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OCEAN PARK
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Our Ref: PD/PW/GOV/151/006443

28 April 2011

By Hand

Environment Protection Department
Environmental Compliance Division
Regional Office (South)
2/F Chinachem Exchange Square
1 Hoi Wan Street
Quarry Bay
Hong Kong

Attention: Mr. Peter Tang

Dear Sir,

Ocean Park Master Redevelopment Project
EP-249/2006A – Condition 3.4 of Monthly EM & A Report (March 2011)

Pursuant to Condition 3.4 of the above referenced Environmental Permit, we enclose herewith one hard copy and one electronic copy of the Monthly EM & A Report for March 2011. The report has been certified by the Project ET Leader and verified by IEC.

Yours faithfully,
For and on behalf of
Ocean Park Corporation

Lindsay Pickles
Project Development Director

LP/ec

Encl + CD

cc Master File (w/e)
OPC - Mr. Arthur Wong, PMR (w/e)
Aecom / PMR - Mr Mike Wong (w/e)
EPD - Ms. Mable Chan (with two hard copies and one soft copy)
AFCD - Dr. Cheung Ka Hong (w/e)

Ocean Park Master Redevelopment Project

EP-249/2006/A – Condition 3.4

Monthly EM&A Report – March 2011

Certified by _____ on 28 April-11

Lindsay Pickles (ETL)

Verified by Independent Environmental Checker on 27-April-11

IEC Certificate attached in the submission? Yes

Ocean Park Master Redevelopment Project

Environmental Permit No. EP-249/2006/B - Condition 3.4

Monthly EM&A Report – March 2011

Submitted by Ocean Park Corporation on 27-04-2011

This is to verify that

Monthly EM&A Report – March 2011

Submitted by Ocean Park Corporation

On 27-04-2011

Has been verified by the undersigned.

Signed

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

Date 27 April 2011

Ocean Park Master Redevelopment Project

Monthly Environmental Monitoring & Audit Report – March 2011

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"CS02 "Rainforest" under Part 2, and CS03 "Thrill Mountain and Polar Adventure" under Part 3. This report presents the results of EM&A works conducted in the reporting month of March 2011 (from 26 February 2011 to 25 March 2011) for construction works and in the reporting month of February (27 January 2011 to 26 February 2011) for Operational Monitoring.

Construction works at the Entry Plaza, Aqua City and Grand Aquarium under CI07 have been completed in January 2011 and, as advised to EPD on 1 April (PD/PW/GOV/151/006107), no further construction monitoring will be undertaken.

The contracts at the Summit, CS02 for the Rainforest and CS03 for the Thrill Mountain and Polar Adventure are still underway. However, other than ongoing Coral Survey, there will be no construction monitoring undertaken. The audits will continue to be carried out by the Contractors ET and OPC's ET and verified by the IEC.

Environmental monitoring for the Park's Operations has commenced upon the opening of Aqua City and with the commencement of the Symbio Show on 27 January 2011. The 1st Air Quality and Noise Monitoring Report for the Ocean Park Symbio Show is included in this report under Part 4.

No complaint, 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 March 2011.

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 under Environmental Permit, EP-249/2006/B.

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 and Construction phase has ceased in mid-February 2010
CI-07	Entry Plaza, Aqua City and Grand Aquarium	Leighton Contractors (Asia) Ltd.	15 August 2008 and Construction Phase has ceased in January 2011
CS-02	Rainforest	W. Hing Construction Co. Ltd.	11 May 2009
CS-03	Thrill Mountain and Polar Adventure	Kaden – ATAL JV	2 November 2009

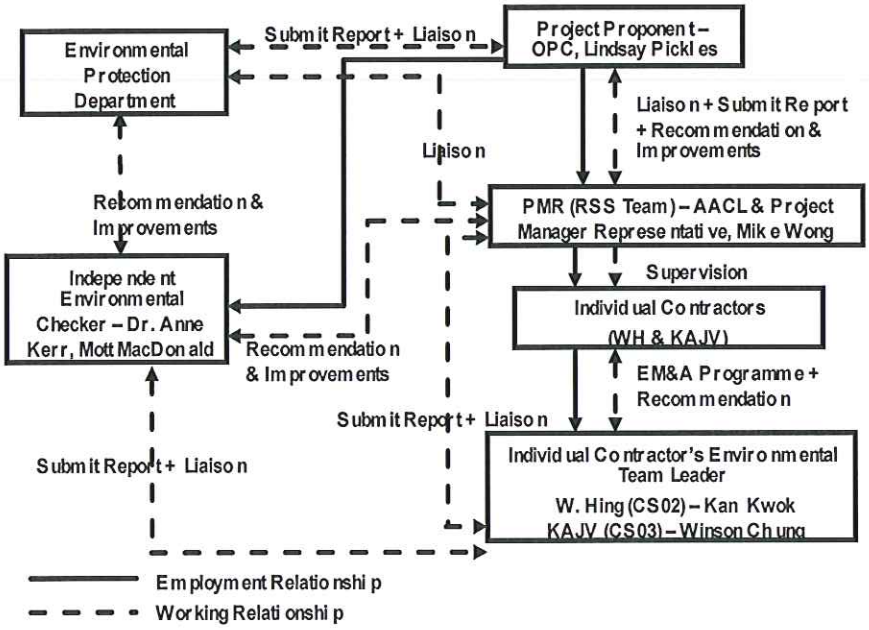
The Contractors conduct environmental audits during the construction stage and produce contract specific monthly EM&A reports. This is the combined monthly EM&A Report including the IEC audit findings, CS02 and CS03 Monthly EM&A Report, and the Operational Monitoring Report for the Ocean Park Symbio Show.

This report presents the results of EM&A works conducted in the reporting month of March 2011 (from 26 February 2011 to 25 March 2011) for construction works and in the reporting month of February 2011 (27 January 2011 to 26 February 2011) for operational monitoring.

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 are summarised as follows.

CI-05

- Construction phase has ceased in early June 2009.

CS-01

- Construction phase has ceased in mid-October 2008.

CW-02

- Construction phase has ceased in mid-February 2010.

CI-07

- Construction phase has ceased in January 2011.

CS-02

- Wiring E&M Equipment Installation, Metal Works Installation and Finishing Works at Stilt Village.
- Fit-out works for Rental Shops, Cladding for Ancillary Building, Roadworks, Tree Planting, Paving Works, and Finishing works at the External Area.

CS-03

- Construction of queue area and pools at North Pole;
- Construction of Tuxedos Restaurant at South Pole;
- Construction of Pools inside North Pole;
- Apply waterproofing membrane and carry out water test for roof of North Pole;
- Construction of Bobsled Station superstructure and installation of rides;
- Construction Footing and superstructure for Thrill Mountain;
- Erection of structure steel works for ride at Floorless Coaster Station;
- Carry out wall finishing works for PA Building;
- Apply waterproofing at roof of PA Building;
- Construction of Superstructure for Floorless Coaster;
- Construction of Drainage system and Water main for External Works;
- Installation of theme works and
- Disposal Existing Stockpile.

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.
EP-249/2006B	3 November 2010	• Total sound power level of all loudspeaker clusters shall not exceed 109 db(A) and the sound pressure level at 9m away from each loudspeaker cluster shall not exceed 75 db(A). • Submit noise review study • Submit detail design of night time functional and thematic lighting • Trial pyrotechnical special effects materials display and submit air quality sampling plan

4.2 CNP

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

Permit No.	Starting Date	Expired Date	Validity	Location	Contract No.	Status
CS-02 (W. Hing)						
GW-RS1042-10	09-Dec-10	3-Jun-11	*Notice of Issue of Construction Noise Permit* Pursuant to Section 8(6) of the Noise Control Ordinance		CS02	Valid
CS-03 (KAJV)						
GW-RS0036-11	1-Feb-11	31-Jul-11	*Various*	Top of Nam Long Shan Road	CS03	Valid
GW-RS0932-10	1-Dec-10	31-May-11	*Various*	Top of Nam Long Shan Road	CS03	Valid
GW-RS0933-10	23 Nov 10	09-May-11	*Various*	Shun Wan Road	CS03	Valid

4.3 Other Permits & Licenses

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

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	Rainforest	Valid
Registration as Chemical Waste Producer				
WPN5214-176-W1150-03	13-May-09	N/A	Rainforest	Registered
Construction Waste Disposal Billing Account with EPD				
WFG07578	N/A	N/A	Rainforest	Issued

CS-03

Permit/Ref/No	Valid Period		Section	Status
Notification of Construction Work under APCO				
311433	N/A	N/A	Thrill Mountain and Polar Adventure	Valid
Water Discharge License				
WT00005926-2010	12-Feb-10	28-Feb-15	Thrill Mountain and Polar Adventure	Valid
Registration as Chemical Waste Producer				
WPN5213-176-K2880-02	25-Nov-09	N/A	Thrill Mountain and Polar Adventure	Registered
Construction Waste Disposal Billing Account with EPD				
7009695	N/A	N/A	Thrill Mountain and Polar Adventure	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 March 2011 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
CW02, CI07, CS02 and CS03	• Combined Monthly EM&A Report (February 2011)
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
Environmental Permit Conditions	• Noise Review Study Report • Glare impact Assessment report • Air Quality Sampling Plan

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	CS-02	CS-03	Total
C&D Waste	SENT	59.15 tonnes	40..20 Tonnes	99.35 tonnes
	TKOSF	--	--	0.00 Tonnes
	TMSF	--	--	0.00 tonne
C&D Material	CWPFBP	88.28 tonnes	1731.20 tonnes	1,819.48 tonnes
	TKOFB	--	--	0.00 tonne
Chemical Waste	Collected by licensed collector	--	400 litres	400 litres
General Waste	Collected by licensed collector	--	--	0.00 tonne

7. Environmental Monitoring and Results

7.1 Monitoring Requirements

Under EP-249/2006/B 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, which has been updated to include operational monitoring of the Ocean Park Symbio Show.

7.1.1 Construction Monitoring

Construction works at the Entry Plaza, Aqua City and Grand Aquarium under CI07 have been completed in January 2011 and, as advised to EPD on 1 April 2011 (PD/PW/GOV/151/006107), no further construction monitoring will be undertaken.

The contracts at the Summit, CS02 for the Rainforest and CS03 for the Thrill Mountain and Polar Adventure are still underway. However, other than ongoing Coral Survey, no construction monitoring will be undertaken for those works, only auditing works. The audits will continue to be carried out by the Contractors ET and OPC's ET and verified by the IEC.

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 and as shown in the figure 2.1 of the Coral Survey Report (Part 4 of this report).

Coral Impact Monitoring Stations	Identity/Description
Site 1	Seaside near the Lowland
Site 2 to Site 5	Around Headland
Control Station	Between Near Round Island and Chung Hom Kok

Ocean Park Symbio Show

Operational Stage Monitoring for Ocean Park Symbio Show for Environmental Monitoring for the Symbio Show commenced on the 27 January 2011.

Air Quality monitoring was conducted at the agreed designated air quality monitoring station (AQMS) located at the rooftop of the Administrative Building in Ocean Park as presented in the Table below.

AQMS ID	Location	Sampling Height (m above ground)
AM1	Rooftop of Administrative Building (Former Staff Quarters) in Ocean Park)	10

One 24-hr average RSP sample was collected on each scheduled day for monitoring by a High Volume Sampler (HVS) following the USEPA method, EPA IO-2.1. Calibration of the equipment has followed the requirements set out in EPA IO-2.1.

Noise monitoring was conducted at five designated noise monitoring locations in accordance with the approved EM&A Manual. Alternative noise monitoring had been proposed because of accessibility problem, as set out in the Table below.

Monitoring Noise Monitoring Stations	Description	Location	With or without Façade Correction
AON1	Open Area adjacent to Police Training School	1.2m above street level	Without façade correction
AON2	Old canteen building, Ocean Park	1.2m above street level	With façade correction
AON3	Orchid Valley	1.2m above street level near the entrance gate	Without façade correction
AON4	Manly Villa	1.2m above street level near the entrance	With façade correction
AON5	Hau Yuen	1.2m above street level outside boundary wall	With façade correction

Six consecutive measurements of $L_{Aeq, 5\ min}$ reading were carried out to calculate the $L_{Aeq, 30\ min}$ noise level during the Lagoon Show.

Six consecutive measurements of $L_{Aeq, 5\ min}$ reading were carried out to calculate the $L_{Aeq, 30\ min}$ noise level before the lagoon night show, ie during daily operation of the Ocean Park without the Lagoon Show.

Three consecutive measurements of $L_{Aeq, 5\ min}$ reading were carried out to calculate the $L_{Aeq, 15\ min}$ noise level after the lagoon night show, ie without operation of the Ocean Park to establish the background noise levels.

Any significant influencing factors on the measured noise levels were taken into account in accordance with standard acoustical principles and practices. The corrected noise level due to the lagoon night show and the operation of Ocean Park was computed based on the background noise level and measured noise level.

7.2 Monitoring Results

7.2.1 Construction Monitoring Results

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 coral monitoring survey was carried out in March 2011. The next coral monitoring survey will be carried out in May 2011.

7.2.2 Operational Stage Monitoring for Ocean Park Symbio Show

The report on the impact monitoring results for the open-air night show, which commenced on 27 January 2011, is provided at Part 4 of this report.

For Air Quality Monitoring, 24-hr average Respirable Suspended Particulates (RSP) monitoring was conducted at a designated monitoring station on the rooftop of the Administrative Building in OP (AM1) on 28 January and 4, 12 and 20 February 2011. All Monitored 24-hour average RSP concentrations measured at AM1 complied with the Action/Limit (A/L) Level. No exceedance of A/L Level is monitored during the reporting period.

Monitoring Location	Monitoring Date	24-hr RSP Concentration (μgm^{-3})	Action/Limit Level (μgm^{-3})
AM1	28 January 2011	63	180
(Rooftop of Administrative	4 February 2011	88	180
Building (Old Staff Quarters in	12 February 2011	101	180
Ocean Park)	20 February 20	36	180

Noise Monitoring results indicated that the background corrected Lagoon Night Show Noise Levels have complied with the Limit Levels at all monitoring stations during all monitoring dates.

The background corrected Daily Operational Noise Levels have complied with the Limit Levels at most of the monitoring stations during most of the monitoring dates. Noise exceedances were recorded at AON1 (Open Area adjacent to Police Training School) and AON5 (Hau Yuen) due to the noise from the bus terminus and high background noise from the visitors and traffic during public holidays as indicated in the summary below.

Summary of Daily Operational Noise Exceedance during this Reporting Period

Date	Noise Monitoring Station	Measured Noise Level, dB(A)		Daily Operational Noise Level (Background Corrected) [(a)], Leq (30 min) dB(A)	Limit Level, Leq (30 min) dB(A)
		Daily Operational Noise Level, Leq (30 min) dB(A)	Background Noise Level, Leq (15 min) dB(A)		
30 Jan 2011 (Public holiday)	AON1	67.4	65.4	65.9	60
	AON5	59.9	57.1	56.6	55
6 Feb 2011 (Public holiday)	AON1	65.8	63.3	65.2	60
	AON5	58.1	54.5	55.7	55
20 Feb 2011 (Public holiday)	AON1	67.4	65.5	63.3	60

Note :
(a) The Background corrected Noise Levels were either measured in front of a façade or with façade correction of 3dB(A).

8. Site Audit

8.1 IEC Site Audit

IEC conducted monthly site audit on CS02 and CS-03 on 23 March 2011. Audit checklists are attached in Appendix A of Part 1.

CS-02 Observations:

- Two oil drums were placed on bare ground, drip tray should be provided to avoid oil spillage.
- Panel access road was dry and dusty.
- Drip try with air compressor was accumulated with roches should be cleaned to ensure effectiveness.

CS-03 Observations:

- Drip tray with a number of oil drums were accumulated with oil and water. The Contractor is reminded to remove them as chemical waste and ensure effectiveness of the drip tray.

- Stockpiles of backfill material which are idle should be covered with tarpaulin sheets or other means to suppress dust.

8.2 Non- Compliance

No non-compliances were recorded in March 2011.

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

No complaint, summon or prosecution was recorded in the reporting month.

11. Future Issues

Key Issues to be considered in the coming month include:

CI-05
- Construction phase had ceased in early-June 2009.

CS-01
- Construction phase had ceased in mid-October 2008.

CW-02
- Construction phase had ceased in mid-February 2010.

CI-07
- Construction phase had ceased in January 2011.

CS-02
- Ensure stockpile materials to be covered by tarpaulin or other means;
- Ensure water spray on haul road to avoid dusty environment
- Remove waste more frequently.
- Ensure drip tray to be provided for oil drum

CS-03
- Remove waste more frequently.
- Ensure drip tray to be provided for oil drum
- Ensure water spray on haul road to avoid dusty environment.
- Ensure stockpile materials to be covered by tarpaulin or other means.

12. Conclusion and Recommendation

12.1 Conclusion

No non-compliance from IEC, complaint, summons or prosecution related to environmental issues was made against the Ocean Park Master Redevelopment Project in the reporting period of March 2011.

Daily operational noise and lagoon night show noise monitoring was carried out at five designated monitoring stations during this reporting period. Out of the 5 stations, noise exceedances were recorded at AON1 (Open Area adjacent to Police Training School) and AON5 (Hau Yuen) due to noise emanating from the bus terminus and high background noise from visitors and traffic during the public holidays.

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 concerns raised or exceedances 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 concerns raised or exceedances 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.

Operational Stage Monitoring for Ocean Park Symbio Show

Recommendation has been given to continue with noise monitoring at the same stations using the same frequency and approach during the second to the twelfth months of the operation of the open-air night show.

To satisfy potentials concerns over RSP concentrators, recommendation has been given to 3 more AQ monitoring stations. Weekly monitoring will be conducted at all monitoring locations in the 2nd month of the operation of the Symbio Show. If the monitored results are within the AQO, the frequency will be reduced to monthly for the remaining 11 months.

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	23/03/2011	Time	13:45	Inspected By	EM: IEC: Florence Yuen Contractor: CS02: L. Wong CS03: W. Chung
Site Location	CS02 CS03				

Weather

Condition	☐	Sunny	☐	Fine	☑	Overcast	☐	Drizzle	☐	Rain	☐	Storm	☐ Hazy
Temperature	18 °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?			✓		CS02 ① P1120786 ③ P1120796 CS03 ① P1120772
	• 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?				✓ (502②)P1120790
	• 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?				✓ (503②)P1120777
	• Is open stockpiles avoided or covered and placed far enough from the ASRs?			✓	
	• Is the dropping height of material restricted to minimise the fugitive dust from unloading/loading?			✓	
	• Is tarpaulin used to cover all dusty vehicle loads transported to, from and within the site?			✓	
	• Are vehicle wheel and body washing facilities available at the exit points of the site?			✓	
	• Are wind shield and dust extraction units or similar dust mitigation measures provided at the loading points? If dust generation is likely during the process, particularly in dry seasons, is water sprinklers provided at the loading site?			✓	
	• Do the vehicles comply with the recommended speed limit of 10 km/h on unpaved roads?			✓	
	• Are dusty activities rescheduled during high-wind conditions?		✓		
	• Are the routing of vehicles and positioning of construction plants at maximum possible distance from the ASRs?			✓	
	• Is suitable buffer zone provided and work areas fenced off with hoarding (not less than 2.4m from ground level)?			✓	
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?			✓	
	• 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?		✓			
	• Are open stockpiles of construction materials or construction wastes of more than $50m^3$ covered with tarpaulin during rainstorm?		✓			
	In case of an excavation in rainy seasons: • Is temporary exposed slope/soil surfaces covered by tarpaulin as far as practicable?		✓			
	• 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?		✓			
	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?			✓		
	• 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?		✓			

Observations for this month

(1) Two oil drums were placed on bareground. Drip tray should be provided to avoid oil spillage.

(2) Paved access road was dry and dusty.

(3) Drip tray with air compressor was accumulated with rocks. Should be cleared to ensure effectiveness.

IEC Representative	Environmental Manager	Contractor's Representative CS02
Florence Yuen		
(Florence Yuen)	(Lindsay Pickles 23/3/11)	([illegible] WONG)

Observations for this month

(1) Drip tray with a number of oil drums was accumulated with oil and water. The Contractor is reminded to remove them as chemical waste and ensure effectiveness of the drip tray.

(2) Stockpiles of backfill material which are idle should be covered with tarpaulin sheets or other means to suppress dust

IEC Representative	Environmental Manager	Contractor's Representative CS03
Florence Yuen		
(Florence Yuen)	(Lindsay Pickles) 23/3/11	(Wilson Chung 23/3/11)

Ocean Park Master Redevelopment Project
Contract P007
Independent Environmental Checker

MONTHLY SITE INSPECTION PHOTOS

Contract CS02 Rainforest	
Follow up observations in February 2011	
Observation in last site inspection	**Observation in this site inspection**
	
P1120580: General refuse and construction waste were accumulated around the waste skip. The Contractor was reminded to remove them from site more frequently to avoid accumulation.	Closed – P1120787: Removal of general refuse and construction waste from the site was in progress.
	
P1120578: A drip tray with diesel drums was accumulated with sand and mud. The Contractor was reminded to clear any materials accumulated in the drip tray to ensure effectiveness.	P1120796: A drip tray with an air compressor was accumulated with rocks and other materials. The Contractor was reminded to clear any materials accumulated in the drip tray to ensure effectiveness.

Observations in March 2011	
	
P1120786: Two oil drums were placed on bareground. The Contractor was reminded to provide drip tray to all oil drums on-site to avoid oil spillage.	P1120790: Paved access road was dry and dusty. The Contractor was reminded to clear the dusty materials deposited on the paved access road more frequently.

Ocean Park Master Redevelopment Project
Contract P007
Independent Environmental Checker

MONTHLY SITE INSPECTION PHOTOS

Contract CS03 Trill Mountain and Polar Adventure	
Follow up observations in February 2011	
Observation in last site inspection	**Observation in this site inspection**
	
P1120566: A few oil drums were scattered on bare ground and oil stain was observed. The Contractor was reminded to place them in drip trays to avoid oil spillage and dispose the contaminated sand as chemical waste.	P1120772: Drip tray with a number of oil drums was accumulated with oil and water. The Contractor was reminded to remove the oil and water as chemical waste and maintain and ensure effectiveness of the drip tray.
	
P1120564: A stockpile of C&D material was uncovered. The Contractor was reminded to cover any idle stockpiles on-site with tarpaulin sheets or other means to suppress dust.	P1120777: Idled stockpiles of backfill materials were not covered. The Contractor was reminded to cover all idle stockpiles with tarpaulin sheets or other means to suppress dust.

Part 2 CS-02 EM&A REPORT (March 2011)

W. Hing Construction Co., Ltd.

Ocean Park Redevelopment Project
Contract No. CS02 - Rainforest

Monthly EM&A Report
(Version 1.0)

March 2011

Approved By: _____

Billy Lee
Construction Manager

REMARKS:

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

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EXECUTIVE SUMMARY

Introduction

This is the 22nd 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 in March 2011.

- Wiring, E&M Equipment Installation, Metal Works Installation and Finishing Works at Stilt Village
- Fit-out Works for Retail Shops, Cladding for Ancillary Building, Tree Planting, Paving Works and Finishing Works 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. Weekly Environmental site audits were conducted on 4th, 11th, 18th, 25th March 2011. No non-compliance was observed during the site audits. Monthly Environmental Audit was conducted on 23rd March 2011 by Independent Environmental Checker (IEC). 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:

- Fit-out works for Rental Shop, Ancillary Building, Roadworks, Paving Works, E&M Equipment Testing and Commissioning and Finishing Works 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 December 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 (July 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 22nd monthly EM&A Report summarizing the EM&A works for the Project in March 2011.

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	Ms Lindsay Pickles	Project Development Director	2910 3109	2814 0179
	Mr. Andy Ng		90118067	
Contractor ET	Mr. Billy Lee	Construction Manager	6193 4096	2518 4883
	Mr. Eddie Chiu	Environmental & Safety Manager	6105 4075	
	Mr. Wesley Lo	Environmental Officer	6277 1749	
	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:

- Wiring, E&M Equipment Installation, Metal Works Installation and Finishing Works at Stilt Village
- Fit-out works for Rental Shops, Cladding for Ancillary Building, Roadworks, Tree Planting, Paving Works, and Finishing Works 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 March 2011.

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 4th, 11th, 18th, 25th March 2011. No non-compliance was observed during the site audits. The monthly site audits conducted by the IEC conducted on 23rd March 2011 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
Air	23/03/2011	Site access road was dry and dusty. It shall be sprayed with water to prevent dust dispersion.	This item was rectified on 23/03/2011.
Waste/ Chemical Management	23/03/2011	Oil drums were placed on bareground. Drip tray should be provided to avoid oil spillage.	This item was rectified on 23/03/2011.
		Drip tray with air compressor was accumulated with rocks. It should cleared to ensure effectiveness.	This item was rectified on 23/03/2011.

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				
GW-RS1042-10	09/12/2010	03/06/2011	Notice of Issue of Construction Noise Permit Pursuant to Section 8(6) of the Noise Control Ordinance	Valid
GW-RS0504-10	18/06/2010	08/12/2010	Notice of Issue of Construction Noise Permit Pursuant to Section 8(6) of the Noise Control Ordinance	Expired
GW-RS0925-09	14/12/2009	08/06/2010	Notice of Issue of Construction Noise Permit Pursuant to Section 8(6) of the Noise Control Ordinance	Expired
GW-RS0756-09	10/10/2009	13/03/2009	Notice of Issue of Construction Noise Permit Pursuant to Section 8(6) of the Noise Control Ordinance	Cancel
Water Discharge License				
WT00004136-2009	19/06/2009	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:

- Fit-out works for Rental Shops, Ancillary Building, Roadworks,, Paving Works, E&M Equipment Testing and Commissioning and Finishing Works 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 Three environmental site audits were performed in March 2011. No non-compliance was observed during the site audits.

4.1.2 No exceedance 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:

Air Impact

- Site haul road shall be watered regular to prevent dust dispersion.
- Excavated material, cement bags and stockpile shall be covered up with tarpaulin sheet.

Water Quality Impact

- Waste water shall only be treated and discharged in accordance with requirement of the permit.

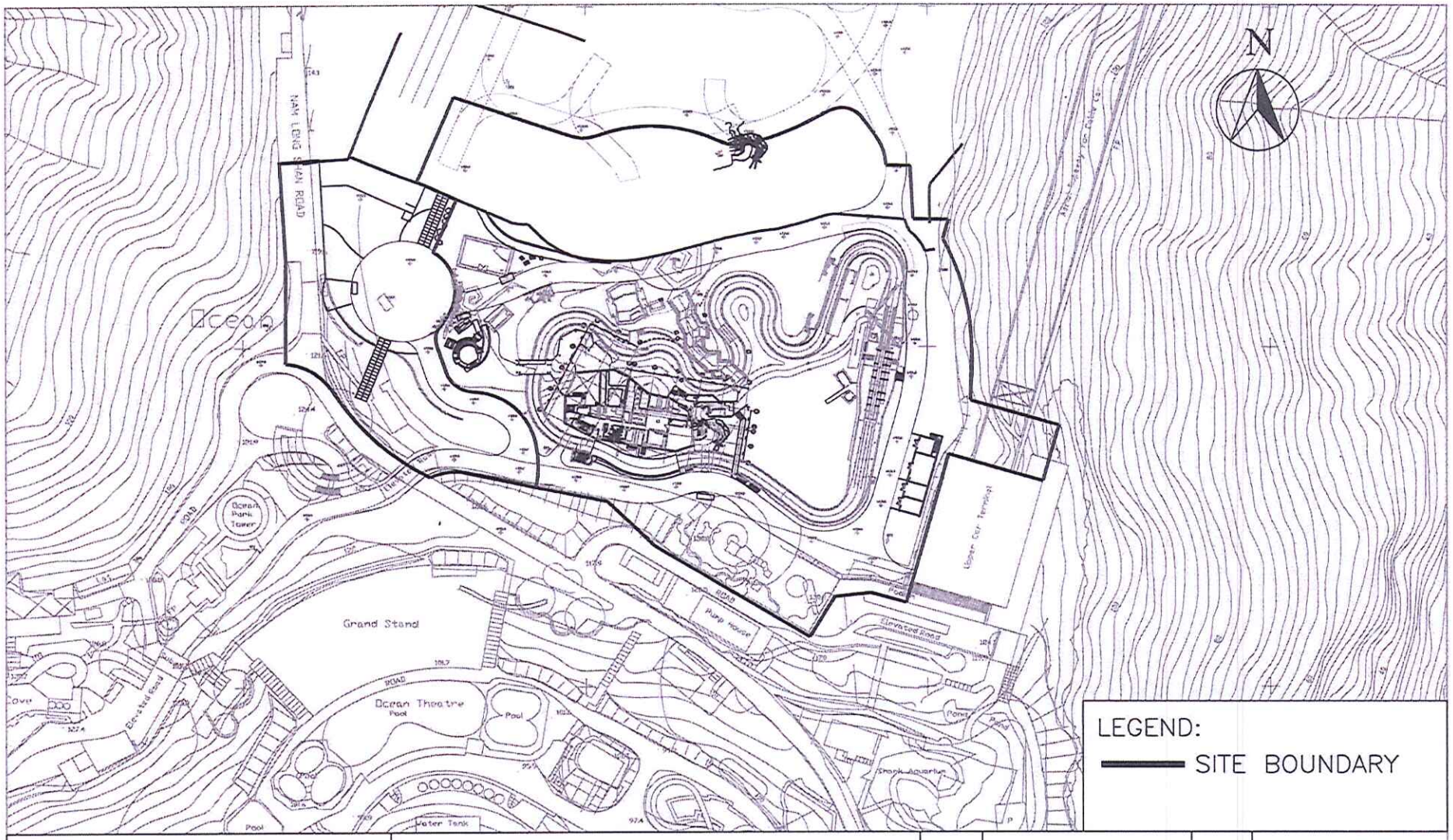
Chemical Management

- Chemical container shall be stored in the drip tray.

Waste Management

- Accumulation of construction waste at the waste collection point was observed. Contractor was reminded to clear and remove waste water from the site more frequently.

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	23/03/2011	Time	13:45	Inspected By	EM: IEC: Florence Yuen Contractor: CS02: L. Wong CS03: W. Chung
Site Location	CS02 CS03				

Weather

Condition	☐	Sunny	☐	Fine	☑	Overcast	☐	Drizzle	☐	Rain	☐	Storm	☐ Hazy
Temperature	18 °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?			✓		CS02 ① P1120786 ③ P1120796 CS03 ① P1120772
	• 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?				✓ (S02②)P1120790
	• 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?				✓ (S03②)P1120777
	• Is open stockpiles avoided or covered and placed far enough from the ASRs?			✓	
	• Is the dropping height of material restricted to minimise the fugitive dust from unloading/loading?			✓	
	• Is tarpaulin used to cover all dusty vehicle loads transported to, from and within the site?			✓	
	• Are vehicle wheel and body washing facilities available at the exit points of the site?			✓	
	• Are wind shield and dust extraction units or similar dust mitigation measures provided at the loading points? If dust generation is likely during the process, particularly in dry seasons, is water sprinklers provided at the loading site?			✓	
	• Do the vehicles comply with the recommended speed limit of 10 km/h on unpaved roads?			✓	
	• Are dusty activities rescheduled during high-wind conditions?		✓		
	• Are the routing of vehicles and positioning of construction plants at maximum possible distance from the ASRs?			✓	
	• Is suitable buffer zone provided and work areas fenced off with hoarding (not less than 2.4m from ground level)?			✓	
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?			✓	
	• 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?		✓		
	• Are open stockpiles of construction materials or construction wastes of more than $50m^3$ covered with tarpaulin during rainstorm?		✓		
	In case of an excavation in rainy seasons: • Is temporary exposed slope/soil surfaces covered by tarpaulin as far as practicable?		✓		
	• 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?		✓		
	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?			✓	
	• 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?		✓			

Observations for this month

(1) Two oil drums were placed on bareground. Drip tray should be provided to avoid oil spillage.

(2) Paved access road was dry and dusty.

(3) Drip tray with air compressor was accumulated with rocks. Should be cleared to ensure effectiveness.

IEC Representative	Environmental Manager	Contractor's Representative CS02
Florence Yuen		
(Florence Yuen)	(Lindsay Pickles 23/3/11)	(LEO WONG)

Observations for this month

(1) Drip tray with a number of oil drums was accumulated with oil and water. The Contractor is reminded to remove them as chemical waste and ensure effectiveness of the drip tray

(2) Stockpiles of backfill material which are idle should be covered with Tarpaulin sheets or other means to suppress dust

IEC Representative	Environmental Manager	Contractor's Representative CS03
Florence Yuen		
(Florence Yuen)	(Lindsay Pickles) 23/3/11	(Wilson Chung) 23/3/11

Ocean Park Master Redevelopment Project
Contract P007
Independent Environmental Checker

MONTHLY SITE INSPECTION PHOTOS

Contract CS02 Rainforest	
Follow up observations in February 2011	
Observation in last site inspection	**Observation in this site inspection**
	
P1120580: General refuse and construction waste were accumulated around the waste skip. The Contractor was reminded to remove them from site more frequently to avoid accumulation.	Closed – P1120787: Removal of general refuse and construction waste from the site was in progress.
	
P1120578: A drip tray with diesel drums was accumulated with sand and mud. The Contractor was reminded to clear any materials accumulated in the drip tray to ensure effectiveness.	P1120796: A drip tray with an air compressor was accumulated with rocks and other materials. The Contractor was reminded to clear any materials accumulated in the drip tray to ensure effectiveness.

Observations in March 2011	
	
P1120786: Two oil drums were placed on bareground. The Contractor was reminded to provide drip tray to all oil drums on-site to avoid oil spillage.	P1120790: Paved access road was dry and dusty. The Contractor was reminded to clear the dusty materials deposited on the paved access road more frequently.

Ocean Park Master Redevelopment Project
Contract P007
Independent Environmental Checker

MONTHLY SITE INSPECTION PHOTOS

Contract CS03 Trill Mountain and Polar Adventure	
Follow up observations in February 2011	
Observation in last site inspection	**Observation in this site inspection**
	
P1120566: A few oil drums were scattered on bare ground and oil stain was observed. The Contractor was reminded to place them in drip trays to avoid oil spillage and dispose the contaminated sand as chemical waste.	P1120772: Drip tray with a number of oil drums was accumulated with oil and water. The Contractor was reminded to remove the oil and water as chemical waste and maintain and ensure effectiveness of the drip tray.
	
P1120564: A stockpile of C&D material was uncovered. The Contractor was reminded to cover any idle stockpiles on-site with tarpaulin sheets or other means to suppress dust.	P1120777: Idled stockpiles of backfill materials were not covered. The Contractor was reminded to cover all idle stockpiles with tarpaulin sheets or other means to suppress dust.

APPENDIX C
SUMMARY OF WASTE GENERATED

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

Monthly Summary Waste Flow Table

Month	Actual Quantities of Inert C&D Materials Generated		Non-inert C&D Waste disposed to Sorting Facilities at Tseung Kwan O	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 Fill Bank at Tseung Kwan O	Disposed to Public Fill Barging Point 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	10.1	N/A	23.74	N/A	N/A	N/A
Sep-09	N/A	152.30	N/A	9.27	N/A	N/A	N/A
Oct-09	N/A	256.09	N/A	20.55	N/A	N/A	N/A
Nov-09	N/A	522.69	N/A	23.15	N/A	N/A	N/A
Dec-09	N/A	207.94	N/A	22.46	N/A	N/A	N/A
Jan-10	N/A	427.83	N/A	39.62	N/A	N/A	N/A
Feb-10	N/A	437.81	N/A	21.44	N/A	N/A	N/A
Mar-10	N/A	235.38	N/A	33.51	N/A	N/A	N/A
Apr-10	N/A	504.52	N/A	33.04	N/A	N/A	N/A
May-10	N/A	577.89	N/A	26.1	N/A	N/A	N/A
Jun-10	N/A	565.63	N/A	41.34	N/A	N/A	N/A
Jul-10	N/A	732.8	N/A	37.71	N/A	N/A	N/A
Aug-10	N/A	889.23	N/A	46.38	N/A	N/A	N/A
Sep-10	N/A	1506.21	N/A	42.31	N/A	N/A	N/A
Oct-10	N/A	1025.56	N/A	72.64	N/A	N/A	N/A
Nov-10	N/A	768.63	N/A	124.13	N/A	N/A	N/A
Dec-10	N/A	194.61	N/A	91.33	N/A	N/A	N/A
Jan-11	N/A	47.87	N/A	27.44	N/A	N/A	N/A
Feb-11	N/A	92.71	N/A	38.95	N/A	N/A	N/A
Mar-11	N/A	88.28	N/A	59.15	N/A	N/A	N/A
Total:	0	9244.08	0	810.52	0	0	0

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.	C
	◆ Use of frequent watering for particularly dusty construction areas, temporary stockpiles and areas close to ASRs.	C
	◆ 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.	C
	◆ Open stockpiles shall be avoided or covered. Where possible, prevent placing dusty material storage piles near ASRs.	C
	◆ Restricting heights from which materials are dropped, as far as practicable to minimize the fugitive dust arising from unloading/ loading.	C
	◆ Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations.	R
	◆ Use of vehicle wheel and body washing facilities at the exit points of the site.	C
	◆ 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.	R
	◆ Imposition of speed controls for vehicles on unpaved site roads. Ten kilometers per hour is the recommended limit.	C
	◆ 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. •	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

Remarks:

C	Compliance of mitigation measure	NC	Non-compliance of mitigation measure	N/A	Not Applicable
*	Non-compliance but rectified by the contractor	R	Recommendation was made during site audit but improved/rectified by the contractor.		

APPENDIX D - Summary of Environmental Mitigation Implementation Schedule

Types of Impacts	Mitigation Measures	Status
Construction Dust	*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.	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	C
	◆ Silencers or mufflers on construction equipment should be utilized and should be properly maintained during the construction programme	C
	◆ Mobile plant, if any, should be sited as far from NSRs as possible.	C
	◆ 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	C
	◆ 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	C
	◆ Material stockpiles and other structures should be effectively utilized, wherever practicable, in screening noise from on-site construction activities	N/A

Remarks:

C	Compliance of mitigation measure	NC	Non-compliance of mitigation measure	N/A	Not Applicable
*	Non-compliance but rectified by the contractor	R	Recommendation was made during site audit but improved/rectified by the contractor.		

APPENDIX D - Summary of Environmental Mitigation Implementation Schedule

Types of Impacts	Mitigation Measures	Status
Construction Noise	*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	C
	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 OPC Guest Route during the examination periods. Early liaison with the OPC of this impacted area 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 area to comply with the noise criterion of 65dB(A).	C C N/A

Remarks:

C	Compliance of mitigation measure	NC	Non-compliance of mitigation measure	N/A	Not Applicable
*	Non-compliance but rectified by the contractor	R	Recommendation was made during site audit but improved/rectified by the contractor.		

APPENDIX D - Summary of Environmental Mitigation Implementation Schedule

Types of Impacts	Mitigation Measures	Status
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.	C
	◆ 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.	C
	◆ Placement of equipment or stockpile in designated works areas and access routes selected on existing disturbed land to minimise disturbance to natural habitats	R
	◆ Construction activities shall be restricted to the work areas that would be clearly demarcated	C
	◆ The work areas shall be reinstated immediately after completion of the works	C
	◆ Waste skips shall be provided to collect general refuse and construction wastes. The wastes would be disposed of timely and properly off-site.	R
	◆ Drainage arrangements shall include sediment traps to collect and control construction run-off	C
	◆ Open burning on works sites is illegal, and shall be strictly enforced	C
	◆ Landscaping works on newly formed land shall as far as possible make use of native plant species	C

Remarks:

C	Compliance of mitigation measure	NC	Non-compliance of mitigation measure	N/A	Not Applicable
*	Non-compliance but rectified by the contractor	R	Recommendation was made during site audit but improved/rectified by the contractor.		

APPENDIX D - Summary of Environmental Mitigation Implementation Schedule

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	C
	◆ 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. Catch pits and perimeter channels should be constructed in advance of relevant site formation works.	C
	◆ Boundaries of earthworks should be marked and surrounded by dykes or embankments for flood protection, as necessary.	R
	◆ 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.	C
	◆ 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.	R
	◆ Exposed soil surfaces should be covered.	R

Remarks:

C	Compliance of mitigation measure	NC	Non-compliance of mitigation measure	N/A	Not Applicable
*	Non-compliance but rectified by the contractor	R	Recommendation was made during site audit but improved/rectified by the contractor.		

APPENDIX D - Summary of Environmental Mitigation Implementation Schedule

Types of Impacts	Mitigation Measures	Status
Water Quality	◆ Water pumped out from foundation excavations should be discharged into silt removal facilities.	C
	◆ 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.	R
	◆ Exposed soil areas should be minimized to reduce potential for increased siltation and contamination of runoff.	R
	◆ 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	C
	◆ Open stockpiles of construction materials or construction wastes on-site of more than 50m3 should be covered with tarpaulin or similar fabric during rainstorms	R
	General Construction Activities	
	◆ Debris and refuse generated on-site should be collected	C
	◆ 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	C
	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	C

Remarks:

C	Compliance of mitigation measure	NC	Non-compliance of mitigation measure	N/A	Not Applicable
*	Non-compliance but rectified by the contractor	R	Recommendation was made during site audit but improved/rectified by the contractor.		

APPENDIX D - Summary of Environmental Mitigation Implementation Schedule

Types of Impacts	Mitigation Measures	Status
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	C
	◆ regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors	R
	◆ training of site personnel in proper waste management and chemical handling procedures	R
	◆ provision of sufficient waste disposal points and regular collection for disposal	R
	◆ appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers	R
	Waste Reduction Measures	
	◆ sort C&D waste from demolition and decommissioning of the existing facilities to recover recyclable portions such as metals	C
	◆ 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.	R
	◆ proper storage and site practices to minimise the potential for damage or contamination of construction materials	R
	◆ 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.	C
	◆ plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste.	R

Remarks:

C	Compliance of mitigation measure	NC	Non-compliance of mitigation measure	N/A	Not Applicable
*	Non-compliance but rectified by the contractor	R	Recommendation was made during site audit but improved/rectified by the contractor.		

APPENDIX D - Summary of Environmental Mitigation Implementation Schedule

Types of Impacts	Mitigation Measures	Status
Waste / Chemical	*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.	R
	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.	C C C
	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	R

Remarks:

C	Compliance of mitigation measure	NC	Non-compliance of mitigation measure	N/A	Not Applicable
*	Non-compliance but rectified by the contractor	R	Recommendation was made during site audit but improved/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

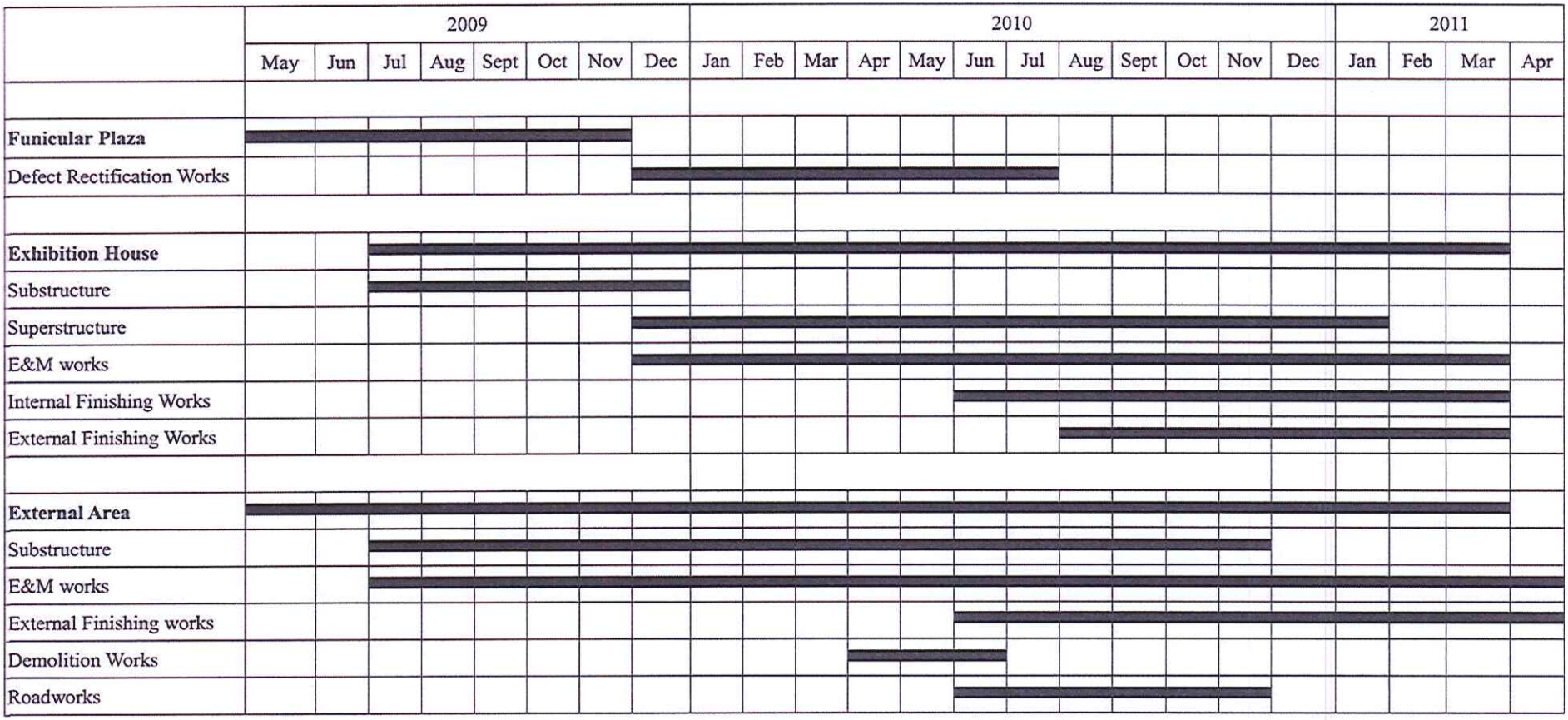
Event	Action		
	Contractor's ET	Contractor	PM
Action Level	1. Identify source 2. Notify Contractor and PM 3. Conduct additional monitoring to investigate the causes, if necessary 4. Report the investigation results and if exceedance to Contractor and PM	1. Take immediate action to avoid further exceedance 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.

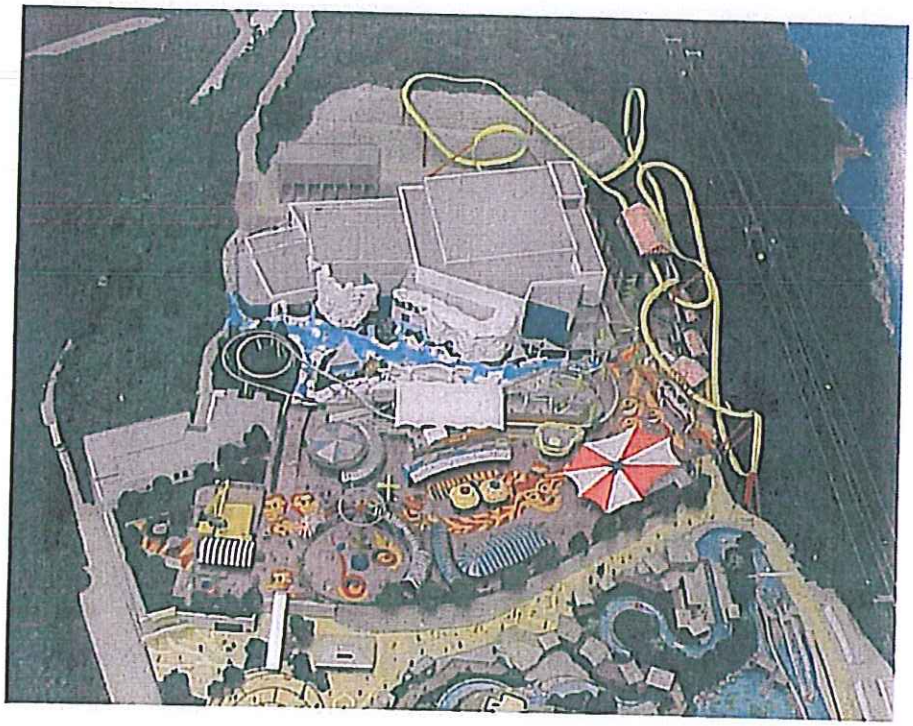
Ocean Park Redevelopment Project Contract No.: CS02 – Rainforest

Outline Program



Part 3 CS-03 EM&A REPORT (March 2011)

KADEN - ATAL JOINT VENTURE



Contract No. CS03

Ocean Park Redevelopment Project - Thrill Mountain & Polar Adventure

Monthly EM&A Report

March 2011

Prepared By	Winson Chung
Certified By	(Eric Wong)
	(Construction Manager)

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EXECUTIVE SUMMARY

Introduction

This is the 10th monthly Environmental Monitoring and Audit (EM&A) Report prepared by Kaden – ATAL JV for the Contract No. CS03 "Ocean Park Redevelopment Project – Thrill Mountain & Polar Adventure" (hereinafter called "the Project"). The Project was commenced on 2nd November 2009. This document reports the findings of the environmental auditing works conducted in March 2011.

The major site activities undertaken in the reporting month included:

- Construction of queue area and pools at North Pole;
- Construction of Tuxedos Restaurant at South Pole;
- Construction of Pools inside North Pole;
- Apply waterproofing membrane and carry out water test for roof of North Pole;
- Construction of Bobsled Station superstructure and installation of rides;
- Construction Footing and superstructure for Thrill Mountain;
- Erection of structure steel works for ride at Floorless Coaster Station;
- Carry out wall finishing works for PA Building;
- Apply waterproofing at roof of PA Building;
- Construction of Superstructure for Floorless Coaster;
- Construction of Drainage system and Water main for External Works;
- Installation of theme works and
- Disposal Existing Stockpile prior.

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 4th, 11th, 18th & 23rd March 2011 and the environmental ICE monthly site inspection was conducted on 23rd March 2011 and No non-compliance was observed during the site audits.

The implementation of the environmental mitigation measures was checked and the environmental management plan was submitted.

No notification of exceedance was received from the Assistance Project Environmental Team Leader (ETL) in the reporting month.

Environmental Licenses and Permits

Licenses/Permits granted to the Project include the Environmental Permit (EP) for the Redevelopment Project, Construction Noise Permit (CNP), Billing Account for Disposal of Construction Waste and Water Discharge License

Registration of Waste Producer (Chemical Waste), and notification pursuant to Section 3(1) of the Air Pollution Control (Construction Dust) Regulation was acknowledged by EPD.

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:

- Construction of Pools inside North Pole;
- Construction Superstructure for Floorless Coaster;
- Construction of Communal Toilet Structure at South Pole;
- Construction of Concrete Structure for Bobsled Station;
- Installation of Ride Track at Floorless Coaster and Bobsled Station;
- Construction of Concrete Structure for Thrill Mountain Area;
- Internal Finishing Works at PA Building;
- Construction of road works for permanent EVA Access;
- Construction of Drainage System and Water Main for Thrill Mountain and Bobsled Station Area.
- Installation of theme works.

1. INTRODUCTION

Background

1.1 Kaden-ATAL JV (the Contractor) was commissioned by the Employer to undertake the construction of the Contract No. CS03 "Ocean Park Redevelopment Project – Thrill Mountain & Polar Adventure" (the Project) and the project was commenced on 2nd November 2009. The site layout plan is illustrated in Figure 1.1.

1.2 These report summaries the environmental monitoring and audit works for the Project in the month of March 2011.

1.3 The scope of works for the Project includes:

(a) Construction of summit reservoir and associated pump room.
(b) Construction of vehicular bridge.
(c) Construction of the Polar Adventure Building.
(d) Construction of back of house facilities in the Polar Adventure Building.
(e) Construction of other one to three storey buildings in Polar Adventure.
(f) Construction of foundation and installation of Bobsled Ride.
(g) Installation of Life Support Systems.
(h) Construction of one to three storey buildings in Thrill Mountain.
(i) Construction of foundation and installation of the Floorless Coaster.
(j) Installation of the Ultramax, Aviator, Musik Express and Bumper Car.
(k) New roadwork, paving, footpaths and infrastructure support.
(l) Installation of building services.
(m) Soft and hard landscape works.
(n) Construction of underground utilities and services.
(o) Construction of earth retaining structures.
(p) Construction of all interior fitting out works.
(q) Supply and installation of all elevator(s) and escalator(s).
(r) Coral survey and maintenance of existing suit curtain.

Project Organizations

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

- The Engineer and Project Environmental Team Leader (ETL) – AECOM Consultant Ltd.
- Contractor – Kaden-ATAL JV.
- Independent Environmental Checker (IEC) – Mott MacDonald HK Ltd.

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

1.6 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. Tommy Lau	RSS Representative (Safety & Environmental)	2552 1546	2552 1406
Contractor	Mr. Keith Kwan	Acting Project Manager	3582 6099	3582 4877
	Mr. Eric Wong	Construction Manager	3582 6005	
Contractor's ET	Mr. Alex Enagnon Gbaguidi	Contractor's Assistance Environmental Team Leader	3582 4880	3582 4877
IEC	Miss Florence Yuen	Independent Environmental Checker (IEC) Representative	2828 5757	28271823

Construction Programme

1.7 The site activities undertaken in the reporting month were:

- Construction of queue area and pools at North Pole;
- Construction of Tuxedos Restaurant at South Pole;
- Construction of Pools inside North Pole;
- Apply waterproofing membrane and carry out water test for roof of South Pole;
- Construction of Bobsled Station superstructure and installation of rides;
- Erection of structure steel works for ride at Floorless Coaster Station;
- Carry out wall finishing works for PA Building;
- Construction of Superstructure for Floorless Coaster;
- Construction of Drainage system and Water main for External Works;
- Construction of Road Work for EVA Access and;
- Disposal Existing Stockpile.
- Installation of theme works.

Summary of EM&A Requirements

1.8 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 the Contractor's EM&A Manual.

1.9 This report presents the environmental monitoring and audit works for the Project in March 2011.

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 4th, 11th, 18th & 23rd March 2011 and the environmental ICE monthly site inspection was conducted on 23rd March 2011. 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
Waste/ Chemical Management	11/03/11	General refuse were scattered on site.	Remove the waste from site more frequently or put into skip at nearby area.
	23/03/11	Drip tray with a number of oil drums was accumulated with oil and water.	Remove oil and water in drip tray.
Dust Control	4/03/11	Some sections of haul roads were dry and dusty.	Provide water spray regularly to suppress dust.
	23/03/11	Idled stockpiles of backfill materials were not covered.	Stockpiles were covered with tarpaulin sheet or spraying water regularly.
Air Pollution	23/3/11	N/A	

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				
WPN5213-176-K2880-02	25/11/2009	N/A	Waste Disposal (Chemical Waste) (General) Regulation - Registration of Waste Producer	Valid
Construction Noise Permit				
GW-RS0036-11 GW-RS0932-10 GW-RS0933-10	01/02/2011 01/12/2010 23/11/2010	31/07/2011 31/05/2011 09/05/2011	Construction Noise Permit for Top of Nam Long Shan Rd., Ocean Park, 180 Wong Chuk Hang, Hong Kong	Valid Valid Valid
Water Discharge License				
WT00005926-2010	05/11/2009	28/02/2015	Discharge of industrial trade effluent arising from the Sedimentation tank at the construction site (CS03 Ocean Park Redevelopment Project) to communal storm water drain.	Valid
Others				
311433	N/A	N/A	Notification Pursuant to Section 3(1) of the Air Pollution Control (Construction Dust) Regulation	Valid
7009695	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 **Table 2.3.**

Table 2.3 Actual Quantity of Waste Generated in March 2011

Waste Type	Examples	Actual quantity disposed (Tonnes / Liter)	Disposal Locations
C&D Waste	Construction waste (Plastic, wood and bamboo)	40.2 (T)	SENT Landfill
	Mixed rock & soil	1731.2 (T)	CW barging point
Chemical waste	Used oil, spent solvent	400 L	Collected by licensed collector

Implementation Status of Environmental Mitigation Measures

2.6 During site inspections in the month, the following observations and recommendations were made.

Water Quality Mitigation Measures

- The waste water was recycled for wheel washing and dust control and Septic Tank should be maintain well functioning.

Air Quality Mitigation Measures

- The Contractor to ensure cement materials was well covered.
- The Contractor to ensure water spray was carry out during breaking of rocks.
- The Contractor was reminded to cover the existing stockpile general fill material when they were not in use.

Noise

- No violation was observed nor recorded.

Ecology

- No violation was observed nor recorded.

Waste / Chemical Management

- Stagnant water was accumulated in drip tray. Contractor to ensure all contaminated water was well collected and stored in chemical waste storage area without spillage.
- Oil drums were observed without drip tray and place on the ground. Ensure no spillage of the chemical oil and provide trip tray accordingly.
- Collection of waste oil by registered waste collector.

Others

- No other violation was observed nor recorded.

Summary of Exceedances

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

Implementation Status of Event Action Plans

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

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:

- Construction of Pools inside North Pole;
- Construction Superstructure for Floorless Coaster;
- Construction of Communal Toilet Structure at South Pole;
- Construction of Concrete Structure for Bobsled Station;
- Installation of Ride Track at Floorless Coaster and Bobsled Station;
- Construction of Concrete Structure for Thrill Mountain Area;
- Internal Finishing Works at PA Building;
- Construction of road works for permanent EVA Access;
- Construction of Drainage System and Water Main for Thrill Mountain and Bobsled Station Area.
- Apply waterproofing at roof of South Pole.
- Installation of theme works.

4. CONSTRUCTION OF DRAINAGE, SEWERAGE AND WATER MAIN SYSTEM.CONCLUSIONS AND RECOMMENDATIONS

Conclusions

4.1 Four environmental site audits were performed in March 2011. 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:

Water Quality Impact

- Should ensure that the sedimentation tank is well function before discharging waste water off site.

Dust Impact

- To carry out routine water spray to all haul roads and during rock breaking activity.
- To cover the existing stockpile general fill material when they were not in use.
- To ensure auto waterspray head is on when the floor is dry and dusty.

Waste / Chemical Waste Impact

- To carry out routine inspection for chemical waste storage area after rainy day.
- To ensure spent oil keep in dip tray during drilling rig maintenance.
- To ensure all domestic waste was fully cover in rubbish bin and cleaning up frequently.
- To ensure general refuse were store in the enclosed container or compaction units and separate from C& D materials.

Air Pollution Impact

- To ensure all plants and equipments are well maintained in good condition and replace air filter frequently.

Site Layout Plan

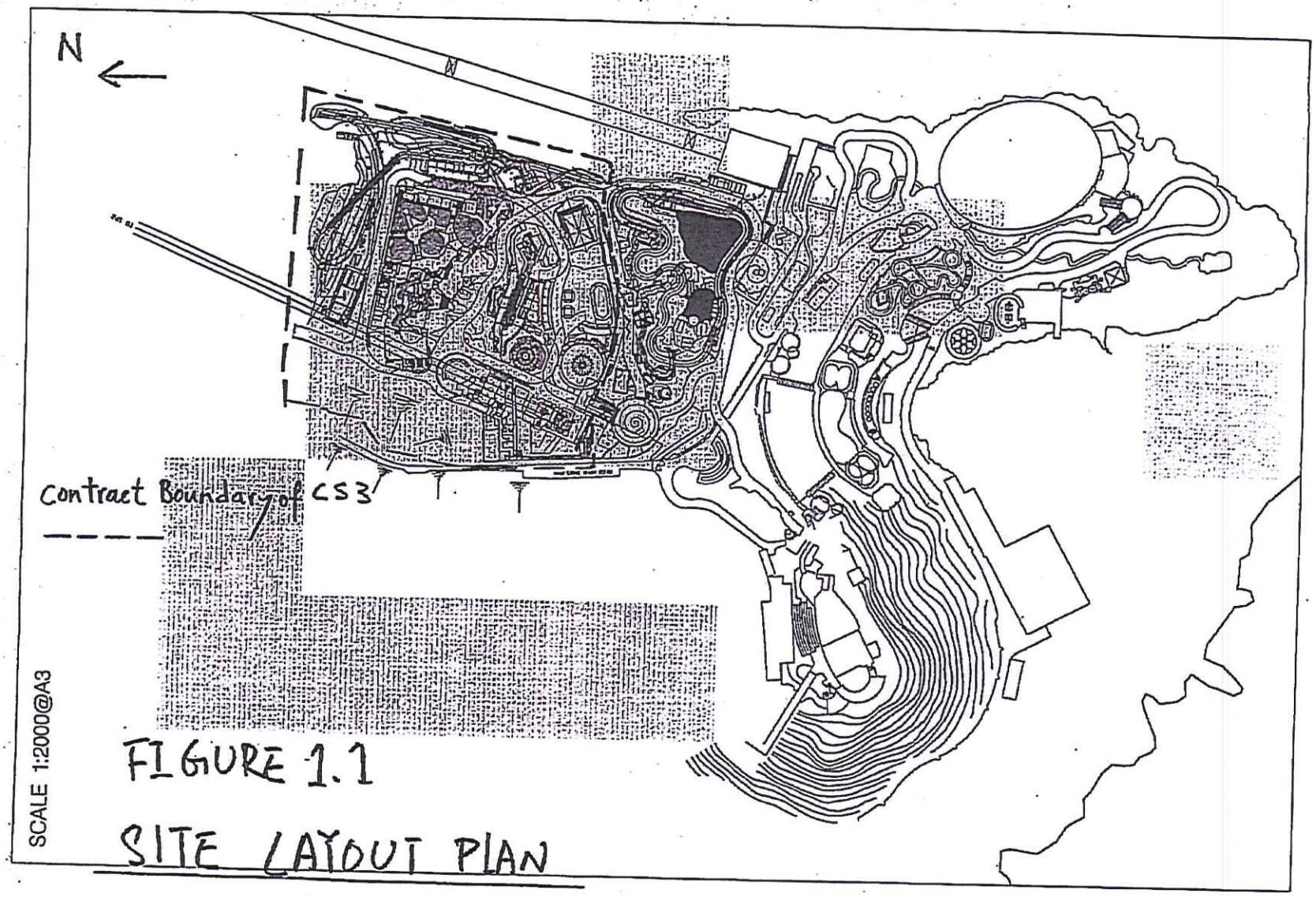

FIGURE 1.1

SITE LAYOUT PLAN

Appendix A

Site Audit Summary

Ocean Park Master Redevelopment Project
Contract P007
Independent Environmental Checker

MONTHLY SITE INSPECTION CHECKLIST

Inspection Date	23/03/2011	Time	13:45	Inspected By	EM: IEC: Florence Yuen Contractor: CS02: L. Wong CS03: W. Chung
Site Location	CS02 CS03				

Weather

Condition	☐	Sunny	☐	Fine	☑	Overcast	☐	Drizzle	☐	Rain	☐	Storm	☐ Hazy
Temperature	18 °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?			✓		CS02 ① P112078-6 ③ P112079-6
	• Is the Contractor licensed to transport and dispose of the chemical wastes?			✓		CS03 ① P112077-2
	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? | | | | ✓ | (S02②)P1120790 |
- 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? | | | | ✓ | (S03②)P1120777 |
- Is open stockpiles avoided or covered and placed far enough from the ASRs? | | | ✓ | | |
- Is the dropping height of material restricted to minimise the fugitive dust from unloading/loading? | | | ✓ | | |
- Is tarpaulin used to cover all dusty vehicle loads transported to, from and within the site? | | | ✓ | | |
- Are vehicle wheel and body washing facilities available at the exit points of the site? | | | ✓ | | |
- Are wind shield and dust extraction units or similar dust mitigation measures provided at the loading points? If dust generation is likely during the process, particularly in dry seasons, is water sprinklers provided at the loading site? | | | ✓ | | |
- Do the vehicles comply with the recommended speed limit of 10 km/h on unpaved roads? | | | ✓ | | |
- Are dusty activities rescheduled during high-wind conditions? | | ✓ | | | |
- Are the routing of vehicles and positioning of construction plants at maximum possible distance from the ASRs? | | | ✓ | | |
- Is suitable buffer zone provided and work areas fenced off with hoarding (not less than 2.4m from ground level)? | | | ✓ | | |

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? ✓
- 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?		✓			
	• Are open stockpiles of construction materials or construction wastes of more than $50m^3$ covered with tarpaulin during rainstorm?		✓			
	In case of an excavation in rainy seasons: • Is temporary exposed slope/soil surfaces covered by tarpaulin as far as practicable?		✓			
	• 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?		✓			
	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?			✓		
	• 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 6 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 initiation during charging and blasting limited by the following means?

  - Closing the Ocean Park from commencement of charging holes until completion of blasting each day. ✓

  - 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? ✓

Observations for this month

(1) Drip tray with a number of oil drums was accumulated with oil and water. The Contractor is reminded to remove them as chemical waste and ensure effectiveness of the drip tray

(2) Stockpiles of backfill material which are idle should be covered with tarpaulin sheets or other means to suppress dust

IEC Representative	Environmental Manager	Contractor's Representative CS03
Florence Yuen		
(Florence Yuen)	(Lindsay Pickles) 23/3/11	(Wilson Chung) 23/3/11

Ocean Park Master Redevelopment Project
Contract P007
Independent Environmental Checker

MONTHLY SITE INSPECTION PHOTOS

Contract CS03 Trill Mountain and Polar Adventure	
Follow up observations in February 2011	
Observation in last site inspection	**Observation in this site inspection**
	
P1120566: A few oil drums were scattered on bare ground and oil stain was observed. The Contractor was reminded to place them in drip trays to avoid oil spillage and dispose the contaminated sand as chemical waste.	P1120772: Drip tray with a number of oil drums was accumulated with oil and water. The Contractor was reminded to remove the oil and water as chemical waste and maintain and ensure effectiveness of the drip tray.
	
P1120564: A stockpile of C&D material was uncovered. The Contractor was reminded to cover any idle stockpiles on-site with tarpaulin sheets or other means to suppress dust.	P1120777: Idled stockpiles of backfill materials were not covered. The Contractor was reminded to cover all idle stockpiles with tarpaulin sheets or other means to suppress dust.

Part 4 **Ocean Park Symbio Show**
1st Monthly Monitoring Report

REPORT

Ocean Park Corporation, Hong Kong

Ocean Park Symbio Show:
1st Air Quality and Noise Monitoring Report

April 2011

Environmental Resources Management
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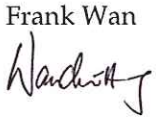
REPORT

Ocean Park Corporation, Hong Kong

Ocean Park Symbio Show:
1st Air Quality and Noise Monitoring Report

April 2011

Reference 0128330

For and on behalf of ERM-Hong Kong, Limited	
Approved by:	Frank Wan
Signed:	
Position:	Partner
Date:	12 April 2011

CONTENTS

ANNEXES

1 INTRODUCTION

ERM-Hong Kong, Limited (ERM) has been appointed by Ocean Park Corporation (OPC) to undertake air quality and noise monitoring for the first operational year of the Open-air Night Show under the *"Repositioning and Long Term Operation Plan of Ocean Park"* (the Project).

1.1 PURPOSE OF THE REPORT

The Open-air Night Show commenced on 27 January 2011. This is the first air quality and noise monitoring report which summarises the impact monitoring results during the reporting period from **27 January** to **26 February 2011**.

1.2 STRUCTURE OF THE REPORT

After this introductory section, the remainder of this report is arranged as follows:

Section 2 describes the air quality sampling methodology, presents the monitoring results and discusses the results;

Section 3 describes the noise monitoring methodology, presents the monitoring results and discusses the results;

Section 4 presents an overall conclusion of the air quality and noise monitoring.

2 AIR QUALITY MONITORING

2.1 INTRODUCTION

In accordance with Clause 2.31 of the Environmental Permit (EP), an updated air quality monitoring programme shall be developed as part of the updated EM&A Manual for the measurement of air quality impact (in terms of respirable suspended particulates, RSP) during the first operational year of the Open-air Night Show and for submission to the Director of Environmental Protection (DEP) in January 2011. The air quality monitoring has been carried out based on the requirements given in the updated air quality monitoring programme.

2.2 SAMPLING METHODOLOGY

2.2.1 *Sampling Parameters and Frequency*

In accordance with the updated air quality monitoring programme, 24-hr average RSP levels have to be monitored on a weekly basis in the first month of the Open-air Night Show. The 24-hr average RSP monitoring samples were therefore taken on 28 January 2011, and 4, 12, and 20 February 2011.

2.2.2 *Sampling Locations*

Air quality monitoring was conducted at an agreed designated air quality monitoring station (AQMS) located at the rooftop of the Administrative Building in Ocean Park as presented in *Table 2.1* and illustrated in *Figure 2.1*.

Table 2.1 *Air Quality Monitoring Station*

AQMS ID	Location	Sampling Height (m above ground)
AM1	Rooftop of Administrative Building (Former Staff Quarters) in Ocean Park	10

2.2.3 *Sampling and Laboratory Analysis Methodology*

One 24-hr average RSP sample was collected on each scheduled day for monitoring by a High Volume Sampler (HVS) following the USEPA method, EPA IO-2.1. Calibration of the equipment has followed the requirements set out in EPA IO-2.1 with the calibration record given in *Annex A1*. A summary of the sampling methodology and equipment is presented in *Table* 2.2.

Table 2.2 *Summary of Sampling and Laboratory Analysis Method*

Sampling Parameter	Method	Equipment
24-hr average RSP	EPA IO-2.1	High volume sampler

Figure 2.1

24-hr Average RSP Monitoring Station during Operation of Symbio Show

File: 0125363_RSP station.mxd
Date: 06/04/2011

Environmental Resources Management

ERM

The sampling equipment setup at the sampling location is shown in *Figure 2.1.*

2.2.4 *Sampling Period*

The sampling periods at AM1 are summarized in *Table 2.3.*

Table 2.3 ***Sampling Period***

Sampling Parameter	Sampling Period
24-hr average RSP	17:00 (28 January 2011) – 17:00 (29 January 2011) 17:00 (4 February 2011) – 17:00 (5 February 2011) 17:00 (12 February 2011) – 17:00 (13 February 2011) 17:00 (20 February 2011) – 17:00 (21 February 2011)

2.2.5 *Compliance Assessment*

The measured 24-hr average RSP concentrations have been compared with the Action/Limit Level (A/L Level which is the 24-hr average AQO for RSP (180 μgm^{-3}). Should exceedance of A/L Level occur, actions summarized in the Event and Action Plan (*Table 7.5* of updated EM&A Manual) should be followed.

2.3 *MONITORING RESULTS*

The 24-hour average RSP concentrations monitored at AM1 are summarized in *Table 2.4.* The detailed laboratory report is presented in *Annex A2.*

Table 2.4 ***24-hr Average RSP Monitoring Results***

Monitoring Location	Monitoring Date	24-hr RSP Concentration (μgm^{-3})	Action/Limit Level (μgm^{-3})
AM1 (Rooftop of Administrative Building (Old Staff Quarters in Ocean Park))	28 January 2011	63	180
	4 February 2011	88	180
	12 February 2011	101	180
	20 February 2011	36	180

The measured 24-hour average RSP concentrations have been well below the A/L Level (ie, 180 μgm^{-3}). Detailed result summary of the air quality monitoring data and graphical presentation of the results are given in *Annex A3.*

The average 24-hour average RSP concentrations during the Open-air Night Show time measured at five EPD air quality monitoring stations (AQMSs) at Tung Chung, Shatin, Tai Po, Yuen Long and Tap Mun were also provided as a reference (See *Annex A4*). The 24-hour average background RSP concentrations measured at the 5 EPD stations were between 46.1 $\mu g\ m^{-3}$ and 63.8 $\mu g\ m^{-3}$ during the reporting period. The monitored 24-hr RSP concentrations at AM1 have been compared with those measured at the EPD's AQMSs during the same monitoring periods. Wind data (including wind directions and speeds), ambient temperature and relative humidity measured

at Wong Chuk Hang weather station operated by the Hong Kong Observatory (HKO) were also provided in *Annex A5* as reference.

3 NOISE MONITORING

3.1 INTRODUCTION

Noise monitoring has been carried out following the requirements given in the updated EM&A Manual. The requirements and results are detailed in the following sections.

3.2 NOISE MONITORING REQUIREMENTS

It has been recommended in the EIA Report for *"Repositioning and Long Term Operation Plan of Ocean Park"* and stated in the EM&A Manual that fixed plant noise source monitoring should be conducted during the first operational year of the Open-air Night Show at the Aqua City.

The monitoring of fixed plant noise source impact is to be conducted:

- During the lagoon night show (hereinafter referred to as "lagoon night show noise monitoring")
- Not during the lagoon night show (hereinafter referred to as "daily operational noise monitoring")

Lagoon night show noise monitoring was carried out at all designated monitoring stations during the performance of lagoon night shows at a logging interval of 30 minutes. The noise monitoring was conducted twice a week, i.e. once on a normal weekday and once on a general holiday or Sunday.

The need for noise monitoring during the lagoon night show was reviewed based on the monitoring results, any requirements to adjust the loudspeaker system, and any change to the show schedule or rundown. With the same loudspeaker system and show rundown, if the noise levels of the month comply with the fixed plant noise criteria as stipulated in *Technical Memorandum on Environmental Impact Assessment Process* (EIAO-TM), or are consistent with the baseline noise levels, the ETL may consider not including the noise monitoring in the subsequent monitoring programme. Agreement from the IEC and approval from EPD must be sought prior to suspension of noise monitoring. Impact monitoring can be resumed if there is any change to the power, orientation, and volume of the loudspeaker system, or to the show rundown, or an increase of show frequency.

For daily operational noise monitoring, 30-minute average noise measurement at each designated station during the operational hours of Ocean Park but not during the lagoon night show should be conducted. The monitoring frequency should be the same as that for the noise monitoring during the

lagoon night show. Agreement from the IEC and approval from EPD must be obtained prior to suspension of noise monitoring.

The following sections describe the detailed methodology of the fixed plant noise monitoring.

3.2.1 *Monitoring Locations*

Noise monitoring was conducted at five designated noise monitoring locations in accordance with the approved EM&A Manual. Alternative noise monitoring has been proposed because of accessibility problem, as presented in *Table 3.1*, and shown in *Figure 3.1*. The alternative noise monitoring locations have been agreed by the ET and IEC.

Table 3.1 *Alternative Noise Monitoring Stations during the Operational Phase*

Alternative Noise Monitoring Stations	Description	Location	With or without Façade Correction
AON1	Open Area adjacent to Police Training School	1.2m above street level	without facade correction
AON2	Old canteen building, Ocean Park	1.2m above roof level	with facade correction
AON3	Orchid Valley	1.2m above street level near the entrance gate	without facade correction
AON4	Manly Villa	1.2m above street level near the entrance	with facade correction
AON5	Hau Yuen	1.2m above street level outside boundary wall	with façade correction

3.2.2 *Monitoring Parameters*

Lagoon Night Show Noise Monitoring

Six consecutive measurements of $L_{Aeq, 5\ min}$ reading were carried out to calculate the $L_{Aeq, 30\ min}$ noise level during the lagoon night show.

Daily Operational Noise Monitoring

Six consecutive measurements of $L_{Aeq, 5\ min}$ reading were carried out to calculate the $L_{Aeq, 30\ min}$ noise level before the lagoon night show, ie during operation of the Ocean Park.

Background Noise Level

Three consecutive measurements of $L_{Aeq, 5\ min}$ reading were carried out to calculate the $L_{Aeq, 15\ min}$ noise level after the lagoon night show, ie without operation of the Ocean Park.

Any significant influencing factors on the measured noise levels were taken into account in accordance with standard acoustical principles and practices. The corrected noise level due to the lagoon night show and the operation of Ocean Park was computed based on the background noise level and measured noise level.

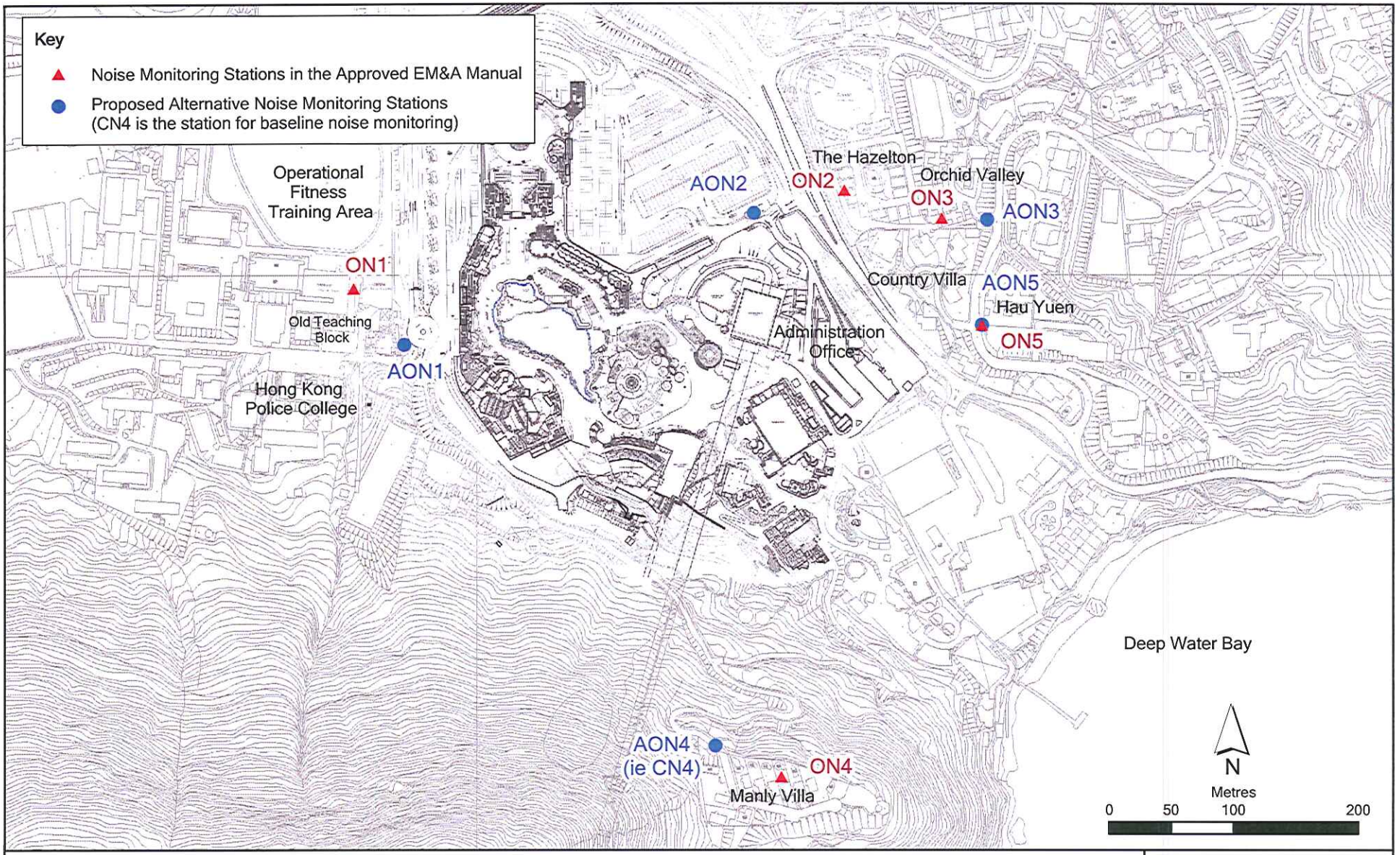


Figure 3.1

Proposed Noise Monitoring Stations in the Approved EM&A Manual and
Proposed Alternatve Noise Monitoring Stations

File: 0128330_noise monitoring station.mxd
Date: 28/03/2011

Environmental
Resources
Management

ERM

3.2.3 *Monitoring Frequency*

The monitoring for both lagoon night show noise monitoring and daily operational noise monitoring were conducted twice per week - one on a normal weekday and one on a general holiday, including Sundays during this reporting month.

3.2.4 *Monitoring Methodology*

The sound level meters and calibrator used for the noise monitoring, as listed in *Table 3.2* below, complies with IEC 651: 1979 and 804:1985 (Type 1) specification.

Table 3.2 *Noise Measurement Equipments*

Monitoring Location		Monitoring Equipment
AON1	Open Area adjacent to Police Training School	RION NA-27 Sound Level Meter RION NC-73 calibrator
AON2	Old canteen building, Ocean Park	RION NL-31 Sound Level Meter RION NC-73 calibrator
AON3	Orchid Valley	RION NL-31 Sound Level Meter RION NC-73 calibrator
AON4	Manly Villa	RION NL-31 Sound Level Meter RION NC-73 calibrator
AON5	Hau Yuen	RION NL-31 Sound Level Meter RION NC-73 calibrator

Noise monitoring was conducted with reference to the calibration and measurement procedures as stated in the *Technical Memorandum for the Assessment of Noise from Places other than Domestic Premises, Public Places or Construction Sites (IND-TM).* Immediately prior to and following each noise measurement the accuracy of the monitoring equipments was checked using an acoustic calibrator generating a known sound pressure level at a known frequency. Measurements were accepted if the calibration levels from before and after the noise measurement agree to within 1.0 dB.

The sound level meters and acoustic calibrator have been calibrated by a HOKLAS accredited laboratory every two years. The relevant calibration certificates are presented in *Annex B1.*

Noise measurements were made without the presence of fog and rain, and with steady wind speed and gusts not exceeding 5ms^{-1} and 10 ms^{-1}, respectively in accordance with international standards and practices (1). Broadband measurement of L_{Aeq}, L_{10}, L_{90}, L_{max} and L_{min} has been recorded at 100ms interval.

(1) ISO 11819-1:1997 and ISO/FDIS 13472-1:2001

3.2.5 *Compliance Assessment*

Fixed Plant Noise

As recommended in the EIA and stated in the EM&A Manual, OPC will follow the Action and Limit (A/L) Levels as recommended in EIA and EM&A Manual which are summarised in *Table 3.3*. In case exceedances are resulted from cumulative impacts, all steps stipulated in the Event/ Action Plan shall be followed.

Table 3.3 ***Action and Limit Levels for Entertainment Noise***

Identification No.	Action Level	Limit Level
ON1/AON1	When documented complaint is received from any one of the sensitive receivers	$L_{eq\ (30\ min)}$ 60 dB(A)
ON2/AON2		$L_{eq\ (30\ min)}$ 60 dB(A)
ON3/AON3		$L_{eq\ (30\ min)}$ 55 dB(A)
ON4/AON4		$L_{eq\ (30\ min)}$ 55 dB(A)
ON5/AON5		$L_{eq\ (30\ min)}$ 55 dB(A)

3.3 *RESULTS OF NOISE MONITORING*

The measured noise levels at the monitoring locations are given in *Annex B2* and graphically presented in *Annex B3*.

Results indicated that the background corrected Lagoon Night Show Noise Levels has complied with the Limit Level at all monitoring stations during all monitoring dates.

The background corrected Daily Operational Noise Levels complied with the Limit Levels at most of the monitoring stations during most of the monitoring dates. Noise exceedances were recorded at AON1 (Open Area adjacent to Police Training School) and AON5 (Hau Yuen) due to the noise from the bus terminus and high background noise from the visitors and traffic during public holidays. Detail discussion on noise exceedances are given in *Section 3.4* below.

3.4 *SUMMARY OF NOISE EXCEEDANCES*

Noise exceedances recorded during this reporting period are summarised in *Table 3.4* below.

Table 3.4 *Summary of Daily Operational Noise Exceedance during this Reporting Period*

Date	Noise Monitoring Station	Measured Noise Level, dB(A)		Daily Operational Noise Level (Background Corrected) [a], $L_{eq\ (30min)}$ dB(A)	Limit Level, $L_{eq\ (30\ min)}$ dB(A)
		Daily Operational Noise Level, $L_{eq\ (30min)}$ dB(A)	Background Noise Level, $L_{eq\ (15min)}$ dB(A)		
30 Jan 2011 (Public Holiday)	AON1	67.4	65.4	65.9	60
	AON5	59.9	57.1	56.6	55
6 Feb 2011 (Public Holiday)	AON1	65.8	63.3	65.2	60
	AON5	58.1	54.5	55.7	55
20 Feb 2011 (Public Holiday)	AON1	67.4	66.5	63.3	60

Note:

(a) The Background Corrected Noise Levels were either measured in front of a façade or with façade correction of 3 dB(A).

AON1 - Noise from Bus Terminus and during Public Holidays

The monitoring station AON1 is directly facing the bus terminus of the Ocean Park. The measured noise levels were dominated by the bus parking, bus moving in and out the terminus to pick up visitors leaving the Ocean Park during evening time. The measured background noise levels were in the range of 63 to 67 dB(A), ie 3 to 7 dB(A) higher than the Limit Level, during the three days with noise exceedances as they were public holidays with more visitors (see *Table 3.4*).

AON5 – High Background Noise during Public Holidays

The exceedances at AON5 were mainly due to the high background noise with large number of visitors and traffic generated on 30 January and 6 February 2011, which were the public holidays after the grand opening of the Aqua City and during the Chinese Lunar New Year.

As mentioned above, the noise exceedances were due to the bus movements at the bus terminus and exceptional increase of visitors after the grand opening of the Aqua City and during the Chinese Lunar New Year public holidays, ie not due to the fixed plant noise sources or the lagoon night show from the Ocean Park.

3.5 REVIEW OF THE NEED OF NOISE MONITORING

In view of the results of noise exceedances during the first monitoring month, it is proposed that the noise monitoring should continue for the rest of eleven months in the first operational year of the open-air night show.

Based on the above, the noise monitoring during the 2nd to the 12th months will be continued at the same frequency, ie twice per week (during normal week days and general holidays) with and without the show in operation at the five alternative noise monitoring stations. 30-minute noise measurement

will be carried out at each designated station and L_{Aeq}, L_{10}, L_{90} and L_{max} will be recorded at the specified interval.

4 *OVERALL CONCLUSIONS*

The Open-air Night Show commenced on 26 January 2011. According to the requirements set out in the Environmental Permit (EP) and the updated EM&A Manual, air quality and noise monitoring shall be carried out during the first year of the operation of Open-air Night Show. This is the first air quality and noise monitoring report which summarises the impact monitoring results during the reporting period from **26 January** to **25 February 2011**.

24-hr average Respirable Suspended Particulates (RSP) monitoring were conducted at a designated monitoring station on the rooftop of the Administrative Building in OP (AM1) on 28 January and 4, 12 and 20 February 2011. All monitored 24-hour average RSP concentrations measured at AM1 complied with the Action/Limit (A/L) Level. No exceedance of A/L Level is monitored during the reporting period.

Daily operational noise and lagoon night show noise monitoring were carried out at five designated monitoring stations during this reporting period. Out of the 5 stations, noise exceedances were recorded at AON1 (Open Area adjacent to Police Training School) and AON5 (Hau Yuen) due to noise emanating from the bus terminus and high background noise from visitors and traffic during the public holidays.

Recommendation has been given to continue with noise monitoring at the same stations using the same frequency and approach during the second to the twelfth months of the operation of the open-air night show.

Annex A1

HVS Calibration Report

ALS Technichem (HK) Pty Ltd

CERTIFICATE OF ANALYSIS

CONTACT:	MS. WINNIE KO	**WORK ORDER:**	HK1105531
CLIENT:	ERM - HONG KONG LTD	**LABORATORY:**	HONG KONG
ADDRESS:	21/F., LINCOLN HOUSE, 979 KING'S ROAD, TAIKOO PLACE, QUARRY BAY, HONG KONG	**DATE RECEIVED:**	28/01/2011
		DATE OF ISSUE:	09/03/2011
		SAMPLE TYPE:	EQUIPMENT
PROJECT:	OPC AIR QUALITY MONITORING FOR OPERATION OF SYMBIO SHOW	**No. of SAMPLES:**	1

COMMENTS

The calibration procedure used for the analysis has been applied for the calibration of the above instrument.

NOTES

This is the Final Report and supersedes any preliminary report with this batch number.
Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

ISSUING LABORATORY: HONG KONG

Address

ALS Technichem (HK) Pty Ltd

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Chung Shun Knitting Centre
1-3 Wing Yip Street
Kwai Chung
HONG KONG

Phone: 852-2610 1044
Fax: 852-2610 2021
Email: hongkong@alsenviro.com

Mr Chan Kwok Fai, Godfrey
Laboratory Manager - Hong Kong

Abbreviations: *% SPK REC denotes percentage spike recovery*
CHK denotes duplicate check sample
LOR denotes limit of reporting
LCS % REC denotes Laboratory Control Sample percentage recovery

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ALS Technichem (HK) Pty Ltd

Calibration Report for High Volume Sampler (TSP Sampler)

Report No. : HK1105531
Location : ERM (HONG KONG)

Equipment No. : HK653
Calibration date : 28/01/2011
Calibration Due date : 28/04/2011

CALIBRATION OF CONTINUOUS FLOW RECORDER

Ambient Condition					
Ambient			Seasonal		
Temperature, Ta	290.5	K	Temperature, Ts	291.3	K
Pressure,Pa	1019.0	hPa	Pressure,Ps	1018.0	hPa
Orifice Transfer Standars Information					
Equipment No.	TE-5025A (#1483)	Slope,m_c	1.25411	Intercept, b_c	-0.00314
Last Calibration Date	02-June-2010	$Q_a = [\sqrt{(}$	$\Delta H.Ta/Pa)-b_c]/m_c$		
Next Calibration Date	02-June-2011				

Calibration of RSP				
Calibration Point	Manometer Reading H(inches of water)	Q_{std} (m^3/min) X-axis	Continuous Flow Recorder, W (CFM)	$W((Ta+30)/Pa)^{1/2}$ Y-axis
1	12.5	1.5077	58	32.5278
2	10.0	1.3488	50	28.0412
3	8.3	1.2291	45	25.2371
4	5.1	0.9640	32	17.9464
5	3.7	0.8214	28	15.7031

By Linear Regression of Y Vs X

Correlation coefficient, R = 0.99743
Slope,m = 24.94472
Intercept, b = -5.39923
Calibration result :

*If the correlation coefficient, R is < 0.9900. Checking and recalibration are requried.

Remarks :

Calibration by : Sam
Signature :
Date : 28/01/2011

Checked by : Iris Lin
Signature :
Date : 28/01/2011

ADDRESS 11/F, Chung Shun Knitting Centre, 1-3 Wing Yip Street, Kwai Chung, N.T., Hong Kong PHONE +852 2610 1044 FAX +852 2610 2021
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Annex A2

Laboratory Report

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

CERTIFICATE OF ANALYSIS

Client	: ERM HONG KONG	Laboratory	: ALS Technichem HK Pty Ltd	Page	: 1 of 2
Contact	: MS WINNIE KO	Contact	: Chan Kwok Fai, Godfrey	Work Order	: HK1102497
Address	: 21/F, LINCOLN HOUSE, 979 KING`S ROAD, TAIKOO PLACE, ISLAND EAST, QUARRY BAY, HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: Winnie.ko@erm.com	E-mail	: Godfrey.Chan@alsenviro.com		
Telephone	: +852 2271 3147	Telephone	: +852 2610 1044		
Facsimile	: +852 2723 5660	Facsimile	: +852 2610 2021		
Project	: OPC AIR QUALITY MONITORING FOR OPERATION OF SYMBIO SHOW	Quote number	: ----	Date Samples Received	: 31-JAN-2011
Order number	: ----			Issue Date	: 07-FEB-2011
C-O-C number	: ----			No. of samples received	: 1
Site	: OCEAN PARK			No. of samples analysed	: 1

General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. The completion date of analysis is: 07-FEB-2011

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific comments for Work Order: **HK1102497**

Sample(s) were collected by ALS Technichem (HK) staff on 28 January, 2011.

Sample(s) analysed and reported on an as received basis.

This document has been electronically signed by those names that appear on this report and are the authorised signatories. Electronic signing has been carried out in compliance with procedures specified in the Electronic Transactions Ordinance of Hong Kong, Chapter 553, Section 6.

Signatories	*Position*	*Authorised results for*
Fung Lim Chee, Richard	**General Manager**	**Inorganics**

Analytical Results

Sub-Matrix: **FILTER**

			Client sample ID	AM1				
			Client sampling date / time	28-JAN-2011 17:00				
Compound	CAS Number	LOR	Unit	HK1102497-001				
EA/ED: Physical and Aggregate Properties								
HK-RSP: Respirable Suspended Particulate	—	0.01	mg/m³	**0.06**				

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

CERTIFICATE OF ANALYSIS

Client	: ERM HONG KONG	Laboratory	: ALS Technichem HK Pty Ltd	Page	: 1 of 2
Contact	: MR CLEMENT PANG	Contact	: Chan Kwok Fai, Godfrey	Work Order	: HK1102839
Address	: 21/F, LINCOLN HOUSE, 979 KING`S ROAD, TAIKOO PLACE, ISLAND EAST, QUARRY BAY, HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: clement.pang@erm.com	E-mail	: Godfrey.Chan@alsenviro.com		
Telephone	: +852 2271 3000	Telephone	: +852 2610 1044		
Facsimile	: +852 2723 5660	Facsimile	: +852 2610 2021		
Project	: OPC AIR QUALITY MONITORING FOR OPERATION OF SYMBIO SHOW	Quote number	: ----	Date Samples Received	: 07-FEB-2011
Order number	: ----			Issue Date	: 09-FEB-2011
C-O-C number	: ----			No. of samples received	: 1
Site	: OCEAN PARK			No. of samples analysed	: 1

General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. The completion date of analysis is: 09-FEB-2011

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific comments for Work Order: **HK1102839**

Sample(s) were collected by ALS Technichem (HK) staff on 04 February, 2011.

Sample(s) analysed and reported on an as received basis.

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Signatories	*Position*	*Authorised results for*
Fung Lim Chee, Richard	**General Manager**	**Inorganics**

Analytical Results

Sub-Matrix: **FILTER**

			Client sample ID	AM1				
			Client sampling date / time	[04-FEB-2011]				
Compound	CAS Number	LOR	Unit	HK1102839-001				
EA/ED: Physical and Aggregate Properties								
HK-RSP: Respirable Suspended Particulate	---	0.01	mg/m³	**0.09**				

CERTIFICATE OF ANALYSIS

Client	: ERM HONG KONG	Laboratory	: ALS Technichem HK Pty Ltd	Page	: 1 of 2
Contact	: MS WINNIE KO	Contact	: Chan Kwok Fai, Godfrey	Work Order	: HK1103646
Address	: 21/F, LINCOLN HOUSE, 979 KING`S ROAD, TAIKOO PLACE, ISLAND EAST, QUARRY BAY, HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
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Facsimile	: +852 2723 5660	Facsimile	: +852 2610 2021		
Project	: OPC AIR QUALITY MONITORING FOR OPERATION OF SYMBIO SHOW	Quote number	: ----	Date Samples Received	: 16-FEB-2011
Order number	: ----			Issue Date	: 21-FEB-2011
C-O-C number	: ----			No. of samples received	: 1
Site	: OCEAN PARK			No. of samples analysed	: 1

General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. The completion date of analysis is: 18-FEB-2011

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific comments for Work Order: **HK1103646**

Sample(s) were collected by ALS Technichem (HK) staff on 12 February,2011.

Sample(s) analysed and reported on an as received basis.

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Signatories	*Position*	*Authorised results for*
Fung Lim Chee, Richard	**General Manager**	**Inorganics**

Analytical Results

Sub-Matrix: **FILTER**

			Client sample ID	AM1				
			Client sampling date / time	[12-FEB-2011]				
Compound	CAS Number	LOR	Unit	HK1103646-001				
EA/ED: Physical and Aggregate Properties								
HK-RSP: Respirable Suspended Particulate	—	0.01	mg/m³	**0.10**				

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

CERTIFICATE OF ANALYSIS

Client	: ERM HONG KONG	Laboratory	: ALS Technichem HK Pty Ltd	Page	: 1 of 2
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Project	: OPC AIR QUALITY MONITORING FOR OPERATION OF SYMBIO SHOW	Quote number	: ---	Date Samples Received	: 21-FEB-2011
Order number	: ---			Issue Date	: 23-FEB-2011
C-O-C number	: ---			No. of samples received	: 1
Site	: ---			No. of samples analysed	: 1

General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. The completion date of analysis is: 22-FEB-2011

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific comments for Work Order: **HK1104098**

Sample(s) were collected by ALS Technichem (HK) staff on 20 February,2011.

Sample(s) analysed and reported on an as received basis.

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Signatories	*Position*	*Authorised results for*
Fung Lim Chee, Richard	**General Manager**	**Inorganics**

Analytical Results

Sub-Matrix: **FILTER**

			Client sample ID	AM1				
			Client sampling date / time	[20-FEB-2011]				
Compound	CAS Number	LOR	Unit	HK1104098-001				
EA/ED: Physical and Aggregate Properties								
HK-RSP: Respirable Suspended Particulate	—	0.01	mg/m³	**0.04**				

Annex A3

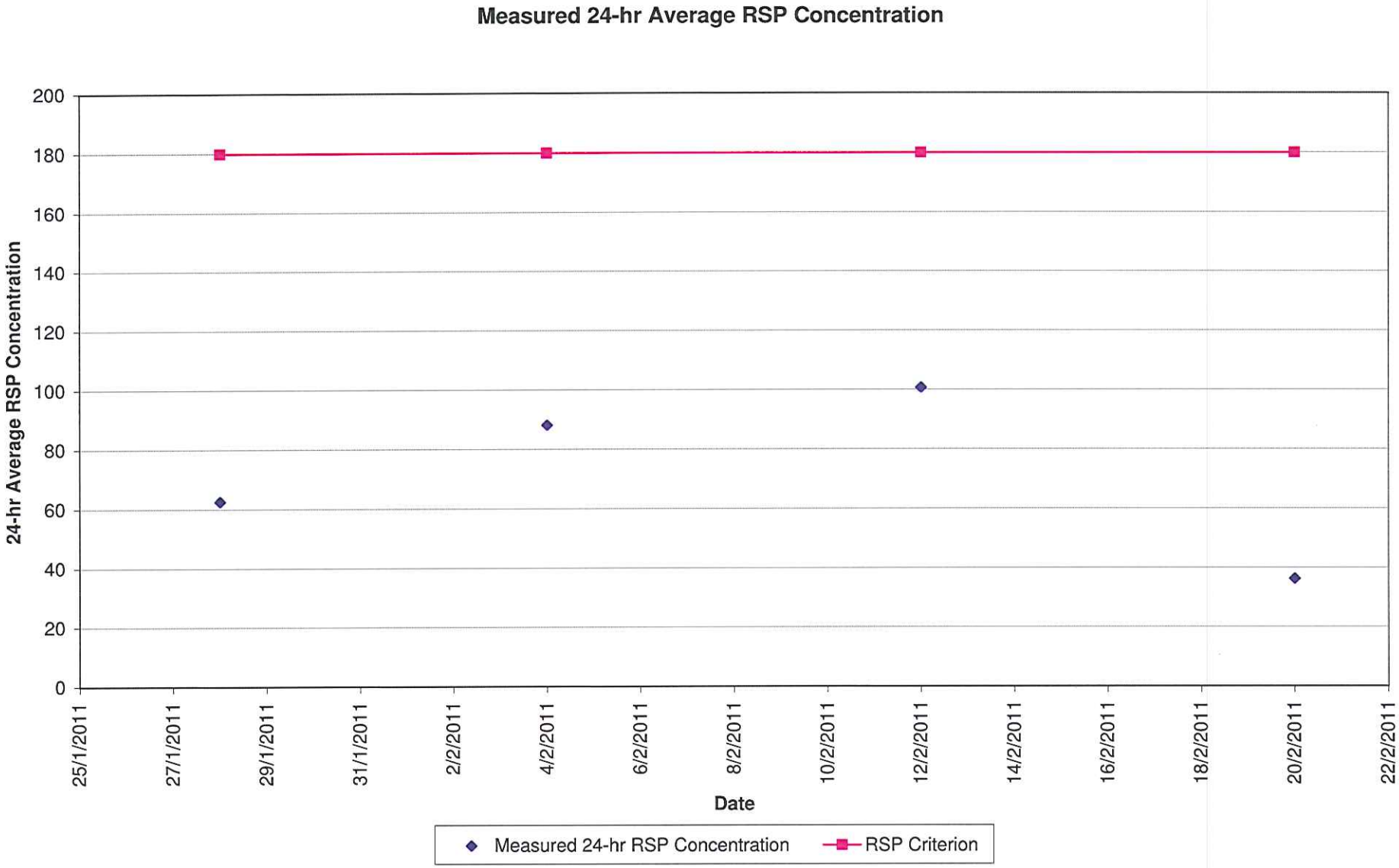
RSP Monitoring Results

Annex A3
Measured 24-hour Average RSP Concentrations

RSP Monitoring Station : AM1 (Rooftop of Admininstration Building in Ocean Park)

Start		Finish		Weather	Filter Weight (g)		Elapsed Time Reading		Sampling Time (hrs)	Flow Rate (m^3/min)			RSP Conc. ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)	Filter ID
Date	Time	Date	Time		Initial	Final	Initial	Final		Initial	Final	Average			
28-Jan-11	17:00	29-Jan-11	17:00	Sunny	2.8652	2.9914	17711.68	17735.95	24.27	1.39	1.39	1.39	63	180	202102
4-Feb-11	17:00	5-Feb-11	17:00	Sunny	2.8755	3.0567	17735.95	17760.30	24.35	1.39	1.43	1.41	88	180	202099
12-Feb-11	17:00	13-Feb-11	17:00	Cloudy	2.8808	3.0820	17760.30	17784.33	24.03	1.39	1.39	1.39	101	180	202100
20-Feb-11	17:00	21-Feb-11	17:00	Cloudy	2.8770	2.9497	17784.33	17808.45	24.12	1.39	1.39	1.39	36	180	202101

Min.	36
Max.	101
Average	72


Measured 24-hr Average RSP Concentration
24-hr Average RSP Concentration
200
180
160
140
120
100
80
60
40
20
0
25/1/2011
27/1/2011
29/1/2011
31/1/2011
2/2/2011
4/2/2011
6/2/2011
8/2/2011
10/2/2011
12/2/2011
14/2/2011
16/2/2011
18/2/2011
20/2/2011
22/2/2011
Date
Measured 24-hr RSP Concentration
RSP Criterion

Annex A4

Recorded RSP Concentrations at EPD's AQMSs in Tung Chung, Shatin, Tai Po, Yuen Long and Tap Mun on 28 January 2011, and 4, 12, and 20 February 2011

Annex A4 *Recorded RSP Concentrations at EPD's AQMSs in Tung Chung, Shatin, Tai Po, Yuen Long and Tap Mun on 28 January 2011, and 4, 12, and 20 February 2011*

28 January 2011

Tung Chung

Date & Time	RSP
1/28/2011 17:00	80.7
1/28/2011 18:00	77.7
1/28/2011 19:00	71.6
1/28/2011 20:00	39.5
1/28/2011 21:00	39.7
1/28/2011 22:00	50.5
1/28/2011 23:00	68.1
1/29/2011 0:00	55.8
1/29/2011 1:00	45.1
1/29/2011 2:00	47.1
1/29/2011 3:00	45.5
1/29/2011 4:00	42
1/29/2011 5:00	38.1
1/29/2011 6:00	39
1/29/2011 7:00	29.5
1/29/2011 8:00	51.7
1/29/2011 9:00	25.4
1/29/2011 10:00	53
1/29/2011 11:00	53.6
1/29/2011 12:00	55
1/29/2011 13:00	62
1/29/2011 14:00	61.4
1/29/2011 15:00	70.9
1/29/2011 16:00	70

Shatin

Date & Time	RSP
1/28/2011 17:00	40.4
1/28/2011 18:00	44.7
1/28/2011 19:00	41.7
1/28/2011 20:00	45
1/28/2011 21:00	38.6
1/28/2011 22:00	34.8
1/28/2011 23:00	29.8
1/29/2011 0:00	29.3
1/29/2011 1:00	31.8
1/29/2011 2:00	31.1
1/29/2011 3:00	33.6
1/29/2011 4:00	35.2
1/29/2011 5:00	34.3
1/29/2011 6:00	34.6
1/29/2011 7:00	33.5
1/29/2011 8:00	34.7
1/29/2011 9:00	39.8
1/29/2011 10:00	40.3
1/29/2011 11:00	41.4
1/29/2011 12:00	42.3

Date & Time	RSP
1/29/2011 13:00	43.4
1/29/2011 14:00	43.8
1/29/2011 15:00	40.6
1/29/2011 16:00	48.5

Tai Po

Date & Time	RSP
1/28/2011 17:00	44.5
1/28/2011 18:00	42.3
1/28/2011 19:00	43.5
1/28/2011 20:00	47.9
1/28/2011 21:00	41.3
1/28/2011 22:00	34
1/28/2011 23:00	34.1
1/29/2011 0:00	35
1/29/2011 1:00	35.1
1/29/2011 2:00	41
1/29/2011 3:00	41.7
1/29/2011 4:00	43.4
1/29/2011 5:00	40.7
1/29/2011 6:00	40.3
1/29/2011 7:00	38.8
1/29/2011 8:00	44.4
1/29/2011 9:00	45.3
1/29/2011 10:00	46.5
1/29/2011 11:00	48.1
1/29/2011 12:00	56.3
1/29/2011 13:00	50.6
1/29/2011 14:00	50.8
1/29/2011 15:00	53.4
1/29/2011 16:00	53.9

Yuen Long

Date & Time	RSP
1/28/2011 17:00	67.9
1/28/2011 18:00	61.5
1/28/2011 19:00	70.8
1/28/2011 20:00	66
1/28/2011 21:00	55.2
1/28/2011 22:00	54.5
1/28/2011 23:00	46.7
1/29/2011 0:00	43.5
1/29/2011 1:00	56.3
1/29/2011 2:00	51.1
1/29/2011 3:00	48.5
1/29/2011 4:00	40.1
1/29/2011 5:00	38.2
1/29/2011 6:00	42.8
1/29/2011 7:00	49.4
1/29/2011 8:00	51.1
1/29/2011 9:00	63.3
1/29/2011 10:00	76.4
1/29/2011 11:00	67.2
1/29/2011 12:00	66.7
1/29/2011 13:00	64.9

Date & Time	RSP
1/29/2011 14:00	62.2
1/29/2011 15:00	60.4
1/29/2011 16:00	68.8

Tap Mun

Date & Time	RSP
1/28/2011 17:00	45.2
1/28/2011 18:00	31.9
1/28/2011 19:00	31.9
1/28/2011 20:00	31.6
1/28/2011 21:00	30
1/28/2011 22:00	27
1/28/2011 23:00	31
1/29/2011 0:00	34
1/29/2011 1:00	34.8
1/29/2011 2:00	36.3
1/29/2011 3:00	36.1
1/29/2011 4:00	38.8
1/29/2011 5:00	42.7
1/29/2011 6:00	39.6
1/29/2011 7:00	38.3
1/29/2011 8:00	39.3
1/29/2011 9:00	40.6
1/29/2011 10:00	43.6
1/29/2011 11:00	42.6
1/29/2011 12:00	46.5
1/29/2011 13:00	45.3
1/29/2011 14:00	39.8
1/29/2011 15:00	45.9
1/29/2011 16:00	45.7

4 February 2011

Tung Chung

Date & Time	RSP
2/4/2011 17:00	78.2
2/4/2011 18:00	51.8
2/4/2011 19:00	61.9
2/4/2011 20:00	61.2
2/4/2011 21:00	60.5
2/4/2011 22:00	62.2
2/4/2011 23:00	54.7
2/5/2011 0:00	51.9
2/5/2011 1:00	55.7
2/5/2011 2:00	65.3
2/5/2011 3:00	64.1
2/5/2011 4:00	62.6
2/5/2011 5:00	62.7
2/5/2011 6:00	63
2/5/2011 7:00	65.1
2/5/2011 8:00	61.8
2/5/2011 9:00	34.2
2/5/2011 10:00	75.6
2/5/2011 11:00	74.3
2/5/2011 12:00	60.9
2/5/2011 13:00	102.4
2/5/2011 14:00	78.8
2/5/2011 15:00	76.7
2/5/2011 16:00	70.3

Shatin

Date & Time	RSP
2/4/2011 17:00	77.2
2/4/2011 18:00	80.8
2/4/2011 19:00	92.3
2/4/2011 20:00	85.9
2/4/2011 21:00	85
2/4/2011 22:00	81.7
2/4/2011 23:00	76.9
2/5/2011 0:00	74.5
2/5/2011 1:00	71.8
2/5/2011 2:00	68
2/5/2011 3:00	65.7
2/5/2011 4:00	63
2/5/2011 5:00	63.1
2/5/2011 6:00	63.9
2/5/2011 7:00	63.8
2/5/2011 8:00	67.8
2/5/2011 9:00	74
2/5/2011 10:00	67.7
2/5/2011 11:00	71.5
2/5/2011 12:00	41.2
2/5/2011 13:00	50.3
2/5/2011 14:00	45.4
2/5/2011 15:00	53.4
2/5/2011 16:00	52.5

Tai Po

Date & Time	RSP
2/4/2011 17:00	64.2
2/4/2011 18:00	66.2
2/4/2011 19:00	64.7
2/4/2011 20:00	66.1
2/4/2011 21:00	67.7
2/4/2011 22:00	66.7
2/4/2011 23:00	65.5
2/5/2011 0:00	63.3
2/5/2011 1:00	58.3
2/5/2011 2:00	57.8
2/5/2011 3:00	54.9
2/5/2011 4:00	52.4
2/5/2011 5:00	51.7
2/5/2011 6:00	53.1
2/5/2011 7:00	57.8
2/5/2011 8:00	63.1
2/5/2011 9:00	72.5
2/5/2011 10:00	70.1
2/5/2011 11:00	45.5
2/5/2011 12:00	42.5
2/5/2011 13:00	50.8
2/5/2011 14:00	58.1
2/5/2011 15:00	54
2/5/2011 16:00	54.6

Yuen Long

Date & Time	RSP
2/4/2011 17:00	65.9
2/4/2011 18:00	68.1
2/4/2011 19:00	71.9
2/4/2011 20:00	76.1
2/4/2011 21:00	83
2/4/2011 22:00	92.9
2/4/2011 23:00	86.2
2/5/2011 0:00	82.4
2/5/2011 1:00	80.2
2/5/2011 2:00	77.1
2/5/2011 3:00	68.5
2/5/2011 4:00	66.2
2/5/2011 5:00	66.3
2/5/2011 6:00	67.2
2/5/2011 7:00	68.3
2/5/2011 8:00	72.5
2/5/2011 9:00	77.8
2/5/2011 10:00	80
2/5/2011 11:00	69.2
2/5/2011 12:00	61.9
2/5/2011 13:00	55.8
2/5/2011 14:00	67.8
2/5/2011 15:00	58.9
2/5/2011 16:00	56.3

Tap Mun

Date & Time	RSP

Date & Time	RSP
2/4/2011 17:00	66.7
2/4/2011 18:00	78.6
2/4/2011 19:00	81.7
2/4/2011 20:00	63.4
2/4/2011 21:00	55
2/4/2011 22:00	53.4
2/4/2011 23:00	53.1
2/5/2011 0:00	52.4
2/5/2011 1:00	49.7
2/5/2011 2:00	52.8
2/5/2011 3:00	53.4
2/5/2011 4:00	54.2
2/5/2011 5:00	53
2/5/2011 6:00	51.2
2/5/2011 7:00	53.1
2/5/2011 8:00	54.7
2/5/2011 9:00	52.5
2/5/2011 10:00	34.6
2/5/2011 11:00	27.9
2/5/2011 12:00	49.2
2/5/2011 13:00	41.1
2/5/2011 14:00	60.4
2/5/2011 15:00	65.3
2/5/2011 16:00	59.5

12 February 2011

Tung Chung

Date & Time	RSP
2/12/2011 17:00	45.1
2/12/2011 18:00	51.6
2/12/2011 19:00	65.8
2/12/2011 20:00	65.9
2/12/2011 21:00	65.7
2/12/2011 22:00	66.5
2/12/2011 23:00	62.8
2/13/2011 0:00	66.7
2/13/2011 1:00	66.8
2/13/2011 2:00	73.2
2/13/2011 3:00	69
2/13/2011 4:00	68.6
2/13/2011 5:00	62.2
2/13/2011 6:00	68.6
2/13/2011 7:00	63.5
2/13/2011 8:00	75.8
2/13/2011 9:00	77.7
2/13/2011 10:00	52.5
2/13/2011 11:00	71.5
2/13/2011 12:00	51.3
2/13/2011 13:00	48.1
2/13/2011 14:00	43.7
2/13/2011 15:00	24.9
2/13/2011 16:00	18.2

Shatin

Date & Time	RSP
2/12/2011 17:00	60.1
2/12/2011 18:00	70.3
2/12/2011 19:00	66.6
2/12/2011 20:00	62.9
2/12/2011 21:00	65.5
2/12/2011 22:00	65.8
2/12/2011 23:00	64
2/13/2011 0:00	69.6
2/13/2011 1:00	71.2
2/13/2011 2:00	72.7
2/13/2011 3:00	66.8
2/13/2011 4:00	64.3
2/13/2011 5:00	67.9
2/13/2011 6:00	70.4
2/13/2011 7:00	69.4
2/13/2011 8:00	74.9
2/13/2011 9:00	66.8
2/13/2011 10:00	67.3
2/13/2011 11:00	70.7
2/13/2011 12:00	55.8
2/13/2011 13:00	44.8
2/13/2011 14:00	34.5
2/13/2011 15:00	16.9
2/13/2011 16:00	16.2

Tai Po

Date & Time	RSP
2/12/2011 17:00	50.4
2/12/2011 18:00	61.1
2/12/2011 19:00	67.3
2/12/2011 20:00	65.4
2/12/2011 21:00	65.7
2/12/2011 22:00	67
2/12/2011 23:00	65.4
2/13/2011 0:00	68.5
2/13/2011 1:00	69
2/13/2011 2:00	71.8
2/13/2011 3:00	70.3
2/13/2011 4:00	67.9
2/13/2011 5:00	62.9
2/13/2011 6:00	68.6
2/13/2011 7:00	71.3
2/13/2011 8:00	70.4
2/13/2011 9:00	63.4
2/13/2011 10:00	63.2
2/13/2011 11:00	67
2/13/2011 12:00	56.7
2/13/2011 13:00	44.9
2/13/2011 14:00	32.9
2/13/2011 15:00	18.1
2/13/2011 16:00	16.1

Yuen Long

Date & Time	RSP
2/12/2011 17:00	54.7
2/12/2011 18:00	54.5
2/12/2011 19:00	67.3
2/12/2011 20:00	72.6
2/12/2011 21:00	70.2
2/12/2011 22:00	72.4
2/12/2011 23:00	69.5
2/13/2011 0:00	68.5
2/13/2011 1:00	69.2
2/13/2011 2:00	71.4
2/13/2011 3:00	69.9
2/13/2011 4:00	69.4
2/13/2011 5:00	63.6
2/13/2011 6:00	65
2/13/2011 7:00	68.8
2/13/2011 8:00	73.9
2/13/2011 9:00	65
2/13/2011 10:00	68.2
2/13/2011 11:00	68.7
2/13/2011 12:00	63.3
2/13/2011 13:00	50.2
2/13/2011 14:00	39.6
2/13/2011 15:00	30.7
2/13/2011 16:00	18.6

Tap Mun

Date & Time	RSP

2/12/2011 17:00	66.7
2/12/2011 18:00	70.1
2/12/2011 19:00	70.3
2/12/2011 20:00	72.7
2/12/2011 21:00	71.4
2/12/2011 22:00	70.5
2/12/2011 23:00	76.4
2/13/2011 0:00	83.4
2/13/2011 1:00	75.4
2/13/2011 2:00	78
2/13/2011 3:00	79
2/13/2011 4:00	72.9
2/13/2011 5:00	75.8
2/13/2011 6:00	85.8
2/13/2011 7:00	79.3
2/13/2011 8:00	84.2
2/13/2011 9:00	73.8
2/13/2011 10:00	63.7
2/13/2011 11:00	54.4
2/13/2011 12:00	41.3
2/13/2011 13:00	31.2
2/13/2011 14:00	15.2
2/13/2011 15:00	12.8
2/13/2011 16:00	4.6

20 February 2011

Tung Chung

Date & Time	RSP
2/20/2011 17:00	66.6
2/20/2011 18:00	80.9
2/20/2011 19:00	72.8
2/20/2011 20:00	60.9
2/20/2011 21:00	57.1
2/20/2011 22:00	52.3
2/20/2011 23:00	51.1
2/21/2011 0:00	47.4
2/21/2011 1:00	41.8
2/21/2011 2:00	36.3
2/21/2011 3:00	35.9
2/21/2011 4:00	40.8
2/21/2011 5:00	47
2/21/2011 6:00	33.1
2/21/2011 7:00	41.4
2/21/2011 8:00	60.3
2/21/2011 9:00	45.1
2/21/2011 10:00	50.5
2/21/2011 11:00	43.3
2/21/2011 12:00	47.2
2/21/2011 13:00	44.4
2/21/2011 14:00	44.6
2/21/2011 15:00	42.3
2/21/2011 16:00	57.1

Shatin

Date & Time	RSP
2/20/2011 17:00	48
2/20/2011 18:00	49.8
2/20/2011 19:00	48.7
2/20/2011 20:00	52
2/20/2011 21:00	52.3
2/20/2011 22:00	51.1
2/20/2011 23:00	31.6
2/21/2011 0:00	30.8
2/21/2011 1:00	31.9
2/21/2011 2:00	36.9
2/21/2011 3:00	41.9
2/21/2011 4:00	46.1
2/21/2011 5:00	44
2/21/2011 6:00	42.4
2/21/2011 7:00	44.9
2/21/2011 8:00	48.1
2/21/2011 9:00	51.2
2/21/2011 10:00	48.5
2/21/2011 11:00	46.4
2/21/2011 12:00	45.5
2/21/2011 13:00	48.5
2/21/2011 14:00	42.5
2/21/2011 15:00	38.3
2/21/2011 16:00	41

Tai Po

Date & Time	RSP
2/20/2011 17:00	57.4
2/20/2011 18:00	56.4
2/20/2011 19:00	62.2
2/20/2011 20:00	55.6
2/20/2011 21:00	50.9
2/20/2011 22:00	52
2/20/2011 23:00	47.3
2/21/2011 0:00	41.3
2/21/2011 1:00	32.4
2/21/2011 2:00	27.3
2/21/2011 3:00	37.4
2/21/2011 4:00	38.9
2/21/2011 5:00	39.1
2/21/2011 6:00	39.8
2/21/2011 7:00	42.9
2/21/2011 8:00	45.7
2/21/2011 9:00	51.3
2/21/2011 10:00	54.5
2/21/2011 11:00	55.4
2/21/2011 12:00	56.7
2/21/2011 13:00	49
2/21/2011 14:00	39.6
2/21/2011 15:00	39.3
2/21/2011 16:00	37.6

Yuen Long

Date & Time	RSP
2/20/2011 17:00	76.1
2/20/2011 18:00	73.2
2/20/2011 19:00	80.4
2/20/2011 20:00	76
2/20/2011 21:00	72.3
2/20/2011 22:00	73
2/20/2011 23:00	82.2
2/21/2011 0:00	60.2
2/21/2011 1:00	63.4
2/21/2011 2:00	45.6
2/21/2011 3:00	43.2
2/21/2011 4:00	29.6
2/21/2011 5:00	31
2/21/2011 6:00	32.7
2/21/2011 7:00	36
2/21/2011 8:00	46.6
2/21/2011 9:00	45.4
2/21/2011 10:00	52
2/21/2011 11:00	--
2/21/2011 12:00	--
2/21/2011 13:00	48.9
2/21/2011 14:00	49.3
2/21/2011 15:00	51.6
2/21/2011 16:00	47.9

Tap Mun

Date & Time	RSP
2/20/2011 17:00	58.6
2/20/2011 18:00	65.2
2/20/2011 19:00	56.2
2/20/2011 20:00	50.4
2/20/2011 21:00	44.4
2/20/2011 22:00	43.2
2/20/2011 23:00	28.5
2/21/2011 0:00	22.7
2/21/2011 1:00	32.7
2/21/2011 2:00	43.4
2/21/2011 3:00	43.4
2/21/2011 4:00	42.9
2/21/2011 5:00	41.4
2/21/2011 6:00	38.2
2/21/2011 7:00	55.1
2/21/2011 8:00	60.2
2/21/2011 9:00	59.5
2/21/2011 10:00	57.9
2/21/2011 11:00	57.1
2/21/2011 12:00	48.6
2/21/2011 13:00	38.9
2/21/2011 14:00	36.2
2/21/2011 15:00	56.5
2/21/2011 16:00	74.4

Note:

1. Time shown is in HK time.
2. RSP – respirable suspended particulates, NO_2 – nitrogen dioxide, O_3 – ozone, SO_2 – sulphur dioxide, CO – carbon monoxide
3. Concentration shown in $\mu g\ m^{-3}$
4. The concentration information was based on raw data taken directly from EPD's Air Quality Monitoring Network

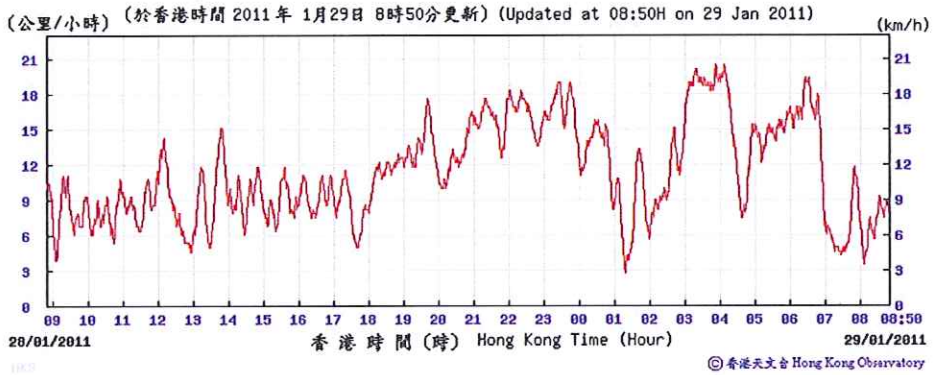
Annex A5

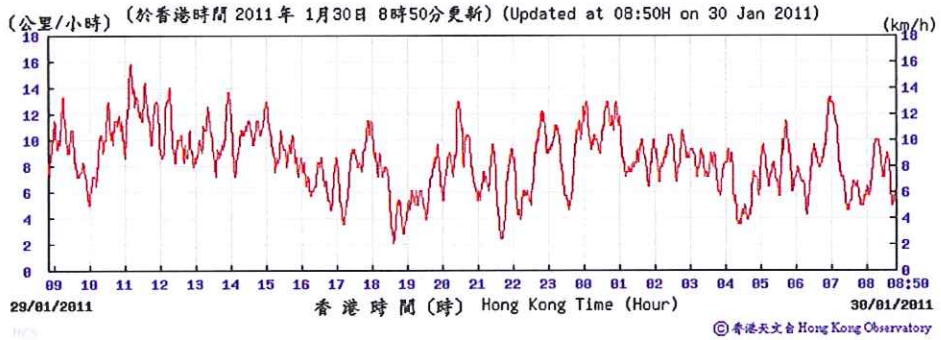
Weather Data Recorded at HKO's Weather Station in Wong Chuk Hang on 28 January 2011, and 4, 12, and 20 February 2011

Annex A5 ***Weather Data Recorded at HKO's Weather Station in Wong Chuk Hang on 28 January 2011, and 4, 12, and 20 February 2011***

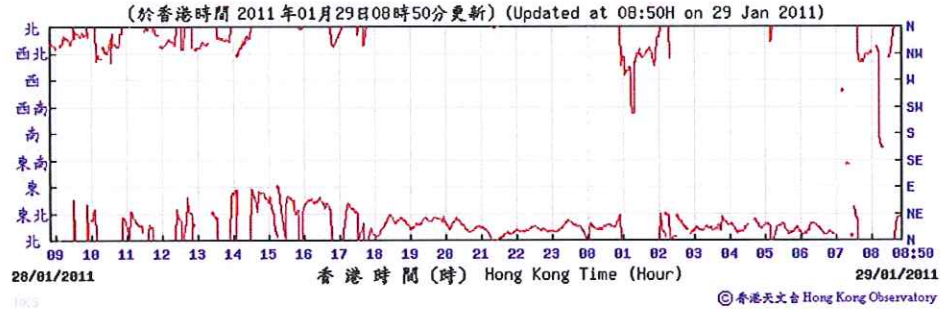
28 January 2011

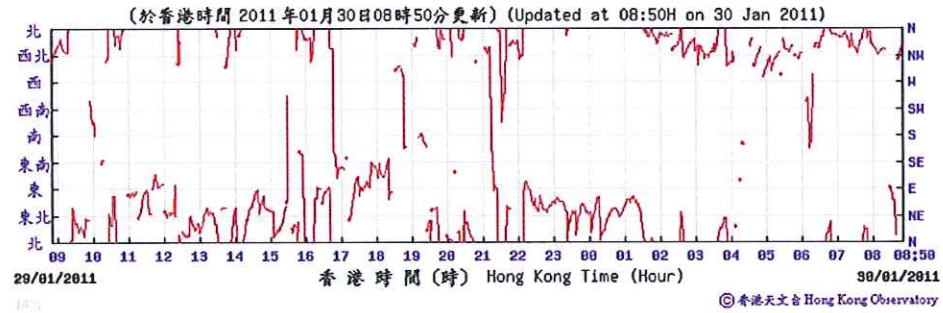
Prevailing Wind Speed



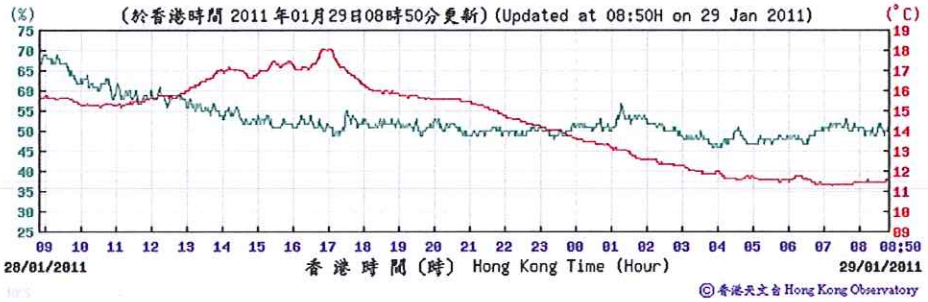


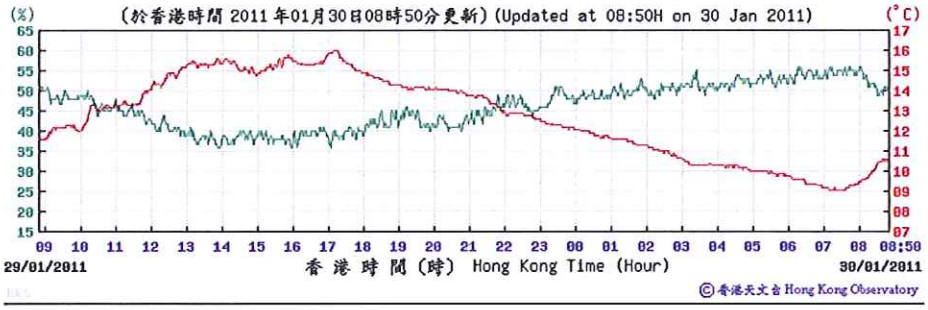
Prevailing Wind Direction





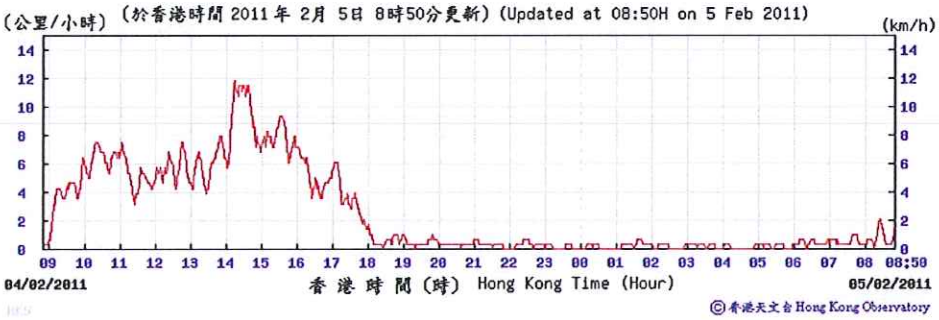
Ambient Temperature and Relative Humidity

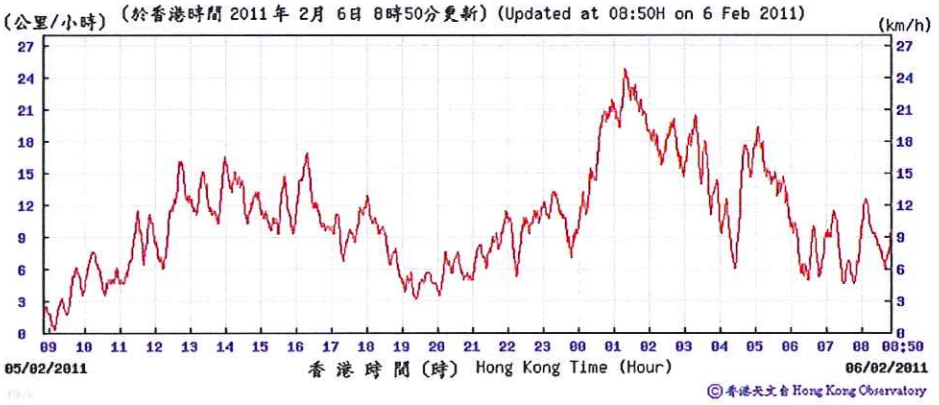




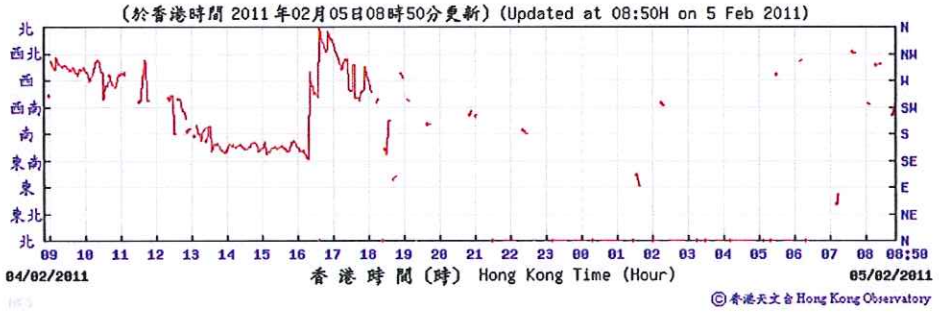
4 February 2011

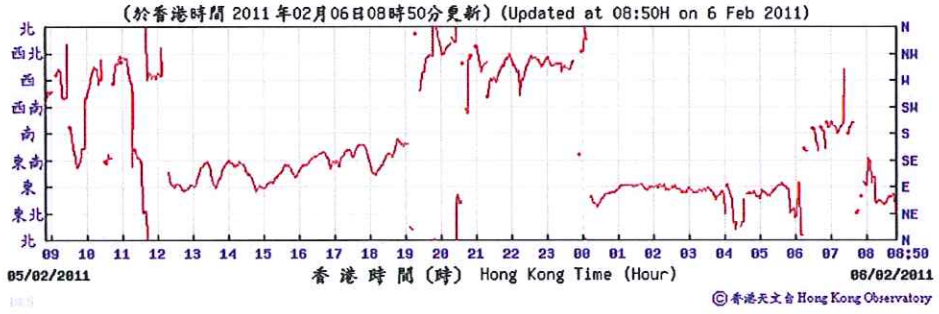
Prevailing Wind Speed



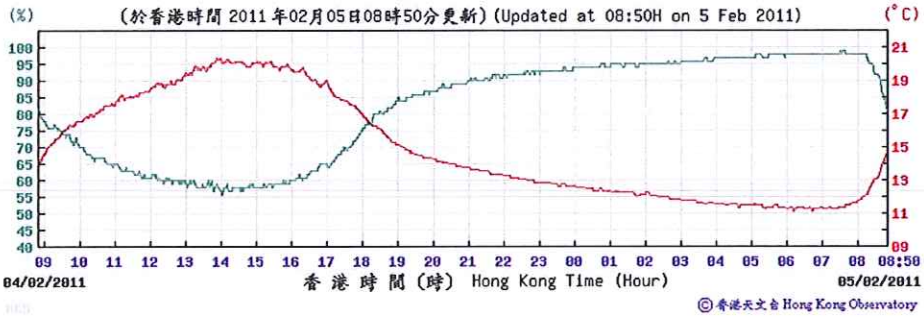


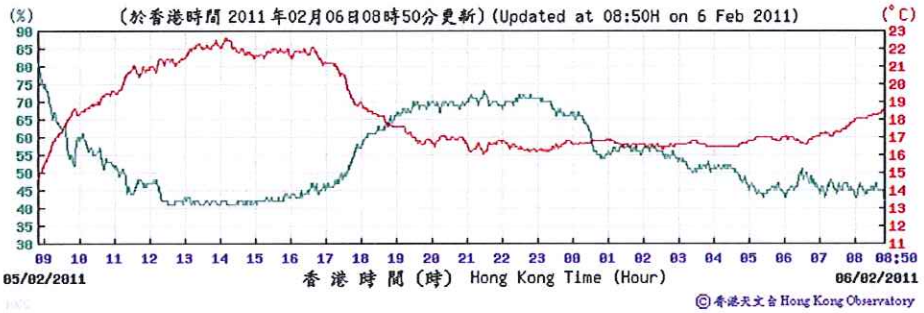
Prevailing Wind Direction





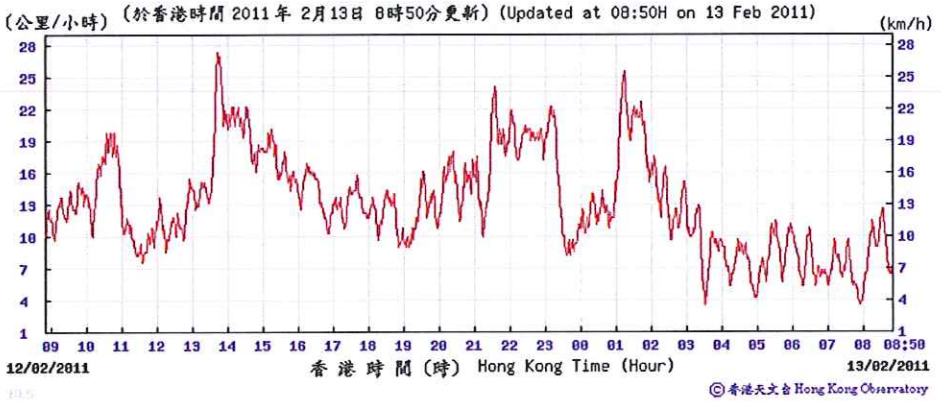
Ambient Temperature and Relative Humidity

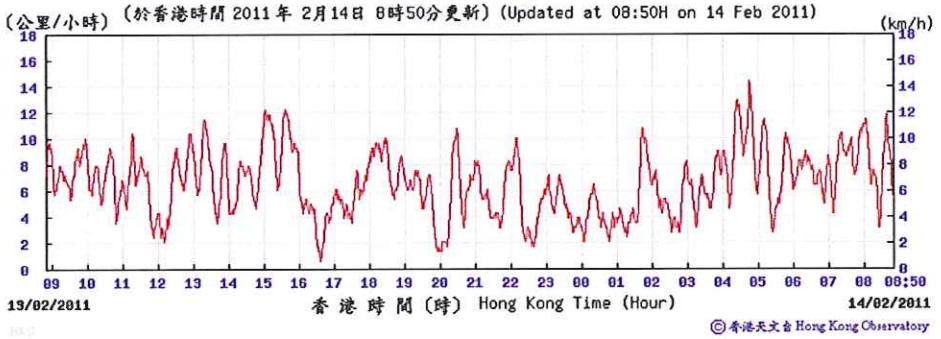




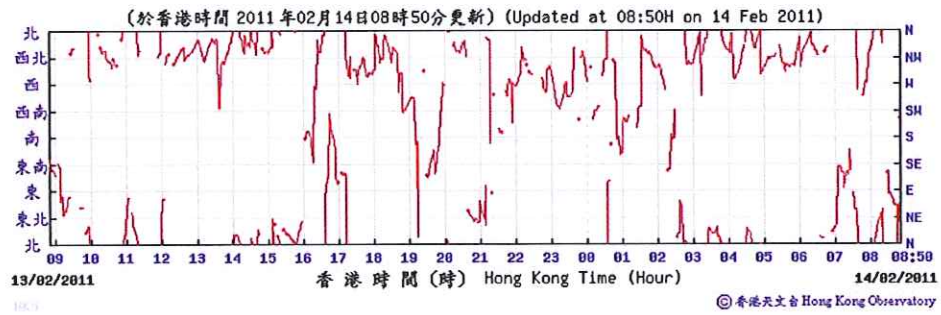
12 February 2011

Prevailing Wind Speed



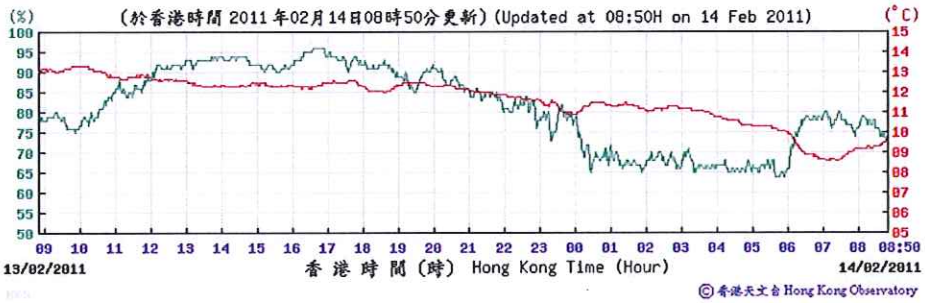


Prevailing Wind Direction



Ambient Temperature and Relative Humidity


(%)
(於香港時間 2011 年02月13日08時50分更新) (Updated at 08:50H on 13 Feb 2011)
(°C)
90 85 80 75 70 65 60 55 50 45
17 16 15 14 13 12 11 10 09 08
09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 00 01 02 03 04 05 06 07 08 08:50
12/02/2011
香 港 時 間 (時) Hong Kong Time (Hour)
13/02/2011
© 香港天文台 Hong Kong Observatory


(%)
(於香港時間 2011 年02月14日08時50分更新) (Updated at 08:50H on 14 Feb 2011)
(°C)
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15 14 13 12 11 10 09 08 07 06 05
09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 00 01 02 03 04 05 06 07 08 08:50
13/02/2011
香 港 時 間 (時) Hong Kong Time (Hour)
14/02/2011
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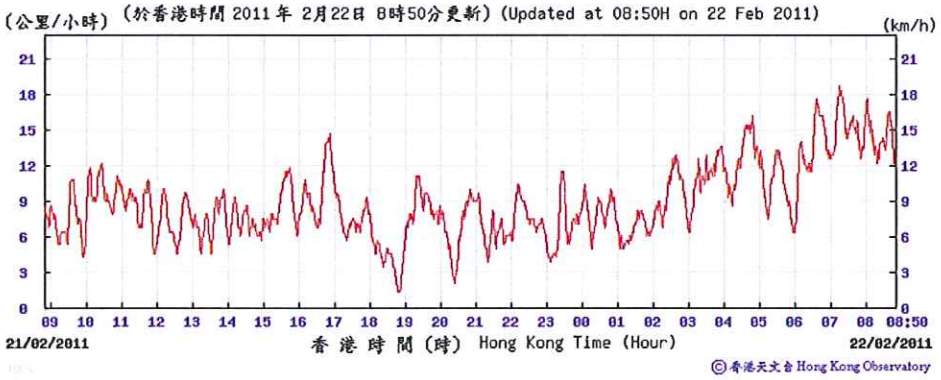
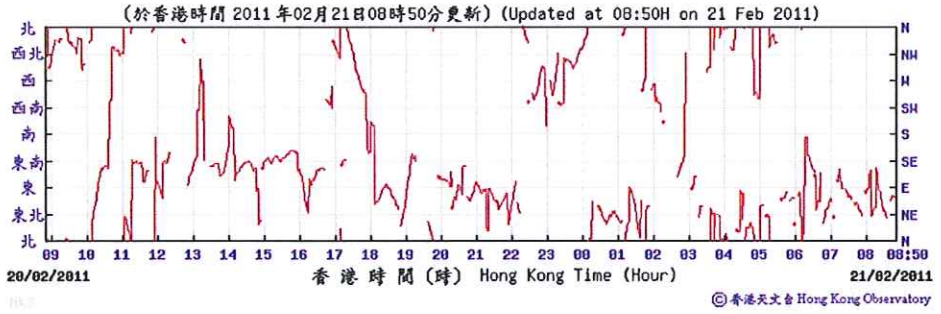
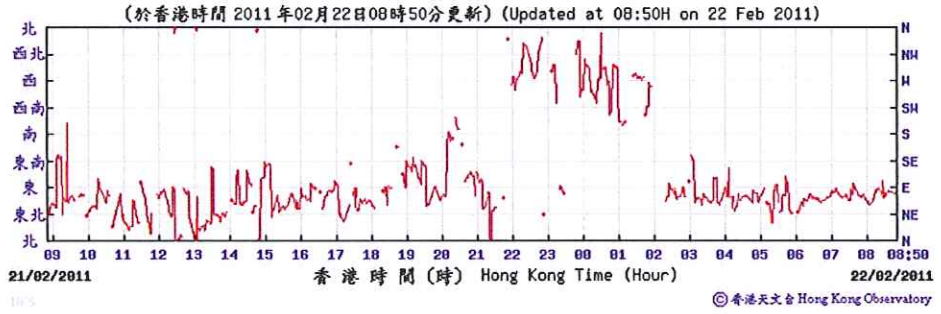
20 February 2011

Prevailing Wind Speed

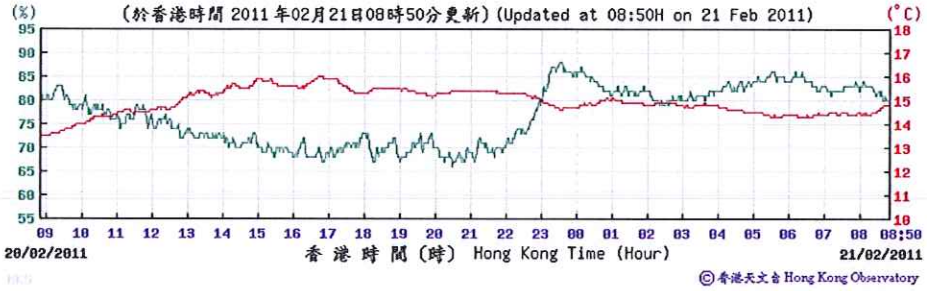


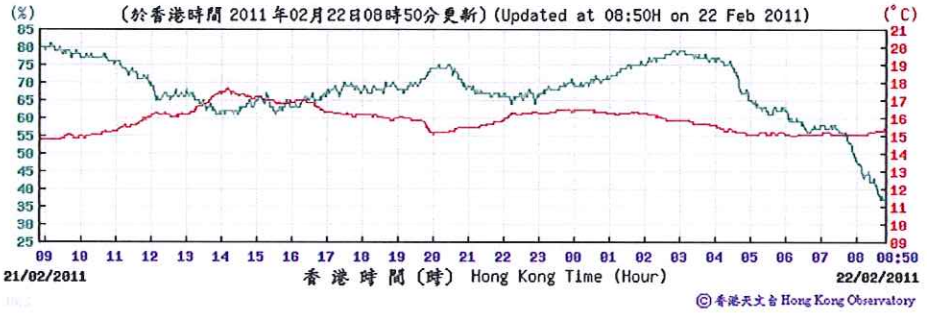
Prevailing Wind Direction





Ambient Temperature and Relative Humidity





Annex B1

Calibration Certificates of the Noise Measurement Equipment

輝創工程有限公司

Sun Creation Engineering Limited Calibration and Testing Laboratory

Certificate No. : C103766

Certificate of Calibration

This is to certify that the equipment

Description : Sound Level Calibrator

Manufacturer : Rion

Model No. : NC-73

Serial No. : 10786708

has been calibrated for the specific items and ranges.
The results are shown in the Calibration Report No. C103766.

The equipment is supplied by

Co. Name : Envirotech Services Co.

Address : Shop 6, G/F., Casio Mansion, 209 Shaukeiwan Road, Hong Kong

Date of Issue : 13 July 2010

Certified by : K C Lee

Calibration and Testing Laboratory of Sun Creation Engineering Limited
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
Tel: 2927 2606 Fax: 2744 8986 E-mail: callab@suncreation.com Website: www.suncreation.com

輝創工程有限公司
Sun Creation Engineering Limited Calibration and Testing Laboratory

Report No. : C103766

Calibration Report

ITEM TESTED

DESCRIPTION : Sound Level Calibrator
MANUFACTURER : Rion
MODEL NO. : NC-73
SERIAL NO. : 10786708

TEST CONDITIONS

AMBIENT TEMPERATURE : (23 ± 2)°C RELATIVE HUMIDITY : (55 ± 20)%
LINE VOLTAGE : ---

TEST SPECIFICATIONS

Calibration check

DATE OF TEST : 12 July 2010 ***JOB NO.*** : IC10-1738

TEST RESULTS

The results apply to the particular unit-under-test only.
All results are within manufacturer's specification.
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Agilent Technologies, USA
- Fluke Everett Service Center, USA
- Rohde & Schwarz Laboratory, Germany
- The Bruel & Kjaer Calibration Laboratory, Denmark

Tested by : *L L Cheung* *Date : 13 July 2010*

Calibration and Testing Laboratory of Sun Creation Engineering Limited
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
Tel: 2927 2606 Fax: 2744 8986 E-mail: callab@suncreation.com Website: www.suncreation.com

Report No. : C103766

Calibration Report

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 24 hours before the commencement of the test.

2. The results presented are the mean of 3 measurements at each calibration point.

3. Test equipment :

Equipment ID	Description	Certificate No.
TST150A	Measuring Amplifier	C101008
CL130	Universal Counter	C103289
CL281	Multifunction Acoustic Calibrator	C1005490

4. Test procedure : MA100N.

5. Results :

5.1 Sound Level Accuracy

UUT Nominal Value	Measured Value (dB)	Mfr's Spec. (dB)	Uncertainty of Measured Value (dB)
94 dB, 1 kHz	94.0	± 0.5	± 0.2

5.2 Frequency Accuracy

UUT Nominal Value (kHz)	Measured Value (kHz)	Mfr's Spec.	Uncertainty of Measured Value (Hz)
1	0.991 0	1 kHz ± 2 %	± 0.1

Remark : - The uncertainties are for a confidence probability of not less than 95 %.

Note :
The values given in this Calibration Report 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 environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

Calibration and Testing Laboratory of Sun Creation Engineering Limited
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
Tel: 2927 2606 Fax: 2744 8986 E-mail: callab@suncreation.com Website: www.suncreation.com

輝創工程有限公司

Sun Creation Engineering Limited Calibration and Testing Laboratory

Certificate No. : C103852

Certificate of Calibration

This is to certify that the equipment

Description : Precision Sound Level Meter

Manufacturer : Rion

Model No. : NA-27

Serial No. : 00201194

has been calibrated for the specific items and ranges.
The results are shown in the Calibration Report No. C103852.

The equipment is supplied by

Co. Name : Envirotech Services Co.

Address : Shop 6, G/F., Casio Mansion, 209 Shaukeiwan Road, Hong Kong

Date of Issue : 15 July 2010

Certified by : K C Lee

Calibration and Testing Laboratory of Sun Creation Engineering Limited
c/o 4 T, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
Tel: 2927 2606 Fax: 2744 8986 E-mail: callab@suncreation.com Website: www.suncreation.com

輝創工程有限公司
Sun Creation Engineering Limited Calibration and Testing Laboratory

Report No. : C103852

Calibration Report

ITEM TESTED

DESCRIPTION : Precision Sound Level Meter
MANUFACTURER : Rion
MODEL NO. : NA-27
SERIAL NO. : 00201194

TEST CONDITIONS

AMBIENT TEMPERATURE : (23 ± 2)°C RELATIVE HUMIDITY : (55 ± 20)%
LINE VOLTAGE : ---

TEST SPECIFICATIONS

Calibration

DATE OF TEST : 15 July 2010 ***JOB NO.*** : IC10-1790

TEST RESULTS

The results apply to the particular unit-under-test only.
All results are within manufacturer's specification.
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Agilent Technologies, USA
- Fluke Everett Service Center, USA
- Rohde & Schwarz Laboratory, Germany
- The Bruel & Kjaer Calibration Laboratory, Denmark

Tested by : *L L Cheung* *Date : 15 July 2010*

Calibration and Testing Laboratory of Sun Creation Engineering Limited
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
Tel: 2927 2606 Fax: 2744 8986 E-mail: callab@suncreation.com Website: www.suncreation.com

Report No. : C103852

Calibration Report

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 24 hours, and switched on to warm up for over 10 minutes before the commencement of the test.

2. Self-calibration using the internal standard (After Adjustment) was performed before the test 6.1.2 - 6.4.

3. The results presented are the mean of 3 measurement at each calibration point.

4. Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C100067
CL281	Multifunction Acoustic Calibrator	DC1005490

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

UUT Setting			Applied Value		UUT Reading (dB)		IEC 60651 Type 1
Range (dB)	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	Before Adjustment	After Adjustment	Spec. (dB)
50 - 110	LA	Fast	94.00	1	94.6	94.0	± 0.7

6.1.2 Linearity

UUT Setting			Applied Value		UUT Reading (dB)
Range (dB)	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
60 - 120	LA	Fast	94.00	1	94.0 (Ref.)
			104.00		104.0
			114.00		114.0

IEC 60651 Type 1 Spec. : ± 0.4 dB per 10 dB step and ± 0.7 dB for overall different.

6.2 Time Weighting

UUT Setting			Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
50 - 110	LA	Fast	94.00	1	94.0	Ref.
		Slow			94.0	± 0.1

Report No. : C103852

Calibration Report

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting			Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
50 - 110	LA	Fast	94.00	31.5 Hz	54.4	-39.4 ± 1.5
				63 Hz	67.7	-26.2 ± 1.5
				125 Hz	77.8	-16.1 ± 1.0
				250 Hz	85.2	-8.6 ± 1.0
				500 Hz	90.7	-3.2 ± 1.0
				1 kHz	94.0	Ref.
				2 kHz	95.2	+1.2 ± 1.0
				4 kHz	95.0	+1.0 ± 1.0
				8 kHz	92.8	-1.1 (+1.5 ; -3.0)
				12.5 kHz	89.7	-4.3 (+3.0 ; -6.0)

6.3.2 C-Weighting

UUT Setting			Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
50 - 110	LC	Fast	94.00	31.5 Hz	90.9	-3.0 ± 1.5
				63 Hz	93.1	-0.8 ± 1.5
				125 Hz	93.8	-0.2 ± 1.0
				250 Hz	93.9	0.0 ± 1.0
				500 Hz	94.0	0.0 ± 1.0
				1 kHz	93.9	Ref.
				2 kHz	93.8	-0.2 ± 1.0
				4 kHz	93.1	-0.8 ± 1.0
				8 kHz	90.9	-3.0 (+1.5 ; -3.0)
				12.5 kHz	87.7	-6.2 (+3.0 ; -6.0)

Report No. : C103852

Calibration Report

6.4 Time Averaging

UUT Setting			Applied Value					UUT Reading (dB)	IEC 60804 Type 1 Spec. (dB)
Range (dB)	Mode	Integrating Time	Freq. (kHz)	Burst Duration (ms)	Burst Duty Factor	Burst Level (dB)	Equivalent Level (dB)		
50 - 110	LAeq	10 sec.	4	1	1/10	110.0	100	99.9	± 0.5
					$1/10^2$		90	90.2	± 0.5
		60 sec.			$1/10^3$		80	80.0	± 1.0
		5 min.			$1/10^4$		70	70.0	± 1.0

Remarks : - Mfr's Spec. : IEC 60651 Type 1 & IEC 60804 Type 1

- Uncertainties of Applied Value :

94 dB	:	31.5 Hz - 125 Hz	: ± 0.35 dB
		250 Hz - 500 Hz	: ± 0.30 dB
		1 kHz	: ± 0.20 dB
		2 kHz - 4 kHz	: ± 0.35 dB
		8 kHz	: ± 0.45 dB
		12.5 kHz	: ± 0.70 dB
104 dB	:	1 kHz	: ± 0.10 dB (Ref. 94 dB)
114 dB	:	1 kHz	: ± 0.10 dB (Ref. 94 dB)

- The uncertainties are for a confidence probability of not less than 95 %.

Note :
The values given in this Calibration Report 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 environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

輝創工程有限公司

Sun Creation Engineering Limited Calibration and Testing Laboratory

Certificate No. : C102904

Certificate of Calibration

This is to certify that the equipment

Description : Sound Level Meter

Manufacturer : Rion

Model No. : NL-31

Serial No. : 00410224

has been calibrated for the specific items and ranges.
The results are shown in the Calibration Report No. C102904.

The equipment is supplied by

Co. Name : Envirotech Services Co.

Address : Shop 6, G/F., Casio Mansion, 209 Shaukeiwan Road, Hong Kong

Date of Issue : 31 May 2010

Certified by : K C Lee

Calibration and Testing Laboratory of Sun Creation Engineering Limited
c/o 4 F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
Tel: 2927 2606 Fax: 2744 8986 E-mail: callab@suncreation.com Website: www.suncreation.com

輝創工程有限公司
Sun Creation Engineering Limited Calibration and Testing Laboratory

Report No. : C102904

Calibration Report

ITEM TESTED

DESCRIPTION : Sound Level Meter
MANUFACTURER : Rion
MODEL NO. : NL-31
SERIAL NO. : 00410224

TEST CONDITIONS

AMBIENT TEMPERATURE : (23 ± 2)°C RELATIVE HUMIDITY : (55 ± 20)%
LINE VOLTAGE : ---

TEST SPECIFICATIONS

Calibration check

DATE OF TEST : 31 May 2010 ***JOB NO.*** : IC10-1356

TEST RESULTS

The results apply to the particular unit-under-test only.
All results are within manufacturer's specification.
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA
- Agilent Technologies, USA

Tested by : *L L Cheung* *Date : 31 May 2010*

Report No. : C102904

Calibration Report

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 24 hours, and switched on to warm up for over 10 minutes before the commencement of the test.

2. Self-calibration was performed before the test.

3. The results presented are the mean of 3 measurements at each calibration point.

4. Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C100067
CL179	Acoustical Calibrator	C095223

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 120	L_A	A	Fast	94.00	1	93.9	± 0.7

6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
30 - 120	L_A	A	Fast	94.00	1	93.9 (Ref.)
				114.00		113.9

IEC 60651 Type 1 Spec. : ± 0.4 dB per 10 dB step and ± 0.7 dB for overall different.

6.2 Time Weighting

6.2.1 Continuous Signal

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 120	L_A	A	Fast	94.00	1	93.9	Ref.
			Slow			93.8	± 0.1

Report No. : C102904

Calibration Report

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 120	L_A	A	Fast	94.00	31.5 Hz	54.2	-39.4 ± 1.5
					63 Hz	67.6	-26.2 ± 1.5
					125 Hz	77.7	-16.1 ± 1.0
					250 Hz	85.2	-8.6 ± 1.0
					500 Hz	90.6	-3.2 ± 1.0
					1 kHz	93.9	Ref.
					2 kHz	95.2	+1.2 ± 1.0
					4 kHz	95.0	+1.0 ± 1.0
					8 kHz	92.9	-1.1 (+1.5 ; -3.0)
					12.5 kHz	90.0	-4.3 (+3.0 ; -6.0)

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 120	L_C	C	Fast	94.00	31.5 Hz	90.6	-3.0 ± 1.5
					63 Hz	93.1	-0.8 ± 1.5
					125 Hz	93.7	-0.2 ± 1.0
					250 Hz	93.9	0.0 ± 1.0
					500 Hz	93.9	0.0 ± 1.0
					1 kHz	93.9	Ref.
					2 kHz	93.9	-0.2 ± 1.0
					4 kHz	93.3	-0.8 ± 1.0
					8 kHz	91.0	-3.0 (+1.5 ; -3.0)
					12.5 kHz	88.1	-6.2 (+3.0 ; -6.0)

Report No. : C102904

Calibration Report

6.4 Time Averaging

UUT Setting				Applied Value					UUT Reading (dB)	IEC 60804 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Freq. (kHz)	Burst Duration (ms)	Burst Duty Factor	Burst Level (dB)	Equivalent Level (dB)		
20 - 110	L_{Aeq}	A	10 sec.	4	1	1/10	110.0	100	100.0	± 0.5
						$1/10^2$		90	90.0	± 0.5
			60 sec.			$1/10^3$		80	80.0	± 1.0
			5 min.			$1/10^4$		70	70.0	± 1.0

Remarks : - Mfr's Spec. : IEC 60651 Type 1 & IEC 60804 Type 1

- Uncertainties of Applied Value : 94 dB : 31.5 Hz - 125 Hz : ± 0.35 dB
  250 Hz - 1 kHz : ± 0.30 dB
  2 kHz - 4 kHz : ± 0.35 dB
  8 kHz : ± 0.45 dB
  12.5 kHz : ± 0.70 dB
  114 dB : 1 kHz : ± 0.10 dB (Ref. 94 dB)

- The uncertainties are for a confidence probability of not less than 95 %.

Note :
The values given in this Calibration Report 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 environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

輝創工程有限公司
Sun Creation Engineering Limited Calibration and Testing Laboratory

Certificate No. : C103778

Certificate of Calibration

This is to certify that the equipment

Description : Sound Level Meter

Manufacturer : Rion

Model No. : NL-31

Serial No. : 00320533

has been calibrated for the specific items and ranges.
The results are shown in the Calibration Report No. C103778.

The equipment is supplied by

Co. Name : Envirotech Services Co.

Address : Shop 6, G/F., Casio Mansion, 209 Shaukeiwan Road, Hong Kong

Date of Issue : 13 July 2010

Certified by : K C Lee

Calibration and Testing Laboratory of Sun Creation Engineering Limited
c/o 4 F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
Tel: 2927 2606 Fax: 2744 8986 E-mail: callab@suncreation.com Website: www.suncreation.com

輝創工程有限公司
Sun Creation Engineering Limited Calibration and Testing Laboratory

Report No. : C103778

Calibration Report

ITEM TESTED

DESCRIPTION : Sound Level Meter
MANUFACTURER : Rion
MODEL NO. : NL-31
SERIAL NO. : 00320533

TEST CONDITIONS

AMBIENT TEMPERATURE : (23 ± 2)°C RELATIVE HUMIDITY : (55 ± 20)%
LINE VOLTAGE : ---

TEST SPECIFICATIONS

Calibration check

DATE OF TEST : 12 July 2010 ***JOB NO.*** : IC10-1738

TEST RESULTS

The results apply to the particular unit-under-test only.
All results are within manufacturer's specification.
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Agilent Technologies, USA
- Fluke Everett Service Center, USA
- Rohde & Schwarz Laboratory, Germany
- The Bruel & Kjaer Calibration Laboratory, Denmark

Tested by : *L L Cheung* *Date : 13 July 2010*

Calibration and Testing Laboratory of Sun Creation Engineering Limited
c/o 4 F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
Tel: 2927 2606 Fax: 2744 8986 E-mail: callab@suncreation.com Website: www.suncreation.com

Report No. : C103778

Calibration Report

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 24 hours, and switched on to warm up for over 10 minutes before the commencement of the test.

2. Self-calibration was performed before the test.

3. The results presented are the mean of 3 measurements at each calibration point.

4. Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C100067
CL281	Multifunction Acoustic Calibrator	C1005490

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

UUT Setting				Applied Value		UUT	IEC 60651
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	Reading (dB)	Type 1 Spec. (dB)
30 - 120	L_A	A	Fast	94.00	1	94.3	± 0.7

6.1.2 Linearity

UUT Setting				Applied Value		UUT
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	Reading (dB)
30 - 120	L_A	A	Fast	94.00	1	94.3 (Ref.)
				104.00		104.3
				114.00		114.3

IEC 60651 Type 1 Spec. : ± 0.4 dB per 10 dB step and ± 0.7 dB for overall different.

6.2 Time Weighting

6.2.1 Continuous Signal

UUT Setting				Applied Value		UUT	IEC 60651
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	Reading (dB)	Type 1 Spec. (dB)
30 - 120	L_A	A	Fast	94.00	1	94.3	Ref.
			Slow			94.2	± 0.1

Report No. : C103778

Calibration Report

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 120	L_A	A	Fast	94.00	31.5 Hz	55.3	-39.4 ± 1.5
					63 Hz	68.4	-26.2 ± 1.5
					125 Hz	78.4	-16.1 ± 1.0
					250 Hz	85.8	-8.6 ± 1.0
					500 Hz	91.1	-3.2 ± 1.0
					1 kHz	94.3	Ref.
					2 kHz	95.3	+1.2 ± 1.0
					4 kHz	94.5	+1.0 ± 1.0
					8 kHz	90.5	-1.1 (+1.5 ; -3.0)
					12.5 kHz	85.0	-4.3 (+3.0 ; -6.0)

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 120	L_C	C	Fast	94.00	31.5 Hz	91.5	-3.0 ± 1.5
					63 Hz	93.7	-0.8 ± 1.5
					125 Hz	94.2	-0.2 ± 1.0
					250 Hz	94.4	0.0 ± 1.0
					500 Hz	94.4	0.0 ± 1.0
					1 kHz	94.3	Ref.
					2 kHz	94.0	-0.2 ± 1.0
					4 kHz	92.8	-0.8 ± 1.0
					8 kHz	88.7	-3.0 (+1.5 ; -3.0)
					12.5 kHz	82.4	-6.2 (+3.0 ; -6.0)

6.4 Time Averaging

UUT Setting				Applied Value					UUT Reading (dB)	IEC 60804 Type 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Freq. (kHz)	Burst Duration (ms)	Burst Duty Factor	Burst Level (dB)	Equivalent Level (dB)		
20 - 110	L_{Aeq}	A	60 sec.	4	1	$1/10^3$	110.0	80	80.7	± 1.0
			5 min.			$1/10^4$		70	70.7	± 1.0

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Calibration Report

Remarks : - Mfr's Spec. : IEC 60651 Type 1 & IEC 60804 Type 1

- Uncertainties of Applied Value :

94 dB	:	31.5 Hz - 125 Hz	: ± 0.35 dB
		250 Hz - 1 kHz	: ± 0.30 dB
		2 kHz - 4 kHz	: ± 0.35 dB
		8 kHz	: ± 0.45 dB
		12.5 kHz	: ± 0.70 dB
104 dB	:	1 kHz	: ± 0.10 dB (Ref. 94 dB)
114 dB	:	1 kHz	: ± 0.10 dB (Ref. 94 dB)

- The uncertainties are for a confidence probability of not less than 95 %.

Note :
The values given in this Calibration Report 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 environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

Calibration and Testing Laboratory of Sun Creation Engineering Limited
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輝創工程有限公司

Sun Creation Engineering Limited Calibration and Testing Laboratory

Certificate No. : C105886

Certificate of Calibration

This is to certify that the equipment

Description : Sound Level Meter

Manufacturer : Rion

Model No. : NL-31

Serial No. : 00983400

has been calibrated for the specific items and ranges.
The results are shown in the Calibration Report No. C105886.

The equipment is supplied by

Co. Name : Envirotech Services Co.

Address : Shop 6, G/F., Casio Mansion, 209 Shaukeiwan Road, Hong Kong

Date of Issue : 26 October 2010

Certified by : K C Lee

Calibration and Testing Laboratory of Sun Creation Engineering Limited
c/o 4 F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
Tel: 2927 2606 Fax: 2744 8986 E-mail: callab@suncreation.com Website: www.suncreation.com

輝創工程有限公司
Sun Creation Engineering Limited Calibration and Testing Laboratory

Report No. : C105886

Calibration Report

ITEM TESTED

DESCRIPTION : Sound Level Meter
MANUFACTURER : Rion
MODEL NO. : NL-31
SERIAL NO. : 00983400

TEST CONDITIONS

AMBIENT TEMPERATURE : (23 ± 2)°C RELATIVE HUMIDITY : (55 ± 20)%
LINE VOLTAGE : ---

TEST SPECIFICATIONS

Calibration check

DATE OF TEST : 25 October 2010 ***JOB NO.*** : IC10-2726

TEST RESULTS

The results apply to the particular unit-under-test only.
All results are within manufacturer's specification.
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- The Bruel & Kjaer Calibration Laboratory, Denmark
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA
- Agilent Technologies, USA

Tested by : L L Cheung *Date : 26 October 2010*

Report No. : C105886

Calibration Report

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 24 hours, and switched on to warm up for over 10 minutes before the commencement of the test.

2. Self-calibration was performed before the test.

3. The results presented are the mean of 3 measurements at each calibration point.

4. Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C100067
CL281	Multifunction Acoustic Calibrator	C1006860

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 120	L_A	A	Fast	94.00	1	94.0	± 1.1

6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
30 - 120	L_A	A	Fast	94.00	1	94.0 (Ref.)
				104.00		104.0
				114.00		114.1

IEC 61672 Class 1 Spec. : ± 0.6 dB per 10 dB step and ± 1.1 dB for overall different.

6.2 Time Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 120	L_A	A	Fast	94.00	1	94.0	Ref.
			Slow			93.9	± 0.3

Report No. : C105886

Calibration Report

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 120	L_A	A	Fast	94.00	63 Hz	67.6	-26.2 ± 1.5
					125 Hz	77.7	-16.1 ± 1.5
					250 Hz	85.2	-8.6 ± 1.4
					500 Hz	90.7	-3.2 ± 1.4
					1 kHz	94.0	Ref.
					2 kHz	95.3	+1.2 ± 1.6
					4 kHz	95.1	+1.0 ± 1.6
					8 kHz	93.0	-1.1 (+2.1 ; -3.1)
					12.5 kHz	90.1	-4.3 (+3.0 ; -6.0)

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 120	L_C	C	Fast	94.00	63 Hz	93.2	-0.8 ± 1.5
					125 Hz	93.8	-0.2 ± 1.5
					250 Hz	94.0	0.0 ± 1.4
					500 Hz	94.0	0.0 ± 1.4
					1 kHz	94.0	Ref.
					2 kHz	93.9	-0.2 ± 1.6
					4 kHz	93.4	-0.8 ± 1.6
					8 kHz	91.1	-3.0 (+2.1 ; -3.1)
					12.5 kHz	88.3	-6.2 (+3.0 ; -6.0)

Report No. : C105886

Calibration Report

Remarks : - Mfr's Spec. : IEC 61672 Class 1

- Uncertainties of Applied Value :

94 dB	:	63 Hz - 125 Hz	: ± 0.35 dB
		250 Hz - 500 Hz	: ± 0.30 dB
		1 kHz	: ± 0.20 dB
		2 kHz - 4 kHz	: ± 0.35 dB
		8 kHz	: ± 0.45 dB
		12.5 kHz	: ± 0.70 dB
104 dB	:	1 kHz	: ± 0.10 dB (Ref. 94 dB)
114 dB	:	1 kHz	: ± 0.10 dB (Ref. 94 dB)

- The uncertainties are for a confidence probability of not less than 95 %.

Note :
The values given in this Calibration Report 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 environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

Annex B2

Results of Noise Monitoring

Annex B2
Operational Noise Monitoring Results

Monitoring Location: AON1 **Open area adjacent to Police Training School**

Date	Weekdays/ Public Holiday (WD/PH)	Measurement Period, hours		Measured Noise Level [1], dB(A)			Daily Operational Noise Level (Background Corrected), $L_{eq, 30min}$		Lagoon Night Show Noise Level (Background Corrected), $L_{eq, 30min}$		Noise Criteria, $L_{eq(30mins)}$, dB(A)	Remark / Other Noise Source(s)
		Start	End	Daily Operational Noise Level, $L_{eq, 30min}$	Lagoon Night Show Noise Level, $L_{eq, 30min}$	Background Noise Level, $L_{eq, 15min}$	Without façade	With façade correction	Without façade	With façade correction		
30-Jan-11	PH	1810	1930	67.4	65.9	**65.4**	**62.9**	**65.9**	56.4	59.4	60	Note [2] & [3]
1-Feb-11	WD	1820	1930	64.3	63.6	**64.0**	51.8	54.8	Negligible	Negligible	60	-
6-Feb-11	PH	1920	2030	65.8	63.1	**63.3**	**62.2**	**65.2**	Negligible	Negligible	60	Note [2] & [3]
8-Feb-11	WD	1920	2030	63.1	63.0	**63.1**	Negligible	Negligible	Negligible	Negligible	60	-
13-Feb-11	PH	-	-	-	-	-	-	-	-	-	60	Note [4]
17-Feb-11	WD	1820	1930	61.9	62.2	**62.7**	Negligible	Negligible	Negligible	Negligible	60	-
20-Feb-11	PH	1820	1930	67.4	66.6	**66.5**	60.3	**63.3**	47.1	50.1	60	Note [2] & [3]
22-Feb-11	WD	1820	1930	62.9	62.6	**62.1**	54.9	57.9	52.8	55.8	60	-

Monitoring Location: AON2 **Roof of Old Canteen Building**

Date	Weekdays/ Public Holiday (WD/PH)	Measurement Period, hours		Measured Noise Level [1], dB(A)			Daily Operational Noise Level (Background Corrected), $L_{eq, 30min}$	Lagoon Night Show Noise Level (Background Corrected), $L_{eq, 30min}$	Noise Criteria, $L_{eq(30mins)}$, dB(A)	Remark / Other Noise Source(s)
		Start	End	Daily Operational Noise Level, $L_{eq, 30min}$	Lagoon Night Show Noise Level, $L_{eq, 30min}$	Background Noise Level, $L_{eq, 15min}$				
30-Jan-11	PH	1810	1930	59.2	57.9	56.2	56.2	52.8	60	-
1-Feb-11	WD	1820	1930	57.3	57.1	55.4	52.8	52.2	60	-
6-Feb-11	PH	1920	2030	58.8	57.8	56.1	55.4	52.7	60	-
8-Feb-11	WD	1920	2030	58.4	57.2	55.4	55.3	52.6	60	-
13-Feb-11	PH	-	-	-	-	-	-	-	60	Note [4]
17-Feb-11	WD	1820	1930	57.1	57.1	55.0	52.9	52.9	60	-
20-Feb-11	PH	1820	1930	57.5	57.6	55.7	52.7	53.0	60	-
22-Feb-11	WD	1820	1930	58.8	57.6	55.9	55.7	52.8	60	-

Monitoring Location: AON3 **Orchid Valley**

Date	Weekdays/ Public Holiday (WD/PH)	Measurement Period, hours		Measured Noise Level [1], dB(A)			Daily Operational Noise Level (Background Corrected), $L_{eq, 30min}$		Lagoon Night Show Noise Level (Background Corrected), $L_{eq, 30min}$		Noise Criteria, $L_{eq(30mins)}$, dB(A)	Remark / Other Noise Source(s)
		Start	End	Daily Operational Noise Level, $L_{eq, 30min}$	Lagoon Night Show Noise Level, $L_{eq, 30min}$	Background Noise Level, $L_{eq, 15min}$	Without façade	With façade correction	Without façade	With façade correction		
30-Jan-11	PH	-	-	-	-	-	-	-	-	-	55	Note [5]
1-Feb-11	WD	1820	1930	53.4	53.9	53.3	35.2	38.2	45.0	48.0	55	-
6-Feb-11	PH	1920	2030	52.3	50.7	50.7	47.1	50.1	29.6	32.6	55	-
8-Feb-11	WD	1920	2030	53.9	52.5	51.7	49.8	52.8	44.4	47.4	55	-
13-Feb-11	PH	-	-	-	-	-	-	-	-	-	55	Note [4]
17-Feb-11	WD	1820	1930	54.0	54.1	53.4	45.3	48.3	45.9	48.9	55	-
20-Feb-11	PH	1820	1930	52.2	54.2	52.8	Negligible	Negligible	48.7	51.7	55	-
22-Feb-11	WD	1820	1930	54.1	53.2	52.3	49.3	52.3	45.8	48.8	55	-

Monitoring Location: AON4 Manly Villa

Date	Weekdays/ Public Holiday (WD/PH)	Measurement Period, hours		Measured Noise Level [1], dB(A)			Daily Operational Noise Level (Background Corrected), $L_{eq, 30min}$	Lagoon Night Show Noise Level (Background Corrected), $L_{eq, 30min}$	Noise Criteria, $L_{eq(30mins)}$, dB(A)	Remark / Other Noise Source(s)
		Start	End	Daily Operational Noise Level, $L_{eq, 30min}$	Lagoon Night Show Noise Level, $L_{eq, 30min}$	Background Noise Level, $L_{eq, 15min}$				
30-Jan-11	PH	1810	1930	58.0	55.9	54.9	55.0	48.6	55	-
1-Feb-11	WD	1820	1930	57.1	56.4	55.4	52.2	49.5	55	-
6-Feb-11	PH	1920	2030	56.8	54.3	53.0	54.5	48.4	55	-
8-Feb-11	WD	1920	2030	55.7	54.1	52.8	52.5	48.2	55	-
13-Feb-11	PH	-	-	-	-	-	-	-	55	Note [4]
17-Feb-11	WD	1820	1930	54.7	54.8	53.8	47.2	47.7	55	-
20-Feb-11	PH	1820	1930	55.3	55.2	54.5	47.3	47.1	55	-
22-Feb-11	WD	1820	1930	56.4	56.4	**55.7**	48.2	48.2	55	-

Monitoring Location: AON5 Hau Yuen

Date	Weekdays/ Public Holiday (WD/PH)	Measurement Period, hours		Measured Noise Level [1], dB(A)			Daily Operational Noise Level (Background Corrected), $L_{eq, 30min}$	Lagoon Night Show Noise Level (Background Corrected), $L_{eq, 30min}$	Noise Criteria, $L_{eq(30mins)}$, dB(A)	Remark / Other Noise Source(s)
		Start	End	Daily Operational Noise Level, $L_{eq, 30min}$	Lagoon Night Show Noise Level, $L_{eq, 30min}$	Background Noise Level, $L_{eq, 15min}$				
30-Jan-11	PH	1810	1930	59.9	57.6	**57.1**	**56.6**	47.8	55	Note [3]
1-Feb-11	WD	1820	1930	59.0	58.7	**58.6**	48.4	44.5	55	-
6-Feb-11	PH	1920	2030	58.1	55.0	54.5	**55.7**	45.8	55	Note [3]
8-Feb-11	WD	1920	2030	58.8	57.9	**56.3**	55.3	52.7	55	-
13-Feb-11	PH	-	-	-	-	-	-	-	55	Note [4]
17-Feb-11	WD	1820	1930	58.2	58.6	**57.8**	46.6	50.6	55	-
20-Feb-11	PH	1820	1930	57.3	58.9	**57.2**	42.1	54.1	55	-
22-Feb-11	WD	1820	1930	59.6	58.5	**57.4**	55.4	51.7	55	-

Notes:

[1] Bolded value indicates exceedance over the noise criteria.
Negligible refers to the measured impact noise levels lower than the background noise levels.

[2] The exceedance were due to the movement of buses in the vicinity of the bus terminus. In accordance with the traffic noise impact assessment conducted in the approved EIA Report. The predicted traffic noise levels are in the range of 62-66dB(A) at PTS1 with the OPC Redevelopment during weekdays, based on traffic forecast at Year 2026. It is justified that the measured noise levels at AON1 would be higher than 60dB(A) based on the EIA results and due to the fact that AON1 is located immediately next to the road.

[3] The exceedance were due to the high level of background noise from visitors and traffic on public holidays, especially on 30 Jan and 6 Feb 2011, which were public holidays before and during the Chinese Lunar New Year.

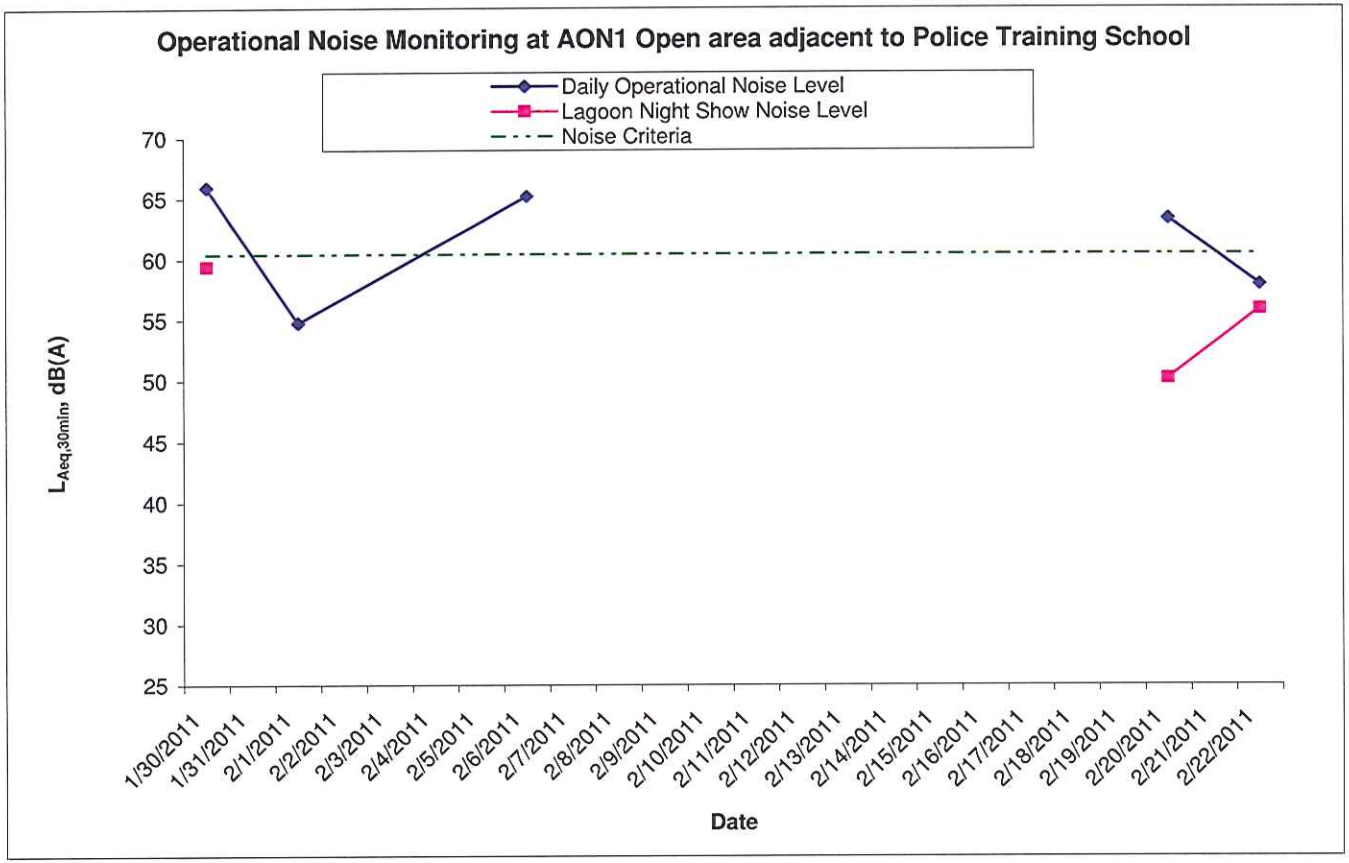
[4] Noise monitoring on 13 Feb 2011 was cancelled due to the rainy weather.

[5] Noise monitoring at AON3 started from 1 Feb 2011.

Annex B3

Graphical Presentation of Noise Monitoring Results

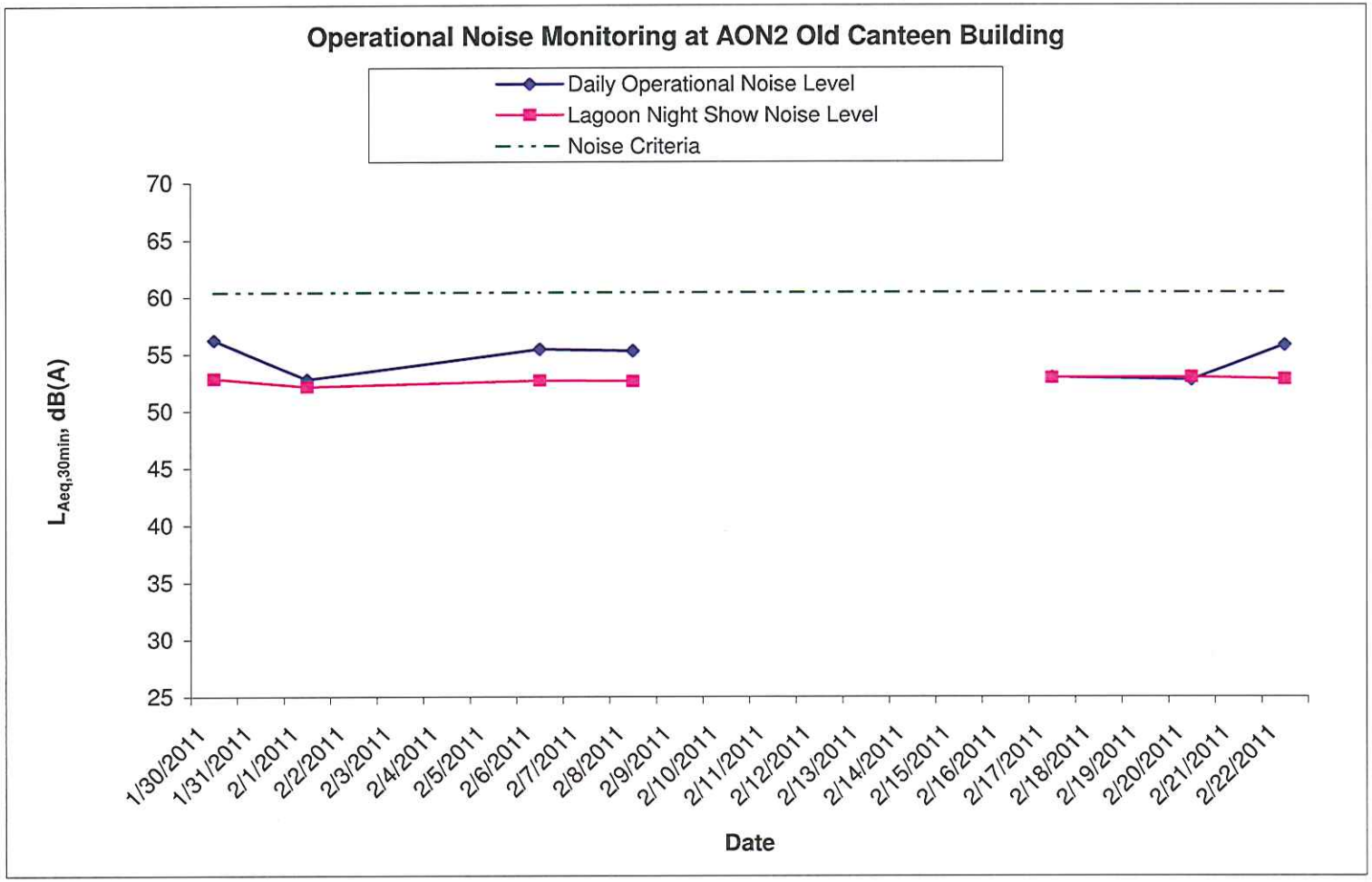
Annex B3-1



Notes: The exceedance were due to the movement of buses in the vicinity of the bus terminus. In accordance with the traffic noise impact assessment conducted in the approved EIA Report. The predicted traffic noise levels are in the range of 62-66dB(A) at PTS1 with the OPC Redevelopment during weekdays, based on traffic forecast at Year 2026. It is justified that the measured noise levels at AON1 would be higher than 60dB(A) based on the EIA results and due to the fact that AON1 is located immediately next to the road.

The exceedance were also due to the high level of background noise from visitors and traffic on public holidays, especially on 30 Jan and 6 Feb 2011, which were public holidays before and during the Chinese Lunar New Year.

Annex B3-2


Operational Noise Monitoring at AON2 Old Canteen Building
Daily Operational Noise Level
Lagoon Night Show Noise Level
Noise Criteria
70
65
60
55
50
45
40
35
30
25
$L_{Aeq,30min}$, dB(A)
1/30/2011
1/31/2011
2/1/2011
2/2/2011
2/3/2011
2/4/2011
2/5/2011
2/6/2011
2/7/2011
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2/14/2011
2/15/2011
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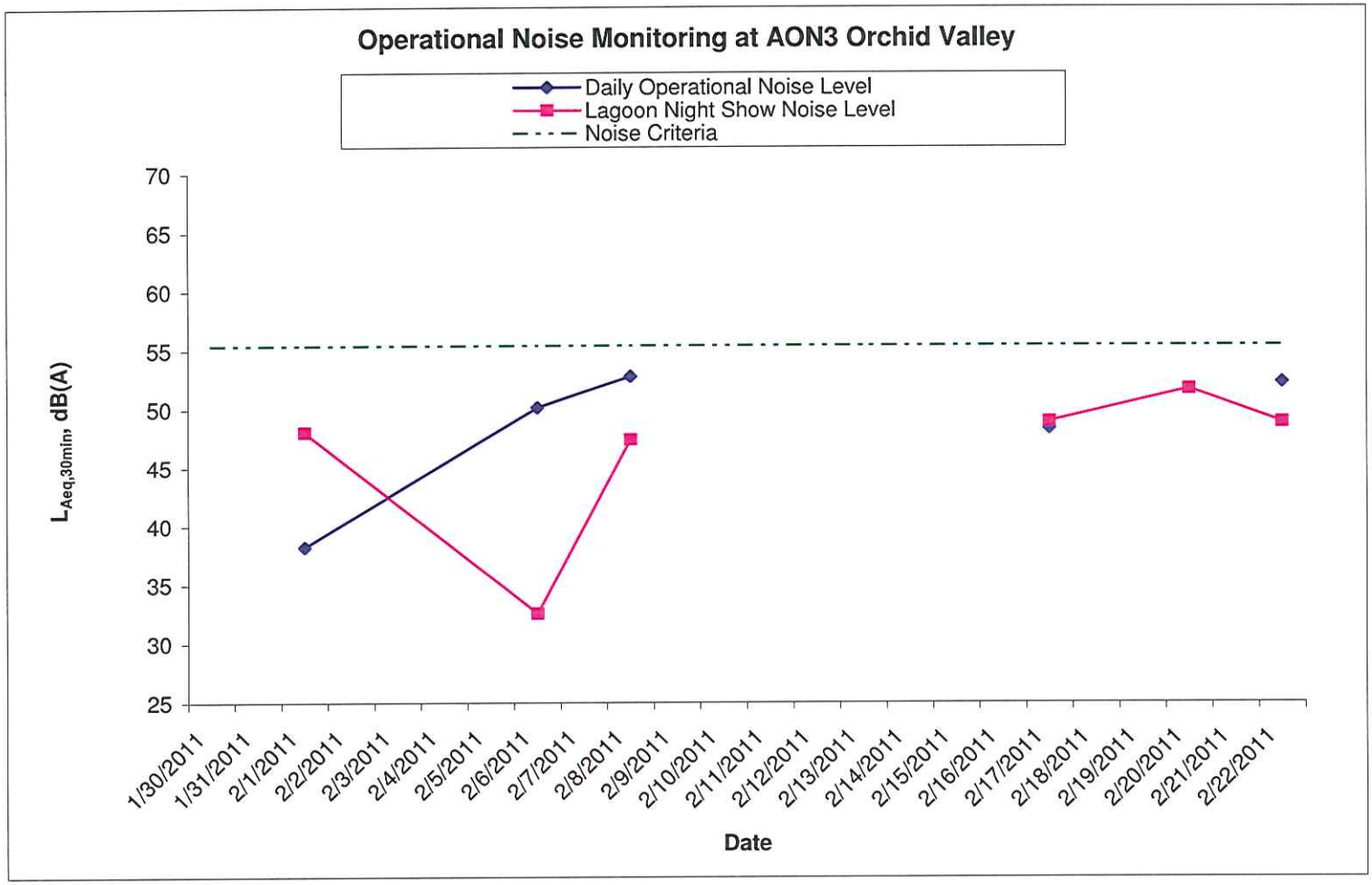
2/21/2011
2/22/2011
Date

Annex B3-3


Operational Noise Monitoring at AON3 Orchid Valley
Daily Operational Noise Level
Lagoon Night Show Noise Level
Noise Criteria
70
65
60
55
50
45
40
35
30
25
$L_{Aeq,30min}$, dB(A)
1/30/2011
1/31/2011
2/1/2011
2/2/2011
2/3/2011
2/4/2011
2/5/2011
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2/14/2011
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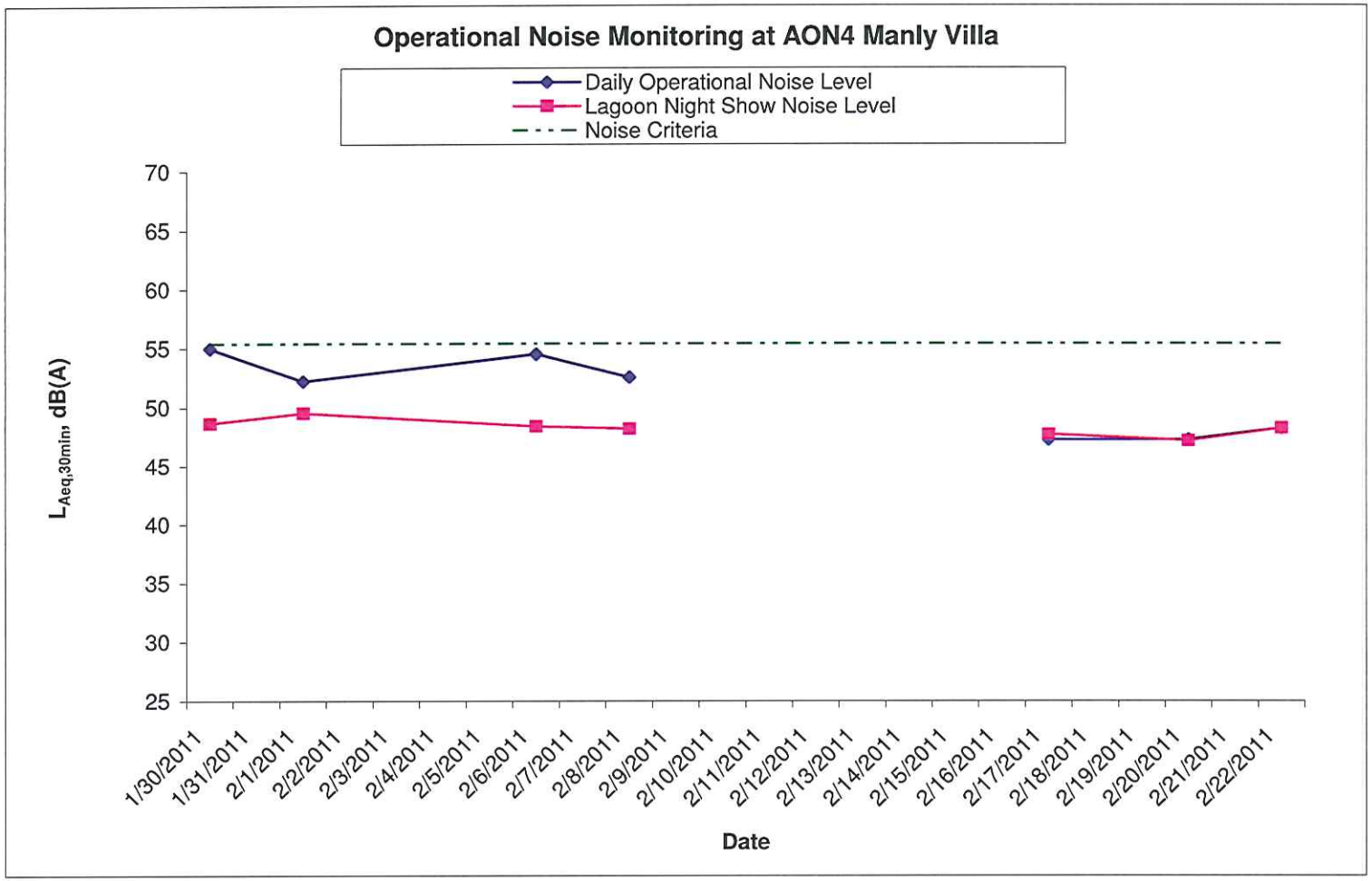
2/22/2011
Date

Annex B3-4


Operational Noise Monitoring at AON4 Manly Villa
Daily Operational Noise Level
Lagoon Night Show Noise Level
Noise Criteria
70
65
60
55
50
45
40
35
30
25
$L_{Aeq,30min}$, dB(A)
1/30/2011
1/31/2011
2/1/2011
2/2/2011
2/3/2011
2/4/2011
2/5/2011
2/6/2011
2/7/2011
2/8/2011
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2/10/2011
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2/14/2011
2/15/2011
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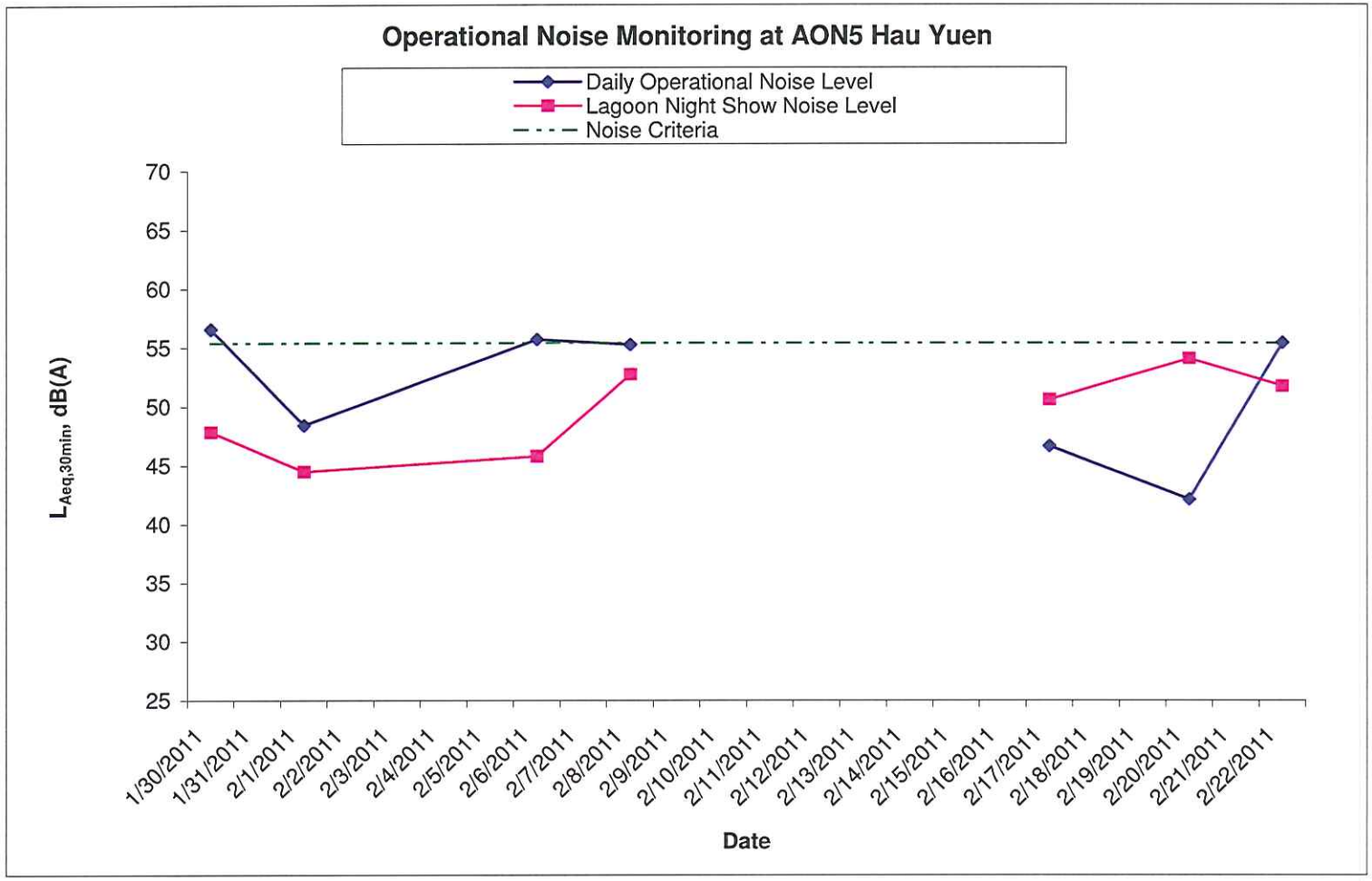
2/20/2011
2/21/2011
2/22/2011
Date

Annex B3-5



Note: The exceedance were due to the high level of background noise from visitors and traffic on public holidays, especially on 30 Jan and 6 Feb 2011, which were public holidays before and during the Chinese Lunar New Year.