06-Feb-08	114	89	125
23-Nov-07	87	92	174	02-Jan-08	175	155	360	11-Feb-08	116	146	177
26-Nov-07	153	140	202	04-Jan-08	102	117	200	12-Feb-08	136	144	206
28-Nov-07	286	211	370	07-Jan-08	133	213	333	13-Feb-08	158	146	164

Notes: * Exceedance of Limit Level
Exceedance of Action Level
- No monitoring due to bad weather

APPENDIX B – AIR QUALITY MONITORING RESULTS (CONT'D)

Table B.1 Monitoring Results of 1-hr TSP

Date of Monitoring	1-hr TSP (μg/m^3)			Date of Monitoring	1-hr TSP (μg/m^3)			Date of Monitoring	1-hr TSP (μg/m^3)		
	AM1	AM2	AM3/AM3A		AM1	AM2	AM3/AM3A		AM1	AM2	AM3/AM3A
15-Feb-08	156	150	160	26-Mar-08	88	134	178	05-May-08	59	75	228
18-Feb-08	154	178	378	28-Mar-08	71	161	271	07-May-08	90	104	95
20-Feb-08	122	161	192	31-Mar-08	140	149	357	09-May-08	110	76	188
22-Feb-08	169	215	294	01-Apr-08	63	78	96	10-May-08	72	95	250
23-Feb-08	93	118	141	02-Apr-08	74	101	84	13-May-08	87	118	136
25-Feb-08	98	112	148	05-Apr-08	87	89	156	14-May-08	136	145	191
27-Feb-08	121	154	269	07-Apr-08	55	87	114	16-May-08	121	153	199
29-Feb-08	125	171	339	09-Apr-08	148	127	209	19-May-08	125	118	135
03-Mar-08	179	158	231	11-Apr-08	121	150	220	21-May-08	109	116	121
05-Mar-08	229	314	427	14-Apr-08	69	118	169	22-May-08	128	141	169
06-Mar-08	223	293	342	16-Apr-08	90	133	211	23-May-08	51	102	75
07-Mar-08	83	97	148	17-Apr-08	142	172	294	26-May-08	91	101	207
10-Mar-08	146	171	357	18-Apr-08	121	158	281	28-May-08	91	102	145
12-Mar-08	154	265	327	21-Apr-08	-	228	-	30-May-08	90	82	138
14-Mar-08	120	154	150	23-Apr-08	-	132	287	02-Jun-08	112	134	132
17-Mar-08	146	175	271	25-Apr-08	138	160	218	03-Jun-08	88	96	112
18-Mar-08	92	103	149	28-Apr-08	68	98	208	04-Jun-08	27	31	38
19-Mar-08	164	199	221	29-Apr-08	61	89	78	06-Jun-08	66	78	118
20-Mar-08	139	174	241	30-Apr-08	70	80	155	07-Jun-08	-	161	199
25-Mar-08	146	125	260	02-May-08	170	105	189	10-Jun-08	22	92	78

Notes: * Exceedance of Limit Level
Exceedance of Action Level
- No monitoring due to bad weather

APPENDIX B – AIR QUALITY MONITORING RESULTS (CONT'D)

Table B.1 Monitoring Results of 1-hr TSP

Date of Monitoring	1-hr TSP (μg/m³)			Date of Monitoring	1-hr TSP (μg/m³)			Date of Monitoring	1-hr TSP (μg/m³)		
	AM1	AM2	AM3/AM3A		AM1	AM2	AM3/AM3A		AM1	AM2	AM3/AM3A
11-Jun-08	57	93	153	19-Jul-08	48	89	192	27-Aug-08	59	82	227
13-Jun-08	145	157	265	21-Jul-08	34	40	96	29-Aug-08	52	83	210
14-Jun-08	277	207	246	23-Jul-08	91	119	241	01-Sep-08	41	28	75
16-Jun-08	36	118	73	25-Jul-08	87	135	265	03-Sep-08	72	117	235
18-Jun-08	85	119	144	28-Jul-08	280	269	355	04-Sep-08	45	89	203
20-Jun-08	69	80	105	30-Jul-08	96	114	254	05-Sep-08	40	66	83
23-Jun-08	56	76	128	31-Jul-08	49	116	182	08-Sep-08	54	85	208
25-Jun-08	37	40	58	01-Aug-08	24	67	97	10-Sep-08	48	65	185
26-Jun-08	97	105	115	04-Aug-08	51	85	169	12-Sep-08	63	92	176
27-Jun-08	58	64	42	06-Aug-08	-	-	-	13-Sep-08	112	90	176
30-Jun-08	58	63	148	08-Aug-08	64	51	85	16-Sep-08	140	166	474
02-Jul-08	86	102	161	11-Aug-08	43	54	152	17-Sep-08	127	158	171
04-Jul-08	70	83	200	12-Aug-08	86	102	102	19-Sep-08	60	82	176
07-Jul-08	52	95	191	13-Aug-08	51	69	93	22-Sep-08	132	132	208
08-Jul-08	51	48	77	15-Aug-08	88	102	180	24-Sep-08	-	-	-
09-Jul-08	56	93	76	18-Aug-08	106	96	294	26-Sep-08	73	69	210
11-Jul-08	122	84	100	20-Aug-08	72	77	186	27-Sep-08	55	73	193
14-Jul-08	46	63	150	22-Aug-08	-	-	-	29-Sep-08	132	97	119
16-Jul-08	94	65	145	23-Aug-08	45	50	82	02-Oct-08	232	177	348
18-Jul-08	55	75	142	25-Aug-08	96	114	89	03-Oct-08	53	76	134

Notes: * Exceedance of Limit Level
Exceedance of Action Level
- No monitoring due to bad weather

APPENDIX B – AIR QUALITY MONITORING RESULTS (CONT'D)

Table B.1 Monitoring Results of 1-hr TSP

Date of Monitoring	1-hr TSP (μg/m^3)			Date of Monitoring	1-hr TSP (μg/m^3)			Date of Monitoring	1-hr TSP (μg/m^3)		
	AM1	AM2	AM3/AM3A		AM1	AM2	AM3/AM3A		AM1	AM2	AM3/AM3A
06-Oct-08	-	61	124	13-Nov-08	54	71	151	22-Dec-08	184	203	328
08-Oct-08	64	67	150	14-Nov-08	62	75	116	24-Dec-09	141	215	364
09-Oct-08	73	89	142	17-Nov-08	83	113	223	25-Dec-08	103	149	208
10-Oct-08	134	111	400	19-Nov-08	140	133	240	29-Dec-08	57	98	120
13-Oct-08	82	89	263	21-Nov-08	103	166	209	30-Dec-08	91	139	142
15-Oct-08	98	137	225	24-Nov-08	81	104	179	31-Dec-08	59	79	77
17-Oct-08	73	87	107	25-Nov-08	108	67	212	02-Jan-09	107	129	216
20-Oct-08	115	115	234	26-Nov-08	88	119	200	05-Jan-09	103	177	282
21-Oct-08	72	60	144	28-Nov-08	93	112	267	07-Jan-09	118	133	225
22-Oct-08	102	97	101	01-Dec-08	133	190	329	09-Jan-09	164	189	324
24-Oct-08	174	152	253	03-Dec-08	121	133	222	10-Jan-09	215	227	283
27-Oct-08	176	137	280	05-Dec-08	207	209	363	12-Jan-09	143	158	178
29-Oct-08	167	105	87	06-Dec-08	147	137	277	14-Jan-09	163	176	276
31-Oct-08	120	84	127	08-Dec-08	114	123	149	16-Jan-09	114	186	316
01-Nov-08	88	108	275	10-Dec-08	116	148	334	19-Jan-09	106	128	148
03-Nov-08	73	84	160	12-Dec-08	116	207	371	21-Jan-09	166	177	247
05-Nov-08	94	100	128	15-Dec-08	145	238	311	22-Jan-09	218	307	375
07-Nov-08	91	104	160	17-Dec-08	111	113	121	23-Jan-09	175	192	216
10-Nov-08	62	42	71	18-Dec-08	65	131	204	24-Jan-09	152	164	295
12-Nov-08	91	72	154	19-Dec-08	60	83	120	29-Jan-09	139	163	257

Notes: * Exceedance of Limit Level
Exceedance of Action Level
- No monitoring due to bad weather

APPENDIX B – AIR QUALITY MONITORING RESULTS (CONT'D)

Table B.1 Monitoring Results of 1-hr TSP

Date of Monitoring	1-hr TSP (μg/m^3)		
	AM1	AM2	AM3/AM3A
30-Jan-09	91	88	76
02-Feb-09	132	145	222
04-Feb-09	89	112	320
06-Feb-09	61	73	148
09-Feb-09	102	109	198
10-Feb-09	120	144	296
11-Feb-09	41	101	139
13-Feb-09	147	183	225
16-Feb-09	121	216	218
18-Feb-09	151	151	165
20-Feb-09	173	209	234
21-Feb-09	156	197	271
23-Feb-09	162	125	225
25-Feb-09	114	175	255

Notes: * Exceedance of Limit Level
Exceedance of Action Level
- No monitoring due to bad weather

APPENDIX B – AIR QUALITY MONITORING RESULTS (CONT'D)

Table B.2 Monitoring Results of 24-hr TSP

Date of Monitoring	241-hr TSP (μg/m^3)			Date of Monitoring	241-hr TSP (μg/m^3)			Date of Monitoring	241-hr TSP (μg/m^3)		
	AM1	AM2	AM3/AM3A		AM1	AM2	AM3/AM3A		AM1	AM2	AM3/AM3A
12-Mar-07	71	88	76	05-Jul-07	31	40	37	30-Oct-07	84	97	103
17-Mar-07	49	57	56	11-Jul-07	42	56	-	05-Nov-07	88	83	136
23-Mar-07	58	65	60	17-Jul-07	39	37	56	10-Nov-07	86	105	116
29-Mar-07	35	49	41	23-Jul-07	26	28	34	16-Nov-07	40	64	79
04-Apr-07	58	48	64	28-Jul-07	22	33	29	22-Nov-07	78	97	120
10-Apr-07	52	59	64	03-Aug-07	55	59	70	28-Nov-07	90	112	149
16-Apr-07	53	50	52	09-Aug-07	18	21	18	04-Dec-07	115	142	158
21-Apr-07	-	41	68	15-Aug-07	60	78	73	10-Dec-07	33	60	86
27-Apr-07	-	73	91	21-Aug-07	25	36	34	15-Dec-07	101	126	178
03-May-07	63	57	78	27-Aug-07	20	33	21	21-Dec-07	35	69	149
09-May-07	70	66	80	01-Sep-07	20	27	25	27-Dec-07	45	69	138
15-May-07	54	55	72	07-Sep-07	49	66	74	02-Jan-08	81	105	162
21-May-07	51	54	-	13-Sep-07	68	85	84	08-Jan-08	62	98	150
26-May-07	31	35	45	19-Sep-07	115	136	167	14-Jan-08	53	80	95
01-Jun-07	36	31	50	25-Sep-07	27	40	61	19-Jan-08	31	39	52
07-Jun-07	26	35	34	02-Oct-07	21	26	63	25-Jan-08	42	40	59
13-Jun-07	26	30	25	08-Oct-07	103	115	187	31-Jan-08	32	41	63
18-Jun-07	18	36	46	13-Oct-07	68	79	95	06-Feb-08	60	80	95
23-Jun-07	51	63	-	18-Oct-07	75	95	121	12-Feb-08	73	85	95
29-Jun-07	44	56	41	24-Oct-07	50	64	84	18-Feb-08	61	82	110

Notes: * Exceedance of Limit Level
Exceedance of Action Level
- No monitoring due to bad weather

APPENDIX B – AIR QUALITY MONITORING RESULTS (CONT'D)

Table B.2 Monitoring Results of 24-hr TSP

Date of Monitoring	241-hr TSP (μg/m^3)			Date of Monitoring	241-hr TSP (μg/m^3)			Date of Monitoring	241-hr TSP (μg/m^3)		
	AM1	AM2	AM3/AM3A		AM1	AM2	AM3/AM3A		AM1	AM2	AM3/AM3A
23-Feb-08	79	92	109	20-Jun-08	15	33	79	15-Oct-08	66	69	100
29-Feb-08	126	108	180	26-Jun-08	19	26	29	21-Oct-08	52	55	71
06-Mar-08	95	162	98	02-Jul-08	21	34	76	27-Oct-08	85	78	45
12-Mar-08	47	75	81	08-Jul-08	21	35	37	01-Nov-08	50	47	61
18-Mar-08	82	119	130	14-Jul-08	23	39	109	07-Nov-08	43	45	86
25-Mar-08	81	98	118	19-Jul-08	28	36	95	13-Nov-08	46	60	138
31-Mar-08	24	30	36	25-Jul-08	29	47	84	19-Nov-08	76	87	124
05-Apr-08	36	56	55	31-Jul-08	19	33	68	25-Nov-08	74	95	125
11-Apr-08	54	73	72	08-Aug-08	22	30	62	01-Dec-08	63	91	146
17-Apr-08	57	76	135	12-Aug-08	33	39	82	06-Dec-08	80	106	118
23-Apr-08	-	89	106	18-Aug-08	17	30	47	12-Dec-08	76	107	121
29-Apr-08	52	59	74	23-Aug-08	25	31	60	18-Dec-08	79	109	150
05-May-08	46	58	91	29-Aug-08	21	37	71	24-Dec-08	78	81	156
10-May-08	43	51	67	04-Sep-08	21	34	58	30-Dec-08	51	60	77
16-May-08	88	92	130	10-Sep-08	35	57	109	05-Jan-09	50	52	105
22-May-08	30	44	57	16-Sep-08	71	90	118	10-Jan-09	116	94	114
28-May-08	36	49	57	22-Sep-08	152	131	180	16-Jan-09	63	104	126
03-Jun-08	23	31	36	27-Sep-08	58	48	72	22-Jan-09	88	115	165
10-Jun-08	25	49	70	03-Oct-08	-	37	37	29-Jan-09	63	80	103
14-Jun-08	17	27	32	09-Oct-08	48	32	52	04-Feb-09	50	79	110

Notes: * Exceedance of Limit Level
Exceedance of Action Level
- No monitoring due to bad weather

APPENDIX B – AIR QUALITY MONITORING RESULTS (CONT'D)

Table B.2 Monitoring Results of 24-hr TSP

Date of Monitoring	241-hr TSP (μg/m^3)		
	AM1	AM2	AM3/AM3A
10-Feb-09	84	99	176
16-Feb-09	33	42	77
21-Feb-09	108	115	-

Notes: * Exceedance of Limit Level
Exceedance of Action Level
- No monitoring due to bad weather

APPENDIX C – NOISE MONITORING RESULTS

Table C.1 Monitoring Results of Daytime Noise

Date of Monitoring	Noise Level, Leq (30-min), dB(A)				Date of Monitoring	Noise Level, Leq (30-min), dB(A)			
	CN1	CN2	CN3	CN4		CN1	CN2	CN3	CN4
12-Mar-07	63.2	63.2	60.0	56.7	30-Jul-07	67.8	66.8	66.1	62.5
19-Mar-07	64.3	64.3	58.8	56.7	06-Aug-07	67.4	63.5	64.9	57.8
26-Mar-07	62.2	64.8	57.9	56.5	13-Aug-07	67.2	64.0	64.2	58.2
02-Apr-07	61.4	65.0	58.4	57.6	20-Aug-07	67.8	63.5	61.8	56.3
10-Apr-07	64.3	63.4	58.3	55.6	27-Aug-07	66.9	64.2	60.4	55.9
16-Apr-07	60.6	64.6	59.7	58.4	03-Sep-07	68.8	65.1	61.0	56.5
23-Apr-07	61.2	63.6	56.1	55.2	10-Sep-07	65.8	60.7	63.1	61.5
30-Apr-07	60.9	63.2	55.7	57.3	17-Sep-07	67.4	62.2	60.9	58.3
07-May-07	63.3	66.1	55.5	54.8	25-Sep-07	66.2	63.6	62.7	58.0
14-May-07	62.6	65.4	56.2	55.2	02-Oct-07	64.7	62.7	62.2	57.7
21-May-07	62.3	60.6	57.0	55.1	08-Oct-07	61.9	60.0	59.7	56.4
28-May-07	65.8	64.9	59.2	57.7	15-Oct-07	61.9	60.7	56.7	55.5
04-Jun-07	68.3	65.2	58.7	60.7	22-Oct-07	62.4	61.2	55.9	56.4
11-Jun-07	67.9	65.5	57.9	61.0	29-Oct-07	61.2	60.7	56.4	55.8
18-Jun-07	67.3	65.5	68.9	58.7	05-Nov-07	59.2	60.1	57.6	56.2
25-Jun-07	66.7	66.1	67.6	58.9	12-Nov-07	66.7	60.5	60.9	65.4
03-Jul-07	66.3	65.9	67.8	59.2	19-Nov-07	65.4	60.8	59.6	66.1
09-Jul-07	61.8	63.7	58.0	57.5	26-Nov-07	69.9	60.7	58.9	70.6
16-Jul-07	68.8	67.0	66.3	60.4	03-Dec-07	67.8	61.2	59.9	69.5
23-Jul-07	68.2	66.4	65.8	61.2	10-Dec-07	67.1	58.4	58.9	71.3

Notes: * Exceedance of Limit Level
Exceedance of Action Level

APPENDIX C – NOISE MONITORING RESULTS (CONT'D)

Table C.1 Monitoring Results of Daytime Noise

Date of Monitoring	Noise Level, Leq (30-min), dB(A)				Date of Monitoring	Noise Level, Leq (30-min), dB(A)			
	CN1	CN2	CN3	CN4		CN1	CN2	CN3	CN4
17-Dec-07	67.4	59.7	59.3	67.6	05-May-08	64.3	58.7	58.0	63.8
24-Dec-07	67.2	57.9	57.2	68.3	13-May-08	62.7	59.3	57.5	64.3
31-Dec-07	66.5	57.0	56.3	67.1	19-May-08	67.6	59.8	58.9	67.7
07-Jan-08	66.5	57.0	57.3	62.8	26-May-08	61.1	61.8	60.7	57.9
14-Jan-08	65.9	56.7	56.2	60.7	02-Jun-08	66.8	59.4	58.8	66.7
21-Jan-08	69.9	60.8	60.6	71.9	10-Jun-08	64.7	61.7	60.2	67.3
28-Jan-08	64.8	57.3	56.6	59.8	16-Jun-08	68.1	60.4	60.2	69.7
04-Feb-08	67.8	56.6	55.8	64.5	23-Jun-08	69.8	60.6	58.4	68.4
11-Feb-08	64.8	55.3	55.2	62.7	30-Jun-08	69.5	61.3	60.8	67.4
18-Feb-08	64.9	59.0	58.7	66.5	07-Jul-08	69.4	61.8	60.8	68.1
25-Feb-08	63.7	58.2	59.2	67.1	14-Jul-08	67.7	58.5	57.9	68.0
03-Mar-08	68.1	60.4	59.2	70.1	21-Jul-08	70.1	62.0	61.4	68.2
10-Mar-08	70.2	61.1	58.4	65.1	28-Jul-08	67.9	60.9	61.8	64.7
17-Mar-08	66.5	67.0	60.0	64.2	04-Aug-08	67.3	61.4	60.7	63.8
25-Mar-08	67.7	59.5	58.8	68.0	11-Aug-08	65.1	60.2	61.0	62.8
31-Mar-08	66.9	58.4	59.1	67.3	18-Aug-08	68.7	63.4	60.6	64.3
07-Apr-08	66.5	58.8	56.7	66.0	25-Aug-08	68.1	62.0	59.8	63.5
14-Apr-08	65.0	58.2	55.4	62.7	01-Sep-08	64.7	61.1	62.2	63.8
21-Apr-08	70.2	69.0	67.9	68.2	08-Sep-08	66.3	62.8	59.3	65.4
28-Apr-08	70.3	67.4	68.2	66.9	16-Sep-08	64.0	66.5	63.7	62.7

Notes: * Exceedance of Limit Level
Exceedance of Action Level

APPENDIX C – NOISE MONITORING RESULTS (CONT'D)

Table C.1 Monitoring Results of Daytime Noise

Date of Monitoring	Noise Level, Leq (30-min), dB(A)				Date of Monitoring	Noise Level, Leq (30-min), dB(A)			
	CN1	CN2	CN3	CN4		CN1	CN2	CN3	CN4
22-Sep-08	63.2	67.3	64.2	61.2	09-Feb-09	66.1	67.3	61.1	60.0
29-Sep-08	65.6	57.1	56.6	66.7	16-Feb-09	65.7	68.1	65.0	61.6
06-Oct-08	66.2	60.6	55.9	67.1	23-Feb-09	64.9	67.8	65.4	62.2
13-Oct-08	67.8	61.4	62.2	71.0					
20-Oct-08	66.4	59.7	61.1	70.1					
27-Oct-08	65.8	59.7	57.8	66.6					
03-Nov-08	70.1	62.2	61.4	67.7					
10-Nov-08	68.9	65.4	62.3	64.7					
17-Nov-08	60.1	66.4	60.0	63.8					
24-Nov-08	60.9	67.0	61.2	64.4					
01-Dec-08	63.8	64.9	61.3	60.4					
08-Dec-08	64.4	63.7	62.9	61.7					
15-Dec-08	65.0	64.1	61.7	60.9					
22-Dec-08	66.4	63.0	61.4	65.9					
29-Dec-08	66.9	62.4	59.9	63.7					
05-Jan-09	67.5	61.0	60.2	63.8					
12-Jan-09	63.4	59.9	60.4	64.2					
19-Jan-09	65.3	61.2	59.5	67.1					
29-Jan-09	64.9	62.4	60.1	65.9					
02-Feb-09	65.7	64.4	59.8	62.3					

Notes: * Exceedance of Limit Level
Exceedance of Action Level

APPENDIX C – NOISE MONITORING RESULTS (CONT'D)

Table C.2 Monitoring Results of Evening Noise

Date of Monitoring	Noise Level, Leq (30-min), dB(A)				Date of Monitoring	Noise Level, Leq (30-min), dB(A)			
	CN1	CN2	CN3	CN4		CN1	CN2	CN3	CN4
28-Mar-07	52.4	54.7	54.6	51.9	07-May-08	50.8	51.9	52.9	50.9
11-Apr-07	59.3	56.2	56.4	51.6	14-May-08	51.2	50.8	52.8	51.2
18-Apr-07	57.0	56.8	53.1	48.2	21-May-08	51.6	51.2	52.7	51.6
25-Apr-07	54.0	55.4	56.2	56.0	28-May-08	51.9	52.5	52.8	51.6
21-Jun-07	57.2	56.3	56.5	55.0	04-Jun-08	51.4	52.1	51.9	52.1
16-Jan-08	54.9	57.0	57.1	56.7	02-Jul-08	51.7	52.3	52.0	51.5
23-Jan-08	54.4	57.4	57.7	53.5	16-Jul-08	51.5	51.9	51.8	51.3
31-Jan-08	55.0	58.8	57.1	49.2	23-Jul-08	51.6	52.1	51.5	50.9
04-Feb-08	59.3	59.2	59.4	48.2	30-Jul-08	51.5	51.8	51.6	51.2
13-Feb-08	54.0	58.4	59.2	50.2	13-Aug-08	50.3	51.1	51.3	49.8
20-Feb-08	55.3	56.2	56.8	49.6	20-Aug-08	50.5	51.2	51.4	49.4
27-Feb-08	53.2	55.3	55.4	54.0	27-Aug-08	51.4	51.5	51.4	49.5
05-Mar-08	52.4	53.3	54.8	52.9	03-Sep-08	50.4	51.1	51.5	49.7
12-Mar-08	54.0	58.4	59.2	56.0	10-Sep-08	50.6	51.3	51.4	49.6
19-Mar-08	53.5	56.2	54.3	55.3	17-Sep-08	51.1	51.7	51.6	50.1
26-Mar-08	52.0	53.5	54.5	52.5	08-Oct-08	51.6	52.1	51.6	50.8
09-Apr-08	50.5	51.8	52.1	51.8	15-Oct-08	51.8	51.7	51.2	51.2
16-Apr-08	51.1	51.3	51.3	49.9	22-Oct-08	51.9	52.2	51.6	52.1
23-Apr-08	50.8	51.2	51.8	50.1	29-Oct-08	51.6	52.1	51.6	50.8
30-Apr-08	51.9	52.5	52.5	51.8	05-Nov-08	51.8	52.4	52.1	51.6

Notes: * Exceedance of Limit Level
Exceedance of Action Level

APPENDIX C – NOISE MONITORING RESULTS (CONT'D)

Table C.2 Monitoring Results of Evening Noise

Date of Monitoring	Noise Level, Leq (30-min), dB(A)			
	CN1	**CN2**	**CN3**	**CN4**
12-Nov-08	52.1	52.2	52.1	50.7
19-Nov-08	51.7	52.9	52.1	51.7
26-Nov-08	51.9	52.1	51.7	51.8
03-Dec-08	52.4	53.1	52.3	53.1
10-Dec-08	51.8	52.5	51.8	52.9
17-Dec-08	52.2	52.9	52.1	52.8
23-Dec-08	52.0	53.2	52.5	52.3
30-Dec-08	51.6	52.2	51.2	52.1
07-Jan-09	51.8	51.8	51.0	51.9
14-Jan-09	52.3	51.9	51.5	52.2
21-Jan-09	52.0	52.5	51.8	52.4
30-Jan-09	51.4	52.5	51.1	51.9
04-Feb-09	52.6	54.1	53.7	52.2

Notes: * Exceedance of Limit Level
Exceedance of Action Level

APPENDIX D – SUMMARY OF ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Status	Other / Remarks
				Site Installation	Method Statement	Toolbox Talk		
Air Quality								
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.	✓			✓	
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.		✓	✓	✓	
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.		✓	✓	✓	

APPENDIX D – SUMMARY OF ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Status	Other / Remarks
				Site Installation	Method Statement	Toolbox Talk		
Air Quality								
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.	✓			✓	
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.	✓		✓	✓	
AQ12a	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.	✓		✓	✓	

APPENDIX D – SUMMARY OF ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Status	Other / Remarks
				Site Installation	Method Statement	Toolbox Talk		
Air Quality								
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^3 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.	✓	✓		✓	
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.	✓	✓		✓	

APPENDIX D – SUMMARY OF ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Status	Other / Remarks
				Site Installation	Method Statement	Toolbox Talk		
Air Quality								
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.		✓		✓	
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.	✓	✓	✓	✓	
AQ31	Dust Emission from Tunnel		Exhausts from tunnel ventilation should face away from sensitive receivers.	✓	✓	✓	✓	

APPENDIX D – SUMMARY OF ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Status	Other / Remarks
				Site Installation	Method Statement	Toolbox Talk		
Air Quality								
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.	✓	✓	✓	✓	
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.	✓		✓	✓	
AQ34	Dust Emission from Crushing Plant	PS 26.10(2)	The crushing plant shall be operated in accordance with the specified process licence.	✓		✓	✓	
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
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)	✓		✓	✓	

APPENDIX D – SUMMARY OF ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Status	Other / Remarks
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Air Quality								
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.		✓	✓	✓	
Noise/Vibration								
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.			✓	✓	
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).			✓	✓	

APPENDIX D – SUMMARY OF ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Status	Other / Remarks
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Noise/Vibration								
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:					
			• Change of construction equipment location and scheduling of activities;		✓	✓	✓	
			• Change of construction equipment location and scheduling of activities;	✓		✓	✓	
			• Installation of construction equipment soundproofing;	✓		✓	✓	
			• Provision of alternative Contractor's equipment;		✓	✓	✓	
			• Erection of sound barriers around the part of the Site or the location of the construction noise source; or	✓		✓	✓	
			• Any other measures that may be effective in reducing noise.		✓	✓	✓	
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.	✓	✓	✓	✓	
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.	✓		✓	✓	

APPENDIX D – SUMMARY OF ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

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				Site Installation	Method Statement	Toolbox Talk		
Water Quality (Refer to Drainage Management Plan as stated in PS 26.17(7))								
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: • Use of sediment traps, oil interceptors; and • Adequate maintenance of drainage systems to prevent flooding and overflow.	✓	✓	✓ ✓	✓ ✓	
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		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.	✓	✓		✓	

APPENDIX D – SUMMARY OF ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Status	Other / Remarks
				Site Installation	Method Statement	Toolbox Talk		
Water Quality (Refer to Drainage Management Plan as stated in PS 26.17(7))								
WQ08	Flooding and wastewater including surface runoff discharges from the construction site/work to inland coastal waters, communal sewers and drains	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.	✓		✓	✓	Updated Drainage Proposal is being implemented
WQ09		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		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.			✓	✓	
WQ13		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.		✓	✓	✓	

APPENDIX D – SUMMARY OF ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Status	Other / Remarks
				Site Installation	Method Statement	Toolbox Talk		
Water Quality (Refer to Drainage Management Plan as stated in PS 26.17(7))								
WQ14	Flooding and wastewater including surface runoff discharges from the construction site/work to inland coastal waters, communal sewers and drains	EP Clause2.12 & 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		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		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.			✓	✓	
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		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.	✓			✓	

APPENDIX D – SUMMARY OF ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Status	Other / Remarks
				Site Installation	Method Statement	Toolbox Talk		
Water Quality (Refer to Drainage Management Plan as stated in PS 26.17(7))								
WQ20	Flooding and wastewater including surface runoff discharges from the construction site/work to inland coastal waters, communal sewers and drains	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.	✓			✓	
WQ21		PS 26.12	Open stockpiles of construction materials of more than $50m^3$ should be covered with tarpaulin or similar fabric.			✓	✓	
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)								
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
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.	✓			✓	
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.	✓		✓	✓	

APPENDIX D – SUMMARY OF ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Status	Other / Remarks
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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)								
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.			✓	✓	
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.	✓			✓	
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.	✓			N/A	
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.	✓		✓	✓	

APPENDIX D – SUMMARY OF ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Status	Other / Remarks
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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)								
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.	✓			✓	
Waste Management (Refer to Waste Management Plan as stated in EP Clause 2.21)								
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.			✓	✓	
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

APPENDIX D – SUMMARY OF ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Status	Other / Remarks
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Waste Management (Refer to Waste Management Plan as stated in EP Clause 2.21)								
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.			✓	✓	
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.	✓		✓	✓	

APPENDIX D – SUMMARY OF ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Status	Other / Remarks
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Waste Management (Refer to Waste Management Plan as stated in EP Clause 2.21)								
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 • The Waste Disposal Ordinance (Cap 354), • Waste Disposal (Chemical Waste)(General) Regulation (Cap 354), • The Crown Land Ordinance (Cap 28), and • Dumping at Sea Ordinance (Cap 466)			✓	✓	
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.			✓	✓	
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

APPENDIX D – SUMMARY OF ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Status	Other / Remarks
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Waste Management (Refer to Waste Management Plan as stated in EP Clause 2.21)								
WM17	Storage of Chemical Waste	Cap 354 sub. leg. C s. 13, 14, 15, 16, 18 & 19; PS 26.18(4)	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:					
			• 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.	✓			✓	
			• The container used for the storage of chemical waste should be used for chemical waste only and kept clean and dry all the times.	✓		✓	✓	
			• The container shall be suitable for the substance they are holding, resistant to corrosion, maintained in a good condition, and securely closed.	✓		✓	✓	
			• The container should have a capacity of less than 450 l unless the specifications have been approved by EPD.	✓			✓	
			• 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.	✓		✓	✓	
			• 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.	✓		✓	✓	

APPENDIX D – SUMMARY OF ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Status	Other / Remarks
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Waste Management (Refer to Waste Management Plan as stated in EP Clause 2.21)								
WM17 (contd)	Storage of Chemical Waste	Cap 354 sub. leg. C s. 13, 14, 15, 16, 18 & 19; PS 26.18(4)	• 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	✓		✓	✓	
			• 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)	✓		✓	✓	
			• 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.	✓		✓	✓	
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.	✓		✓	✓	

APPENDIX D – SUMMARY OF ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Status	Other / Remarks
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Waste Management (Refer to Waste Management Plan as stated in EP Clause 2.21)								
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.	✓		✓	✓	
Ecology								
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.	✓	✓	✓	✓	

APPENDIX D – SUMMARY OF ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Status	Other / Remarks
				Site Installation	Method Statement	Toolbox Talk		
Ecology								
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.	✓		✓	✓	
EC07	Disturbance the ecological sensitive receivers	EM&A section 6.2.5	Minimize the impact due to construction on the existing surrounding vegetation by:					
			• Set up of temporary tree nurseries;	✓			✓	
			• Designation of "no-intrusion zones" and to record any trespass, including the damage to the existing vegetation;			✓	✓	
			• Hill fire prevention;			✓	✓	
			• Dust and erosion control for exposed soil; and	✓		✓	✓	
			• Well-planned irrigation networks throughout the establishment period.	✓	✓	✓	✓	

APPENDIX D – SUMMARY OF ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Status	Other / Remarks
				Site Installation	Method Statement	Toolbox Talk		
Ecology								
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:					
			• Vegetation survey and subsequent transplantation of locally uncommon or restricted species as far as practicable;		✓		Uncommon or restricted species including Long Tentacle Orchid, Sword-leaved Orchid, Green-flowered Rattlesnake-Plantain, Cycad-fern, Balloon Flower and Chinese Lily	
			• Trees located within the works areas shall be preserved as far as practicable;	✓		✓	✓	
			• Placement of equipment or stockpile in designated works areas and access routes selected on existing disturbed land to minimize disturbance to natural habitats;			✓	✓	
			• Construction activities shall be restricted to the works areas that would be clearly demarcated;	✓		✓	✓	
			• The work areas shall be reinstated immediately after the completion of works;	✓			✓	
			• Landscaping works on newly formed land shall as far as possible make use of native plant species.	✓			✓	
Hazard to Life								
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.	✓	✓	✓	✓	

APPENDIX D – SUMMARY OF ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

No.	Environmental Aspect	Requirement (Classification)	Aspect Mitigation	Delivery Method			Status	Other / Remarks
				Site Installation	Method Statement	Toolbox Talk		
Landscape and Visual								
LV01	Visual and Appearance considerations	EM&A Section 6.2.5	Minimize the visual and appearance impact by:					
			careful choice between 'impermeable' and 'permeable' hoardings.	✓			✓	
			control over the appearance of construction workers, construction plants/ machines.			✓	✓	
			proper screening and careful alignment of the temporary barging point and conveyor system.	✓			In the design	
			careful selection of security floodlights to avoid light pollution.	✓			✓	
Cultural and Heritage Impact								
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.
o denotes to be implemented.

APPENDIX E – EVENT AND ACTION PLANS

Event/Action Plan for Air Quality Monitoring

Event	Action			
Action Level	CET	Contractor	PMR	IEC
Exceedance for one sample	1. Identify source. 2. Notify IEC, PMR and Contractor. 3. Conduct additional monitoring to investigate the causes. 4. Report the investigation results and if exceedance is due to contractor's construction works to the IEC, PMR and Contractor. 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.	1. Take immediate action to avoid further exceedance and rectify any unacceptable practice. 2. Submit air mitigation proposal to IEC and PMR for agreement if CET indicated that exceedance is related to the construction works. 3. Implement agreed proposal within a time scale agreed with PMR and IEC.	1. Confirm receipt of notification of failure in writing. 2. Notify Contractor. 3. Require Contractor to submit air mitigation proposal. 4. Ensure remedial measures are properly implemented.	1. Review monitoring data and investigation report submitted by CET. 2. Review Contractor's air mitigation proposal and advise the PMR accordingly. 3. Supervise and confirm in writing the implementation of remedial measures.
Exceedance for two or more consecutive samples	1. Identify source. 2. Notify EPD, IEC, PMR and Contractor. 3. Conduct additional monitoring to investigate the causes. 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. 5. 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. 6. If exceedances continue after 1-week monitoring events, request PMR to arrange meeting with PMR, IEC and contractor to discuss remedial actions.	1. Take immediate action to avoid further exceedance and rectify any unacceptable practice. 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. 3. Implement agreed proposal within a time scale agreed with PMR and IEC. 4. Amend working methods if appropriate.	1. Confirm receipt of notification of failure in writing. 2. Notify Contractor. 3. Require Contractor to submit air mitigation proposal. 4. Ensure remedial measures are properly implemented.	1. Review monitoring data and investigation report submitted by CET. 2. Discuss amongst PMR, CET and Contractor in order to formulate air mitigation proposal. 3. Review Contractor's air mitigation proposal and advise the PMR accordingly. 4. Supervise and confirm in writing the implementation of remedial measures.

APPENDIX E – 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	1. Identify source. 2. Notify EPD, IEC, PMR and Contractor. 3. Conduct additional monitoring to investigate the causes. 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. 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.	1. Take immediate action to avoid further exceedance and rectify any unacceptable practice 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 3. Implement agreed proposal within a time scale agreed with PMR and IEC. 4. Amend working methods if appropriate.	1. Confirm receipt of notification of failure in writing. 2. Notify Contractor. 3. Require Contractor to submit air mitigation proposal. 4. Ensure remedial measures are properly implemented.	1. Review monitoring data and investigation report submitted by CET. 2. Discuss amongst PMR, CET and Contractor in order to formulate air mitigation proposal. 3. Review Contractor's air mitigation proposal and advise the PMR accordingly. 4. Supervise and confirm in writing the implementation of remedial measures.
Exceedance for two or more consecutive samples	1. Identify source. 2. Notify EPD, IEC, PMR and Contractor. 3. Conduct additional monitoring to investigate the causes. 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. 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. 6. If exceedances continue after 2 consecutive monitoring events, request PMR to arrange meeting with IEC and contractor to discuss remedial actions.	1. Take immediate action to avoid further exceedance and rectify any unacceptable practice. 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. 3. Implement agreed proposal within a time scale agreed with PMR and IEC. 4. Amend working methods and proposal if appropriate. 5. Stop relevant portion(s) of works as required by PMR, CET and IEC.	1. Confirm receipt of notification of failure in writing. 2. Notify Contractor. 3. Require Contractor to submit air mitigation proposal. 4. Ensure remedial measures are properly implemented. 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.	1. Review monitoring data and investigation report submitted by CET. 2. Discuss amongst PMR, CET and Contractor in order to formulate air mitigation proposal. 3. Review Contractor's air mitigation proposal and advise the PMR accordingly. 4. Supervise and confirm in writing the implementation of remedial measures.

APPENDIX E – EVENT AND ACTION PLANS (CONT'D)

Event/Action Plan for Regular Construction Noise Monitoring

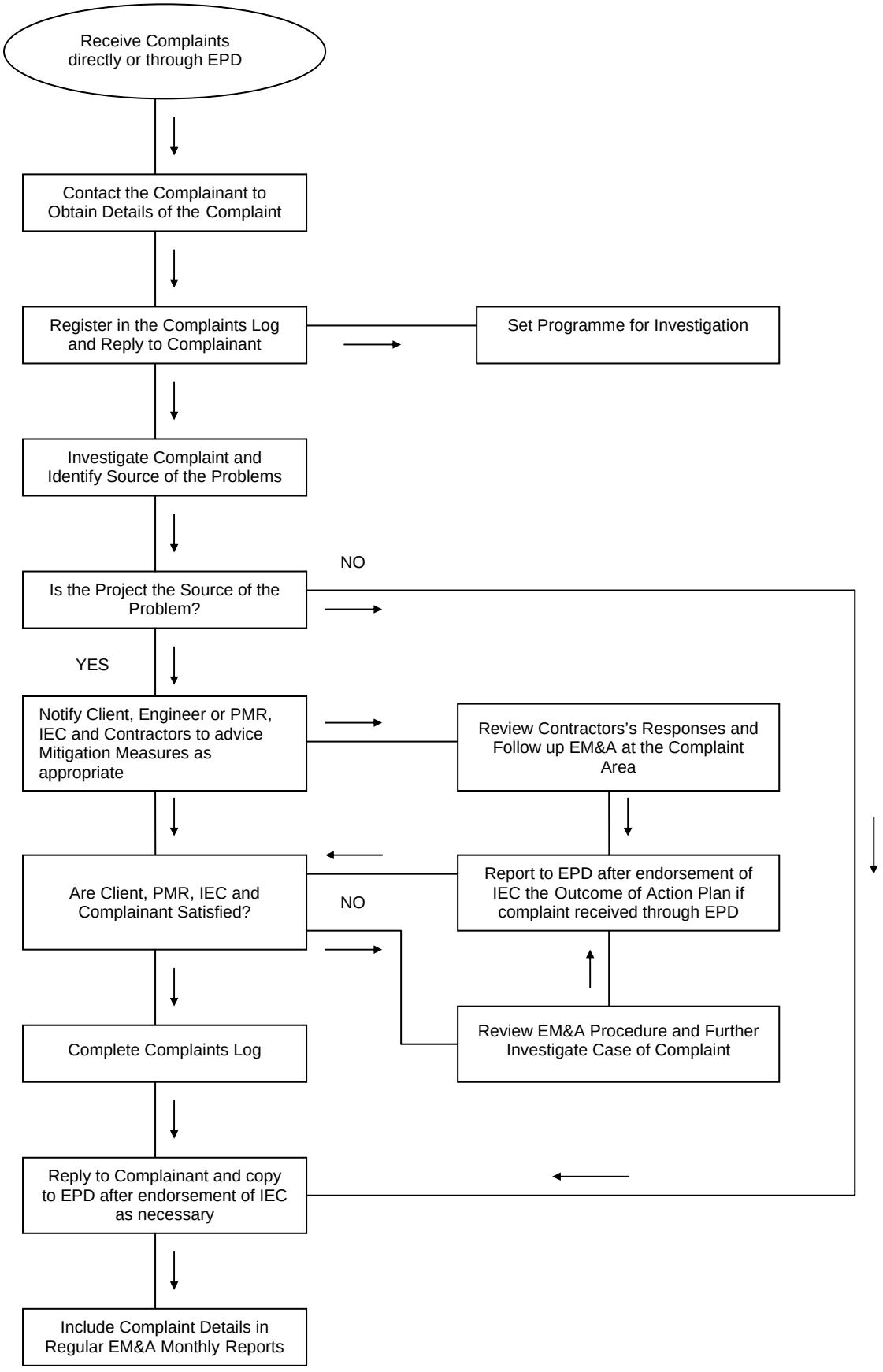
Event	Action			
	CET	Contractor	PMR	IEC
Action Level Exceedance	1. Identify source. 2. Notify IEC, PMR and Contractor. 3. Conduct additional noise monitoring to investigate the causes. 4. Report the investigation results to the IEC, PMR and Contractor. 5. Discuss with Contractor for their formulation of remedial measures if the exceedance is related to construction works. 6. Conduct additional monitoring to check mitigation effectiveness.	1. Take immediate action to avoid further exceedance. 2. Submit noise mitigation proposals to ET, PMR and IEC. 3. Implement noise mitigation proposals.	1. Confirm receipt of notification of failure in writing. 2. Notify Contractor. 3. Require Contractor to propose remedial measures for the analysed noise problem. 4. Ensure remedial measures are properly implemented.	1. Review the analysed results submitted by the CET. 2. Review the proposed remedial measures by the Contractor and advise the PMR accordingly. 3. Supervise and confirm in writing the implementation of remedial measures
Limit Level Exceedance	1. Identify source. 2. Notify EPD, IEC, PMR and Contractor. 3. Conduct additional noise monitoring and analyse Contractor's working procedures to determine possible cause of exceedance. 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. 5. Assess effectiveness by additional monitoring and report to EPD, IEC, PMR and Contractor the results. 6. If exceedance stops, cease additional monitoring.	1. Take immediate action to avoid further exceedance. 2. Submit proposals for remedial actions to CET, PMR and IEC within 3 working days of notification. 3. Implement the agreed proposals. 4. Resubmit proposals if problem still not under control. 5. Stop the relevant portion of works as determined by the PMR until the exceedance is abated.	1. Confirm receipt of notification of failure in writing. 2. Notify Contractor. 3. Require Contractor to propose remedial measures for the analysed noise problem. 4. Ensure remedial measures are properly implemented. 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.	1. Discuss amongst PMR, CET and Contractor on the potential remedial actions. 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the PMR accordingly. 3. Supervise and confirm in writing the implementation of remedial measures.

APPENDIX E – EVENT AND ACTION PLANS (CONT'D)

Event/Action Plan for Subtidal Monitoring

Event	CET
Action Level Exceedance	**Step 1 -** 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) **Step 2 -** Audit the implementation of mitigation measures on site. **Step 3 -** If non-compliance continues, check and confirm the effectiveness of mitigation measures and repeat monitoring survey measurements.
Limit Level Exceedance	Undertake **Steps 1-3**. If further exceedance of Limit Level, suspend construction works until an effective solution is identified. Once the solutions have been identified and agreed with all parties, construction works may commence.

APPENDIX F – COMPLAINT FLOW DIAGRAM AND COMPLAINT LOG



COMPLAINT RECORD REGISTER

Record ID	Date Received	Type (PMR / EPD / Public / Others, please specify)	Description	Responsible Project	Justified complaint?	Status (Open / Closed)
OPE/DBJV/PROJ/QSE/ECR/001	05-Nov-07	Public thro' EPD	The complainant claimed that dust nuisance was observed at Tai Shue Wan on 03-Nov-07.	CI05	N/A	The inspector of EPD came to the scene on 05-Nov-07 and no significant observation was made, hence the complaint was closed.
OPE/DBJV/PROJ/QSE/ECR/002	09-Jan-08	Public thro' OPC	The complainant claimed that noise nuisance was heard from the Ocean Park construction sites during the restricted hours	CI05	Justified	Under investigation, the noise nuisance was concluded from the soft ground tunnel support work adjacent to GPH. Rock breaking had to be carried out within the tunnel works areas due to safety and emergency in order to prevent the collapse of the ground support structure. With regards to the complaints, immediate action was taken and summarized as follows: • The enclosure and the acoustic doors have been built and completed on 21-Jan-08; and • Surveillance was stepped up in order to ensure that timely actions could be taken to rectify any complaints.
OPE/DBJV/PROJ/QSE/ECR/003						
OPE/DBJV/PROJ/QSE/ECR/004	13-Feb-08	Public thro' EPD	The complainant claimed that noise nuisance was heard from the Ocean Park construction sites during the restricted hours at Tai Shue Wan	CI05	Justified	With regards to the complaints, immediate action was taken and summarized as follows: • Additional noise control measures, including noise enclosure at the junction of the conveyors at Tai Shue Wan; and • Well manage the working sequence in order to minimize the impacts to the vicinity.
OPE/DBJV/PROJ/QSE/ECR/005	12-Mar-08	Public thro' EPD	The resident from Broadview Court claimed that noise nuisance from the night works at Nam Long Shan Road	CI05	Justified	With regards to the complaint, investigation has conducted and the findings and action to be taken were summarized as follows: • Movable noise panels and the noise shield have been used during the breaking works. The potential cause of the noise nuisance might be the panels were not placed properly and the noise emitted from the gap. The in-charge foreman has been reminded to place the panels properly in order to minimize the noise nuisance to the vicinity.
OPE/DBJV/PROJ/QSE/ECR/006	13-Mar-08	Public thro' EPD	The complainant claimed that noise nuisance from the night works at Nam Long Shan Road	CI05	Justified	Please refer to the findings of Record ID No. OPE/DBJV/PROJ/QSE/ECR/005.
OPE/DBJV/PROJ/QSE/ECR/007	20-Mar-08	Public thro' EPD	The complainant claimed that noise nuisance from the night works at Nam Long Shan Road	CI05	Justified	With regards to the complaint, investigation has conducted and the findings could not made any conclusions. In this context, the in-charge engineer/foreman of each CNP has notified and reminded that all requirements under the CNP should be complied with all the times.
OPE/DBJV/PROJ/QSE/ECR/008	15-Mar-08	Public thro' EPD	The complainant claimed that dust nuisance from the crusher, Nam Long Shan Road	CI05	Justified	With regards to the complaint, action was taken as follows: • Enhance the water spraying, especially the frequency, in order to minimize the dust nuisance to the vicinity. Besides, the length of dust screen was extended to increase the coverage area of stockpile to minimize the dust nuisance due to strong wind.
OPE/DBJV/PROJ/QSE/ECR/009	19-Mar-08	Public thro' EPD	The complainant claimed that noise from the temporary steel plates over trenches at Nam Long Shan Road	CI05	Justified	With regards to the complaint, immediate action was taken and summarized as follows: • Inform the in-charge foreman to provide sufficient sandbags or rubber pad before placing the temporary steel plates back to cover the trench.
OPE/DBJV/PROJ/QSE/ECR/010	25-Mar-08	Public thro' EPD	Police Training School claimed that dust nuisance from CI12C to the school	CI05	Justified	With regards to the complaint, immediate action was taken and summarized as follows: • Inform the in-charge foreman to increase the frequency of water spraying of the exposed areas.

COMPLAINT RECORD REGISTER

Record ID	Date Received	Type (PMR / EPD / Public / Others, please specify)	Description	Responsible Project	Justified complaint?	Status (Open / Closed)
OPE/DBJV/PROJ/QSE/ECR/011	23-May-08	Public thro' EPD	The complainant claimed that noise from the temporary steel plates over trenches at Nam Long Shan Road	CI05	Justified	With regards to the complaint, immediate action was taken and summarized as follows: • Inform the in-charge foreman to ensure that the temporary steel plates should be placed tight without loose and gap before leaving. • Inform the heavy vehicle drivers try to not step on the metal plate when driving thro' the metal plates and reduce the speed.

APPENDIX G – CONTACTS OF KEY ENVIRONMENTAL PERSONNEL

Company	Contact Person	Position	Telephone No.
Ocean Park Corporation	Arthur WONG	Project Manager	2910 3106
Maunsell Consultants Asia Ltd	Ernest TORBET	Project Manager Representative (PMR)	2871 5888
	KC CHAN	RSS (Safety & Environment)	2910 3155
Dragages-Bouygues J.V.	YT SO	Project QSE Manager	2555 4110
	Schroeder TAM	Project QSE Officer (Env.)	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